



Water quality Data from two Agricultural Drainage Basins in Northwestern Indiana and Northeastern Illinois: II. Diel Data, 1999-2001



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Cover photograph: Top photo, Iroquois River at the CR 100W Newton County bridge near Kentland, Indiana, on April 3, 2002. Bottom photo, Sugar Creek at the State Highway 71 bridge near Raub, Indiana, on February 27, 2002.



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Water quality Data from two Agricultural Drainage Basins in Northwestern Indiana and Northeastern Illinois: II. Diel Data, 1999-2001

By Ronald C. Antweiler, Richard L. Smith, Mary A. Voytek and John-Karl Böhlke

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Conversion Factors

Multiply	By	To obtain
Length		
inch (in.)	2.54	centimeter (cm)
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
Volume		
gallon (gal)	3.785	liter (L)
gallon (gal)	0.003785	cubic meter (m ³)
cubic foot (ft ³)	0.02832	cubic meter (m ³)
Flow rate		
acre-foot per day (acre-ft/d)	0.01427	cubic meter per second (m ³ /s)
cubic foot per second (ft ³ /s)	0.02832	cubic meter per second (m ³ /s)

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:

$$^{\circ}\text{F}=(1.8\times^{\circ}\text{C})+32$$

Temperature in degrees Fahrenheit (°F) may be converted to degrees Celsius (°C) as follows:

$$^{\circ}\text{C}=(^{\circ}\text{F}-32)/1.8$$

ABBREVIATED WATER-QUALITY UNITS

Chemical concentration and water temperature are given only in metric units. Chemical concentration in water is given in milligrams per liter (mg/L), micrograms per liter (µg/L), or nanograms per liter (ng/L). Milligrams per liter is a unit expressing the solute mass (milligrams) per unit volume (liter) of water. One thousand micrograms per liter is equivalent to 1 milligram per liter. One thousand nanograms per liter is equivalent to 1 microgram per liter. For all concentrations in this report, concentrations in milligrams per liter are about the same as for concentrations in parts per million. Specific conductance is given in microsiemens per centimeter at 25 degrees Celsius (µS/cm at 25°C).

ABBREVIATED CHEMICAL NAMES

Throughout this report, chemical elements and compounds are abbreviated according to their chemical symbols. The table below describes these.

Symbol	Name	Symbol	Name	Symbol	Name
Al	Aluminum	HCO ₃	Bicarbonate	S	Sulfur
As	Arsenic	Hg	Mercury	SO ₄	Sulfate
B	Boron	Ho	Holmium	Sb	Antimony
Ba	Barium	K	Potassium	Se	Selenium
Be	Beryllium	La	Lanthanum	Si	Silicon
Bi	Bismuth	Li	Lithium	SiO ₂	Silica
Br	Bromine	Lu	Lutetium	Sm	Samarium
C	Carbon	Mg	Magnesium	Sr	Strontium
CO ₃	Carbonate	Mn	Manganese	Ta	Tantalum
Ca	Calcium	Mo	Molybdenum	Tb	Terbium
Cd	Cadmium	N	Nitrogen	Te	Tellurium
Ce	Cerium	NH ₄	Ammonium	Th	Thorium
Cl	Chlorine	NO ₂	Nitrite	Ti	Titanium
Co	Cobalt	NO ₃	Nitrate	Tl	Thallium
Cr	Chromium	Na	Sodium	Tm	Thulium
Cs	Cesium	Nd	Neodymium	U	Uranium
Cu	Copper	Ni	Nickel	V	Vanadium
DOC	Dissolved Organic Carbon	O	Oxygen	W	Tungsten
Dy	Dysprosium	P	Phosphorus	Y	Yttrium
Er	Erbium	PO ₄	Phosphate	Yb	Ytterbium
Eu	Europium	Pb	Lead	Zn	Zinc
Fe	Iron	Pr	Praseodymium	Zr	Zirconium
Gd	Gadolinium	Rb	Rubidium		
H	Hydrogen	Re	Rhenium		

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Abstract

Methods of data collection and results of analyses are presented for diel water-quality data collected from two nearby agricultural drainages in northwestern Indiana, the Iroquois River and Sugar Creek. During four separate sampling trips, in June and September 1999, May 2000 and September 2001, 208 discrete water samples were collected to document the aqueous chemistry over the course of 2 to 4 days on each of these drainages. Data were collected for nutrients, dissolved organic carbon, suspended sediment, major inorganic constituents (major cations and anions), trace elements, total bacterial counts, and chlorophyll-*a* concentrations. In addition, field measurements of water temperature, specific conductance, pH, and dissolved oxygen concentrations were made during all trips.

Introduction

Scientists first recorded hypoxic, or low-oxygen, zones on the continental shelf of the northern Gulf of Mexico in the 1970s (Turner and Allen, 1982), and began systematic assessments of these zones in 1985 (Rabalais and others, 1991). Studies have concluded that nutrient loads being carried by the Mississippi River are one of the dominant causes of this hypoxia (Bierman and others, 1994; Justic and others, 1993, 1995a, b; Rabalais, 1998; Rabalais and others, 1996, 1998; Turner and Rabalais, 1991, 1994). Other studies (for example, Antweiler and others, 1996a; Goolsby and others, 1999; Carey and others, 1999; Battaglin and others, 2001) determined that one of the chief sources of these nutrients within the Mississippi River was agricultural practices in the Upper Mississippi River basin (that part of the Mississippi River basin above the confluence with the Missouri River, herein called UMRB). At the same time, modeling studies (for instance, SPARROW, Smith and others, 1997; and Howarth and others, 1996) based on current understanding of nutrient processing in streams, indicated that large amounts of nitrate should have been removed by natural denitrification reactions within the surface waters of the UMRB, especially in the headwaters and small streams. These studies indicated that nitrate concentrations in some parts of the UMRB should be lower than they are. The apparent inconsistencies between the model results and observations led the U.S. Geological Survey (USGS) to undertake a study, in cooperation with the U.S. Department of Agriculture, to determine the sources and fate of nitrogen in representative headwaters streams of the UMRB. Accordingly, one sampling site on each of two small predominantly agricultural drainage basins of the Illinois River (one of the chief tributaries to

the Mississippi River in the UMRB) was selected for in-depth study. The basins are located in northwestern Indiana and northeastern Illinois, and the two sites were located on the Iroquois River, and one of its tributaries, Sugar Creek, both in northwestern Indiana (fig. 1). The chief motivation of the study was to collect data both spatially and temporally along each of the two selected drainages, with an ultimate aim to understanding in-stream processes, particularly involving inorganic nitrogen.

Purpose and Scope

This report describes data collected at two specific sites (one in each drainage basin) during each of four sampling trips ranging from June 1999 to September 2001. During these sampling trips, discrete water samples were collected every 2 to 4 hours over the course of the sampling trip, resulting in a total of 208 samples. In addition, continuous automated measurements were made during each trip of the water temperature, specific conductance, pH, and dissolved oxygen concentration. More long-term temporal data were collected at these same sites from a biweekly sampling effort which spanned 28 months. (Antweiler and others, 2005). The spatial component was examined by collecting Lagrangian and synoptic data along a reach on each drainage which encompassed the sampling sites in this report (Antweiler and others, 2004). Additional work, including tracer studies, ground-water analyses, and incubation studies also were performed at these sites. This report only describes the diel data, that is, the data which were collected every 2 to 4 hours during the four trips. In this report, the term ‘major inorganic constituents’ refers to major cations and anions.

Acknowledgments

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Sampling Locations and Times

Figure 1 shows the location of the two sample collection sites. The Iroquois River site was at the CR 100 W Newton County (Ind.) bridge crossing, approximately 3 kilometers east of U.S. Highway 41 and about 7 kilometers northeast of Kentland, Ind. The Sugar Creek site was at the Indiana State Highway 71 bridge crossing, which was approximately 3 kilometers east of the state line and about 12 kilometers southwest of Kentland, Ind.

There were four trips during which diel sampling occurred. Here, “diel sampling” refers to the collection of a sample every 2 to 4 hours during a span of 2 to 4 days encompassing a sampling trip. These trips were June 22-27, 1999; September 13-16, 1999; May 8-10, 2000; and September 10-14, 2001. They corresponded (roughly) to two mid-high-flow periods (June 1999 and May 2000) and two low-flow periods (September 1999 and September 2001). Table 1 lists the number and type of samples collected at each site during each of the four trips.

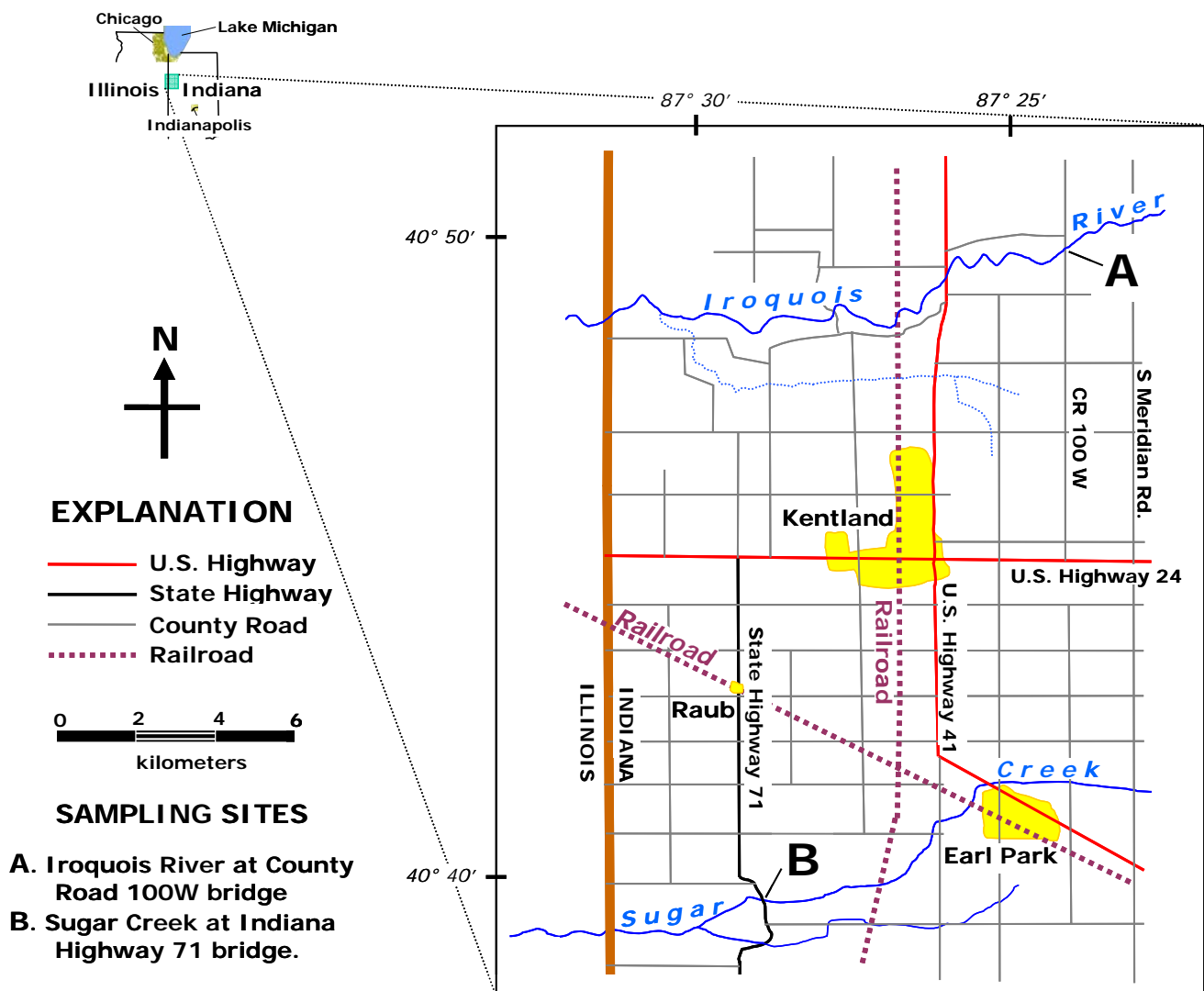


Figure 1. Location of the two sampling sites.

Table 1. Number and type of samples collected during each trip.

Drainage	Sample type	June 1999	Sept. 1999	May 2000	Sept. 2001
Iroquois River	Nutrients	11	26	22	33
	Dissolved Organic Carbon (DOC)	11	26	22	33
	Suspended Sediment	11	24	22	33
	Major inorganic constituents and trace elements	11	26	22	33
	Total bacterial count	10	26	19	0
	Chlorophyll- <i>a</i>	11	13	21	27
Sugar Creek	Nutrients	35	26	19	36
	Dissolved Organic Carbon (DOC)	27	25	16	36
	Suspended Sediment	34	26	15	36
	Major inorganic constituents and trace elements	35	26	19	36
	Total bacterial count	35	24	13	0
	Chlorophyll- <i>a</i>	18	13	9	22

Precipitation

Ideally, it was undesirable to sample during or directly after a rainstorm because precipitation tends to have a marked effect on the chemistry of river water, an effect which tends to be short-lived and therefore does not represent the longer-term processes occurring in the river. However once a sampling schedule was started, it was continued even in the event of rain. Daily precipitation data were collected from eight nearby weather stations which surrounded the study area (fig. 2) as shown in figure 3 for the three weeks preceding and the week of each of the sampling trips.

Methods of Data Collection

Although streamflow was not measured specifically for each sample collected, instantaneous flow measurements were made once at each sampling site during each of the four sampling periods according to standard USGS protocols (Rantz and others, 1982). Specifics about how streamflow was measured are contained in Antweiler and others (2004). In addition, there were two nearby USGS streamflow-gaging stations on the Iroquois River and one on Sugar Creek at which automated instantaneous discharge measurements were recorded during all four trips (fig. 2). The gaging stations on the Iroquois River are located near Foresman, Ind. (USGS Station ID 05524500) and at Iroquois, Ill. (USGS Station ID 05525000); the gaging station on Sugar Creek is located near Milford, Ill. (USGS Station ID 05525500). The Foresman gage is approximately 12 kilometers upstream from the sample site on the Iroquois River; the Iroquois gage is approximately 19 kilometers downstream from the sample site. The Milford gage is about 28 kilometers downstream from the Sugar Creek sample site and its measurements include three tributaries which enter the creek downstream from the sample site. Streamflow data for these gages are available from the USGS National Water Information System (NWIS) at <http://water.usgs.gov/nwis>.

Field parameters

Field parameters (water temperature, specific conductance, pH, and dissolved oxygen concentration) were collected and recorded using Hydrolab MiniSonde 4a and DataSonde 4a probes. The probes were deployed in-stream within 1-2 m of the water sampler collection tube, at mid-stream depth, by attaching them to metal posts with hose clamps. Immediately prior to deployment, pH was calibrated at 7 and 10, specific conductance was calibrated at 0 and 750 $\mu\text{S cm}^{-1}$, and dissolved oxygen was calibrated to 100 percent saturation. Field parameters were measured every 15 or 30 minutes. At the end of deployment, electrode drift for pH, specific conductance, and dissolved oxygen was checked using standard solutions. The maximum change was about 0.2 pH units, 2 percent for specific conductance, and 4 percent saturation for dissolved oxygen after a 1-week deployment. Readings were not corrected for drift.

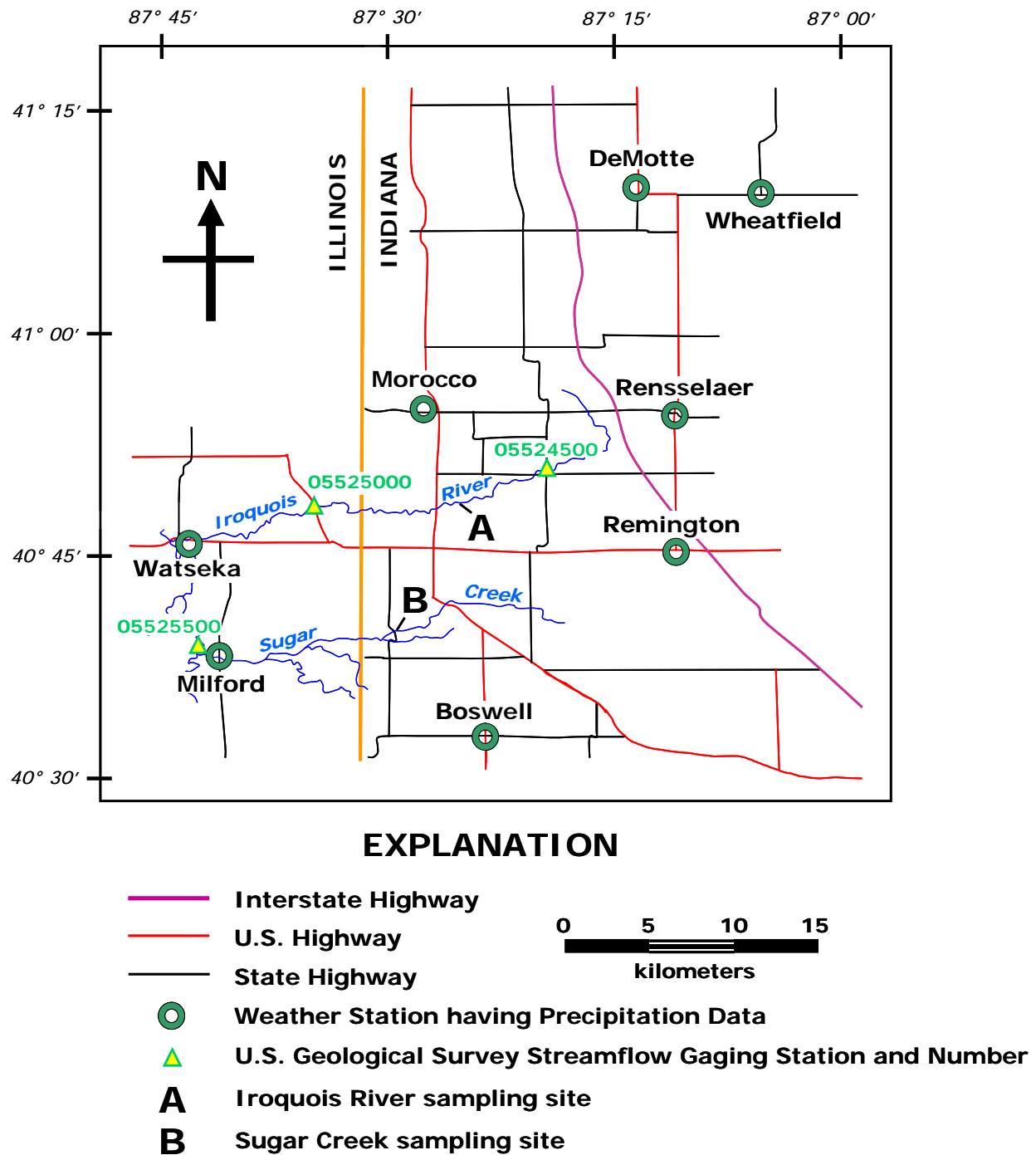


Figure 2. Eight local weather stations which had daily precipitation data available for the duration of the study, along with three USGS Streamflow gaging stations and their station numbers.

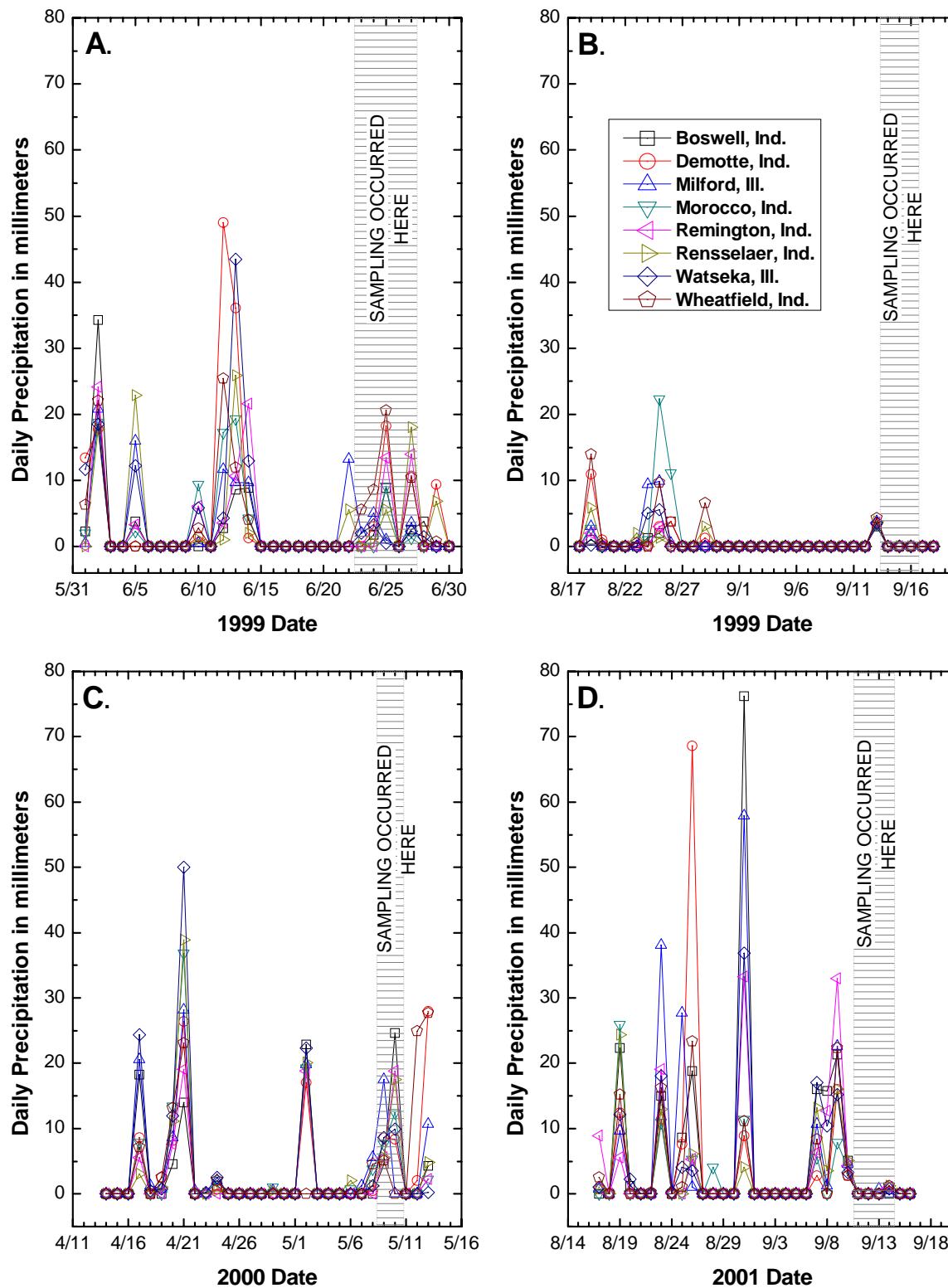


Figure 3. Daily precipitation data for eight weather stations preceding and during sampling trips in A. June 1999; B. September 1999; C. May 2000; D. September 2001.

Collection of water samples

Water samples were collected into four 1-L polyethylene bottles using an ISCO Model 3700 Portable Sampler. The water sampler was connected with Teflon tubing to a weighted intake tube whose suction end was placed at about mid-stream depth. The suction end was situated approximately 4 meters from the stream's edge and held in place with a metal post. The portable sampler was programmed to twice rinse the tubing extensively before the 1-L bottles were filled. Unfiltered samples were collected every 2 to 4 hours continuously during the sampling period on the particular drainage. Each sample consisted of four consecutively collected 1-L bottles. Samples were gathered and processed within 6 hours of collection. Interim storage occurred with chilling by filling the portable sampler center compartment with ice.

Processing of samples

After a sample was collected, the four 1-L bottles comprising that sample were transported to a field laboratory (located in Kentland, Ind., approximately 10 to 15 minutes away from either site, figure 1), where they were processed. At the field laboratory, one of the 1-L bottles was vigorously shaken and a 250-mL polyethylene bottle was filled for the determination of suspended sediment concentration. This aliquot was chilled until analysis. Next, a 19-mL aliquot was collected from the same 1-L bottle by decanting into a 20-mL glass bottle pre-dosed with 1 mL of formalin. This subsample was collected for the determination of total bacterial count; it was stored at room temperature for as many as 4 days and thereafter at 4°C until analysis.

A second 1-L bottle was filtered through a 47-mm diameter, 0.4-μm nominal pore-size glass-fiber filter (GFF) for chlorophyll-*a* analysis. The volume of water passing through the filter was recorded. The filtrate was disposed; the GFF was frozen with liquid nitrogen until analysis.

The remaining two 1-L bottles were filtered through a 0.2-μm Gelman spiral-cap capsule filter. Out of these two bottles, the first 400-500 mL of filtrate were discarded to acclimate the filter. Then, the following filtered aliquots were collected into pre-cleaned bottles: (1) 120 mL for trace metal and major cation analysis; this bottle was acidified with 1 mL of doubly-distilled trace-metal grade nitric acid; (2) 120 mL for mercury analysis; this bottle was preserved with 5-mL of a solution of 1 percent (by weight) potassium dichromate in concentrated nitric acid; (3) 120 mL for nutrient analyses; this aliquot was refrigerated to 4°C immediately after filtration; (4) 60 mL for major anions analysis; this aliquot was refrigerated to 4°C immediately after filtration; (5) 60 mL for dissolved organic carbon (DOC) analysis; this aliquot was refrigerated to 4°C after filtration.

Methods of Analysis

All samples were analyzed as described in Antweiler and others (2004). A brief summary is provided here. Nitrate, nitrite, ammonium, and phosphate were analyzed colorimetrically at the USGS National Research Program (NRP) laboratories in Boulder, Colo. (Antweiler and others, 1996b); Kjeldahl nitrogen was determined at the USGS National Water Quality Laboratories (NWQL) in Denver, Colo. on a select subset by digestion (Patton and Truitt, 2000).

Major cations, total phosphorus, silica, and dissolved iron were determined by inductively coupled-atomic emission spectrophotometry (ICP-AES) (Mitko and Bebek, 1999, 2000); trace elements (excluding Hg) were analyzed by inductively coupled-mass spectrometry (ICP-MS) (Taylor, 2001). Total dissolved mercury was analyzed by cold-vapor atomic fluorescence spectrophotometry (Roth and others, 2001). All of these analyses were done at the USGS NRP laboratories in Boulder, Colo.

Dissolved chloride, nitrate, and sulfate were analyzed by ion chromatography (Brinton and others, 1996); Total alkalinity was measured by titration (Kramer, 1982); and dissolved organic

carbon (DOC) were determined by infrared spectrometry (Wershaw and others, 1983). Suspended sediment concentrations were measured gravimetrically (Antweiler and others, 2004). All of these were analyzed at the USGS NRP laboratories in Boulder, Colo.

Total bacterial cell counts were made by staining with DAPI (4'6-diamidino-2-phenylindole) according to the method of Porter and Feig (1980). Chlorophyll-*a* was determined by fluorescence following the procedures of Arar and Collins (1997). Both of these were done at the USGS NRP laboratories in Reston, Vir.

Quality Control/Quality Assurance

The quality of the data for trace metals, major cations and anions, and nutrients was assessed by a vigorous program involving a large number of quality-control (QC) standards which were analyzed as unknowns during the analysis of all samples collected during the study. The frequency of analysis of these QC standards was variable depending upon the methodology used, but was always at least 20 percent of the total number of samples collected. All of the analyses for QC are presented in Antweiler and others (2004). Results of these analyses indicated good agreement between the published values and the observed concentrations for all trace elements, major inorganic constituents, and nutrients.

Field blank samples were collected during the June 1999, September 1999, and May 2000 sampling trips to evaluate whether field procedures could have introduced contamination into the samples. These data are presented in Antweiler and others (2004), and do not indicate any contamination problems.

Detection limits for all constituents are given in Antweiler and others (2004).

Results of Analyses

Continuous stream water field results, representing the water temperature, specific conductance, pH, and dissolved oxygen concentration from each of the four sampling trips, are presented graphically in figures 4-11. No field measurements were made on the Iroquois River during May 2000 because of instrument failure.

The results of all analyses for the diel sampling are contained in the tables of Appendix A. The general structure of these tables is as follows: All results from the Iroquois River sampling in June 1999 are presented first (tables A1-A4), followed by all results from the Sugar Creek sampling in June 1999 (tables A5-A8). Next, all the results from the September 1999 sampling trip are presented (tables A9-A16), followed by the May 2000 trip (tables A17-A24), and finally the September 2001 trip (tables A25-A32). For each site and sampling trip, the tables are ordered so that nutrient, DOC, and suspended sediment data are presented first, followed by data for major inorganic constituents, trace elements, and, finally, total bacterial counts and chlorophyll-*a* data. Average and standard deviation values shown for constituent concentrations in Tables A1-A3, A5-A7, A9-A11, A13-A15, A17-A19, A21-A23, A25-A27 and A29-A31 are based on multiple laboratory analyses on subsamples of each sample processed in the field.

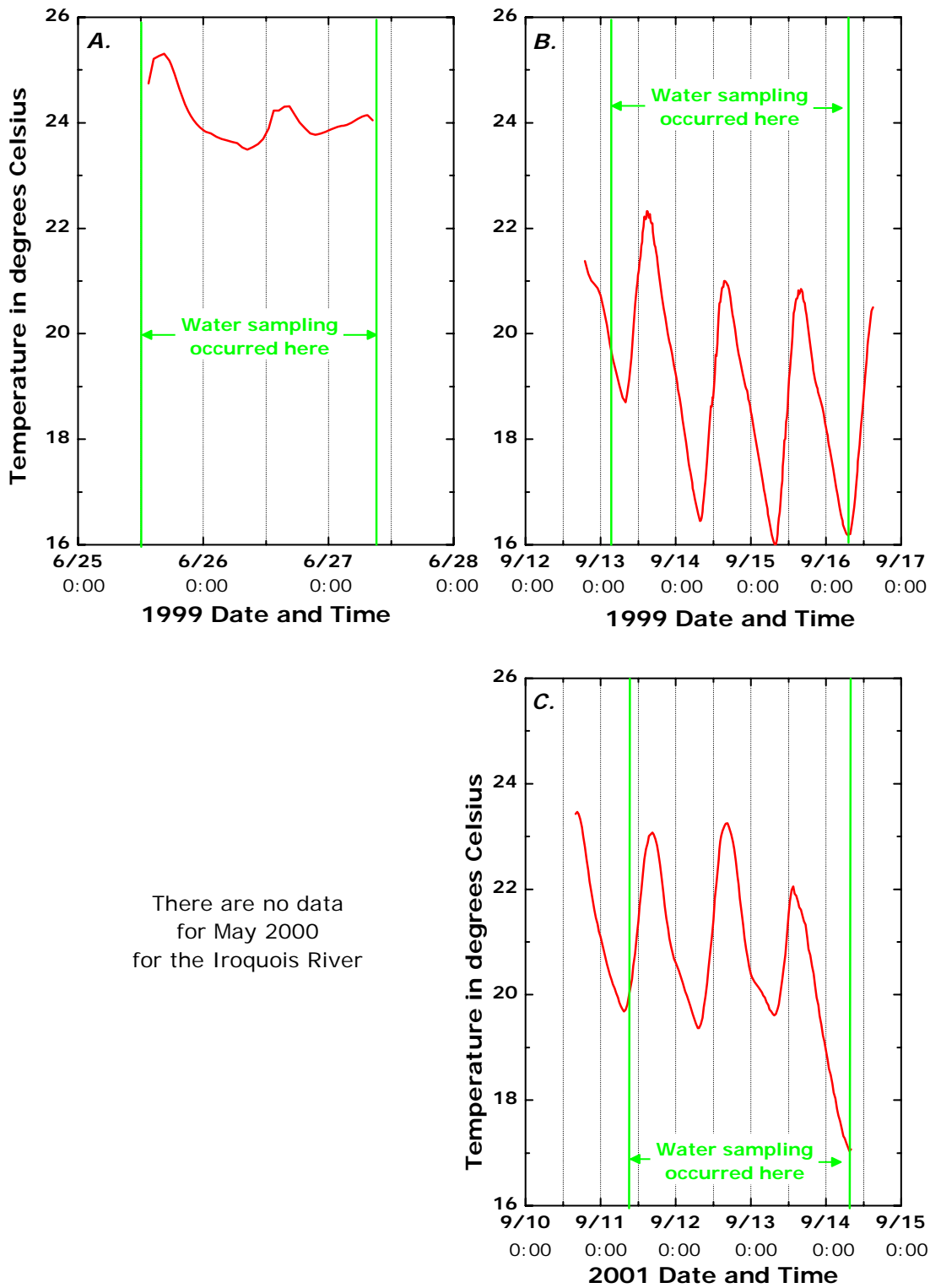


Figure 4. Water temperature of the Iroquois River at County Road 100W bridge, Ind. during: A. June 1999; B. September 1999; C. September 2001.

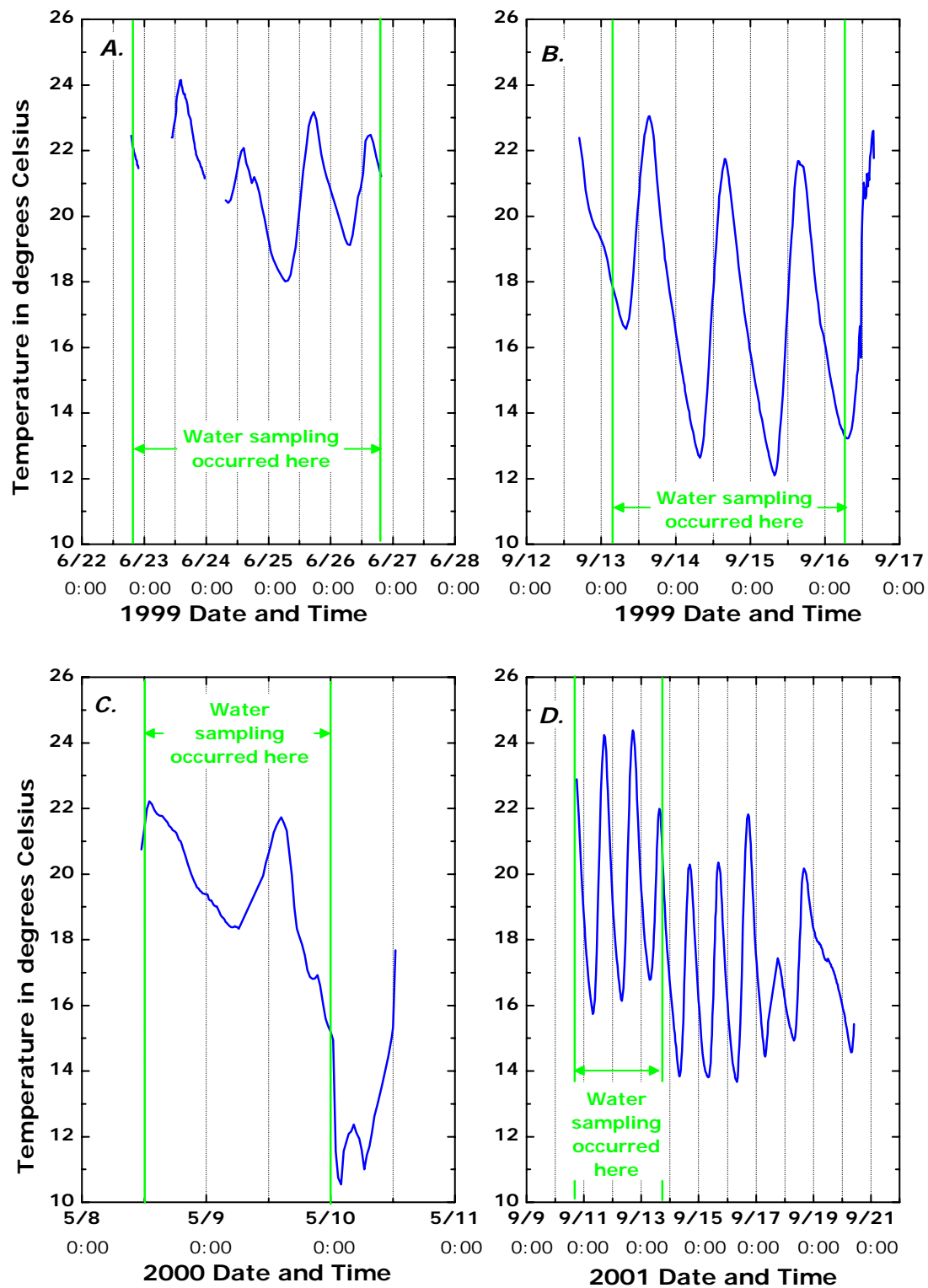


Figure 5. Water temperature of Sugar Creek at Indiana Highway 71 bridge during: A. June 1999; B. September 1999; C. May 2000; D. September 2001.

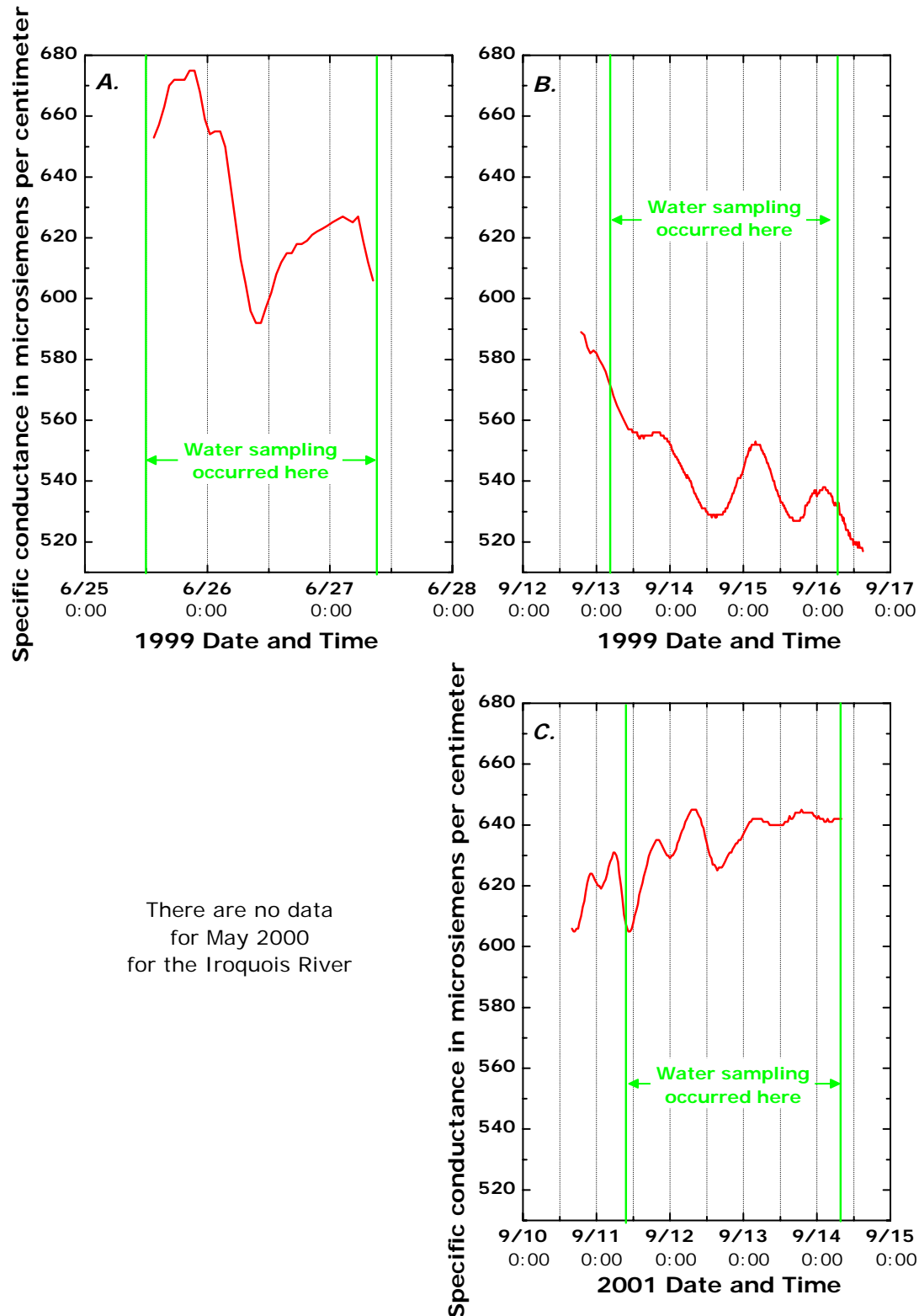


Figure 6. Specific conductance in the Iroquois River at County Road 100W bridge, Ind. during: A. June 1999; B. September 1999; C. September 2001.

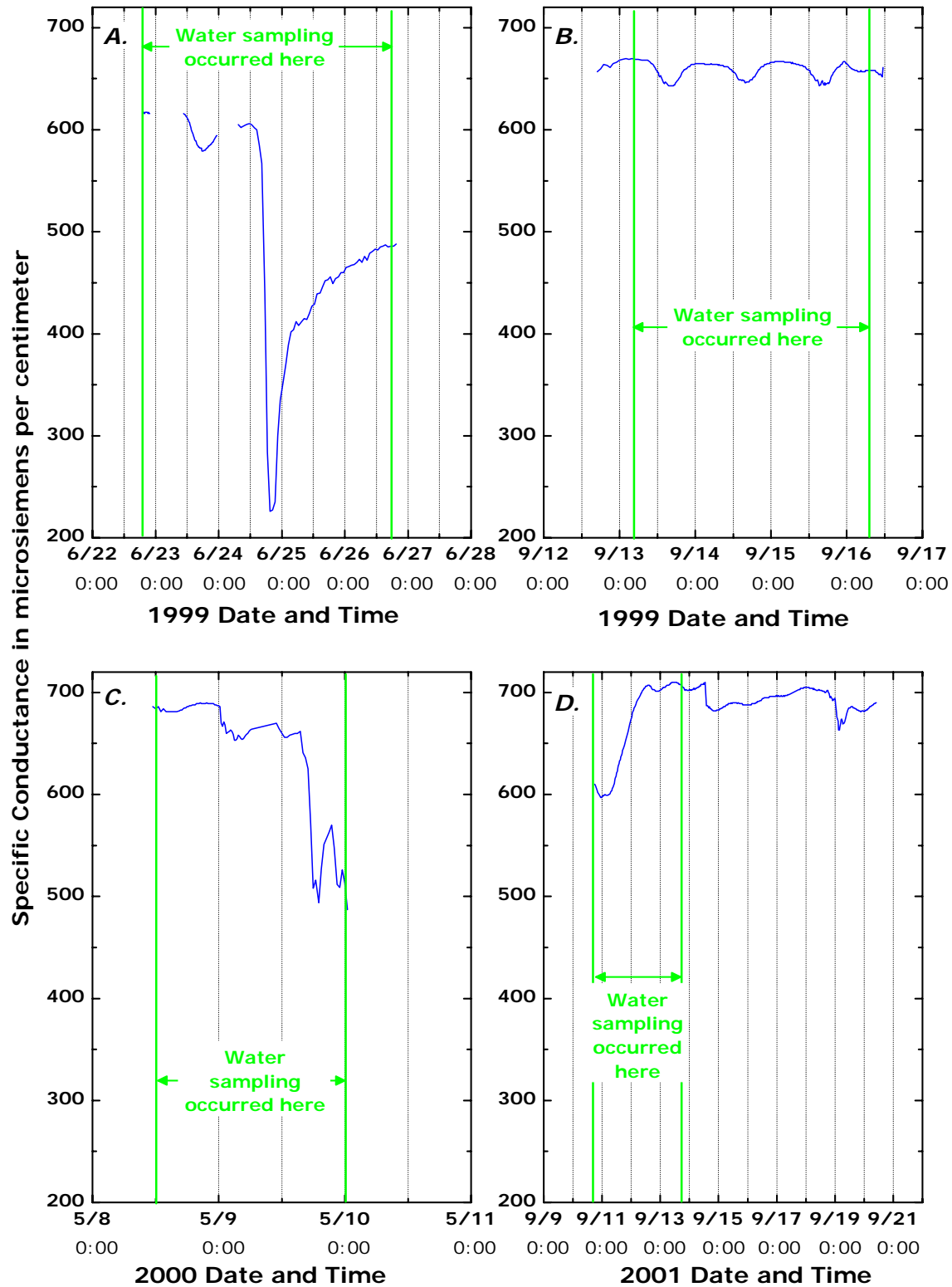


Figure 7. Specific conductance in Sugar Creek at Indiana Highway 71 bridge during: A. June 1999; B. September 1999; C. May 2000; D. September 2001.

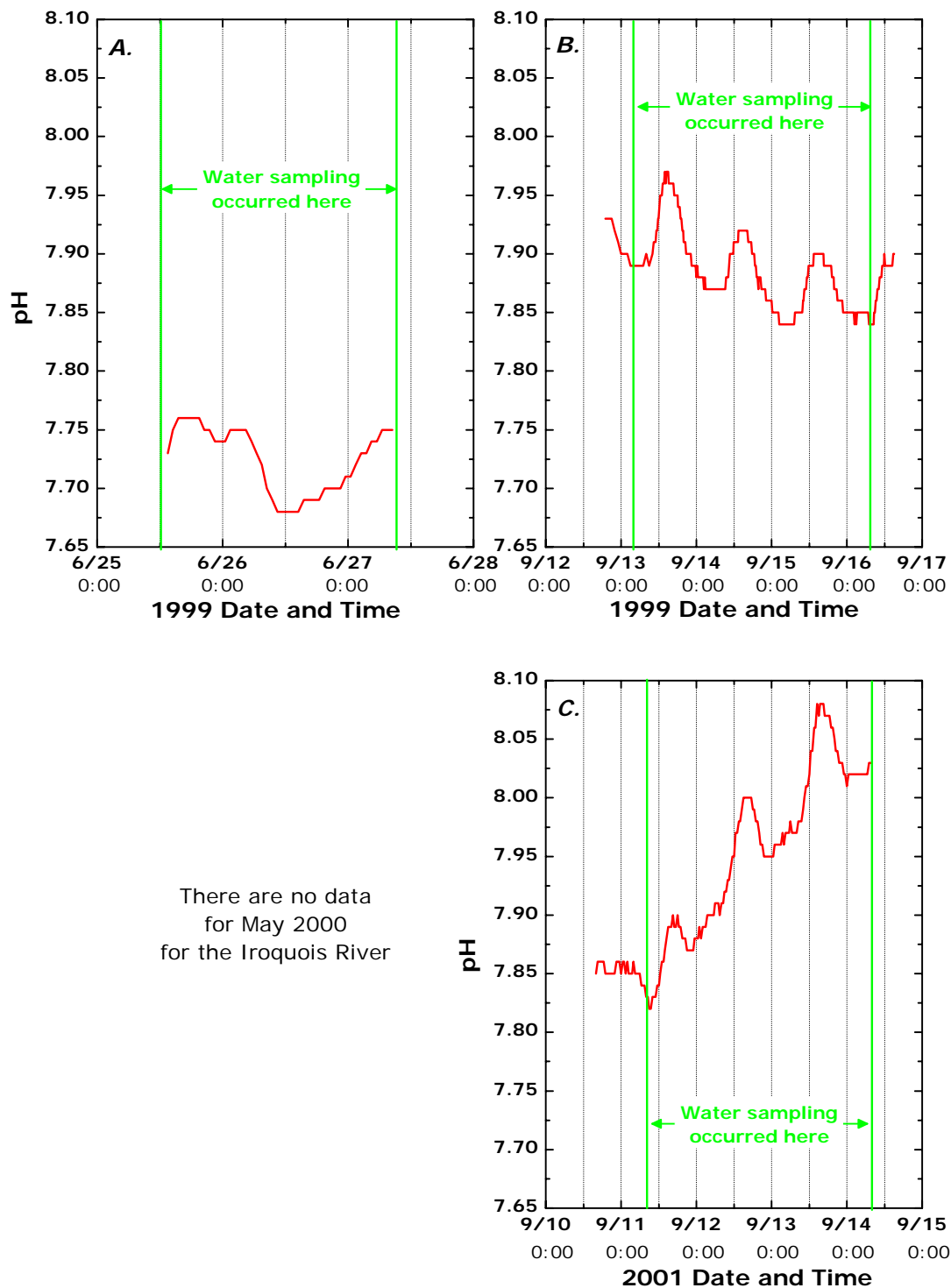


Figure 8. pH in the Iroquois River at County Road 100W bridge, Ind. during: A. June 1999; B. September 1999; C. September 2001.

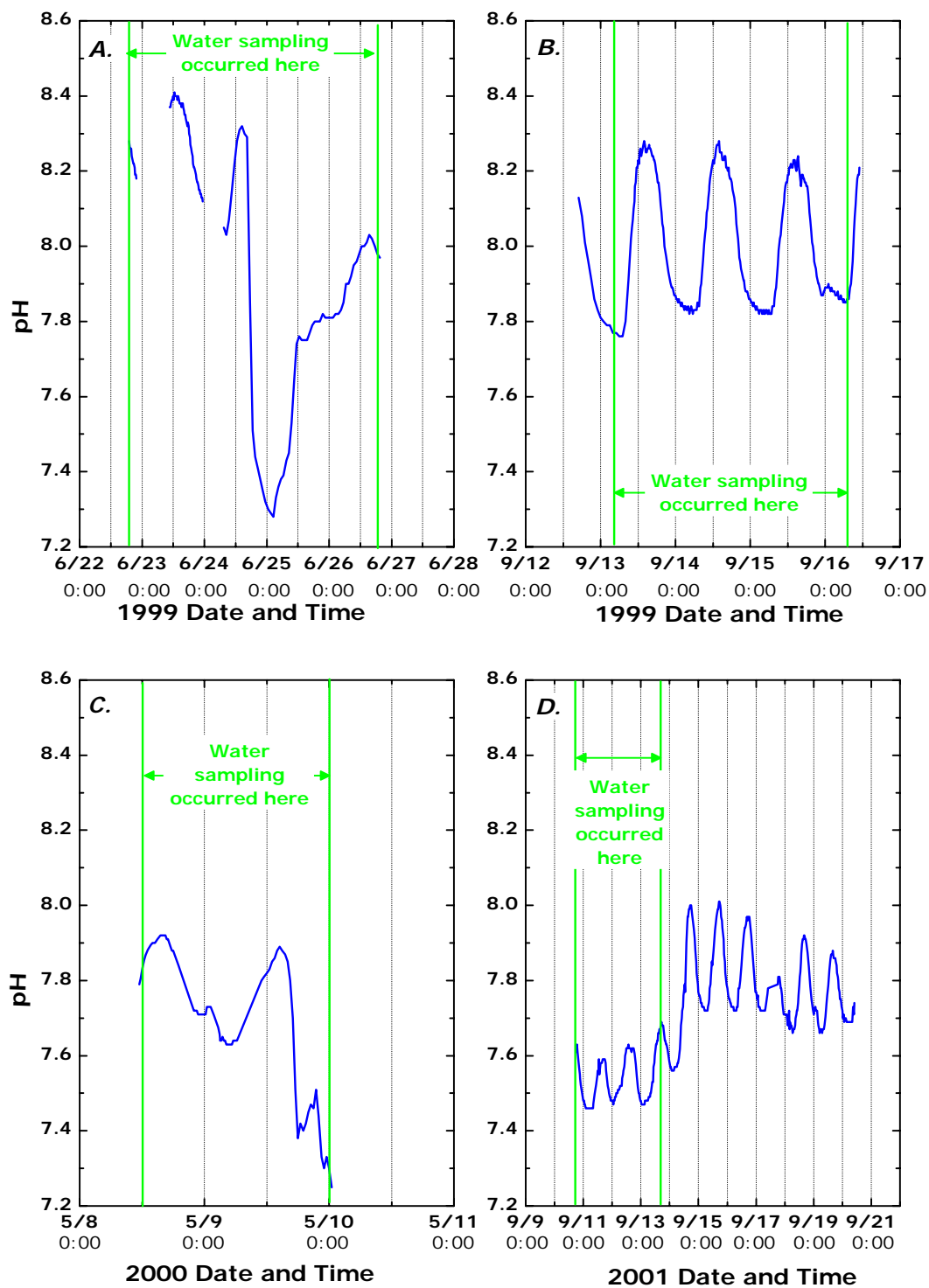


Figure 9. pH in Sugar Creek at Indiana Highway 71 bridge during: A. June 1999; B. September 1999; C. May 2000; D. September 2001.

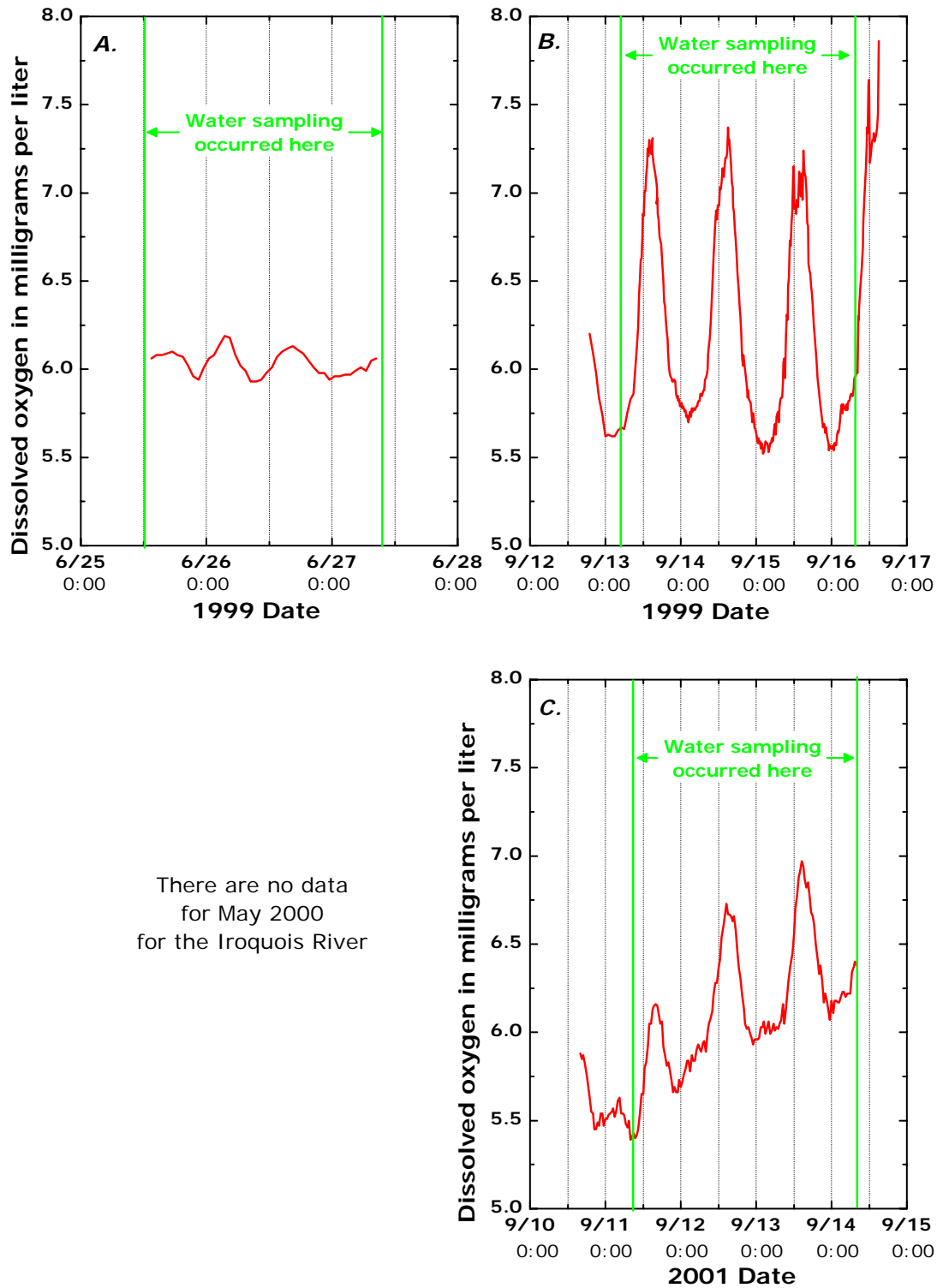


Figure 10. Dissolved oxygen concentrations in the Iroquois River at County Road 100W bridge, Ind. during: A. June 1999; B. September 1999; C. September 2001.

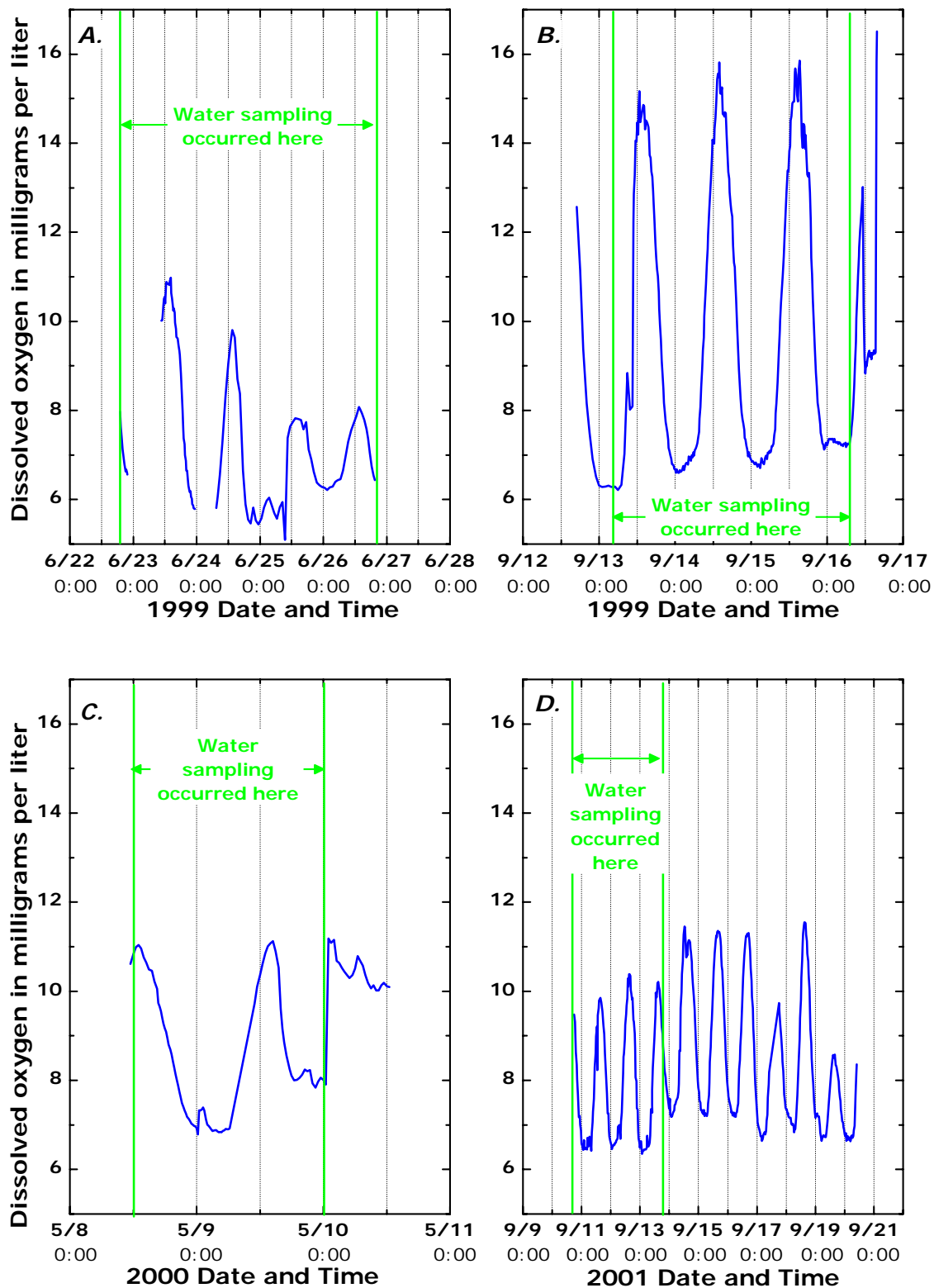


Figure 11. Dissolved oxygen concentrations in Sugar Creek at Indiana Highway 71 bridge during: A. June 1999; B. September 1999; C. May 2000; D. September 2001.

Instantaneous streamflow measured at each site during each trip are tabulated in Table 2, along with median values of selected chemical and biological parameters. The ranges of concentrations of a few major inorganic constituents are summarized in box plots (fig. 12A). Chloride concentrations ranged from 5 to 55 mg/L, and were generally higher in the Iroquois River than in Sugar Creek. Sulfate concentrations ranged from 11 to 114 mg/L, and were far more variable in Sugar Creek than in the Iroquois River. Calcium values ranged from 22 to 95 mg/L, and magnesium from 7 to 37 mg/L.

Nitrate concentrations (fig. 12B) were much higher in June 1999 and May 2000 than in September 1999 and 2001. For example, in May 2000, Sugar Creek nitrate concentrations varied from 9.9 to 15.4 mg N/L, whereas the highest concentration recorded in either September trip was 1.2 mg N/L. The opposite pattern was seen for potassium and, to a lesser extent, for silica, with lower concentrations observed during June 1999 and May 2000 than during either September trip. Concentrations of DOC ranged from 1.6 to 7.0 mg C/L, and tended to be higher on the Iroquois River.

The concentrations of four selected constituents at low-level concentrations (two trace elements and two nutrients) are presented in figure 12C. As with potassium and silica, boron and manganese concentrations were substantially higher during the two September trips for both drainages. For example, manganese concentrations ranged from 70 to 190 $\mu\text{g/L}$ during both September trips on the Iroquois River, compared with maximum concentrations of about 50 $\mu\text{g/L}$ during the June 1999 and May 2000 trips. Nitrite concentrations mirrored those of nitrate, showing higher concentrations during the June 1999 and May 2000 trips compared to the September trips. Ammonium concentrations did not show any consistent patterns, and ranged from near zero to 0.21 mg N/L (210 $\mu\text{g N/L}$).

Other trace elements tended to have low concentrations. For example, lead concentrations were all less than 0.22 $\mu\text{g/L}$, cadmium concentrations were all less than 0.16 $\mu\text{g/L}$, and nickel concentrations ranged from 0.1 to 2.4 $\mu\text{g/L}$.

Summary

This report contains the results of analyses made for diel sampling during four trips at two locations, one on Sugar Creek and the other on the Iroquois River, both of which flow in northwestern Indiana and northeastern Illinois. The four trips were in June 1999, September 1999, May 2000 and September 2001. The diel sampling consisted of the collection, processing and analysis of samples every 2 to 4 hours, and resulted in a total of 208 discrete samples. Additionally, continuous field measurements were taken (every 15-30 minutes) on each drainage of water temperature, specific conductance, pH, and dissolved oxygen concentration. Methods and results are reported for field parameters, nutrients, dissolved organic carbon, suspended sediment, major inorganic constituents (major cations and anions), trace elements, total bacterial counts and chlorophyll-*a*.

Table 2. A comparison of streamflow and median values of selected chemical and biological parameters for the Iroquois River and Sugar Creek.

[cms, cubic meters per second; mg/L, milligrams per liter; μ S/cm, microsiemens per centimeter; °C, degrees Celsius; mg N/L, milligrams per liter as nitrogen; mg P/L, milligrams per liter as phosphorus; mg C/L, milligrams per liter as carbon; meq/L, milliequivalents per liter; μ g/L, micrograms per liter; millions/mL, millions per milliliter; na, not available; <, less than]

Parameter	Units	Iroquois River				Sugar Creek		
		6/1999	9/1999	5/2000	9/2001	6/1999	9/1999	5/2000
Streamflow ¹	cms	7.4	0.62	17	1.2	0.51	0.062	0.57
Suspended Sediment	mg/L	59	64	47	49	18	7	13
Specific Conductance	μ S/cm	625	537	na	635	582	659	660
Water Temperature	°C	24.0	19.0	na	20.6	21.7	17.1	19.0
Dissolved Oxygen	mg/L	6.0	6.0	na	6.0	7.2	8.8	8.5
pH	pH	7.73	7.88	na	7.95	8.16	7.93	7.71
NO ₃	mg N/L	5.85	0.60	8.99	1.01	7.68	0.91	10.4
NO ₂	mg N/L	0.053	0.016	0.108	0.024	0.038	0.019	0.079
NH ₄	mg N/L	0.036	0.085	0.098	0.089	0.006	0.183	0.051
Kjeldahl N	mg N/L	0.58	0.54	0.60	0.56	0.29	0.18	0.32
PO ₄	mg P/L	0.034	0.063	0.029	0.036	< 0.02	< 0.02	< 0.006
DOC	mg C/L	6.3	6.2	5.4	6.4	3.1	2.4	3.0
Cl	mg/L	26	47	33	38	17	17	22
SO ₄	mg/L	51	75	73	62	58	105	64
Alkalinity	meq/L	3.82	4.48	4.05	4.02	3.99	4.03	4.15
Na	mg/L	9.7	26	11	22	6.1	9.3	7.3
K	mg/L	2.2	3.1	1.9	4.3	1.0	1.9	1.0
Mg	mg/L	20	26	24	23	25	33	29
Ca	mg/L	69	75	83	70	70	85	84
SiO ₂	mg/L	7.1	7.9	5.9	10.4	4.5	7.4	6.9
Al	μ g/L	1.90	1.66	1.76	1.11	1.30	0.63	1.50
As	μ g/L	1.17	1.78	0.74	1.92	0.55	0.93	0.58
B	μ g/L	51	123	46	96	44	71	42
Ba	μ g/L	60	74	60	69	49	47	48
Cd	μ g/L	0.012	0.012	0.015	< 0.006	0.015	0.008	0.003
Cu	μ g/L	0.86	1.26	1.03	1.12	0.48	1.21	1.04
Fe	μ g/L	9.7	4.6	16.9	11.8	9.7	15.4	33.9
Li	μ g/L	3.5	7.5	3.5	5.4	4.0	5.8	3.7
Mn	μ g/L	16	160	23	85	18	36	27
Mo	μ g/L	4.6	5.2	4.4	4.6	4.4	6.3	3.8
Ni	μ g/L	1.0	2.0	1.1	1.5	0.5	1.4	1.8
Pb	μ g/L	0.026	0.029	0.037	0.053	0.018	0.030	0.044
Rb	μ g/L	0.91	1.14	0.77	1.37	0.53	0.94	0.60
Sb	μ g/L	0.15	0.16	0.13	0.17	0.11	0.11	0.10
Se	μ g/L	0.41	0.28	0.99	0.34	0.67	0.46	1.90
Sr	μ g/L	234	399	247	280	165	177	174
Tl	μ g/L	0.012	0.006	0.009	0.005	0.010	0.017	0.010
U	μ g/L	1.7	1.2	2.2	1.2	2.3	2.9	2.6
V	μ g/L	1.0	1.2	0.1	1.2	0.5	< 0.1	< 0.2
Zn	μ g/L	0.9	0.8	1.2	1.2	2.0	1.1	1.6
Bacterial Cell Counts	millions/mL	1.4	0.9	2.6	na	1.6	2.5	2.4
Chlorophyll- <i>a</i>	μ g/L	8.1	6.2	5.0	8.5	9.1	7.6	4.7

¹Instantaneous streamflow measured at sites A (Iroquois River) and B (Sugar Creek) one time during each sampling trip.

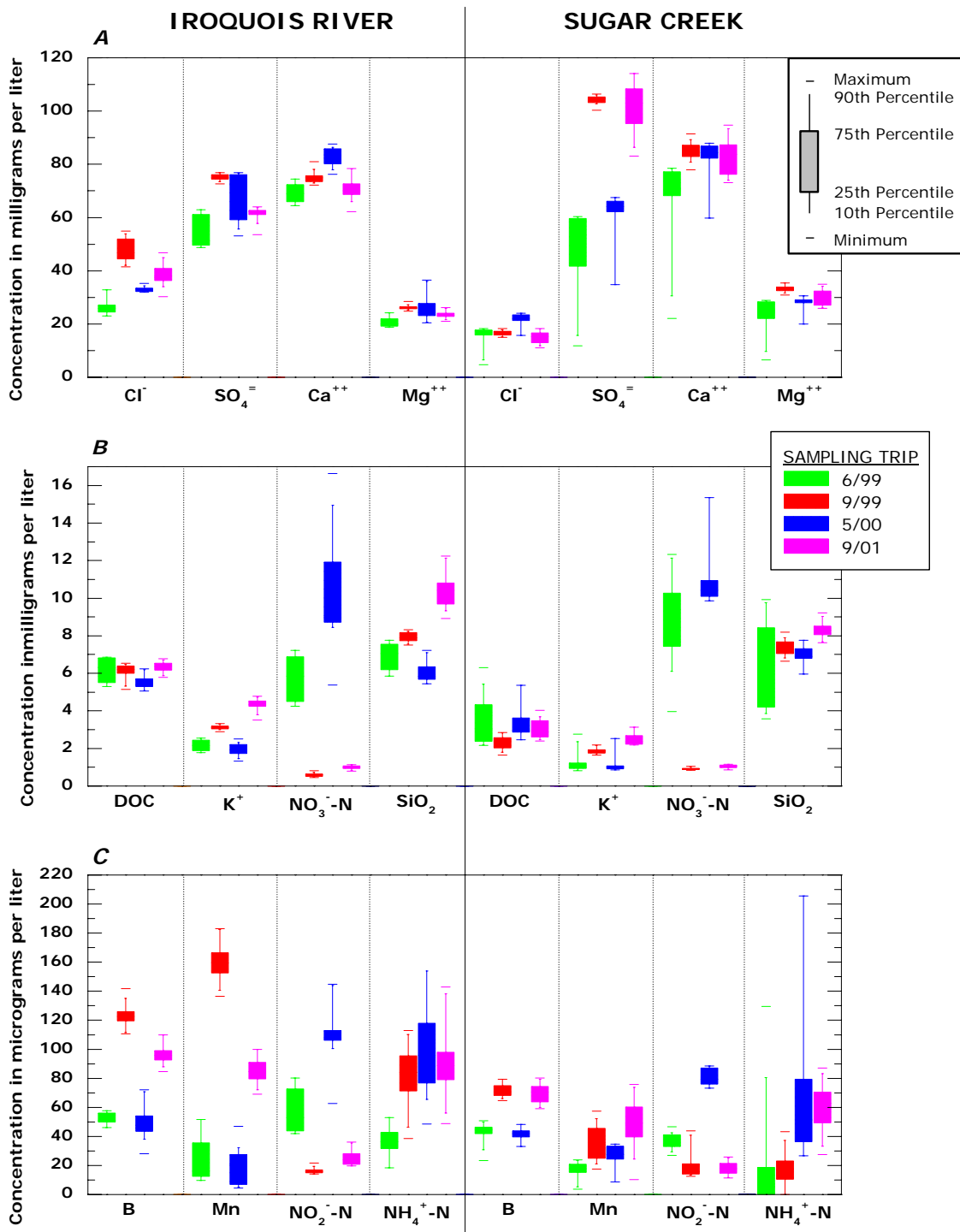


Figure 12. Box plots showing the concentration ranges of data for the Iroquois River at County Road 100W bridge, Ind. and Sugar Creek at Indiana Highway 71 bridge for (A) Major cations and anions: chloride (Cl⁻), sulfate (SO₄⁼), calcium (Ca⁺⁺) and magnesium (Mg⁺⁺); (B) Other dissolved species: dissolved organic carbon (DOC), potassium (K⁺), nitrate (NO₃⁻-N), and silica (SiO₂); (C) Selected constituents at low-level concentrations: boron (B), manganese (Mn), nitrite (NO₂⁻-N) and ammonium (NH₄⁺-N).

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Appendix A

Table A1. Concentrations of nutrients, dissolved organic carbon (DOC) and suspended sediment for samples collected on the Iroquois River during June 1999.

[hr, hours; mg/L, milligrams per liter; mg N/L, milligrams per liter as nitrogen; mg P/L, milligrams per liter as phosphorus; mg C/L, milligrams per liter as carbon; Avg, average; SD, standard deviation]

Date-Time	Time from start hr	NO ₃		NO ₂		NH ₄		Kjeldahl N		PO ₄		P		DOC		Suspended Sediment mg/L Value
		Avg	SD	Avg	SD	Avg	SD	mg N/L Value	mg N/L Value	Avg	SD	Avg	SD	mg C/L Avg	SD	
06/25/99 12:30	0.0	4.50	0.02	0.044	0.001	0.033	0.006	0.58	0.028	0.008	0.008	0.037	0.001	5.3	0.3	33
06/25/99 16:30	4.0	4.24	0.06	0.042	0.001	0.018	0.004	0.46	0.027	0.006	0.006	0.048	0.002	5.5	0.3	59
06/25/99 20:30	8.0	4.24	0.02	0.044	0.001	0.043	0.005	0.45	0.036	0.008	0.008	0.054	0.004	5.5	0.5	51
06/26/99 05:00	16.5	4.86	0.14	0.052	0.001	0.032	0.005	0.54	0.019	0.006	0.006	0.045	0.002	6.3	0.4	54
06/26/99 08:30	20.0	5.40	0.12	0.059	0.001	0.035	0.004	0.57	0.030	0.007	0.007	0.046	0.004	6.4	0.3	64
06/26/99 12:30	24.0	6.89	0.05	0.078	0.001	0.053	0.009	0.66	0.035	0.006	0.006	0.055	0.003	6.8	0.5	67
06/26/99 16:30	28.0	7.22	0.18	0.080	0.003	0.037	0.005	0.65	0.034	0.002	0.002	0.056	0.005	6.8	0.3	67
06/26/99 20:30	32.0	6.98	0.08	0.073	0.000	0.036	0.007	0.64	0.029	0.005	0.005	0.051	0.002	6.9	0.4	70
06/27/99 00:30	36.0	6.34	0.08	0.062	0.000	0.026	0.003	0.62	0.036	0.004	0.004	0.051	0.004	6.6	0.4	69
06/27/99 04:30	40.0	6.02	0.04	0.053	0.000	0.047	0.017	0.58	0.034	0.004	0.004	0.056	0.001	6.1	0.3	58
06/27/99 08:30	44.0	5.85	0.02	0.052	0.000	0.042	0.005	0.56	0.034	0.016	0.016	0.048	0.002	6.0	0.3	58

Table A2. Concentrations of major inorganic constituents for samples collected on the Iroquois River during June 1999.

[hr, hours; mg/L, milligrams per liter; mg C/L, milligrams per liter as carbon; µg/L, micrograms per liter; Avg, average; SD, standard deviation; na, not available]

Date-Time	Time from start hr	Cl		SO ₄		HCO ₃		CO ₃		Br		Na		K		Mg		Ca		SiO ₂	
		Avg	SD	Avg	SD	mg C/L Value	mg C/L Value	mg C/L Value	mg C/L Value	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
06/25/99 12:30	0.0	26.3	2.0	61.2	1.0	50.6	0.064	0.064	0.064	23	8	10.5	0.1	1.8	0.2	24	3	74	5	6.2	0.5
06/25/99 16:30	4.0	27.1	na	62.9	na	51.3	0.069	0.069	0.069	9	1	11.5	0.6	1.8	0.1	22	1	72	0	5.8	0.0
06/25/99 20:30	8.0	32.8	na	62.2	na	50.8	0.067	0.067	0.067	9	1	13.2	0.7	1.9	0.1	22	0	73	0	6.0	0.0
06/26/99 05:00	16.5	24.5	1.2	56.5	2.5	48.0	0.076	0.076	0.076	20	10	9.73	0.02	2.1	0.1	22	0	72	0	6.6	0.1
06/26/99 08:30	20.0	23.0	na	51.2	na	45.4	0.053	0.053	0.053	7	2	8.76	0.10	2.2	0.1	19	0	64	0	6.8	0.2
06/26/99 12:30	24.0	24.0	na	48.7	na	44.0	0.049	0.049	0.049	7	2	8.79	0.82	2.5	0.1	19	0	66	2	7.4	0.1
06/26/99 16:30	28.0	25.9	0.7	49.6	0.7	45.2	0.052	0.052	0.052	10	2	9.91	0.16	2.6	0.1	20	0	67	1	7.6	0.0
06/26/99 20:30	32.0	24.8	na	50.4	na	45.2	0.053	0.053	0.053	9	2	9.58	0.25	2.5	0.2	20	1	69	3	7.8	0.4
06/27/99 00:30	36.0	25.9	na	50.9	na	46.5	0.056	0.056	0.056	12	2	9.43	0.57	2.3	0.1	20	0	70	0	7.6	0.1
06/27/99 04:30	40.0	27.4	na	51.2	na	46.0	0.059	0.059	0.059	8	2	10.7	0.1	2.4	0.0	20	1	68	0	7.4	0.0
06/27/99 08:30	44.0	24.9	na	49.5	na	44.6	0.059	0.059	0.059	28	9	9.68	0.03	2.0	0.0	19	1	65	0	7.1	0.0

Table A3. Concentrations of trace elements for samples collected on the Iroquois River during June 1999.

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Al		As		B		Ba		Be		Bi		Cd		Ce		Co		Cr	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
06/25/99 12:30	0.0	1.9	0.1	1.10	0.02	53	0	59.7	0.6	<0.01	0.01	0.0008	0.0005	0.007	0.002	0.0202	0.0010	0.15	0.01	<0.4	0.0
06/25/99 16:30	4.0	3.2	0.2	1.20	0.03	57	2	62.6	1.1	<0.005	0.007	0.0056	0.0046	0.016	0.000	0.0260	0.0001	0.096	0.016	<0.2	0.0
06/25/99 20:30	8.0	1.9	0.1	1.20	0.01	58	2	64.8	1.2	<0.005	0.006	0.0018	0.0010	0.014	0.001	0.0208	0.0008	0.089	0.003	<0.2	0.1
06/26/99 05:00	16.5	1.7	0.0	1.14	0.02	56	3	60.8	1.6	<0.01	0.00	0.0031	0.0029	0.004	0.002	0.0215	0.0021	0.13	0.01	<0.4	0.2
06/26/99 08:30	20.0	2.1	0.2	1.13	0.02	48	2	55.8	1.1	<0.005	0.009	0.0015	0.0008	0.014	0.002	0.0193	0.0007	0.087	0.004	<0.2	0.1
06/26/99 12:30	24.0	2.0	0.2	1.19	0.05	50	2	58.2	1.6	<0.005	0.007	0.0020	0.0011	0.019	0.002	0.0179	0.0012	0.083	0.012	<0.2	0.0
06/26/99 16:30	28.0	2.2	0.1	1.17	0.02	51	3	60.2	1.5	0.005	0.017	0.0016	0.0010	0.011	0.002	0.0192	0.0003	0.098	0.018	<0.2	0.0
06/26/99 20:30	32.0	1.7	0.2	1.22	0.04	51	4	60.1	1.0	<0.005	0.011	0.0012	0.0009	0.008	0.002	0.0181	0.0004	0.078	0.007	<0.2	0.1
06/27/99 00:30	36.0	1.9	0.1	1.17	0.01	50	2	63.0	0.5	<0.005	0.011	0.0013	0.0010	0.010	0.002	0.0192	0.0003	0.074	0.008	<0.2	0.0
06/27/99 04:30	40.0	1.8	0.5	1.22	0.04	50	3	61.2	0.5	0.007	0.010	0.0016	0.0009	0.012	0.001	0.0187	0.0010	0.078	0.003	<0.2	0.1
06/27/99 08:30	44.0	1.9	0.2	1.10	0.05	46	3	57.9	0.3	<0.01	0.01	0.0016	0.0004	0.039	0.001	0.0164	0.0009	0.12	0.01	<0.4	0.0

Table A3. Concentrations of trace elements for samples collected on the Iroquois River during June 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start	Cs		Cu		Dy		Er		Eu		Fe		Gd		Hg	
	hr	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
06/25/99 12:30	0.0	<0.003	0.001	0.70	0.03	0.0047	0.0004	0.0044	0.0003	0.0025	0.0008	7.0	0.1	0.0050	0.0003	0.4	0.1
06/25/99 16:30	4.0	0.0017	0.0019	0.62	0.04	0.0044	0.0003	0.0046	0.0002	0.0009	0.0001	11	0	0.0067	0.0002	<0.3	0.0
06/25/99 20:30	8.0	<0.001	0.0005	0.61	0.07	0.0061	0.0001	0.0038	0.0003	<0.0004	0.0002	8.6	0.3	0.0062	0.0009	0.7	0.1
06/26/99 05:00	16.5	<0.003	0.001	0.80	0.04	0.0045	0.0009	0.0051	0.0005	0.0025	0.0009	11	0	0.0058	0.0006	0.4	0.2
06/26/99 08:30	20.0	0.0028	0.0019	0.89	0.01	0.0046	0.0001	0.0048	0.0002	0.0011	0.0007	9.7	0.2	0.0050	0.0007	0.3	0.1
06/26/99 12:30	24.0	0.0039	0.0011	0.97	0.01	0.0046	0.0004	0.0045	0.0016	0.0007	0.0007	8.5	0.3	0.0039	0.0004	116	3
06/26/99 16:30	28.0	0.0035	0.0008	0.98	0.02	0.0046	0.0003	0.0058	0.0012	0.0005	0.0008	8.2	0.4	0.0048	0.0007	0.3	0.1
06/26/99 20:30	32.0	0.0015	0.0009	0.90	0.01	0.0045	0.0002	0.0041	0.0004	0.0016	0.0003	9.9	0.7	0.0054	0.0001	<0.3	0.1
06/27/99 00:30	36.0	0.0016	0.0010	0.86	0.04	0.0048	0.0005	0.0053	0.0002	0.0015	0.0010	11	0	0.0044	0.0006	<0.3	0.2
06/27/99 04:30	40.0	0.0035	0.0024	0.86	0.05	0.0044	0.0006	0.0064	0.0005	0.0011	0.0010	11	0	0.0048	0.0006	0.4	0.2
06/27/99 08:30	44.0	<0.003	0.002	0.84	0.00	0.0045	0.0008	0.0048	0.0004	0.0015	0.0007	7.8	0.4	0.0048	0.0006	0.3	0.2

Table A3. Concentrations of trace elements for samples collected on the Iroquois River during June 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Ho		La		Li		Lu		Mn		Mo		Nd		Ni		Pb	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
06/25/99 12:30	0.0	0.0010	0.0000	0.0128	0.0008	4.17	0.13	0.0014	0.0002	51.5	0.5	5.11	0.03	0.0170	0.0008	1.02	0.36	0.021	0.004
06/25/99 16:30	4.0	0.0013	0.0001	0.0151	0.0002	4.10	0.04	0.0015	0.0001	37.5	0.0	5.08	0.09	0.0205	0.0016	0.86	0.17	0.028	0.000
06/25/99 20:30	8.0	0.0014	0.0001	0.0136	0.0007	4.00	0.11	0.0013	0.0003	35.4	0.6	4.91	0.10	0.0182	0.0009	0.98	0.21	0.028	0.004
06/26/99 05:00	16.5	0.0012	0.0001	0.0149	0.0006	4.09	0.00	0.0013	0.0001	20.4	1.9	4.87	0.20	0.0184	0.0015	0.83	0.07	0.025	0.003
06/26/99 08:30	20.0	0.0013	0.0001	0.0126	0.0005	3.38	0.04	0.0015	0.0002	15.2	0.6	4.36	0.12	0.0158	0.0008	1.18	0.06	0.025	0.003
06/26/99 12:30	24.0	0.0012	0.0002	0.0123	0.0006	3.43	0.17	0.0017	0.0001	16.0	0.2	4.13	0.08	0.0170	0.0004	0.95	0.02	0.027	0.005
06/26/99 16:30	28.0	0.0015	0.0001	0.0123	0.0005	3.56	0.12	0.0020	0.0001	30.4	0.2	4.28	0.08	0.0172	0.0016	0.92	0.00	0.030	0.002
06/26/99 20:30	32.0	0.0010	0.0000	0.0129	0.0004	3.42	0.03	0.0021	0.0003	12.6	0.2	4.45	0.06	0.0173	0.0015	1.25	0.21	0.021	0.002
06/27/99 00:30	36.0	0.0013	0.0002	0.0143	0.0007	3.24	0.06	0.0015	0.0001	13.1	0.1	4.56	0.13	0.0176	0.0003	1.49	0.25	0.026	0.003
06/27/99 04:30	40.0	0.0015	0.0002	0.0131	0.0006	3.45	0.07	0.0021	0.0003	11.6	0.2	4.45	0.08	0.0183	0.0024	1.19	0.29	0.035	0.014
06/27/99 08:30	44.0	0.0014	0.0001	0.0123	0.0004	3.32	0.19	0.0016	0.0001	9.8	0.7	4.57	0.12	0.0162	0.0013	1.22	0.30	0.014	0.003

Table A3. Concentrations of trace elements for samples collected on the Iroquois River during June 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start	Pr		Rb		Re		Sb		Se		Sm		Sr		Ta		Tb	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
06/25/99 12:30	0.0	0.0030	0.0000	0.79	0.01	0.0155	0.0011	0.150	0.005	0.41	0.05	0.0033	0.0002	246	3	< 0.004	0.002	0.0007	0.0001
06/25/99 16:30	4.0	0.0043	0.0001	0.81	0.01	0.0148	0.0002	0.145	0.005	0.34	0.03	0.0046	0.0010	262	1	< 0.001	0.001	0.0007	0.0001
06/25/99 20:30	8.0	0.0037	0.0003	0.85	0.01	0.0161	0.0018	0.149	0.005	0.35	0.05	0.0034	0.0011	257	1	< 0.001	0.000	0.0007	0.0002
06/26/99 05:00	16.5	0.0039	0.0004	0.86	0.00	0.0142	0.0015	0.144	0.005	0.48	0.06	0.0042	0.0008	249	6	< 0.004	0.002	0.0006	0.0001
06/26/99 08:30	20.0	0.0035	0.0002	0.92	0.01	0.0139	0.0001	0.147	0.008	0.31	0.03	0.0042	0.0003	223	3	0.002	0.000	0.0006	0.0001
06/26/99 12:30	24.0	0.0035	0.0003	1.03	0.02	0.0132	0.0015	0.155	0.004	0.41	0.06	0.0038	0.0004	225	3	0.002	0.001	0.0007	0.0001
06/26/99 16:30	28.0	0.0031	0.0000	1.00	0.00	0.0153	0.0007	0.164	0.002	0.45	0.08	0.0044	0.0015	230	2	< 0.001	0.000	0.0006	0.0002
06/26/99 20:30	32.0	0.0038	0.0003	0.96	0.03	0.0143	0.0009	0.156	0.005	0.48	0.04	0.0036	0.0002	235	4	0.002	0.001	0.0006	0.0003
06/27/99 00:30	36.0	0.0038	0.0001	0.91	0.02	0.0162	0.0000	0.162	0.003	0.34	0.03	0.0038	0.0002	234	1	< 0.001	0.001	0.0006	0.0001
06/27/99 04:30	40.0	0.0038	0.0003	0.91	0.02	0.0149	0.0005	0.159	0.006	0.47	0.04	0.0039	0.0006	231	1	< 0.001	0.000	0.0008	0.0002
06/27/99 08:30	44.0	0.0033	0.0001	0.89	0.03	0.0141	0.0005	0.154	0.002	0.43	0.13	0.0040	0.0001	217	3	< 0.004	0.002	0.0006	0.0001

Table A3. Concentrations of trace elements for samples collected on the Iroquois River during June 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start	Te		Th		Ti		Tl		Tm		U		V		W	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
06/25/99 12:30	0.0	0.014	0.004	0.0011	0.0003	<0.06	0.02	0.011	0.001	0.0008	0.0001	1.98	0.07	0.92	0.15	0.008	0.003
06/25/99 16:30	4.0	<0.009	0.002	0.0010	0.0001	<0.04	0.11	0.011	0.000	0.0009	0.0001	1.97	0.01	1.03	0.08	0.005	0.002
06/25/99 20:30	8.0	<0.009	0.001	0.0008	0.0001	0.04	0.03	0.010	0.001	0.0008	0.0001	1.94	0.03	0.96	0.01	0.005	0.002
06/26/99 05:00	16.5	0.011	0.006	0.0016	0.0001	<0.06	0.04	0.018	0.009	0.0008	0.0001	1.85	0.07	0.97	0.05	0.008	0.002
06/26/99 08:30	20.0	0.013	0.002	0.0014	0.0000	0.06	0.07	0.020	0.001	0.0007	0.0001	1.61	0.01	1.04	0.14	0.011	0.002
06/26/99 12:30	24.0	<0.009	0.002	0.0012	0.0000	<0.04	0.10	0.012	0.002	0.0009	0.0001	1.58	0.02	1.04	0.04	0.005	0.001
06/26/99 16:30	28.0	<0.009	0.005	0.0011	0.0000	0.07	0.07	0.012	0.001	0.0011	0.0001	1.67	0.02	1.17	0.12	0.006	0.001
06/26/99 20:30	32.0	<0.009	0.005	0.0014	0.0002	0.05	0.08	0.012	0.001	0.0009	0.0001	1.79	0.03	1.09	0.04	0.007	0.002
06/27/99 00:30	36.0	0.012	0.002	0.0015	0.0001	0.04	0.08	0.011	0.001	0.0010	0.0002	1.73	0.01	1.05	0.07	0.007	0.002
06/27/99 04:30	40.0	<0.009	0.001	0.0012	0.0001	<0.04	0.06	0.012	0.000	0.0010	0.0001	1.72	0.03	1.14	0.16	0.019	0.004
06/27/99 08:30	44.0	0.012	0.000	0.0009	0.0002	<0.06	0.02	0.014	0.002	0.0009	0.0002	1.72	0.08	0.95	0.19	0.007	0.000

Table A3. Concentrations of trace elements for samples collected on the Iroquois River during June 1999 -- continued

[hr, hours; µg/L, micrograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Y		Yb		Zn		Zr	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD
06/25/99 12:30	0.0	0.0421	0.0007	0.0062	0.0006	0.48	0.02	0.082	0.012
06/25/99 16:30	4.0	0.0468	0.0003	0.0064	0.0007	2.39	0.02	0.0758	0.0029
06/25/99 20:30	8.0	0.0422	0.0014	0.0069	0.0002	0.98	0.05	0.0713	0.0033
06/26/99 05:00	16.5	0.0435	0.0008	0.0066	0.0004	1.43	0.11	0.092	0.012
06/26/99 08:30	20.0	0.0399	0.0004	0.0061	0.0006	1.71	0.04	0.0859	0.0002
06/26/99 12:30	24.0	0.0409	0.0010	0.0085	0.0008	0.54	0.05	0.0906	0.0043
06/26/99 16:30	28.0	0.0440	0.0008	0.0091	0.0003	0.89	0.08	0.0988	0.0050
06/26/99 20:30	32.0	0.0454	0.0006	0.0098	0.0007	0.52	0.03	0.0940	0.0046
06/27/99 00:30	36.0	0.0429	0.0004	0.0090	0.0001	1.26	0.12	0.0921	0.0027
06/27/99 04:30	40.0	0.0420	0.0011	0.0089	0.0006	0.92	0.04	0.0785	0.0049
06/27/99 08:30	44.0	0.0370	0.0003	0.0077	0.0012	0.45	0.02	0.074	0.007

Table A4. Bacterial cell counts and chlorophyll-*a* concentrations for samples collected on the Iroquois River during June 1999.

[hr, hours; µg/L, micrograms per liter; millions/mL, millions per milliliter; na, not available]

Date-Time	Time from start hr	Bacterial Cell Counts millions/mL	Chlorophyll- <i>a</i> concentrations µg/L
06/25/99 12:30	0.0	1.51	7.37
06/25/99 16:30	4.0	1.10	8.26
06/25/99 20:30	8.0	1.58	6.91
06/26/99 05:00	16.5	0.98	6.91
06/26/99 08:30	20.0	1.36	9.35
06/26/99 12:30	24.0	1.34	10.7
06/26/99 16:30	28.0	1.67	9.13
06/26/99 20:30	32.0	0.78	7.53
06/27/99 00:30	36.0	na	6.93
06/27/99 04:30	40.0	1.19	8.55
06/27/99 08:30	44.0	1.40	8.15

Table A5. Concentrations of nutrients, dissolved organic carbon (DOC) and suspended sediment for samples collected on Sugar Creek during June 1999.

[hr, hours; mg/L, milligrams per liter; mg N/L, milligrams per liter as nitrogen; mg P/L, milligrams per liter as phosphorus; mg C/L, milligrams per liter as carbon; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	NO ₃		NO ₂		NH ₄		Kjeldahl N		PO ₄		P		DOC		Suspended Sediment	
		Avg	SD	Avg	SD	Avg	SD	Value	mg N/L	Avg	SD	Avg	SD	Avg	SD	mg/L	Value
06/22/99 19:00	0.0	7.81	0.05	0.036	0.001	<0.003	0.005	0.24	<0.02	0.01	0.01	<0.004	0.002	2.3	0.0	22	
06/22/99 21:00	2.0	7.82	0.03	0.035	0.001	0.016	0.003	0.24	<0.02	0.01	0.01	<0.004	0.001	2.8	0.2	25	
06/22/99 23:00	4.0	7.68	0.14	0.036	0.001	0.005	0.001	0.25	<0.02	0.00	0.00	<0.004	0.003	na	na	17	
06/23/99 01:00	6.0	7.74	0.12	0.038	0.001	<0.003	0.003	0.22	<0.02	0.00	0.00	<0.004	0.001	2.2	0.3	na	
06/23/99 07:30	12.5	7.57	0.19	0.041	0.002	0.008	0.005	0.23	<0.02	0.01	0.01	<0.004	0.002	na	na	14	
06/23/99 10:30	15.5	7.68	0.07	0.041	0.000	0.005	0.004	0.22	<0.02	0.00	0.00	<0.004	0.001	na	na	4	
06/23/99 12:30	17.5	7.59	0.02	0.042	0.002	<0.003	0.003	0.21	<0.02	0.01	0.01	<0.004	0.001	2.2	0.1	11	
06/23/99 14:30	19.5	7.71	0.28	0.041	0.001	<0.003	0.003	0.24	<0.02	0.00	0.00	<0.004	0.001	na	na	8	
06/23/99 16:30	21.5	7.46	0.04	0.038	0.001	<0.003	0.004	0.48	<0.02	0.01	0.01	<0.004	0.001	na	na	10	
06/23/99 18:30	23.5	7.48	0.25	0.036	0.000	<0.003	0.002	0.29	<0.02	0.01	0.01	<0.004	0.001	2.6	0.1	11	
06/23/99 20:30	25.5	7.50	0.03	0.035	0.001	0.004	0.006	0.20	<0.02	0.01	0.01	<0.004	0.002	na	na	10	
06/23/99 22:30	27.5	7.54	0.09	0.036	0.001	<0.003	0.001	0.26	<0.02	0.00	0.00	<0.004	0.001	3.7	0.2	14	
06/24/99 00:30	29.5	7.34	0.06	0.037	0.000	0.004	0.004	0.26	<0.02	0.00	0.00	<0.004	0.001	na	na	14	
06/24/99 02:30	31.5	7.44	0.13	0.039	0.001	<0.003	0.003	0.29	<0.02	0.00	0.00	<0.004	0.003	2.3	0.3	14	
06/24/99 04:30	33.5	7.43	0.15	0.039	0.001	<0.003	0.004	0.23	<0.02	0.00	0.00	<0.004	0.000	na	na	12	
06/24/99 06:30	35.5	7.49	0.07	0.040	0.000	0.004	0.002	0.26	<0.02	0.01	0.01	<0.004	0.001	2.3	0.2	10	
06/24/99 08:30	37.5	7.28	0.05	0.041	0.001	0.009	0.002	0.20	<0.02	0.00	0.00	<0.004	0.002	2.9	0.4	10	
06/24/99 10:30	39.5	7.27	0.26	0.042	0.001	0.005	0.005	0.27	<0.02	0.01	0.01	<0.004	0.002	2.4	0.2	8	
06/24/99 12:30	41.5	7.29	0.05	0.042	0.000	0.007	0.000	0.24	<0.02	0.00	0.00	<0.004	0.001	2.4	0.2	12	
06/24/99 14:30	43.5	7.29	0.01	0.041	0.000	<0.003	0.002	0.27	<0.02	0.00	0.00	<0.004	0.001	2.5	0.2	8	
06/24/99 16:30	45.5	6.38	0.00	0.038	0.001	<0.003	0.001	0.32	<0.02	0.00	0.00	<0.004	0.001	2.7	0.0	349	
06/24/99 18:30	47.5	3.97	0.08	0.027	0.001	0.130	0.006	0.51	0.075	0.029	0.029	0.087	0.002	4.3	0.6	810	
06/24/99 20:30	49.5	6.11	0.12	0.035	0.001	0.080	0.018	0.57	0.106	0.006	0.006	0.116	0.002	5.1	0.6	392	
06/25/99 00:30	53.5	8.37	0.02	0.041	0.001	0.034	0.006	0.54	0.098	0.006	0.006	0.105	0.005	5.4	0.3	191	
06/25/99 04:30	57.5	10.55	0.14	0.047	0.001	0.025	0.007	0.55	0.052	0.002	0.002	0.051	0.003	4.5	0.2	117	
06/25/99 08:30	61.5	11.36	0.70	0.038	0.001	0.027	0.004	0.56	0.031	0.007	0.007	0.033	0.003	6.3	0.2	110	
06/25/99 10:30	63.5	12.34	0.13	0.032	0.001	0.025	0.010	0.53	0.021	0.010	0.010	0.034	0.004	4.6	0.2	73	

Table A5. Concentrations of nutrients, dissolved organic carbon (DOC) and suspended sediment for samples collected on Sugar Creek during June 1999 -- continued

[hr, hours; mg/L, milligrams per liter; mg N/L, milligrams per liter as nitrogen; mg P/L, milligrams per liter as phosphorus; mg C/L, milligrams per liter as carbon; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	NO ₃		NO ₂		NH ₄		Kjeldahl N		PO ₄		P		DOC		Suspended Sediment	
		Avg	SD	Avg	SD	Avg	SD	mg N/L	Value	Avg	SD	Avg	SD	mg C/L	SD	mg/L	Value
06/25/99 14:30	67.5	11.99	0.35	0.031	0.001	0.020	0.005	0.51	0.51	0.015	0.006	0.029	0.004	4.3	0.1	70	
06/25/99 18:30	71.5	12.13	0.38	0.032	0.001	0.019	0.007	0.46	0.46	0.010	0.005	0.028	0.001	4.3	0.2	52	
06/25/99 22:30	75.5	11.63	0.06	0.030	0.001	0.006	0.003	0.43	0.43	<0.006	0.004	0.024	0.002	4.0	0.3	58	
06/26/99 00:30	77.5	11.08	0.25	0.031	0.000	0.017	0.008	0.42	0.42	<0.006	0.005	0.020	0.002	3.8	0.2	36	
06/26/99 04:30	81.5	8.52	0.21	0.040	0.000	0.021	0.008	0.43	0.43	0.018	0.004	0.031	0.002	4.5	0.3	54	
06/26/99 08:30	85.5	10.26	0.47	0.033	0.001	0.006	0.006	0.38	0.38	<0.006	0.002	0.021	0.001	3.3	0.2	37	
06/26/99 12:30	89.5	10.48	0.32	0.031	0.001	0.008	0.004	0.36	0.36	<0.006	0.003	0.017	0.002	3.1	0.2	23	
06/26/99 16:30	93.5	9.99	0.31	0.029	0.001	0.008	0.006	0.34	0.34	<0.006	0.007	0.017	0.003	2.8	0.3	18	

Table A6. Concentrations of major inorganic constituents for samples collected on Sugar Creek during June 1999.

[hr, hours; mg/L, milligrams per liter; mg C/L, milligrams per liter as carbon; µg/L, micrograms per liter; Avg, average; SD, standard deviation; na, not available]

Date-Time	Time from start hr	Cl		SO ₄		HCO ₃		CO ₃		Br		Na		K		Mg		Ca		SiO ₂	
		Avg	SD	mg/L	mg/L	mg C/L	mg C/L	mg C/L	mg C/L	μg/L	Avg	SD	mg/L	mg/L	mg/L	mg/L	Avg	SD	mg/L	mg/L	Avg
06/22/99 19:00	0.0	17.9	na	58.9	na	47.3	0.21	0.19	47.3	21	8	6.20	0.09	0.87	0.05	25	1	70	2	4.2	0.1
06/22/99 21:00	2.0	18.3	0.9	59.0	1.2	49.2	0.19	0.19	49.2	17	8	6.14	0.04	0.87	0.03	25	1	72	3	4.3	0.1
06/22/99 23:00	4.0	18.0	na	58.0	na	51.1	0.19	0.19	51.1	7	1	6.10	0.23	0.82	0.04	24	0	69	1	3.9	0.0
06/23/99 01:00	6.0	na	na	58.2	na	48.4	0.18	0.18	48.4	11	1	6.06	0.22	0.84	0.04	24	0	69	1	3.9	0.0
06/23/99 07:30	12.5	18.1	na	58.4	na	na	na	na	na	13	2	6.64	0.02	0.96	0.05	29	1	78	2	4.3	0.1
06/23/99 10:30	15.5	17.7	na	59.4	na	47.0	0.26	0.26	47.0	14	3	6.23	0.21	0.93	0.04	28	0	77	1	4.3	0.1
06/23/99 12:30	17.5	17.5	na	59.3	na	47.2	0.29	0.29	47.2	13	4	6.20	0.20	0.96	0.01	29	1	77	1	4.5	0.0
06/23/99 14:30	19.5	17.3	na	59.1	na	46.5	0.26	0.26	46.5	15	5	6.16	0.13	0.89	0.05	25	1	70	2	4.2	0.1
06/23/99 16:30	21.5	17.6	na	59.5	na	47.2	0.25	0.25	47.2	14	6	6.26	0.19	0.89	0.02	25	0	70	1	4.2	0.0
06/23/99 18:30	23.5	17.7	na	59.9	na	47.9	0.22	0.22	47.9	17	7	6.52	0.09	0.86	0.00	24	0	68	1	4.1	0.1
06/23/99 20:30	25.5	18.0	na	59.9	na	48.3	0.18	0.18	48.3	7	2	6.28	0.16	1.0	0.0	29	1	78	1	4.7	0.1
06/23/99 22:30	27.5	17.7	na	59.9	na	50.6	0.16	0.16	50.6	7	5	6.23	0.24	0.99	0.03	29	1	77	0	4.5	0.1
06/24/99 00:30	29.5	17.7	na	59.7	na	50.7	0.16	0.16	50.7	8	1	6.32	0.42	1.0	0.0	29	0	78	1	4.4	0.0
06/24/99 02:30	31.5	17.8	na	60.3	na	51.4	0.15	0.15	51.4	11	6	6.25	0.25	0.99	0.02	28	0	78	1	4.2	0.1
06/24/99 04:30	33.5	18.1	0.6	60.4	0.6	51.4	0.14	0.14	51.4	9	7	6.13	0.11	1.0	0.0	29	1	78	1	4.2	0.0
06/24/99 06:30	35.5	17.8	na	60.0	na	52.4	0.14	0.14	52.4	7	6	6.18	0.04	1.0	0.0	29	0	79	4	4.3	0.1
06/24/99 08:30	37.5	17.5	na	58.6	na	52.1	0.13	0.13	52.1	15	3	6.02	0.07	0.99	0.03	28	1	75	1	4.2	0.1
06/24/99 10:30	39.5	17.2	na	58.4	na	52.1	0.17	0.17	52.1	18	6	6.11	0.17	0.94	0.06	27	1	75	3	4.3	0.2
06/24/99 12:30	41.5	17.7	na	59.5	na	52.5	0.24	0.24	52.5	18	7	6.17	0.09	0.99	0.06	29	1	78	1	4.7	0.2
06/24/99 14:30	43.5	18.2	0.7	59.7	0.2	48.8	0.24	0.24	48.8	20	2	6.25	0.15	0.95	0.05	28	1	76	1	4.8	0.2
06/24/99 16:30	45.5	17.1	1.4	54.4	2.9	48.9	0.23	0.23	48.9	27	10	5.97	0.12	0.97	0.06	22	1	65	1	4.2	0.1
06/24/99 18:30	47.5	4.7	0.1	11.8	1.8	13.8	0.010	0.010	13.8	4	2	2.32	0.05	2.4	0.1	6.6	0.1	22	0	3.6	0.1
06/24/99 20:30	49.5	6.6	0.1	15.8	1.6	18.4	0.011	0.011	18.4	8	3	2.64	0.07	2.8	0.0	9.6	0.1	31	0	5.3	0.1
06/25/99 00:30	53.5	10.0	0.2	22.7	1.6	26.7	0.012	0.012	26.7	13	5	3.76	0.16	2.4	0.1	12	0	40	1	6.5	0.1
06/25/99 04:30	57.5	14.4	0.6	35.3	1.0	40.4	0.022	0.022	40.4	13	5	4.85	0.12	1.7	0.0	21	0	63	1	9.0	0.1
06/25/99 08:30	61.5	13.7	0.6	32.0	1.3	37.8	0.025	0.025	37.8	8	5	4.23	0.09	1.5	0.0	20	0	62	1	9.2	0.1
06/25/99 10:30	63.5	15.3	1.1	34.4	1.5	40.4	0.041	0.041	40.4	10	6	4.77	0.24	1.4	0.0	22	0	65	0	9.7	0.1
06/25/99 14:30	67.5	15.9	1.5	37.5	2.3	42.4	0.056	0.056	42.4	24	6	5.24	0.12	1.2	0.0	22	1	67	1	9.8	0.0

Table A6. Concentrations of major inorganic constituents for samples collected on Sugar Creek during June 1999 -- continued

[hr, hours; mg/L, milligrams per liter; mg C/L, milligrams per liter as carbon; µg/L, micrograms per liter; Avg, average; SD, standard deviation; na, not available]

Date-Time	Time from start hr	Cl		SO ₄		HCO ₃		CO ₃		Br		Na		K		Mg		Ca		SiO ₂	
		Avg	SD	Avg	SD	mg C/L	Value	mg C/L	Value	µg/L	Avg	Avg	SD	Avg	SD	mg/L	Avg	Avg	SD	mg/L	SD
06/25/99 18:30	71.5	16.5	1.0	39.9	0.7	43.2	0.064	0.064	43.2	14	4	5.23	0.04	1.3	0.0	24	1	70	1	9.9	0.2
06/25/99 22:30	75.5	17.2	1.0	41.7	1.3	44.9	0.068	0.068	44.9	15	6	5.49	0.02	1.2	0.1	24	1	72	0	9.6	0.1
06/26/99 00:30	77.5	16.9	0.7	43.0	0.8	45.6	0.069	0.069	45.6	14	1	5.57	0.09	1.1	0.0	23	1	70	1	8.8	0.2
06/26/99 04:30	81.5	18.0	na	49.1	na	47.1	0.062	0.062	47.1	7	1	6.87	0.17	1.4	0.0	21	1	69	2	7.3	0.1
06/26/99 08:30	85.5	16.9	0.6	45.0	0.3	47.4	0.093	0.093	47.4	26	11	5.47	0.08	1.0	0.1	22	1	70	1	8.3	0.0
06/26/99 12:30	89.5	15.7	na	47.5	na	48.0	0.11	0.11	48.0	8	3	5.48	0.12	1.1	0.0	25	0	75	1	8.9	0.1
06/26/99 16:30	93.5	15.2	na	48.1	na	48.5	0.12	0.12	48.5	8	6	5.70	0.20	1.1	0.0	25	1	76	1	8.4	0.2

Table A7. Concentrations of trace elements for samples collected on Sugar Creek during June 1999.

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Al		As		B		Ba		Be		Bi		Cd		Ce	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
06/22/99 19:00	0.0	1.42	0.26	0.51	0.06	42	3	48.2	0.9	<0.01	0.01	0.0021	0.0008	0.025	0.001	0.0177	0.0017
06/22/99 21:00	2.0	1.45	0.25	0.52	0.06	42	1	47.8	0.3	<0.01	0.00	0.0013	0.0003	0.010	0.001	0.0245	0.0009
06/22/99 23:00	4.0	0.98	0.11	0.55	0.00	40	2	49.7	0.9	<0.005	0.002	0.0016	0.0013	0.020	0.003	0.0223	0.0006
06/23/99 01:00	6.0	1.30	0.03	0.54	0.04	41	1	49.1	0.3	<0.005	0.007	0.0019	0.0001	0.013	0.002	0.0233	0.0014
06/23/99 07:30	12.5	0.82	0.03	0.45	0.03	46	2	48.9	0.0	<0.01	0.01	0.0019	0.0006	0.008	0.003	0.0214	0.0006
06/23/99 10:30	15.5	1.02	0.05	0.47	0.04	45	1	48.4	0.5	<0.01	0.01	0.0007	0.0005	0.019	0.001	0.0215	0.0008
06/23/99 12:30	17.5	0.95	0.04	0.48	0.04	46	1	48.9	1.5	<0.01	0.01	0.0010	0.0002	0.006	0.002	0.0199	0.0017
06/23/99 14:30	19.5	0.94	0.13	0.53	0.05	42	1	48.6	0.7	<0.01	0.00	0.0016	0.0009	0.009	0.001	0.0191	0.0004
06/23/99 16:30	21.5	0.76	0.20	0.55	0.05	43	1	47.8	0.8	<0.01	0.00	0.0015	0.0003	0.011	0.002	0.0178	0.0012
06/23/99 18:30	23.5	0.83	0.48	0.55	0.09	41	1	48.1	0.5	<0.01	0.01	0.0007	0.0001	0.041	0.003	0.0198	0.0003
06/23/99 20:30	25.5	1.07	0.02	0.55	0.06	49	1	50.0	1.8	<0.02	0.01	0.0023	0.0017	0.029	0.006	0.0204	0.0003
06/23/99 22:30	27.5	1.47	0.06	0.56	0.04	49	0	49.3	0.9	<0.02	0.01	0.0010	0.0003	0.030	0.001	0.0200	0.0009
06/24/99 00:30	29.5	0.90	0.11	0.56	0.03	49	1	50.2	1.0	<0.02	0.02	0.0011	0.0003	0.020	0.004	0.0196	0.0005
06/24/99 02:30	31.5	0.89	0.08	0.54	0.04	48	1	50.5	1.5	<0.02	0.02	0.0019	0.0004	0.020	0.003	0.0207	0.0009
06/24/99 04:30	33.5	0.77	0.11	0.55	0.10	50	2	50.8	1.6	<0.02	0.00	0.0027	0.0023	0.016	0.001	0.0207	0.0009
06/24/99 06:30	35.5	0.42	0.25	0.56	0.12	51	5	51.2	1.9	<0.02	0.01	0.0007	0.0005	0.025	0.003	0.0226	0.0004
06/24/99 08:30	37.5	0.68	0.05	0.49	0.03	45	1	49.2	0.4	<0.01	0.01	0.0007	0.0003	0.010	0.002	0.0186	0.0006
06/24/99 10:30	39.5	0.59	0.02	0.51	0.05	44	2	49.6	0.7	<0.01	0.00	0.0012	0.0003	0.011	0.001	0.0205	0.0014
06/24/99 12:30	41.5	0.76	0.03	0.52	0.02	46	2	49.3	0.2	<0.01	0.01	0.0015	0.0007	0.014	0.002	0.0228	0.0009
06/24/99 14:30	43.5	1.13	0.26	0.53	0.02	45	0	49.4	0.2	<0.01	0.00	0.0031	0.0010	0.039	0.006	0.0238	0.0024
06/24/99 16:30	45.5	0.94	0.04	0.49	0.04	38	2	44.4	0.1	<0.01	0.00	0.0018	0.0009	0.008	0.003	0.0207	0.0018
06/24/99 18:30	47.5	6.48	0.09	0.62	0.03	23	1	19.1	1.1	<0.02	0.02	0.0010	0.0001	0.024	0.002	0.0576	0.0018
06/24/99 20:30	49.5	6.41	0.12	0.62	0.04	31	0	27.0	1.3	<0.02	0.02	0.0017	0.0004	0.016	0.003	0.0633	0.0001
06/25/99 00:30	53.5	7.00	0.13	0.66	0.04	35	1	33.8	0.2	<0.01	0.00	0.0075	0.0072	0.005	0.001	0.0434	0.0031
06/25/99 04:30	57.5	4.42	0.03	0.56	0.05	49	0	44.2	1.7	<0.02	0.00	0.0020	0.0009	0.015	0.002	0.0299	0.0016
06/25/99 08:30	61.5	3.75	0.21	0.55	0.04	47	1	43.9	1.2	<0.02	0.01	0.0030	0.0015	0.012	0.001	0.0301	0.0013
06/25/99 10:30	63.5	2.82	0.24	0.55	0.06	44	1	45.8	2.1	<0.02	0.02	0.0017	0.0013	0.017	0.001	0.0272	0.0005
06/25/99 14:30	67.5	2.85	0.05	0.55	0.02	42	1	47.0	0.8	<0.01	0.00	0.0010	0.0002	0.007	0.002	0.0265	0.0007

Table A7. Concentrations of trace elements for samples collected on Sugar Creek during June 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Al		As		B		Ba		Be		Bi		Cd		Ce	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
06/25/99 18:30	71.5	2.06	0.04	0.55	0.04	43	1	46.5	1.0	0.06	0.01	0.0018	0.0009	0.005	0.002	0.0215	0.0009
06/25/99 22:30	75.5	3.39	0.09	0.54	0.03	43	2	48.2	0.9	<0.01	0.00	0.0010	0.0000	0.029	0.000	0.0273	0.0014
06/26/99 00:30	77.5	1.62	0.03	0.56	0.03	43	1	48.9	0.7	<0.01	0.01	0.0016	0.0004	0.008	0.001	0.0234	0.0017
06/26/99 04:30	81.5	1.70	0.04	0.80	0.01	45	1	53.0	0.7	<0.005	0.004	0.0018	0.0009	0.011	0.001	0.0201	0.0010
06/26/99 08:30	85.5	1.94	0.08	0.56	0.06	40	1	47.9	0.4	<0.01	0.00	0.0016	0.0007	0.012	0.001	0.0205	0.0007
06/26/99 12:30	89.5	1.84	0.05	0.56	0.05	46	1	49.6	1.4	<0.02	0.01	0.0017	0.0004	0.016	0.002	0.0199	0.0007
06/26/99 16:30	93.5	1.70	0.24	0.59	0.03	46	1	50.8	1.6	0.02	0.01	0.0012	0.0008	0.021	0.004	0.0212	0.0012

Table A7. Concentrations of trace elements for samples collected on Sugar Creek during June 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Co		Cr		Cs		Cu		Dy		Er		Eu	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
06/22/99 19:00	0.0	0.058	0.013	< 0.4	0.2	< 0.003	0.001	0.39	0.03	0.0034	0.0002	0.0023	0.0002	0.0018	0.0007
06/22/99 21:00	2.0	0.054	0.008	< 0.4	0.0	< 0.003	0.001	0.36	0.02	0.0043	0.0004	0.0025	0.0005	0.0018	0.0008
06/22/99 23:00	4.0	< 0.003	0.010	< 0.2	0.0	0.0016	0.0021	0.30	0.00	0.0046	0.0005	0.0027	0.0006	0.0011	0.0010
06/23/99 01:00	6.0	< 0.003	0.007	< 0.2	0.1	0.0051	0.0009	0.32	0.01	0.0050	0.0005	0.0027	0.0008	0.0009	0.0006
06/23/99 07:30	12.5	0.039	0.009	< 0.4	0.2	< 0.003	0.000	0.28	0.00	0.0050	0.0007	0.0018	0.0006	0.0026	0.0002
06/23/99 10:30	15.5	0.034	0.004	< 0.4	0.2	< 0.003	0.001	0.34	0.04	0.0042	0.0003	0.0035	0.0001	0.0022	0.0007
06/23/99 12:30	17.5	0.038	0.003	< 0.4	0.0	< 0.003	0.001	0.40	0.03	0.0045	0.0007	0.0033	0.0005	0.0020	0.0007
06/23/99 14:30	19.5	0.050	0.011	< 0.4	0.0	< 0.003	0.000	0.42	0.01	0.0044	0.0007	0.0032	0.0001	0.0020	0.0005
06/23/99 16:30	21.5	0.031	0.010	< 0.4	0.2	< 0.003	0.001	0.43	0.02	0.0031	0.0006	0.0022	0.0006	0.0012	0.0011
06/23/99 18:30	23.5	0.055	0.013	< 0.4	0.1	< 0.003	0.002	0.39	0.01	0.0036	0.0006	0.0023	0.0005	0.0015	0.0006
06/23/99 20:30	25.5	0.018	0.003	< 0.4	0.1	< 0.002	0.0007	0.61	0.10	0.0034	0.0007	0.0020	0.0003	0.0008	0.0013
06/23/99 22:30	27.5	0.005	0.017	< 0.4	0.0	< 0.002	0.0008	0.67	0.05	0.0032	0.0007	0.0015	0.0002	< 0.0004	0.0008
06/24/99 00:30	29.5	0.016	0.004	< 0.4	0.2	0.0018	0.0011	0.40	0.05	0.0035	0.0008	0.0018	0.0002	< 0.0004	0.0010
06/24/99 02:30	31.5	0.037	0.019	< 0.4	0.1	< 0.002	0.0013	0.39	0.01	0.0045	0.0006	0.0024	0.0007	< 0.0004	0.0007
06/24/99 04:30	33.5	0.184	0.020	< 0.4	0.1	< 0.002	0.0008	0.37	0.02	0.0038	0.0003	0.0029	0.0000	0.0015	0.0011
06/24/99 06:30	35.5	0.026	0.001	< 0.4	0.2	< 0.002	0.0008	0.39	0.02	0.0037	0.0007	0.0024	0.0004	0.0011	0.0004
06/24/99 08:30	37.5	0.039	0.007	< 0.4	0.1	< 0.003	0.001	0.39	0.02	0.0045	0.0007	0.0022	0.0002	0.0018	0.0008
06/24/99 10:30	39.5	0.053	0.007	< 0.4	0.0	< 0.003	0.001	0.45	0.04	0.0042	0.0005	0.0027	0.0007	0.0021	0.0004
06/24/99 12:30	41.5	0.027	0.010	< 0.4	0.0	< 0.003	0.001	0.41	0.02	0.0045	0.0007	0.0033	0.0002	0.0020	0.0015
06/24/99 14:30	43.5	0.027	0.009	< 0.4	0.1	< 0.003	0.001	0.66	0.04	0.0047	0.0006	0.0031	0.0000	0.0020	0.0010
06/24/99 16:30	45.5	0.046	0.004	< 0.4	0.2	< 0.003	0.002	0.48	0.02	0.0044	0.0003	0.0028	0.0003	0.0012	0.0008
06/24/99 18:30	47.5	0.095	0.003	< 0.4	0.1	< 0.002	0.0009	0.86	0.04	0.0093	0.0003	0.0046	0.0005	0.0024	0.0003
06/24/99 20:30	49.5	0.084	0.004	< 0.4	0.2	< 0.002	0.0008	1.17	0.03	0.0104	0.0002	0.0059	0.0005	0.0030	0.0013
06/25/99 00:30	53.5	0.053	0.002	< 0.4	0.2	< 0.003	0.002	1.38	0.02	0.0076	0.0006	0.0044	0.0001	0.0026	0.0002
06/25/99 04:30	57.5	0.012	0.002	< 0.4	0.1	< 0.002	0.0004	0.89	0.01	0.0057	0.0008	0.0046	0.0003	0.0012	0.0003
06/25/99 08:30	61.5	0.026	0.006	< 0.4	0.1	< 0.002	0.0006	0.97	0.00	0.0061	0.0007	0.0045	0.0008	0.0018	0.0013
06/25/99 10:30	63.5	0.041	0.009	< 0.4	0.0	0.0018	0.0016	1.00	0.04	0.0055	0.0005	0.0028	0.0006	0.0010	0.0007
06/25/99 14:30	67.5	0.046	0.008	< 0.4	0.1	< 0.003	0.001	0.94	0.02	0.0057	0.0007	0.0045	0.0004	0.0033	0.0003

Table A7. Concentrations of trace elements for samples collected on Sugar Creek during June 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Co µg/L		Cr µg/L		Cs µg/L		Cu µg/L		Dy µg/L		Er µg/L		Eu µg/L	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
06/25/99 18:30	71.5	0.051	0.013	< 0.4	0.0	< 0.003	0.000	0.89	0.03	0.0050	0.0006	0.0043	0.0005	0.0022	0.0008
06/25/99 22:30	75.5	0.051	0.014	< 0.4	0.0	< 0.003	0.001	0.91	0.02	0.0055	0.0004	0.0035	0.0008	0.0017	0.0004
06/26/99 00:30	77.5	0.046	0.007	< 0.4	0.1	< 0.003	0.001	0.78	0.03	0.0055	0.0004	0.0041	0.0006	0.0017	0.0003
06/26/99 04:30	81.5	0.130	0.013	< 0.4	0.2	< 0.001	0.0006	0.68	0.01	0.0038	0.0001	0.0033	0.0009	0.0007	0.0004
06/26/99 08:30	85.5	0.055	0.008	< 0.4	0.1	0.007	0.004	0.79	0.03	0.0057	0.0006	0.0041	0.0000	0.0024	0.0005
06/26/99 12:30	89.5	0.009	0.015	< 0.4	0.2	< 0.002	0.0010	0.66	0.03	0.0056	0.0001	0.0033	0.0002	0.0011	0.0013
06/26/99 16:30	93.5	< 0.004	0.014	< 0.4	0.3	0.0020	0.0006	0.63	0.03	0.0055	0.0007	0.0034	0.0012	< 0.0004	0.0017

Table A7. Concentrations of trace elements for samples collected on Sugar Creek during June 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start	Fe		Gd		Hg		Ho		La		Li		Lu		Mn	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
06/22/99 19:00	0.0	8.5	0.4	0.0049	0.0004	0.3	0.4	0.0008	0.0002	0.0138	0.0011	4.38	0.11	0.0005	0.0001	18.2	2.9
06/22/99 21:00	2.0	9.7	0.3	0.0054	0.0001	<0.3	0.1	0.0011	0.0001	0.0184	0.0007	4.22	0.17	0.0004	0.0001	23.0	0.4
06/22/99 23:00	4.0	10	0	0.0050	0.0003	<0.3	0.0	0.0009	0.0001	0.0174	0.0008	3.92	0.15	0.0005	0.0000	20.8	0.3
06/23/99 01:00	6.0	10	0	0.0047	0.0002	na	na	0.0009	0.0001	0.0171	0.0003	3.86	0.24	0.0003	0.0001	17.6	0.6
06/23/99 07:30	12.5	9.1	0.1	0.0061	0.0007	<0.3	0.2	0.0009	0.0001	0.0164	0.0003	4.26	0.09	0.0003	0.0001	20.1	0.3
06/23/99 10:30	15.5	10	0	0.0055	0.0009	<0.3	0.2	0.0011	0.0001	0.0175	0.0006	4.07	0.04	0.0005	0.0001	18.8	1.4
06/23/99 12:30	17.5	10	0	0.0053	0.0004	0.6	0.0	0.0009	0.0002	0.0165	0.0006	4.00	0.20	0.0004	0.0001	17.7	0.4
06/23/99 14:30	19.5	13	0	0.0051	0.0004	<0.3	0.2	0.0009	0.0002	0.0154	0.0002	4.13	0.42	0.0004	0.0001	15.7	0.9
06/23/99 16:30	21.5	13	0	0.0041	0.0003	0.4	0.1	0.0008	0.0003	0.0140	0.0005	4.10	0.39	0.0003	0.0001	15.4	0.9
06/23/99 18:30	23.5	14	0	0.0048	0.0014	<0.3	0.1	0.0007	0.0001	0.0159	0.0005	4.59	0.22	0.0003	0.0001	17.5	0.4
06/23/99 20:30	25.5	13	0	0.0043	0.0002	<0.3	0.1	0.0006	0.0000	0.0149	0.0001	4.00	0.24	0.0003	0.0001	17.4	0.7
06/23/99 22:30	27.5	13	0	0.0051	0.0003	0.6	0.1	0.0006	0.0002	0.0152	0.0004	4.04	0.46	0.0004	0.0001	19.9	0.9
06/24/99 00:30	29.5	12	0	0.0058	0.0004	<0.3	0.2	0.0008	0.0002	0.0155	0.0003	4.39	0.16	0.0005	0.0001	22.1	0.1
06/24/99 02:30	31.5	12	0	0.0052	0.0007	0.4	0.1	0.0009	0.0002	0.0161	0.0008	4.23	0.28	0.0004	0.0001	23.3	0.5
06/24/99 04:30	33.5	12	0	0.0051	0.0007	<0.3	0.1	0.0009	0.0004	0.0163	0.0003	4.00	0.24	0.0004	0.0001	20.0	0.5
06/24/99 06:30	35.5	11	1	0.0044	0.0002	<0.3	0.0	0.0008	0.0002	0.0165	0.0008	4.20	0.04	0.0005	0.0001	22.5	0.1
06/24/99 08:30	37.5	10	0	0.0049	0.0009	0.4	0.3	0.0008	0.0002	0.0158	0.0005	3.99	0.15	0.0004	0.0001	22.5	0.9
06/24/99 10:30	39.5	11	0	0.0045	0.0002	0.7	0.2	0.0010	0.0002	0.0166	0.0002	4.10	0.22	0.0004	0.0001	23.8	0.7
06/24/99 12:30	41.5	13	0	0.0063	0.0002	1.2	0.1	0.0009	0.0002	0.0185	0.0009	4.10	0.12	0.0004	0.0001	22.3	0.6
06/24/99 14:30	43.5	12	0	0.0055	0.0007	408	6	0.0010	0.0001	0.0187	0.0002	4.15	0.24	0.0003	0.0001	21.1	1.3
06/24/99 16:30	45.5	6.8	0.3	0.0056	0.0005	0.7	0.2	0.0013	0.0001	0.0163	0.0009	4.10	0.07	0.0004	0.0001	11.5	1.3
06/24/99 18:30	47.5	8.7	0.1	0.0099	0.0004	1.1	0.2	0.0016	0.0002	0.0401	0.0007	0.82	0.06	0.0005	0.0000	6.56	0.17
06/24/99 20:30	49.5	9.4	0.1	0.0122	0.0004	1.1	0.2	0.0023	0.0000	0.0482	0.0004	1.05	0.12	0.0008	0.0001	9.04	0.23
06/25/99 00:30	53.5	8.0	0.2	0.0109	0.0008	1.6	0.1	0.0017	0.0003	0.0364	0.0013	1.61	0.27	0.0007	0.0001	3.5	0.5
06/25/99 04:30	57.5	5.9	0.0	0.0075	0.0004	1.4	0.2	0.0015	0.0000	0.0280	0.0013	2.63	0.06	0.0008	0.0000	5.19	0.09
06/25/99 08:30	61.5	5.5	0.1	0.0068	0.0006	142	3	0.0013	0.0000	0.0258	0.0012	2.33	0.03	0.0006	0.0000	6.79	0.17
06/25/99 10:30	63.5	5.1	0.1	0.0060	0.0000	0.9	0.2	0.0010	0.0001	0.0226	0.0015	2.56	0.09	0.0006	0.0001	11.8	0.4
06/25/99 14:30	67.5	4.6	0.1	0.0065	0.0008	0.6	0.1	0.0014	0.0001	0.0225	0.0002	2.58	0.06	0.0006	0.0001	17.0	0.7

Table A7. Concentrations of trace elements for samples collected on Sugar Creek during June 1999 --- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Fe		Gd		Hg		Ho		La		Li		Lu		Mn	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
06/25/99 18:30	71.5	3.1	0.1	0.0058	0.0007	0.6	0.1	0.0012	0.0001	0.0192	0.0013	2.70	0.05	0.0006	0.0000	15.2	0.4
06/25/99 22:30	75.5	5.3	0.1	0.0063	0.0001	0.4	0.2	0.0012	0.0002	0.0237	0.0005	2.88	0.10	0.0006	0.0001	18.4	0.8
06/26/99 00:30	77.5	3.5	0.2	0.0068	0.0013	0.6	0.1	0.0012	0.0001	0.0222	0.0003	2.90	0.13	0.0006	0.0001	15.2	0.9
06/26/99 04:30	81.5	5.2	0.1	0.0052	0.0001	1.6	0.2	0.0011	0.0001	0.0159	0.0005	3.25	0.08	0.0009	0.0002	17.7	0.4
06/26/99 08:30	85.5	3.0	0.1	0.0060	0.0009	0.4	0.3	0.0013	0.0001	0.0184	0.0008	3.22	0.12	0.0005	0.0003	16.2	0.4
06/26/99 12:30	89.5	2.7	0.1	0.0052	0.0004	0.5	0.1	0.0013	0.0001	0.0165	0.0006	3.02	0.16	0.0006	0.0001	16.8	0.4
06/26/99 16:30	93.5	3.3	0.3	0.0056	0.0004	<0.3	0.0	0.0013	0.0002	0.0166	0.0000	3.27	0.00	0.0006	0.0000	19.5	0.7

Table A7. Concentrations of trace elements for samples collected on Sugar Creek during June 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Mo		Nd		Ni		Pb		Pr		Rb		Re		Sb	
		Avg	SD	µg/L	Avg	SD	µg/L	Avg	SD	µg/L	Avg	SD	µg/L	Avg	SD	µg/L	SD
06/22/99 19:00	0.0	4.58	0.23	0.0147	0.0025	0.40	0.15	0.056	0.001	0.0036	0.0002	0.52	0.01	0.0128	0.0003	0.113	0.011
06/22/99 21:00	2.0	4.47	0.17	0.0203	0.0003	0.40	0.09	0.043	0.001	0.0044	0.0003	0.52	0.01	0.0116	0.0003	0.104	0.002
06/22/99 23:00	4.0	4.35	0.04	0.0198	0.0013	0.30	0.14	0.036	0.008	0.0045	0.0001	0.50	0.00	0.0116	0.0004	0.103	0.005
06/23/99 01:00	6.0	4.38	0.09	0.0195	0.0021	0.55	0.15	0.025	0.002	0.0046	0.0001	0.52	0.02	0.0127	0.0008	0.106	0.003
06/23/99 07:30	12.5	4.38	0.17	0.0181	0.0013	0.65	0.12	0.016	0.005	0.0044	0.0001	0.48	0.01	0.0127	0.0006	0.116	0.001
06/23/99 10:30	15.5	4.39	0.08	0.0207	0.0003	0.41	0.26	0.023	0.003	0.0044	0.0003	0.50	0.02	0.0126	0.0008	0.108	0.003
06/23/99 12:30	17.5	4.46	0.13	0.0195	0.0013	0.38	0.18	0.013	0.001	0.0042	0.0003	0.53	0.00	0.0137	0.0001	0.103	0.002
06/23/99 14:30	19.5	4.53	0.08	0.0185	0.0005	0.31	0.22	0.023	0.002	0.0040	0.0003	0.54	0.01	0.0127	0.0004	0.111	0.003
06/23/99 16:30	21.5	4.62	0.05	0.0150	0.0001	0.33	0.01	0.021	0.002	0.0036	0.0002	0.54	0.01	0.0141	0.0013	0.104	0.001
06/23/99 18:30	23.5	4.78	0.06	0.0192	0.0003	0.55	0.18	0.020	0.004	0.0040	0.0003	0.53	0.03	0.0123	0.0001	0.107	0.005
06/23/99 20:30	25.5	4.48	0.03	0.0156	0.0009	0.69	0.16	0.044	0.008	0.0042	0.0002	0.54	0.01	0.0139	0.0007	0.106	0.007
06/23/99 22:30	27.5	4.44	0.01	0.0184	0.0022	0.10	0.55	0.024	0.000	0.0041	0.0004	0.54	0.01	0.0124	0.0011	0.097	0.001
06/24/99 00:30	29.5	4.58	0.22	0.0169	0.0015	0.10	0.60	0.039	0.015	0.0041	0.0002	0.55	0.00	0.0133	0.0004	0.108	0.000
06/24/99 02:30	31.5	4.44	0.14	0.0201	0.0003	0.15	0.45	0.026	0.003	0.0041	0.0003	0.54	0.01	0.0131	0.0006	0.102	0.003
06/24/99 04:30	33.5	4.40	0.02	0.0188	0.0016	0.71	0.29	0.024	0.002	0.0044	0.0001	0.53	0.01	0.0127	0.0008	0.104	0.007
06/24/99 06:30	35.5	4.48	0.12	0.0183	0.0012	0.54	0.19	0.045	0.003	0.0042	0.0004	0.54	0.01	0.0128	0.0014	0.101	0.003
06/24/99 08:30	37.5	4.44	0.02	0.0178	0.0014	0.35	0.19	0.013	0.001	0.0038	0.0004	0.59	0.01	0.0123	0.0004	0.101	0.004
06/24/99 10:30	39.5	4.54	0.06	0.0180	0.0007	0.35	0.24	0.020	0.004	0.0042	0.0001	0.57	0.00	0.0128	0.0002	0.110	0.010
06/24/99 12:30	41.5	4.57	0.16	0.0199	0.0013	0.31	0.30	0.017	0.000	0.0047	0.0002	0.56	0.01	0.0128	0.0003	0.102	0.001
06/24/99 14:30	43.5	4.56	0.16	0.0219	0.0007	0.15	0.02	0.049	0.008	0.0046	0.0003	0.59	0.02	0.0127	0.0005	0.114	0.001
06/24/99 16:30	45.5	4.40	0.08	0.0209	0.0010	0.40	0.24	0.025	0.002	0.0041	0.0004	0.61	0.01	0.0127	0.0008	0.107	0.002
06/24/99 18:30	47.5	1.30	0.06	0.0572	0.0008	0.81	0.13	0.014	0.003	0.0117	0.0004	0.70	0.02	0.0032	0.0002	0.094	0.003
06/24/99 20:30	49.5	1.57	0.04	0.0648	0.0016	0.79	0.17	0.016	0.004	0.0152	0.0001	0.62	0.01	0.0048	0.0005	0.108	0.006
06/25/99 00:30	53.5	2.09	0.18	0.0470	0.0007	0.78	0.08	0.010	0.001	0.0104	0.0003	0.63	0.01	0.0058	0.0002	0.126	0.002
06/25/99 04:30	57.5	2.84	0.03	0.0336	0.0013	0.59	0.03	0.015	0.004	0.0078	0.0001	0.52	0.01	0.0100	0.0007	0.128	0.002
06/25/99 08:30	61.5	2.77	0.03	0.0296	0.0013	0.93	0.35	0.015	0.002	0.0062	0.0001	0.56	0.01	0.0097	0.0007	0.121	0.004
06/25/99 10:30	63.5	2.71	0.03	0.0252	0.0023	0.94	0.26	0.014	0.001	0.0060	0.0001	0.53	0.01	0.0104	0.0008	0.128	0.001
06/25/99 14:30	67.5	2.98	0.05	0.0266	0.0016	0.66	0.29	0.011	0.001	0.0055	0.0005	0.50	0.00	0.0121	0.0003	0.133	0.005

Table A7. Concentrations of trace elements for samples collected on Sugar Creek during June 1999 --- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start	Mo		Nd		Ni		Pb		Pr		Rb		Re		Sb	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
06/25/99 18:30	71.5	3.05	0.03	0.0225	0.0005	0.86	0.18	0.008	0.001	0.0047	0.0002	0.48	0.02	0.0109	0.0008	0.130	0.001
06/25/99 22:30	75.5	3.26	0.05	0.0251	0.0011	0.71	0.02	0.018	0.002	0.0059	0.0003	0.49	0.01	0.0116	0.0002	0.138	0.002
06/26/99 00:30	77.5	3.44	0.11	0.0228	0.0005	0.60	0.22	0.012	0.003	0.0057	0.0001	0.46	0.01	0.0113	0.0002	0.135	0.002
06/26/99 04:30	81.5	3.91	0.04	0.0192	0.0007	0.57	0.14	0.017	0.003	0.0043	0.0001	0.62	0.01	0.0138	0.0006	0.133	0.005
06/26/99 08:30	85.5	3.68	0.01	0.0196	0.0003	0.66	0.16	0.018	0.002	0.0048	0.0001	0.48	0.00	0.0114	0.0002	0.123	0.006
06/26/99 12:30	89.5	3.59	0.07	0.0196	0.0017	0.44	0.49	0.012	0.004	0.0041	0.0001	0.46	0.01	0.0126	0.0001	0.120	0.004
06/26/99 16:30	93.5	3.54	0.03	0.0216	0.0015	0.18	0.59	0.013	0.003	0.0045	0.0002	0.46	0.01	0.0124	0.0002	0.120	0.005

Table A7. Concentrations of trace elements for samples collected on Sugar Creek during June 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Se		Sm		Sr		Ta		Tb		Te		Th		Ti	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
06/22/99 19:00	0.0	0.67	0.03	0.0040	0.0010	166	8	<0.004	0.000	0.0005	0.0001	<0.009	0.004	0.0007	0.0000	<0.06	0.11
06/22/99 21:00	2.0	0.70	0.07	0.0042	0.0006	164	7	<0.004	0.002	0.0007	0.0001	0.014	0.001	0.0011	0.0003	<0.06	0.06
06/22/99 23:00	4.0	0.66	0.07	0.0039	0.0006	165	1	0.002	0.001	0.0006	0.0001	0.012	0.004	0.0007	0.0001	0.06	0.09
06/23/99 01:00	6.0	0.55	0.12	0.0042	0.0001	167	5	0.002	0.000	0.0005	0.0001	0.016	0.002	0.0009	0.0002	0.07	0.11
06/23/99 07:30	12.5	0.70	0.11	0.0046	0.0000	156	1	<0.004	0.001	0.0006	0.0001	0.011	0.004	0.0005	0.0003	<0.06	0.03
06/23/99 10:30	15.5	0.65	0.07	0.0050	0.0003	160	2	<0.004	0.002	0.0008	0.0001	0.015	0.003	0.0008	0.0001	<0.06	0.02
06/23/99 12:30	17.5	0.72	0.04	0.0049	0.0001	170	2	<0.004	0.002	0.0006	0.0001	0.014	0.003	0.0008	0.0002	<0.06	0.03
06/23/99 14:30	19.5	0.80	0.00	0.0044	0.0005	167	0	<0.004	0.002	0.0005	0.0001	0.012	0.009	0.0009	0.0002	<0.06	0.04
06/23/99 16:30	21.5	0.80	0.03	0.0035	0.0006	169	1	<0.004	0.005	0.0005	0.0001	0.013	0.003	0.0008	0.0001	<0.06	0.09
06/23/99 18:30	23.5	0.71	0.05	0.0042	0.0006	169	2	<0.004	0.002	0.0006	0.0001	0.016	0.007	0.0010	0.0004	<0.06	0.01
06/23/99 20:30	25.5	0.46	0.10	0.0045	0.0013	173	4	<0.001	0.000	0.0005	0.0000	<0.01	0.001	0.0010	0.0002	<0.07	0.12
06/23/99 22:30	27.5	0.62	0.21	0.0040	0.0003	166	0	<0.001	0.000	0.0006	0.0002	0.012	0.005	0.0009	0.0004	<0.07	0.20
06/24/99 00:30	29.5	0.54	0.28	0.0044	0.0010	174	1	<0.001	0.001	0.0005	0.0002	0.011	0.002	0.0012	0.0008	0.13	0.12
06/24/99 02:30	31.5	0.46	0.11	0.0033	0.0005	170	1	<0.001	0.001	0.0006	0.0001	<0.01	0.002	0.0006	0.0002	<0.07	0.04
06/24/99 04:30	33.5	0.34	0.14	0.0034	0.0009	168	1	<0.001	0.000	0.0005	0.0001	<0.01	0.006	0.0007	0.0003	<0.07	0.12
06/24/99 06:30	35.5	0.47	0.19	0.0038	0.0004	169	2	0.002	0.001	0.0006	0.0001	0.012	0.004	0.0010	0.0001	<0.07	0.18
06/24/99 08:30	37.5	0.67	0.11	0.0041	0.0005	167	3	<0.004	0.001	0.0004	0.0001	0.017	0.003	0.0008	0.0004	<0.06	0.08
06/24/99 10:30	39.5	0.71	0.11	0.0046	0.0009	170	3	<0.004	0.002	0.0007	0.0000	0.010	0.007	0.0007	0.0001	<0.06	0.04
06/24/99 12:30	41.5	0.75	0.05	0.0053	0.0000	173	1	<0.004	0.002	0.0007	0.0001	0.014	0.004	0.0005	0.0000	<0.06	0.06
06/24/99 14:30	43.5	0.73	0.07	0.0049	0.0004	172	4	<0.004	0.001	0.0007	0.0000	<0.009	0.003	0.0011	0.0003	<0.06	0.07
06/24/99 16:30	45.5	0.58	0.08	0.0044	0.0011	156	3	<0.004	0.002	0.0008	0.0001	0.012	0.005	0.0011	0.0004	<0.06	0.03
06/24/99 18:30	47.5	<0.3	0.1	0.0116	0.0006	41	1	<0.001	0.001	0.0014	0.0001	<0.01	0.006	0.0041	0.0009	0.10	0.05
06/24/99 20:30	49.5	0.33	0.17	0.0138	0.0005	55	1	0.001	0.001	0.0018	0.0002	<0.01	0.005	0.0042	0.0005	0.12	0.15
06/25/99 00:30	53.5	0.55	0.07	0.0106	0.0008	80	4	<0.004	0.003	0.0013	0.0003	<0.009	0.005	0.0032	0.0006	<0.06	0.03
06/25/99 04:30	57.5	0.43	0.02	0.0076	0.0001	126	2	<0.001	0.001	0.0011	0.0001	<0.01	0.004	0.0017	0.0003	0.14	0.06
06/25/99 08:30	61.5	0.62	0.02	0.0065	0.0008	125	1	<0.001	0.001	0.0008	0.0001	<0.01	0.002	0.0015	0.0000	<0.07	0.08
06/25/99 10:30	63.5	0.48	0.20	0.0059	0.0004	129	3	0.001	0.001	0.0008	0.0001	<0.01	0.002	0.0020	0.0003	0.19	0.20
06/25/99 14:30	67.5	0.71	0.05	0.0051	0.0008	133	1	<0.004	0.001	0.0009	0.0001	<0.009	0.001	0.0013	0.0002	<0.06	0.07

Table A7. Concentrations of trace elements for samples collected on Sugar Creek during June 1999 --- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Se		Sm		Sr		Ta		Tb		Te		Th		Ti	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
06/25/99 18:30	71.5	0.81	0.10	0.0059	0.0005	132	2	<0.004	0.002	0.0008	0.0001	<0.009	0.005	0.0013	0.0001	<0.06	0.04
06/25/99 22:30	75.5	0.85	0.08	0.0050	0.0003	139	3	<0.004	0.001	0.0009	0.0001	0.010	0.002	0.0016	0.0001	<0.06	0.02
06/26/99 00:30	77.5	0.83	0.01	0.0059	0.0000	140	2	<0.004	0.003	0.0009	0.0001	<0.009	0.002	0.0012	0.0003	<0.06	0.02
06/26/99 04:30	81.5	0.64	0.08	0.0047	0.0006	183	2	<0.001	0.000	0.0006	0.0001	0.011	0.004	0.0006	0.0003	<0.04	0.06
06/26/99 08:30	85.5	0.84	0.02	0.0049	0.0005	146	1	<0.004	0.002	0.0009	0.0001	0.009	0.001	0.0012	0.0002	<0.06	0.04
06/26/99 12:30	89.5	0.77	0.10	0.0057	0.0002	149	1	<0.001	0.000	0.0008	0.0002	<0.01	0.005	0.0008	0.0002	<0.07	0.10
06/26/99 16:30	93.5	0.84	0.12	0.0052	0.0006	150	4	0.001	0.001	0.0008	0.0001	0.012	0.006	0.0007	0.0002	<0.07	0.15

Table A7. Concentrations of trace elements for samples collected on Sugar Creek during June 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Tl		Tm		U		V		W		Y		Yb		Zn		Zr	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
06/22/99 19:00	0.0	0.015	0.002	0.0003	0.0001	2.36	0.01	0.40	0.04	0.019	0.000	0.0300	0.0012	0.0020	0.0000	7.65	0.30	0.031	0.008
06/22/99 21:00	2.0	0.013	0.001	0.0005	0.0000	2.32	0.03	0.55	0.26	0.011	0.004	0.0405	0.0030	0.0025	0.0003	3.31	0.28	0.030	0.004
06/22/99 23:00	4.0	0.010	0.001	0.0004	0.0001	2.33	0.03	0.45	0.03	0.003	0.001	0.0366	0.0009	0.0027	0.0005	4.67	0.11	0.0266	0.0007
06/23/99 01:00	6.0	0.010	0.001	0.0004	0.0002	2.29	0.05	0.47	0.06	0.005	0.002	0.0379	0.0003	0.0027	0.0007	6.07	0.01	0.0278	0.0020
06/23/99 07:30	12.5	0.011	0.002	0.0005	0.0000	2.32	0.02	<0.3	0.1	0.005	0.003	0.0392	0.0030	0.0022	0.0006	2.42	0.04	0.028	0.002
06/23/99 10:30	15.5	0.009	0.001	0.0005	0.0001	2.29	0.08	0.31	0.13	0.003	0.002	0.0427	0.0024	0.0030	0.0005	2.04	0.12	0.026	0.003
06/23/99 12:30	17.5	0.010	0.000	0.0004	0.0001	2.28	0.02	0.33	0.04	0.005	0.002	0.0411	0.0011	0.0027	0.0003	1.37	0.05	0.025	0.002
06/23/99 14:30	19.5	0.012	0.000	0.0003	0.0000	2.37	0.01	0.47	0.21	0.006	0.003	0.0343	0.0002	0.0025	0.0004	1.79	0.05	0.029	0.002
06/23/99 16:30	21.5	0.013	0.001	0.0003	0.0001	2.31	0.03	0.50	0.19	0.004	0.001	0.0278	0.0014	0.0021	0.0005	12.1	0.1	0.027	0.004
06/23/99 18:30	23.5	0.013	0.001	0.0004	0.0000	2.36	0.01	0.40	0.13	0.004	0.001	0.0291	0.0012	0.0015	0.0003	1.92	0.00	0.022	0.004
06/23/99 20:30	25.5	0.014	0.005	0.0003	0.0002	2.38	0.02	0.39	0.17	0.004	0.001	0.0301	0.0008	0.0018	0.0003	5.85	0.35	0.039	0.003
06/23/99 22:30	27.5	0.010	0.003	0.0004	0.0002	2.34	0.10	0.60	0.29	0.004	0.002	0.0325	0.0020	0.0023	0.0005	2.23	0.36	0.034	0.002
06/24/99 00:30	29.5	0.031	0.000	0.0004	0.0001	2.29	0.01	0.46	0.09	0.022	0.001	0.0331	0.0017	0.0020	0.0005	1.41	0.26	0.028	0.004
06/24/99 02:30	31.5	0.012	0.001	0.0004	0.0001	2.37	0.09	0.51	0.12	0.004	0.001	0.0346	0.0002	0.0024	0.0004	2.39	0.18	0.029	0.004
06/24/99 04:30	33.5	0.010	0.002	0.0004	0.0000	2.34	0.09	0.39	0.04	0.003	0.001	0.0355	0.0002	0.0027	0.0004	4.95	0.20	0.025	0.002
06/24/99 06:30	35.5	0.011	0.003	0.0003	0.0001	2.38	0.08	0.48	0.11	0.006	0.002	0.0364	0.0008	0.0023	0.0001	21.3	0.1	0.024	0.003
06/24/99 08:30	37.5	0.009	0.001	0.0004	0.0001	2.22	0.10	<0.3	0.0	0.004	0.001	0.0364	0.0009	0.0022	0.0003	5.40	0.01	0.023	0.001
06/24/99 10:30	39.5	0.011	0.002	0.0003	0.0001	2.22	0.00	0.31	0.07	0.004	0.001	0.0408	0.0018	0.0026	0.0001	3.60	0.20	0.027	0.002
06/24/99 12:30	41.5	0.010	0.001	0.0004	0.0001	2.33	0.09	0.36	0.06	0.005	0.002	0.0437	0.0011	0.0027	0.0002	19.5	0.4	0.029	0.003
06/24/99 14:30	43.5	0.011	0.000	0.0004	0.0001	2.37	0.09	0.42	0.04	0.006	0.003	0.0426	0.0008	0.0030	0.0003	1.93	0.02	0.028	0.001
06/24/99 16:30	45.5	0.017	0.006	0.0006	0.0000	2.24	0.01	0.58	0.41	0.009	0.007	0.0444	0.0013	0.0028	0.0003	0.50	0.06	0.053	0.001
06/24/99 18:30	47.5	0.009	0.002	0.0006	0.0001	0.30	0.02	0.87	0.13	0.014	0.001	0.0498	0.0016	0.0042	0.0003	0.48	0.12	0.061	0.007
06/24/99 20:30	49.5	0.009	0.001	0.0008	0.0001	0.47	0.02	0.91	0.14	0.010	0.002	0.0572	0.0007	0.0053	0.0002	5.66	0.07	0.079	0.000
06/25/99 00:30	53.5	0.023	0.012	0.0007	0.0000	0.88	0.05	0.97	0.14	0.014	0.003	0.0526	0.0021	0.0033	0.0001	0.61	0.05	0.095	0.007
06/25/99 04:30	57.5	0.009	0.001	0.0006	0.0001	1.41	0.07	0.72	0.15	0.004	0.003	0.0525	0.0017	0.0044	0.0001	0.65	0.05	0.077	0.001
06/25/99 08:30	61.5	0.010	0.002	0.0005	0.0001	1.28	0.03	0.85	0.17	0.016	0.000	0.0454	0.0006	0.0038	0.0001	0.72	0.06	0.079	0.002
06/25/99 10:30	63.5	0.010	0.002	0.0004	0.0001	1.40	0.05	0.95	0.14	0.005	0.001	0.0453	0.0013	0.0042	0.0001	0.87	0.06	0.096	0.000
06/25/99 14:30	67.5	0.011	0.003	0.0005	0.0000	1.58	0.03	0.68	0.08	0.005	0.001	0.0494	0.0005	0.0035	0.0005	1.17	0.07	0.070	0.002

Table A7. Concentrations of trace elements for samples collected on Sugar Creek during June 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Tl		Tm		U		V		W		Y		Yb		Zn		Zr	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
06/25/99 18:30	71.5	0.009	0.001	0.0006	0.0002	1.66	0.02	0.67	0.09	0.008	0.003	0.0459	0.0011	0.0034	0.0001	0.90	0.02	0.067	0.008
06/25/99 22:30	75.5	0.011	0.003	0.0006	0.0001	1.80	0.05	0.74	0.07	0.005	0.001	0.0496	0.0033	0.0036	0.0007	94.2	3.9	0.066	0.007
06/26/99 00:30	77.5	0.010	0.002	0.0006	0.0001	1.92	0.07	0.76	0.07	0.007	0.002	0.0461	0.0005	0.0038	0.0003	2.43	0.17	0.061	0.011
06/26/99 04:30	81.5	0.010	0.001	0.0006	0.0001	1.88	0.02	0.86	0.05	0.007	0.005	0.0431	0.0006	0.0047	0.0007	0.72	0.01	0.0605	0.0056
06/26/99 08:30	85.5	0.010	0.000	0.0006	0.0002	1.99	0.00	0.82	0.28	0.008	0.004	0.0499	0.0013	0.0031	0.0002	1.70	0.01	0.055	0.004
06/26/99 12:30	89.5	0.010	0.001	0.0006	0.0002	2.10	0.07	0.63	0.13	0.003	0.002	0.0489	0.0022	0.0038	0.0001	1.28	0.45	0.042	0.007
06/26/99 16:30	93.5	0.010	0.003	0.0004	0.0002	2.07	0.11	0.79	0.16	0.004	0.001	0.0481	0.0010	0.0034	0.0002	0.62	0.03	0.059	0.012

Table A8. Bacterial cell counts and chlorophyll-*a* concentrations for samples collected on Sugar Creek during June 1999.

[hr, hours; µg/L, micrograms per liter; millions/mL, millions per milliliter; na, not available]

Date-Time	Time from start hr	Bacterial Cell Counts millions/mL	Chlorophyll- <i>a</i> concentrations µg/L
06/22/99 19:00	0.0	1.18	10.0
06/22/99 21:00	2.0	2.01	na
06/22/99 23:00	4.0	1.01	7.45
06/23/99 01:00	6.0	1.80	na
06/23/99 07:30	12.5	2.50	8.09
06/23/99 10:30	15.5	1.70	na
06/23/99 12:30	17.5	1.93	5.52
06/23/99 14:30	19.5	1.48	na
06/23/99 16:30	21.5	2.75	6.27
06/23/99 18:30	23.5	2.94	na
06/23/99 20:30	25.5	2.41	6.77
06/23/99 22:30	27.5	2.78	na
06/24/99 00:30	29.5	3.26	9.34
06/24/99 02:30	31.5	1.56	na
06/24/99 04:30	33.5	2.45	8.96
06/24/99 06:30	35.5	1.94	na
06/24/99 08:30	37.5	2.47	9.27
06/24/99 10:30	39.5	2.70	na
06/24/99 12:30	41.5	2.57	8.15
06/24/99 14:30	43.5	2.29	na
06/24/99 16:30	45.5	2.21	99
06/24/99 18:30	47.5	0.19	na
06/24/99 20:30	49.5	0.04	16.7
06/25/99 00:30	53.5	1.59	na
06/25/99 04:30	57.5	1.54	13.3
06/25/99 08:30	61.5	0.53	na
06/25/99 10:30	63.5	1.20	11.2
06/25/99 14:30	67.5	0.98	na

Table A8. Bacterial cell counts and chlorophyll-*a* concentrations for samples collected on Sugar Creek during June 1999 -- continued
[hr, hours; µg/L, micrograms per liter; millions/mL, millions per milliliter; na, not available]

Date-Time	Time from start hr	Bacterial Cell Counts millions/mL	Chlorophyll- <i>a</i> concentrations µg/L
06/25/99 18:30	71.5	1.36	9.62
06/25/99 22:30	75.5	1.00	na
06/26/99 00:30	77.5	0.85	8.16
06/26/99 04:30	81.5	0.94	11.1
06/26/99 08:30	85.5	0.88	na
06/26/99 12:30	89.5	0.96	6.96
06/26/99 16:30	93.5	0.55	na

Table A9. Concentrations of nutrients, dissolved organic carbon (DOC) and suspended sediment for samples collected on the Iroquois River during September 1999.

[hr, hours; mg/L, milligrams per liter; mg N/L, milligrams per liter as nitrogen; mg P/L, milligrams per liter as phosphorus; mg C/L, milligrams per liter as carbon; Avg, average; SD, standard deviation; na, not available]

Date-Time	Time from start hr	NO ₃		NO ₂		NH ₄		Kjeldahl N		PO ₄		P		DOC		Suspended Sediment mg/L
		Avg	SD	Avg	SD	Avg	SD	Value	mg N/L	Avg	SD	Avg	SD	Avg	SD	Value
09/13/99 04:00	0.0	0.70	0.01	0.016	0.001	0.089	0.004	0.53	0.05	0.01	0.002	0.077	0.002	6.1	0.0	102
09/13/99 07:00	3.0	0.64	0.02	0.016	0.001	0.098	0.004	0.59	0.06	0.00	0.007	0.066	0.007	6.3	0.1	77
09/13/99 10:00	6.0	0.61	0.00	0.015	0.001	0.086	0.001	0.61	0.06	0.00	0.003	0.073	0.003	6.3	0.1	65
09/13/99 13:00	9.0	0.58	0.00	0.015	0.001	0.071	0.001	0.49	0.07	0.00	0.007	0.067	0.007	6.2	0.2	47
09/13/99 16:00	12.0	0.57	0.00	0.015	0.000	0.070	0.000	0.49	0.07	0.00	0.005	0.072	0.005	6.3	0.0	34
09/13/99 19:00	15.0	0.61	0.02	0.016	0.001	0.096	0.000	0.51	0.06	0.00	0.007	0.067	0.007	6.2	0.0	71
09/13/99 22:00	18.0	0.63	0.01	0.015	0.001	0.081	0.002	0.65	0.06	0.00	0.001	0.070	0.001	6.4	0.2	50
09/14/99 01:00	21.0	0.66	0.01	0.015	0.001	0.066	0.003	0.49	0.06	0.00	0.009	0.071	0.009	5.3	0.1	75
09/14/99 04:00	24.0	0.65	0.01	0.016	0.000	0.071	0.001	0.53	0.07	0.00	0.004	0.069	0.004	5.9	0.1	101
09/14/99 07:00	27.0	0.58	0.00	0.016	0.000	0.097	0.004	0.50	0.06	0.00	0.010	0.068	0.010	5.1	0.2	77
09/14/99 10:00	30.0	0.50	0.00	0.015	0.001	0.083	0.006	0.47	0.07	0.00	0.006	0.066	0.006	5.3	0.0	38
09/14/99 13:00	33.0	0.46	0.01	0.014	0.000	0.065	0.002	0.53	0.06	0.00	0.004	0.068	0.004	6.4	0.1	38
09/14/99 16:00	36.0	0.47	0.01	0.014	0.000	0.071	0.002	0.55	0.06	0.00	0.005	0.064	0.005	6.4	0.0	33
09/14/99 19:00	39.0	0.52	0.00	0.014	0.000	0.080	0.003	0.54	0.06	0.00	0.002	0.070	0.002	5.6	0.0	50
09/14/99 22:00	42.0	0.61	0.00	0.016	0.001	0.082	0.000	0.50	0.06	0.00	0.004	0.065	0.004	6.4	0.1	79
09/15/99 01:00	45.0	0.73	0.01	0.020	0.000	0.098	0.003	0.57	0.06	0.00	0.003	0.067	0.003	6.2	0.1	74
09/15/99 04:00	48.0	0.81	0.05	0.022	0.001	0.110	0.002	0.59	0.07	0.00	0.004	0.074	0.004	6.5	0.1	na
09/15/99 07:00	51.0	0.66	0.02	0.018	0.000	0.091	0.000	0.54	0.07	0.00	0.004	0.066	0.004	6.2	0.1	85
09/15/99 10:00	54.0	0.59	0.01	0.016	0.002	0.094	0.001	0.50	0.07	0.00	0.008	0.070	0.008	6.0	0.1	54
09/15/99 13:00	57.0	0.49	0.01	0.016	0.000	0.088	0.001	0.56	0.07	0.01	0.006	0.064	0.006	6.0	0.2	29
09/15/99 16:00	60.0	0.53	0.00	0.016	0.001	0.046	0.006	0.58	0.05	0.00	0.003	0.065	0.003	5.9	0.2	na
09/15/99 19:00	63.0	0.47	0.01	0.016	0.000	0.039	0.001	0.56	0.06	0.01	0.005	0.071	0.005	6.4	0.2	62
09/15/99 22:00	66.0	0.52	0.00	0.017	0.001	0.091	0.000	0.54	0.06	0.00	0.005	0.068	0.005	6.5	0.1	57
09/16/99 01:00	69.0	0.58	0.00	0.019	0.001	0.113	0.003	0.54	0.06	0.00	0.004	0.070	0.004	6.2	0.0	77
09/16/99 04:00	72.0	0.62	0.01	0.018	0.001	0.105	0.002	0.53	0.06	0.00	0.002	0.066	0.002	6.2	0.1	74
09/16/99 07:00	75.0	0.61	0.00	0.017	0.001	0.084	0.001	0.56	0.06	0.00	0.004	0.066	0.004	6.2	0.1	52

Table A10. Concentrations of major inorganic constituents for samples collected on the Iroquois River during September 1999.

[hr, hours; mg/L, milligrams per liter; mg C/L, milligrams per liter as carbon; µg/L, micrograms per liter; Avg, average; SD, standard deviation; na, not available]

Date-Time	Time from start hr	Cl		SO ₄		HCO ₃		CO ₃		Br		Na		K		Mg		Ca		SiO ₂	
		Avg	SD	Avg	SD	Value	mg C/L	Value	mg C/L	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/13/99 04:00	0.0	47	na	75	na	54.3	0.099	22	4	27	1	3.1	0.0	27	0	77	10	7.9	0.3	7.9	0.3
09/13/99 07:00	3.0	45	na	75	na	54.4	0.099	20	0	26	1	3.1	0.1	26	1	73	4	7.9	0.3	7.9	0.3
09/13/99 10:00	6.0	44	na	75	na	54.6	0.102	22	2	26	0	3.1	0.2	26	1	74	2	8.2	0.0	8.2	0.0
09/13/99 13:00	9.0	44	na	76	na	54.3	0.114	28	5	25	1	3.0	0.1	26	1	74	1	8.1	0.1	8.1	0.1
09/13/99 16:00	12.0	44	na	75	na	54.0	0.116	22	3	26	1	3.1	0.1	26	1	75	3	8.3	0.4	8.3	0.4
09/13/99 19:00	15.0	44	na	74	na	53.8	0.108	24	3	27	1	3.1	0.1	26	0	75	1	8.2	0.2	8.2	0.2
09/13/99 22:00	18.0	42	na	73	na	54.2	0.101	25	2	27	1	3.2	0.0	27	0	76	1	7.9	0.5	7.9	0.5
09/14/99 01:00	21.0	42	na	74	na	53.1	0.095	20	2	26	2	3.1	0.0	26	1	75	3	8.2	0.3	8.2	0.3
09/14/99 04:00	24.0	48	na	75	na	53.3	0.093	17	1	26	1	3.0	0.1	25	0	73	1	8.2	0.1	8.2	0.1
09/14/99 07:00	27.0	45	na	74	na	53.1	0.092	17	0	25	3	3.0	0.4	26	3	67	2	7.5	0.4	7.5	0.4
09/14/99 10:00	30.0	46	na	74	na	52.8	0.094	19	3	24	0	2.9	0.1	25	0	74	1	8.2	0.2	8.2	0.2
09/14/99 13:00	33.0	43	na	75	na	52.5	0.100	19	2	24	1	3.2	0.0	26	1	75	2	8.2	0.2	8.2	0.2
09/14/99 16:00	36.0	45	na	74	na	52.5	0.103	21	6	24	1	3.0	0.2	25	1	73	3	7.9	0.4	7.9	0.4
09/14/99 19:00	39.0	45	na	75	na	51.9	0.094	20	1	24	1	3.1	0.1	25	1	74	3	7.8	0.4	7.8	0.4
09/14/99 22:00	42.0	49	na	77	na	53.1	0.092	20	2	26	1	3.1	0.2	26	1	75	2	7.8	0.1	7.8	0.1
09/15/99 01:00	45.0	53	na	76	na	54.0	0.090	22	2	29	1	3.2	0.1	27	0	77	1	8.0	0.1	8.0	0.1
09/15/99 04:00	48.0	54	na	77	na	54.3	0.088	27	3	29	0	3.2	0.1	26	1	76	1	7.7	0.2	7.7	0.2
09/15/99 07:00	51.0	53	na	77	na	53.6	0.087	27	7	27	1	3.1	0.1	26	0	75	1	7.6	0.1	7.6	0.1
09/15/99 10:00	54.0	52	na	75	na	52.8	0.090	23	0	28	1	3.3	0.0	29	1	81	1	8.2	0.0	8.2	0.0
09/15/99 13:00	57.0	48	na	74	na	52.7	0.096	22	2	24	0	3.1	0.2	25	0	72	0	7.7	0.3	7.7	0.3
09/15/99 16:00	60.0	48	na	76	na	52.5	0.098	24	2	25	1	3.1	0.0	26	0	75	1	7.7	0.1	7.7	0.1
09/15/99 19:00	63.0	47	na	76	na	53.6	0.098	21	2	26	3	3.0	0.1	26	2	73	2	7.5	0.1	7.5	0.1
09/15/99 22:00	66.0	52	na	76	na	53.6	0.091	25	6	27	1	3.1	0.1	26	0	74	0	7.7	0.3	7.7	0.3
09/16/99 01:00	69.0	50	na	77	na	54.4	0.090	24	3	29	1	3.3	0.1	27	1	78	1	7.9	0.0	7.9	0.0
09/16/99 04:00	72.0	55	na	76	na	54.9	0.091	26	5	29	1	3.2	0.1	26	1	77	1	7.8	0.3	7.8	0.3
09/16/99 07:00	75.0	52	na	76	na	53.9	0.087	22	5	28	1	3.2	0.1	27	1	77	1	7.9	0.3	7.9	0.3

Table A11. Concentrations of trace elements for samples collected on the Iroquois River during September 1999.

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Al		As		B		Ba		Be		Bi		Cd		Ce		Co	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/13/99 04:00	0.0	1.4	0.0	1.8	0.0	135	5	73	1	0.005	0.006	<0.002	0.001	0.010	0.001	0.019	0.001	0.033	0.017
09/13/99 07:00	3.0	1.2	0.0	1.7	0.0	129	5	72	1	<0.005	0.007	0.004	0.001	0.014	0.002	0.022	0.001	0.052	0.003
09/13/99 10:00	6.0	1.6	0.2	1.8	0.1	126	3	71	1	<0.008	0.004	0.0005	0.0005	0.003	0.001	0.020	0.000	0.027	0.006
09/13/99 13:00	9.0	2.1	0.3	1.9	0.1	122	1	66	6	<0.008	0.009	<0.0004	0.0002	0.010	0.001	0.019	0.000	0.030	0.011
09/13/99 16:00	12.0	1.7	0.1	1.8	0.1	121	5	75	1	<0.008	0.005	0.0006	0.0002	0.009	0.001	0.021	0.001	0.047	0.002
09/13/99 19:00	15.0	1.6	0.1	1.8	0.1	124	2	75	3	<0.008	0.005	<0.0004	0.0005	0.009	0.005	0.023	0.001	0.027	0.012
09/13/99 22:00	18.0	1.8	0.2	1.9	0.1	119	6	79	1	0.011	0.004	<0.0004	0.0003	0.013	0.001	0.023	0.002	0.024	0.006
09/14/99 01:00	21.0	4.1	0.0	1.8	0.0	115	6	73	1	<0.008	0.004	0.0020	0.0014	0.013	0.001	0.023	0.000	0.019	0.012
09/14/99 04:00	24.0	3.4	0.5	1.7	0.1	111	4	72	1	0.010	0.006	0.0011	0.0004	0.012	0.003	0.021	0.000	0.022	0.010
09/14/99 07:00	27.0	4.4	0.3	1.6	0.0	128	19	73	2	<0.005	0.002	<0.002	0.000	0.013	0.002	0.024	0.000	0.043	0.002
09/14/99 10:00	30.0	3.4	0.1	1.7	0.0	112	6	73	2	<0.005	0.004	<0.002	0.000	0.011	0.003	0.023	0.000	0.027	0.007
09/14/99 13:00	33.0	1.7	0.2	1.8	0.0	118	6	72	2	<0.008	0.006	<0.0004	0.0002	0.016	0.002	0.023	0.001	0.011	0.012
09/14/99 16:00	36.0	1.8	0.1	1.8	0.0	121	3	67	1	<0.008	0.004	0.0013	0.0008	0.020	0.001	0.020	0.000	0.015	0.002
09/14/99 19:00	39.0	11	0	1.8	0.1	117	4	73	1	<0.008	0.005	0.0016	0.0001	0.015	0.002	0.034	0.001	0.042	0.011
09/14/99 22:00	42.0	1.4	0.2	1.8	0.0	123	5	77	4	<0.008	0.005	0.0010	0.0007	0.005	0.002	0.021	0.001	0.029	0.002
09/15/99 01:00	45.0	1.3	0.0	1.7	0.1	126	1	71	1	<0.008	0.002	0.0005	0.0000	0.009	0.001	0.024	0.001	0.032	0.010
09/15/99 04:00	48.0	2.3	0.6	1.8	0.1	122	2	74	2	0.013	0.009	0.0020	0.0003	0.012	0.001	0.029	0.000	0.052	0.004
09/15/99 07:00	51.0	1.3	0.0	1.8	0.1	122	2	74	1	<0.008	0.005	<0.0004	0.0001	0.017	0.001	0.023	0.000	0.033	0.024
09/15/99 10:00	54.0	1.2	0.0	1.7	0.0	142	3	74	0	0.006	0.002	<0.002	0.000	0.010	0.002	0.015	0.000	0.036	0.014
09/15/99 13:00	57.0	2.8	0.2	1.7	0.0	119	5	73	2	0.008	0.001	<0.002	0.000	0.012	0.002	0.019	0.000	0.033	0.011
09/15/99 16:00	60.0	1.6	0.3	1.8	0.1	123	3	74	3	<0.008	0.008	<0.0004	0.0003	0.006	0.001	0.020	0.002	0.024	0.020
09/15/99 19:00	63.0	2.0	0.5	1.8	0.1	126	15	74	1	<0.008	0.002	0.0011	0.0004	0.011	0.001	0.024	0.001	0.039	0.003
09/15/99 22:00	66.0	1.3	0.2	1.8	0.1	126	2	75	2	<0.008	0.007	0.0008	0.0008	0.006	0.002	0.020	0.000	0.022	0.021
09/16/99 01:00	69.0	1.4	0.2	1.8	0.1	130	3	80	1	0.010	0.004	0.0021	0.0017	0.16	0.00	0.022	0.000	0.031	0.004
09/16/99 04:00	72.0	1.3	0.1	1.7	0.0	125	4	82	1	<0.008	0.003	<0.0004	0.0000	0.024	0.001	0.021	0.000	0.017	0.013
09/16/99 07:00	75.0	1.5	0.3	1.7	0.1	126	5	77	3	<0.008	0.006	0.0007	0.0007	0.009	0.001	0.023	0.000	0.025	0.008

Table A11. Concentrations of trace elements for samples collected on the Iroquois River during September 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Cr		Cs		Cu		Dy		Er		Eu		Fe	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/13/99 04:00	0.0	<0.1	0.0	<0.0009	0.0006	1.2	0.0	0.0052	0.0003	0.0040	0.0004	0.0022	0.0009	4.6	0.7
09/13/99 07:00	3.0	<0.1	0.0	0.0010	0.0007	0.76	0.00	0.0054	0.0001	0.0039	0.0001	0.0017	0.0001	4.9	0.3
09/13/99 10:00	6.0	<0.4	0.1	<0.002	0.001	0.19	0.07	0.0049	0.0002	0.0032	0.0004	0.0064	0.0005	4.6	0.3
09/13/99 13:00	9.0	<0.4	0.1	<0.002	0.002	0.29	0.05	0.0048	0.0000	0.0034	0.0004	0.0071	0.0001	4.0	0.2
09/13/99 16:00	12.0	<0.4	0.1	<0.002	0.000	0.14	0.04	0.0045	0.0002	0.0037	0.0004	0.0054	0.0002	4.3	0.2
09/13/99 19:00	15.0	<0.4	0.0	<0.002	0.002	0.23	0.06	0.0043	0.0000	0.0034	0.0001	0.0063	0.0026	4.7	0.1
09/13/99 22:00	18.0	<0.4	0.0	<0.002	0.002	0.42	0.05	0.0055	0.0002	0.0040	0.0010	0.0051	0.0020	4.2	0.4
09/14/99 01:00	21.0	<0.4	0.1	<0.002	0.000	2.2	0.1	0.0045	0.0003	0.0044	0.0002	0.0046	0.0013	5.8	0.3
09/14/99 04:00	24.0	<0.4	0.0	<0.002	0.002	1.7	0.1	0.0055	0.0000	0.0036	0.0004	0.0057	0.0011	6.1	0.7
09/14/99 07:00	27.0	<0.1	0.0	<0.0009	0.0003	1.6	0.0	0.0053	0.0006	0.0040	0.0003	0.0017	0.0001	6.7	0.7
09/14/99 10:00	30.0	<0.1	0.1	<0.0009	0.0001	2.5	0.0	0.0055	0.0010	0.0050	0.0006	0.0015	0.0012	5.8	0.3
09/14/99 13:00	33.0	<0.4	0.0	<0.002	0.001	1.7	0.1	0.0050	0.0006	0.0037	0.0002	0.0070	0.0001	5.5	0.3
09/14/99 16:00	36.0	<0.4	0.1	<0.002	0.001	1.7	0.1	0.0039	0.0004	0.0037	0.0004	0.0061	0.0000	3.2	0.3
09/14/99 19:00	39.0	<0.4	0.0	0.006	0.002	2.8	0.1	0.0056	0.0002	0.0047	0.0004	0.0069	0.0009	16	0
09/14/99 22:00	42.0	<0.4	0.0	<0.002	0.001	0.05	0.05	0.0048	0.0005	0.0035	0.0005	0.0061	0.0001	4.1	0.3
09/15/99 01:00	45.0	<0.4	0.1	<0.002	0.001	2.3	0.1	0.0045	0.0005	0.0038	0.0004	0.0062	0.0012	5.8	0.3
09/15/99 04:00	48.0	<0.4	0.1	<0.002	0.001	0.83	0.05	0.0058	0.0003	0.0042	0.0001	0.0052	0.0002	7.4	0.1
09/15/99 07:00	51.0	<0.4	0.0	<0.002	0.001	0.90	0.04	0.0049	0.0001	0.0044	0.0006	0.0052	0.0022	4.3	0.2
09/15/99 10:00	54.0	<0.1	0.0	<0.0009	0.0002	3.2	0.0	0.0048	0.0001	0.0036	0.0001	0.0008	0.0008	3.9	0.5
09/15/99 13:00	57.0	<0.1	0.0	<0.0009	0.0002	2.9	0.0	0.0053	0.0004	0.0040	0.0008	0.0008	0.0004	5.8	0.4
09/15/99 16:00	60.0	<0.4	0.0	<0.002	0.001	0.71	0.05	0.0041	0.0004	0.0039	0.0002	0.0035	0.0007	4.5	0.4
09/15/99 19:00	63.0	<0.4	0.1	0.003	0.002	1.3	0.0	0.0055	0.0002	0.0039	0.0003	0.0051	0.0002	4.4	0.3
09/15/99 22:00	66.0	<0.4	0.1	<0.002	0.000	0.15	0.04	0.0047	0.0007	0.0039	0.0007	0.0044	0.0004	4.6	0.2
09/16/99 01:00	69.0	<0.4	0.0	<0.002	0.001	1.6	0.0	0.0059	0.0004	0.0045	0.0002	0.0055	0.0006	3.8	0.2
09/16/99 04:00	72.0	<0.4	0.1	<0.002	0.000	1.1	0.1	0.0051	0.0010	0.0045	0.0002	0.0049	0.0013	3.6	0.3
09/16/99 07:00	75.0	<0.4	0.1	<0.002	0.001	1.5	0.0	0.0058	0.0000	0.0033	0.0003	0.0057	0.0014	4.8	0.2

Table A11. Concentrations of trace elements for samples collected on the Iroquois River during September 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Gd µg/L		Hg ng/L		Ho µg/L		La µg/L		Li µg/L		Lu µg/L		Mn µg/L		Mo µg/L	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/13/99 04:00	0.0	0.0063	0.0001	0.6	0.1	0.0013	0.0001	0.013	0.001	8.2	0.2	0.0010	0.0000	141	4	5.7	0.1
09/13/99 07:00	3.0	0.0056	0.0003	0.6	0.1	0.0013	0.0001	0.013	0.000	7.8	0.5	0.0008	0.0001	161	1	5.8	0.0
09/13/99 10:00	6.0	0.0045	0.0004	0.5	0.3	0.0011	0.0001	0.012	0.001	7.7	0.2	0.0008	0.0001	153	2	5.7	0.2
09/13/99 13:00	9.0	0.0050	0.0003	0.4	0.1	0.0010	0.0001	0.011	0.001	8.0	0.4	0.0009	0.0000	158	18	5.7	0.1
09/13/99 16:00	12.0	0.0056	0.0004	0.7	0.4	0.0012	0.0001	0.013	0.000	7.8	0.2	0.0009	0.0001	160	1	5.6	0.1
09/13/99 19:00	15.0	0.0054	0.0007	0.5	0.3	0.0012	0.0001	0.014	0.001	7.5	0.2	0.0010	0.0001	159	3	5.6	0.1
09/13/99 22:00	18.0	0.0060	0.0002	0.9	0.1	0.0014	0.0002	0.015	0.000	7.6	0.2	0.0011	0.0001	155	4	5.7	0.1
09/14/99 01:00	21.0	0.0062	0.0008	1.0	0.2	0.0014	0.0003	0.015	0.001	7.0	0.4	0.0009	0.0000	136	6	5.4	0.1
09/14/99 04:00	24.0	0.0056	0.0007	0.5	0.1	0.0011	0.0001	0.014	0.001	6.9	0.2	0.0009	0.0001	146	2	5.3	0.2
09/14/99 07:00	27.0	0.0062	0.0002	1.4	0.1	0.0012	0.0000	0.015	0.001	6.6	0.6	0.0009	0.0000	148	0	5.2	0.1
09/14/99 10:00	30.0	0.0053	0.0010	0.3	0.1	0.0012	0.0001	0.015	0.000	6.7	0.3	0.0010	0.0001	148	2	5.2	0.0
09/14/99 13:00	33.0	0.0054	0.0006	na	na	0.0010	0.0001	0.015	0.000	6.9	0.1	0.0009	0.0002	158	14	5.3	0.0
09/14/99 16:00	36.0	0.0049	0.0005	1.0	0.3	0.0010	0.0000	0.012	0.001	7.0	0.2	0.0008	0.0001	158	13	5.1	0.1
09/14/99 19:00	39.0	0.0074	0.0003	0.8	0.1	0.0013	0.0001	0.020	0.001	7.2	0.2	0.0009	0.0000	162	11	5.1	0.1
09/14/99 22:00	42.0	0.0072	0.0004	0.4	0.1	0.0010	0.0001	0.013	0.001	7.1	0.2	0.0009	0.0001	166	3	5.2	0.1
09/15/99 01:00	45.0	0.011	0.000	0.8	0.2	0.0011	0.0002	0.014	0.000	7.5	0.2	0.0008	0.0000	183	1	5.0	0.0
09/15/99 04:00	48.0	0.013	0.000	na	na	0.0013	0.0002	0.018	0.002	7.6	0.3	0.0009	0.0003	183	3	5.0	0.1
09/15/99 07:00	51.0	0.0085	0.0002	1.5	0.1	0.0012	0.0001	0.014	0.001	7.2	0.4	0.0011	0.0001	166	11	5.1	0.1
09/15/99 10:00	54.0	0.011	0.000	na	na	0.0011	0.0001	0.010	0.000	7.5	0.0	0.0009	0.0001	166	3	5.0	0.0
09/15/99 13:00	57.0	0.010	0.001	8.4	0.0	0.0011	0.0001	0.013	0.000	7.4	0.2	0.0009	0.0001	178	1	5.2	0.1
09/15/99 16:00	60.0	0.0099	0.0002	8.5	0.1	0.0011	0.0002	0.012	0.001	7.6	0.1	0.0008	0.0000	173	13	5.1	0.1
09/15/99 19:00	63.0	0.012	0.000	1.0	0.2	0.0013	0.0002	0.014	0.000	7.6	0.3	0.0008	0.0000	165	11	5.2	0.1
09/15/99 22:00	66.0	0.011	0.000	0.6	0.2	0.0011	0.0001	0.013	0.000	7.7	0.3	0.0009	0.0001	152	3	5.1	0.1
09/16/99 01:00	69.0	0.012	0.001	2.1	0.2	0.0013	0.0002	0.014	0.000	7.6	0.6	0.0010	0.0002	176	13	5.2	0.1
09/16/99 04:00	72.0	0.011	0.001	0.6	0.2	0.0012	0.0002	0.013	0.001	7.5	0.3	0.0010	0.0001	176	3	5.1	0.1
09/16/99 07:00	75.0	0.010	0.001	0.5	0.1	0.0013	0.0001	0.014	0.000	7.6	0.4	0.0009	0.0002	160	2	5.0	0.2

Table A11. Concentrations of trace elements for samples collected on the Iroquois River during September 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Nd		Ni		Pb		Pr		Rb		Re		Sb		Se	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/13/99 04:00	0.0	0.017	0.001	1.8	0.3	0.033	0.007	0.0037	0.0001	1.2	0.0	0.0057	0.0002	0.16	0.00	0.30	0.05
09/13/99 07:00	3.0	0.019	0.001	2.0	0.0	0.030	0.001	0.0038	0.0000	1.2	0.0	0.0090	0.0001	0.16	0.00	0.27	0.01
09/13/99 10:00	6.0	0.018	0.001	1.8	0.4	0.026	0.004	0.0033	0.0001	1.1	0.1	0.0059	0.0002	0.15	0.00	0.3	0.1
09/13/99 13:00	9.0	0.015	0.001	2.4	0.2	0.031	0.006	0.0032	0.0004	1.1	0.1	0.0040	0.0003	0.16	0.00	0.3	0.1
09/13/99 16:00	12.0	0.016	0.001	2.1	0.3	0.021	0.003	0.0035	0.0003	1.1	0.1	0.0080	0.0003	0.16	0.00	0.2	0.1
09/13/99 19:00	15.0	0.018	0.001	2.1	0.1	0.034	0.002	0.0036	0.0002	1.1	0.1	0.0096	0.0003	0.16	0.00	0.3	0.0
09/13/99 22:00	18.0	0.017	0.001	1.6	0.1	0.027	0.003	0.0042	0.0001	1.1	0.1	0.0086	0.0004	0.17	0.00	0.3	0.1
09/14/99 01:00	21.0	0.019	0.002	2.0	0.1	0.031	0.006	0.0040	0.0002	1.1	0.1	0.013	0.000	0.15	0.01	0.3	0.1
09/14/99 04:00	24.0	0.017	0.001	2.0	0.1	0.020	0.001	0.0036	0.0003	1.1	0.1	0.013	0.001	0.15	0.00	0.2	0.0
09/14/99 07:00	27.0	0.017	0.001	1.9	0.0	0.032	0.005	0.0039	0.0003	1.1	0.0	0.013	0.000	0.15	0.00	0.28	0.05
09/14/99 10:00	30.0	0.018	0.002	1.9	0.2	0.026	0.001	0.0039	0.0003	1.1	0.0	0.013	0.000	0.14	0.00	0.30	0.01
09/14/99 13:00	33.0	0.018	0.001	2.2	0.3	0.023	0.001	0.0035	0.0002	1.1	0.1	0.013	0.000	0.14	0.00	0.3	0.0
09/14/99 16:00	36.0	0.015	0.001	2.0	0.4	0.020	0.008	0.0028	0.0002	1.1	0.1	0.013	0.000	0.15	0.01	0.3	0.0
09/14/99 19:00	39.0	0.026	0.000	2.4	0.1	0.054	0.006	0.0050	0.0002	1.1	0.1	0.012	0.000	0.17	0.00	0.3	0.1
09/14/99 22:00	42.0	0.016	0.000	1.7	0.3	0.022	0.003	0.0033	0.0003	1.1	0.1	0.012	0.000	0.15	0.01	0.3	0.0
09/15/99 01:00	45.0	0.018	0.001	2.3	0.3	0.037	0.003	0.0040	0.0000	1.2	0.1	0.012	0.000	0.15	0.00	0.3	0.1
09/15/99 04:00	48.0	0.022	0.001	1.9	0.3	0.052	0.009	0.0044	0.0001	1.1	0.2	0.014	0.000	0.17	0.00	0.3	0.1
09/15/99 07:00	51.0	0.017	0.001	2.1	0.1	0.029	0.008	0.0036	0.0003	1.1	0.1	0.013	0.000	0.17	0.00	0.3	0.1
09/15/99 10:00	54.0	0.014	0.002	2.1	0.1	0.029	0.006	0.0025	0.0000	1.2	0.0	0.013	0.000	0.15	0.00	0.32	0.02
09/15/99 13:00	57.0	0.017	0.001	2.1	0.1	0.056	0.004	0.0039	0.0004	1.2	0.0	0.014	0.000	0.16	0.00	0.31	0.01
09/15/99 16:00	60.0	0.017	0.001	1.7	0.4	0.028	0.002	0.0031	0.0002	1.1	0.1	0.014	0.001	0.16	0.00	0.3	0.1
09/15/99 19:00	63.0	0.018	0.001	2.2	0.3	0.031	0.001	0.0039	0.0003	1.2	0.1	0.0056	0.0002	0.16	0.00	0.2	0.0
09/15/99 22:00	66.0	0.019	0.005	1.5	0.2	0.022	0.008	0.0034	0.0003	1.1	0.1	0.012	0.001	0.16	0.01	0.3	0.0
09/16/99 01:00	69.0	0.018	0.001	1.5	0.3	0.029	0.004	0.0035	0.0002	1.2	0.1	0.013	0.000	0.18	0.00	0.3	0.1
09/16/99 04:00	72.0	0.018	0.000	1.7	0.1	0.023	0.003	0.0037	0.0001	1.2	0.1	0.014	0.000	0.15	0.00	0.3	0.1
09/16/99 07:00	75.0	0.018	0.002	2.0	0.2	0.027	0.002	0.0038	0.0004	1.2	0.1	0.012	0.000	0.15	0.00	0.2	0.1

Table A11. Concentrations of trace elements for samples collected on the Iroquois River during September 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Sm µg/L		Sr µg/L		Ta µg/L		Tb µg/L		Te µg/L		Th µg/L		Ti µg/L		Tl µg/L	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD		
09/13/99 04:00	0.0	0.0042	0.0010	403	2	<0.001	0.001	0.0008	0.0001	0.013	0.000	0.0012	0.0002	<0.06	0.24	0.0061	0.0017
09/13/99 07:00	3.0	0.0043	0.0008	401	5	0.002	0.000	0.0006	0.0000	<0.01	0.003	0.0016	0.0000	<0.06	0.01	0.0044	0.0001
09/13/99 10:00	6.0	0.0038	0.0000	400	20	<0.0004	0.0000	0.0007	0.0001	0.012	0.004	0.0020	0.0001	<0.08	0.00	0.010	0.003
09/13/99 13:00	9.0	0.0034	0.0002	406	16	<0.0004	0.0003	0.0006	0.0001	0.010	0.002	0.0012	0.0001	<0.08	0.17	0.006	0.004
09/13/99 16:00	12.0	0.0043	0.0003	403	3	<0.0004	0.0001	0.0008	0.0002	0.008	0.003	0.0010	0.0001	<0.08	0.03	0.007	0.004
09/13/99 19:00	15.0	0.0050	0.0004	408	15	0.0006	0.0007	0.0007	0.0001	0.010	0.000	0.0013	0.0001	<0.08	0.14	0.008	0.004
09/13/99 22:00	18.0	0.0046	0.0007	423	4	<0.0004	0.0000	0.0009	0.0001	0.011	0.003	0.0014	0.0002	<0.08	0.13	0.008	0.000
09/14/99 01:00	21.0	0.0048	0.0005	380	5	<0.0004	0.0001	0.0008	0.0001	0.014	0.005	0.0020	0.0007	<0.08	0.15	0.015	0.011
09/14/99 04:00	24.0	0.0045	0.0007	373	16	<0.0004	0.0003	0.0007	0.0001	0.010	0.002	0.0015	0.0005	<0.08	0.09	0.008	0.003
09/14/99 07:00	27.0	0.0054	0.0005	374	1	<0.001	0.000	0.0009	0.0000	<0.01	0.002	0.0011	0.0001	<0.06	0.16	0.0051	0.0004
09/14/99 10:00	30.0	0.0053	0.0017	372	1	<0.001	0.001	0.0006	0.0000	<0.01	0.003	0.0011	0.0000	<0.06	0.06	0.0052	0.0007
09/14/99 13:00	33.0	0.0039	0.0003	391	12	<0.0004	0.0004	0.0006	0.0001	0.009	0.003	0.0013	0.0001	<0.08	0.13	0.007	0.003
09/14/99 16:00	36.0	0.0038	0.0002	386	9	<0.0004	0.0004	0.0008	0.0001	0.009	0.003	0.0012	0.0003	<0.08	0.10	0.008	0.003
09/14/99 19:00	39.0	0.0061	0.0003	380	13	<0.0004	0.0002	0.0010	0.0001	0.007	0.004	0.0027	0.0001	<0.08	0.09	0.006	0.002
09/14/99 22:00	42.0	0.0042	0.0005	394	7	<0.0004	0.0004	0.0007	0.0001	0.012	0.004	0.0010	0.0001	<0.08	0.11	0.006	0.001
09/15/99 01:00	45.0	0.0040	0.0003	400	5	<0.0004	0.0003	0.0007	0.0001	0.011	0.000	0.0012	0.0001	<0.08	0.06	0.004	0.001
09/15/99 04:00	48.0	0.0049	0.0006	395	28	<0.0004	0.0001	0.0009	0.0001	0.013	0.008	0.0020	0.0008	<0.08	0.14	0.005	0.000
09/15/99 07:00	51.0	0.0052	0.0012	388	16	<0.0004	0.0003	0.0007	0.0001	0.010	0.004	0.0010	0.0000	<0.08	0.01	0.006	0.002
09/15/99 10:00	54.0	0.0028	0.0002	396	1	<0.001	0.000	0.0007	0.0000	<0.01	0.005	0.0008	0.0002	<0.06	0.03	0.0049	0.0003
09/15/99 13:00	57.0	0.0035	0.0002	398	4	<0.001	0.000	0.0006	0.0000	0.012	0.000	0.0009	0.0002	<0.06	0.23	0.0051	0.0006
09/15/99 16:00	60.0	0.0042	0.0001	407	1	<0.0004	0.0001	0.0008	0.0001	0.009	0.001	0.0012	0.0004	<0.08	0.14	0.007	0.002
09/15/99 19:00	63.0	0.0038	0.0006	398	9	<0.0004	0.0002	0.0009	0.0001	0.010	0.003	0.0014	0.0003	<0.08	0.01	0.008	0.004
09/15/99 22:00	66.0	0.0051	0.0003	408	3	<0.0004	0.0001	0.0008	0.0001	0.009	0.003	0.0012	0.0001	<0.08	0.14	0.005	0.001
09/16/99 01:00	69.0	0.0042	0.0001	419	3	<0.0004	0.0000	0.0008	0.0001	0.009	0.000	0.0012	0.0003	<0.08	0.04	0.008	0.002
09/16/99 04:00	72.0	0.0048	0.0003	414	3	<0.0004	0.0003	0.0007	0.0000	0.015	0.003	0.0011	0.0004	<0.08	0.03	0.007	0.003
09/16/99 07:00	75.0	0.0048	0.0007	415	4	<0.0004	0.0002	0.0008	0.0001	0.006	0.003	0.0013	0.0001	<0.08	0.09	0.006	0.002

Table A11. Concentrations of trace elements for samples collected on the Iroquois River during September 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Tm		U		V		W		Y		Yb		Zn		Zr	
		Avg	SD	µg/L	SD	Avg	SD	µg/L	SD	Avg	SD	µg/L	SD	Avg	SD	µg/L	SD
09/13/99 04:00	0.0	0.0005	0.0001	1.2	0.0	1.2	0.0	0.004	0.001	0.049	0.001	0.0042	0.0005	0.80	0.16	0.091	0.002
09/13/99 07:00	3.0	0.0007	0.0002	1.2	0.0	1.1	0.0	0.005	0.001	0.049	0.000	0.0044	0.0005	1.3	0.1	0.076	0.000
09/13/99 10:00	6.0	0.0004	0.0002	1.2	0.0	1.2	0.1	0.008	0.000	0.045	0.006	0.0041	0.0001	0.4	0.1	0.090	0.011
09/13/99 13:00	9.0	0.0005	0.0001	1.1	0.1	1.3	0.0	0.007	0.001	0.047	0.006	0.0039	0.0001	0.6	0.0	0.099	0.002
09/13/99 16:00	12.0	0.0006	0.0001	1.3	0.0	1.3	0.2	0.006	0.001	0.048	0.006	0.0047	0.0003	0.4	0.2	0.094	0.004
09/13/99 19:00	15.0	0.0006	0.0001	1.2	0.1	1.3	0.1	0.009	0.001	0.049	0.007	0.0042	0.0005	0.5	0.2	0.092	0.007
09/13/99 22:00	18.0	0.0007	0.0000	1.2	0.1	1.3	0.1	0.006	0.001	0.050	0.005	0.0046	0.0005	3.2	0.0	0.103	0.002
09/14/99 01:00	21.0	0.0005	0.0001	1.2	0.0	1.2	0.1	0.011	0.000	0.047	0.007	0.0041	0.0001	0.5	0.1	0.095	0.007
09/14/99 04:00	24.0	0.0005	0.0000	1.2	0.0	1.1	0.1	0.007	0.003	0.044	0.006	0.0042	0.0006	0.5	0.2	0.083	0.001
09/14/99 07:00	27.0	0.0006	0.0001	1.2	0.0	1.0	0.1	0.005	0.000	0.047	0.000	0.0036	0.0001	0.97	0.08	0.082	0.006
09/14/99 10:00	30.0	0.0005	0.0001	1.2	0.0	1.1	0.0	0.006	0.000	0.047	0.001	0.0045	0.0008	1.0	0.1	0.078	0.002
09/14/99 13:00	33.0	0.0005	0.0001	1.2	0.0	1.1	0.1	0.008	0.001	0.048	0.006	0.0042	0.0004	0.6	0.0	0.096	0.002
09/14/99 16:00	36.0	0.0005	0.0000	1.2	0.1	1.2	0.1	0.008	0.001	0.044	0.005	0.0045	0.0000	0.5	0.1	0.076	0.005
09/14/99 19:00	39.0	0.0005	0.0001	1.2	0.0	1.2	0.1	0.007	0.001	0.050	0.006	0.0046	0.0006	1.9	0.3	0.099	0.003
09/14/99 22:00	42.0	0.0006	0.0001	1.2	0.1	1.2	0.1	0.006	0.001	0.044	0.005	0.0046	0.0004	0.5	0.1	0.082	0.002
09/15/99 01:00	45.0	0.0005	0.0001	1.2	0.1	1.1	0.1	0.005	0.000	0.049	0.006	0.0043	0.0003	0.7	0.2	0.087	0.006
09/15/99 04:00	48.0	0.0007	0.0001	1.2	0.0	1.2	0.1	0.008	0.002	0.051	0.006	0.0046	0.0003	1.6	0.2	0.091	0.001
09/15/99 07:00	51.0	0.0005	0.0000	1.3	0.0	1.2	0.1	0.005	0.000	0.047	0.006	0.0049	0.0006	0.8	0.2	0.077	0.003
09/15/99 10:00	54.0	0.0006	0.0001	1.2	0.0	1.1	0.1	0.004	0.000	0.047	0.002	0.0038	0.0002	1.0	0.0	0.074	0.000
09/15/99 13:00	57.0	0.0006	0.0001	1.2	0.0	1.2	0.1	0.005	0.000	0.050	0.001	0.0043	0.0003	1.8	0.0	0.082	0.003
09/15/99 16:00	60.0	0.0006	0.0000	1.2	0.1	1.3	0.2	0.005	0.001	0.046	0.006	0.0040	0.0001	1.0	0.1	0.085	0.001
09/15/99 19:00	63.0	0.0006	0.0001	1.3	0.0	1.2	0.1	0.006	0.001	0.050	0.006	0.0045	0.0005	0.8	0.1	0.097	0.001
09/15/99 22:00	66.0	0.0005	0.0001	1.2	0.0	1.2	0.1	0.004	0.001	0.046	0.008	0.0042	0.0005	0.6	0.3	0.084	0.002
09/16/99 01:00	69.0	0.0006	0.0001	1.3	0.0	1.2	0.1	0.007	0.000	0.048	0.005	0.0046	0.0008	1.1	0.1	0.093	0.001
09/16/99 04:00	72.0	0.0006	0.0000	1.2	0.0	1.1	0.1	0.004	0.000	0.048	0.005	0.0047	0.0002	0.8	0.1	0.092	0.000
09/16/99 07:00	75.0	0.0005	0.0001	1.3	0.0	1.1	0.1	0.004	0.001	0.046	0.007	0.0046	0.0002	0.8	0.1	0.097	0.001

Table A12. Bacterial cell counts and chlorophyll-a concentrations for samples collected on the Iroquois River during September 1999.

[hr, hours; µg/L, micrograms per liter; millions/mL, millions per milliliter; na, not available]

Date-Time	Time from start hr	Bacterial Cell Counts millions/mL	Chlorophyll-a concentrations µg/L
09/13/99 04:00	0.0	1.72	7.27
09/13/99 07:00	3.0	2.35	na
09/13/99 10:00	6.0	1.54	8.68
09/13/99 13:00	9.0	0.02	na
09/13/99 16:00	12.0	0.74	6.70
09/13/99 19:00	15.0	0.10	na
09/13/99 22:00	18.0	0.50	5.46
09/14/99 01:00	21.0	1.02	na
09/14/99 04:00	24.0	1.24	5.15
09/14/99 07:00	27.0	0.46	na
09/14/99 10:00	30.0	1.09	5.61
09/14/99 13:00	33.0	0.31	na
09/14/99 16:00	36.0	0.17	6.20
09/14/99 19:00	39.0	0.74	na
09/14/99 22:00	42.0	1.14	5.38
09/15/99 01:00	45.0	0.41	na
09/15/99 04:00	48.0	0.02	6.39
09/15/99 07:00	51.0	0.07	na
09/15/99 10:00	54.0	1.24	7.05
09/15/99 13:00	57.0	0.78	na
09/15/99 16:00	60.0	0.98	5.29
09/15/99 19:00	63.0	1.58	na
09/15/99 22:00	66.0	0.68	5.67
09/16/99 01:00	69.0	1.53	na
09/16/99 04:00	72.0	1.49	6.45
09/16/99 07:00	75.0	1.17	na

Table A13. Concentrations of nutrients, dissolved organic carbon (DOC) and suspended sediment for samples collected on Sugar Creek during September 1999.

[hr, hours; mg/L, milligrams per liter; mg N/L, milligrams per liter as nitrogen; mg P/L, milligrams per liter as phosphorus; mg C/L, milligrams per liter as carbon; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	NO ₃		NO ₂		NH ₄		Kjeldahl N		PO ₄		P		DOC		Suspended Sediment mg/L Value
		Avg	SD	Avg	SD	Avg	SD	mg N/L Value	mg N/L	Avg	SD	Avg	SD	mg C/L Avg	SD	
09/13/99 04:00	0.0	0.95	0.01	0.044	0.001	0.037	0.001	0.24	< 0.02	0.00	0.00	< 0.007	0.006	2.6	0.1	< 5
09/13/99 07:00	3.0	0.97	0.08	0.041	0.006	0.043	0.002	0.20	< 0.02	0.00	0.00	< 0.007	0.007	2.8	0.1	23
09/13/99 10:00	6.0	1.04	0.00	0.037	0.001	0.034	0.002	0.19	< 0.02	0.00	0.00	< 0.007	0.004	2.3	0.1	< 5
09/13/99 13:00	9.0	1.04	0.01	0.028	0.001	0.022	0.000	0.21	< 0.02	0.00	0.00	< 0.007	0.006	2.6	0.1	9
09/13/99 16:00	12.0	0.98	0.00	0.023	0.000	0.014	0.004	0.20	< 0.02	0.00	0.00	< 0.007	0.002	2.8	0.1	< 5
09/13/99 19:00	15.0	0.93	0.04	0.021	0.000	0.020	0.005	0.18	< 0.02	0.00	0.00	< 0.007	0.006	2.7	0.1	9
09/13/99 22:00	18.0	0.87	0.02	0.021	0.001	0.017	0.000	0.20	< 0.02	0.00	0.00	0.010	0.008	2.6	0.1	< 5
09/14/99 01:00	21.0	0.88	0.04	0.021	0.001	0.023	0.001	0.19	< 0.02	0.00	0.00	< 0.007	0.002	na	na	6
09/14/99 04:00	24.0	0.91	0.02	0.021	0.000	0.008	0.000	0.17	< 0.02	0.00	0.00	< 0.007	0.000	2.3	0.1	< 5
09/14/99 07:00	27.0	0.94	0.00	0.019	0.000	< 0.007	0.001	0.26	< 0.02	0.00	0.00	< 0.007	0.006	2.4	0.1	< 5
09/14/99 10:00	30.0	0.91	0.03	0.016	0.000	0.009	0.001	0.15	< 0.02	0.00	0.00	< 0.007	0.006	2.4	0.1	< 5
09/14/99 13:00	33.0	0.93	0.03	0.014	0.000	< 0.007	0.000	0.23	< 0.02	0.00	0.00	0.013	0.002	1.6	0.2	7
09/14/99 16:00	36.0	0.86	0.00	0.014	0.000	< 0.007	0.000	0.17	< 0.02	0.00	0.00	< 0.007	0.008	2.0	0.0	< 5
09/14/99 19:00	39.0	0.89	0.01	0.014	0.000	0.009	0.000	0.14	< 0.02	0.00	0.00	< 0.007	0.002	2.0	0.2	8
09/14/99 22:00	42.0	0.90	0.01	0.015	0.000	0.014	0.000	0.15	< 0.02	0.00	0.00	< 0.007	0.008	2.4	0.3	6
09/15/99 01:00	45.0	0.86	0.01	0.016	0.001	0.021	0.002	0.15	< 0.02	0.00	0.00	< 0.007	0.001	2.2	0.2	< 5
09/15/99 04:00	48.0	0.89	0.02	0.017	0.001	0.022	0.001	0.22	< 0.02	0.00	0.00	< 0.007	0.002	2.0	0.2	< 5
09/15/99 07:00	51.0	0.89	0.04	0.016	0.001	0.025	0.001	0.17	< 0.02	0.00	0.00	< 0.007	0.001	2.0	0.1	< 5
09/15/99 10:00	54.0	0.94	0.00	0.015	0.000	0.032	0.029	0.12	< 0.02	0.00	0.00	0.012	0.004	2.7	0.1	< 5
09/15/99 13:00	57.0	0.92	0.00	0.014	0.001	0.013	0.001	0.17	< 0.02	0.00	0.00	0.008	0.006	1.8	0.1	< 5
09/15/99 16:00	60.0	0.87	0.02	0.014	0.000	0.011	0.002	0.17	< 0.02	0.00	0.00	0.010	0.002	2.3	0.0	< 5
09/15/99 19:00	63.0	0.83	0.02	0.014	0.000	0.014	0.003	0.16	< 0.02	0.00	0.00	0.008	0.004	2.1	0.0	6
09/15/99 22:00	66.0	0.91	0.01	0.014	0.001	0.031	0.002	0.18	< 0.02	0.00	0.00	< 0.007	0.003	2.4	0.2	< 5
09/16/99 01:00	69.0	0.99	0.02	0.014	0.000	0.019	0.001	0.19	< 0.02	0.00	0.00	< 0.007	0.005	2.5	0.1	< 5
09/16/99 04:00	72.0	0.92	0.00	0.013	0.000	0.013	0.001	0.29	< 0.02	0.00	0.00	< 0.007	0.005	2.5	0.2	< 5
09/16/99 07:00	75.0	0.91	0.03	0.012	0.000	0.019	0.001	0.18	< 0.02	0.00	0.00	< 0.007	0.002	2.0	0.1	< 5

Table A14. Concentrations of major inorganic constituents for samples collected on Sugar Creek during September 1999.

[hr, hours; mg/L, milligrams per liter; mg C/L, milligrams per liter as carbon; µg/L, micrograms per liter; Avg, average; SD, standard deviation; na, not available]

Date-Time	Time from start hr	Cl		SO ₄		HCO ₃		CO ₃		Br		Na		K		Mg		Ca		SiO ₂	
		Avg	SD	Avg	SD	mg C/L	Value	mg C/L	Value	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/13/99 04:00	0.0	15	na	103	na	53.0	0.073	17	1	9.1	0.0	2.2	0.2	33	2	88	1	7.7	0.1		
09/13/99 07:00	3.0	17	na	103	na	49.0	0.066	16	2	9.2	0.6	2.2	0.1	34	0	87	2	7.8	0.3		
09/13/99 10:00	6.0	17	na	100	na	47.3	0.12	18	1	8.5	0.1	1.9	0.0	31	0	83	1	7.6	0.4		
09/13/99 13:00	9.0	17	na	103	na	43.2	0.18	14	0	9.3	0.1	2.0	0.1	33	1	83	1	7.9	0.1		
09/13/99 16:00	12.0	16	na	105	na	43.3	0.19	15	2	9.0	0.6	2.0	0.1	32	0	78	0	7.5	0.0		
09/13/99 19:00	15.0	16	na	105	na	44.6	0.14	16	1	8.9	0.1	1.9	0.0	32	0	81	1	7.4	0.1		
09/13/99 22:00	18.0	16	na	104	na	48.6	0.095	20	1	10	1	1.9	0.0	32	0	83	1	7.5	0.0		
09/14/99 01:00	21.0	17	na	105	na	47.7	0.081	15	1	9.3	0.4	1.8	0.1	32	1	83	3	7.2	0.2		
09/14/99 04:00	24.0	17	na	103	na	47.1	0.076	15	2	9.7	0.2	1.9	0.1	34	1	89	2	7.7	0.2		
09/14/99 07:00	27.0	18	na	106	na	51.3	0.085	20	3	9.3	0.6	1.9	0.1	34	0	89	1	7.6	0.1		
09/14/99 10:00	30.0	18	na	106	na	46.2	0.13	15	2	9.4	0.0	1.9	0.2	33	1	86	3	7.6	0.1		
09/14/99 13:00	33.0	17	na	103	na	54.5	0.23	17	2	10	1	1.9	0.3	35	2	89	4	8.2	0.5		
09/14/99 16:00	36.0	16	na	104	na	47.2	0.19	16	1	9.3	0.7	2.0	0.0	34	1	82	4	7.4	0.4		
09/14/99 19:00	39.0	15	na	105	na	50.6	0.16	17	2	9.0	0.2	1.9	0.1	33	0	83	1	7.2	0.1		
09/14/99 22:00	42.0	15	na	105	na	45.7	0.087	15	2	9.4	0.5	1.8	0.0	33	2	85	6	7.2	0.6		
09/15/99 01:00	45.0	17	na	103	na	51.3	0.085	15	1	8.9	0.7	1.9	0.1	33	2	85	4	6.9	0.3		
09/15/99 04:00	48.0	17	na	106	na	45.6	0.072	17	2	9.2	0.5	1.7	0.1	33	2	86	5	6.9	0.4		
09/15/99 07:00	51.0	18	na	104	na	57.7	0.094	19	6	9.3	0.4	1.7	0.0	33	1	84	3	6.9	0.3		
09/15/99 10:00	54.0	17	na	104	na	53.4	0.14	18	3	10	1	1.8	0.0	35	1	91	0	7.7	0.1		
09/15/99 13:00	57.0	16	na	106	na	48.9	0.19	15	2	9.3	0.6	1.7	0.0	33	1	85	4	7.3	0.4		
09/15/99 16:00	60.0	17	na	105	na	47.8	0.17	15	2	10	1	1.9	0.3	35	2	87	5	7.7	0.5		
09/15/99 19:00	63.0	17	na	106	na	41.6	0.12	17	2	9.4	0.0	1.7	0.1	33	0	83	1	7.0	0.1		
09/15/99 22:00	66.0	16	na	105	na	47.3	0.088	15	3	9.1	0.1	1.9	0.1	34	1	86	1	6.8	0.1		
09/16/99 01:00	69.0	17	na	105	na	49.0	0.091	18	2	8.9	0.5	1.6	0.1	32	2	82	3	6.6	0.4		
09/16/99 04:00	72.0	18	na	103	na	50.9	0.091	15	2	9.9	0.0	1.8	0.0	34	1	86	3	7.0	0.2		
09/16/99 07:00	75.0	17	na	103	na	48.5	0.082	18	3	10	0	1.8	0.0	34	0	87	1	7.1	0.1		

Table A15. Concentrations of trace element for samples collected on Sugar Creek during September 1999.

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Al		As		B		Ba		Be		Bi		Cd		Ce	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/13/99 04:00	0.0	1.0	0.4	0.93	0.02	67	2	51	2	<0.01	0.01	<0.0008	0.0005	0.022	0.000	0.012	0.000
09/13/99 07:00	3.0	0.5	0.1	0.97	0.03	71	4	49	2	<0.01	0.00	<0.0008	0.0008	0.003	0.001	0.011	0.000
09/13/99 10:00	6.0	0.6	0.1	0.96	0.02	66	1	47	2	<0.01	0.01	<0.0008	0.0006	<0.002	0.002	0.011	0.001
09/13/99 13:00	9.0	0.9	0.1	0.99	0.03	71	2	44	1	<0.01	0.01	<0.0008	0.0003	<0.002	0.003	0.010	0.001
09/13/99 16:00	12.0	0.6	0.0	1.0	0.0	69	1	42	2	<0.01	0.01	<0.0008	0.0002	<0.002	0.005	0.0084	0.0016
09/13/99 19:00	15.0	0.8	0.0	1.1	0.0	69	2	46	2	<0.01	0.00	<0.0008	0.0003	0.025	0.002	0.013	0.001
09/13/99 22:00	18.0	0.7	0.1	0.98	0.01	76	0	46	4	<0.01	0.01	<0.0008	0.0005	0.013	0.003	0.011	0.001
09/14/99 01:00	21.0	0.6	0.1	1.0	0.0	71	2	52	0	<0.01	0.01	<0.0008	0.0010	0.018	0.002	0.012	0.001
09/14/99 04:00	24.0	0.6	0.1	0.96	0.04	75	1	49	0	<0.01	0.01	0.0013	0.0017	0.011	0.001	0.016	0.000
09/14/99 07:00	27.0	0.6	0.0	0.84	0.00	73	1	49	3	<0.01	0.01	<0.0008	0.0004	0.013	0.002	0.015	0.001
09/14/99 10:00	30.0	0.5	0.1	0.88	0.04	66	1	47	2	<0.01	0.00	<0.0008	0.0001	0.005	0.002	0.011	0.001
09/14/99 13:00	33.0	1.5	0.2	0.89	0.02	79	2	49	1	<0.01	0.01	<0.0008	0.0007	0.005	0.004	0.023	0.000
09/14/99 16:00	36.0	0.8	0.1	0.94	0.01	69	3	44	0	<0.01	0.00	<0.0008	0.0001	<0.002	0.001	0.019	0.001
09/14/99 19:00	39.0	0.8	0.1	0.93	0.01	71	0	45	1	<0.01	0.02	<0.0008	0.0012	<0.002	0.002	0.019	0.001
09/14/99 22:00	42.0	0.6	0.1	0.93	0.01	77	8	46	2	<0.01	0.00	<0.0008	0.0005	0.005	0.003	0.012	0.000
09/15/99 01:00	45.0	0.6	0.0	0.94	0.02	68	2	49	1	<0.01	0.01	<0.0008	0.0003	0.022	0.002	0.011	0.000
09/15/99 04:00	48.0	0.6	0.1	0.91	0.03	71	4	50	2	<0.01	0.01	<0.0008	0.0001	0.005	0.002	0.010	0.001
09/15/99 07:00	51.0	2.0	0.2	0.93	0.05	65	5	51	3	<0.008	0.008	0.0024	0.0001	0.022	0.003	0.011	0.000
09/15/99 10:00	54.0	0.6	0.0	0.81	0.02	74	9	45	0	<0.01	0.01	<0.0008	0.0001	<0.002	0.000	0.011	0.001
09/15/99 13:00	57.0	1.0	0.0	0.87	0.02	74	7	45	2	<0.01	0.00	0.0016	0.0012	0.072	0.005	0.012	0.000
09/15/99 16:00	60.0	1.6	0.0	0.92	0.01	79	5	44	0	<0.01	0.00	<0.0008	0.0005	0.089	0.002	0.012	0.000
09/15/99 19:00	63.0	0.7	0.1	0.93	0.04	71	4	44	1	<0.01	0.01	<0.0008	0.0009	0.009	0.002	0.018	0.001
09/15/99 22:00	66.0	0.8	0.0	0.91	0.02	68	2	46	2	<0.01	0.01	<0.0008	0.0006	0.038	0.002	0.012	0.000
09/16/99 01:00	69.0	0.6	0.1	0.90	0.05	67	5	51	0	<0.01	0.01	<0.0008	0.0006	0.006	0.004	0.012	0.001
09/16/99 04:00	72.0	0.5	0.0	0.90	0.01	75	2	47	2	<0.01	0.00	<0.0008	0.0008	0.013	0.004	0.011	0.000
09/16/99 07:00	75.0	0.4	0.0	0.89	0.02	75	1	48	1	<0.01	0.01	<0.0008	0.0005	<0.002	0.002	0.0092	0.0003

Table A15. Concentrations of trace element for samples collected on Sugar Creek during September 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Co µg/L		Cr µg/L		Cs µg/L		Cu µg/L		Dy µg/L		Er µg/L		Eu µg/L	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/13/99 04:00	0.0	<0.002	0.021	<0.3	0.1	<0.005	0.001	0.60	0.03	0.0025	0.0004	0.0020	0.0006	0.0006	0.0006
09/13/99 07:00	3.0	<0.002	0.024	<0.3	0.0	<0.005	0.001	0.69	0.02	0.0027	0.0002	0.0015	0.0002	0.0016	0.0007
09/13/99 10:00	6.0	<0.002	0.004	<0.3	0.1	<0.005	0.002	0.49	0.01	0.0031	0.0007	0.0021	0.0005	0.0013	0.0010
09/13/99 13:00	9.0	<0.002	0.003	<0.3	0.0	<0.005	0.002	0.52	0.03	0.0014	0.0006	0.0010	0.0003	<0.0003	0.0004
09/13/99 16:00	12.0	<0.002	0.014	<0.3	0.1	<0.005	0.001	0.57	0.06	0.0017	0.0003	0.0011	0.0003	0.0013	0.0002
09/13/99 19:00	15.0	<0.002	0.003	<0.3	0.1	<0.005	0.000	0.75	0.04	0.0040	0.0003	0.0019	0.0003	0.0010	0.0003
09/13/99 22:00	18.0	<0.002	0.047	<0.3	0.1	<0.005	0.002	1.3	0.1	0.0028	0.0008	0.0017	0.0002	0.0005	0.0007
09/14/99 01:00	21.0	<0.002	0.014	<0.3	0.1	<0.005	0.004	1.9	0.1	0.0028	0.0009	0.0015	0.0008	0.0020	0.0005
09/14/99 04:00	24.0	<0.002	0.024	<0.3	0.1	<0.005	0.002	2.5	0.2	0.0032	0.0003	0.0018	0.0004	0.0014	0.0004
09/14/99 07:00	27.0	<0.002	0.037	<0.3	0.1	<0.005	0.003	0.81	0.06	0.0032	0.0002	0.0026	0.0003	0.0008	0.0005
09/14/99 10:00	30.0	<0.002	0.029	<0.3	0.0	<0.005	0.001	1.0	0.1	0.0031	0.0005	0.0018	0.0005	0.0009	0.0006
09/14/99 13:00	33.0	<0.002	0.009	<0.3	0.1	<0.005	0.001	2.2	0.0	0.0048	0.0006	0.0037	0.0004	0.0014	0.0005
09/14/99 16:00	36.0	<0.002	0.009	<0.3	0.1	<0.005	0.002	1.5	0.1	0.0046	0.0004	0.0022	0.0003	0.0010	0.0004
09/14/99 19:00	39.0	<0.002	0.011	<0.3	0.1	<0.005	0.001	1.4	0.0	0.0038	0.0008	0.0034	0.0001	0.0010	0.0002
09/14/99 22:00	42.0	<0.002	0.011	<0.3	0.1	<0.005	0.002	0.52	0.01	0.0025	0.0007	0.0015	0.0002	0.0017	0.0011
09/15/99 01:00	45.0	<0.002	0.009	<0.3	0.1	<0.005	0.001	1.9	0.0	0.0028	0.0002	0.0014	0.0005	0.0010	0.0010
09/15/99 04:00	48.0	<0.002	0.005	<0.3	0.2	<0.005	0.001	1.4	0.1	0.0024	0.0001	0.0019	0.0003	0.0019	0.0002
09/15/99 07:00	51.0	<0.002	0.008	<0.4	0.1	<0.002	0.001	0.87	0.02	0.0023	0.0002	0.0020	0.0005	0.0033	0.0016
09/15/99 10:00	54.0	<0.002	0.043	<0.3	0.1	<0.005	0.006	1.7	0.1	0.0022	0.0005	0.0016	0.0002	0.0008	0.0006
09/15/99 13:00	57.0	<0.002	0.013	<0.3	0.0	<0.005	0.000	2.0	0.1	0.0029	0.0004	0.0018	0.0001	0.0017	0.0005
09/15/99 16:00	60.0	<0.002	0.018	<0.3	0.1	<0.005	0.002	0.99	0.03	0.0026	0.0005	0.0020	0.0004	0.0014	0.0009
09/15/99 19:00	63.0	<0.002	0.005	<0.3	0.1	<0.005	0.000	1.9	0.1	0.0034	0.0003	0.0024	0.0001	0.0020	0.0008
09/15/99 22:00	66.0	<0.002	0.024	<0.3	0.2	<0.005	0.003	1.1	0.0	0.0028	0.0005	0.0019	0.0007	0.0023	0.0024
09/16/99 01:00	69.0	<0.002	0.023	<0.3	0.0	<0.005	0.003	1.7	0.1	0.0033	0.0005	0.0021	0.0006	0.0008	0.0021
09/16/99 04:00	72.0	<0.002	0.017	<0.3	0.1	<0.005	0.000	1.8	0.0	0.0026	0.0004	0.0020	0.0006	0.0023	0.0007
09/16/99 07:00	75.0	<0.002	0.011	<0.3	0.1	<0.005	0.001	0.46	0.06	0.0024	0.0004	0.0024	0.0005	0.0014	0.0003

Table A15. Concentrations of trace element for samples collected on Sugar Creek during September 1999 --- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Fe		Gd		Hg		Ho		La		Li		Lu		Mn	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/13/99 04:00	0.0	18	0	0.0039	0.0005	3.4	0.0	0.0008	0.0001	0.0089	0.0004	5.6	0.3	0.0003	0.0001	36	1
09/13/99 07:00	3.0	16	0	0.0031	0.0006	1.2	0.5	0.0007	0.0001	0.0076	0.0005	5.8	0.5	0.0002	0.0001	57	1
09/13/99 10:00	6.0	16	0	0.0039	0.0003	0.9	0.2	0.0008	0.0000	0.0086	0.0004	5.6	0.1	0.0003	0.0001	44	0
09/13/99 13:00	9.0	17	0	0.0022	0.0005	0.7	0.1	0.0004	0.0002	0.0066	0.0005	5.4	0.2	<0.0002	0.0001	21	0
09/13/99 16:00	12.0	14	1	0.0025	0.0005	1.2	0.2	0.0003	0.0001	0.0055	0.0003	5.8	0.2	0.0002	0.0002	18	0
09/13/99 19:00	15.0	17	1	0.0036	0.0003	1.0	0.2	0.0007	0.0001	0.0099	0.0003	5.7	0.1	0.0004	0.0000	25	1
09/13/99 22:00	18.0	16	0	0.0037	0.0004	0.8	0.2	0.0006	0.0001	0.0093	0.0004	6.2	0.3	0.0003	0.0001	33	1
09/14/99 01:00	21.0	18	0	0.0038	0.0008	1.1	0.0	0.0006	0.0001	0.0095	0.0006	5.9	0.3	0.0003	0.0001	43	1
09/14/99 04:00	24.0	18	0	0.0038	0.0005	2.6	0.3	0.0008	0.0000	0.011	0.001	6.1	0.5	0.0003	0.0001	47	0
09/14/99 07:00	27.0	17	1	0.0042	0.0002	10.6	0.0	0.0008	0.0001	0.0099	0.0005	5.8	0.3	0.0003	0.0001	51	3
09/14/99 10:00	30.0	17	0	0.0041	0.0003	1.2	0.2	0.0007	0.0000	0.0082	0.0004	5.8	0.3	0.0003	0.0001	48	1
09/14/99 13:00	33.0	3.5	0.5	0.0067	0.0011	0.9	0.2	0.0013	0.0002	0.015	0.000	5.6	0.3	0.0005	0.0001	35	1
09/14/99 16:00	36.0	3.9	0.3	0.0044	0.0005	1.3	0.2	0.0010	0.0001	0.011	0.000	5.7	0.1	0.0003	0.0001	23	0
09/14/99 19:00	39.0	2.1	0.3	0.0040	0.0006	2.0	0.1	0.0009	0.0002	0.012	0.001	5.7	0.4	0.0003	0.0001	22	0
09/14/99 22:00	42.0	15	2	0.0039	0.0001	1.0	0.1	0.0005	0.0001	0.0082	0.0003	5.9	0.3	0.0002	0.0001	38	0
09/15/99 01:00	45.0	15	1	0.0036	0.0005	1.1	0.1	0.0006	0.0002	0.0081	0.0003	5.8	0.3	0.0003	0.0001	45	0
09/15/99 04:00	48.0	12	1	0.0034	0.0011	2.3	0.1	0.0006	0.0002	0.0075	0.0001	5.9	0.6	0.0004	0.0001	47	0
09/15/99 07:00	51.0	11	0	0.0038	0.0003	na	na	0.0006	0.0001	0.0079	0.0005	5.6	0.1	0.0004	0.0000	52	3
09/15/99 10:00	54.0	20	1	0.0029	0.0002	na	na	0.0006	0.0001	0.0078	0.0002	5.9	0.3	0.0003	0.0001	45	2
09/15/99 13:00	57.0	17	1	0.0039	0.0002	4.1	0.0	0.0006	0.0001	0.0081	0.0005	5.7	0.1	0.0003	0.0001	33	1
09/15/99 16:00	60.0	18	1	0.0030	0.0002	15.1	0.3	0.0005	0.0001	0.0084	0.0007	5.9	0.3	0.0003	0.0000	23	1
09/15/99 19:00	63.0	12	1	0.0042	0.0004	3.9	0.0	0.0008	0.0002	0.012	0.001	5.9	0.3	0.0003	0.0001	25	0
09/15/99 22:00	66.0	15	0	0.0030	0.0005	1.0	0.1	0.0005	0.0001	0.0081	0.0006	6.1	0.3	0.0003	0.0001	36	1
09/16/99 01:00	69.0	10	1	0.0038	0.0003	0.9	0.0	0.0007	0.0002	0.0089	0.0003	5.9	0.2	0.0004	0.0002	23	1
09/16/99 04:00	72.0	14	1	0.0036	0.0004	0.7	0.1	0.0006	0.0001	0.0083	0.0005	6.5	0.0	0.0002	0.0000	34	0
09/16/99 07:00	75.0	12	0	0.0033	0.0009	0.7	0.1	0.0005	0.0001	0.0069	0.0003	5.5	0.1	0.0003	0.0001	46	1

Table A15. Concentrations of trace element for samples collected on Sugar Creek during September 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Mo		Nd		Ni		Pb		Pr		Rb		Re		Sb		Se	
		Avg	SD	µg/L	Avg	SD	µg/L	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/13/99 04:00	0.0	6.3	0.1	0.010	0.001	1.4	0.4	0.031	0.003	0.0025	0.0001	1.3	0.0	0.013	0.000	0.11	0.00	0.4	0.1
09/13/99 07:00	3.0	6.3	0.0	0.009	0.001	1.4	0.5	0.016	0.003	0.0018	0.0001	1.2	0.0	0.010	0.001	0.10	0.01	0.4	0.0
09/13/99 10:00	6.0	6.4	0.0	0.011	0.002	1.1	0.0	0.019	0.008	0.0022	0.0002	1.1	0.0	0.0037	0.0006	0.10	0.00	0.5	0.1
09/13/99 13:00	9.0	6.4	0.2	0.008	0.002	1.2	0.1	0.020	0.002	0.0017	0.0000	1.0	0.0	0.0040	0.0010	0.10	0.01	0.4	0.0
09/13/99 16:00	12.0	6.3	0.0	0.007	0.001	1.6	0.7	0.011	0.001	0.0015	0.0003	1.0	0.0	0.011	0.000	0.11	0.00	0.4	0.1
09/13/99 19:00	15.0	6.5	0.1	0.010	0.000	1.1	0.2	0.049	0.001	0.0023	0.0001	1.0	0.0	0.0042	0.0001	0.12	0.01	0.5	0.1
09/13/99 22:00	18.0	6.6	0.0	0.010	0.001	1.5	1.1	0.12	0.00	0.0023	0.0005	1.0	0.0	0.015	0.001	0.11	0.01	0.4	0.0
09/14/99 01:00	21.0	6.5	0.0	0.011	0.001	1.5	0.3	0.055	0.004	0.0023	0.0001	1.0	0.0	0.018	0.001	0.11	0.00	0.5	0.1
09/14/99 04:00	24.0	6.5	0.1	0.013	0.001	2.0	0.7	0.035	0.001	0.0030	0.0004	1.0	0.0	0.019	0.001	0.11	0.00	0.5	0.1
09/14/99 07:00	27.0	6.3	0.1	0.011	0.002	1.1	0.4	0.053	0.004	0.0024	0.0001	0.95	0.00	0.016	0.001	0.11	0.00	0.5	0.0
09/14/99 10:00	30.0	6.3	0.1	0.009	0.002	1.3	0.4	0.018	0.002	0.0020	0.0002	0.92	0.02	0.018	0.002	0.099	0.004	0.5	0.0
09/14/99 13:00	33.0	6.3	0.0	0.017	0.001	1.3	0.1	0.013	0.004	0.0038	0.0001	0.79	0.01	0.019	0.000	0.10	0.01	0.5	0.1
09/14/99 16:00	36.0	6.4	0.0	0.014	0.002	1.1	0.1	0.011	0.003	0.0031	0.0002	0.91	0.02	0.020	0.001	0.11	0.01	0.6	0.1
09/14/99 19:00	39.0	6.4	0.0	0.015	0.001	1.2	0.1	0.008	0.002	0.0029	0.0003	0.92	0.02	0.020	0.000	0.11	0.00	0.4	0.0
09/14/99 22:00	42.0	6.3	0.1	0.009	0.001	1.6	0.4	0.014	0.003	0.0023	0.0001	0.94	0.05	0.018	0.000	0.11	0.01	0.4	0.1
09/15/99 01:00	45.0	6.2	0.1	0.009	0.002	1.7	0.4	0.042	0.005	0.0022	0.0002	0.94	0.02	0.017	0.001	0.12	0.00	0.5	0.1
09/15/99 04:00	48.0	6.3	0.1	0.008	0.001	1.5	0.4	0.028	0.004	0.0018	0.0001	0.98	0.00	0.019	0.001	0.11	0.00	0.5	0.1
09/15/99 07:00	51.0	6.3	0.1	0.0091	0.0002	1.4	0.4	0.050	0.006	0.0021	0.0003	0.93	0.10	0.021	0.002	0.11	0.00	0.5	0.1
09/15/99 10:00	54.0	6.2	0.0	0.008	0.000	1.4	0.6	0.023	0.008	0.0019	0.0001	0.85	0.01	0.019	0.000	0.097	0.008	0.5	0.1
09/15/99 13:00	57.0	6.2	0.1	0.010	0.001	1.2	0.4	0.22	0.00	0.0020	0.0001	0.89	0.03	0.019	0.000	0.11	0.01	0.5	0.1
09/15/99 16:00	60.0	6.3	0.1	0.010	0.002	1.2	0.4	0.14	0.00	0.0022	0.0002	0.94	0.02	0.016	0.001	0.16	0.00	0.5	0.0
09/15/99 19:00	63.0	6.3	0.0	0.014	0.001	1.8	0.3	0.034	0.003	0.0028	0.0002	0.91	0.03	0.019	0.000	0.12	0.00	0.4	0.0
09/15/99 22:00	66.0	6.2	0.0	0.010	0.001	1.8	0.9	0.10	0.01	0.0019	0.0001	0.93	0.04	0.0071	0.0007	0.15	0.00	0.5	0.1
09/16/99 01:00	69.0	6.3	0.0	0.011	0.001	1.4	0.7	0.024	0.003	0.0020	0.0001	0.96	0.04	0.019	0.001	0.11	0.00	0.6	0.2
09/16/99 04:00	72.0	6.4	0.1	0.009	0.001	2.0	0.6	0.036	0.000	0.0021	0.0002	0.89	0.02	0.019	0.000	0.10	0.00	0.4	0.1
09/16/99 07:00	75.0	6.4	0.0	0.010	0.002	1.7	0.7	0.011	0.001	0.0017	0.0002	0.88	0.02	0.017	0.001	0.099	0.002	0.4	0.1

Table A15. Concentrations of trace element for samples collected on Sugar Creek during September 1999 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Tm		U		V		W		Y		Yb		Zn		Zr	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/13/99 04:00	0.0	0.0004	0.0001	2.8	0.1	0.15	0.03	0.004	0.000	0.026	0.001	0.0022	0.0004	1.2	0.0	0.031	0.003
09/13/99 07:00	3.0	<0.0002	0.0001	2.9	0.1	<0.1	0.03	0.001	0.001	0.025	0.001	0.0021	0.0006	0.7	0.1	0.030	0.001
09/13/99 10:00	6.0	0.0003	0.0000	2.8	0.1	<0.1	0.03	<0.001	0.000	0.029	0.001	0.0021	0.0006	0.5	0.0	0.033	0.004
09/13/99 13:00	9.0	<0.0002	0.0001	2.8	0.0	0.15	0.02	0.002	0.001	0.015	0.000	0.0016	0.0001	0.6	0.0	0.030	0.003
09/13/99 16:00	12.0	<0.0002	0.0001	3.0	0.1	0.16	0.01	<0.001	0.000	0.014	0.000	0.0014	0.0002	0.4	0.0	0.022	0.001
09/13/99 19:00	15.0	0.0003	0.0000	2.9	0.1	0.20	0.02	0.001	0.001	0.027	0.001	0.0022	0.0001	0.8	0.1	0.030	0.001
09/13/99 22:00	18.0	<0.0002	0.0000	2.9	0.0	0.16	0.08	0.007	0.001	0.027	0.001	0.0016	0.0003	3.5	0.1	0.054	0.012
09/14/99 01:00	21.0	<0.0002	0.0001	2.9	0.1	<0.1	0.02	0.009	0.002	0.029	0.001	0.0017	0.0000	1.7	0.2	0.029	0.002
09/14/99 04:00	24.0	0.0003	0.0000	2.8	0.0	<0.1	0.01	0.004	0.000	0.034	0.000	0.0025	0.0002	1.2	0.1	0.032	0.005
09/14/99 07:00	27.0	<0.0002	0.0000	2.9	0.1	0.12	0.01	0.003	0.001	0.030	0.000	0.0023	0.0004	1.1	0.1	0.033	0.003
09/14/99 10:00	30.0	0.0003	0.0002	2.9	0.1	<0.1	0.02	0.005	0.001	0.026	0.001	0.0021	0.0003	0.8	0.1	0.028	0.004
09/14/99 13:00	33.0	0.0006	0.0000	2.9	0.0	0.13	0.03	0.004	0.001	0.054	0.000	0.0035	0.0003	0.6	0.1	0.030	0.003
09/14/99 16:00	36.0	0.0004	0.0001	2.9	0.0	0.16	0.00	0.004	0.001	0.034	0.000	0.0023	0.0002	0.4	0.0	0.023	0.001
09/14/99 19:00	39.0	0.0004	0.0001	3.0	0.2	0.13	0.02	0.005	0.001	0.036	0.000	0.0022	0.0002	0.4	0.1	0.024	0.003
09/14/99 22:00	42.0	<0.0002	0.0001	2.9	0.0	<0.1	0.01	<0.001	0.001	0.024	0.001	0.0014	0.0002	0.8	0.0	0.022	0.002
09/15/99 01:00	45.0	0.0003	0.0000	2.9	0.1	<0.1	0.02	0.002	0.001	0.024	0.001	0.0021	0.0003	2.1	0.1	0.024	0.001
09/15/99 04:00	48.0	0.0003	0.0000	3.0	0.1	<0.1	0.02	0.002	0.002	0.025	0.000	0.0016	0.0000	1.1	0.1	0.021	0.001
09/15/99 07:00	51.0	0.0003	0.0000	3.0	0.0	0.2	0.1	0.004	0.001	0.024	0.003	0.0018	0.0002	3.2	0.2	0.028	0.000
09/15/99 10:00	54.0	0.0003	0.0001	2.9	0.1	<0.1	0.03	0.002	0.001	0.024	0.001	0.0023	0.0005	1.8	0.0	0.029	0.004
09/15/99 13:00	57.0	0.0003	0.0001	3.0	0.0	<0.1	0.03	0.002	0.000	0.028	0.001	0.0016	0.0005	5.5	0.0	0.023	0.002
09/15/99 16:00	60.0	0.0004	0.0001	3.0	0.1	0.16	0.01	0.004	0.000	0.024	0.001	0.0025	0.0001	6.5	0.1	0.032	0.005
09/15/99 19:00	63.0	0.0003	0.0002	3.0	0.1	<0.1	0.05	0.003	0.000	0.031	0.002	0.0028	0.0001	1.5	0.1	0.019	0.001
09/15/99 22:00	66.0	0.0003	0.0001	3.2	0.1	<0.1	0.00	0.003	0.001	0.024	0.000	0.0023	0.0002	3.2	0.0	0.032	0.005
09/16/99 01:00	69.0	<0.0002	0.0000	3.0	0.0	<0.1	0.04	<0.001	0.001	0.025	0.001	0.0021	0.0004	0.6	0.1	0.021	0.002
09/16/99 04:00	72.0	0.0002	0.0001	3.1	0.1	<0.1	0.02	<0.001	0.001	0.026	0.001	0.0018	0.0001	1.1	0.1	0.022	0.002
09/16/99 07:00	75.0	<0.0002	0.0001	3.0	0.0	<0.1	0.04	0.001	0.001	0.023	0.000	0.0015	0.0001	0.6	0.1	0.027	0.003

Table A16. Bacterial cell counts and chlorophyll-a concentrations for samples collected on Sugar Creek during September 1999.

[hr, hours; µg/L, micrograms per liter; millions/mL, millions per milliliter; na, not available]

Date-Time	Time from start hr	Bacterial Cell Counts millions/mL	Chlorophyll-a concentrations µg/L
09/13/99 04:00	0.0	3.75	7.34
09/13/99 07:00	3.0	3.49	na
09/13/99 10:00	6.0	1.80	6.63
09/13/99 13:00	9.0	2.08	na
09/13/99 16:00	12.0	na	6.17
09/13/99 19:00	15.0	2.90	na
09/13/99 22:00	18.0	2.32	6.02
09/14/99 01:00	21.0	2.08	na
09/14/99 04:00	24.0	4.08	7.85
09/14/99 07:00	27.0	1.69	na
09/14/99 10:00	30.0	2.48	5.15
09/14/99 13:00	33.0	2.44	na
09/14/99 16:00	36.0	2.95	8.63
09/14/99 19:00	39.0	2.19	na
09/14/99 22:00	42.0	2.98	9.05
09/15/99 01:00	45.0	2.85	na
09/15/99 04:00	48.0	2.70	7.62
09/15/99 07:00	51.0	na	na
09/15/99 10:00	54.0	1.66	7.37
09/15/99 13:00	57.0	1.95	na
09/15/99 16:00	60.0	2.24	8.28
09/15/99 19:00	63.0	2.52	na
09/15/99 22:00	66.0	2.57	8.68
09/16/99 01:00	69.0	3.07	na
09/16/99 04:00	72.0	2.87	12.5
09/16/99 07:00	75.0	2.54	na

Table A17. Concentrations of nutrients, dissolved organic carbon (DOC) and suspended sediment for samples collected on the Iroquois River during May 2000.

[hr, hours; mg/L, milligrams per liter; mg N/L, milligrams per liter as nitrogen; mg P/L, milligrams per liter as phosphorus; mg C/L, milligrams per liter as carbon; Avg, average; SD, standard deviation; na, not available]

Date-Time	Time from start hr	NO ₃		NO ₂		NH ₄		Kjeldahl N		PO ₄		P		DOC		Suspended Sediment mg/L
		Avg	SD	Avg	SD	Avg	SD	Value	mg N/L	Avg	SD	Avg	SD	Avg	SD	Value
05/09/00 00:00	0.0	9.06	0.15	0.106	0.001	0.067	0.006	0.62	0.014	0.000	0.000	0.036	0.002	5.40	0.26	42
05/09/00 02:00	2.0	8.93	0.04	0.106	0.001	0.070	0.002	na	0.017	0.000	0.000	0.036	0.002	5.08	0.15	51
05/09/00 04:00	4.0	9.01	0.29	0.107	0.001	0.065	0.004	0.59	0.019	0.000	0.000	0.039	0.002	5.32	0.19	51
05/09/00 06:00	6.0	8.77	0.03	0.110	0.000	0.077	0.005	na	0.025	0.003	0.003	0.045	0.001	5.30	0.10	45
05/09/00 08:00	8.0	8.97	0.22	0.112	0.001	0.103	0.012	0.58	0.050	0.001	0.001	0.057	0.003	5.07	0.09	44
05/09/00 10:00	10.0	8.72	0.03	0.109	0.001	0.078	0.002	na	0.032	0.001	0.001	0.051	0.002	5.40	0.05	31
05/09/00 12:00	12.0	8.71	0.07	0.108	0.001	0.077	0.002	0.58	0.024	0.000	0.000	0.043	0.002	5.25	0.24	24
05/09/00 14:00	14.0	8.75	0.03	0.107	0.001	0.085	0.002	na	0.030	0.000	0.000	0.046	0.001	5.30	0.14	35
05/09/00 16:00	16.0	8.45	0.13	0.104	0.002	0.079	0.002	0.57	0.025	0.001	0.001	0.042	0.002	5.19	0.08	46
05/09/00 18:00	18.0	8.63	0.05	0.104	0.001	0.072	0.001	na	0.026	0.001	0.001	0.040	0.002	5.55	0.04	36
05/09/00 20:00	20.0	8.58	0.01	0.107	0.001	0.096	0.002	0.60	0.025	0.001	0.001	0.041	0.001	5.49	0.03	38
05/09/00 22:00	22.0	8.88	0.12	0.113	0.003	0.101	0.005	0.60	0.025	0.001	0.001	0.044	0.001	5.38	0.09	40
05/10/00 00:00	24.0	5.38	0.05	0.063	0.001	0.049	0.006	0.29	0.014	0.000	0.000	0.047	0.003	5.33	0.09	41
05/10/00 02:00	26.0	9.99	0.06	0.108	0.002	0.118	0.003	na	0.030	0.001	0.001	0.050	0.001	5.30	0.14	48
05/10/00 04:00	28.0	11.4	0.0	0.107	0.002	0.106	0.004	0.59	0.027	0.003	0.003	0.042	0.002	5.49	0.05	65
05/10/00 06:00	30.0	11.9	0.1	0.115	0.001	0.133	0.004	na	0.036	0.004	0.004	0.051	0.003	5.46	0.04	69
05/10/00 08:00	32.0	12.4	0.1	0.112	0.000	0.235	0.004	0.91	0.049	0.004	0.004	0.051	0.001	5.75	0.05	91
05/10/00 10:00	34.0	11.4	0.3	0.100	0.001	0.154	0.005	na	0.042	0.002	0.002	0.060	0.001	5.90	0.00	102
05/10/00 12:00	36.0	16.6	4.8	0.120	0.003	0.137	0.013	0.73	0.038	0.001	0.001	0.060	0.008	5.70	0.15	87
05/10/00 14:00	38.0	13.3	0.1	0.144	0.000	0.108	0.003	na	0.045	0.003	0.003	0.056	0.001	5.99	0.06	68
05/10/00 16:00	40.0	13.9	0.2	0.145	0.003	0.106	0.006	0.73	0.049	0.002	0.002	0.067	0.004	6.24	0.39	97
05/10/00 18:00	42.0	14.9	0.0	0.130	0.000	0.128	0.008	na	0.043	0.006	0.006	0.051	0.000	6.20	0.07	78

Table A18. Concentrations of major inorganic constituents for samples collected on the Iroquois River during May 2000.

[hr, hours; mg/L, milligrams per liter; mg C/L, milligrams per liter as carbon; µg/L, micrograms per liter; Avg, average; SD, standard deviation; na, not available]

Date-Time	Time from start hr	Cl		SO ₄		HCO ₃		CO ₃		Br		Na		K		Mg		Ca		SiO ₂	
		Avg	SD	Avg	SD	mg C/L Value	mg C/L Value	mg C/L Value	mg C/L Value	µg/L Avg	µg/L SD	mg/L Avg	mg/L SD	mg/L Avg	mg/L SD	mg/L Avg	mg/L SD	mg/L Avg	mg/L SD	mg/L Avg	mg/L SD
05/09/00 00:00	0.0	33.9	0.7	76.7	0.4	49.3	na	na	na	10	2	11	0	1.3	0.3	20	9	85	2	5.5	0.3
05/09/00 02:00	2.0	35.2	na	76.8	na	49.1	na	na	na	10	2	12	0	1.7	0.4	21	2	86	0	5.6	0.2
05/09/00 04:00	4.0	33.2	na	76.5	na	49.1	na	na	na	10	2	12	0	2.1	0.5	36	3	86	2	5.7	0.2
05/09/00 06:00	6.0	34.2	na	76.7	na	49.3	na	na	na	12	2	11	0	1.8	0.3	27	5	85	1	5.8	0.1
05/09/00 08:00	8.0	32.6	na	74.4	na	49.4	na	na	na	12	2	11	0	1.8	0.2	27	4	86	2	5.7	0.2
05/09/00 10:00	10.0	32.6	0.1	75.3	1.0	49.5	na	na	na	9.5	1.1	11	0	1.6	0.3	24	3	86	2	5.7	0.1
05/09/00 12:00	12.0	33.2	0.3	76.1	0.3	49.6	na	na	na	9.9	1.4	11	0	1.6	0.4	23	4	85	1	5.6	0.0
05/09/00 14:00	14.0	33.4	0.3	76.2	1.4	49.8	na	na	na	12	1	12	0	1.5	0.0	21	3	88	1	5.9	0.2
05/09/00 16:00	16.0	33.5	1.4	74.9	0.6	49.3	na	na	na	11	1	12	0	2.2	0.4	37	2	86	1	6.1	0.1
05/09/00 18:00	18.0	32.2	1.8	72.9	2.3	48.6	na	na	na	9.4	0.9	12	0	2.0	0.2	29	5	85	2	6.1	0.1
05/09/00 20:00	20.0	33.1	0.5	72.4	1.7	48.7	na	na	na	9.3	1.0	11	0	1.9	0.2	26	4	84	0	5.7	0.0
05/09/00 22:00	22.0	32.8	na	72.7	na	48.8	na	na	na	9.5	1.0	11	0	2.0	0.1	28	6	82	0	5.8	0.1
05/10/00 00:00	24.0	32.2	na	70.1	na	47.8	na	na	na	9.6	1.0	11	0	1.8	0.2	24	2	79	0	5.7	0.1
05/10/00 02:00	26.0	33.2	0.7	66.8	0.6	46.7	na	na	na	8.8	0.1	11	0	1.9	0.5	23	1	81	1	6.1	0.1
05/10/00 04:00	28.0	32.1	na	62.1	na	45.5	na	na	na	9.0	1.4	11	0	2.3	0.4	36	1	81	1	6.2	0.0
05/10/00 06:00	30.0	33.3	na	60.5	na	45.2	na	na	na	9.8	1.1	11	0	2.5	0.4	30	6	80	3	6.4	0.1
05/10/00 08:00	32.0	31.9	na	58.3	na	43.4	na	na	na	9.4	0.5	8.8	0.3	2.2	0.2	23	3	65	1	5.4	0.1
05/10/00 10:00	34.0	32.8	na	59.2	na	43.8	na	na	na	9.9	1.9	11	0	2.3	0.3	24	6	80	1	6.8	0.0
05/10/00 12:00	36.0	32.3	na	58.3	na	43.8	na	na	na	11	2	10	0	2.1	0.8	28	2	81	1	7.1	0.0
05/10/00 14:00	38.0	33.5	na	56.6	na	42.6	na	na	na	13	2	11	0	1.7	0.3	24	10	80	1	7.1	0.1
05/10/00 16:00	40.0	34.4	na	55.7	na	41.4	na	na	na	12	0	12	0	2.2	0.1	22	6	78	1	7.2	0.0
05/10/00 18:00	42.0	32.1	na	53.2	na	39.9	na	na	na	11	0	9.7	0.2	1.9	0.3	23	10	76	1	7.0	0.1

Table A19. Concentrations of trace elements for samples collected on the Iroquois River during May 2000.

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Al		As		B		Ba		Be		Bi		Cd		Ce		Co	
		Avg	SD	µg/L	SD	Avg	SD	µg/L	SD	Avg	SD	µg/L	SD	Avg	SD	µg/L	SD	Avg	SD
05/09/00 00:00	0.0	1.1	0.2	0.74	0.06	28	7	62	0	0.006	0.005	0.0079	0.0089	0.012	0.003	0.029	0.000	<0.002	0.024
05/09/00 02:00	2.0	1.6	0.2	0.75	0.07	38	3	61	1	<0.004	0.002	0.0023	0.0026	0.017	0.003	0.027	0.000	<0.002	0.023
05/09/00 04:00	4.0	1.4	0.1	0.78	0.05	68	2	63	2	<0.004	0.002	0.0052	0.0011	0.019	0.003	0.028	0.001	<0.002	0.016
05/09/00 06:00	6.0	1.2	0.1	0.81	0.03	51	9	62	1	<0.004	0.013	0.0021	0.0012	0.014	0.004	0.026	0.001	<0.002	0.013
05/09/00 08:00	8.0	1.0	0.1	0.81	0.05	51	7	62	1	<0.004	0.004	0.0023	0.0021	0.016	0.003	0.027	0.001	<0.002	0.007
05/09/00 10:00	10.0	1.1	0.3	0.80	0.08	46	6	61	1	<0.004	0.004	<0.001	0.0003	0.012	0.002	0.026	0.000	<0.002	0.018
05/09/00 12:00	12.0	1.2	0.2	0.78	0.05	45	9	62	2	<0.004	0.005	0.0016	0.0007	0.042	0.004	0.029	0.000	<0.002	0.021
05/09/00 14:00	14.0	1.2	0.1	0.78	0.04	40	6	63	0	0.006	0.005	<0.001	0.0000	0.024	0.004	0.028	0.001	<0.002	0.014
05/09/00 16:00	16.0	0.5	0.4	0.83	0.03	72	1	62	2	<0.004	0.004	0.0010	0.0009	0.017	0.004	0.024	0.001	<0.002	0.027
05/09/00 18:00	18.0	1.4	0.1	0.81	0.02	55	9	62	0	<0.004	0.006	<0.001	0.0006	0.012	0.001	0.021	0.001	<0.002	0.018
05/09/00 20:00	20.0	2.4	0.1	0.78	0.05	52	9	61	1	<0.004	0.000	0.0018	0.0009	0.014	0.000	0.023	0.001	<0.002	0.002
05/09/00 22:00	22.0	1.4	0.1	0.77	0.04	54	11	60	1	0.005	0.004	0.0010	0.0016	0.016	0.003	0.023	0.001	<0.002	0.014
05/10/00 00:00	24.0	1.9	0.2	0.74	0.04	46	3	54	0	<0.004	0.004	<0.001	0.0007	0.012	0.002	0.019	0.001	<0.002	0.017
05/10/00 02:00	26.0	2.3	0.1	0.74	0.07	45	5	56	0	<0.004	0.007	<0.001	0.0001	0.014	0.004	0.024	0.001	<0.002	0.020
05/10/00 04:00	28.0	2.0	0.1	0.66	0.05	71	0	55	1	<0.004	0.008	0.0021	0.0017	0.016	0.003	0.028	0.001	<0.002	0.018
05/10/00 06:00	30.0	2.5	0.1	0.67	0.03	58	11	55	1	<0.004	0.006	0.0016	0.0009	0.014	0.002	0.021	0.000	<0.002	0.009
05/10/00 08:00	32.0	5.2	0.0	0.53	0.06	45	6	45	1	<0.004	0.003	<0.001	0.0007	0.014	0.002	0.024	0.000	<0.002	0.007
05/10/00 10:00	34.0	4.5	0.2	0.64	0.05	44	12	53	1	<0.004	0.009	<0.001	0.0004	0.016	0.005	0.026	0.001	<0.002	0.012
05/10/00 12:00	36.0	3.3	0.1	0.61	0.07	50	5	53	1	0.005	0.001	<0.001	0.0015	0.018	0.004	0.024	0.001	<0.002	0.008
05/10/00 14:00	38.0	2.6	0.0	0.60	0.05	44	20	52	1	0.006	0.002	0.0041	0.0051	0.015	0.002	0.020	0.001	<0.002	0.000
05/10/00 16:00	40.0	2.8	0.1	0.59	0.05	40	11	52	1	<0.004	0.007	0.0017	0.0011	0.014	0.003	0.023	0.001	<0.002	0.002
05/10/00 18:00	42.0	3.2	0.0	0.60	0.01	40	18	54	0	<0.004	0.007	0.0038	0.0006	0.015	0.003	0.023	0.001	<0.002	0.018

Table A19. Concentrations of trace elements for samples collected on the Iroquois River during May 2000 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Cr		Cs		Cu		Dy		Er		Eu		Fe	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
05/09/00 00:00	0.0	<0.1	0.1	<0.009	0.003	1.3	0.0	0.0049	0.0013	0.0052	0.0013	0.0008	0.0004	25	7
05/09/00 02:00	2.0	<0.1	0.1	<0.009	0.002	1.3	0.1	0.0039	0.0002	0.0053	0.0000	<0.0003	0.0009	25	6
05/09/00 04:00	4.0	<0.1	0.1	<0.009	0.004	1.5	0.0	0.0049	0.0001	0.0053	0.0003	0.0006	0.0004	32	5
05/09/00 06:00	6.0	<0.1	0.0	<0.009	0.002	1.8	0.0	0.0048	0.0005	0.0046	0.0002	0.0007	0.0008	24	2
05/09/00 08:00	8.0	<0.1	0.1	<0.009	0.001	1.4	0.0	0.0052	0.0007	0.0051	0.0006	0.0006	0.0012	27	1
05/09/00 10:00	10.0	<0.1	0.1	<0.009	0.001	1.8	0.0	0.0047	0.0003	0.0043	0.0002	0.0006	0.0005	26	2
05/09/00 12:00	12.0	<0.1	0.1	<0.009	0.002	1.6	0.1	0.0057	0.0002	0.0042	0.0004	<0.0003	0.0017	29	5
05/09/00 14:00	14.0	<0.1	0.1	<0.009	0.002	0.71	0.05	0.0053	0.0003	0.0051	0.0006	0.0016	0.0003	26	2
05/09/00 16:00	16.0	<0.1	0.0	<0.009	0.000	1.4	0.0	0.0051	0.0004	0.0050	0.0004	0.0008	0.0015	27	2
05/09/00 18:00	18.0	<0.1	0.1	<0.009	0.002	0.77	0.03	0.0041	0.0001	0.0052	0.0006	0.0005	0.0006	14	1
05/09/00 20:00	20.0	<0.1	0.1	<0.009	0.004	0.85	0.02	0.0048	0.0008	0.0052	0.0000	0.0012	0.0010	12	1
05/09/00 22:00	22.0	<0.1	0.1	<0.009	0.001	0.83	0.02	0.0048	0.0009	0.0046	0.0003	0.0006	0.0007	14	1
05/10/00 00:00	24.0	<0.1	0.1	<0.009	0.003	1.6	0.0	0.0040	0.0004	0.0046	0.0003	0.0008	0.0006	11	1
05/10/00 02:00	26.0	<0.1	0.1	<0.009	0.000	0.59	0.00	0.0054	0.0005	0.0049	0.0004	0.0007	0.0012	21	1
05/10/00 04:00	28.0	<0.1	0.1	0.010	0.000	0.80	0.02	0.0059	0.0012	0.0060	0.0006	<0.0003	0.0004	20	2
05/10/00 06:00	30.0	<0.1	0.0	<0.009	0.002	0.91	0.07	0.0050	0.0004	0.0049	0.0002	0.0011	0.0002	12	1
05/10/00 08:00	32.0	<0.1	0.0	<0.009	0.001	0.82	0.01	0.0049	0.0004	0.0045	0.0004	0.0010	0.0008	9.3	0.3
05/10/00 10:00	34.0	<0.1	0.1	<0.009	0.007	0.73	0.01	0.0061	0.0005	0.0044	0.0004	0.0006	0.0001	7.4	0.8
05/10/00 12:00	36.0	<0.1	0.1	<0.009	0.002	1.3	0.0	0.0054	0.0005	0.0056	0.0010	0.0007	0.0006	5.4	1.2
05/10/00 14:00	38.0	<0.1	0.1	<0.009	0.003	0.94	0.01	0.0055	0.0001	0.0038	0.0000	0.0004	0.0008	9.6	3.5
05/10/00 16:00	40.0	<0.1	0.0	<0.009	0.005	1.1	0.0	0.0053	0.0010	0.0046	0.0003	0.0009	0.0003	12	3
05/10/00 18:00	42.0	<0.1	0.1	<0.009	0.003	0.92	0.03	0.0053	0.0004	0.0055	0.0001	0.0006	0.0009	7.5	1.0

Table A19. Concentrations of trace elements for samples collected on the Iroquois River during May 2000 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Gd		Hg		Ho		La		Li		Lu		Mn		Mo	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
05/09/00 00:00	0.0	0.0068	0.0007	0.3	0.2	0.0013	0.0000	0.019	0.001	3.7	0.2	0.0015	0.0001	20	5	4.5	0.0
05/09/00 02:00	2.0	0.0067	0.0003	<0.5	0.2	0.0012	0.0002	0.018	0.001	3.7	0.1	0.0015	0.0002	26	6	4.6	0.1
05/09/00 04:00	4.0	0.0068	0.0003	0.5	0.1	0.0014	0.0000	0.018	0.001	3.8	0.0	0.0017	0.0002	32	5	4.6	0.1
05/09/00 06:00	6.0	0.0068	0.0007	<0.5	0.1	0.0013	0.0000	0.017	0.001	3.8	0.1	0.0016	0.0002	29	3	4.6	0.1
05/09/00 08:00	8.0	0.0069	0.0002	<0.3	0.1	0.0011	0.0001	0.020	0.000	3.7	0.2	0.0015	0.0003	26	1	4.6	0.1
05/09/00 10:00	10.0	0.0067	0.0003	0.5	0.0	0.0014	0.0000	0.019	0.001	3.7	0.2	0.0014	0.0001	26	2	4.5	0.1
05/09/00 12:00	12.0	0.0069	0.0003	1.5	0.1	0.0013	0.0000	0.018	0.001	3.6	0.0	0.0015	0.0002	27	5	4.6	0.0
05/09/00 14:00	14.0	0.0068	0.0006	<0.4	0.0	0.0012	0.0002	0.018	0.001	3.8	0.0	0.0014	0.0002	26	0	4.6	0.0
05/09/00 16:00	16.0	0.0061	0.0002	0.4	0.1	0.0011	0.0001	0.016	0.001	3.8	0.2	0.0015	0.0000	47	3	4.6	0.0
05/09/00 18:00	18.0	0.0060	0.0007	<0.3	0.2	0.0012	0.0000	0.016	0.001	3.6	0.1	0.0016	0.0001	28	2	4.5	0.1
05/09/00 20:00	20.0	0.0068	0.0004	<0.3	0.4	0.0014	0.0001	0.018	0.001	3.5	0.0	0.0017	0.0002	25	2	4.5	0.1
05/09/00 22:00	22.0	0.0063	0.0010	0.4	0.0	0.0015	0.0000	0.017	0.001	3.7	0.1	0.0016	0.0000	28	2	4.4	0.1
05/10/00 00:00	24.0	0.0056	0.0004	0.5	0.3	0.0013	0.0001	0.016	0.001	3.3	0.0	0.0015	0.0001	16	1	4.2	0.0
05/10/00 02:00	26.0	0.0067	0.0005	0.6	0.3	0.0013	0.0001	0.019	0.001	3.5	0.1	0.0015	0.0000	14	3	4.3	0.1
05/10/00 04:00	28.0	0.0066	0.0006	1.2	0.0	0.0017	0.0000	0.022	0.000	3.4	0.0	0.0016	0.0000	11	1	4.0	0.0
05/10/00 06:00	30.0	0.0059	0.0007	<0.4	0.2	0.0015	0.0001	0.018	0.000	3.3	0.1	0.0017	0.0003	4.9	0.4	4.0	0.0
05/10/00 08:00	32.0	0.0060	0.0007	0.8	0.1	0.0014	0.0001	0.019	0.000	2.7	0.0	0.0013	0.0002	4.5	0.1	3.2	0.1
05/10/00 10:00	34.0	0.0061	0.0002	<0.4	0.1	0.0014	0.0001	0.021	0.001	3.2	0.1	0.0016	0.0000	6.0	0.6	3.8	0.0
05/10/00 12:00	36.0	0.0082	0.0007	1.2	0.4	0.0013	0.0002	0.020	0.001	3.2	0.1	0.0014	0.0000	7.0	2.2	3.8	0.0
05/10/00 14:00	38.0	0.0051	0.0003	<0.4	0.5	0.0010	0.0000	0.016	0.000	3.2	0.0	0.0013	0.0003	6.7	2.2	3.7	0.0
05/10/00 16:00	40.0	0.0059	0.0010	0.5	0.1	0.0015	0.0000	0.017	0.000	3.3	0.1	0.0015	0.0001	6.9	0.8	3.7	0.0
05/10/00 18:00	42.0	0.0060	0.0013	<0.4	0.1	0.0013	0.0000	0.018	0.000	2.9	0.1	0.0012	0.0001	6.3	2.1	3.4	0.1

Table A19. Concentrations of trace elements for samples collected on the Iroquois River during May 2000 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Nd		Ni		Pb		Pr		Rb		Re		Sb		Se		Sm	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
05/09/00 00:00	0.0	0.022	0.001	1.2	0.2	0.067	0.004	0.0047	0.0001	0.73	0.02	0.019	0.001	0.13	0.01	1.0	0.1	0.0058	0.0000
05/09/00 02:00	2.0	0.022	0.004	1.2	0.4	0.051	0.005	0.0046	0.0002	0.76	0.02	0.020	0.000	0.14	0.00	1.0	0.1	0.0039	0.0003
05/09/00 04:00	4.0	0.022	0.002	1.3	0.5	0.051	0.004	0.0047	0.0001	0.77	0.01	0.020	0.001	0.13	0.00	1.0	0.1	0.0045	0.0010
05/09/00 06:00	6.0	0.021	0.000	1.0	0.2	0.045	0.004	0.0043	0.0001	0.77	0.01	0.021	0.000	0.13	0.00	1.0	0.0	0.0060	0.0004
05/09/00 08:00	8.0	0.023	0.002	1.1	0.1	0.046	0.001	0.0052	0.0004	0.80	0.02	0.019	0.001	0.13	0.01	1.0	0.1	0.0047	0.0009
05/09/00 10:00	10.0	0.021	0.002	1.0	0.2	0.052	0.004	0.0048	0.0002	0.76	0.01	0.020	0.000	0.13	0.01	1.1	0.1	0.0049	0.0001
05/09/00 12:00	12.0	0.022	0.001	0.9	0.2	0.11	0.02	0.0051	0.0002	0.73	0.00	0.019	0.001	0.14	0.01	1.0	0.0	0.0040	0.0004
05/09/00 14:00	14.0	0.022	0.002	1.1	0.3	0.073	0.008	0.0047	0.0003	0.78	0.01	0.020	0.001	0.13	0.00	1.1	0.1	0.0057	0.0002
05/09/00 16:00	16.0	0.019	0.000	1.6	0.6	0.045	0.004	0.0041	0.0001	0.76	0.01	0.020	0.001	0.13	0.00	1.0	0.0	0.0043	0.0005
05/09/00 18:00	18.0	0.019	0.002	1.2	0.2	0.027	0.003	0.0041	0.0003	0.76	0.01	0.019	0.001	0.13	0.01	1.0	0.0	0.0054	0.0004
05/09/00 20:00	20.0	0.022	0.001	1.2	0.3	0.027	0.007	0.0049	0.0003	0.75	0.01	0.019	0.001	0.13	0.00	1.0	0.1	0.0039	0.0003
05/09/00 22:00	22.0	0.022	0.001	1.2	0.1	0.030	0.001	0.0044	0.0002	0.79	0.01	0.019	0.000	0.13	0.01	1.0	0.0	0.0046	0.0005
05/10/00 00:00	24.0	0.017	0.001	1.2	0.2	0.026	0.001	0.0037	0.0000	0.75	0.01	0.016	0.001	0.12	0.00	0.8	0.1	0.0044	0.0007
05/10/00 02:00	26.0	0.022	0.000	1.2	0.3	0.031	0.000	0.0048	0.0002	0.79	0.01	0.017	0.001	0.13	0.01	1.0	0.1	0.0047	0.0004
05/10/00 04:00	28.0	0.026	0.001	1.2	0.3	0.040	0.002	0.0059	0.0002	0.73	0.02	0.018	0.001	0.12	0.01	1.0	0.1	0.0057	0.0008
05/10/00 06:00	30.0	0.023	0.001	1.3	0.2	0.030	0.003	0.0046	0.0004	0.84	0.01	0.017	0.000	0.12	0.00	1.0	0.1	0.0070	0.0003
05/10/00 08:00	32.0	0.024	0.001	1.0	0.1	0.024	0.004	0.0051	0.0003	0.76	0.02	0.014	0.000	0.10	0.00	0.7	0.1	0.0039	0.0003
05/10/00 10:00	34.0	0.024	0.000	0.9	0.3	0.024	0.004	0.0053	0.0001	0.85	0.03	0.017	0.000	0.12	0.01	1.0	0.0	0.0053	0.0002
05/10/00 12:00	36.0	0.021	0.001	1.0	0.4	0.042	0.006	0.0048	0.0003	0.82	0.01	0.017	0.001	0.12	0.00	1.0	0.1	0.0041	0.0006
05/10/00 14:00	38.0	0.018	0.001	0.9	0.2	0.031	0.007	0.0039	0.0002	0.79	0.01	0.016	0.001	0.12	0.00	1.0	0.1	0.0037	0.0001
05/10/00 16:00	40.0	0.022	0.002	0.7	0.4	0.034	0.004	0.0050	0.0002	0.85	0.01	0.016	0.001	0.13	0.00	0.9	0.1	0.0047	0.0005
05/10/00 18:00	42.0	0.021	0.003	1.0	0.4	0.034	0.013	0.0049	0.0002	0.86	0.01	0.016	0.001	0.13	0.00	1.0	0.0	0.0052	0.0011

Table A19. Concentrations of trace elements for samples collected on the Iroquois River during May 2000 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Sr		Ta		Tb		Te		Th		Ti		Tl		Tm	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
05/09/00 00:00	0.0	251	1	0.007	0.010	0.0009	0.0001	<0.01	0.007	0.0022	0.0001	<0.1	0.3	0.020	0.013	0.0008	0.0000
05/09/00 02:00	2.0	255	1	<0.005	0.005	0.0007	0.0001	0.012	0.010	0.0015	0.0004	<0.1	0.3	0.0081	0.0013	0.0008	0.0001
05/09/00 04:00	4.0	264	3	<0.005	0.003	0.0007	0.0002	<0.01	0.007	0.0012	0.0003	<0.1	0.1	0.011	0.003	0.0008	0.0001
05/09/00 06:00	6.0	262	5	<0.005	0.006	0.0008	0.0001	<0.01	0.006	0.0012	0.0001	<0.1	0.2	0.0090	0.0007	0.0009	0.0001
05/09/00 08:00	8.0	260	3	<0.005	0.007	0.0006	0.0001	<0.01	0.002	0.0012	0.0001	<0.1	0.3	0.011	0.002	0.0009	0.0000
05/09/00 10:00	10.0	260	4	<0.005	0.005	0.0008	0.0002	0.013	0.008	0.0012	0.0001	<0.1	0.2	0.0091	0.0019	0.0009	0.0001
05/09/00 12:00	12.0	253	2	<0.005	0.005	0.0008	0.0001	0.018	0.003	0.0013	0.0003	<0.1	0.2	0.010	0.004	0.0008	0.0001
05/09/00 14:00	14.0	263	1	<0.005	0.003	0.0007	0.0002	<0.01	0.008	0.0010	0.0001	<0.1	0.0	0.010	0.003	0.0009	0.0002
05/09/00 16:00	16.0	258	4	<0.005	0.005	0.0007	0.0001	<0.01	0.001	0.0010	0.0001	<0.1	0.1	0.0097	0.0005	0.0009	0.0001
05/09/00 18:00	18.0	254	2	<0.005	0.003	0.0006	0.0001	0.011	0.003	0.0008	0.0001	<0.1	0.2	0.0087	0.0008	0.0008	0.0001
05/09/00 20:00	20.0	248	11	<0.005	0.002	0.0009	0.0001	<0.01	0.004	0.0012	0.0003	<0.1	0.1	0.0094	0.0027	0.0008	0.0000
05/09/00 22:00	22.0	246	0	<0.005	0.001	0.0008	0.0000	0.010	0.004	0.0010	0.0003	<0.1	0.2	0.0074	0.0013	0.0009	0.0001
05/10/00 00:00	24.0	234	3	<0.005	0.003	0.0008	0.0001	<0.01	0.003	0.0009	0.0000	<0.1	0.2	0.0072	0.0015	0.0009	0.0002
05/10/00 02:00	26.0	236	2	<0.005	0.000	0.0008	0.0001	<0.01	0.000	0.0010	0.0002	<0.1	0.0	0.0082	0.0014	0.0009	0.0001
05/10/00 04:00	28.0	226	4	<0.005	0.003	0.0008	0.0001	0.012	0.007	0.0014	0.0003	<0.1	0.2	0.0080	0.0002	0.0009	0.0000
05/10/00 06:00	30.0	218	2	<0.005	0.002	0.0008	0.0001	<0.01	0.004	0.0012	0.0000	<0.1	0.1	0.0097	0.0018	0.0008	0.0000
05/10/00 08:00	32.0	178	1	<0.005	0.005	0.0008	0.0002	<0.01	0.006	0.0012	0.0002	<0.1	0.1	0.0089	0.0003	0.0008	0.0001
05/10/00 10:00	34.0	226	0	<0.005	0.006	0.0010	0.0001	<0.01	0.006	0.0010	0.0001	<0.1	0.1	0.0082	0.0011	0.0008	0.0002
05/10/00 12:00	36.0	226	1	0.011	0.001	0.0008	0.0000	<0.01	0.001	0.0016	0.0002	<0.1	0.2	0.010	0.003	0.0009	0.0001
05/10/00 14:00	38.0	224	3	<0.005	0.002	0.0007	0.0001	<0.01	0.001	0.0017	0.0008	<0.1	0.0	0.0087	0.0001	0.0007	0.0000
05/10/00 16:00	40.0	218	1	0.005	0.007	0.0008	0.0000	<0.01	0.002	0.0018	0.0003	<0.1	0.2	0.0091	0.0006	0.0007	0.0001
05/10/00 18:00	42.0	211	0	<0.005	0.004	0.0009	0.0001	<0.01	0.003	0.0016	0.0003	<0.1	0.1	0.013	0.003	0.0009	0.0000

Table A19. Concentrations of trace elements for samples collected on the Iroquois River during May 2000 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	U		V		W		Y		Yb		Zn		Zr	
		Avg	SD	µg/L	SD	Avg	SD	µg/L	SD	Avg	SD	µg/L	SD	Avg	SD
05/09/00 00:00	0.0	2.3	0.0	0.12	0.03	0.003	0.000	0.044	0.001	0.0077	0.0008	1.8	0.2	0.061	0.003
05/09/00 02:00	2.0	2.3	0.0	0.12	0.10	0.003	0.001	0.043	0.002	0.0072	0.0009	1.6	0.2	0.059	0.005
05/09/00 04:00	4.0	2.4	0.0	0.18	0.01	0.002	0.001	0.044	0.001	0.0075	0.0011	1.3	0.2	0.071	0.002
05/09/00 06:00	6.0	2.4	0.0	0.17	0.04	0.002	0.001	0.043	0.001	0.0074	0.0005	1.2	0.3	0.063	0.003
05/09/00 08:00	8.0	2.4	0.0	0.17	0.05	<0.002	0.001	0.040	0.001	0.0075	0.0010	1.1	0.3	0.060	0.004
05/09/00 10:00	10.0	2.3	0.0	0.17	0.06	0.003	0.001	0.043	0.001	0.0071	0.0002	1.2	0.1	0.062	0.004
05/09/00 12:00	12.0	2.3	0.0	0.15	0.03	<0.002	0.000	0.040	0.001	0.0077	0.0003	1.4	0.2	0.057	0.005
05/09/00 14:00	14.0	2.4	0.0	0.16	0.04	<0.002	0.001	0.042	0.001	0.0067	0.0002	1.1	0.1	0.060	0.001
05/09/00 16:00	16.0	2.3	0.0	0.19	0.04	0.004	0.000	0.040	0.001	0.0062	0.0001	1.2	0.3	0.061	0.002
05/09/00 18:00	18.0	2.4	0.0	0.14	0.03	0.002	0.001	0.043	0.003	0.0068	0.0001	1.2	0.3	0.061	0.001
05/09/00 20:00	20.0	2.3	0.1	0.12	0.02	0.002	0.001	0.046	0.002	0.0071	0.0009	1.1	0.2	0.064	0.005
05/09/00 22:00	22.0	2.2	0.1	0.15	0.02	<0.002	0.000	0.044	0.001	0.0074	0.0000	1.3	0.1	0.063	0.001
05/10/00 00:00	24.0	2.1	0.0	0.16	0.01	0.003	0.002	0.041	0.000	0.0070	0.0001	1.3	0.1	0.062	0.002
05/10/00 02:00	26.0	2.1	0.0	0.15	0.07	0.005	0.002	0.044	0.001	0.0074	0.0005	1.6	0.1	0.065	0.005
05/10/00 04:00	28.0	2.0	0.0	0.10	0.03	0.003	0.000	0.048	0.001	0.0079	0.0003	1.0	0.1	0.062	0.002
05/10/00 06:00	30.0	2.0	0.0	0.08	0.03	0.004	0.001	0.046	0.000	0.0077	0.0005	0.96	0.23	0.074	0.004
05/10/00 08:00	32.0	1.6	0.0	0.09	0.03	0.003	0.001	0.039	0.001	0.0059	0.0004	0.65	0.06	0.063	0.001
05/10/00 10:00	34.0	2.0	0.0	0.08	0.01	0.005	0.001	0.045	0.001	0.0065	0.0002	1.2	0.2	0.072	0.000
05/10/00 12:00	36.0	1.9	0.0	0.07	0.10	0.006	0.001	0.043	0.002	0.0071	0.0006	1.2	0.1	0.079	0.007
05/10/00 14:00	38.0	1.9	0.0	<0.05	0.05	0.005	0.002	0.039	0.000	0.0071	0.0007	1.2	0.2	0.071	0.000
05/10/00 16:00	40.0	1.9	0.0	<0.05	0.01	0.004	0.000	0.040	0.000	0.0070	0.0003	1.5	0.0	0.087	0.009
05/10/00 18:00	42.0	1.8	0.0	0.10	0.04	0.003	0.002	0.039	0.001	0.0075	0.0003	1.1	0.3	0.079	0.003

Table A20. Bacterial cell counts and chlorophyll-a concentrations for samples collected on the Iroquois River during May 2000.

[hr, hours; µg/L, micrograms per liter; millions/mL, millions per milliliter; na, not available]

Date-Time	Time from start hr	Bacterial Cell Counts millions/mL	Chlorophyll-a concentrations µg/L
05/09/00 00:00	0.0	2.40	4.67
05/09/00 02:00	2.0	3.40	4.44
05/09/00 04:00	4.0	2.30	4.09
05/09/00 06:00	6.0	1.40	3.68
05/09/00 08:00	8.0	2.60	5.65
05/09/00 10:00	10.0	2.50	3.28
05/09/00 12:00	12.0	na	6.55
05/09/00 14:00	14.0	3.10	7.06
05/09/00 16:00	16.0	2.10	2.06
05/09/00 18:00	18.0	3.10	4.97
05/09/00 20:00	20.0	2.40	4.96
05/09/00 22:00	22.0	1.39	4.59
05/10/00 00:00	24.0	5.30	4.82
05/10/00 02:00	26.0	1.77	3.32
05/10/00 04:00	28.0	4.17	6.07
05/10/00 06:00	30.0	3.80	10.1
05/10/00 08:00	32.0	0.95	na
05/10/00 10:00	34.0	na	7.23
05/10/00 12:00	36.0	na	7.54
05/10/00 14:00	38.0	3.30	8.30
05/10/00 16:00	40.0	3.50	5.25
05/10/00 18:00	42.0	3.90	6.11

Table A21. Concentrations of nutrients, dissolved organic carbon (DOC) and suspended sediment for samples collected on Sugar Creek during May 2000.

[hr, hours; mg/L, milligrams per liter; mg N/L, milligrams per liter as nitrogen; mg P/L, milligrams per liter as phosphorus; mg C/L, milligrams per liter as carbon; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	NO ₃		NO ₂		NH ₄		Kjeldahl N		PO ₄		P		DOC		Suspended Sediment	
		Avg	SD	Avg	SD	Avg	SD	mg N/L	Value	Avg	SD	Avg	SD	Avg	SD	mg/L	Value
05/08/00 12:00	0.0	10.3	0.2	0.078	0.003	0.040	0.007	0.27	<0.006	0.001	0.001	0.017	0.001	2.89	0.05	na	na
05/08/00 14:00	2.0	10.5	0.2	0.079	0.002	0.027	0.003	na	<0.006	0.000	0.002	0.014	0.002	2.92	0.05	12	12
05/08/00 16:00	4.0	10.1	0.2	0.075	0.002	0.027	0.005	0.29	<0.006	0.004	0.003	0.018	0.003	2.87	0.13	13	13
05/08/00 18:00	6.0	10.1	0.1	0.073	0.003	0.028	0.006	0.26	<0.006	0.000	0.003	0.008	0.003	2.46	0.27	4	4
05/08/00 20:00	8.0	9.94	0.02	0.074	0.002	0.031	0.006	0.30	<0.006	0.001	0.002	0.008	0.002	2.77	0.00	na	na
05/08/00 22:00	10.0	10.0	0.1	0.075	0.001	0.046	0.001	0.25	<0.006	0.001	0.001	0.011	0.001	2.74	0.39	38	38
05/09/00 00:00	12.0	10.2	0.0	0.079	0.001	0.062	0.005	0.32	<0.006	0.000	0.002	0.009	0.002	2.97	0.04	12	12
05/09/00 02:00	14.0	9.85	0.14	0.080	0.001	0.079	0.004	0.35	<0.006	0.001	0.009	0.009	0.000	na	na	8	8
05/09/00 04:00	16.0	10.3	0.2	0.088	0.003	0.077	0.002	0.35	<0.006	0.002	0.021	0.001	0.001	na	na	12	12
05/09/00 06:00	18.0	10.4	0.3	0.087	0.002	0.084	0.002	0.35	<0.006	0.004	0.019	0.001	0.001	na	na	na	na
05/09/00 08:00	20.0	10.9	0.2	0.086	0.002	0.076	0.001	0.29	<0.006	0.003	0.017	0.001	0.001	3.27	0.01	17	17
05/09/00 10:00	22.0	11.0	0.0	0.087	0.002	0.051	0.004	0.31	<0.006	0.003	0.012	0.002	0.002	3.63	0.16	na	na
05/09/00 12:00	24.0	10.4	0.0	0.088	0.002	0.049	0.004	0.33	<0.006	0.003	0.013	0.001	0.001	3.02	0.03	10	10
05/09/00 14:00	26.0	10.6	0.0	0.089	0.003	0.036	0.004	0.32	<0.006	0.002	0.011	0.004	0.004	2.98	0.04	11	11
05/09/00 16:00	28.0	10.1	0.0	0.082	0.002	0.043	0.007	0.32	<0.006	0.004	0.010	0.001	0.001	2.88	0.12	135	135
05/09/00 18:00	30.0	10.9	0.0	0.076	0.001	0.060	0.004	0.51	0.122	0.005	0.15	0.01	0.01	4.30	0.19	899	899
05/09/00 20:00	32.0	14.5	0.2	0.078	0.001	0.101	0.007	0.56	0.073	0.018	0.088	0.003	0.003	4.61	0.08	418	418
05/09/00 22:00	34.0	13.9	0.4	0.076	0.002	0.141	0.012	0.53	0.064	0.001	0.079	0.002	0.002	4.55	0.04	340	340
05/10/00 00:00	36.0	15.4	0.4	0.081	0.001	0.206	0.011	0.60	0.032	0.003	0.066	0.001	0.001	5.37	0.01	881	881

Table A22. Concentrations of major inorganic constituents for samples collected on Sugar Creek during May 2000.

[hr, hours; mg/L, milligrams per liter; mg C/L, milligrams per liter as carbon; µg/L, micrograms per liter; Avg, average; SD, standard deviation; na, not available]

Date-Time	Time from start hr	Cl		SO ₄		HCO ₃		CO ₃		Br		Na		K		Mg		Ca		SiO ₂	
		Avg	SD	Avg	SD	mg C/L Value	mg C/L Value	mg C/L Value	mg C/L Value	µg/L Avg	µg/L SD	mg/L Avg	mg/L SD	mg/L Avg	mg/L SD	mg/L Avg	mg/L SD	mg/L Avg	mg/L SD	mg/L Avg	mg/L SD
05/08/00 12:00	0.0	23.5	na	66.2	na	51.2	na	na	na	8.6	1.4	7.5	0.5	0.86	0.04	29	1	87	3	6.8	0.4
05/08/00 14:00	2.0	23.3	na	66.8	na	51.0	na	na	na	11	0	7.7	0.2	0.85	0.03	29	1	88	2	6.8	0.2
05/08/00 16:00	4.0	24.1	na	65.6	na	51.2	na	na	na	8.3	1.0	8.0	0.3	0.88	0.01	28	1	85	3	6.5	0.0
05/08/00 18:00	6.0	23.8	0.3	66.0	0.6	51.9	na	na	na	8.3	0.9	8.2	0.3	0.89	0.02	28	1	87	2	6.9	0.1
05/08/00 20:00	8.0	23.4	na	66.1	na	52.1	na	na	na	8.9	0.5	8.1	0.2	0.93	0.02	29	1	87	2	7.0	0.1
05/08/00 22:00	10.0	23.6	na	66.0	na	52.2	na	na	na	8.7	1.0	8.5	0.0	0.97	0.06	28	0	87	1	7.0	0.3
05/09/00 00:00	12.0	23.6	na	67.5	na	52.4	na	na	na	8.7	0.4	7.6	0.1	0.96	0.03	31	1	87	1	6.8	0.1
05/09/00 02:00	14.0	21.5	na	66.1	na	50.0	na	na	na	8.3	0.4	7.4	0.2	0.98	0.06	29	1	83	1	6.7	0.1
05/09/00 04:00	16.0	22.0	0.3	64.8	0.0	49.5	na	na	na	8.3	0.5	7.1	0.0	1.1	0.0	29	1	82	1	6.8	0.2
05/09/00 06:00	18.0	22.1	na	62.6	na	49.8	na	na	na	7.3	1.2	7.1	0.1	1.0	0.0	28	1	83	3	6.9	0.0
05/09/00 08:00	20.0	22.3	na	64.0	na	50.2	na	na	na	8.0	2.0	7.0	0.1	1.0	0.1	29	1	88	1	7.3	0.3
05/09/00 10:00	22.0	21.3	na	62.2	na	48.9	na	na	na	7.9	1.3	7.0	0.3	1.0	0.0	30	0	87	4	7.5	0.2
05/09/00 12:00	24.0	21.6	na	63.1	na	49.2	na	na	na	8.0	1.3	7.2	0.2	1.0	0.0	29	0	84	3	7.2	0.2
05/09/00 14:00	26.0	22.4	0.6	64.2	0.3	49.7	na	na	na	8.9	0.5	7.3	0.2	1.0	0.0	29	1	84	1	7.1	0.3
05/09/00 16:00	28.0	22.0	na	63.7	na	47.6	na	na	na	8.1	2.1	7.7	0.3	1.1	0.0	29	1	82	1	6.9	0.2
05/09/00 18:00	30.0	15.8	na	43.1	na	34.8	na	na	na	8.1	0.3	5.9	0.0	2.5	0.1	21	1	61	0	6.0	0.1
05/09/00 20:00	32.0	15.7	na	40.2	na	34.5	na	na	na	13	1	5.2	0.3	1.8	0.1	24	1	67	1	7.6	0.4
05/09/00 22:00	34.0	18.2	na	42.2	na	35.3	na	na	na	10	1	6.5	0.3	2.0	0.0	23	0	65	1	7.4	0.2
05/10/00 00:00	36.0	17.2	0.5	34.7	0.7	30.1	na	na	na	10	0	5.9	0.1	2.5	0.0	20	1	60	1	7.8	0.1

Table A23. Concentrations of trace elements for samples collected on Sugar Creek during May 2000.

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Al		As		B		Ba		Be		Bi		Cd		Ce		Co	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
05/08/00 12:00	0.0	2.2	0.0	0.54	0.03	44	3	50	1	<0.01	0.00	<0.002	0.000	0.004	0.001	0.035	0.001	<0.002	0.010
05/08/00 14:00	2.0	2.5	0.1	0.59	0.02	41	2	50	1	<0.01	0.01	<0.002	0.000	0.005	0.000	0.038	0.000	<0.002	0.013
05/08/00 16:00	4.0	2.0	0.1	0.55	0.01	44	1	49	1	<0.01	0.01	0.003	0.000	0.002	0.002	0.033	0.000	<0.002	0.011
05/08/00 18:00	6.0	1.3	0.1	0.58	0.02	44	0	51	1	<0.01	0.01	0.002	0.002	<0.002	0.002	0.034	0.000	<0.002	0.007
05/08/00 20:00	8.0	1.3	0.3	0.53	0.03	46	1	52	0	<0.01	0.01	0.004	0.005	<0.002	0.003	0.031	0.001	<0.002	0.008
05/08/00 22:00	10.0	1.5	0.1	0.56	0.01	48	2	50	1	<0.01	0.00	<0.002	0.002	<0.002	0.002	0.041	0.000	<0.002	0.013
05/09/00 00:00	12.0	1.0	0.0	0.58	0.05	43	1	50	1	<0.01	0.01	<0.002	0.000	0.003	0.002	0.032	0.001	<0.002	0.007
05/09/00 02:00	14.0	1.4	0.1	0.58	0.01	42	2	48	0	<0.01	0.00	<0.002	0.000	<0.002	0.002	0.026	0.001	<0.002	0.014
05/09/00 04:00	16.0	3.2	0.1	0.57	0.02	39	2	47	1	<0.01	0.01	<0.002	0.001	<0.002	0.002	0.032	0.000	<0.002	0.013
05/09/00 06:00	18.0	1.4	0.1	0.53	0.01	42	1	48	1	<0.01	0.00	<0.002	0.001	0.015	0.002	0.026	0.000	<0.002	0.009
05/09/00 08:00	20.0	1.1	0.0	0.56	0.04	41	1	48	1	<0.01	0.01	<0.002	0.001	0.007	0.001	0.026	0.002	<0.002	0.004
05/09/00 10:00	22.0	1.4	0.0	0.59	0.07	41	0	49	1	<0.01	0.00	<0.002	0.002	0.011	0.009	0.028	0.000	<0.002	0.000
05/09/00 12:00	24.0	1.5	0.1	0.57	0.03	44	1	49	0	<0.01	0.00	<0.002	0.000	<0.002	0.001	0.029	0.001	<0.002	0.004
05/09/00 14:00	26.0	1.4	0.1	0.59	0.04	44	3	48	1	<0.01	0.00	<0.002	0.000	<0.002	0.001	0.030	0.000	<0.002	0.004
05/09/00 16:00	28.0	2.4	0.2	0.58	0.05	42	2	47	1	<0.01	0.00	0.004	0.005	<0.002	0.002	0.014	0.001	<0.002	0.004
05/09/00 18:00	30.0	5.1	0.0	0.70	0.07	33	2	44	0	<0.01	0.00	<0.002	0.001	0.005	0.002	0.036	0.000	<0.002	0.008
05/09/00 20:00	32.0	4.8	0.3	0.57	0.03	40	2	42	0	<0.01	0.01	<0.002	0.000	0.011	0.004	0.040	0.001	<0.002	0.006
05/09/00 22:00	34.0	4.9	0.1	0.65	0.01	39	1	41	1	<0.01	0.01	<0.002	0.001	0.007	0.004	0.036	0.001	<0.002	0.010
05/10/00 00:00	36.0	5.7	0.3	0.69	0.01	34	3	45	1	0.01	0.00	<0.002	0.001	0.005	0.002	0.061	0.000	<0.002	0.004

Table A23. Concentrations of trace elements for samples collected on Sugar Creek during May 2000 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Cr µg/L		Cs µg/L		Cu µg/L		Dy µg/L		Er µg/L		Eu µg/L		Fe µg/L	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
05/08/00 12:00	0.0	< 0.2	0.1	< 0.04	0.03	0.97	0.03	0.0056	0.0004	0.0032	0.0004	0.0003	0.0013	44	3
05/08/00 14:00	2.0	< 0.2	0.1	< 0.04	0.01	2.1	0.0	0.0052	0.0001	0.0039	0.0001	< 0.0002	0.0002	46	0
05/08/00 16:00	4.0	< 0.2	0.1	< 0.04	0.01	2.4	0.0	0.0052	0.0005	0.0033	0.0004	0.0006	0.0009	44	1
05/08/00 18:00	6.0	< 0.2	0.0	< 0.04	0.00	0.66	0.09	0.0047	0.0004	0.0037	0.0010	0.0004	0.0008	47	0
05/08/00 20:00	8.0	< 0.2	0.1	< 0.04	0.01	1.2	0.1	0.0048	0.0005	0.0027	0.0006	< 0.0002	0.0010	44	0
05/08/00 22:00	10.0	< 0.2	0.0	< 0.04	0.01	1.5	0.0	0.0048	0.0005	0.0040	0.0005	0.0010	0.0004	47	0
05/09/00 00:00	12.0	< 0.2	0.0	< 0.04	0.01	1.4	0.1	0.0042	0.0006	0.0031	0.0008	0.0003	0.0001	47	1
05/09/00 02:00	14.0	< 0.2	0.0	< 0.04	0.01	0.84	0.01	0.0049	0.0003	0.0032	0.0007	< 0.0002	0.0007	34	0
05/09/00 04:00	16.0	< 0.2	0.1	< 0.04	0.01	0.42	0.02	0.0060	0.0007	0.0050	0.0006	0.0006	0.0008	16	0
05/09/00 06:00	18.0	< 0.2	0.1	< 0.04	0.02	1.3	0.0	0.0050	0.0002	0.0032	0.0006	0.0011	0.0016	21	0
05/09/00 08:00	20.0	< 0.2	0.0	< 0.04	0.01	1.2	0.0	0.0051	0.0001	0.0032	0.0006	< 0.0002	0.0002	36	12
05/09/00 10:00	22.0	< 0.2	0.1	< 0.04	0.01	1.1	0.0	0.0045	0.0000	0.0033	0.0002	0.0013	0.0020	27	1
05/09/00 12:00	24.0	< 0.2	0.2	< 0.04	0.01	0.47	0.04	0.0041	0.0004	0.0036	0.0008	< 0.0002	0.0002	35	1
05/09/00 14:00	26.0	< 0.2	0.1	< 0.04	0.01	1.6	0.0	0.0053	0.0007	0.0034	0.0007	< 0.0002	0.0009	34	1
05/09/00 16:00	28.0	< 0.2	0.0	< 0.04	0.00	0.52	0.05	0.0028	0.0002	0.0024	0.0007	0.0004	0.0006	12	1
05/09/00 18:00	30.0	< 0.2	0.1	< 0.04	0.01	0.94	0.01	0.0060	0.0004	0.0041	0.0003	0.0008	0.0005	12	1
05/09/00 20:00	32.0	< 0.6	0.3	< 0.1	0.0	0.91	0.00	0.0085	0.0007	0.0053	0.0005	0.0029	0.0001	< 6	3
05/09/00 22:00	34.0	< 0.6	0.2	< 0.1	0.0	0.97	0.04	0.0063	0.0006	0.0049	0.0006	0.0030	0.0002	8	3
05/10/00 00:00	36.0	< 0.2	0.0	< 0.04	0.02	1.0	0.0	0.0090	0.0002	0.0059	0.0002	0.0015	0.0001	13	1

Table A23. Concentrations of trace elements for samples collected on Sugar Creek during May 2000 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Gd µg/L		Hg ng/L		Ho µg/L		La µg/L		Li µg/L		Lu µg/L		Mn µg/L		Mo µg/L	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
05/08/00 12:00	0.0	0.0071	0.0003	0.6	0.2	0.0011	0.0002	0.024	0.001	3.9	0.1	0.0006	0.0000	29	2	3.8	0.0
05/08/00 14:00	2.0	0.0074	0.0007	2.3	0.1	0.0012	0.0001	0.026	0.000	3.8	0.1	0.0006	0.0000	28	0	3.8	0.0
05/08/00 16:00	4.0	0.0070	0.0012	0.5	0.1	0.0011	0.0001	0.023	0.001	3.8	0.1	0.0005	0.0001	28	0	3.8	0.1
05/08/00 18:00	6.0	0.0058	0.0009	4.1	0.3	0.0011	0.0002	0.024	0.001	3.9	0.1	0.0005	0.0001	25	2	3.9	0.1
05/08/00 20:00	8.0	0.0067	0.0009	0.7	0.1	0.0010	0.0001	0.022	0.001	3.7	0.0	0.0005	0.0002	27	0	3.8	0.1
05/08/00 22:00	10.0	0.0067	0.0008	1.3	0.3	0.0010	0.0002	0.025	0.001	3.9	0.2	0.0005	0.0001	31	6	3.9	0.1
05/09/00 00:00	12.0	0.0065	0.0002	9.6	0.1	0.0010	0.0001	0.023	0.001	3.8	0.1	0.0005	0.0001	27	0	3.9	0.0
05/09/00 02:00	14.0	0.0059	0.0009	1.0	0.3	0.0009	0.0001	0.020	0.000	3.8	0.1	0.0006	0.0000	27	1	3.8	0.1
05/09/00 04:00	16.0	0.0082	0.0007	0.5	0.1	0.0015	0.0001	0.031	0.001	3.6	0.1	0.0006	0.0000	24	1	3.7	0.0
05/09/00 06:00	18.0	0.0068	0.0006	1.1	0.2	0.0009	0.0000	0.025	0.001	3.5	0.1	0.0005	0.0001	25	0	3.6	0.1
05/09/00 08:00	20.0	0.0047	0.0008	0.2	0.2	0.0010	0.0001	0.022	0.001	3.6	0.0	0.0006	0.0001	34	8	3.8	0.1
05/09/00 10:00	22.0	0.0066	0.0010	<0.4	0.1	0.0012	0.0002	0.024	0.001	3.7	0.1	0.0005	0.0001	33	1	3.7	0.1
05/09/00 12:00	24.0	0.0061	0.0010	2.4	0.0	0.0011	0.0001	0.021	0.000	3.6	0.1	0.0005	0.0001	33	1	3.7	0.0
05/09/00 14:00	26.0	0.0071	0.0006	0.5	0.3	0.0011	0.0002	0.022	0.000	3.7	0.1	0.0005	0.0001	33	1	3.9	0.0
05/09/00 16:00	28.0	0.0043	0.0004	<0.4	0.1	0.0007	0.0002	0.011	0.001	3.6	0.1	0.0005	0.0000	35	0	3.9	0.1
05/09/00 18:00	30.0	0.0094	0.0009	0.9	0.1	0.0015	0.0002	0.040	0.001	2.2	0.0	0.0007	0.0001	8.7	0.3	3.0	0.0
05/09/00 20:00	32.0	0.010	0.001	0.9	0.2	0.0014	0.0001	0.042	0.001	2.5	0.0	0.0007	0.0001	11	0	2.5	0.1
05/09/00 22:00	34.0	0.0088	0.0001	<0.4	0.4	0.0016	0.0002	0.039	0.001	2.4	0.1	0.0005	0.0000	8.9	0.0	2.4	0.0
05/10/00 00:00	36.0	0.012	0.001	1.2	0.1	0.0020	0.0001	0.047	0.001	2.0	0.1	0.0008	0.0000	11	0	2.3	0.1

Table A23. Concentrations of trace elements for samples collected on Sugar Creek during May 2000 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Nd		Ni		Pb		Pr		Rb		Re		Sb		Se		Sm	
		Avg	SD	µg/L	SD	Avg	SD	µg/L	SD	Avg	SD	µg/L	SD	Avg	SD	µg/L	SD	µg/L	SD
05/08/00 12:00	0.0	0.025	0.001	1.8	0.3	0.055	0.004	0.0062	0.0005	0.55	0.01	0.017	0.001	0.092	0.001	1.9	0.1	0.0053	0.0007
05/08/00 14:00	2.0	0.028	0.001	2.0	0.2	0.11	0.00	0.0063	0.0003	0.55	0.01	0.016	0.000	0.097	0.003	2.0	0.2	0.0065	0.0007
05/08/00 16:00	4.0	0.025	0.003	1.6	0.2	0.096	0.001	0.0059	0.0002	0.52	0.00	0.016	0.001	0.095	0.003	1.9	0.0	0.0051	0.0006
05/08/00 18:00	6.0	0.027	0.002	1.8	0.2	0.061	0.002	0.0059	0.0000	0.55	0.00	0.017	0.001	0.094	0.004	2.1	0.1	0.0059	0.0012
05/08/00 20:00	8.0	0.024	0.001	1.6	0.0	0.052	0.000	0.0054	0.0002	0.57	0.02	0.017	0.000	0.097	0.002	2.2	0.1	0.0065	0.0004
05/08/00 22:00	10.0	0.027	0.000	1.8	0.1	0.061	0.003	0.0067	0.0002	0.60	0.01	0.016	0.001	0.097	0.007	1.9	0.1	0.0066	0.0008
05/09/00 00:00	12.0	0.025	0.002	1.7	0.2	0.12	0.01	0.0057	0.0003	0.61	0.01	0.016	0.001	0.095	0.003	2.1	0.0	0.0062	0.0003
05/09/00 02:00	14.0	0.025	0.001	1.7	0.1	0.044	0.004	0.0057	0.0000	0.67	0.01	0.016	0.001	0.092	0.004	2.0	0.2	0.0045	0.0007
05/09/00 04:00	16.0	0.037	0.000	1.7	0.1	0.035	0.014	0.0075	0.0004	0.68	0.01	0.016	0.001	0.092	0.002	1.9	0.1	0.0075	0.0011
05/09/00 06:00	18.0	0.027	0.001	2.1	0.3	0.031	0.003	0.0062	0.0001	0.72	0.00	0.015	0.000	0.086	0.005	1.9	0.2	0.0052	0.0010
05/09/00 08:00	20.0	0.026	0.001	1.8	0.0	0.032	0.001	0.0059	0.0001	0.69	0.02	0.016	0.001	0.095	0.005	1.9	0.1	0.0055	0.0012
05/09/00 10:00	22.0	0.025	0.001	2.1	0.5	0.035	0.003	0.0060	0.0006	0.66	0.02	0.017	0.001	0.094	0.001	1.9	0.0	0.0067	0.0011
05/09/00 12:00	24.0	0.025	0.000	1.7	0.1	0.063	0.001	0.0054	0.0004	0.63	0.01	0.016	0.000	0.096	0.004	1.9	0.1	0.0052	0.0005
05/09/00 14:00	26.0	0.024	0.001	2.0	0.5	0.056	0.008	0.0056	0.0004	0.58	0.01	0.016	0.002	0.10	0.01	2.0	0.1	0.0052	0.0006
05/09/00 16:00	28.0	0.014	0.002	1.5	0.1	0.033	0.004	0.0029	0.0003	0.59	0.01	0.016	0.000	0.10	0.00	1.9	0.1	0.0028	0.0005
05/09/00 18:00	30.0	0.047	0.000	1.8	0.2	0.013	0.002	0.010	0.000	0.50	0.00	0.012	0.000	0.10	0.00	1.5	0.1	0.0091	0.0007
05/09/00 20:00	32.0	0.049	0.003	na	na	0.012	0.001	0.010	0.001	0.53	0.01	0.012	0.000	0.097	0.006	1.4	0.1	0.010	0.000
05/09/00 22:00	34.0	0.045	0.002	na	na	0.011	0.001	0.0095	0.0005	0.60	0.00	0.012	0.000	0.11	0.00	1.6	0.1	0.008	0.003
05/10/00 00:00	36.0	0.060	0.001	2.0	0.4	0.023	0.004	0.013	0.000	0.75	0.01	0.011	0.001	0.12	0.01	1.6	0.1	0.011	0.001

Table A23. Concentrations of trace elements for samples collected on Sugar Creek during May 2000 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	Sr		Ta		Tb		Te		Th		Ti		Tl		Tm	
		Avg	SD	µg/L	SD	µg/L	SD	µg/L	SD	µg/L	SD	µg/L	SD	µg/L	SD	µg/L	SD
05/08/00 12:00	0.0	180	1	<0.002	0.000	0.0009	0.0002	0.014	0.002	0.0014	0.0002	<0.04	0.05	0.010	0.002	0.0006	0.0001
05/08/00 14:00	2.0	179	2	<0.002	0.001	0.0012	0.0001	0.015	0.006	0.0014	0.0003	<0.04	0.06	0.011	0.003	0.0005	0.0000
05/08/00 16:00	4.0	179	4	<0.002	0.002	0.0009	0.0000	0.014	0.006	0.0014	0.0002	<0.04	0.06	0.010	0.001	0.0004	0.0001
05/08/00 18:00	6.0	182	1	<0.002	0.001	0.0009	0.0000	0.015	0.009	0.0017	0.0008	<0.04	0.09	0.012	0.003	0.0003	0.0001
05/08/00 20:00	8.0	183	4	<0.002	0.000	0.0009	0.0000	0.016	0.002	0.0015	0.0004	<0.04	0.02	0.012	0.003	0.0005	0.0001
05/08/00 22:00	10.0	184	2	<0.002	0.000	0.0010	0.0001	0.015	0.006	0.0020	0.0007	<0.04	0.01	0.016	0.010	0.0004	0.0000
05/09/00 00:00	12.0	177	0	<0.002	0.000	0.0009	0.0001	0.011	0.002	0.0013	0.0003	<0.04	0.13	0.009	0.002	0.0005	0.0001
05/09/00 02:00	14.0	173	2	<0.002	0.001	0.0008	0.0000	0.014	0.006	0.0013	0.0008	<0.04	0.08	0.009	0.001	0.0005	0.0000
05/09/00 04:00	16.0	167	2	<0.002	0.001	0.0010	0.0001	0.011	0.005	0.0011	0.0004	<0.04	0.05	0.012	0.002	0.0005	0.0000
05/09/00 06:00	18.0	173	3	<0.002	0.001	0.0007	0.0000	0.008	0.003	0.0013	0.0002	<0.04	0.03	0.012	0.004	0.0004	0.0001
05/09/00 08:00	20.0	176	1	<0.002	0.000	0.0008	0.0002	0.010	0.004	0.0008	0.0001	<0.04	0.06	0.009	0.002	0.0005	0.0001
05/09/00 10:00	22.0	179	1	<0.002	0.001	0.0010	0.0001	0.021	0.007	0.0011	0.0002	<0.04	0.03	0.009	0.003	0.0004	0.0001
05/09/00 12:00	24.0	172	2	<0.002	0.000	0.0009	0.0001	0.011	0.005	0.0013	0.0004	<0.04	0.07	0.008	0.000	0.0004	0.0000
05/09/00 14:00	26.0	174	1	<0.002	0.001	0.0008	0.0001	0.012	0.003	0.0013	0.0002	<0.04	0.10	0.009	0.002	0.0005	0.0000
05/09/00 16:00	28.0	167	2	<0.002	0.001	0.0005	0.0001	0.013	0.003	0.0012	0.0008	<0.04	0.06	0.010	0.002	0.0004	0.0001
05/09/00 18:00	30.0	114	0	<0.002	0.000	0.0013	0.0001	<0.008	0.003	0.0020	0.0002	<0.04	0.05	0.008	0.001	0.0004	0.0001
05/09/00 20:00	32.0	126	2	<0.001	0.000	0.0014	0.0003	<0.02	0.00	0.0020	0.0003	<0.2	1.2	0.011	0.002	0.0008	0.0000
05/09/00 22:00	34.0	121	3	<0.001	0.001	0.0013	0.0002	<0.02	0.01	0.0015	0.0002	<0.2	0.7	0.0098	0.0014	0.0007	0.0001
05/10/00 00:00	36.0	112	3	<0.002	0.001	0.0016	0.0001	<0.008	0.006	0.0035	0.0000	<0.04	0.05	0.008	0.003	0.0008	0.0002

Table A23. Concentrations of trace elements for samples collected on Sugar Creek during May 2000 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	U		V		W		Y		Yb		Zn		Zr	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
05/08/00 12:00	0.0	2.7	0.0	<0.2	0.0	0.004	0.002	0.044	0.001	0.0026	0.0006	1.9	0.1	0.019	0.002
05/08/00 14:00	2.0	2.7	0.0	<0.2	0.0	0.003	0.002	0.045	0.000	0.0036	0.0004	1.8	0.2	0.022	0.003
05/08/00 16:00	4.0	2.6	0.0	<0.2	0.0	0.003	0.002	0.044	0.001	0.0031	0.0006	1.6	0.1	0.020	0.001
05/08/00 18:00	6.0	2.7	0.0	<0.2	0.0	0.003	0.001	0.041	0.000	0.0034	0.0005	1.1	0.1	0.016	0.001
05/08/00 20:00	8.0	2.6	0.0	<0.2	0.0	0.004	0.001	0.041	0.002	0.0029	0.0002	1.3	0.2	0.019	0.001
05/08/00 22:00	10.0	2.6	0.0	<0.2	0.1	0.004	0.001	0.046	0.000	0.0029	0.0004	1.9	0.2	0.021	0.002
05/09/00 00:00	12.0	2.6	0.0	<0.2	0.0	0.002	0.001	0.039	0.001	0.0027	0.0001	1.7	0.1	0.021	0.001
05/09/00 02:00	14.0	2.6	0.0	<0.2	0.1	<0.001	0.001	0.036	0.002	0.0029	0.0003	1.3	0.1	0.017	0.001
05/09/00 04:00	16.0	2.5	0.0	<0.2	0.0	<0.001	0.001	0.059	0.001	0.0040	0.0001	1.7	0.1	0.026	0.002
05/09/00 06:00	18.0	2.5	0.0	<0.2	0.1	0.005	0.004	0.048	0.000	0.0032	0.0002	2.1	0.0	0.023	0.003
05/09/00 08:00	20.0	2.6	0.0	<0.2	0.2	0.003	0.002	0.044	0.003	0.0029	0.0003	2.0	0.1	0.021	0.001
05/09/00 10:00	22.0	2.6	0.0	<0.2	0.1	0.003	0.001	0.043	0.001	0.0031	0.0004	3.1	1.1	0.026	0.005
05/09/00 12:00	24.0	2.5	0.0	<0.2	0.1	0.002	0.002	0.043	0.001	0.0030	0.0004	1.6	0.4	0.022	0.000
05/09/00 14:00	26.0	2.5	0.1	<0.2	0.1	0.003	0.002	0.045	0.002	0.0032	0.0003	1.3	0.1	0.021	0.002
05/09/00 16:00	28.0	2.5	0.0	<0.2	0.1	0.003	0.000	0.035	0.002	0.0027	0.0004	1.4	0.2	0.019	0.004
05/09/00 18:00	30.0	2.2	0.0	0.3	0.0	0.005	0.001	0.050	0.002	0.0037	0.0006	1.2	0.1	0.042	0.003
05/09/00 20:00	32.0	1.8	0.1	0.4	0.1	0.003	0.002	0.056	0.003	0.0044	0.0007	1.0	0.4	0.056	0.002
05/09/00 22:00	34.0	1.8	0.1	0.3	0.1	0.005	0.002	0.053	0.001	0.0040	0.0002	<0.7	0.3	0.063	0.007
05/10/00 00:00	36.0	1.6	0.0	0.3	0.1	0.004	0.001	0.056	0.000	0.0055	0.0004	1.5	0.4	0.080	0.001

Table A24. Bacterial cell counts and chlorophyll-a concentrations for samples collected on Sugar Creek during May 2000.

[hr, hours; µg/L, micrograms per liter; millions/mL, millions per milliliter; na, not available]

Date-Time	Time from start hr	Bacterial Cell Counts millions/mL	Chlorophyll-a concentrations µg/L
05/08/00 12:00	0.0	2.50	na
05/08/00 14:00	2.0	2.00	na
05/08/00 16:00	4.0	na	na
05/08/00 18:00	6.0	2.00	na
05/08/00 20:00	8.0	1.56	na
05/08/00 22:00	10.0	na	na
05/09/00 00:00	12.0	2.90	na
05/09/00 02:00	14.0	2.00	na
05/09/00 04:00	16.0	1.50	4.47
05/09/00 06:00	18.0	2.90	4.73
05/09/00 08:00	20.0	3.20	5.52
05/09/00 10:00	22.0	2.10	4.63
05/09/00 12:00	24.0	na	4.05
05/09/00 14:00	26.0	na	3.83
05/09/00 16:00	28.0	4.90	na
05/09/00 18:00	30.0	na	7.7
05/09/00 20:00	32.0	na	16.8
05/09/00 22:00	34.0	3.60	na
05/10/00 00:00	36.0	2.40	38.3

Table A25. Concentrations of nutrients, dissolved organic carbon (DOC) and suspended sediment for samples collected on the Iroquois River during September 2001.

[hr, hours; mg/L, milligrams per liter; mg N/L, milligrams per liter as nitrogen; mg P/L, milligrams per liter as phosphorus; mg C/L, milligrams per liter as carbon; Avg, average; SD, standard deviation; na, not available]

Date-Time	Time from start hr	NO ₃		NO ₂		NH ₄		Kjeldahl N mg N/L Value	PO ₄		P		DOC		Suspended Sediment mg/L Value
		Avg	SD	Avg	SD	Avg	SD		Avg	SD	Avg	SD	Avg	SD	
09/11/01 10:00	0.0	0.85	0.02	0.036	0.001	0.13	0.01	na	0.032	0.009	0.086	0.005	5.9	0.2	78
09/11/01 12:00	2.0	0.83	0.03	0.036	0.000	0.14	0.01	na	0.038	0.010	0.080	0.005	6.3	0.1	49
09/11/01 14:00	4.0	0.80	0.04	0.034	0.000	0.11	0.01	na	0.033	0.010	0.087	0.004	6.6	0.1	34
09/11/01 20:30	10.5	0.88	0.04	0.031	0.000	0.12	0.01	0.56	0.036	0.010	0.087	0.005	6.1	0.2	42
09/11/01 23:00	13.0	0.90	0.06	0.029	0.001	0.13	0.01	na	0.034	0.013	0.086	0.001	6.3	0.0	72
09/12/01 01:00	15.0	1.0	0.1	0.026	0.001	0.093	0.007	0.60	0.034	0.009	0.082	0.004	6.1	0.1	71
09/12/01 03:00	17.0	1.0	0.1	0.028	0.002	0.079	0.006	na	0.031	0.007	0.085	0.001	6.4	0.0	49
09/12/01 05:00	19.0	0.99	0.04	0.028	0.000	0.079	0.007	na	0.036	0.006	0.087	0.000	6.0	0.0	68
09/12/01 07:00	21.0	0.96	0.02	0.028	0.000	0.079	0.010	na	0.035	0.009	0.082	0.002	6.6	0.2	64
09/12/01 09:00	23.0	0.91	0.01	0.028	0.000	0.085	0.011	0.56	0.032	0.009	0.084	0.005	6.4	0.1	57
09/12/01 11:00	25.0	0.99	0.01	0.027	0.001	0.083	0.011	na	0.036	0.008	0.110	0.010	6.7	0.1	37
09/12/01 13:00	27.0	1.0	0.0	0.026	0.000	0.092	0.009	0.55	0.036	0.009	0.110	0.010	5.8	0.1	28
09/12/01 15:00	29.0	1.1	0.0	0.025	0.000	0.076	0.016	na	0.034	0.008	0.100	0.010	6.3	0.0	26
09/12/01 17:00	31.0	1.1	0.1	0.025	0.001	0.079	0.008	0.54	0.041	0.004	0.110	0.010	6.5	0.1	23
09/12/01 19:00	33.0	1.1	0.1	0.024	0.000	0.11	0.00	na	0.038	0.009	0.100	0.020	6.3	0.2	27
09/12/01 21:00	35.0	1.1	0.1	0.024	0.000	0.14	0.00	na	0.033	0.003	0.120	0.010	6.3	na	40
09/13/01 00:00	38.0	1.1	0.0	0.024	0.000	0.070	0.012	na	0.050	0.007	0.100	0.010	6.2	0.2	30
09/13/01 02:00	40.0	1.1	0.0	0.024	0.000	0.088	0.013	0.56	0.048	0.003	0.100	0.020	6.1	0.1	50
09/13/01 04:00	42.0	1.1	0.0	0.023	0.001	0.089	0.009	na	0.045	0.000	0.110	0.010	6.0	0.3	52
09/13/01 06:00	44.0	1.1	0.0	0.023	0.001	0.089	0.007	0.55	0.044	0.001	0.110	0.010	6.3	0.1	58
09/13/01 08:00	46.0	1.1	0.0	0.022	0.000	0.098	0.010	na	0.043	0.002	0.130	0.040	6.2	0.0	62
09/13/01 10:00	48.0	0.94	0.00	0.020	0.000	0.069	0.009	na	0.038	0.002	0.130	0.040	6.5	0.0	42
09/13/01 12:00	50.0	0.96	0.01	0.020	0.001	0.056	0.004	0.50	0.032	0.002	0.100	0.030	6.4	0.1	38
09/13/01 14:00	52.0	0.96	0.01	0.022	0.001	0.049	0.026	na	0.042	0.004	0.100	0.030	6.8	0.0	34
09/13/01 16:00	54.0	0.99	0.03	0.021	0.001	0.076	0.004	na	0.037	0.005	0.088	0.005	6.7	0.0	27
09/13/01 18:00	56.0	0.95	0.03	0.020	0.001	0.072	0.005	na	0.030	0.005	0.120	0.040	6.5	0.3	36
09/13/01 20:00	58.0	0.95	0.02	0.020	0.000	0.086	0.003	na	0.034	0.002	0.120	0.040	6.7	0.0	42
09/13/01 22:00	60.0	0.97	0.00	0.021	0.000	0.088	0.007	na	0.034	0.004	0.120	0.050	6.5	0.2	69
09/14/01 00:00	62.0	0.94	0.00	0.021	0.000	0.090	0.005	na	0.035	0.010	0.074	0.002	6.5	0.0	82
09/14/01 02:00	64.0	0.94	0.00	0.020	0.000	0.093	0.001	na	0.036	0.000	0.082	0.002	6.5	0.1	52
09/14/01 04:00	66.0	0.94	0.01	0.021	0.000	0.099	0.003	na	0.036	0.000	0.084	0.003	6.3	0.1	53
09/14/01 06:00	68.0	0.92	0.01	0.020	0.000	0.090	0.005	na	0.032	0.001	0.084	0.007	6.7	0.1	58
09/14/01 08:00	70.0	0.93	0.02	0.020	0.000	0.096	0.000	na	0.030	0.004	0.083	0.005	6.5	0.0	48

Table A26. Concentrations of major inorganic constituents for samples collected on the Iroquois River during September 2001.

[hr, hours; mg/L, milligrams per liter; mg C/L, milligrams per liter as carbon; µg/L, micrograms per liter; Avg, average; SD, standard deviation; na, not available]

Date-Time	Time from start hr	Cl		SO ₄		HCO ₃		CO ₃		Br		Na		K		Mg		Ca		SiO ₂	
		Avg	SD	Avg	SD	Value	mg C/L	Value	mg C/L	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/11/01 10:00	0.0	38	na	62	na	43.3	0.069	18	0	21	1	3.8	0.1	23	1	67	3	9.3	0.5	0.5	0.5
09/11/01 12:00	2.0	37	na	62	na	43.1	0.070	15	1	20	1	3.5	0.2	21	1	62	3	8.9	0.5	0.5	0.5
09/11/01 14:00	4.0	38	na	62	na	43.2	0.075	5.7	0.4	21	2	3.9	0.1	22	2	66	4	9.4	0.7	0.7	0.7
09/11/01 20:30	10.5	40	na	64	na	43.4	0.077	16	1	24	1	4.1	0.2	23	1	69	2	9.4	0.2	0.2	0.2
09/11/01 23:00	13.0	39	na	60	na	47.8	0.083	17	0	24	0	4.2	0.1	23	0	68	2	9.4	0.1	0.1	0.1
09/12/01 01:00	15.0	47	na	60	na	47.9	0.087	18	1	25	1	4.3	0.1	23	1	68	2	9.7	0.2	0.2	0.2
09/12/01 03:00	17.0	45	5	62	2	48.0	0.088	17	1	26	2	4.2	0.2	23	1	69	3	9.7	0.6	0.6	0.6
09/12/01 05:00	19.0	42	na	64	na	48.1	0.090	17	0	26	1	4.3	0.1	23	0	69	2	9.8	0.2	0.2	0.2
09/12/01 07:00	21.0	41	na	62	na	47.9	0.091	16	0	25	0	4.3	0.1	23	0	70	2	9.7	0.1	0.1	0.1
09/12/01 09:00	23.0	40	na	63	na	47.9	0.093	18	0	25	0	4.2	0.1	23	0	70	2	9.7	0.2	0.2	0.2
09/12/01 11:00	25.0	41	na	61	na	47.6	0.097	13	1	26	0	4.6	0.4	24	1	72	1	10	0	0	0
09/12/01 13:00	27.0	41	na	61	na	47.4	0.104	12	1	25	0	4.7	0.4	24	0	73	1	10	0	0	0
09/12/01 15:00	29.0	40	2	59	1	47.1	0.111	12	1	24	1	4.6	0.1	23	1	71	3	10	1	1	1
09/12/01 17:00	31.0	37	na	58	na	47.5	0.112	12	1	21	1	4.4	0.2	23	1	69	4	10	1	1	1
09/12/01 19:00	33.0	38	na	60	na	47.6	0.107	13	1	22	1	4.3	0.2	23	1	70	2	10	1	1	1
09/12/01 21:00	35.0	38	na	62	na	48.0	0.103	11	0	24	1	4.7	0.4	24	0	73	0	11	0	0	0
09/13/01 00:00	38.0	37	na	60	na	48.9	0.102	13	1	22	1	4.4	0.1	23	2	68	4	10	1	1	1
09/13/01 02:00	40.0	42	1	61	0	49.2	0.105	13	0	21	0	4.3	0.2	23	2	69	5	10	1	1	1
09/13/01 04:00	42.0	43	na	62	na	49.6	0.106	13	1	23	2	4.5	0.2	23	2	70	7	11	1	1	1
09/13/01 06:00	44.0	41	na	61	na	50.1	0.112	13	0	22	1	4.4	0.2	23	2	70	7	11	1	1	1
09/13/01 08:00	46.0	40	na	61	na	50.0	0.110	15	1	24	0	4.8	0.1	26	1	78	1	12	0	0	0
09/13/01 10:00	48.0	40	na	63	na	50.2	0.115	14	1	23	2	4.7	0.2	26	0	78	1	12	0	0	0
09/13/01 12:00	50.0	37	0	62	0	50.5	0.124	14	0	20	1	4.3	0.3	22	0	71	6	11	1	1	1
09/13/01 14:00	52.0	36	na	63	na	51.3	0.138	16	1	19	1	4.1	0.0	24	2	71	5	11	1	1	1
09/13/01 16:00	54.0	30	na	54	na	44.2	0.125	15	2	19	1	4.3	0.2	24	2	72	4	11	0	0	0
09/13/01 18:00	56.0	36	na	63	na	51.1	0.141	16	1	21	1	4.6	0.0	25	1	76	3	12	0	0	0
09/13/01 20:00	58.0	36	na	64	na	51.1	0.135	15	1	20	1	4.5	0.1	25	0	75	2	12	0	0	0
09/13/01 22:00	60.0	35	na	61	na	51.7	0.130	15	1	20	1	4.5	0.1	25	0	74	1	12	1	1	1
09/14/01 00:00	62.0	36	na	64	na	52.1	0.125	14	1	17	2	4.1	0.6	22	2	67	3	9.7	0.6	0.6	0.6
09/14/01 02:00	64.0	34	na	61	na	52.1	0.128	15	1	18	1	4.3	0.2	23	1	72	1	11	1	1	1
09/14/01 04:00	66.0	35	na	63	na	52.5	0.129	14	1	19	1	4.4	0.1	24	0	74	1	11	0	0	0
09/14/01 06:00	68.0	34	na	63	na	52.3	0.129	14	1	19	1	4.4	0.2	24	1	73	5	11	0	0	0
09/14/01 08:00	70.0	35	na	62	na	52.4	0.132	14	0	18	0	4.3	0.0	24	0	72	2	11	0	0	0

Table A27. Concentrations of trace elements for samples collected on the Iroquois River during September 2001.

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Al		As		B		Ba		Be		Bi		Cd		Ce		Co	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/11/01 10:00	0.0	1.1	0.2	1.9	0.0	98	4	65	3	< 0.03	0.02	0.006	0.001	< 0.007	0.002	0.017	0.001	< 0.002	0.026
09/11/01 12:00	2.0	1.2	0.0	1.8	0.0	88	3	64	0	< 0.03	0.02	0.002	0.001	< 0.007	0.008	0.022	0.001	< 0.002	0.034
09/11/01 14:00	4.0	0.5	0.1	0.59	0.03	93	5	22	1	< 0.03	0.01	0.002	0.000	< 0.007	0.004	0.0072	0.0003	< 0.002	0.010
09/11/01 20:30	10.5	1.2	0.1	1.9	0.0	99	5	68	2	< 0.03	0.02	< 0.001	0.001	< 0.007	0.008	0.021	0.001	< 0.002	0.025
09/11/01 23:00	13.0	1.4	0.1	1.9	0.0	100	4	67	4	< 0.03	0.02	< 0.001	0.001	< 0.007	0.003	0.023	0.001	< 0.002	0.016
09/12/01 01:00	15.0	1.0	0.1	1.9	0.0	94	3	70	0	< 0.03	0.02	< 0.001	0.000	< 0.007	0.002	0.024	0.001	< 0.002	0.019
09/12/01 03:00	17.0	0.8	0.2	1.9	0.1	93	3	69	2	< 0.03	0.02	< 0.001	0.001	< 0.007	0.003	0.022	0.000	< 0.002	0.026
09/12/01 05:00	19.0	0.9	0.1	2.0	0.0	96	2	68	3	< 0.03	0.03	< 0.001	0.001	< 0.007	0.004	0.026	0.001	< 0.002	0.009
09/12/01 07:00	21.0	1.2	0.2	1.9	0.0	97	3	68	4	< 0.03	0.02	< 0.001	0.001	< 0.007	0.001	0.024	0.001	< 0.002	0.020
09/12/01 09:00	23.0	0.9	0.1	2.0	0.0	97	4	69	1	< 0.03	0.00	< 0.001	0.001	< 0.007	0.003	0.019	0.000	< 0.002	0.017
09/12/01 11:00	25.0	1.2	0.3	2.0	0.0	96	5	65	0	< 0.05	0.06	0.002	0.000	< 0.006	0.005	0.022	0.001	< 0.005	0.005
09/12/01 13:00	27.0	1.0	0.1	1.9	0.1	99	4	67	2	< 0.05	0.05	< 0.002	0.000	< 0.006	0.007	0.026	0.002	< 0.005	0.012
09/12/01 15:00	29.0	1.0	0.0	2.0	0.1	96	8	66	4	< 0.05	0.06	< 0.002	0.001	< 0.006	0.007	0.028	0.000	< 0.005	0.016
09/12/01 17:00	31.0	1.2	0.2	2.0	0.0	95	8	68	4	< 0.05	0.02	< 0.002	0.001	< 0.006	0.003	0.021	0.000	< 0.005	0.013
09/12/01 19:00	33.0	1.2	0.1	2.0	0.1	95	6	71	3	< 0.05	0.05	< 0.002	0.001	< 0.006	0.005	0.025	0.001	< 0.005	0.013
09/12/01 21:00	35.0	1.1	0.1	2.0	0.0	100	10	70	4	< 0.05	0.05	< 0.002	0.000	< 0.006	0.003	0.022	0.000	0.011	0.016
09/13/01 00:00	38.0	1.1	0.0	1.9	0.1	91	6	68	4	< 0.05	0.04	< 0.002	0.001	< 0.006	0.003	0.023	0.001	< 0.005	0.002
09/13/01 02:00	40.0	1.1	0.2	2.0	0.0	93	8	70	3	< 0.05	0.03	< 0.002	0.000	< 0.006	0.004	0.027	0.000	< 0.005	0.004
09/13/01 04:00	42.0	1.4	0.1	1.9	0.0	94	11	71	3	< 0.05	0.04	0.002	0.000	< 0.006	0.003	0.022	0.000	< 0.005	0.019
09/13/01 06:00	44.0	1.1	0.0	2.0	0.1	94	10	70	4	< 0.05	0.02	< 0.002	0.000	< 0.006	0.004	0.022	0.001	< 0.005	0.010
09/13/01 08:00	46.0	1.00	0.04	1.8	0.0	110	0	67	3	< 0.02	0.00	< 0.002	0.000	< 0.002	0.003	0.022	0.001	0.015	0.019
09/13/01 10:00	48.0	1.2	0.2	1.9	0.0	110	0	68	4	< 0.02	0.00	< 0.002	0.001	< 0.002	0.005	0.024	0.000	0.011	0.013
09/13/01 12:00	50.0	1.1	0.1	1.9	0.1	94	9	68	2	< 0.02	0.00	< 0.002	0.001	< 0.002	0.003	0.023	0.000	0.017	0.003
09/13/01 14:00	52.0	1.2	0.1	1.9	0.0	96	5	68	1	< 0.02	0.00	< 0.002	0.002	< 0.002	0.002	0.024	0.001	0.017	0.014
09/13/01 16:00	54.0	1.5	0.2	1.9	0.0	98	3	69	3	< 0.02	0.00	< 0.002	0.001	< 0.002	0.002	0.024	0.002	0.006	0.010
09/13/01 18:00	56.0	1.2	0.1	1.9	0.1	100	0	70	2	< 0.02	0.00	< 0.002	0.001	< 0.002	0.004	0.023	0.001	0.006	0.020
09/13/01 20:00	58.0	1.0	0.1	1.9	0.0	100	0	69	2	< 0.02	0.00	< 0.002	0.001	< 0.002	0.001	0.022	0.001	0.011	0.013
09/13/01 22:00	60.0	0.98	0.08	1.9	0.0	100	10	70	2	< 0.02	0.01	< 0.002	0.000	< 0.002	0.002	0.024	0.002	0.006	0.023
09/14/01 00:00	62.0	1.0	0.1	1.8	0.0	85	8	70	1	< 0.02	0.00	< 0.002	0.001	< 0.002	0.002	0.022	0.000	0.013	0.011
09/14/01 02:00	64.0	0.90	0.08	2.0	0.0	91	3	69	3	< 0.02	0.00	< 0.002	0.001	< 0.002	0.001	0.023	0.001	0.006	0.019
09/14/01 04:00	66.0	1.2	0.2	1.9	0.0	91	2	71	1	< 0.02	0.00	< 0.002	0.002	< 0.002	0.004	0.023	0.000	0.012	0.027
09/14/01 06:00	68.0	1.0	0.1	1.9	0.0	90	3	72	2	< 0.02	0.00	< 0.002	0.001	< 0.002	0.002	0.026	0.000	< 0.002	0.019
09/14/01 08:00	70.0	1.1	0.1	1.9	0.1	90	1	70	1	< 0.02	0.01	< 0.002	0.000	< 0.002	0.006	0.023	0.000	0.007	0.008

Table A27. Concentrations of trace elements for samples collected on the Iroquois River during September 2001 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Cr		Cs		Cu		Dy		Er		Eu		Fe	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/11/01 10:00	0.0	<0.04	0.02	0.009	0.004	1.2	0.0	0.0032	0.0009	0.002	0.000	<0.0004	0.0000	9	2
09/11/01 12:00	2.0	<0.04	0.02	<0.009	0.009	1.2	0.0	0.0043	0.0002	0.002	0.001	<0.0004	0.0005	10	2
09/11/01 14:00	4.0	<0.04	0.01	0.089	0.003	0.69	0.02	0.0017	0.0005	<0.001	0.001	<0.0004	0.0005	8	2
09/11/01 20:30	10.5	<0.04	0.02	<0.009	0.003	1.0	0.1	0.0041	0.0009	0.003	0.001	<0.0004	0.0003	9	1
09/11/01 23:00	13.0	<0.04	0.02	0.012	0.004	1.6	0.1	0.0044	0.0006	0.004	0.001	<0.0004	0.0013	11	1
09/12/01 01:00	15.0	<0.04	0.04	<0.009	0.003	1.0	0.0	0.0049	0.0010	0.004	0.001	<0.0004	0.0002	12	2
09/12/01 03:00	17.0	<0.04	0.03	<0.009	0.006	1.3	0.0	0.0046	0.0005	0.004	0.000	<0.0004	0.0004	9	1
09/12/01 05:00	19.0	<0.04	0.02	<0.009	0.005	1.2	0.0	0.0042	0.0004	0.005	0.001	<0.0004	0.0006	14	1
09/12/01 07:00	21.0	<0.04	0.02	<0.009	0.005	2.2	0.1	0.0053	0.0002	0.005	0.000	<0.0004	0.0002	12	2
09/12/01 09:00	23.0	<0.04	0.03	<0.009	0.004	1.1	0.0	0.0050	0.0006	0.005	0.001	<0.0004	0.0008	7	1
09/12/01 11:00	25.0	<0.3	0.2	<0.01	0.01	2.7	0.1	0.0043	0.0001	0.005	0.000	0.0011	0.0012	14	2
09/12/01 13:00	27.0	<0.3	0.1	<0.01	0.01	3.2	0.1	0.0042	0.0006	0.004	0.001	0.0014	0.0016	14	0
09/12/01 15:00	29.0	<0.3	0.0	<0.01	0.01	2.1	0.1	0.0049	0.0004	0.004	0.001	<0.0008	0.0015	12	1
09/12/01 17:00	31.0	<0.3	0.0	<0.01	0.01	1.3	0.0	0.0043	0.0009	0.004	0.000	0.0009	0.0015	12	1
09/12/01 19:00	33.0	<0.3	0.1	<0.01	0.00	1.4	0.0	0.0045	0.0003	0.005	0.001	0.0010	0.0013	12	1
09/12/01 21:00	35.0	<0.3	0.1	<0.01	0.01	1.2	0.1	0.0052	0.0003	0.005	0.000	<0.0008	0.0015	13	1
09/13/01 00:00	38.0	<0.3	0.2	<0.01	0.00	1.1	0.0	0.0046	0.0006	0.004	0.001	<0.0008	0.0014	11	1
09/13/01 02:00	40.0	<0.3	0.1	0.06	0.00	1.1	0.0	0.0046	0.0007	0.006	0.001	<0.0008	0.0009	13	1
09/13/01 04:00	42.0	<0.3	0.3	0.01	0.01	1.1	0.0	0.0052	0.0009	0.004	0.001	<0.0008	0.0010	13	0
09/13/01 06:00	44.0	<0.3	0.1	0.10	0.01	1.3	0.0	0.0038	0.0002	0.005	0.001	<0.0008	0.0004	13	2
09/13/01 08:00	46.0	<0.1	0.1	0.020	0.019	0.88	0.07	0.0049	0.0009	0.0039	0.0005	0.0005	0.0016	17	2
09/13/01 10:00	48.0	<0.1	0.0	0.003	0.003	0.89	0.06	0.0048	0.0007	0.0044	0.0003	0.0007	0.0012	14	0
09/13/01 12:00	50.0	<0.1	0.1	<0.003	0.001	1.3	0.1	0.0043	0.0013	0.0045	0.0003	0.0006	0.0001	9.6	1.3
09/13/01 14:00	52.0	<0.1	0.0	<0.003	0.001	1.4	0.1	0.0049	0.0006	0.0044	0.0003	<0.0002	0.0008	13	2
09/13/01 16:00	54.0	<0.1	0.1	0.052	0.037	0.93	0.07	0.0043	0.0004	0.0045	0.0004	<0.0002	0.0004	11	1
09/13/01 18:00	56.0	<0.1	0.1	<0.003	0.001	0.81	0.03	0.0050	0.0008	0.0042	0.0002	0.0004	0.0004	12	1
09/13/01 20:00	58.0	<0.1	0.1	<0.003	0.000	0.83	0.07	0.0040	0.0006	0.0030	0.0002	<0.0002	0.0003	14	2
09/13/01 22:00	60.0	<0.1	0.1	0.010	0.003	0.91	0.06	0.0048	0.0004	0.0044	0.0002	<0.0002	0.0008	11	0
09/14/01 00:00	62.0	<0.1	0.0	0.005	0.002	0.79	0.03	0.0050	0.0003	0.0042	0.0007	<0.0002	0.0008	12	3
09/14/01 02:00	64.0	<0.1	0.0	<0.003	0.003	0.79	0.06	0.0041	0.0002	0.0042	0.0003	0.0005	0.0004	10	1
09/14/01 04:00	66.0	<0.1	0.1	0.007	0.006	0.75	0.04	0.0042	0.0002	0.0048	0.0006	0.0004	0.0008	12	1
09/14/01 06:00	68.0	<0.1	0.1	0.013	0.005	0.86	0.04	0.0050	0.0016	0.0047	0.0006	<0.0002	0.0007	12	1
09/14/01 08:00	70.0	<0.1	0.0	0.004	0.007	0.88	0.05	0.0034	0.0003	0.0043	0.0005	0.0006	0.0003	11	1

Table A27. Concentrations of trace elements for samples collected on the Iroquois River during September 2001 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Gd µg/L		Hg ng/L		Ho µg/L		La µg/L		Li µg/L		Lu µg/L		Mn µg/L		Mo µg/L	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/11/01 10:00	0.0	0.0058	0.0007	9.3	0.2	0.0010	0.0002	0.012	0.002	5.6	0.0	0.0009	0.0002	88	3	4.2	0.1
09/11/01 12:00	2.0	0.0068	0.0006	9.4	0.2	0.0008	0.0002	0.013	0.000	5.2	0.0	0.0011	0.0002	93	0	3.9	0.1
09/11/01 14:00	4.0	0.0022	0.0007	8.2	0.1	0.0003	0.0001	0.0049	0.0003	1.9	0.1	0.0003	0.0003	31	1	1.4	0.0
09/11/01 20:30	10.5	0.0056	0.0003	4.8	0.2	0.0010	0.0002	0.013	0.001	5.6	0.1	0.0011	0.0000	89	3	5.0	0.0
09/11/01 23:00	13.0	0.0063	0.0010	5.7	0.2	0.0012	0.0003	0.014	0.001	5.5	0.0	0.0013	0.0004	95	3	5.0	0.0
09/12/01 01:00	15.0	0.012	0.000	4.6	0.2	0.0012	0.0003	0.014	0.001	5.4	0.1	0.0015	0.0001	94	2	5.0	0.0
09/12/01 03:00	17.0	0.011	0.001	2.3	0.2	0.0011	0.0003	0.013	0.001	5.5	0.1	0.0016	0.0002	88	1	5.0	0.0
09/12/01 05:00	19.0	0.010	0.001	5.8	0.2	0.0011	0.0002	0.017	0.000	5.6	0.1	0.0014	0.0001	87	2	5.2	0.0
09/12/01 07:00	21.0	0.0084	0.0011	2.8	0.1	0.0014	0.0000	0.015	0.001	5.4	0.1	0.0011	0.0000	80	1	5.0	0.0
09/12/01 09:00	23.0	0.0068	0.0004	2.6	0.2	0.0013	0.0001	0.013	0.000	5.4	0.0	0.0012	0.0002	75	1	5.0	0.0
09/12/01 11:00	25.0	0.011	0.000	2.7	0.2	0.0011	0.0003	0.015	0.001	5.5	0.2	0.0013	0.0000	76	2	4.9	0.1
09/12/01 13:00	27.0	0.008	0.000	6.8	0.1	0.0013	0.0005	0.016	0.001	5.4	0.0	0.0014	0.0004	80	2	4.7	0.1
09/12/01 15:00	29.0	0.010	0.001	2.4	0.2	0.0011	0.0002	0.015	0.000	5.4	0.3	0.0012	0.0000	80	3	4.7	0.2
09/12/01 17:00	31.0	0.008	0.001	1.7	0.2	0.0012	0.0006	0.014	0.001	5.3	0.2	0.0015	0.0002	79	1	4.6	0.1
09/12/01 19:00	33.0	0.009	0.001	1.3	0.1	0.0011	0.0004	0.015	0.001	5.4	0.3	0.0015	0.0003	78	2	4.8	0.0
09/12/01 21:00	35.0	0.009	0.001	1.5	0.1	0.0010	0.0003	0.014	0.001	5.5	0.1	0.0011	0.0003	82	3	4.6	0.1
09/13/01 00:00	38.0	0.008	0.000	2.0	0.2	0.0011	0.0002	0.014	0.001	5.2	0.3	0.0015	0.0002	69	2	4.6	0.1
09/13/01 02:00	40.0	0.008	0.000	1.0	0.1	0.0011	0.0004	0.017	0.001	5.2	0.3	0.0015	0.0001	72	1	4.7	0.1
09/13/01 04:00	42.0	0.009	0.001	0.7	0.1	0.0011	0.0004	0.014	0.001	5.5	0.3	0.0013	0.0003	76	1	4.7	0.0
09/13/01 06:00	44.0	0.009	0.001	2.0	0.1	0.0011	0.0001	0.016	0.001	5.4	0.3	0.0019	0.0003	80	2	4.6	0.1
09/13/01 08:00	46.0	0.0073	0.0004	0.6	0.1	0.0011	0.0001	0.014	0.001	5.1	0.7	0.0013	0.0001	85	0	4.4	0.0
09/13/01 10:00	48.0	0.0064	0.0009	0.7	0.1	0.0011	0.0001	0.014	0.000	5.1	0.6	0.0016	0.0000	84	1	4.5	0.1
09/13/01 12:00	50.0	0.0074	0.0015	1.2	0.1	0.0008	0.0000	0.014	0.001	5.3	0.7	0.0011	0.0001	87	1	4.4	0.0
09/13/01 14:00	52.0	0.0069	0.0004	1.3	0.1	0.0009	0.0001	0.014	0.000	5.5	0.8	0.0014	0.0001	86	1	4.4	0.1
09/13/01 16:00	54.0	0.0062	0.0010	1.0	0.2	0.0013	0.0001	0.015	0.001	5.4	0.6	0.0012	0.0003	84	0	4.5	0.1
09/13/01 18:00	56.0	0.0070	0.0011	0.8	0.0	0.0011	0.0002	0.015	0.001	5.5	0.6	0.0012	0.0002	91	1	4.4	0.0
09/13/01 20:00	58.0	0.0061	0.0002	1.3	0.2	0.0012	0.0001	0.015	0.001	5.5	0.5	0.0012	0.0001	80	1	4.5	0.1
09/13/01 22:00	60.0	0.0060	0.0001	1.1	0.1	0.0011	0.0000	0.014	0.001	5.3	0.4	0.0012	0.0002	89	1	4.5	0.1
09/14/01 00:00	62.0	0.0067	0.0007	1.0	0.1	0.0011	0.0001	0.016	0.000	5.2	0.4	0.0013	0.0003	95	1	4.6	0.0
09/14/01 02:00	64.0	0.0079	0.0006	1.8	0.2	0.0010	0.0001	0.014	0.001	5.4	0.4	0.0013	0.0002	93	0	4.7	0.1
09/14/01 04:00	66.0	0.0066	0.0005	0.7	0.1	0.0010	0.0002	0.015	0.000	5.3	0.4	0.0015	0.0001	98	0	4.6	0.1
09/14/01 06:00	68.0	0.0077	0.0004	0.8	0.1	0.0012	0.0002	0.016	0.000	5.3	0.5	0.0014	0.0000	100	0	4.6	0.0
09/14/01 08:00	70.0	0.0076	0.0008	1.1	0.2	0.0009	0.0000	0.015	0.000	5.3	0.4	0.0013	0.0002	100	0	4.6	0.0

Table A27. Concentrations of trace elements for samples collected on the Iroquois River during September 2001 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Nd		Ni		Pb		Pr		Rb		Re		Sb		Se	
		Avg	SD	µg/L	SD	Avg	SD	µg/L	SD	Avg	SD	µg/L	SD	Avg	SD	µg/L	SD
09/11/01 10:00	0.0	0.013	0.000	1.6	0.6	0.09	0.02	0.0028	0.0004	1.5	0.0	0.012	0.000	0.18	0.00	0.5	0.2
09/11/01 12:00	2.0	0.017	0.001	1.5	0.7	0.10	0.03	0.0034	0.0001	1.5	0.0	0.011	0.001	0.16	0.00	0.4	0.2
09/11/01 14:00	4.0	0.005	0.001	1.6	0.4	0.06	0.01	0.0013	0.0001	0.50	0.01	0.0043	0.0005	0.057	0.003	<0.3	0.2
09/11/01 20:30	10.5	0.016	0.001	1.7	0.4	0.09	0.01	0.0035	0.0002	1.4	0.0	0.013	0.000	0.18	0.00	0.5	0.1
09/11/01 23:00	13.0	0.015	0.001	1.9	0.5	0.17	0.06	0.0036	0.0002	1.4	0.0	0.013	0.001	0.18	0.00	0.5	0.1
09/12/01 01:00	15.0	0.016	0.000	1.6	0.1	0.12	0.03	0.0040	0.0003	1.4	0.0	0.014	0.000	0.16	0.01	0.5	0.3
09/12/01 03:00	17.0	0.017	0.001	1.9	0.3	0.11	0.03	0.0035	0.0003	1.3	0.0	0.013	0.000	0.17	0.01	0.6	0.0
09/12/01 05:00	19.0	0.019	0.002	1.9	0.1	0.11	0.02	0.0041	0.0003	1.4	0.0	0.013	0.000	0.17	0.00	0.6	0.0
09/12/01 07:00	21.0	0.019	0.000	2.0	0.1	0.12	0.02	0.0041	0.0004	1.4	0.0	0.013	0.000	0.17	0.00	0.5	0.1
09/12/01 09:00	23.0	0.017	0.002	1.9	0.2	0.10	0.01	0.0031	0.0002	1.4	0.0	0.014	0.000	0.17	0.00	0.5	0.2
09/12/01 11:00	25.0	0.017	0.001	1.4	0.3	0.04	0.02	0.0036	0.0002	1.4	0.0	0.013	0.001	0.17	0.00	<0.8	0.9
09/12/01 13:00	27.0	0.019	0.001	1.7	0.1	0.04	0.01	0.0041	0.0004	1.3	0.0	0.014	0.001	0.17	0.01	<0.8	0.6
09/12/01 15:00	29.0	0.019	0.001	1.7	0.1	0.05	0.02	0.0040	0.0001	1.3	0.0	0.013	0.001	0.16	0.00	<0.8	0.4
09/12/01 17:00	31.0	0.017	0.000	1.5	0.1	0.05	0.02	0.0040	0.0001	1.4	0.0	0.013	0.001	0.17	0.00	<0.8	0.1
09/12/01 19:00	33.0	0.018	0.001	1.4	0.1	0.04	0.01	0.0039	0.0001	1.4	0.0	0.014	0.001	0.18	0.00	<0.8	0.6
09/12/01 21:00	35.0	0.016	0.001	1.5	0.1	0.03	0.00	0.0037	0.0001	1.4	0.1	0.014	0.001	0.16	0.00	<0.8	1.0
09/13/01 00:00	38.0	0.017	0.000	1.4	0.2	0.03	0.00	0.0035	0.0002	1.3	0.0	0.013	0.001	0.17	0.01	0.9	0.7
09/13/01 02:00	40.0	0.022	0.001	1.1	0.1	0.06	0.00	0.0048	0.0001	1.3	0.0	0.012	0.001	0.17	0.01	1.0	0.4
09/13/01 04:00	42.0	0.018	0.002	1.4	0.2	0.05	0.03	0.0036	0.0004	1.3	0.0	0.014	0.001	0.17	0.01	1.3	0.7
09/13/01 06:00	44.0	0.018	0.001	1.2	0.3	0.09	0.02	0.0042	0.0001	1.3	0.0	0.014	0.001	0.17	0.00	1.3	0.5
09/13/01 08:00	46.0	0.017	0.001	1.6	0.1	0.052	0.008	0.0037	0.0002	1.4	0.0	0.013	0.000	0.17	0.00	0.34	0.07
09/13/01 10:00	48.0	0.019	0.002	1.5	0.1	0.048	0.000	0.0037	0.0003	1.4	0.0	0.015	0.001	0.16	0.01	0.39	0.16
09/13/01 12:00	50.0	0.017	0.000	1.3	0.2	0.041	0.009	0.0036	0.0002	1.4	0.0	0.015	0.001	0.16	0.01	0.27	0.08
09/13/01 14:00	52.0	0.018	0.002	1.6	0.0	0.061	0.005	0.0036	0.0001	1.4	0.0	0.013	0.001	0.16	0.00	0.35	0.12
09/13/01 16:00	54.0	0.019	0.001	1.4	0.1	0.057	0.001	0.0037	0.0000	1.4	0.0	0.014	0.001	0.16	0.00	0.36	0.13
09/13/01 18:00	56.0	0.019	0.001	1.4	0.3	0.043	0.007	0.0036	0.0001	1.4	0.0	0.015	0.001	0.16	0.00	0.32	0.06
09/13/01 20:00	58.0	0.017	0.002	1.4	0.3	0.048	0.006	0.0037	0.0001	1.4	0.0	0.014	0.001	0.16	0.01	0.32	0.10
09/13/01 22:00	60.0	0.018	0.000	1.3	0.1	0.049	0.002	0.0035	0.0000	1.4	0.0	0.014	0.000	0.17	0.00	0.34	0.09
09/14/01 00:00	62.0	0.017	0.001	1.3	0.2	0.039	0.007	0.0038	0.0002	1.4	0.0	0.015	0.001	0.16	0.00	0.20	0.03
09/14/01 02:00	64.0	0.019	0.001	1.7	0.2	0.040	0.000	0.0038	0.0002	1.4	0.0	0.014	0.000	0.16	0.00	0.25	0.14
09/14/01 04:00	66.0	0.017	0.001	1.4	0.1	0.057	0.006	0.0034	0.0001	1.4	0.0	0.014	0.001	0.16	0.01	0.25	0.01
09/14/01 06:00	68.0	0.018	0.002	1.5	0.1	0.055	0.003	0.0041	0.0002	1.4	0.0	0.014	0.000	0.16	0.00	0.30	0.02
09/14/01 08:00	70.0	0.016	0.001	1.6	0.1	0.039	0.007	0.0037	0.0004	1.3	0.0	0.014	0.001	0.15	0.00	0.34	0.05

Table A27. Concentrations of trace elements for samples collected on the Iroquois River during September 2001 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Sm		Sr		Ta		Tb		Te		Th		Ti		Tl	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/11/01 10:00	0.0	0.003	0.001	290	0	< 0.002	0.001	0.0007	0.0002	0.02	0.02	0.0009	0.0002	< 0.2	0.2	0.006	0.002
09/11/01 12:00	2.0	0.004	0.000	270	0	< 0.002	0.001	0.0006	0.0001	0.02	0.01	0.0013	0.0003	< 0.2	0.1	0.007	0.003
09/11/01 14:00	4.0	0.002	0.001	96	2	< 0.002	0.000	0.0003	0.0001	< 0.02	0.02	0.0005	0.0003	< 0.2	0.0	0.005	0.002
09/11/01 20:30	10.5	0.004	0.001	290	0	< 0.002	0.000	0.0007	0.0002	< 0.02	0.01	0.0011	0.0001	< 0.2	0.2	0.005	0.001
09/11/01 23:00	13.0	0.005	0.001	280	0	< 0.002	0.001	0.0009	0.0001	< 0.02	0.02	0.0013	0.0002	< 0.2	0.2	0.007	0.002
09/12/01 01:00	15.0	0.005	0.002	280	0	< 0.002	0.000	0.0008	0.0001	< 0.02	0.01	0.0012	0.0002	< 0.2	0.2	0.005	0.001
09/12/01 03:00	17.0	0.006	0.000	280	0	< 0.002	0.000	0.0007	0.0001	< 0.02	0.02	0.0009	0.0002	< 0.2	0.1	0.005	0.002
09/12/01 05:00	19.0	0.004	0.001	290	0	< 0.002	0.000	0.0008	0.0002	0.03	0.01	0.0013	0.0001	< 0.2	0.0	0.005	0.002
09/12/01 07:00	21.0	0.005	0.001	280	0	< 0.002	0.000	0.0009	0.0002	< 0.02	0.01	0.0013	0.0002	< 0.2	0.0	0.006	0.002
09/12/01 09:00	23.0	0.006	0.000	280	0	< 0.002	0.000	0.0008	0.0000	< 0.02	0.01	0.0010	0.0004	< 0.2	0.1	0.006	0.000
09/12/01 11:00	25.0	0.004	0.001	280	0	< 0.006	0.000	0.0005	0.0001	< 0.04	0.05	0.0011	0.0002	< 0.3	0.1	0.004	0.003
09/12/01 13:00	27.0	0.005	0.001	270	10	< 0.006	0.001	0.0005	0.0002	< 0.04	0.04	0.0013	0.0003	< 0.3	0.5	< 0.004	0.002
09/12/01 15:00	29.0	0.005	0.001	280	10	< 0.006	0.001	0.0006	0.0001	< 0.04	0.04	0.0014	0.0003	< 0.3	0.5	< 0.004	0.001
09/12/01 17:00	31.0	0.004	0.002	270	0	< 0.006	0.002	0.0006	0.0002	< 0.04	0.03	0.0010	0.0001	< 0.3	0.5	< 0.004	0.001
09/12/01 19:00	33.0	0.004	0.001	280	10	< 0.006	0.001	0.0006	0.0001	< 0.04	0.03	0.0011	0.0004	< 0.3	0.5	0.004	0.001
09/12/01 21:00	35.0	0.004	0.001	280	0	< 0.006	0.004	0.0005	0.0000	< 0.04	0.05	0.0008	0.0003	< 0.3	0.5	< 0.004	0.004
09/13/01 00:00	38.0	0.003	0.000	270	0	< 0.006	0.002	0.0005	0.0002	< 0.04	0.01	0.0009	0.0003	< 0.3	0.5	< 0.004	0.004
09/13/01 02:00	40.0	0.007	0.001	280	0	< 0.006	0.003	0.0009	0.0001	< 0.04	0.02	0.0010	0.0001	< 0.3	0.4	0.005	0.004
09/13/01 04:00	42.0	0.004	0.002	280	0	< 0.006	0.003	0.0008	0.0001	< 0.04	0.05	0.0009	0.0006	< 0.3	0.1	0.008	0.001
09/13/01 06:00	44.0	0.005	0.000	280	0	< 0.006	0.003	0.0008	0.0000	< 0.04	0.02	0.0012	0.0003	< 0.3	0.3	0.005	0.003
09/13/01 08:00	46.0	0.0040	0.0008	280	0	< 0.003	0.001	0.0008	0.0001	< 0.01	0.01	0.0012	0.0003	< 0.3	0.1	0.006	0.004
09/13/01 10:00	48.0	0.0042	0.0002	290	0	< 0.003	0.001	0.0006	0.0001	0.02	0.01	0.0016	0.0002	< 0.3	0.0	0.011	0.009
09/13/01 12:00	50.0	0.0041	0.0005	290	0	< 0.003	0.001	0.0006	0.0001	< 0.01	0.00	0.0010	0.0000	< 0.3	0.3	< 0.004	0.001
09/13/01 14:00	52.0	0.0047	0.0004	300	0	< 0.003	0.001	0.0008	0.0001	0.02	0.01	0.0015	0.0004	< 0.3	0.5	0.006	0.003
09/13/01 16:00	54.0	0.0042	0.0009	300	0	< 0.003	0.000	0.0004	0.0001	0.01	0.01	0.0015	0.0004	< 0.3	0.6	0.005	0.001
09/13/01 18:00	56.0	0.0042	0.0001	310	0	< 0.003	0.003	0.0007	0.0001	< 0.01	0.00	0.0013	0.0002	< 0.3	0.1	0.007	0.000
09/13/01 20:00	58.0	0.0050	0.0003	300	0	< 0.003	0.001	0.0007	0.0001	0.02	0.01	0.0010	0.0001	< 0.3	0.1	0.004	0.001
09/13/01 22:00	60.0	0.0040	0.0006	310	0	< 0.003	0.001	0.0007	0.0001	0.01	0.00	0.0010	0.0003	< 0.3	0.2	0.006	0.003
09/14/01 00:00	62.0	0.0035	0.0008	300	0	< 0.003	0.001	0.0007	0.0001	< 0.01	0.01	0.0013	0.0003	< 0.3	0.5	0.005	0.005
09/14/01 02:00	64.0	0.0041	0.0004	310	0	< 0.003	0.001	0.0007	0.0002	0.01	0.01	0.0014	0.0003	< 0.3	0.5	0.004	0.000
09/14/01 04:00	66.0	0.0041	0.0010	310	0	< 0.003	0.001	0.0007	0.0001	0.02	0.01	0.0012	0.0001	< 0.3	0.6	0.005	0.001
09/14/01 06:00	68.0	0.0048	0.0003	310	0	< 0.003	0.001	0.0008	0.0000	< 0.01	0.00	0.0013	0.0002	< 0.3	0.4	0.005	0.002
09/14/01 08:00	70.0	0.0034	0.0002	310	0	< 0.003	0.001	0.0007	0.0001	< 0.01	0.01	0.0012	0.0002	< 0.3	0.4	0.004	0.004

Table A27. Concentrations of trace elements for samples collected on the Iroquois River during September 2001 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Tm		U		V		W		Y		Yb		Zn		Zr	
		Avg	SD	µg/L	Avg	SD	µg/L	Avg	SD	µg/L	SD	Avg	SD	µg/L	SD	Avg	SD
09/11/01 10:00	0.0	0.0006	0.0002	0.97	0.05	1.1	0.0	0.013	0.000	0.035	0.001	0.0039	0.0005	1.5	0.3	0.060	0.001
09/11/01 12:00	2.0	0.0006	0.0000	0.94	0.03	1.0	0.0	0.008	0.003	0.034	0.001	0.0047	0.0004	1.1	0.2	0.051	0.001
09/11/01 14:00	4.0	< 0.0003	0.0002	0.33	0.01	0.4	0.0	< 0.003	0.002	0.014	0.001	0.0015	0.0001	4.2	0.1	0.029	0.003
09/11/01 20:30	10.5	0.0007	0.0001	1.1	0.1	1.1	0.0	0.009	0.001	0.036	0.001	0.0050	0.0005	1.1	0.1	0.058	0.002
09/11/01 23:00	13.0	0.0009	0.0000	1.1	0.0	1.1	0.0	0.008	0.001	0.039	0.000	0.0059	0.0011	2.4	0.9	0.052	0.003
09/12/01 01:00	15.0	0.0008	0.0001	1.1	0.0	1.1	0.0	0.007	0.002	0.039	0.002	0.0065	0.0000	1.0	0.1	0.049	0.001
09/12/01 03:00	17.0	0.0007	0.0000	1.1	0.0	1.1	0.0	0.008	0.002	0.039	0.001	0.0072	0.0004	1.4	0.2	0.051	0.002
09/12/01 05:00	19.0	0.0006	0.0000	1.1	0.0	1.1	0.0	0.007	0.002	0.042	0.001	0.0065	0.0005	1.6	0.4	0.052	0.003
09/12/01 07:00	21.0	0.0008	0.0000	1.1	0.0	1.0	0.0	0.007	0.002	0.041	0.000	0.0062	0.0002	1.8	0.6	0.083	0.004
09/12/01 09:00	23.0	0.0006	0.0003	1.1	0.0	1.1	0.0	0.009	0.001	0.040	0.001	0.0065	0.0006	1.1	0.2	0.052	0.004
09/12/01 11:00	25.0	0.0008	0.0002	1.1	0.0	1.2	0.1	0.006	0.005	0.040	0.002	0.007	0.001	1.6	0.3	0.047	0.003
09/12/01 13:00	27.0	0.0007	0.0002	1.1	0.0	1.2	0.1	0.009	0.002	0.040	0.002	0.007	0.001	1.9	0.1	0.057	0.003
09/12/01 15:00	29.0	0.0007	0.0000	1.1	0.1	1.2	0.1	0.006	0.004	0.041	0.001	0.006	0.000	1.6	0.4	0.061	0.001
09/12/01 17:00	31.0	0.0006	0.0001	1.1	0.1	1.2	0.0	0.005	0.003	0.038	0.001	0.007	0.000	1.2	0.1	0.054	0.002
09/12/01 19:00	33.0	0.0009	0.0000	1.2	0.0	1.2	0.0	0.007	0.006	0.039	0.002	0.006	0.001	0.9	0.3	0.054	0.005
09/12/01 21:00	35.0	0.0005	0.0002	1.2	0.1	1.1	0.1	0.009	0.003	0.037	0.002	0.007	0.000	0.9	0.2	0.051	0.003
09/13/01 00:00	38.0	0.0008	0.0001	1.1	0.0	1.2	0.1	0.007	0.003	0.037	0.002	0.007	0.000	1.1	0.2	0.045	0.000
09/13/01 02:00	40.0	0.0009	0.0001	1.2	0.0	1.2	0.0	< 0.005	0.002	0.040	0.002	0.007	0.001	1.4	0.3	0.047	0.001
09/13/01 04:00	42.0	0.0008	0.0002	1.2	0.0	1.2	0.2	0.007	0.006	0.039	0.001	0.007	0.001	1.1	0.5	0.076	0.003
09/13/01 06:00	44.0	0.0010	0.0001	1.2	0.0	1.3	0.1	0.012	0.007	0.039	0.001	0.006	0.000	0.9	0.0	0.053	0.001
09/13/01 08:00	46.0	0.0006	0.0000	1.2	0.0	1.2	0.1	0.005	0.001	0.040	0.001	0.0049	0.0007	0.9	0.3	0.053	0.004
09/13/01 10:00	48.0	0.0006	0.0001	1.2	0.0	1.3	0.0	0.007	0.002	0.042	0.001	0.0056	0.0001	1.4	0.2	0.062	0.011
09/13/01 12:00	50.0	0.0007	0.0000	1.2	0.0	1.3	0.0	0.004	0.002	0.041	0.000	0.0048	0.0002	0.9	0.3	0.060	0.005
09/13/01 14:00	52.0	0.0007	0.0002	1.2	0.0	1.3	0.0	< 0.003	0.000	0.041	0.000	0.0055	0.0007	1.3	0.3	0.054	0.002
09/13/01 16:00	54.0	0.0007	0.0001	1.2	0.0	1.3	0.1	0.005	0.001	0.042	0.002	0.0057	0.0008	1.5	0.3	0.065	0.008
09/13/01 18:00	56.0	0.0007	0.0001	1.2	0.0	1.4	0.0	< 0.003	0.001	0.042	0.000	0.0055	0.0010	1.4	0.3	0.056	0.003
09/13/01 20:00	58.0	0.0006	0.0001	1.2	0.0	1.2	0.0	0.004	0.004	0.042	0.001	0.0058	0.0007	0.8	0.2	0.052	0.003
09/13/01 22:00	60.0	0.0007	0.0002	1.2	0.0	1.3	0.1	0.005	0.001	0.043	0.000	0.0058	0.0004	1.2	0.7	0.058	0.004
09/14/01 00:00	62.0	0.0008	0.0002	1.2	0.0	1.2	0.0	0.005	0.002	0.041	0.001	0.0055	0.0004	2.8	0.2	0.060	0.004
09/14/01 02:00	64.0	0.0007	0.0001	1.2	0.0	1.3	0.0	0.003	0.003	0.043	0.000	0.0063	0.0002	1.5	0.9	0.064	0.002
09/14/01 04:00	66.0	0.0006	0.0001	1.2	0.0	1.3	0.0	0.004	0.001	0.040	0.000	0.0054	0.0003	0.9	0.2	0.057	0.003
09/14/01 06:00	68.0	0.0007	0.0001	1.3	0.0	1.2	0.0	0.004	0.001	0.042	0.000	0.0054	0.0006	0.6	0.0	0.057	0.007
09/14/01 08:00	70.0	0.0006	0.0001	1.3	0.0	1.2	0.0	0.003	0.001	0.042	0.001	0.0056	0.0009	0.7	0.2	0.058	0.003

Table A28. Bacterial cell counts and chlorophyll-a concentrations for samples collected on the Iroquois River during September 2001.

[hr, hours; µg/L, micrograms per liter; millions per milliliter; na, not available]

Date-Time	Time from start hr	Bacterial Cell Counts millions/mL	Chlorophyll-a concentrations µg/L
09/11/01 10:00	0.0	na	11.4
09/11/01 12:00	2.0	na	13.0
09/11/01 14:00	4.0	na	10.3
09/11/01 20:30	10.5	na	8.42
09/11/01 23:00	13.0	na	14.3
09/12/01 01:00	15.0	na	8.46
09/12/01 03:00	17.0	na	8.86
09/12/01 05:00	19.0	na	9.13
09/12/01 07:00	21.0	na	6.64
09/12/01 09:00	23.0	na	14.4
09/12/01 11:00	25.0	na	na
09/12/01 13:00	27.0	na	na
09/12/01 15:00	29.0	na	na
09/12/01 17:00	31.0	na	na
09/12/01 19:00	33.0	na	na
09/12/01 21:00	35.0	na	na
09/13/01 00:00	38.0	na	7.32
09/13/01 02:00	40.0	na	7.14
09/13/01 04:00	42.0	na	7.22
09/13/01 06:00	44.0	na	9.18
09/13/01 08:00	46.0	na	7.65
09/13/01 10:00	48.0	na	8.42
09/13/01 12:00	50.0	na	8.27
09/13/01 14:00	52.0	na	11.0
09/13/01 16:00	54.0	na	10.3
09/13/01 18:00	56.0	na	8.97
09/13/01 20:00	58.0	na	7.33
09/13/01 22:00	60.0	na	8.49
09/14/01 00:00	62.0	na	8.79
09/14/01 02:00	64.0	na	7.05
09/14/01 04:00	66.0	na	7.12
09/14/01 06:00	68.0	na	7.50
09/14/01 08:00	70.0	na	9.13

Table A29. Concentrations of nutrients, dissolved organic carbon (DOC) and suspended sediment for samples collected on Sugar Creek during September 2001.

[hr, hours; mg/L, milligrams per liter; mg N/L, milligrams per liter as nitrogen; mg P/L, milligrams per liter as phosphorus; mg C/L, milligrams per liter as carbon; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	NO ₃		NO ₂		NH ₄		Kjeldahl N		PO ₄		P		DOC		Suspended Sediment mg/L Value
		Avg	SD	Avg	SD	Avg	SD	mg N/L Value	mg N/L Value	Avg	SD	Avg	SD	Avg	SD	
09/10/01 22:00	0.0	1.11	0.10	0.023	0.002	<0.02	0.01	na	na	<0.02	0.01	0.026	0.003	4.0	0.2	<5
09/11/01 00:00	2.0	1.00	0.09	0.022	0.002	0.027	0.002	na	na	<0.02	0.01	0.022	0.002	3.7	0.0	8
09/11/01 02:00	4.0	1.15	0.09	0.024	0.002	0.045	0.006	na	na	<0.02	0.02	0.023	0.002	3.6	0.1	6
09/11/01 04:00	6.0	1.14	0.10	0.025	0.001	0.041	0.009	na	na	<0.02	0.01	0.020	0.001	3.6	0.0	<5
09/11/01 06:00	8.0	1.16	0.10	0.025	0.001	0.055	0.016	na	na	<0.02	0.00	0.022	0.002	3.4	0.1	6
09/11/01 08:00	10.0	1.16	0.13	0.026	0.001	0.057	0.012	na	na	<0.02	0.00	0.020	0.002	3.6	0.0	<5
09/11/01 10:00	12.0	1.17	0.12	0.025	0.000	0.064	0.001	na	na	<0.02	0.00	0.020	0.002	3.6	0.1	30
09/11/01 12:00	14.0	1.11	0.08	0.023	0.001	0.033	0.003	na	na	<0.02	0.01	0.021	0.001	3.7	0.1	<5
09/11/01 14:00	16.0	1.08	0.08	0.022	0.001	0.045	0.010	na	na	<0.02	0.01	0.021	0.003	3.6	0.0	18
09/11/01 18:45	20.8	1.11	0.08	0.021	0.001	0.055	0.012	na	na	<0.02	0.01	0.022	0.001	3.5	0.0	<5
09/11/01 20:00	22.0	1.07	0.11	0.020	0.001	0.070	0.004	na	na	<0.02	0.00	0.021	0.000	3.5	0.0	<5
09/11/01 22:00	24.0	1.11	0.11	0.020	0.001	0.063	0.008	na	na	<0.02	0.00	0.019	0.001	3.2	0.1	29
09/12/01 00:00	26.0	1.11	0.11	0.020	0.001	0.071	0.011	na	na	<0.02	0.00	0.018	0.002	3.1	0.1	<5
09/12/01 02:00	28.0	1.11	0.10	0.021	0.001	0.064	0.010	0.27	0.27	<0.02	0.00	0.018	0.000	2.9	0.1	<5
09/12/01 04:00	30.0	1.12	0.08	0.021	0.001	0.063	0.007	0.26	0.26	<0.02	0.00	0.015	0.001	3.0	0.1	<5
09/12/01 06:00	32.0	1.10	0.11	0.021	0.002	0.070	0.009	0.25	0.25	<0.02	0.01	0.018	0.003	2.9	0.1	<5
09/12/01 08:00	34.0	1.11	0.12	0.020	0.001	0.080	0.001	0.24	0.24	<0.02	0.02	0.018	0.002	2.7	0.1	7
09/12/01 10:00	36.0	1.10	0.11	0.019	0.000	0.075	0.002	0.22	0.22	<0.02	0.01	0.015	0.002	2.9	0.1	<5
09/12/01 12:00	38.0	1.10	0.08	0.018	0.001	0.058	0.013	0.21	0.21	<0.02	0.01	0.015	0.003	2.8	0.1	<5
09/12/01 14:00	40.0	1.08	0.10	0.016	0.000	0.056	0.020	0.25	0.25	<0.02	0.03	0.017	0.002	2.7	0.1	<5
09/12/01 16:00	42.0	1.04	0.09	0.015	0.001	0.042	0.019	0.25	0.25	<0.02	0.01	0.010	0.002	3.3	0.0	<5
09/12/01 18:00	44.0	1.05	0.09	0.015	0.000	0.049	0.021	0.23	0.23	<0.02	0.01	0.016	0.002	2.6	0.1	<5
09/12/01 20:00	46.0	0.99	0.07	0.015	0.001	0.047	0.012	0.25	0.25	<0.02	0.01	0.016	0.002	2.8	0.1	<5
09/12/01 22:00	48.0	0.99	0.08	0.016	0.001	0.061	0.015	0.25	0.25	<0.02	0.01	0.016	0.002	2.6	0.0	6
09/13/01 00:00	50.0	1.01	0.10	0.016	0.001	0.072	0.000	0.26	0.26	<0.02	0.01	0.017	0.000	2.8	0.0	18
09/13/01 02:00	52.0	1.00	0.06	0.018	0.001	0.071	0.005	0.23	0.23	<0.02	0.00	0.015	0.003	2.9	0.0	5
09/13/01 04:00	54.0	1.00	0.05	0.017	0.000	0.083	0.004	0.15	0.15	<0.02	0.00	0.016	0.002	2.5	0.1	12
09/13/01 06:00	56.0	1.00	0.06	0.017	0.001	0.075	0.008	0.20	0.20	<0.02	0.00	0.017	0.002	2.6	0.0	8
09/13/01 08:00	58.0	0.97	0.06	0.016	0.000	0.087	0.002	0.22	0.22	<0.02	0.01	0.015	0.001	2.7	0.0	10

Table A29. Concentrations of nutrients, dissolved organic carbon (DOC) and suspended sediment for samples collected on Sugar Creek during September 2001 -- continued

[hr, hours; mg/L, milligrams per liter; mg N/L, milligrams per liter as nitrogen; mg P/L, milligrams per liter as phosphorus; mg C/L, milligrams per liter as carbon; Avg, average; SD, standard deviation; <, less than; na, not available]

Date-Time	Time from start hr	NO ₃		NO ₂		NH ₄		Kjeldahl N		PO ₄		P		DOC		Suspended Sediment mg/L Value
		Avg	SD	Avg	SD	Avg	SD	mg N/L Value	mg N/L	Avg	SD	Avg	SD	mg C/L Avg	SD	
09/13/01 10:00	60.0	0.96	0.07	0.015	0.000	0.074	0.003	na	< 0.02	0.01	0.013	0.003	0.003	2.6	0.2	10
09/13/01 12:00	62.0	0.95	0.06	0.014	0.000	0.070	0.006	na	< 0.02	0.01	0.015	0.003	0.003	2.5	0.1	5
09/13/01 14:00	64.0	0.95	0.06	0.013	0.000	0.063	0.005	na	< 0.02	0.02	0.016	0.005	0.005	2.4	0.0	7
09/13/01 16:00	66.0	0.92	0.07	0.013	0.001	0.052	0.001	na	< 0.02	0.01	0.017	0.003	0.003	2.5	0.0	6
09/13/01 18:00	68.0	0.89	0.06	0.011	0.000	0.043	0.000	na	< 0.02	0.01	0.013	0.004	0.004	2.6	0.1	6
09/13/01 20:00	70.0	0.86	0.04	0.012	0.001	0.063	0.011	na	< 0.02	0.00	0.014	0.002	0.002	2.5	0.2	14
09/13/01 22:00	72.0	0.89	0.03	0.012	0.001	0.067	0.021	na	< 0.02	0.01	0.015	0.003	0.003	2.5	0.0	12

Table A30. Concentrations of major inorganic constituents for samples collected on Sugar Creek during September 2001.

[hr, hours; mg/L, milligrams per liter; mg C/L, milligrams per liter as carbon; µg/L, micrograms per liter; Avg, average; SD, standard deviation; na, not available]

Date-Time	Time from start hr	Cl		SO ₄		HCO ₃		CO ₃		Br		Na		K		Mg		Ca		SiO ₂	
		Avg	SD	Avg	SD	mg C/L	Value	mg C/L	Value	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/10/01 22:00	0.0	12	na	86	na	49.1	0.038	11	2	8.3	0.4	3.0	0.2	27	1	76	1	7.8	0.4		
09/11/01 00:00	2.0	12	1	91	5	48.7	0.034	10	1	8.3	0.4	3.1	0.1	27	1	74	3	7.8	0.1		
09/11/01 02:00	4.0	13	na	95	na	49.8	0.034	10	0	8.2	0.3	3.1	0.1	26	1	74	3	7.6	0.1		
09/11/01 04:00	6.0	11	na	83	na	48.2	0.033	10	1	8.2	0.5	3.1	0.2	26	1	73	3	7.7	0.4		
09/11/01 06:00	8.0	12	na	91	na	45.4	0.031	11	0	8.5	0.6	3.1	0.1	26	1	75	3	7.9	0.4		
09/11/01 08:00	10.0	13	na	95	na	46.8	0.032	11	0	8.8	0.4	3.1	0.2	26	1	75	3	8.1	0.3		
09/11/01 10:00	12.0	13	na	89	na	43.8	0.033	10	1	9.0	0.6	2.9	0.2	26	1	74	2	8.1	0.3		
09/11/01 12:00	14.0	13	na	92	na	46.1	0.039	3.5	0.1	9.1	0.8	2.8	0.2	27	0	75	4	8.4	0.0		
09/11/01 14:00	16.0	12	na	89	na	47.3	0.041	10	0	9.6	0.5	2.8	0.2	27	2	76	4	8.3	0.5		
09/11/01 18:45	20.8	15	na	100	na	48.9	0.044	11	0	11	1	2.7	0.1	28	1	78	3	8.5	0.3		
09/11/01 20:00	22.0	14	na	103	na	49.5	0.039	12	1	10	0	2.6	0.1	28	1	79	3	8.3	0.2		
09/11/01 22:00	24.0	16	0	98	5	50.7	0.037	12	1	10	1	2.6	0.1	29	1	81	3	8.3	0.3		
09/12/01 00:00	26.0	16	na	98	na	51.8	0.037	12	1	11	1	2.5	0.1	29	2	81	4	8.3	0.5		
09/12/01 02:00	28.0	17	na	100	na	52.7	0.037	12	1	10	1	2.4	0.2	30	2	83	4	8.1	0.5		
09/12/01 04:00	30.0	17	na	104	na	53.5	0.040	13	1	11	1	2.4	0.2	31	2	84	3	8.3	0.4		
09/12/01 06:00	32.0	18	na	103	na	54.0	0.041	12	0	11	1	2.3	0.1	31	1	84	2	8.3	0.3		
09/12/01 08:00	34.0	18	na	106	na	54.3	0.042	12	0	11	0	2.4	0.1	31	1	87	3	8.6	0.2		
09/12/01 10:00	36.0	18	1	110	0	54.4	0.047	13	0	11	0	2.3	0.1	32	1	87	4	8.6	0.3		
09/12/01 12:00	38.0	17	na	108	na	54.5	0.053	10	2	10	1	2.2	0.1	30	1	84	1	8.2	0.6		
09/12/01 14:00	40.0	17	na	112	na	53.9	0.053	8.9	1.4	11	1	2.5	0.1	34	1	93	2	9.0	0.8		
09/12/01 16:00	42.0	18	na	111	na	53.1	0.051	8.3	0.7	12	0	2.5	0.4	33	0	87	6	9.0	0.0		
09/12/01 18:00	44.0	18	na	107	na	52.9	0.052	8.9	0.4	11	1	2.4	0.2	32	0	83	7	8.1	0.9		
09/12/01 20:00	46.0	17	1	109	3	53.0	0.045	9.1	0.2	9.9	0.5	2.2	0.1	30	2	82	6	7.8	0.7		
09/12/01 22:00	48.0	17	na	112	na	53.2	0.039	9.6	0.5	10	1	2.2	0.1	31	2	84	6	8.0	0.7		
09/13/01 00:00	50.0	16	na	111	na	53.7	0.038	8.4	0.3	11	1	2.3	0.0	32	2	88	6	8.4	0.7		
09/13/01 02:00	52.0	16	na	114	na	54.1	0.037	9.4	0.8	10	1	2.2	0.1	32	2	87	3	8.3	0.6		
09/13/01 04:00	54.0	15	na	103	na	50.2	0.035	11	1	10	0	2.2	0.1	31	2	86	5	8.2	0.6		
09/13/01 06:00	56.0	16	0	103	1	51.4	0.036	11	0	11	0	2.3	0.2	32	2	88	6	8.6	0.6		
09/13/01 08:00	58.0	15	na	100	na	50.2	0.037	10	1	10	1	2.2	0.3	33	4	91	11	8.7	0.9		

Table A30. Concentrations of major inorganic constituents for samples collected on Sugar Creek during September 2001 -- continued

[hr, hours; mg/L, milligrams per liter; mg C/L, milligrams per liter as carbon; µg/L, micrograms per liter; Avg, average; SD, standard deviation; na, not available]

Date-Time	Time from start hr	Cl		SO ₄		HCO ₃		CO ₃		Br		Na		K		Mg		Ca		SiO ₂	
		Avg	SD	Avg	SD	mg C/L	Value	mg C/L	Value	µg/L	SD	Avg	SD	mg/L	SD	Avg	SD	mg/L	SD	Avg	SD
09/13/01 10:00	60.0	15	na	108	na	55.1	0.044	11	2	10	0	2.2	0.1	33	3	89	7	8.5	0.7		
09/13/01 12:00	62.0	16	na	114	na	54.8	0.052	11	1	10	1	2.2	0.1	33	3	90	6	8.6	0.7		
09/13/01 14:00	64.0	15	na	104	na	50.4	0.052	9.9	1.1	10	1	2.3	0.2	34	2	93	7	8.9	0.7		
09/13/01 16:00	66.0	15	1	108	1	53.0	0.058	11	1	11	0	2.4	0.0	35	1	95	4	9.2	0.0		
09/13/01 18:00	68.0	15	na	108	na	53.9	0.060	9.2	0.3	9.7	0.3	2.2	0.0	31	1	80	9	7.9	0.3		
09/13/01 20:00	70.0	15	na	110	na	53.5	0.055	10	1	9.8	0.7	2.2	0.1	32	2	87	6	8.2	0.7		
09/13/01 22:00	72.0	13	na	95	na	48.2	0.047	9.6	1.0	10	0	2.2	0.0	33	0	89	1	8.3	0.2		

Table A31. Concentrations of trace element for samples collected on Sugar Creek during September 2001.

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Al µg/L		As µg/L		B µg/L		Ba µg/L		Be µg/L		Bi µg/L		Cd µg/L		Ce µg/L	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/10/01 22:00	0.0	0.8	0.1	1.1	0.0	63	6	43	2	<0.03	0.00	0.006	0.005	<0.007	0.002	0.016	0.001
09/11/01 00:00	2.0	0.5	0.0	1.0	0.0	61	3	43	3	<0.03	0.02	<0.001	0.002	<0.007	0.002	0.013	0.001
09/11/01 02:00	4.0	0.5	0.1	1.0	0.1	62	3	44	3	<0.03	0.01	0.006	0.001	<0.007	0.010	0.017	0.000
09/11/01 04:00	6.0	0.5	0.2	0.94	0.03	59	1	43	1	<0.03	0.00	<0.001	0.002	<0.007	0.005	0.014	0.001
09/11/01 06:00	8.0	0.5	0.1	0.99	0.01	61	3	43	1	<0.03	0.01	0.001	0.001	<0.007	0.002	0.014	0.001
09/11/01 08:00	10.0	0.8	0.2	0.99	0.02	60	1	45	2	<0.03	0.01	0.001	0.001	<0.007	0.007	0.020	0.000
09/11/01 10:00	12.0	0.5	0.0	0.99	0.03	61	3	44	2	<0.03	0.01	0.003	0.001	<0.007	0.006	0.013	0.000
09/11/01 12:00	14.0	0.2	0.0	0.29	0.01	61	3	15	1	<0.03	0.01	<0.001	0.000	<0.007	0.001	0.0041	0.0004
09/11/01 14:00	16.0	0.6	0.4	1.1	0.0	64	2	44	2	<0.03	0.03	<0.001	0.001	<0.007	0.003	0.012	0.000
09/11/01 18:45	20.8	0.8	0.1	1.2	0.0	70	2	45	2	<0.03	0.01	0.002	0.001	<0.007	0.003	0.015	0.001
09/11/01 20:00	22.0	0.7	0.4	1.2	0.0	69	1	46	2	<0.03	0.02	<0.001	0.001	<0.007	0.008	0.012	0.001
09/11/01 22:00	24.0	0.5	0.2	1.2	0.0	69	2	47	2	<0.03	0.03	<0.001	0.000	<0.007	0.004	0.012	0.001
09/12/01 00:00	26.0	0.3	0.1	1.1	0.0	71	2	48	1	<0.03	0.02	<0.001	0.000	<0.007	0.005	0.011	0.000
09/12/01 02:00	28.0	0.3	0.1	1.1	0.0	70	3	49	2	<0.03	0.02	<0.001	0.000	<0.007	0.003	0.010	0.001
09/12/01 04:00	30.0	0.3	0.1	1.1	0.0	69	1	48	2	0.04	0.02	<0.001	0.001	<0.007	0.004	0.011	0.000
09/12/01 06:00	32.0	0.3	0.0	1.0	0.0	68	3	50	2	<0.03	0.02	0.002	0.002	<0.007	0.003	0.012	0.001
09/12/01 08:00	34.0	0.7	0.1	1.0	0.0	72	1	52	1	<0.03	0.00	<0.001	0.000	<0.007	0.003	0.010	0.000
09/12/01 10:00	36.0	0.3	0.1	1.0	0.0	72	3	51	1	<0.03	0.02	<0.001	0.000	<0.007	0.007	0.013	0.000
09/12/01 12:00	38.0	0.6	0.0	1.0	0.1	68	6	51	3	<0.05	0.09	<0.002	0.001	<0.006	0.003	0.012	0.000
09/12/01 14:00	40.0	0.8	0.1	1.1	0.1	76	7	49	3	<0.05	0.05	<0.002	0.001	<0.006	0.003	0.014	0.001
09/12/01 16:00	42.0	<0.3	0.6	1.5	0.1	76	2	42	2	<0.05	0.06	<0.002	0.000	<0.006	0.006	0.0013	0.0001
09/12/01 18:00	44.0	0.6	0.0	1.1	0.0	70	7	50	2	<0.05	0.05	<0.002	0.001	<0.006	0.002	0.012	0.000
09/12/01 20:00	46.0	0.6	0.0	1.2	0.0	71	5	50	4	<0.05	0.01	<0.002	0.001	<0.006	0.007	0.012	0.001
09/12/01 22:00	48.0	0.6	0.2	1.2	0.0	70	7	51	3	<0.05	0.02	<0.002	0.000	<0.006	0.008	0.012	0.000
09/13/01 00:00	50.0	0.6	0.1	1.1	0.0	74	6	51	2	<0.05	0.02	<0.002	0.000	<0.006	0.008	0.014	0.001
09/13/01 02:00	52.0	0.5	0.0	1.1	0.0	73	6	51	3	<0.05	0.06	<0.002	0.000	0.16	0.00	0.015	0.001
09/13/01 04:00	54.0	0.57	0.17	1.00	0.03	73	2	49	2	<0.02	0.00	<0.002	0.001	<0.002	0.001	0.012	0.001
09/13/01 06:00	56.0	0.43	0.03	0.96	0.04	74	5	47	1	<0.02	0.01	<0.002	0.001	<0.002	0.002	0.012	0.001
09/13/01 08:00	58.0	0.35	0.05	0.97	0.03	77	9	49	3	<0.02	0.00	<0.002	0.000	<0.002	0.001	0.012	0.001

Table A31. Concentrations of trace element for samples collected on Sugar Creek during September 2001 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Al		As		B		Ba		Be		Bi		Cd		Ce	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/13/01 10:00	60.0	0.52	0.05	0.94	0.05	73	7	48	2	<0.02	0.01	<0.002	0.001	<0.002	0.002	0.011	0.000
09/13/01 12:00	62.0	0.68	0.06	0.97	0.02	76	5	48	3	<0.02	0.00	<0.002	0.001	<0.002	0.004	0.014	0.000
09/13/01 14:00	64.0	0.63	0.01	1.0	0.0	77	5	48	1	<0.02	0.00	<0.002	0.001	<0.002	0.003	0.014	0.000
09/13/01 16:00	66.0	0.68	0.06	1.1	0.0	80	0	47	0	<0.02	0.00	0.002	0.000	<0.002	0.003	0.015	0.001
09/13/01 18:00	68.0	0.66	0.03	1.1	0.0	79	8	49	3	<0.02	0.01	<0.002	0.001	<0.002	0.003	0.013	0.001
09/13/01 20:00	70.0	0.63	0.07	1.0	0.0	75	3	49	1	<0.02	0.00	<0.002	0.001	<0.002	0.003	0.015	0.001
09/13/01 22:00	72.0	0.55	0.02	1.0	0.0	79	3	49	1	<0.02	0.00	<0.002	0.001	<0.002	0.001	0.014	0.001

Table A31. Concentrations of trace element for samples collected on Sugar Creek during September 2001 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Co		Cr		Cs		Cu		Dy		Er		Eu	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/10/01 22:00	0.0	<0.002	0.012	<0.04	0.03	0.020	0.019	1.6	0.1	0.0024	0.0012	0.002	0.001	<0.0004	0.0004
09/11/01 00:00	2.0	<0.002	0.012	<0.04	0.03	<0.009	0.006	1.1	0.0	0.0021	0.0002	0.001	0.001	<0.0004	0.0003
09/11/01 02:00	4.0	<0.002	0.048	<0.04	0.04	<0.009	0.003	2.1	0.0	0.0026	0.0004	0.002	0.001	<0.0004	0.0006
09/11/01 04:00	6.0	<0.002	0.006	<0.04	0.04	<0.009	0.006	1.2	0.1	0.0024	0.0007	0.002	0.001	<0.0004	0.0005
09/11/01 06:00	8.0	<0.002	0.051	<0.04	0.04	<0.009	0.001	1.7	0.0	0.0028	0.0002	0.001	0.000	<0.0004	0.0008
09/11/01 08:00	10.0	<0.002	0.038	<0.04	0.04	0.012	0.006	1.2	0.1	0.0039	0.0003	0.002	0.000	<0.0004	0.0007
09/11/01 10:00	12.0	<0.002	0.038	<0.04	0.03	<0.009	0.007	0.98	0.06	0.0026	0.0005	0.001	0.000	<0.0004	0.0010
09/11/01 12:00	14.0	<0.002	0.010	<0.04	0.03	0.022	0.012	0.47	0.02	<0.0009	0.0006	<0.001	0.001	<0.0004	0.0004
09/11/01 14:00	16.0	<0.002	0.036	<0.04	0.04	0.055	0.010	1.4	0.1	0.0023	0.0003	0.002	0.001	<0.0004	0.0006
09/11/01 18:45	20.8	<0.002	0.040	<0.04	0.06	<0.009	0.003	0.81	0.06	0.0029	0.0009	0.002	0.000	<0.0004	0.0008
09/11/01 20:00	22.0	<0.002	0.038	<0.04	0.05	<0.009	0.004	0.85	0.17	0.0032	0.0003	0.002	0.000	<0.0004	0.0009
09/11/01 22:00	24.0	<0.002	0.000	<0.04	0.04	<0.009	0.002	0.67	0.05	0.0028	0.0003	0.003	0.000	<0.0004	0.0005
09/12/01 00:00	26.0	<0.002	0.034	<0.04	0.04	<0.009	0.002	1.1	0.0	0.0029	0.0004	0.002	0.000	<0.0004	0.0003
09/12/01 02:00	28.0	<0.002	0.036	<0.04	0.04	<0.009	0.003	0.85	0.04	0.0026	0.0004	0.002	0.001	<0.0004	0.0010
09/12/01 04:00	30.0	<0.002	0.033	<0.04	0.05	<0.009	0.003	0.41	0.06	0.0025	0.0001	0.002	0.000	<0.0004	0.0010
09/12/01 06:00	32.0	<0.002	0.023	<0.04	0.02	<0.009	0.010	0.77	0.13	0.0032	0.0005	0.002	0.000	<0.0004	0.0011
09/12/01 08:00	34.0	<0.002	0.040	<0.04	0.03	<0.009	0.002	1.1	0.1	0.0026	0.0005	0.002	0.001	<0.0004	0.0004
09/12/01 10:00	36.0	<0.002	0.011	<0.04	0.04	<0.009	0.001	0.38	0.03	0.0031	0.0002	0.003	0.000	<0.0004	0.0001
09/12/01 12:00	38.0	<0.005	0.012	<0.3	0.2	<0.01	0.01	0.95	0.12	0.0013	0.0001	<0.001	0.001	0.0010	0.0015
09/12/01 14:00	40.0	<0.005	0.019	<0.3	0.1	<0.01	0.01	1.5	0.1	0.0026	0.0006	0.002	0.001	<0.0008	0.0009
09/12/01 16:00	42.0	<0.005	0.023	<0.3	0.9	0.20	0.18	0.68	0.03	<0.0008	0.0004	<0.001	0.001	<0.0008	0.0008
09/12/01 18:00	44.0	<0.005	0.004	<0.3	0.1	<0.01	0.01	0.89	0.04	0.0028	0.0006	<0.001	0.001	<0.0008	0.0002
09/12/01 20:00	46.0	<0.005	0.009	<0.3	0.1	<0.01	0.01	1.4	0.1	0.0028	0.0007	0.002	0.001	<0.0008	0.0004
09/12/01 22:00	48.0	<0.005	0.013	<0.3	0.1	<0.01	0.00	1.2	0.0	0.0035	0.0010	0.003	0.000	<0.0008	0.0004
09/13/01 00:00	50.0	<0.005	0.015	<0.3	0.1	0.03	0.00	0.71	0.03	0.0028	0.0002	0.002	0.001	<0.0008	0.0007
09/13/01 02:00	52.0	<0.005	0.015	<0.3	0.1	<0.01	0.00	0.99	0.01	0.0028	0.0011	0.002	0.001	<0.0008	0.0004
09/13/01 04:00	54.0	<0.002	0.022	<0.1	0.1	0.010	0.005	0.67	0.09	0.0027	0.0001	0.0021	0.0004	<0.0002	0.0005
09/13/01 06:00	56.0	<0.002	0.017	<0.1	0.0	<0.003	0.001	0.73	0.05	0.0029	0.0004	0.0020	0.0001	<0.0002	0.0001
09/13/01 08:00	58.0	<0.002	0.012	<0.1	0.1	0.005	0.002	0.59	0.12	0.0023	0.0004	0.0027	0.0006	<0.0002	0.0003

Table A31. Concentrations of trace element for samples collected on Sugar Creek during September 2001 --- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Co µg/L		Cr µg/L		Cs µg/L		Cu µg/L		Dy µg/L		Er µg/L		Eu µg/L	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/13/01 10:00	60.0	<0.002	0.004	<0.1	0.1	0.018	0.009	0.37	0.00	0.0024	0.0003	0.0013	0.0006	<0.0002	0.0006
09/13/01 12:00	62.0	<0.002	0.027	<0.1	0.1	0.062	0.070	0.55	0.02	0.0023	0.0004	0.0021	0.0003	<0.0002	0.0001
09/13/01 14:00	64.0	<0.002	0.024	<0.1	0.0	<0.003	0.000	0.31	0.08	0.0024	0.0004	0.0026	0.0005	<0.0002	0.0003
09/13/01 16:00	66.0	<0.002	0.021	<0.1	0.2	0.012	0.011	0.43	0.06	0.0035	0.0006	0.0026	0.0006	<0.0002	0.0015
09/13/01 18:00	68.0	<0.002	0.019	<0.1	0.1	0.006	0.005	0.38	0.06	0.0030	0.0002	0.0023	0.0004	0.0010	0.0003
09/13/01 20:00	70.0	<0.002	0.019	<0.1	0.0	0.021	0.022	0.55	0.06	0.0029	0.0003	0.0021	0.0000	0.0006	0.0003
09/13/01 22:00	72.0	<0.002	0.009	<0.1	0.0	<0.003	0.002	0.34	0.03	0.0027	0.0003	0.0018	0.0002	<0.0002	0.0001

Table A31. Concentrations of trace element for samples collected on Sugar Creek during September 2001 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Fe µg/L		Gd µg/L		Hg ng/L		Ho µg/L		La µg/L		Li µg/L		Lu µg/L		Mn µg/L	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/10/01 22:00	0.0	14	1	0.0033	0.0002	11	0.1	0.0007	0.0002	0.012	0.000	5.4	0.0	0.0005	0.0000	27	1
09/11/01 00:00	2.0	14	3	0.0033	0.0009	7.4	0.1	0.0004	0.0001	0.011	0.001	5.1	0.0	<0.0002	0.0003	36	2
09/11/01 02:00	4.0	14	2	0.0045	0.0011	6.9	0.2	0.0007	0.0001	0.011	0.000	5.0	0.0	<0.0002	0.0001	46	1
09/11/01 04:00	6.0	14	1	0.0039	0.0007	7.1	0.2	0.0005	0.0002	0.011	0.000	4.9	0.1	<0.0002	0.0002	58	1
09/11/01 06:00	8.0	10	2	0.0032	0.0007	4.0	0.1	0.0006	0.0001	0.010	0.000	4.8	0.1	0.0004	0.0003	65	2
09/11/01 08:00	10.0	15	1	0.0040	0.0005	2.2	0.1	0.0007	0.0002	0.013	0.001	5.1	0.2	0.0003	0.0002	76	1
09/11/01 10:00	12.0	12	0	0.0028	0.0004	2.0	0.1	0.0006	0.0002	0.0099	0.0005	5.0	0.1	0.0004	0.0001	73	2
09/11/01 12:00	14.0	10	5	<0.001	0.000	4.7	0.1	<0.0003	0.0002	0.0032	0.0004	1.7	0.1	<0.0002	0.0001	22	0
09/11/01 14:00	16.0	10	2	0.0035	0.0009	3.0	0.2	0.0007	0.0002	0.0091	0.0002	5.1	0.0	0.0004	0.0001	57	2
09/11/01 18:45	20.8	18	0	0.0043	0.0007	4.2	0.1	0.0006	0.0003	0.010	0.000	5.5	0.1	0.0005	0.0001	40	1
09/11/01 20:00	22.0	13	1	0.0044	0.0002	5.4	0.0	0.0006	0.0002	0.0090	0.0006	5.5	0.1	0.0005	0.0001	32	0
09/11/01 22:00	24.0	14	1	0.0036	0.0005	2.8	0.2	0.0005	0.0000	0.0083	0.0002	5.7	0.1	0.0004	0.0002	37	1
09/12/01 00:00	26.0	14	1	0.0044	0.0012	2.5	0.1	0.0008	0.0001	0.0094	0.0004	5.7	0.0	0.0005	0.0002	45	1
09/12/01 02:00	28.0	12	1	0.0045	0.0007	3.2	0.1	0.0006	0.0002	0.0085	0.0005	5.9	0.0	0.0003	0.0001	49	1
09/12/01 04:00	30.0	12	0	0.0034	0.0007	2.4	0.0	0.0006	0.0001	0.0081	0.0008	5.8	0.1	0.0003	0.0001	53	0
09/12/01 06:00	32.0	13	2	0.0034	0.0006	3.0	0.2	0.0007	0.0000	0.0087	0.0008	6.0	0.0	0.0004	0.0001	61	2
09/12/01 08:00	34.0	5	1	0.0046	0.0010	4.1	0.1	0.0008	0.0001	0.0080	0.0004	6.0	0.0	0.0004	0.0001	71	2
09/12/01 10:00	36.0	16	0	0.0043	0.0007	1.5	0.1	0.0008	0.0001	0.0094	0.0007	5.9	0.1	0.0005	0.0001	74	1
09/12/01 12:00	38.0	14	1	0.004	0.001	2.9	0.1	0.0004	0.0000	0.0082	0.0008	6.9	0.2	<0.0005	0.0002	60	0
09/12/01 14:00	40.0	21	1	0.004	0.001	2.7	0.1	0.0008	0.0001	0.0098	0.0009	6.6	0.3	<0.0005	0.0002	50	1
09/12/01 16:00	42.0	1.9	0.4	<0.001	0.001	4.2	0.2	<0.0003	0.0000	0.0023	0.0003	6.7	0.3	<0.0005	0.0002	10	5
09/12/01 18:00	44.0	17	1	0.003	0.000	3.3	0.2	0.0003	0.0000	0.0088	0.0005	6.3	0.2	<0.0005	0.0002	24	1
09/12/01 20:00	46.0	16	1	0.004	0.001	2.6	0.2	0.0007	0.0004	0.0090	0.0009	6.4	0.1	0.0008	0.0000	28	1
09/12/01 22:00	48.0	15	1	0.004	0.000	1.7	0.1	0.0009	0.0004	0.0088	0.0001	6.3	0.2	<0.0005	0.0001	34	0
09/13/01 00:00	50.0	24	1	0.003	0.000	1.1	0.0	0.0004	0.0001	0.011	0.000	6.4	0.3	<0.0005	0.0002	40	0
09/13/01 02:00	52.0	22	2	0.004	0.001	0.6	0.1	0.0004	0.0002	0.011	0.001	6.4	0.4	<0.0005	0.0003	42	1
09/13/01 04:00	54.0	19	1	0.0032	0.0001	1.0	0.1	0.0007	0.0002	0.010	0.000	6.6	0.3	0.0003	0.0000	49	1
09/13/01 06:00	56.0	17	2	0.0040	0.0005	1.0	0.1	0.0006	0.0001	0.0087	0.0002	6.3	0.2	0.0003	0.0001	54	0
09/13/01 08:00	58.0	14	2	0.0030	0.0003	0.6	0.1	0.0006	0.0001	0.0085	0.0003	6.3	0.5	0.0003	0.0001	62	2

Table A31. Concentrations of trace element for samples collected on Sugar Creek during September 2001 --- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Fe		Gd		Hg		Ho		La		Li		Lu		Mn	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/13/01 10:00	60.0	13	2	0.0025	0.0007	0.7	0.2	0.0005	0.0000	0.0079	0.0001	6.4	0.4	0.0003	0.0000	64	1
09/13/01 12:00	62.0	19	1	0.0028	0.0007	0.7	0.2	0.0007	0.0002	0.0085	0.0007	6.4	0.4	0.0004	0.0001	58	0
09/13/01 14:00	64.0	24	1	0.0029	0.0006	0.5	0.0	0.0006	0.0001	0.0095	0.0006	6.0	1.0	0.0004	0.0001	51	1
09/13/01 16:00	66.0	26	1	0.0035	0.0006	0.6	0.1	0.0009	0.0001	0.010	0.000	6.1	1.0	0.0005	0.0001	44	0
09/13/01 18:00	68.0	19	0	0.0041	0.0004	0.8	0.1	0.0007	0.0001	0.011	0.000	6.6	0.4	0.0003	0.0000	41	1
09/13/01 20:00	70.0	22	0	0.0042	0.0005	0.8	0.2	0.0006	0.0000	0.0098	0.0000	6.6	0.2	0.0003	0.0001	41	1
09/13/01 22:00	72.0	23	1	0.0036	0.0003	0.5	0.1	0.0006	0.0000	0.011	0.000	6.7	0.4	0.0003	0.0000	48	0

Table A31. Concentrations of trace element for samples collected on Sugar Creek during September 2001 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Mo		Nd		Ni		Pb		Pr		Rb		Re		Sb		Se	
		Avg	SD	µg/L	Avg	SD	µg/L	Avg	SD	µg/L	Avg	SD	µg/L	Avg	SD	µg/L	Avg	SD	µg/L
09/10/01 22:00	0.0	4.8	0.2	0.011	0.001	1.2	0.8	0.08	0.00	0.0030	0.0003	1.3	0.0	0.015	0.001	0.12	0.00	0.5	0.2
09/11/01 00:00	2.0	4.7	0.0	0.011	0.001	1.6	0.5	<0.03	0.01	0.0027	0.0001	1.3	0.0	0.015	0.001	0.10	0.00	0.5	0.2
09/11/01 02:00	4.0	4.6	0.0	0.013	0.000	1.2	0.6	0.07	0.02	0.0031	0.0003	1.3	0.0	0.014	0.001	0.11	0.00	0.5	0.3
09/11/01 04:00	6.0	4.6	0.0	0.011	0.000	1.4	0.6	<0.03	0.01	0.0027	0.0001	1.3	0.0	0.015	0.000	0.10	0.00	0.4	0.1
09/11/01 06:00	8.0	4.6	0.1	0.012	0.000	1.3	0.6	0.04	0.03	0.0026	0.0003	1.2	0.0	0.013	0.000	0.11	0.00	0.6	0.1
09/11/01 08:00	10.0	4.7	0.0	0.015	0.001	1.3	0.6	0.08	0.02	0.0033	0.0002	1.2	0.0	0.015	0.001	0.11	0.00	0.6	0.0
09/11/01 10:00	12.0	4.6	0.1	0.012	0.002	1.0	0.5	0.05	0.02	0.0024	0.0001	1.2	0.0	0.014	0.001	0.099	0.004	0.7	0.1
09/11/01 12:00	14.0	1.6	0.0	0.003	0.002	1.3	0.5	0.03	0.02	0.0009	0.0003	0.39	0.00	0.0049	0.0004	0.034	0.002	<0.3	0.0
09/11/01 14:00	16.0	4.8	0.1	0.009	0.001	1.4	0.6	0.06	0.02	0.0021	0.0001	1.2	0.0	0.015	0.000	0.11	0.00	0.7	0.1
09/11/01 18:45	20.8	5.2	0.1	0.012	0.001	1.4	0.5	0.06	0.01	0.0028	0.0001	1.2	0.0	0.015	0.001	0.11	0.00	0.7	0.1
09/11/01 20:00	22.0	5.3	0.1	0.011	0.001	1.3	0.7	0.07	0.03	0.0024	0.0005	1.2	0.0	0.015	0.001	0.11	0.00	0.7	0.0
09/11/01 22:00	24.0	5.4	0.1	0.011	0.001	1.2	0.2	0.04	0.02	0.0024	0.0003	1.2	0.0	0.016	0.000	0.12	0.01	0.7	0.1
09/12/01 00:00	26.0	5.4	0.0	0.010	0.001	1.2	0.3	0.05	0.02	0.0024	0.0001	1.1	0.0	0.017	0.000	0.11	0.00	0.7	0.2
09/12/01 02:00	28.0	5.4	0.0	0.010	0.001	1.1	0.2	0.03	0.01	0.0020	0.0003	1.1	0.0	0.016	0.001	0.10	0.00	0.6	0.1
09/12/01 04:00	30.0	5.4	0.1	0.009	0.002	1.2	0.4	0.04	0.02	0.0018	0.0001	1.1	0.0	0.016	0.001	0.11	0.00	0.8	0.2
09/12/01 06:00	32.0	5.5	0.1	0.011	0.001	1.2	0.4	0.05	0.01	0.0025	0.0001	1.1	0.0	0.016	0.001	0.10	0.00	0.7	0.2
09/12/01 08:00	34.0	5.5	0.1	0.009	0.000	1.3	0.4	0.06	0.03	0.0020	0.0002	1.1	0.0	0.017	0.000	0.11	0.00	0.8	0.1
09/12/01 10:00	36.0	5.5	0.0	0.011	0.000	1.1	0.3	0.05	0.01	0.0022	0.0003	1.0	0.0	0.017	0.001	0.096	0.002	0.7	0.1
09/12/01 12:00	38.0	5.7	0.0	0.010	0.001	0.8	0.0	<0.02	0.01	0.0016	0.0001	1.1	0.0	0.017	0.002	0.10	0.01	1.1	0.2
09/12/01 14:00	40.0	5.5	0.1	0.012	0.001	1.0	0.1	0.03	0.01	0.0024	0.0003	1.0	0.0	0.016	0.002	0.11	0.02	<0.8	0.9
09/12/01 16:00	42.0	6.1	0.0	<0.002	0.001	0.8	0.1	<0.02	0.00	<0.0004	0.0001	1.1	0.0	0.016	0.001	0.11	0.00	<0.8	0.1
09/12/01 18:00	44.0	5.7	0.0	0.012	0.000	0.7	0.1	<0.02	0.01	0.0020	0.0002	1.1	0.0	0.019	0.001	0.11	0.00	<0.8	0.8
09/12/01 20:00	46.0	5.8	0.1	0.012	0.001	0.9	0.1	0.04	0.01	0.0026	0.0003	1.1	0.0	0.018	0.000	0.11	0.00	<0.8	0.2
09/12/01 22:00	48.0	5.9	0.0	0.009	0.001	0.7	0.2	0.03	0.01	0.0023	0.0002	1.1	0.0	0.018	0.000	0.11	0.00	0.9	0.3
09/13/01 00:00	50.0	6.0	0.0	0.012	0.000	0.8	0.1	0.03	0.01	0.0030	0.0001	1.1	0.0	0.016	0.001	0.11	0.00	<0.8	0.8
09/13/01 02:00	52.0	5.8	0.1	0.013	0.002	0.5	0.2	0.03	0.01	0.0028	0.0003	1.1	0.0	0.017	0.001	0.11	0.00	0.9	0.0
09/13/01 04:00	54.0	5.8	0.0	0.011	0.001	0.8	0.2	0.020	0.006	0.0022	0.0002	1.1	0.0	0.017	0.002	0.11	0.00	0.58	0.08
09/13/01 06:00	56.0	5.8	0.1	0.010	0.003	0.7	0.3	0.045	0.005	0.0022	0.0003	1.0	0.0	0.017	0.001	0.11	0.00	0.47	0.08
09/13/01 08:00	58.0	5.7	0.2	0.0093	0.0016	0.8	0.3	0.036	0.009	0.0019	0.0001	1.0	0.0	0.017	0.001	0.10	0.00	0.59	0.09

Table A31. Concentrations of trace element for samples collected on Sugar Creek during September 2001 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Mo		Nd		Ni		Pb		Pr		Rb		Re		Sb		Se	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/13/01 10:00	60.0	5.8	0.1	0.0091	0.0006	0.8	0.1	0.019	0.005	0.0020	0.0002	1.0	0.0	0.017	0.000	0.10	0.01	0.50	0.15
09/13/01 12:00	62.0	5.9	0.1	0.012	0.001	0.9	0.2	0.043	0.005	0.0025	0.0001	1.0	0.0	0.017	0.002	0.10	0.00	0.47	0.16
09/13/01 14:00	64.0	5.9	0.1	0.012	0.001	0.9	0.2	0.019	0.006	0.0025	0.0001	1.0	0.0	0.018	0.001	0.100	0.006	0.65	0.16
09/13/01 16:00	66.0	6.0	0.0	0.012	0.001	0.7	0.1	0.016	0.002	0.0022	0.0001	1.0	0.0	0.018	0.001	0.10	0.00	0.63	0.15
09/13/01 18:00	68.0	6.0	0.0	0.011	0.001	1.0	0.2	0.018	0.010	0.0024	0.0000	1.1	0.0	0.018	0.001	0.10	0.00	0.44	0.08
09/13/01 20:00	70.0	6.0	0.1	0.013	0.001	0.9	0.2	0.021	0.004	0.0026	0.0001	1.1	0.0	0.018	0.001	0.098	0.001	0.36	0.07
09/13/01 22:00	72.0	5.9	0.1	0.012	0.001	0.8	0.1	0.012	0.004	0.0026	0.0001	1.1	0.0	0.018	0.001	0.10	0.00	0.54	0.07

Table A31. Concentrations of trace element for samples collected on Sugar Creek during September 2001 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Sm µg/L		Sr µg/L		Ta µg/L		Tb µg/L		Te µg/L		Th µg/L		Ti µg/L		Tl µg/L	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/10/01 22:00	0.0	0.004	0.000	170	0	<0.002	0.002	0.0006	0.0002	<0.02	0.02	0.0011	0.0004	<0.2	0.2	0.018	0.000
09/11/01 00:00	2.0	0.003	0.000	170	0	<0.002	0.001	0.0005	0.0001	<0.02	0.01	0.0007	0.0001	<0.2	0.1	0.017	0.002
09/11/01 02:00	4.0	0.003	0.000	170	0	<0.002	0.000	0.0004	0.0001	<0.02	0.02	0.0010	0.0000	<0.2	0.1	0.016	0.003
09/11/01 04:00	6.0	0.004	0.000	170	0	<0.002	0.001	0.0004	0.0002	<0.02	0.02	0.0011	0.0007	<0.2	0.2	0.015	0.000
09/11/01 06:00	8.0	0.002	0.001	160	0	<0.002	0.001	0.0005	0.0000	<0.02	0.02	0.0010	0.0004	<0.2	0.0	0.017	0.003
09/11/01 08:00	10.0	0.003	0.001	170	0	<0.002	0.001	0.0004	0.0002	0.03	0.02	0.0012	0.0001	<0.2	0.1	0.014	0.005
09/11/01 10:00	12.0	0.003	0.001	170	0	<0.002	0.000	0.0005	0.0001	<0.02	0.01	0.0016	0.0001	<0.2	0.1	0.020	0.009
09/11/01 12:00	14.0	<0.002	0.000	55	0	<0.002	0.001	<0.0002	0.0002	<0.02	0.01	0.0003	0.0002	<0.2	0.0	0.005	0.000
09/11/01 14:00	16.0	0.002	0.000	170	0	<0.002	0.000	0.0005	0.0002	0.02	0.01	0.0008	0.0003	<0.2	0.1	0.016	0.001
09/11/01 18:45	20.8	0.003	0.001	180	0	<0.002	0.000	0.0007	0.0000	<0.02	0.01	0.0012	0.0001	<0.2	0.1	0.020	0.001
09/11/01 20:00	22.0	0.003	0.000	180	0	<0.002	0.001	0.0005	0.0001	<0.02	0.01	0.0009	0.0003	<0.2	0.0	0.019	0.001
09/11/01 22:00	24.0	0.002	0.001	190	0	<0.002	0.001	0.0005	0.0002	0.03	0.01	0.0007	0.0002	<0.2	0.1	0.019	0.002
09/12/01 00:00	26.0	0.003	0.001	190	0	<0.002	0.000	0.0006	0.0002	0.03	0.01	0.0007	0.0001	<0.2	0.1	0.017	0.003
09/12/01 02:00	28.0	0.003	0.001	190	0	<0.002	0.001	0.0004	0.0002	0.03	0.01	0.0006	0.0000	<0.2	0.2	0.014	0.002
09/12/01 04:00	30.0	0.002	0.001	200	0	<0.002	0.001	0.0005	0.0001	0.03	0.02	0.0006	0.0001	<0.2	0.1	0.012	0.002
09/12/01 06:00	32.0	0.003	0.001	200	0	<0.002	0.000	0.0005	0.0002	0.04	0.00	0.0005	0.0001	<0.2	0.2	0.013	0.000
09/12/01 08:00	34.0	0.004	0.000	210	0	<0.002	0.002	0.0004	0.0001	0.03	0.01	0.0005	0.0001	<0.2	0.1	0.012	0.001
09/12/01 10:00	36.0	0.004	0.001	200	0	<0.002	0.001	0.0005	0.0002	0.03	0.02	0.0007	0.0001	<0.2	0.2	0.013	0.004
09/12/01 12:00	38.0	<0.002	0.001	210	0	<0.006	0.003	<0.0004	0.0000	<0.04	0.03	<0.0004	0.0003	<0.3	0.6	0.007	0.004
09/12/01 14:00	40.0	0.003	0.001	200	10	<0.006	0.003	<0.0004	0.0002	<0.04	0.04	0.0006	0.0004	<0.3	0.8	0.012	0.003
09/12/01 16:00	42.0	<0.002	0.001	200	10	0.017	0.003	<0.0004	0.0001	<0.04	0.03	<0.0004	0.0000	<0.3	0.1	<0.004	0.001
09/12/01 18:00	44.0	0.003	0.001	200	10	<0.006	0.005	<0.0004	0.0000	<0.04	0.05	0.0006	0.0002	<0.3	0.5	0.016	0.002
09/12/01 20:00	46.0	0.003	0.000	200	0	<0.006	0.003	0.0005	0.0002	<0.04	0.04	0.0008	0.0003	<0.3	0.7	0.017	0.003
09/12/01 22:00	48.0	0.003	0.001	200	0	<0.006	0.002	0.0005	0.0001	0.05	0.00	0.0006	0.0001	<0.3	0.5	0.015	0.001
09/13/01 00:00	50.0	0.003	0.001	200	0	<0.006	0.003	0.0006	0.0000	<0.04	0.02	0.0007	0.0004	<0.3	0.7	0.011	0.002
09/13/01 02:00	52.0	0.003	0.001	200	0	<0.006	0.004	<0.0004	0.0002	<0.04	0.04	0.0007	0.0001	<0.3	0.5	0.010	0.001
09/13/01 04:00	54.0	0.0024	0.0005	200	0	<0.003	0.002	0.0004	0.0001	0.02	0.00	0.0006	0.0001	<0.3	0.1	0.012	0.001
09/13/01 06:00	56.0	0.0027	0.0011	210	10	<0.003	0.003	0.0004	0.0002	0.01	0.01	0.0007	0.0003	<0.3	0.3	0.011	0.002
09/13/01 08:00	58.0	0.0026	0.0004	200	10	<0.003	0.001	0.0002	0.0001	0.02	0.01	0.0008	0.0006	<0.3	0.3	0.012	0.006

Table A31. Concentrations of trace element for samples collected on Sugar Creek during September 2001 --- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Sm		Sr		Ta		Tb		Te		Th		Ti		Tl	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/13/01 10:00	60.0	0.0022	0.0008	200	0	<0.003	0.002	0.0004	0.0001	0.02	0.01	0.0005	0.0000	<0.3	0.5	0.011	0.002
09/13/01 12:00	62.0	0.0019	0.0003	210	0	<0.003	0.001	0.0003	0.0001	0.02	0.02	0.0008	0.0002	<0.3	0.7	0.013	0.004
09/13/01 14:00	64.0	0.0025	0.0004	200	0	<0.003	0.001	0.0005	0.0001	0.02	0.01	0.0007	0.0002	<0.3	0.5	0.013	0.002
09/13/01 16:00	66.0	0.0027	0.0008	210	0	<0.003	0.001	0.0005	0.0001	0.02	0.01	0.0009	0.0002	<0.3	0.1	0.016	0.004
09/13/01 18:00	68.0	0.0029	0.0005	210	0	<0.003	0.001	0.0005	0.0000	0.03	0.01	0.0006	0.0001	<0.3	0.2	0.011	0.001
09/13/01 20:00	70.0	0.0031	0.0001	210	0	<0.003	0.001	0.0006	0.0000	0.02	0.01	0.0007	0.0004	<0.3	0.6	0.014	0.006
09/13/01 22:00	72.0	0.0024	0.0004	210	0	<0.003	0.000	0.0005	0.0001	0.02	0.01	0.0006	0.0002	<0.3	0.3	0.012	0.003

Table A31. Concentrations of trace element for samples collected on Sugar Creek during September 2001 -- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Tm		U		V		W		Y		Yb		Zn		Zr	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/10/01 22:00	0.0	0.0003	0.0001	2.0	0.0	0.4	0.0	0.004	0.001	0.026	0.000	0.0024	0.0002	2.3	0.4	0.029	0.003
09/11/01 00:00	2.0	< 0.0003	0.0003	2.0	0.1	0.4	0.0	0.005	0.001	0.024	0.001	0.0023	0.0002	2.4	0.0	0.030	0.002
09/11/01 02:00	4.0	0.0003	0.0001	2.0	0.0	0.3	0.0	0.004	0.002	0.026	0.000	0.0024	0.0003	4.5	0.2	0.033	0.001
09/11/01 04:00	6.0	< 0.0003	0.0001	2.0	0.1	0.3	0.0	0.004	0.003	0.024	0.000	0.0016	0.0006	3.7	0.0	0.029	0.003
09/11/01 06:00	8.0	< 0.0003	0.0001	2.0	0.1	0.4	0.0	0.004	0.004	0.024	0.001	0.0018	0.0002	3.3	0.2	0.032	0.002
09/11/01 08:00	10.0	0.0003	0.0002	2.0	0.0	0.3	0.0	0.005	0.002	0.027	0.000	0.0025	0.0005	3.8	0.2	0.031	0.002
09/11/01 10:00	12.0	< 0.0003	0.0002	2.1	0.1	0.3	0.0	0.004	0.002	0.023	0.001	0.0021	0.0002	2.7	0.3	0.039	0.001
09/11/01 12:00	14.0	< 0.0003	0.0001	0.72	0.03	< 0.1	0.0	< 0.003	0.002	0.0076	0.0003	< 0.0007	0.0004	2.9	0.1	0.011	0.002
09/11/01 14:00	16.0	< 0.0003	0.0002	2.2	0.1	0.4	0.0	0.005	0.002	0.024	0.002	0.0018	0.0005	2.5	0.5	0.027	0.002
09/11/01 18:45	20.8	< 0.0003	0.0001	2.3	0.1	0.5	0.0	0.005	0.003	0.026	0.001	0.0020	0.0004	1.8	0.2	0.029	0.003
09/11/01 20:00	22.0	< 0.0003	0.0001	2.4	0.2	0.4	0.0	0.009	0.001	0.026	0.001	0.0021	0.0001	1.2	0.2	0.025	0.003
09/11/01 22:00	24.0	0.0004	0.0001	2.5	0.0	0.4	0.0	0.005	0.006	0.024	0.001	0.0025	0.0008	1.6	0.2	0.023	0.001
09/12/01 00:00	26.0	< 0.0003	0.0000	2.5	0.1	0.4	0.0	0.006	0.001	0.025	0.000	0.0025	0.0007	1.7	0.2	0.020	0.000
09/12/01 02:00	28.0	< 0.0003	0.0000	2.5	0.0	0.4	0.0	0.005	0.002	0.024	0.001	0.0019	0.0004	1.9	0.4	0.022	0.001
09/12/01 04:00	30.0	< 0.0003	0.0001	2.5	0.1	0.3	0.0	< 0.003	0.002	0.025	0.001	0.0022	0.0010	2.0	0.1	0.021	0.001
09/12/01 06:00	32.0	0.0005	0.0000	2.6	0.1	0.3	0.0	0.005	0.002	0.025	0.001	0.0021	0.0004	1.6	0.2	0.024	0.003
09/12/01 08:00	34.0	0.0004	0.0001	2.7	0.0	0.3	0.0	0.006	0.002	0.026	0.001	0.0025	0.0003	2.8	0.1	0.023	0.003
09/12/01 10:00	36.0	0.0004	0.0001	2.6	0.0	0.3	0.0	< 0.003	0.000	0.026	0.001	0.0024	0.0002	1.6	0.3	0.033	0.001
09/12/01 12:00	38.0	< 0.0003	0.0002	2.7	0.0	0.3	0.1	< 0.005	0.001	0.026	0.001	0.002	0.001	1.5	0.2	0.022	0.001
09/12/01 14:00	40.0	0.0003	0.0003	2.7	0.0	0.3	0.0	< 0.005	0.005	0.030	0.001	0.003	0.001	2.1	0.0	0.025	0.002
09/12/01 16:00	42.0	< 0.0003	0.0002	2.3	0.1	0.3	0.1	0.61	0.15	0.0024	0.0006	< 0.002	0.000	0.5	0.1	0.047	0.017
09/12/01 18:00	44.0	0.0003	0.0002	2.7	0.0	0.4	0.1	< 0.005	0.003	0.027	0.001	0.002	0.000	2.5	1.1	0.026	0.002
09/12/01 20:00	46.0	0.0005	0.0001	2.6	0.1	0.4	0.1	< 0.005	0.005	0.028	0.001	0.003	0.000	1.4	0.0	0.021	0.001
09/12/01 22:00	48.0	0.0004	0.0002	2.7	0.0	0.4	0.1	< 0.005	0.002	0.025	0.001	0.003	0.001	2.2	0.3	0.022	0.001
09/13/01 00:00	50.0	< 0.0003	0.0002	2.7	0.0	0.4	0.1	< 0.005	0.007	0.026	0.001	0.002	0.000	1.8	0.4	0.019	0.003
09/13/01 02:00	52.0	< 0.0003	0.0003	2.7	0.0	0.3	0.1	< 0.005	0.004	0.027	0.000	0.002	0.000	1.5	0.4	0.020	0.001
09/13/01 04:00	54.0	0.0002	0.0000	2.6	0.1	0.37	0.01	< 0.003	0.001	0.025	0.001	0.0025	0.0002	2.3	0.1	0.020	0.003
09/13/01 06:00	56.0	0.0003	0.0000	2.6	0.0	0.33	0.04	< 0.003	0.000	0.025	0.001	0.0017	0.0006	1.8	0.2	0.020	0.004
09/13/01 08:00	58.0	0.0002	0.0001	2.6	0.0	0.35	0.00	0.005	0.001	0.024	0.000	0.0022	0.0003	2.4	1.6	0.019	0.002

Table A31. Concentrations of trace element for samples collected on Sugar Creek during September 2001 --- continued

[hr, hours; µg/L, micrograms per liter; ng/L, nanograms per liter; Avg, average; SD, standard deviation; <, less than]

Date-Time	Time from start hr	Tm		U		V		W		Y		Yb		Zn		Zr	
		Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD	Avg	SD
09/13/01 10:00	60.0	0.0003	0.0001	2.7	0.0	0.38	0.10	0.004	0.002	0.026	0.000	0.0016	0.0001	1.4	0.4	0.019	0.002
09/13/01 12:00	62.0	0.0002	0.0001	2.6	0.0	0.44	0.06	<0.003	0.000	0.027	0.001	0.0023	0.0002	2.4	0.2	0.019	0.002
09/13/01 14:00	64.0	0.0004	0.0001	2.7	0.0	0.46	0.06	<0.003	0.003	0.028	0.001	0.0016	0.0004	2.8	0.2	0.017	0.002
09/13/01 16:00	66.0	0.0003	0.0001	2.7	0.1	0.47	0.09	<0.003	0.003	0.030	0.001	0.0018	0.0006	1.6	0.6	0.021	0.002
09/13/01 18:00	68.0	0.0002	0.0001	2.8	0.0	0.41	0.03	0.003	0.003	0.028	0.001	0.0020	0.0005	2.2	0.3	0.021	0.003
09/13/01 20:00	70.0	0.0003	0.0001	2.7	0.0	0.40	0.05	<0.003	0.003	0.029	0.001	0.0022	0.0000	1.6	0.5	0.017	0.002
09/13/01 22:00	72.0	0.0003	0.0001	2.7	0.0	0.38	0.01	<0.003	0.001	0.028	0.000	0.0014	0.0002	1.2	0.3	0.017	0.001

Table A32. Bacterial cell counts and chlorophyll-a concentrations for samples collected on Sugar Creek during September 2001.

[hr, hours; µg/L, micrograms per liter; millions/mL, millions per milliliter; na, not available]

Date-Time	Time from start hr	Bacterial Cell Counts millions/mL	Chlorophyll-a concentrations µg/L
09/10/01 22:00	0.0	na	na
09/11/01 00:00	2.0	na	na
09/11/01 02:00	4.0	na	na
09/11/01 04:00	6.0	na	5.64
09/11/01 06:00	8.0	na	6.59
09/11/01 08:00	10.0	na	6.48
09/11/01 10:00	12.0	na	9.03
09/11/01 12:00	14.0	na	9.47
09/11/01 14:00	16.0	na	8.21
09/11/01 18:45	20.8	na	6.94
09/11/01 20:00	22.0	na	9.55
09/11/01 22:00	24.0	na	6.57
09/12/01 00:00	26.0	na	6.51
09/12/01 02:00	28.0	na	6.44
09/12/01 04:00	30.0	na	3.78
09/12/01 06:00	32.0	na	5.53
09/12/01 08:00	34.0	na	4.19
09/12/01 10:00	36.0	na	4.26
09/12/01 12:00	38.0	na	6.94
09/12/01 14:00	40.0	na	8.95
09/12/01 16:00	42.0	na	4.58
09/12/01 18:00	44.0	na	3.90
09/12/01 20:00	46.0	na	4.92
09/12/01 22:00	48.0	na	4.90
09/13/01 00:00	50.0	na	6.15
09/13/01 02:00	52.0	na	na
09/13/01 04:00	54.0	na	na
09/13/01 06:00	56.0	na	na
09/13/01 08:00	58.0	na	na

Table A32. Bacterial cell counts and chlorophyll-*a* concentrations for samples collected on Sugar Creek during September 2001 --- continued
[hr, hours; µg/L, micrograms per liter; millions/mL, millions per milliliter; na, not available]

Date-Time	Time from start hr	Bacterial Cell Counts millions/mL	Chlorophyll- <i>a</i> concentrations µg/L
09/13/01 10:00	60.0	na	na
09/13/01 12:00	62.0	na	na
09/13/01 14:00	64.0	na	na
09/13/01 16:00	66.0	na	na
09/13/01 18:00	68.0	na	na
09/13/01 20:00	70.0	na	na
09/13/01 22:00	72.0	na	na