APPRAISAL OF WATER-QUALITY CONDITIONS, LOWER BLACK RIVER, WINDSOR COUNTY, VERMONT

By Kenneth W. Toppin

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CONVERSION FACTORS

The following factors can be used to convert inch-pound units to International System of Units (SI), with abbreviations.

Multiply inch-pound unit	by	to obtain SI Unit
inch (in)	25.40	millimeter (mm)
foot (ft)	0.3048	meter (m)
acre	0.4047	hectare
mile	1.609	kilometer (km)
square foot (ft^2)	0.093	square meter (m^2)
cubic foot (ft^3)	0.02832	cubic meter (m^3)
foot per day (ft/d)	0.3048	meter per day (m/d)
cubic foot per day (ft^3/d)	0.02832	cubic meter per day (m^3/d)
foot per foot (ft/ft)	0.3048	meter per meter (m/m)
micromhos per centimeter at 25°C (μmhos/cm at 25°C)	1.000	microsiemens per centimeter at at 25°C (μS/cm at 25°C)

NGVD of 1929 (National Geodetic Vertical Datum of 1929): A geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada, formerly called mean sea level. The datum was derived from the average sea level over a period of many years at 26 tide stations along the Gulf of Mexico, and the Atlantic and Pacific Coasts. NGVD of 1929 is referred to as sea level in this report.

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ABSTRACT

A series of six hydroelectric power dams are planned along the lower Black River in southeastern Windsor County, Vermont. This study is an overall assessment of water-quality conditions along the Black River before construction. Preconstruction water-quality data were collected, during water years 1977-81, at 10 locations extending along a 22-mile reach of the Black River. Nutrient, major constituent, minor element, organic carbon, pesticide, and algal growth potential data were collected at most proposed hydrodam locations and above and below most probable sources of water-quality degradation. Results of this study will be used to prepare an environmental impact statement on the proposed hydroelectric project.

The average specific conductance of the Black River is 101 micromhos per centimeter, indicating that the Black River is relatively low in concentrations of dissolved solids. Concentrations of common constituents and minor elements were generally low and within safe levels for aquatic-life protection.

Near-saturated dissolved-oxygen concentrations and relatively low mean total organic carbon concentrations indicate little inorganic and organic oxygen-consuming substances in the Black River.

Mean total nitrogen concentrations along the study reach ranged from 0.31 to 0.61 mg/L (milligrams per liter). The highest concentrations generally were found below the Towns of Ludlow, Cavendish, and Springfield, most likely due to secondary treated waste discharges entering the river in these areas.

Nitrate was the primary form of inorganic nitrogen found along the Black River. Concentrations of nitrate were also generally highest in the areas of sewage treatment plant discharges. Mean nitrate concentrations ranged from 0.13 to 0.27 mg/L (as N) at the 10 sampling locations and the individual maximum concentrations at these locations ranged from 0.33 to 2.00 mg/L. The data indicate that nitrate concentrations are high enough to promote overproductivity of algae in the proposed Hawks Mountain Reservoir if other growth factors are not limiting.

Mean concentrations of total phosphorus ranged from 0.014 to 0.112 mg/L (as P) along the study reach. Phosphorus concentrations showed little or no increase below sewage treatment plants, except for the farthest downstream station below Springfield. In general, mean total phosphorus concentrations were within the U.S. Environmental Protection Agency suggested concentrations for water entering lakes and reservoirs; however, maximum total phosphorus concentrations were greater than U.S. Environmental Protection Agency suggested levels.

Mean orthophosphorus concentrations ranged from 0.005 to 0.029 mg/L (as P) along the study reach and the individual maximum concentrations at the sampling stations ranged from 0.020 to 0.290 mg/L. These data suggest that the potential exists for nuisance algal conditions to develop in the proposed Hawks Mountain Reservoir.

Maximum individual concentrations of algal growth potential ranged from 2.2 to 15.0 mg/L and mean algal growth potential concentrations ranged from 1.3 to 8.8 mg/L along the study reach. These data indicate that the Black River falls within the moderately high to high productivity range.

Pesticides and polychlorinated biphenyls were not detected in water samples obtained along the Black River.

INTRODUCTION

Background and Description of Study Area

The Black River, a tributary to the Connecticut River, is located in southeastern Windsor County, Vermont (fig. 1), and drains an area of 202 mi^2. The river valley is narrow, and the drainage basin consists mostly of hilly terrain.

A hydroelectric power project consisting of Hawks Mountain, Covered Bridge, Tolles Hill, Gilman, Comtu Falls and Lovejoy hydroelectric dams is planned to provide storage for peak power purposes (Town of Springfield, 1978). The locations of the proposed hydrodams on the Black River are shown in figure 1.

The water quality management plan published by the Vermont Department of Water Resources of the Agency of Environmental Conservation indicates that most of the reach of the Black River studied is classified as class C waters; this is water suitable for recreational boating, for crop irrigation, and as a habitat for fish and wildlife. The reach of the Black River within the area of North Springfield Reservoir is classified as class A water, which is water suitable for public water supply, with disinfection when necessary. These classifications were issued by the Vermont Water Resources Board in 1966, based on water-quality information collected in 1962 (Town of Springfield, 1978).

The Hawks Mountain-Covered Bridge hydroelectric project areas consist mostly of rural forested lands, hay fields, and abandoned fields. Development consists mainly of the urban areas of the Towns of Cavendish and Weathersfield.

The Tolles Hill hydroelectric project area consists mostly of open fields with mixed forest lands to the east of the Black River. Lands in this area are mostly agricultural, and proposed hydroproject lands are owned primarily by the U.S. Army Corps of Engineers.

The proposed Gilman, Comtu, and Lovejoy hydroelectric dams are primarily within the urban area of the Town of Springfield. Industrial and residential development lie adjacent to most of the river in this area.

Ludlow, Cavendish, and Springfield are served by secondary sewage treatment facilities that are located along the Black River. The relationship of the treatment facilities, sampling locations, and proposed hydroelectric units are shown in figure 1.

Streamflow records have been collected on the Black River below North Springfield Reservoir since 1929, and at the Covered Bridge site in Weathersfield since 1975. Drainage areas of the two gages are 158 mi^2 and 114 mi^2, respectively. Average discharge for the North Springfield gage for 52 years of record (1929-81) is 290 ft^3/s (cubic feet per second). Average discharge for the Covered Bridge gage for 7 years of record, water years 1975-81, is 251 ft^3/s.

Water-quality records were collected at the gage in North Springfield in water years 1954 and 1955.

Purpose and Scope

An appraisal of the preimpoundment water-quality conditions of a 22-mile reach of the Black River was made to ascertain water-quality conditions of the Black River before construction of a proposed series of six hydroelectric dams. Data gathered during the study, water years 1977-81, will be used to evaluate the environmental impact hydroelectric development will have on the water quality of the lower Black River.

The objectives of the study are to assess the overall water-quality conditions, discuss the variations in water quality and probable causes, evaluate the effects of secondary treated wastewater on impoundments, and analyze the effect of streamflow regulation on algal production within and downstream of impoundments.

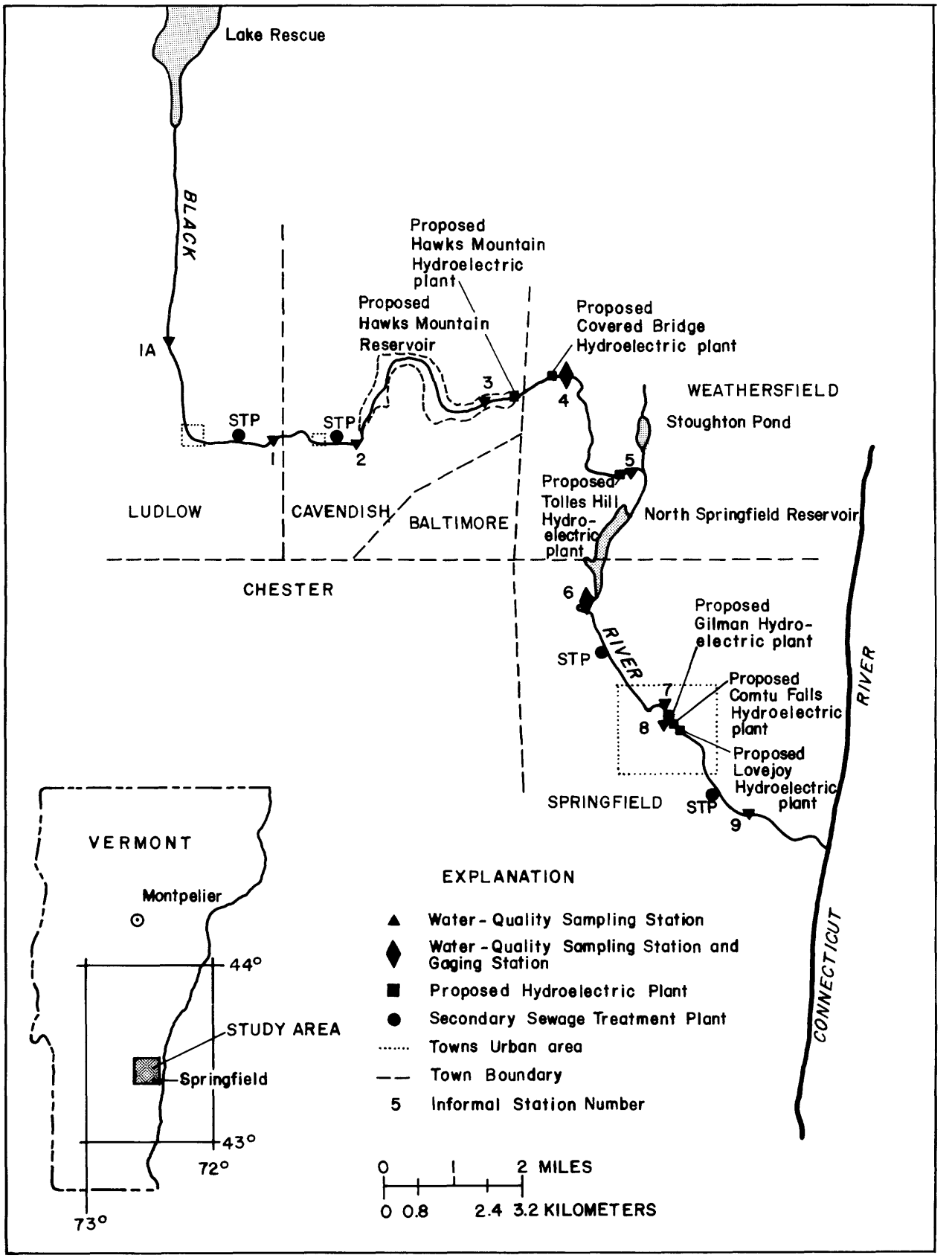

Figure 1.--Location of study area, proposed hydroelectric plants, and water-quality sampling stations

DATA-COLLECTION STATIONS

Nine water-quality data-collection stations were established in 1976. Shown in figure 1 are the locations of the sampling stations and listed in table 1 are the station names, informal numbers and Survey station numbers. The Survey station numbering increases in a downstream direction along the Black River. Station number 8 (01153050) was discontinued in 1978 and replaced by station 01152750 in 1979. Station 01152750 was given the informal number 1A because it was upstream from existing station 1. Throughout the text, references to particular stations will use the informal station number only. Continuous streamflow data were collected at stations 4 and 6.

Table 1.—Data-collection stations

Informal station identification No.	Survey station No.	Station name
1A	01152750	Black River above Ludlow
1	01152760	Black River above Cavendish
2	01152770	Black River below Cavendish
3	01152798	Black River near Hawks Mountain
4	01152800	Black River at Covered Bridge at Weathersfield
5	01152850	Black River at Tolles Hill Dam near Weathersfield
6	01153000	Black River at North Springfield
7	01153025	Black River at Gilman Dam, Springfield
8	01153050	Black River below Comtu Falls Dam, Springfield
9	01153075	Black River below Springfield

METHODS

Various constituents were sampled from November 1976 through November 1980. Nutrient samples were taken once monthly April through November, minor elements and pesticides samples were taken once in July, and samples for major constituents, total organic carbon, and algal growth potential were taken once in April, July, and November of each year (table 2).

Sampling procedures used are described in Guy and Norman (1970), and in Stevens and others (1975). Laboratory analyses were made using the techniques described by Goerlitz and Brown (1972), Greeson and others (1977), and Skougstad and others (1979).

Table 2.—Sampling frequency during water years 1977-81
(X indicates month in which field measurements or samples were obtained.)

	April	May	June	July	August	September	October	November
*Water temperature	X	X	X	X	X	X	X	X
*Specific conductance	X	X	X	X	X	X	X	X
pH	X	X	X	X	X	X	X	X
Dissolved oxygen	X	X	X	X	X	X	X	X
Nutrients	X	X	X	X	X	X	X	X
Minor elements	—	—	—	X	—	—	—	—
Pesticides and PCB's	—	—	—	X	—	—	—	—
Major constituents	X	—	—	X	—	—	—	X
Total organic carbon	X	—	—	X	—	—	—	X
Algal growth potential	X	—	—	X	—	—	—	X

*Miscellaneous measurements of water temperature and specific conductance were taken at sites 4 and 6 at a qreater frequency.

WATER-QUALITY CHARACTERISTICS

Results of Field Measurements

Water Temperature

Water temperatures were taken during midday periods and ranged from 0°C to 29.0°C at the 10 sampling locations (table 3). The data indicate that there were no thermal extremes and the temperatures followed natural seasonal variations.

Table 3.—Ranges of water temperatures

Informal station identification No.	Number of measurements	Maximum (°C)	Minimum (°C)	Mean (°C)
1A	16	24.5	1.0	13.6
1	26	27.0	0.7	14.0
2	27	26.0	0.8	13.8
3	27	29.0	0.0	14.2
4	40	28.0	0.0	13.2
5	27	23.0	0.5	13.3
6	104	26.5	0.0	10.7
7	27	23.4	0.5	13.8
8	11	22.0	2.0	14.3
9	27	23.0	0.5	13.6

pH

pH is a measure of the hydrogen ion activity of water and is used in expressing both acidity and alkalinity of water on a scale of 0 to 14. Water is considered neutral at pH 7.0, increasingly acidic at values less than 7.0, and increasingly alkaline at values greater than 7.0. Natural surface waters generally have a pH range of 6.5 to 8.5 (Hem 1970, p. 93) and is primarily controlled by the carbonate-bicarbonate system composed of carbon dioxide, carbonic acid, bicarbonate ions, and carbonate ions.

The EPA (U.S. Environmental Protection Agency, 1977, p. 178) recommends a pH of 6.5 to 9.0 as the criteria for aquatic life protection. These values were established because pH controls the degree of dissociation of weak acids and bases, and the toxicity of many compounds could be increased depending on the degree of dissociation. For example, ammonia is more toxic to fish in an undissociated form and, at high pH, more of the ammonia present in water is in this form.

Measurements of pH on the Black River were generally made during midday periods and ranged from 5.8 to 9.3 at the 10 sampling locations (table 4). The data show that the maximum value of 9.3 was observed at station 3, Hawks Mountain; this value exceeds the maximum EPA criteria for aquatic life protection. Minimum values exceeded EPA criteria at most sampling locations.

Table 4.—Ranges of pH values

(Sampling period, water years 1977-81.)

Informal station identification No.	Number of measurements	Maximum	Minimum	Mean
1A	16	7.5	5.8	6.7
1	26	7.9	6.0	6.9
2	27	8.5	6.3	7.1
3	27	9.3	6.4	7.8
4	26	8.5	5.8	7.4
5	27	7.5	6.4	6.9
6	29	8.3	6.4	6.9
7	27	7.6	6.3	6.9
8	11	7.4	6.4	6.9
9	27	8.0	6.5	7.1

High concentrations of dissolved solids tend to buffer or increase the ability of water to resist changes in pH. Dissolved solids were found in low concentrations along the Black River which probably accounts for the large variations in pH.

High pH levels are not uncommon in poorly buffered waters during daylight periods when plants utilize carbon dioxide for photosynthesis. High pH levels are generally temporary because maximum photosynthetic activity occurs within a few hours during optimal light conditions and water temperatures.

Low pH levels of 6.5 or less were most likely due to the acidic headwater lakes of the lower Black River, the acid condition perhaps being caused by acid precipitation and the poor buffering capacity of the lower Black River. The low pH levels were observed on overcast days when photosynthetic activity had a minimal impact on the pH level.

Specific Conductance

Specific conductance is a numerical expression of the ability of water to conduct an electric current. The conductance of water is dependent on the sum of its ionic concentrations of constituents and on its temperature. As the amounts of dissolved solids increase, the specific conductance increases. Specific conductance is measured in µmhos/cm and reported at a standard temperature of 25°C.

The highest values of specific conductance usually occurred during periods of low flow when streamflows were maintained by ground-water discharge; the lowest values generally occurred in the spring when streamflow was composed mainly of snowmelt. Figure 2 shows maximum, minimum, and mean specific conductance values along the 10 stations sampled. The range of individual specific conductances from the 10 stations was 46 to 215 µmhos/cm. The highest value occurred at station 9 below Springfield, and the lowest value occurred at station 1A above Ludlow. The relatively low specific conductance values suggest that the Black River is low in total dissolved solids. The average specific conductance increases slightly in a downstream direction which could be due, in part, to a natural increase in dissolved materials, inputs of municipal or domestic sewage, and the effects of highway deicing chemicals.

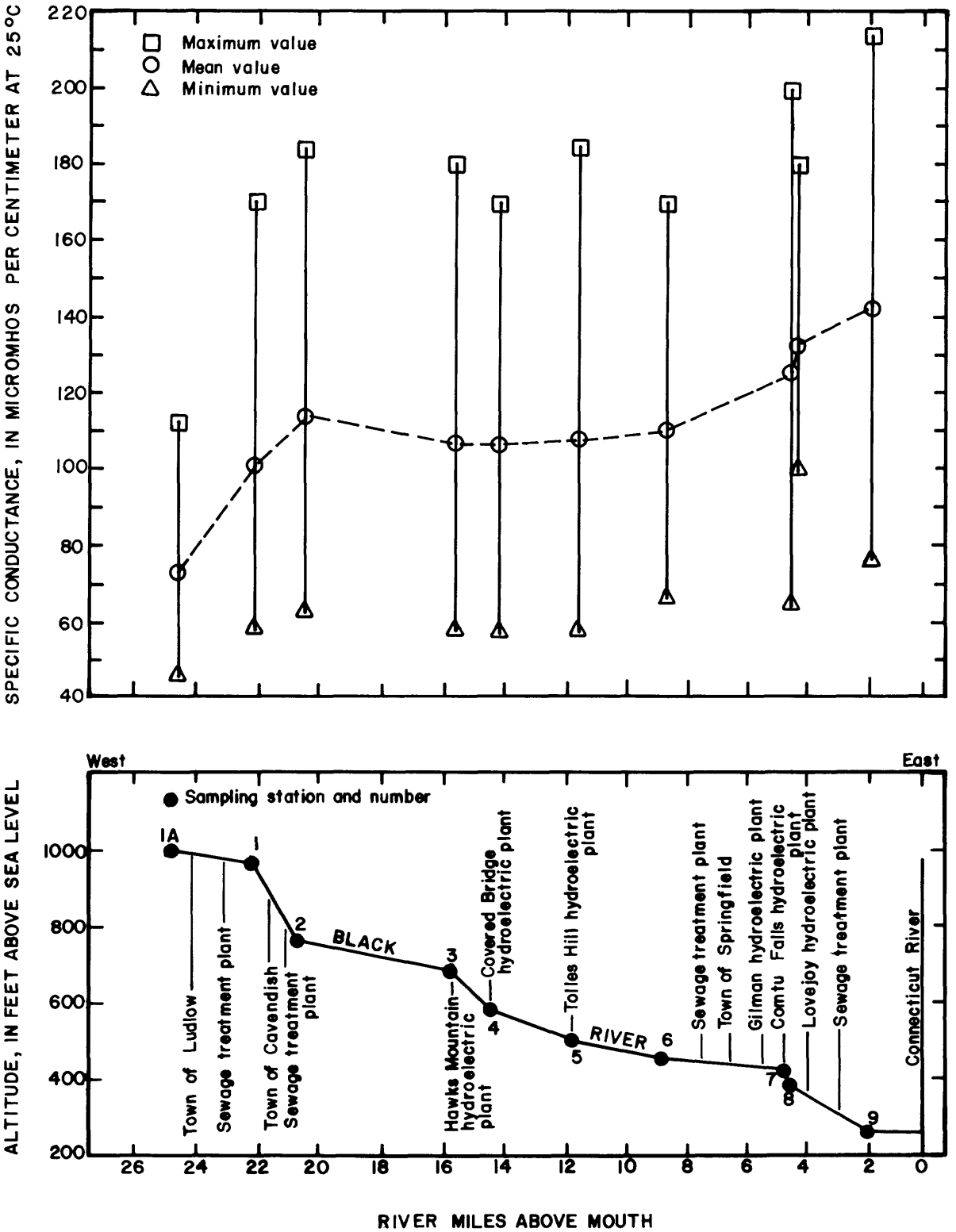

Figure 2.--Maximum, minimum, and mean specific conductance values

Dissolved Oxygen

Dissolved oxygen is probably the most essential substance required by aquatic organisms for metabolism. The atmosphere is the major source of oxygen to water, but oxygen is also contributed to water as a byproduct of photosynthesis. Photosynthetic activity by aquatic plants occurs during the daylight hours when plants convert inorganic substances to organic compounds, thereby releasing oxygen to the water; during the nighttime hours, plants respire and consume oxygen. There are both diel and seasonal variations in dissolved-oxygen concentrations which can be attributed, in part, to variations in temperature, photosynthetic activity, atmospheric pressure, salinity, and oxidation-reduction reactions.

Measurements of dissolved oxygen were made during midday periods only; maximum and minimum listed (table 5) are representative of the oxygen content at the time of sampling only. Minimum dissolved-oxygen concentrations may have been lower at other times of the day, particularly in early morning. Table 5 lists maximum and minimum dissolved-oxygen concentrations as well as maximum and minimum percentages of saturation. The data show that dissolved-oxygen levels are at or near saturation and suggest that either there is little or no demand on dissolved oxygen from the secondary-treated wastewaters that enter the river just upstream of several stations (1, 2, 7, and 9), or that at least oxygen recovery is adequate. Algal growth was not excessive because there were no large variations observed in dissolved-oxygen content.

Table 5.—Ranges of dissolved-oxygen concentrations
(Sampling period, water years 1977-81.)

Informal station identification No.	Number of measurements	Maximum (mg/L)	Percentage of saturation	Minimum (mg/L)	Percentage of saturation
1A	16	13.6	119	8.3	102
1	26	13.4	98	7.0	91
2	27	14.5	105	7.8	99
3	27	15.7	111	7.6	101
4	26	15.0	109	7.1	92
5	27	14.9	106	7.9	81
6	26	14.5	104	7.7	94
7	27	14.9	105	8.2	98
8	11	14.0	103	8.3	95
9	27	14.9	105	8.4	86

Organics

Total Organic Carbon

TOC (total organic carbon) is a measure of the total concentrations of dissolved and suspended organic material. TOC is useful in assessing the organic loading of natural waters, which under natural conditions are known to have TOC concentrations ranging from 1 to 30 mg/L, and in assessing the efficiency of waste treatment.

Eleven TOC samples were taken at all stations during the study except for station 1A (six samples) and station 8 (five samples). Maximum, minimum, and mean concentrations of TOC found at the 10 sampling locations are shown in figure 3. The maximum concentration of 13.0 mg/L was found at station 8, at Comtu Falls Dam, and the high mean of 5.4 mg/L at this station was due to one high value in five samples. The data show that average concentrations of oxygen consuming organics entering the Black River are relatively small. Station 1A has a mean concentration of 2.0 mg/L, and downstream stations have relatively uniform concentrations averaging 3.6 mg/L. The relatively uniform concentrations of TOC along the Black River indicate that discharges from secondary sewage treatment plants, located above stations 1, 2, 7, and 9, do not contain large quantities of organic carbon.

No regulatory criteria are established for TOC, but waters containing concentrations less than 3.0 mg/L have been described as relatively clean (Environment Canada, 1977, p. 44).

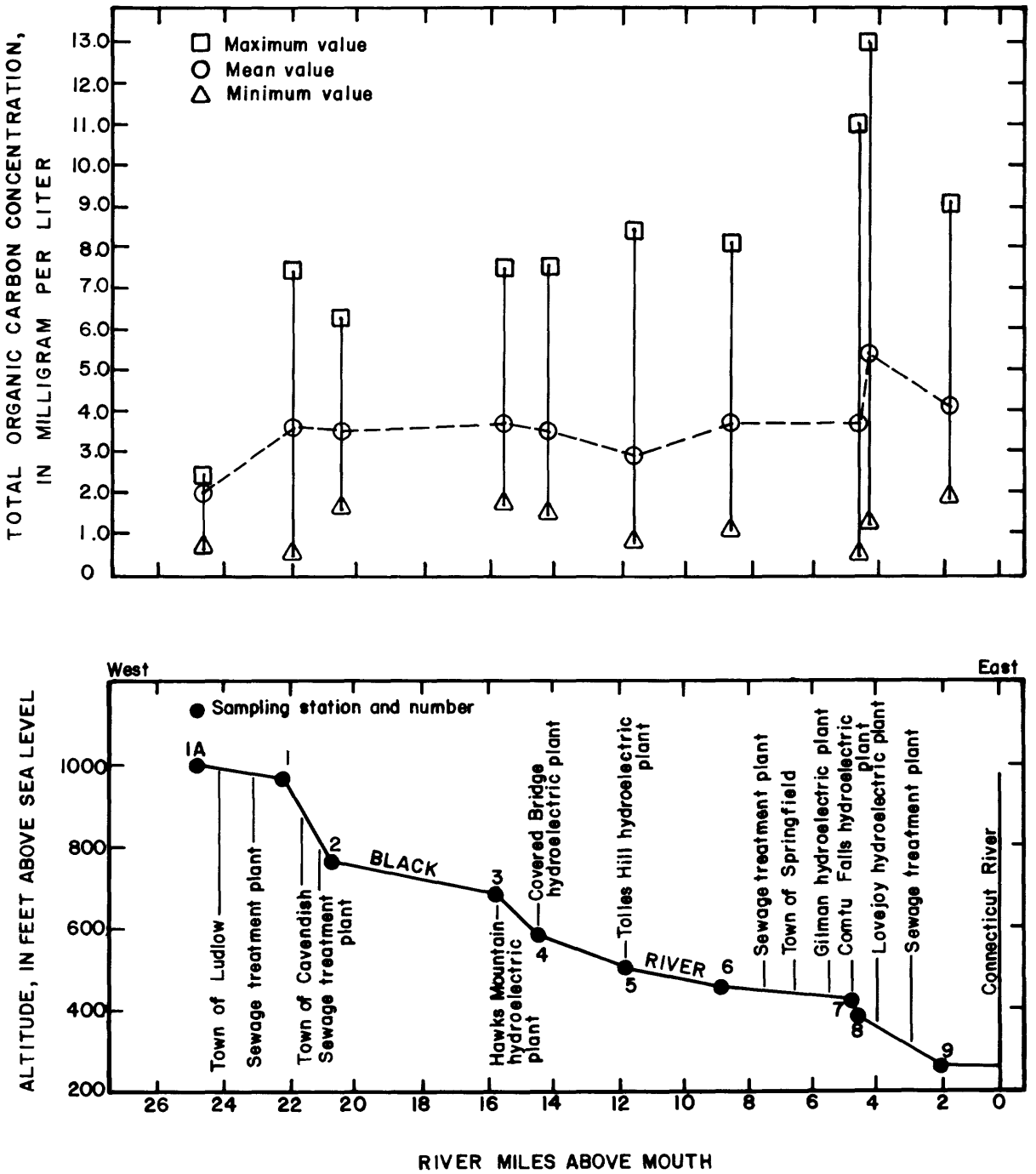

Figure 3.--Maximum, minimum, and mean total organic carbon values

Pesticide Residues and Polychlorinated Biphenyls

Three complete sets of water samples were taken during July of each year for analysis of pesticide residues and PCB's (polychlorinated biphenyls) which included: Perthane, aldrin, lindane, chlordane, DDD, DDT, DDE, dieldrin, endosulfan, endrin, toxaphene, heptachlor, heptachlor epoxide, methoxychlor, mirex, PCB, and polychlorinated napthalene. None of the pesticide residues or PCB's analyzed for were found in detectable concentrations in any of the samples.

Major and Minor Constituents

Major Cations and Anions

Water samples were analyzed for major cations and anions which include calcium, magnesium, sodium, potassium, silica, bicarbonate, sulfate, and chloride. This group of dissolved solids usually accounts for most of the water's specific conductance.

Maximum and minimum concentrations of major anions and cations are listed in table 6. The data show that the bicarbonate, chloride, calcium, and sodium ions comprise the majority of the dissolved solids and an average hardness concentration of approximately 30 mg/L indicated that the Black River water is relatively soft.

Table 6.—Ranges in concentrations of common constituents
(Analyses are in milligrams per liter.)

Informal station identification No.	Calcium dissolved (Ca)	Magnesium dissolved (Mg)	Sodium dissolved (Na)	Potassium dissolved (K)	Silica dissolved (SiO_2)	Bicarbonate (HCO_3)	Sulfate dissolved (SO_4)	Chloride dissolved (Cl)
1A	5.2- 7.4	1.5-2.2	2.9- 4.3	0.8-0.9	2.8-4.5	*24	6.1-6.6	4.6- 7.4
1	4.1-10.0	1.2-2.9	4.2-13.0	0.6-1.6	3.0-4.9	6-31	6.1-8.2	7.2-21.0
2	3.6-11.0	1.2-3.3	2.7-14.0	0.4-1.7	2.6-5.0	10-36	5.5-8.5	7.5-23.0
3	2.0-11.0	1.5-3.0	4.2-12.0	0.8-1.5	2.5-5.3	12-35	4.3-8.6	6.9-20.0
4	4.7-11.0	1.4-3.4	4.1-12.0	0.8-1.6	1.4-5.2	8-34	5.9-8.8	6.3-20.0
5	2.5-12.0	1.5-3.4	4.0-12.0	0.8-1.7	1.9-5.3	9-41	5.8-8.0	5.9-19.0
6	5.4-15.0	1.1-3.4	2.4-10.0	0.6-1.8	2.2-5.4	17-51	5.9-8.4	1.1-17.0
7	5.2-15.0	1.4-3.4	3.5-12.0	0.8-2.0	2.4-5.6	17-50	6.1-8.9	7.4-25.0
8	5.9-16.0	1.5-3.5	4.1-12.0	0.9-2.1	2.9-5.7	19-47	6.1-8.7	7.0-19.0
9	6.0-18.0	1.2-3.7	4.3-14.0	0.8-2.2	2.4-5.7	18-52	6.5-9.2	7.7-24.0
Average number of samples for most stations:	10	10	10	10	10	10	10	10

*One sample taken.

Mean concentrations of all ions increase in a downstream direction, but some concentrations increase more than others. Mean concentrations of potassium, magnesium, silica, and sulfate increase the least. Sodium and chloride mean concentrations show the greatest increases over adjacent upstream stations, particularly at stations 1, 2, 7, and 9 (fig. 4). These sharp increases are most likely due to sewage treatment plant discharges directly upstream from these four stations. Sulfate is a common component of secondary effluents, but does not show the same sharp increases as sodium and chloride. The more intense use of highway deicing chemicals in the urbanized areas of Cavendish, Ludlow, and Springfield could also be contributing to increases in sodium and chloride, although station 8 showed a decrease in mean concentrations of the two constituents. Mean concentrations of sodium and chloride decrease slightly at stations (3, 4, 5, and 6), between urban areas and sewage treatment plants, due to mixing and dilution.

Calcium concentrations gradually increase between stations 1A and 5. Mean calcium concentrations increased by 2.0 mg/L between stations 5 and 6 and then gradually increased by another 1.7 mg/L to station 9.

Concentration guidelines for these ions relate mostly to taste and industrial uses of water containing large amounts of dissolved ions rather than the detrimental effects on man and aquatic life. Although there are some fluctuations of dissolved ions along the Black River, there should be no adverse effects on aquatic life.

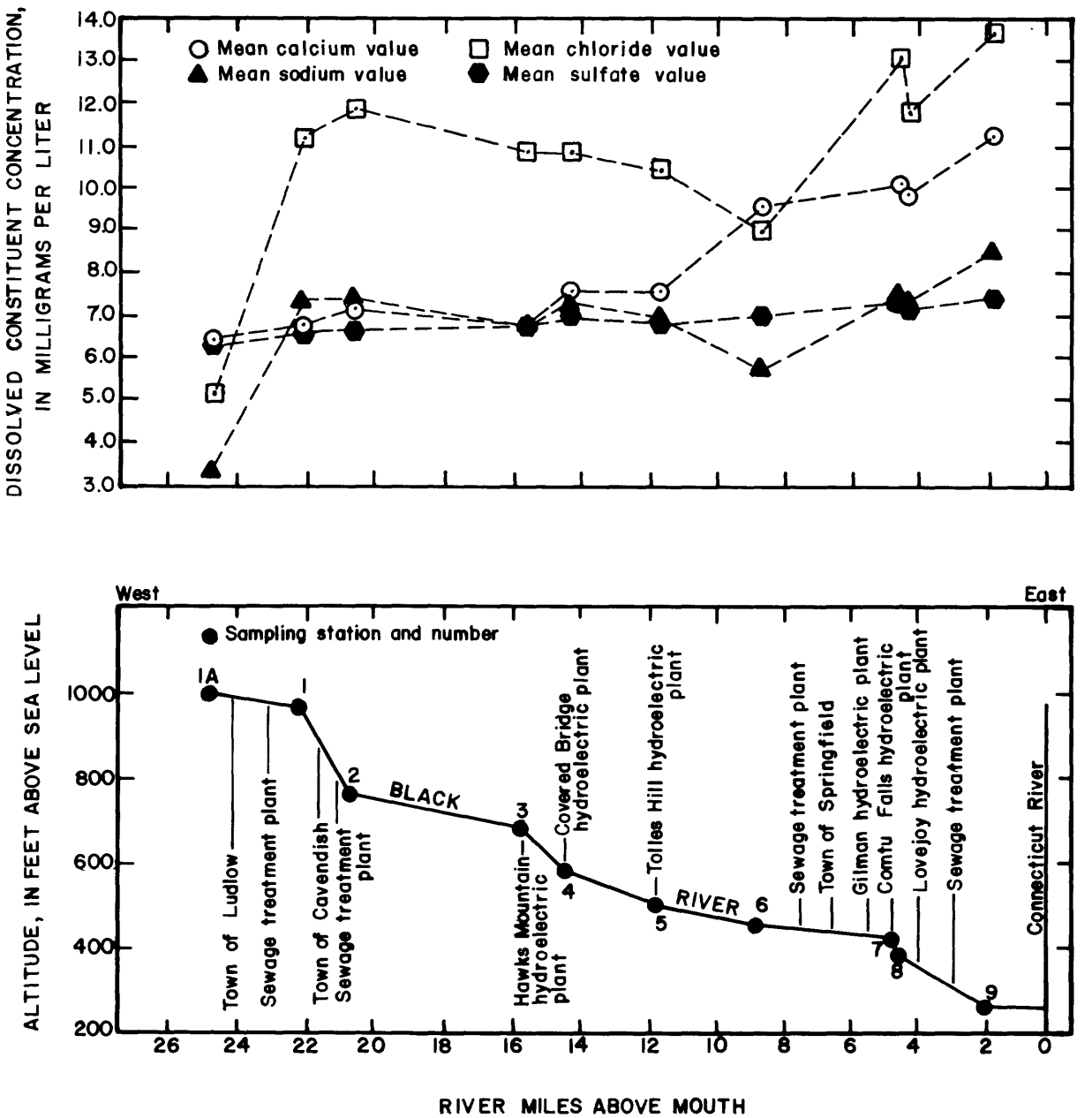

Figure 4.--Mean dissolved concentrations of calcium, sodium, chloride, and sulfate values

Minor Elements

Water samples obtained in July were analyzed for total or dissolved minor elements, which included aluminium, arsenic, cadmium, chromium, cobalt, copper, iron, lead, molybdenum, manganese, nickel, zinc, selenium, and mercury. Natural environments usually contain many of these elements in trace quantities and many are found in secondary-waste effluents.

All minor elements, except zinc, iron, and aluminum, were found in very low concentrations (table 7), within EPA criteria for the protection of aquatic life and criteria levels recommended for drinking water (U.S. Environmental Protection Agency, 1976, 1977).

Although trace quantities of minor elements are essential to aquatic plants and animals for metabolism, elevated concentrations can be toxic to aquatic organisms, particularly fish. Zinc can be acutely toxic to fish particularly in soft water, as in the Black River. Presence of other minor elements, such as copper and cadmium, can enhance the toxicity of zinc. Therefore, guidelines to protect aquatic life specify that zinc concentrations should not exceed 30 µg/L according to the Great Lakes Water Quality Board (McNeely and others, 1979). Stations 3, 4, 7, and 9 all had maximum concentrations at or above 30 µg/L, and the maximum concentration found was 100 µg/L at station 6.

Maximum concentrations of aluminum ranged from 10 µg/L at station 7 to 160 µg/L at station 5. A tentative limit of 100 µg/L set by the Great Lakes Water Quality Board (McNeely and others, 1979) has been proposed for aluminum for the protection of the aquatic biota. Only one sample exceeded this tentative limit. Iron concentrations along the Black River exceeded the EPA concentration limit for the protection of aquatic life (1000 µg/L) in two of the samples collected; sites 2 and 3 had maximum concentrations of 4400 µg/L dissolved iron and 1800 µg/L total iron, respectively.

Minor element concentrations were relatively low along the Black River in most samples and were within safe limits for the protection of aquatic life, except for a few samples. Discharges from sewage treatment plants do not seem to contribute concentrations of minor elements which would adversely affect the Black River.

Cobalt and selenium were below the detectable limit in all samples.

Table 7.—Ranges in concentrations of total and dissolved minor elements

(Concentrations are in micrograms per liter. ND, not detected.)

Site identification No.	Aluminum dissolved	Arsenic dissolved	Arsenic total	Cadmium dissolved	Cadmium total recoverable	Chromium dissolved	Chromium total recoverable	Cobalt dissolved	Copper dissolved
1A	--	--	<1-1	--	<1-<1	--	<20- 20	--	--
1	30- 70	<1-<1	<1-1	<1- 1	<1- 5	<20-<20	<20-<20	<100-<100	<2- 3
2	30- 40	<1- 1	<1-1	<1-<1	<1-12	<20-<20	<20-<20	<100-<100	<2- 5
3	50- 50	<1-<1	<1-3	<1-<1	2- 3	<20-<20	<20-<20	<100-<100	<2- 3
4	60- 70	<1- 1	<1-3	<1-<1	<1- 2	<20-<20	<20- 20	<100-<100	<2- 3
5	30-160	<1-<1	<1-1	<1-<1	<1- 6	<20-<20	<20- 20	<100-<100	<2- 2
6	20- 20	<1-<1	<1-1	<1- 1	<1- 1	<20-<20	<20-<20	<100-<100	<2- 2
7	10- 20	<1-<1	<1-1	<1- 1	<1- 1	<20-<20	<20- 20	<100-<100	<2- 2
8	20- 30	<1-<1	--	<1-<1	--	<20-<20	--	<100-<100	10-12
9	20- 40	<1-<1	<1-3	<1-<1	<1- 2	<20-<20	<20- 20	<100-<100	<2-<2
Average number of samples for most sites----	2	2	2	2	2	2	2	2	2

Table 7.—Ranges in concentrations of total and dissolved minor elements (Continued)

Site identification No.	Copper total recoverable	Iron dissolved	Iron suspended	Iron total recoverable	Lead dissolved	Lead total recoverable	Molybdenum dissolved	Manganese dissolved
1A	ND -1	40- 70	80- 120	120- 180	--	<2- 4	--	--
1	2- 4	<10- 240	90- 190	140- 240	<2- 5	3- 3	<1- 1	20- 80
2	ND- 3	50-4440	150- 200	210- 320	2- 5	<2- 9	<1-<1	80- 90
3	ND- 6	30- 120	140-1700	210-1800	<2- 2	10-10	<1- 1	<10- 60
4	2- 3	30- 150	180- 250	230- 280	<2- 6	<2-<2	<1- 1	20- 70
5	2- 3	<10- 230	140- 160	210- 230	<2- 5	<2-<2	<1- 1	30- 80
6	3-13	<10- 210	470- 700	100- 870	<2-14	<2- 6	1- 1	<10-110
7	4- 5	30- 200	390- 600	480- 710	<2-<2	2- 3	<1- 1	<10- 70
8	--	<10- 160	--	--	2- 2	--	1- 1	<10- 70
9	3- 3	30- 140	530- 540	580- 600	<2-<2	2-10	<1- 1	<10- 80
Average number of samples for most sites----	2	2	2	2	2	2	2	2

Site identification No.	Manganese total recoverable	Nickel dissolved	Mercury dissolved	Mercury total recoverable	Selenium dissolved	Selenium total recoverable	Zinc dissolved	Zinc total recoverable
1A	30- 40	--	--	<0.5-0.5	--	<1-<1	--	10- 20
1	30- 30	ND-1	0.5-0.5	<.5- .5	<1-<1	<1-<1	ND-10	10- 20
2	40- 60	ND-1	.5- .5	<.5- .5	<1-<1	<1-<1	10-10	10- 20
3	30-210	ND-1	.5- .5	<.5- .5	<1-<1	<1-<1	10-10	20- 30
4	20- 30	1-1	.5- .5	<.5- .5	<1-<1	<1-<1	ND-10	10- 40
5	50- 60	1-1	.5- .5	<.5- .5	<1-<1	<1-<1	ND-10	10- 20
6	<10-160	ND-1	.5- .5	<.5- .5	<1-<1	<1-<1	ND-10	20-100
7	120-130	ND-ND	.5- .5	<.5- .5	<1-<1	<1-<1	ND-10	20- 30
8	--	ND-1	.5- .5	--	<1-<1	--	ND-ND	--
9	<10-130	ND-1	.5- .5	<.5- .5	<1-<1	<1-<1	10-10	10- 30
Average number of samples for most sites----	2	2	2	2	2	2	2	2

Nutrients

Samples for nutrient analysis were collected monthly (April through November) of each year. Nitrogen and phosphorus are the two nutrients which are most essential to the growth of aquatic plants and algae, and it is these two nutrients which usually regulate the rate of primary production (algal growth).

There are many sources of nitrogen and phosphorous to water, such as the atmosphere, decomposition of organic material, nitrogen fixation by plants, industrial effluents, agricultural drainage, and weathering of certain types of igneous rocks, to name a few. The overabundance of these nutrients often accelerates the rate of eutrophication and can cause undesirable aquatic conditions. The major forms of nitrogen and phosphorus that affect algal growth are discussed further in this section.

Results of the nutrient analyses (figs. 5-10) were averaged from 28 sets of samples at each station except for station 1A (16 sets) and station 8 (12 sets). Discharge-weighted nutrient concentrations are essentially the same as time-weighted averages as used in this report.

Total Nitrogen

Total nitrogen includes organic nitrogen, nitrates, nitrites, and ammonia nitrogen species. Total nitrogen concentrations are useful in appraising the total amount of nitrogen that potentially is available to aquatic life. Nitrogen can exist in many forms in natural waters, depending on the source of the nitrogen and the degree of decomposition. Decomposition of plant and animal protein results in various forms of organic nitrogen which are further biologically decomposed into ammonia, nitrite, and finally nitrate.

The data (fig. 5) show that mean concentrations of total nitrogen range from 0.31 to 0.61 mg/L along the study reach. The mean total nitrogen concentration at station 1A above Ludlow was 0.37 mg/L. The water quality at station 1A is probably of similar quality to water leaving Lake Rescue, which is approximately 3 miles upstream. Mean concentrations of total nitrogen at stations 1 and 2 are 0.46 and 0.53 mg/L respectively. Slight increases, 0.09 mg/L from stations 1A to 1 and 0.07 mg/L from stations 1 to 2, of mean total nitrogen, are most likely due to the waste discharges from the treatment plants in Ludlow and Cavendish. At stations 3 and 4, mean concentrations of total nitrogen decreased to 0.43 and 0.31 mg/L respectively, indicating dilution and biological assimilation of nitrogen in this area. The mean total nitrogen concentration at station 5 was 0.43 mg/L, increased slightly (0.12 mg/L) over the concentration at station 4. Station 6 had a mean total nitrogen concentration of 0.41 mg/L, decreased slightly from the mean concentration at station 5. There was a steady increase in concentrations of mean total nitrogen at stations 7, 8, and 9 to a mean concentration of 0.61 mg/L at station 9.

Maximum individual concentrations of total nitrogen ranged from 0.58 to 2.5 mg/L along the study reach, the highest value occurring at station 2 below Cavendish. The sewage treatment plants directly above stations 1, 2, 7, and 9 seem to affect the average total nitrogen concentrations along the entire study reach.

Organic Nitrogen

Mean organic nitrogen concentrations (fig. 6) ranged from 0.16 to 0.27 mg/L along the study reach of the Black River. These data indicate that either there is little nitrogenous organic material entering the Black River or that most of the organic forms of nitrogen have been nitrified into other forms, such as nitrite and nitrate. The data show only slight increased mean concentrations of total nitrogen at stations below sewage treatment plants (1, 2, 7, and 9), because most of the nitrogen in secondary effluent is in the inorganic forms.

Maximum individual concentrations of organic nitrogen ranged from 0.33 to 0.99 mg/L along the Black River. Stations 3 and 5 both showed maximum concentrations of 0.99 mg/L The data indicate that as much of the organic nitrogen entering the Black River may be coming from nonpoint sources, such as nitrogenous debris from the watershed.

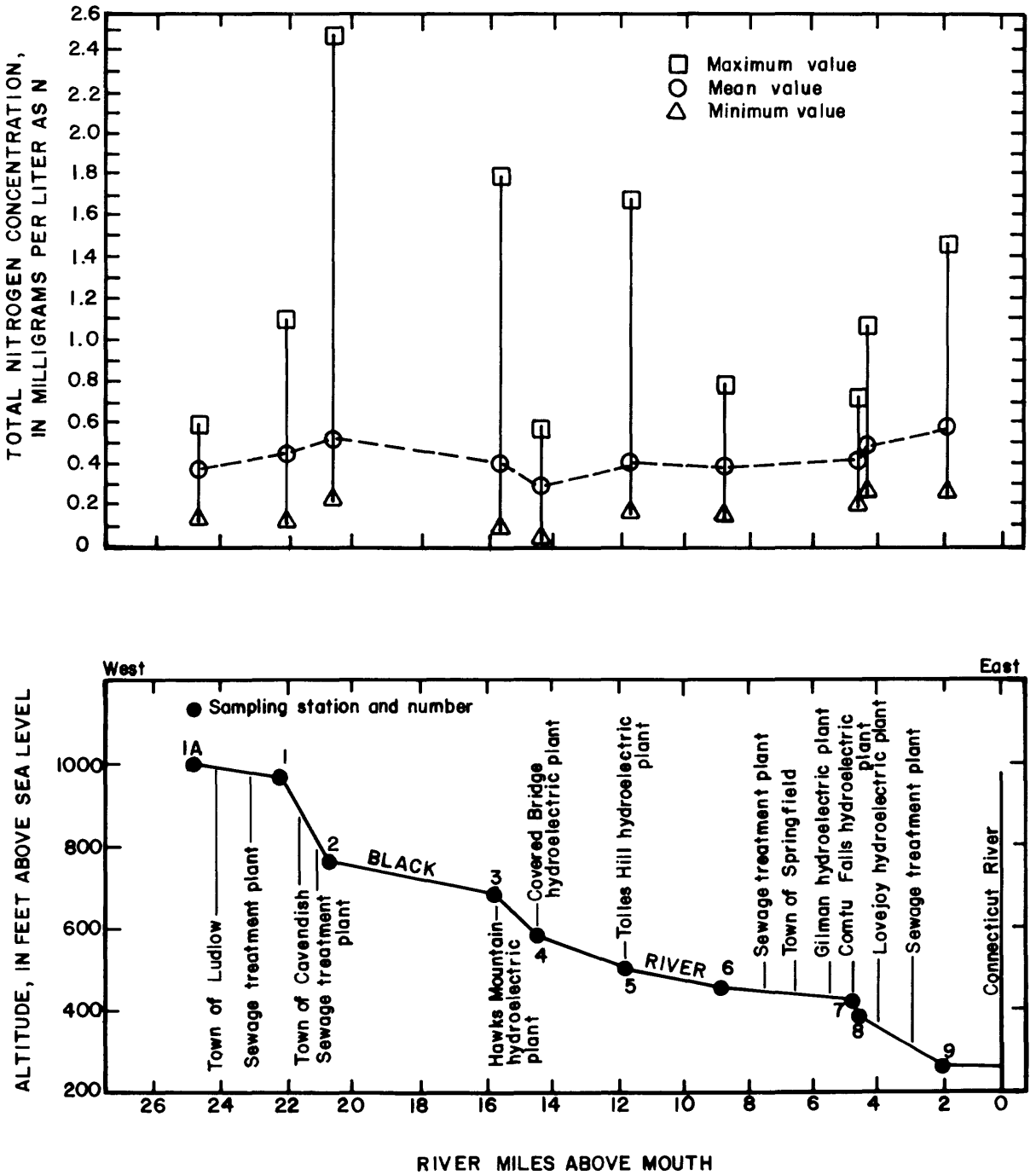

Figure 5.--Maximum, minimum, and mean total nitrogen values

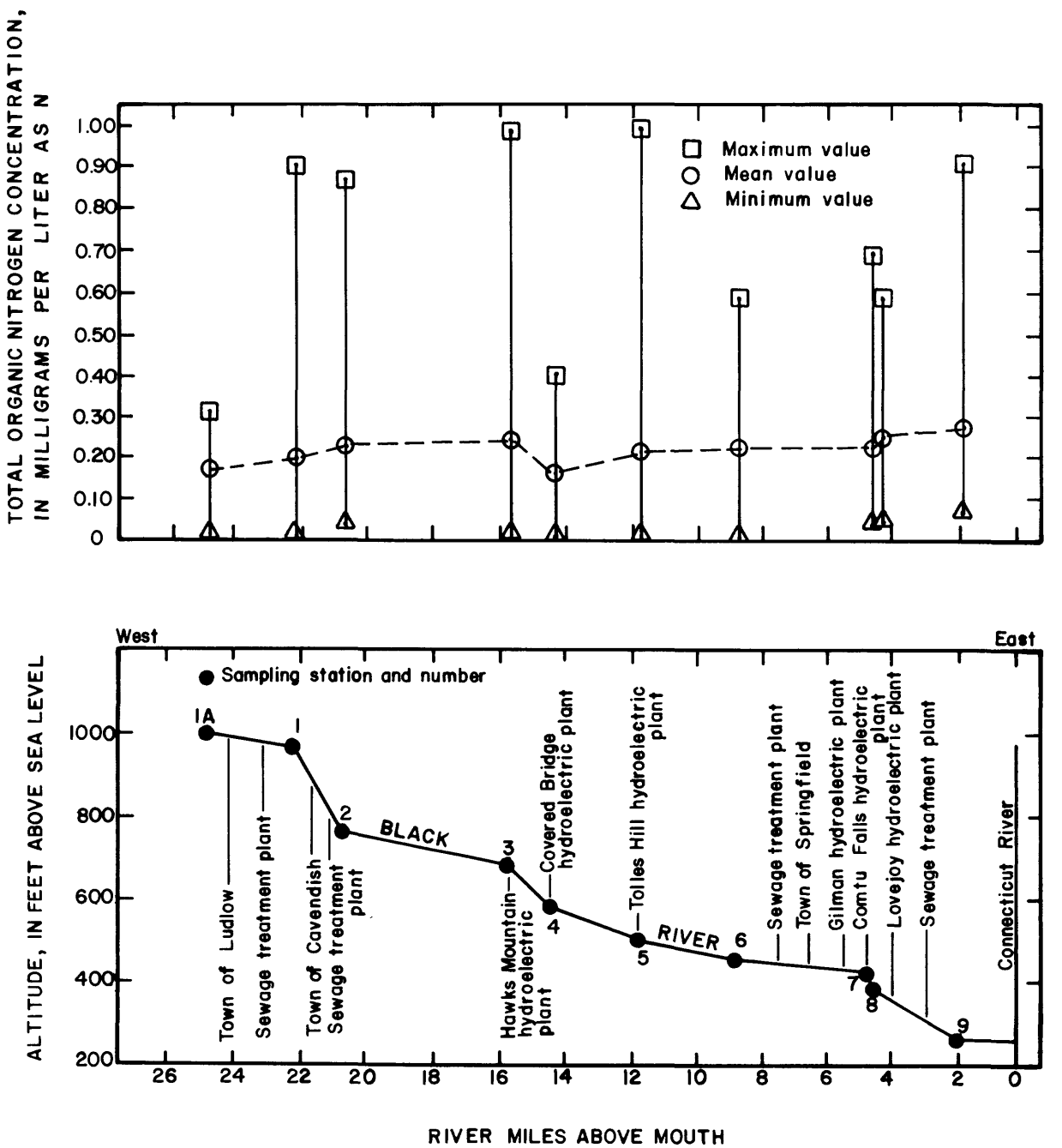

Figure 6.--Maximum, minimum, and mean total organic nitrogen values

Ammonia

Ammonia nitrogen is a common constituent of treated sewage. Natural waters usually contain less than 0.1 mg/L of ammonia (as N), and greater levels are indicative of antheropogenic inputs such as municipal sewage effluents, domestic septic wastes, or industrial effluents. Figure 7 shows that mean concentrations of ammonia nitrogen at all stations are at or below 0.08 mg/L, indicating that there are no excessive man-introduced inputs to the Black River. Ammonia concentrations are generally low because they are rapidly converted to nitrite and nitrate nitrogen forms biologically.

EPA criteria (U.S. Environmental Protection Agency, 1977, p. 10) suggests a maximum permissible concentration of 0.02 mg/L of un-ionized ammonia for aquatic life protection. It is the un-ionized form of ammonia that is most toxic to aquatic life. As ammonia gas dissolves in water, some ammonia reacts with water to form ammonium hydroxide which dissociates into ammonium and hydroxyl ions while some of the ammonia remains un-ionized and attaches loosely to water molecules. The amount of ammonia that remains un-ionized is dependent on pH and water temperature. For example, the greatest individual ammonia concentration was 0.19 mg/L at 18.0°C and a pH of 8.7 at station 3 (Hawks Mountain). Approximately 11 percent (U.S. Environmental Protection Agency, 1977, p. 11) of the 0.19 mg/L of ammonia would be in the un-ionized form at this pH and temperature, accounting for an un-ionized ammonia level of 0.02 mg/L in the worst case. Therefore, all ammonia levels were at or below the EPA criteria level for aquatic life protection.

Nitrite Nitrogen

In bacterial decomposition of organic matter, nitrite nitrogen is an intermediate form which is rapidly converted to nitrate in well-oxygenated natural waters. As expected, this form of nitrogen was found in very low concentrations along the Black River, averaging 0.003 mg/L (as N). The highest mean concentration was 0.15 mg/L at station 9 below Springfield, indicating a significant affect on the Black River by the sewage treatment plant below Springfield. Although nitrite can be used as a source of nitrogen by plants, it is not a major source.

Nitrate Nitrogen

Nitrate nitrogen is the predominant form of inorganic nitrogen found in natural waters because it is the most stable form, resulting from the oxidation of nitrogenous compounds. Sources of nitrate nitrogen include excess application of fertilizer, leachate from domestic septic systems, and municipal sewage effluents. Typical secondary effluents contain approximately 8.0 mg/L (as N) of nitrate nitrogen (Reed and others, 1972, p. 3). This form of nitrogen also exists in waters that have undergone self-purification. Nitrates are seldom abundant in large quantity in surface waters because they are rapidly utilized by plants and algae for growth.

Mean nitrate nitrogen concentrations ranged from 0.13 to 0.27 mg/L along the study reach (fig. 8). Maximum individual concentrations ranged from 0.33 to 2.0 mg/L. Fluctuations in concentrations of nitrate nitrogen showed the same general trend as total nitrogen, that is, higher concentrations generally at stations below sewage treatment plants (stations 1, 2, and 9), except station 7.

Imhoff and Mueller (McKee and Wolf, 1971, p. 227) indicate that excessive growth of plants does not occur in streams and lakes if total nitrate nitrogen is below 0.30 mg/L and total nitrogen is below 0.60 mg/L. Sawyer (1947) suggests that when average spring concentrations of total inorganic nitrogen in lakes and reservoirs are greater than 0.30 mg/L and total inorganic phosphorus concentrations are greater than 0.015 mg/L, nuisance algal conditions could result later on in the summer. Nitrate is the major component of the combined total inorganic forms along the Black River. The data show that mean nitrate nitrogen concentrations are approaching the critical 0.30 mg/L in the area of the proposed Hawks Mountain Reservoir (stations 2 and 3). Station 2 had a mean nitrate nitrogen concentration of 0.27 mg/L and station 3 had a mean of 0.16 mg/L. The lesser concentration at station 3 is probably due to assimilation of nitrate during the summer months. Maximum individual concentrations at all stations exceeded the 0.30 mg/L criteria. Assuming that concentrations of nitrates entering the proposed Hawks Mountain Reservoir will be about the same as during the study, the potential for algal growth problems exists if other growth factors such as temperature and light are adequate and phosphorous or some other micro nutrient is not limiting.

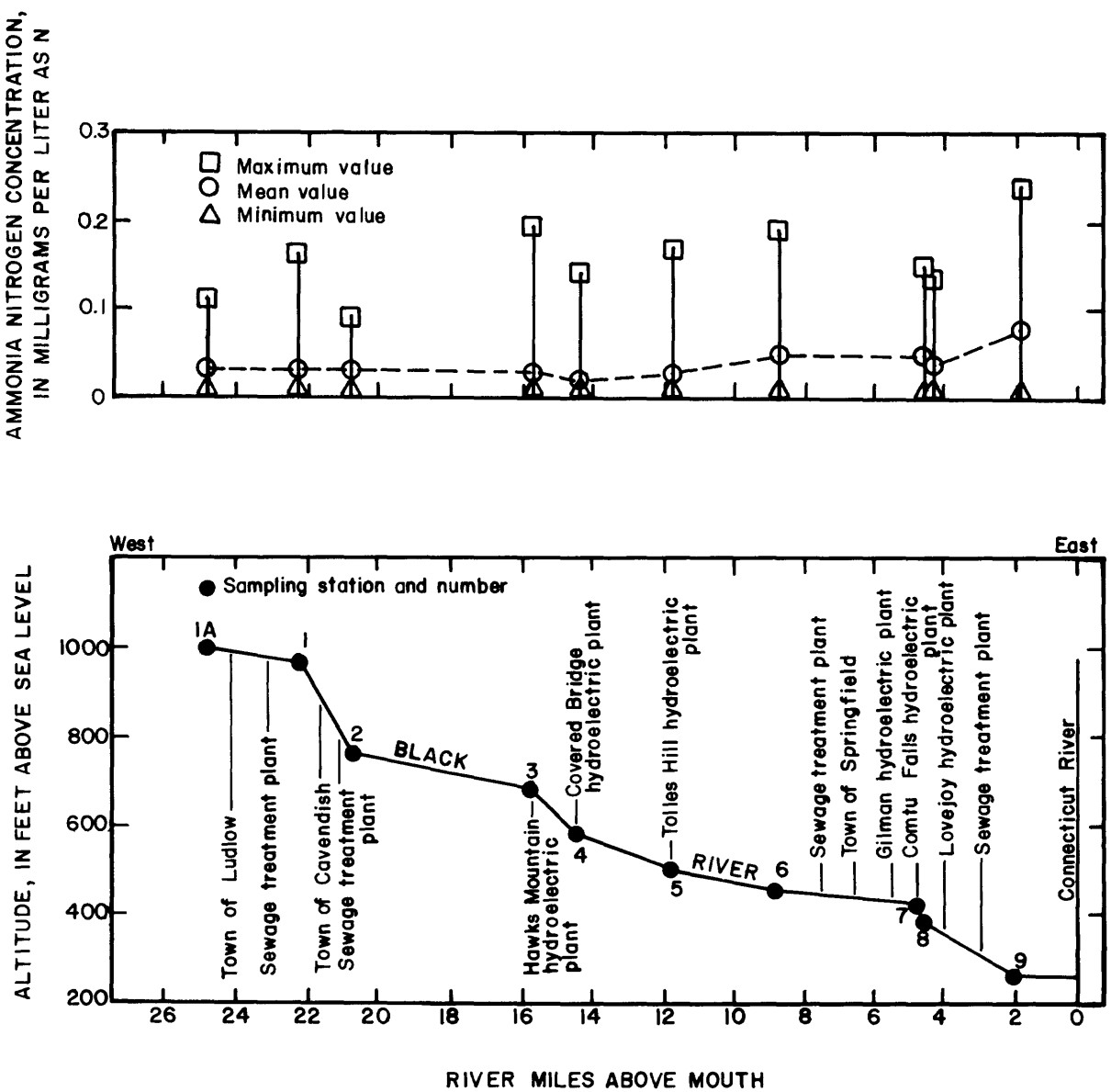

Figure 7.--Maximum, minimum, and mean total ammonia nitrogen values

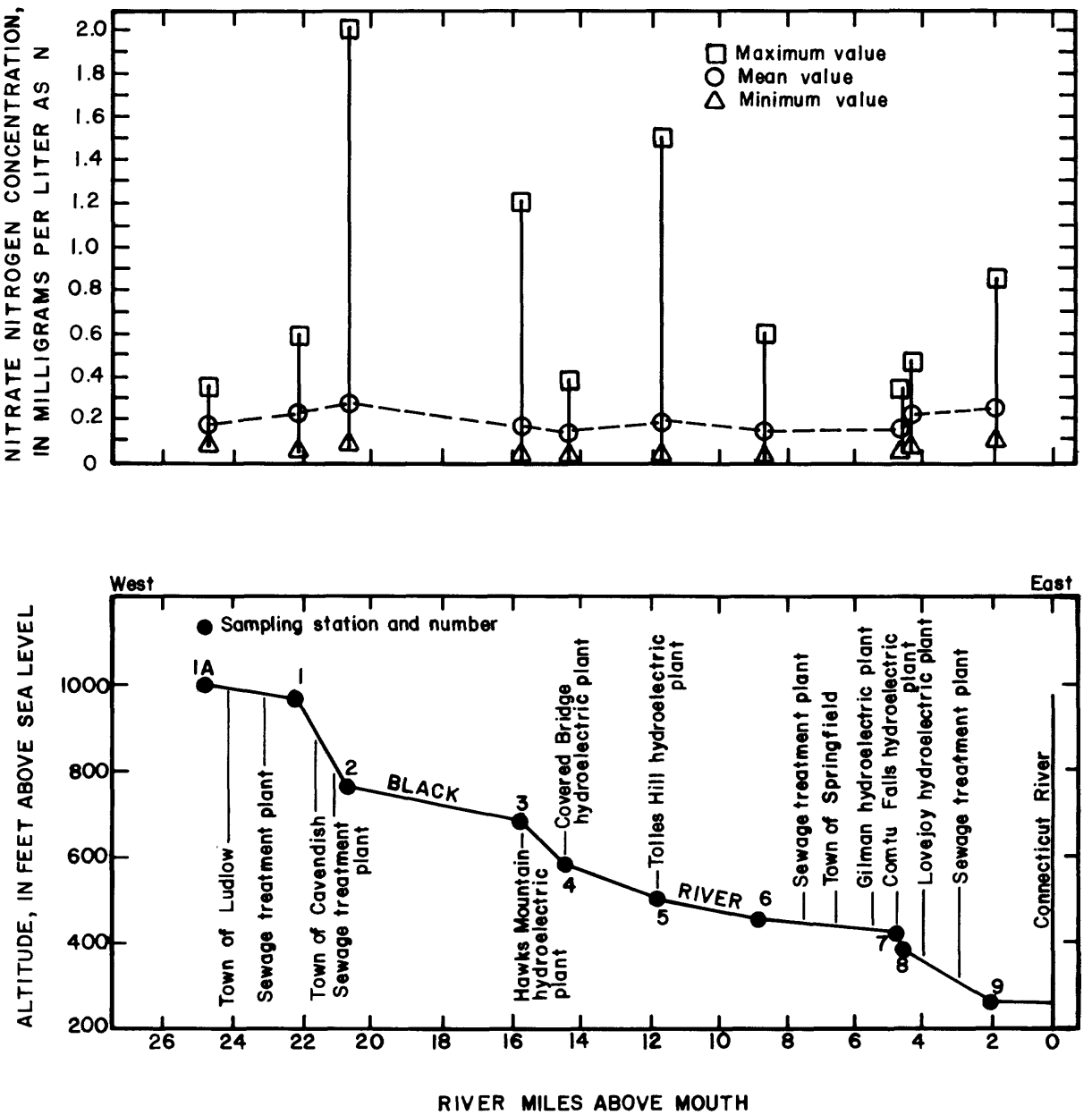

Figure 8.--Maximum, minimum, and mean total nitrate nitrogen values

Phosphorus

Phosphorus is probably the most important element and generally the limiting nutrient for rooted plant and algal growth. Most of the phosphorus entering streams comes from phosphate-bearing rock, fertilizer, detergent, sewage effluent, atmospheric fallout, and the natural breakdown of organic materials.

Phosphorus occurs in natural waters in both organic and inorganic forms. The elemental form of phosphorus which is toxic to aquatic organisms is rarely found in natural waters. Phosphorus, primarily as phosphate, can stimulate nuisance growths of aquatic plants which can be of asthetic and economic concern in lakes and reservoirs.

Twenty-eight sets of total phosphorus samples were taken along the Black River (fig. 9) except for station 1A (16 samples) and station 8 (12 samples). The mean total phosphorus concentration at station 1A was 0.038 mg/L as P. Concentrations of total phosphorus at this station were probably similar to phosphorus concentrations leaving Lake Rescue since station 1A is above the sewage treatment plant and most of the commercial and residential development of the Town of Ludlow. The mean total phosphorus concentrations as P at stations 1 and 2 were 0.031 and 0.020 mg/L, respectively. The data indicate that the sewage treatment plants are either not discharging large amounts of phosphorus or that phosphorus is rapidly utilized by aquatic plants. Stations 3-6 show relatively uniform mean total phosphorus concentrations of 0.024, 0.027, 0.014, and 0.026 mg/L, respectively. Slight differences in phosphorus concentrations at stations 3-6 are most likely due to differences in phosphorus uptake. Station 7 had a mean total phosphorus concentration of 0.034 mg/L, up by 0.008 mg/L over concentration at station 6. The slight increase is probably due to the increase in residential development between stations 6 and 7 as well as some phosphorus inflows to the Black River from the sewage treatment plant above station 7. Stations 8 and 9 had mean total phosphorus concentrations of 0.112 and 0.053 mg/L, respectively. The high mean concentration at station 8 was due to one high concentration of 0.89 mg/L in the 12 samples obtained at this station. The mean phosphorus concentration at station 9 was increased by approximately 0.025 mg/L over concentrations of stations 3-7 most likely due to the large sewage treatment facility which serves the Town of Springfield, located just above this station.

There are no national phosphorus criteria presented for the control of algal overproductivity and other problems associated with eutrophication. However, the EPA suggests that in order to control productivity and accelerated eutrophication, total phosphorus should not exceed 0.050 mg/L as P in a stream where it enters a lake or reservoir, or 0.025 mg/L within a lake or reservoir. Also, in order to limit aquatic plant nuisances in streams, concentrations of total phosphorus should remain below 0.100 mg/L (U.S. Environmental Protection Agency, 1977, p. 188).

The data show that mean concentrations of total phosphorus are within the EPA's suggested levels for water entering lakes and reservoirs at all stations except stations 8 and 9. However, maximum individual concentrations of total phosphorus, obtained at all stations, were either at or above the EPA's recommended levels to lakes and reservoirs.

Although the average concentrations of total phosphorus are generally within suggested levels for the control of eutrophication, the maximum concentrations show that there is a potential for excess phosphorus to sometimes enter the Black River. If other growth substances are available and conditions of temperature and light are favorable for algal growth, the data suggest that nuisance algal conditions are possible in the proposed Hawks Mountain Reservoir.

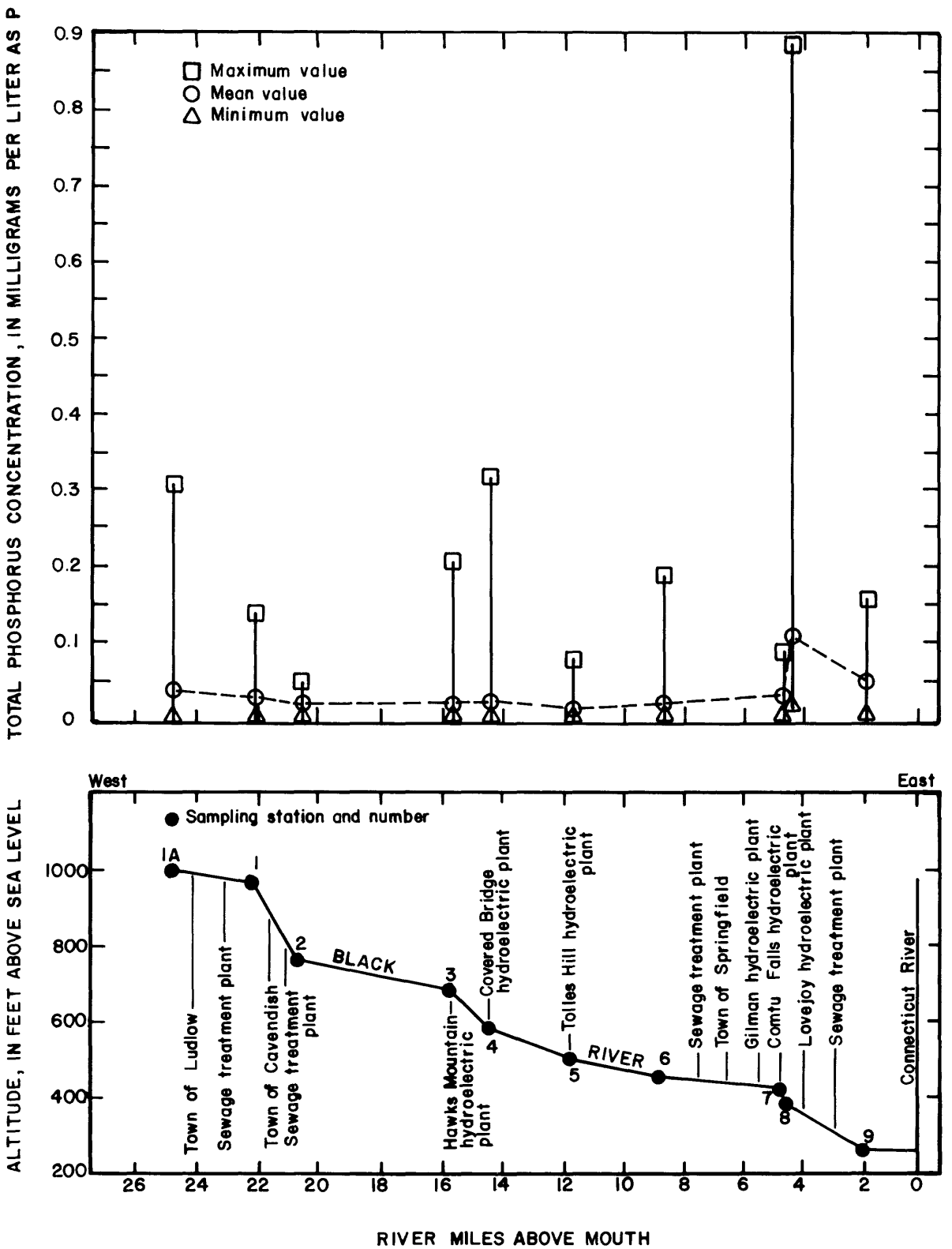

Figure 9.--Maximum, minimum, and mean total phosphorus values

Orthophosphorus

Orthophosphorus is the only significant inorganic form of phosphorus found in natural waters and is the form most readily used by algae for growth. Natural waters usually contain about 10 percent inorganic phosphorus while the remaining 90 percent is organically bound (Wetzel, 1975, p. 216). When average spring concentrations of total inorganic phosphorus in lakes is 0.01 mg/L as P or greater, excessive aquatic growths could occur later on in the summer, according to Sawyer (1947).

Mean concentrations of orthophosphorus at the 10 stations ranged from 0.005 to 0.029 mg/L as P (fig. 10). The highest mean of 0.029 mg/L was at station 1A because of one high orthophosphorus value of 0.29 mg/L in 16 samples. Stations 2 and 3 had mean values of 0.006 mg/L each, in the vicinity of the proposed Hawks Mountain Reservoir.

Minimum concentrations of orthophosphorus observed at all stations were 0.00 mg/L, due to the rapid uptake of orthophosphorus by algae in the summer months.

Maximum concentrations of orthophosphorus ranged from 0.02 to 0.29 mg/L. Most of the maximum concentrations occurred during spring and fall when algal uptake was at a minimum.

The data suggest that spring concentrations of 0.01 mg/L, as suggested by Sawyer, are potentially available for algal growth. This is particularly important in the area of the proposed Hawks Mountain Reservoir, because of the potential for excessive growths in summer months.

ALGAL GROWTH POTENTIAL

AGP (algal growth potential) is a measure of the maximum dry weight of biomass that can be produced in a water sample under ideal standardized laboratory conditions of light and temperature using a test algal species (Greeson and others, 1977). For purposes of this study, the algae was the common green species *Selenastium capricornutum*. The analytical procedure involved autoclaving unfiltered water samples prior to innoculation with the test algae in order to bring all nutrients incorporated in organic forms into solution. Therefore, the total algal growth potential can be measured, and these values can be used to predict potential algal growth problems in lakes and reservoirs. AGP values derived in the laboratory, however, do not necessarily reflect actual conditions of the environment from which the sample was taken.

Average concentrations of AGP (fig. 11) ranged from 1.3 to 8.8 mg/L. The lowest mean value was at station A, and the highest mean value was at station 9. Mean AGP concentrations in the Ludlow, Cavendish, and Springfield areas (stations 1, 2, 7-9) were higher than AGP concentrations in the less densely populated areas, as were the nutrient concentrations in general.

Maximum individual AGP concentrations ranged from 2.2 to 15.0 mg/L.

A study by the EPA (Miller and others, 1974), based on algal productivity in 49 lake waters, defined four algal productivity groups as follows:

(1) Low productivity	0.00-0.10 mg/L dry weight biomass
(2) Moderate productivity	0.11-0.80 mg/L dry weight biomass
(3) Moderately high productivity	0.81-6.00 mg/L dry weight biomass
(4) High productivity	6.10-20.00 mg/L dry weight biomass

The AGP determination is a useful indication of the existing nutrient loading of the Black River, and AGP concentrations can be used to indicate the magnitude of potential algal growth in the proposed Hawks Mountain Reservoir. Maximum, minimum, and mean AGP concentrations indicate that potential productivity levels of the Black River range from moderately high to high productivity.

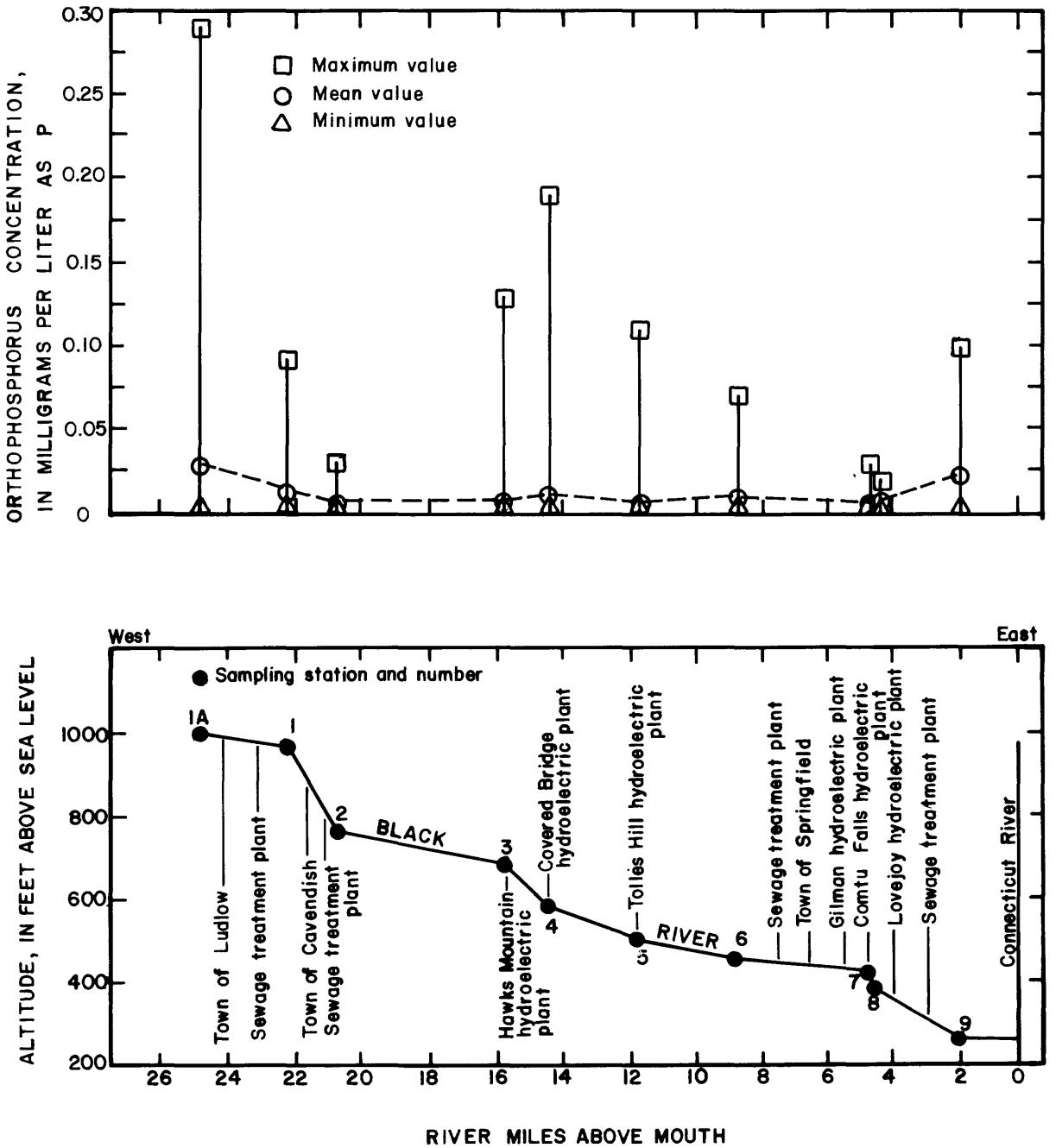

Figure 10.--Maximum, minimum, and mean total orthophosphorus values

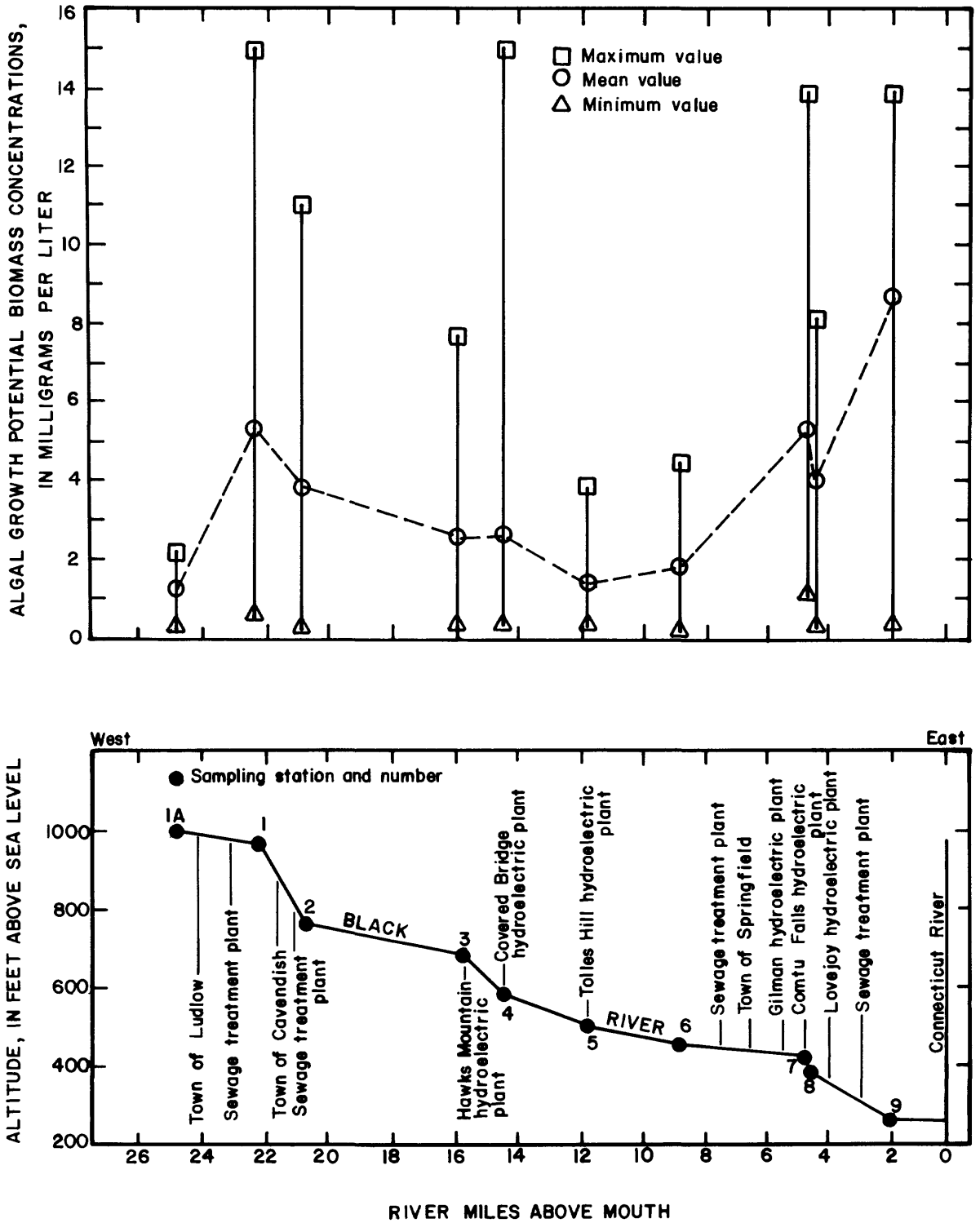

Figure 11.--Maximum, minimum, and mean algal growth potential biomass values

EFFECTS OF SECONDARY EFFLUENTS AND STREAMFLOW REGULATION ON ALGAL PRODUCTION BEHIND AND BELOW IMPOUNDMENTS

Overproductivity of algae in the proposed Hawks Mountain Reservoir as a result of impounded secondary treated wastes is a major concern. The proposed Hawks Mountain Reservoir will cover an area of approximately 24 acres and have an active storage capacity of 6,000 acre-feet (Town of Springfield, 1978). Secondary effluents enter the Black River above station 1 in Ludlow and above station 2 in Cavendish. The upstream end of the proposed reservoir will be approximately in the vicinity of the Cavendish sewage treatment plant, half a mile above station 2.

Typical secondary effluents contain a variety of inorganic chemical elements, including nitrogen and phosphorus, as well as organic compounds such as phenols, chlorinated and other complex organics. Impoundment of secondary effluents will increase the loading of algal growth substances to the reservoir, particularly nitrogen and phosphorus. Therefore, an increase in algal growth is likely. Increased algal growth, in turn, will stimulate growth and increased populations of higher organisms on up the food chain. As organisms die, some are decomposed into inorganic chemical forms and are rapidly recycled. Sedimentation of unutilized inorganics and organics gradually increases the nutrients in the bottom sediments of the reservoir.

Microbial breakdown of organic matter in the water column and sediments utilizes oxygen and is the primary consumer of oxygen in the hypolimnion of lakes and reservoirs. If oxygen is used up in the hypolimnion, chemicals such as phosphorus become more soluble under reducing conditions and are released from the sediments. Under these conditions, phosphorus and other chemicals can become available for plant and algal growth. Therefore, regardless of what the current nutrient loading and trophic status is of a lake or reservoir, nutrient inputs from secondary sewage discharges generally accelerate the eutrophication process of lakes and reservoirs. The extent to which impounded effluents will affect the reservoir is a function of the availability of other growth substances, light and temperature, hydraulic retention time of the reservoir, and to some extent, the degree of hypolimnetic oxygen depletion.

Covered Bridge and Tolles Hill Reservoirs will have active holding capacities of 350 acre-feet and 200 acre-feet, respectively. Daily regulation of flows from the Hawks Mountain Reservoir of approximately 420 acre-feet are expected to flush the Covered Bridge and Tolles Hill impoundments daily. Gilman, Comtu, and Lovejoy hydroelectric units will have no storage capacity (Town of Springfield, 1978). No algal growth problems are anticipated in any of these reservoirs unless unusual conditions, such as the retention of all but minimum flows by Hawks Mountain Reservoir, allow for temperatures and subsequent algal populations to increase.

SUMMARY AND CONCLUSIONS

The Black River is low in dissolved solids, as indicated by a low specific conductance and low concentrations of anions and cations. This suggests that the Black River is affected very little by man. Dissolved-oxygen concentrations were near saturation and TOC concentrations averaged about 3.6 mg/L along the Black River, indicating little or no dissolved-oxygen demand from oxygen consuming substances. No pesticides or PCB's were found. Except for a few high concentrations of aluminum, iron, and zinc, minor elements were found in safe concentrations for the protection of the aquatic environment.

Total nitrogen concentrations, of which nitrate nitrogen was the largest component, were found at higher levels below the Towns of Ludlow, Cavendish, and Springfield. The high concentrations below these towns were most likely due to the secondary effluents entering the Black River in these areas. Nitrate, the most readily utilized form of nitrogen for algal growth, was found in concentrations which could potentially lead to algal growth problems in the proposed Hawks Mountain Reservoir. Organic nitrogen and ammonia were found generally in concentrations which would be protective of aquatic life and no significant increases were found below sewage treatment plants.

Total phosphorus concentrations, at times, exceeded the EPA's recommended levels for water entering lakes and reservoirs, however, mean total phosphorus concentrations were within safe criteria for lakes and reservoirs except at the two farthest downstream stations in Springfield. Orthophosphorus concentrations were found at levels which could potentially promote algal growth if other conditions were favorable. No significant increase in phosphorus concentrations was observed below sewage treatment facilities.

Algal growth potential concentrations indicate that the Black River is in the moderately high to high productivity range. AGP and nutrient data indicate that there is a potential for nuisance algal conditions to develop in the proposed Hawks Mountain Reservoir if factors such as other minor growth substances, light and temperature, and hydraulic retention time are adequate. There should be no problems with algal growths above the the five downstream hydrodams because most dams will not have any storage capacities and the two small dams that do have some storage will be flushed daily by releases from the proposed Hawks Mountain Reservoir.

REFERENCES CITED

Environment Canada, 1977, Surface water quality in Canada—An overview: Inland Waters Directorate, Water Quality Branch, Ottawa, Canada, 45 p.

Goerlitz, D. F., and Brown, Eugene, 1972, Methods for analysis of organic substances in water: U.S. Geological Survey Techniques of Water-Resources Investigations, book 5, chap. A3, 40 p.

Greeson, P. E., Ehlke, T. A., Irwin, G. A., Lium, B. W., and Slack, K. V., 1977, Methods for the collection and analysis of aquatic biological and microbiological samples: U.S. Geological Survey Techniques of Water-Resources Investigations, book 5, chap. A4, 332 p.

Guy, H. P., and Norman, V. W., 1970, Field methods for measurement of fluvial sediment: U.S. Geological Survey Techniques of Water-Resources Investigations, book 3, chap. C2, 59 p.

Hem, J. D., 1970, Study and interpretation of the chemical characteristics of natural water (2d ed.): U.S. Geological Survey Water-Supply Paper 1473, 363 p.

McKee, J. E., and Wolf, H. W., 1971, Water-quality criteria (2d ed.): Resources Agency of California, State Water Resources Control Board, pub. no. 3A, 548 p.

McNeely, R. N., Neimanis, V. P., and Dwyer, L., 1979, Water-quality sourcebook: Environment Canada, Inland Waters Directorate, Water Quality Branch, Ottawa, Canada, 89 p.

Miller, W. E., Maloney, T. E., and Greene, J. C., 1974, Algal productivity in 49 lake waters as determined by algal assays: Water Resources, v. 8, p. 667-679.

Reed, S., Murrmann, P., Koutz, F., Rickard, W., Hunt, P., Buzzell, T., Corey, K., Biello, M., Buda, S., Guter, L., and Sorber, C., 1972, Wastewater management by disposal on land: U.S. Army, Corps of Engineers, Special Report 171, 183 p.

Sawyer, C. N., 1947, Fertilization of lakes by agricultural and urban drainage: New England Water Works Association Journal, v. 61, p. 109-127.

Skougstad, M. W., Fishman, M. J., Friedman, L. C., Erdmann, D. E., and Duncan, S. S., 1979, Methods for determination of inorganic substances in water and fluvial sediments: U.S. Geological Survey Techniques of Water-Resources Investigations, book 5, chap. A1, 626 p.

Stevens, H. H., Jr., Ficke, J. F., and Smoot, G. F., 1975, Water temperature—influential factors, field measurement, and data presentation: U.S. Geological Survey Techniques of Water-Resources Investigations, book 1, chap. D1, 65 p.

Town of Springfield, 1978, Application for license for the Black River hydroelectric project F.E.R.C. Project no. 2750; Exhibit W Environmental report: Prepared for F.E.R.C., 137 p., 12 appendices.

U. S. Council on Environmental Quality, 1975, Environmental Quality, 1975—Sixth annual report of the Council on Environmental Quality: Washington, D.C., U.S. Government Printing Office, 763 p.

U. S. Environmental Protection Agency, 1976, National interim primary drinking water regulations: Washington, D.C., U.S. Environmental Protection Agency, 159 p.

_____1977, Quality criteria for water: Washington, D.C., U.S. Environmental Protection Agency, 256 p.

Wetzel, R. G., 1975, Limnology: Philadelphia, Pa., W. B. Saunders Co., 743 p.

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81

INFORMAL STATION NUMBER 1A. 01152750 - BLACK RIVER ABOVE LUDLOW, VT

DATE	TIME	SPECIFIC CONDUCT-ANCE (UMHOS)	PH (STAND-ARD UNITS)	TEMPER-ATURE, AIR (DEG C)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS NH4)
1979												
APR 17	1340	52	6.8	10.5	4.0	12.6	0.33	0.010	0.34	0.25	0.010	--
MAY 15	1330	55	7.0	22.0	15.0	9.5	.16	<.010	.16	--	.010	0.01
JUN 14	1420	62	7.0	22.0	18.0	9.0	.13	<.010	.13	--	.040	.05
JUL 19	1355	84	7.3	25.0	24.5	8.5	.17	<.010	.17	--	.010	.01
AUG 16	1255	80	7.5	19.0	17.0	9.0	.08	<.010	.08	--	.010	.01
SEP 13	1315	83	6.6	21.0	17.0	9.2	.17	<.010	.17	--	.010	.01
OCT 25	0900	70	6.6	3.0	9.0	10.4	.10	.000	.10	--	.010	.01
NOV 13	1210	65	6.6	7.0	6.0	11.6	.11	.000	.11	--	.010	.01
1980												
APR 24	1230	46	5.8	12.0	6.5	11.3	.32	.000	.32	--	.010	.01
MAY 20	1225	78	6.7	19.0	15.0	10.4	.23	.000	.23	--	.030	.04
JUN 24	1000	85	6.2	24.0	18.0	9.7	.22	.000	.22	--	.070	.08
JUL 24	1410	68	6.7	25.5	24.3	8.3	.11	.010	.12	--	.040	.05
AUG 19	0855	112	6.1	17.5	17.0	9.2	.13	.000	.13	--	.110	.13
SEP 23	1145	97	6.8	20.0	18.0	9.0	.08	.000	.08	--	.110	.13
OCT 28	0845	--	7.2	2.0	8.0	13.6	.18	.000	.18	--	.010	.01
NOV 20	1330	62	6.3	3.0	1.0	13.1	.22	.000	.22	--	.000	.00

DATE	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA+ ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)	PHOS-PHORUS TOTAL (MG/L AS PO4)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)
1979												
APR 17	0.04	0.05	0.39	1.7	0.020	--	--	<0.010	--	--	--	--
MAY 15	.14	.15	.31	1.4	.050	0.15	0.15	<.010	--	--	--	--
JUN 14	.24	.28	.41	1.8	<.010	.00	.00	<.010	--	--	--	--
JUL 19	.18	.19	.36	1.6	<.010	.00	.00	<.010	28	8	7.4	2.2
AUG 16	.04	.05	.13	.58	<.010	.00	.00	<.010	--	--	--	--
SEP 13	.17	.18	.35	1.5	<.010	.06	.00	.020	--	--	--	--
OCT 25	.31	.32	.42	1.9	.010	.03	.03	.010	--	--	--	--
NOV 13	.31	.32	.43	1.9	.010	.00	.03	.000	24	5	6.5	1.9
1980												
APR 24	.26	.27	.59	2.6	.010	.00	.03	.000	19	3	5.2	1.5
MAY 20	.27	.30	.53	2.3	.000	.00	.00	.000	--	--	--	--
JUN 24	.20	.27	.49	2.2	.040	.03	.12	.010	--	--	--	--
JUL 24	.00	.02	.14	.62	.010	.00	.03	.000	25	3	6.8	2.0
AUG 19	.24	.35	.48	2.1	.120	.37	.37	.120	--	--	--	--
SEP 23	.04	.15	.23	1.0	.310	.89	.95	.290	--	--	--	--
OCT 28	.18	.19	.37	1.6	.030	.00	.09	.000	--	--	--	--
NOV 20	.08	.08	.30	1.3	.000	.03	.00	.010	26	9	6.8	2.1

DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	SODIUM+ POTASSIUM DISSOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE FET-FLD (MG/L AS HCO3)	ALKA-LINITY FIELD (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA DIS-SOLVED (MG/L AS SIO2)
1979												
APR 17	--	--	--	--	--	--	11	3.4	6.6	4.8	<0.1	3.8
MAY 15	--	--	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--	--	--
JUL 19	4.3	25	0.4	5.1	0.8	24	20	1.9	6.2	7.4	--	3.5
AUG 16	--	--	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--	--	--
NOV 13	3.2	22	.3	4.0	.8	--	19	9.2	6.5	4.6	--	3.8
1980												
APR 24	2.9	24	.3	--	.8	--	16	49	6.4	4.6	--	3.9
MAY 20	--	--	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--	--	--
JUL 24	3.4	22	.3	--	.8	--	22	8.5	6.1	4.6	--	2.8
AUG 19	--	--	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--	--	--
NOV 20	3.4	22	.3	--	.9	--	--	17	6.2	4.9	--	4.5

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 1A. 01152750 - BLACK RIVER ABOVE LUDLOW, VT (CONTINUED)

DATE	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, INORGANIC, TOTAL (MG/L AS C)	ALGAL GROWTH POTENTIAL (MG/L)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	ARSENIC TOTAL (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)
1979											
APR 17	--	--	2.3	4.1	0.3	--	--	--	--	--	--
MAY 15	--	--	--	--	1.0	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--	--
JUL 19	44	0.06	2.3	--	.9	180	120	60	1	ND	20
AUG 16	--	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--	--
NOV 13	39	.05	.6	6.8	1.7	--	--	70	--	--	--
1980											
APR 24	35	.05	1.8	3.7	2.2	--	--	50	--	--	--
MAY 20	--	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--	--
JUL 24	40	.05	2.4	5.7	1.4	120	80	40	0	0	<10
AUG 19	--	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--	--
NOV 20	39	.05	2.4	5.4	1.1	--	--	40	--	--	--

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	SELENIUM, TOTAL (UG/L AS SE)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, TOTAL (MG/L AS C)	PCB, TOTAL (UG/L)	NAPTHALENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)
1979												
JUL 19	ND	4	30	<0.5	<1	20	--	0.00	0.00	0.00	0.00	0.00
NOV 13	--	--	--	--	--	--	7.4	--	--	--	--	--
1980												
APR 24	--	--	--	--	--	--	5.5	--	--	--	--	--
JUL 24	1	1	40	<.1	0	10	8.1	.00	.00	.00	.00	.00
NOV 20	--	--	--	--	--	--	7.8	--	--	--	--	--

DATE	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)
1979											
JUL 19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0
NOV 13	--	--	--	--	--	--	--	--	--	--	--
1980											
APR 24	--	--	--	--	--	--	--	--	--	--	--
JUL 24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	0
NOV 20	--	--	--	--	--	--	--	--	--	--	--

INFORMAL STATION NUMBER 1. 01152760 - BLACK RIVER ABOVE CAVENDISH, VT

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	PH (STANDARD UNITS)	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)
1976											
NOV 11	1400	--	--	--	--	--	0.21	0.010	0.22	--	0.020
1977											
APR 28	1445	58	6.4	13.0	10.0	10.1	.32	<.010	.32	--	.010
JUN 22	1010	150	6.6	--	16.0	8.5	.16	<.010	.16	--	.020
AUG 25	1410	170	7.4	18.0	17.0	8.7	.58	<.010	.58	--	<.010
OCT 27	1415	69	6.9	--	13.0	9.3	.19	<.010	.19	--	.010
1978											
MAY 23	1515	60	6.5	18.0	16.5	9.8	.19	<.010	.19	--	.010
JUN 27	1415	150	6.8	25.0	22.0	7.3	.37	<.010	.37	--	.010
JUL 19	1545	115	7.0	30.0	27.0	7.0	.22	<.010	.22	--	.040
AUG 29	1355	115	7.2	23.0	19.0	8.6	.15	.010	.16	--	.160
SEP 26	1345	--	--	--	--	--	.13	.010	.14	--	.030
OCT 24	1400	95	6.9	6.0	6.0	13.0	.12	<.010	.12	--	.070
NOV 21	1430	85	6.8	-2.0	4.0	11.0	.16	.010	.17	0.18	.050

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 1. 01152760 - BLACK RIVER ABOVE CAVENDISH, VT (CONTINUED)

DATE	TIME	SPECIFIC CONDUCT-ANCE (UMHOS)	PH (STAND-ARD UNITS)	TEMPER-ATURE, AIR (DEG C)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)
1979											
APR 17	1325	64	6.9	11.0	4.0	12.6	0.23	<0.010	0.23	0.24	<0.010
MAY 15	1305	75	7.4	18.0	15.0	10.0	.22	<.010	.22	--	.010
JUN 14	1400	84	7.3	21.5	18.0	9.7	.21	<.010	.21	--	<.010
JUL 19	1330	138	7.9	24.5	24.0	9.5	.41	<.010	.41	--	.010
AUG 16	1235	114	7.8	19.0	17.0	10.0	.14	<.010	.14	--	.010
SEP 13	1250	83	7.2	21.0	16.0	10.0	.21	<.010	.21	--	<.010
OCT 25	0915	80	6.6	4.0	9.0	11.4	.09	.000	.09	--	.010
NOV 13	1145	75	6.6	7.0	6.0	12.3	.14	.000	.14	--	.010
1980											
APR 24	1210	60	6.0	12.0	6.5	11.3	.04	.000	.04	--	.060
MAY 20	1205	104	7.1	19.0	15.0	10.6	.23	.000	.23	--	.000
JUN 24	1030	136	6.5	24.0	19.0	10.6	.31	.000	.31	--	.080
JUL 24	1345	89	7.0	25.0	23.5	9.2	.04	.000	.04	--	.110
AUG 19	0855	150	6.7	18.0	17.0	10.6	.36	.000	.36	--	.050
SEP 23	1130	132	7.3	19.0	17.0	9.9	.30	.000	.30	--	.030
OCT 28	0910	--	7.2	2.5	5.0	12.8	.26	.000	.26	--	.000
NOV 20	1315	82	6.5	2.0	.7	13.4	.33	.000	.33	--	.000

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS NH4)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)	PHOS-PHORUS TOTAL (MG/L AS PO4)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)
1976											
NOV 11	--	0.13	0.15	0.37	1.6	0.030	--	--	0.010	24	8
1977											
APR 28	--	.18	.19	.51	2.3	.010	--	--	<.010	15	0
JUN 22	--	.22	.24	.40	1.8	.040	--	--	.020	--	--
AUG 25	--	.03	.03	.61	2.7	.110	--	--	.090	37	0
OCT 27	--	.24	.25	.44	1.9	.020	--	--	<.010	--	--
1978											
MAY 23	--	.14	.15	.34	1.5	.020	--	--	<.010	18	0
JUN 27	--	.16	.17	.54	2.4	.050	--	--	.030	--	--
JUL 19	--	.25	.29	.51	2.3	.040	--	--	<.010	29	0
AUG 29	--	.17	.33	.49	2.2	.040	--	--	.010	--	--
SEP 26	--	.10	.13	.27	1.2	.010	--	--	<.010	--	--
OCT 24	--	.41	.48	.60	2.7	.040	--	--	.020	--	--
NOV 21	--	.08	.13	.30	1.3	<.010	--	--	.010	--	--
1979											
APR 17	--	.13	.13	.36	1.6	.010	--	--	<.010	--	--
MAY 15	0.01	.17	.18	.40	1.8	<.010	0.00	0.00	.010	--	--
JUN 14	.00	.17	.17	.38	1.7	.010	.03	.03	<.010	--	--
JUL 19	.01	.20	.21	.62	2.7	.050	.09	.15	.030	32	12
AUG 16	.01	.07	.08	.22	.97	.020	.03	.06	.010	--	--
SEP 13	.00	.90	.90	1.1	4.9	.020	.06	.06	.020	--	--
OCT 25	.01	.20	.21	.30	1.3	.010	.00	.03	.000	--	--
NOV 13	.01	.34	.35	.49	2.2	.010	.00	.03	.000	24	9
1980											
APR 24	.07	.01	.07	.11	.49	.010	.03	.03	.010	20	3
MAY 20	.00	.22	.22	.45	2.0	.010	.06	.03	.020	--	--
JUN 24	.10	.20	.28	.59	2.6	.040	.03	.12	.010	--	--
JUL 24	.13	.01	.12	.16	.71	.140	.00	.43	.000	27	9
AUG 19	.06	.24	.29	.65	2.9	.050	.09	.15	.030	--	--
SEP 23	.04	.26	.29	.59	2.6	.050	.03	.15	.010	--	--
OCT 28	.00	.14	.14	.40	1.8	.020	.00	.06	.000	--	--
NOV 20	.00	.25	.25	.58	2.6	.020	.03	.06	.010	27	10

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 1. 01152760 - BLACK RIVER ABOVE CAVENDISH, VT (CONTINUED)

DATE	CALCIUM, DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DISSOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PER-CENT SODIUM	SODIUM AD-SORP-TION RATIO	SODIUM+ POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE FET-FLD (MG/L AS HCO3)	CAR-BONATE FET-FLD (MG/L AS CO3)	ALKA-LINITY FIELD (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)
1976											
NOV 11	6.2	2.0	5.7	33	0.5	--	0.9	19	--	16	--
1977											
APR 28	4.1	1.2	4.9	40	.6	--	.6	9	0	7.0	5.7
JUN 22	--	--	--	--	--	--	--	--	--	--	--
AUG 25	10	2.9	13	42	1.0	--	1.6	31	0	25	2.0
OCT 27	--	--	--	--	--	--	--	--	--	--	--
1978											
MAY 23	4.8	1.4	4.2	33	.4	--	.9	6	0	5.0	3.0
JUN 27	--	--	--	--	--	--	--	--	--	--	--
JUL 19	8.0	2.3	10	41	.8	--	1.5	24	0	20	3.8
AUG 29	--	--	--	--	--	--	--	--	--	--	--
SEP 26	--	--	--	--	--	--	--	--	--	--	--
OCT 24	--	--	--	--	--	--	--	--	--	--	--
NOV 21	--	--	--	--	--	--	--	--	--	16	4.9
1979											
APR 17	--	--	--	--	--	--	--	--	--	9.0	2.2
MAY 15	--	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--	--
JUL 19	8.7	2.6	13	46	1.0	14	1.1	25	--	21	.5
AUG 16	--	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--	--
NOV 13	6.6	1.9	4.9	30	.4	5.8	.9	--	--	15	7.3
1980											
APR 24	5.5	1.5	5.0	34	.5	--	.8	--	--	17	33
MAY 20	--	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--	--
JUL 24	7.2	2.1	6.2	33	.5	--	1.0	--	--	18	3.5
AUG 19	--	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--	--
NOV 20	7.2	2.3	6.7	34	.6	--	.9	--	--	--	10

DATE	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CON-STITUENTS, DISSOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	CARBON, ORGANIC, TOTAL (MG/L AS C)	CARBON, INORGANIC, TOTAL (MG/L AS C)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	ALGAL GROWTH POTEN-TIAL (MG/L)
1976										
NOV 11	6.8	8.8	--	4.9	45	0.06	6.2	--	--	0.8
1977										
APR 28	6.2	8.1	--	3.0	33	.04	--	--	--	--
JUN 22	--	--	--	--	--	--	--	--	--	--
AUG 25	8.2	19	--	4.8	75	.10	5.9	6.3	--	.6
OCT 27	--	--	--	--	--	--	--	--	--	--
1978										
MAY 23	6.1	7.2	--	3.2	31	.04	7.4	12	--	3.1
JUN 27	--	--	--	--	--	--	--	--	0.00	--
JUL 19	6.7	16	--	4.2	61	.08	4.7	5.3	.00	10
AUG 29	--	--	--	--	--	--	--	--	.00	--
SEP 26	--	--	--	--	--	--	--	--	.00	--
OCT 24	--	--	--	--	--	--	--	--	.00	--
NOV 21	6.5	9.6	<0.1	4.3	--	--	1.9	5.6	--	2.7
1979										
APR 17	6.2	8.8	<.1	4.0	--	--	3.5	4.7	--	.9
MAY 15	--	--	--	--	--	--	--	--	--	3.3
JUN 14	--	--	--	--	--	--	--	--	--	--
JUL 19	7.0	21	--	4.6	70	.10	2.0	--	--	15
AUG 16	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--
NOV 13	6.5	7.4	--	4.1	41	.06	.5	6.3	--	4.8

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 1. 01152760 - BLACK RIVER ABOVE CAVENDISH, VT (CONTINUED)

DATE	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	CARBON, ORGANIC, TOTAL (MG/L AS C)	CARBON, INORGANIC, TOTAL (MG/L AS C)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	ALGAL GROWTH POTENTIAL (MG/L)
1980										
APR 24	6.7	8.6	--	4.1	42	.06	2.8	5.6	--	5.5
MAY 20	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--
JUL 24	6.6	9.4	--	3.2	47	.06	2.2	5.3	--	11
AUG 19	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--
NOV 20	6.7	11	--	4.8	50	.07	2.2	5.6	--	6.8

DATE	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	CHROMIUM, TOTAL, RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)
1976										
NOV 11	--	--	120	70	--	<1	--	ND	--	<20
1977										
APR 28	--	--	240	--	--	--	--	--	--	--
JUN 22	--	--	--	--	--	--	--	--	--	--
AUG 25	--	--	<10	--	--	--	--	--	--	--
OCT 27	--	--	--	--	--	--	--	--	--	--
1978										
MAY 23	--	--	60	--	--	--	--	--	--	--
JUN 27	--	--	--	--	--	--	--	--	--	--
JUL 19	--	--	90	30	--	<1	--	<2	--	2
AUG 29	--	--	--	--	--	--	--	--	--	--
SEP 26	--	--	--	--	--	--	--	--	--	--
OCT 24	--	--	--	--	--	--	--	--	--	--
NOV 21	--	--	--	--	--	--	--	--	--	--
1979										
APR 17	--	--	--	--	--	--	--	--	--	--
MAY 15	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--
JUL 19	240	190	50	--	1	--	5	--	<20	--
AUG 16	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--
NOV 13	--	--	80	--	--	--	--	--	--	--
1980										
APR 24	--	--	50	--	--	--	--	--	--	--
MAY 20	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--
JUL 24	140	90	50	--	0	--	0	--	<10	--
AUG 19	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--
NOV 20	--	--	90	--	--	--	--	--	--	--

DATE	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)
1978											
JUL 19	ND	--	3	--	5	--	20	--	0.5	<1	ND
1979											
JUL 19	--	2	--	3	--	30	--	<0.5	--	--	--
NOV 13	--	--	--	--	--	--	--	--	--	--	--
1980											
APR 24	--	--	--	--	--	--	--	--	--	--	--
JUL 24	--	4	--	3	--	30	--	<.1	--	--	--
NOV 20	--	--	--	--	--	--	--	--	--	--	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 1. 01152760 - BLACK RIVER ABOVE CAVENDISH, VT (CONTINUED)

DATE	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, TOTAL (MG/L AS C)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)
1978											
JUL 19	--	<1	--	<20	--	0.00	0.00	0.00	0.00	0.00	0.00
1979											
JUL 19	<1	--	20	--	--	.00	.00	.00	.00	.00	.00
NOV 13	--	--	--	--	6.8	--	--	--	--	--	--
1980											
APR 24	--	--	--	--	8.4	--	--	--	--	--	--
JUL 24	0	--	10	--	7.5	.00	.00	.00	.00	.00	.00
NOV 20	--	--	--	--	7.8	--	--	--	--	--	--

DATE	DDT, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE, TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PERTHANE, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)
1978										
JUL 19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0
1979										
JUL 19	.00	.00	.00	.00	.00	.00	.00	--	0.00	0
NOV 13	--	--	--	--	--	--	--	--	--	--
1980										
APR 24	--	--	--	--	--	--	--	--	--	--
JUL 24	.00	.00	.00	.00	.00	.00	.00	.00	.00	0
NOV 20	--	--	--	--	--	--	--	--	--	--

INFORMAL STATION NUMBER 2. 01152770 - BLACK RIVER BELOW CAVENDISH, VT

DATE	TIME	SPECIFIC CONDUCT-ANCE (UMHOS)	PH (STAND-ARD UNITS)	TEMPER-ATURE, AIR (DEG C)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)
1976											
NOV 11	1310	--	--	--	--	--	0.22	0.010	0.23	--	0.020
1977											
APR 28	1415	64	6.5	13.0	9.0	10.8	2.0	<.010	2.0	--	.010
JUN 22	1045	125	6.4	--	17.0	8.7	.23	.030	.26	--	<.010
AUG 28	1345	170	7.0	19.0	18.0	9.5	.34	<.010	.34	--	<.010
OCT 27	1355	150	6.7	--	14.0	9.4	.20	<.010	.20	--	.010
1978											
MAY 23	1445	125	6.4	28.0	16.0	10.0	.18	.010	.19	--	.010
JUN 27	1355	160	6.7	27.0	24.0	8.7	.30	<.010	.30	--	.020
JUL 19	1510	115	7.8	31.0	26.0	7.8	.18	<.010	.18	--	.040
AUG 29	1340	120	7.4	24.0	19.0	9.6	.28	.010	.29	--	.080
SEP 26	1345	115	6.8	12.0	12.0	11.0	.14	.010	.15	--	.090
OCT 24	1340	105	7.1	7.0	7.0	13.2	.20	.010	.21	--	.030
NOV 21	1405	85	7.4	-3.0	2.0	12.4	.17	<.010	.17	0.17	.020
1979											
APR 17	1300	64	6.9	11.5	4.0	12.5	.21	<.010	.21	.22	<.010
MAY 15	1240	84	7.7	17.0	14.0	10.5	.20	<.010	.20	--	.010
JUN 14	1340	90	7.4	21.0	16.0	10.2	.16	<.010	.16	--	<.010
JUL 19	1305	145	8.4	24.0	24.0	10.0	.30	<.010	.30	--	.030
AUG 16	1215	120	8.5	18.5	16.0	10.4	.11	<.010	.11	--	.020
SEP 13	1230	129	8.0	21.0	16.5	11.2	.22	.010	.23	--	.020
OCT 25	0930	85	6.7	6.0	9.0	11.6	.08	.000	.08	--	.020
NOV 13	1130	78	6.4	7.0	6.0	12.4	.15	.000	.15	--	.010
1980											
APR 24	1150	63	6.3	11.5	5.8	11.6	.34	.000	.34	--	.070
MAY 20	1150	114	6.7	20.0	13.0	11.2	.21	.000	.21	--	.090
JUN 24	1045	134	6.6	23.0	20.0	8.8	.25	.000	.25	--	.060
JUL 24	1320	100	7.3	25.0	22.2	9.1	.19	.010	.20	--	.060
AUG 19	0945	150	7.1	19.0	18.0	10.2	.07	.000	.07	--	.020
SEP 23	1115	184	7.5	21.0	19.0	9.2	.13	.010	.14	--	.000
OCT 28	0925	--	6.6	2.0	5.0	13.0	.21	.000	.21	--	.000
NOV 20	1250	95	6.9	2.0	.8	14.5	.33	.000	.33	--	.020

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 2. 01152770 - BLACK RIVER BELOW CAVENDISH, VT (CONTINUED)

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS NH4)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)	PHOS-PHORUS TOTAL (MG/L AS PO4)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	HARD-NESS (MG/L AS CACO3)	HARDNESS, NONCAR-BONATE (MG/L CACO3)
1976											
NOV 11	--	0.11	0.13	0.36	1.6	0.020	--	--	.010	25	9
1977											
APR 28	--	.48	.49	2.5	11	.010	--	--	<.010	14	0
JUN 22	--	.52	.52	.78	3.5	.020	--	--	.010	--	--
AUG 28	--	.07	.07	.41	1.8	.040	--	--	.030	41	0
OCT 27	--	.17	.18	.38	1.7	.010	--	--	<.010	--	--
1978											
MAY 23	--	.23	.24	.43	1.9	.020	--	--	<.010	19	0
JUN 27	--	.21	.23	.53	2.3	.010	--	--	<.010	--	--
JUL 19	--	.29	.33	.51	2.3	.020	--	--	<.010	32	0
AUG 29	--	.29	.37	.66	2.9	.050	--	--	<.010	--	--
SEP 26	--	.16	.25	.40	1.8	.030	--	--	.020	--	--
OCT 24	--	.26	.29	.50	2.2	.030	--	--	.010	--	--
NOV 21	--	.12	.14	.31	1.4	<.010	--	--	<.010	--	--
1979											
APR 17	--	.04	.04	.25	1.1	<.010	--	--	<.010	--	--
MAY 15	0.01	.10	.11	.31	1.4	.030	0.09	0.09	<.010	--	--
JUN 14	.00	.20	.20	.36	1.6	.010	.03	.03	<.010	--	--
JUL 19	.04	.17	.20	.50	2.2	.010	.03	.03	.010	36	6
AUG 16	.02	.11	.13	.24	1.1	.010	.00	.03	<.010	--	--
SEP 13	.02	.24	.26	.49	2.2	.010	.00	.03	<.010	--	--
OCT 25	.02	.87	.89	.97	4.3	.010	.00	.03	.000	--	--
NOV 13	.01	.28	.29	.44	1.9	.010	.00	.03	.000	25	2
1980											
APR 24	.08	.08	.15	.49	2.2	.010	.00	.03	.000	20	8
MAY 20	.11	.11	.20	.41	1.8	.010	.00	.03	.000	--	--
JUN 24	.07	.11	.17	.42	1.9	.030	.00	.09	.000	--	--
JUL 24	.07	.06	.12	.32	1.4	.030	.00	.09	.000	30	8
AUG 19	.02	.50	.52	.59	2.6	.040	.03	.12	.010	--	--
SEP 23	.00	.26	.26	.40	1.8	.030	.03	.09	.010	--	--
OCT 28	.00	.12	.12	.33	1.5	.050	.09	.15	.030	--	--
NOV 20	.02	.19	.21	.54	2.4	.010	.06	.03	.020	30	9

DATE	CALCIUM, DIS-SOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORP-TION RATIO	SODIUM+ POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE FET-FLD (MG/L AS HCO3)	CAR-BONATE FET-FLD (MG/L AS CO3)	ALKA-LINITY FIELD (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)
1976											
NOV 11	6.4	2.2	5.6	32	0.5	--	1.0	19	--	16	--
1977											
APR 28	3.6	1.2	2.7	29	.3	--	.4	16	0	13	8.0
JUN 22	--	--	--	--	--	--	--	--	--	--	--
AUG 28	11	3.3	14	41	1.0	--	1.7	36	0	30	5.7
OCT 27	--	--	--	--	--	--	--	--	--	--	--
1978											
MAY 23	5.2	1.5	4.4	32	.5	--	.8	21	0	17	13
JUN 27	--	--	--	--	--	--	--	--	--	--	--
JUL 19	8.5	2.5	10	40	.8	--	1.1	23	0	19	.6
AUG 29	--	--	--	--	--	--	--	--	--	--	--
SEP 26	--	--	--	--	--	--	--	--	--	--	--
OCT 24	--	--	--	--	--	--	--	--	--	--	--
NOV 21	--	--	--	--	--	--	--	--	--	16	1.2
1979											
APR 17	--	--	--	--	--	--	--	--	--	9.0	2.2
MAY 15	--	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--	--
JUL 19	9.4	3.0	13	43	1.0	14	1.3	36	--	30	.2
AUG 16	--	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--	--
NOV 13	6.8	2.0	5.2	30	.5	6.1	.9	--	--	23	18

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 2. 01152770 - BLACK RIVER BELOW CAVENDISH, VT (CONTINUED)

DATE	CALCIUM, DIS-SOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORP-TION RATIO	SODIUM+ POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE FET-FLD (MG/L AS HCO3)	CAR-BONATE FET-FLD (MG/L AS CO3)	ALKA-LINITY FIELD (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)
1980											
APR 24	5.5	1.6	5.5	36	0.5	--	0.8	10	--	12	8.0
MAY 20	--	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--	--
JUL 24	7.9	2.4	7.0	33	.6	--	1.0	--	--	22	2.1
AUG 19	--	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--	--
NOV 20	7.7	2.5	6.6	32	.5	--	.9	--	--	--	5.1

DATE	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CON-STITUENTS, DISSOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	CARBON, ORGANIC, TOTAL (MG/L AS C)	CARBON, INORGANIC, TOTAL (MG/L AS C)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	ALGAL GROWTH POTEN-TIAL (MG/L)
1976										
NOV 11	6.1	9.1	--	5.0	45	0.06	6.3	--	--	0.3
1977										
APR 28	5.5	8.5	--	3.3	33	.05	--	--	--	--
JUN 22	--	--	--	--	--	--	--	--	--	--
AUG 28	8.5	22	--	3.6	86	.11	5.8	7.6	--	11
OCT 27	--	--	--	--	--	--	--	--	--	--
1978										
MAY 23	6.3	7.5	--	3.4	40	.05	5.6	8.5	--	2.6
JUN 27	--	--	--	--	--	--	--	--	0.00	--
JUL 19	6.9	14	--	3.9	59	.08	2.4	4.3	.00	1.2
AUG 29	--	--	--	--	--	--	--	--	.00	--
SEP 26	--	--	--	--	--	--	--	--	.00	--
OCT 24	--	--	--	--	--	--	--	--	.00	--
NOV 21	6.8	9.3	<0.1	4.4	--	--	4.2	.5	--	1.4
1979										
APR 17	6.3	8.8	<.1	4.1	--	--	1.8	5.6	--	.5
MAY 15	--	--	--	--	--	--	--	--	--	3.8
JUN 14	--	--	--	--	--	--	--	--	--	--
JUL 19	7.4	23	--	3.8	79	.11	2.7	--	--	2.8
AUG 16	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--
NOV 13	6.0	8.1	--	4.1	47	.06	4.2	2.8	--	4.4
1980										
APR 24	6.7	9.1	--	4.2	38	.05	1.6	5.8	--	4.6
MAY 20	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--
JUL 24	7.5	11	--	2.6	53	.07	2.2	6.8	--	9.4
AUG 19	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--
NOV 20	6.8	12	--	4.8	54	.07	2.2	6.2	--	4.3

DATE	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)
1976										
NOV 11	--	--	100	40	--	<1	--	ND	--	<20
1977										
APR 28	--	--	130	--	--	--	--	--	--	--
JUN 22	--	--	--	--	--	--	--	--	--	--
AUG 28	--	--	4400	--	--	--	--	--	--	--
OCT 27	--	--	--	--	--	--	--	--	--	--
1978										
MAY 23	--	--	80	--	--	--	--	--	--	--
JUN 27	--	--	--	--	--	--	--	--	--	--
JUL 19	--	--	170	30	--	1	--	ND	--	2
AUG 29	--	--	--	--	--	--	--	--	--	--
SEP 26	--	--	--	--	--	--	--	--	--	--
OCT 24	--	--	--	--	--	--	--	--	--	--
NOV 21	--	--	--	--	--	--	--	--	--	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 2. 01152770 - BLACK RIVER BELOW CAVENDISH, VT (CONTINUED)

DATE	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHRDMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)
1979										
APR 17	--	--	--	--	--	--	--	--	--	--
MAY 15	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--
JUL 19	320	200	120	--	1	--	12	--	<20	--
AUG 16	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--
NOV 13	--	--	80	--	--	--	--	--	--	--
1980										
APR 24	--	--	50	--	--	--	--	--	--	--
MAY 20	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--
JUL 24	210	150	60	--	0	--	0	--	<10	--
AUG 19	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--
NOV 20	--	--	60	--	--	--	--	--	--	--

DATE	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER TOTAL RE-COVERABLE (UG/L AS CU)	COPPER DIS-SOLVED (UG/L AS CU)	LEAD, TDTAL RE-COVERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGANESE, TOTAL RE-COVERABLE (UG/L AS MN)	MANGANESE DISSOLVED (UG/L AS MN)	MERCURY TOTAL, RE-COVERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DISSOLVED (UG/L AS MO)	NICKEL DIS-SOLVED (UG/L AS NI)
1978											
JUL 19	ND	--	5	--	5	--	80	--	0.5	<1	ND
1979											
JUL 19	--	ND	--	9	--	60	--	<0.5	--	--	--
NOV 13	--	--	--	--	--	--	--	--	--	--	--
1980											
APR 24	--	--	--	--	--	--	--	--	--	--	--
JUL 24	--	3	--	1	--	40	--	<.1	--	--	--
NOV 20	--	--	--	--	--	--	--	--	--	--	--

DATE	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, TOTAL (MG/L AS C)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)
1978											
JUL 19	--	<1	--	<20	--	0.00	0.00	0.00	0.00	0.00	0.00
1979											
JUL 19	<1	--	20	--	--	.00	.00	.00	.00	.00	.00
NOV 13	--	--	--	--	7.0	--	--	--	--	--	--
1980											
APR 24	--	--	--	--	7.4	--	--	--	--	--	--
JUL 24	0	--	10	--	9.0	.00	.00	.00	.00	.00	.00
NOV 20	--	--	--	--	8.4	--	--	--	--	--	--

DATE	DDT, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)
1978										
JUL 19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0
1979										
JUL 19	.00	.00	.00	.00	.00	.00	.00	--	0.00	0
NOV 13	--	--	--	--	--	--	--	--	--	--
1980										
APR 24	--	--	--	--	--	--	--	--	--	--
JUL 24	.00	.00	.00	.DO	.00	.00	.00	.00	.00	0
NOV 20	--	--	--	--	--	--	--	--	--	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 3. 01152798 - BLACK RIVER NEAR HAWK MOUNTAIN, BELOW CAVENDISH, VT

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	PH (STANDARD UNITS)	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)
1976											
NOV 11	1150	--	--	--	--	--	0.19	0.010	0.20	--	0.010
1977											
APR 28	1315	58	6.5	14.0	10.0	9.6	1.2	<.010	1.2	--	.010
JUN 22	1100	125	7.7	--	18.0	7.9	.08	<.010	.08	--	.040
AUG 25	1330	180	8.4	18.0	18.0	9.4	.17	.040	.21	--	<.010
OCT 27	1330	95	6.7	--	15.0	8.2	.15	<.010	.15	--	<.010
1978											
MAY 23	1420	125	6.5	28.0	16.0	11.2	.12	<.010	.12	--	.010
JUN 27	1330	125	8.4	28.0	25.0	8.2	.09	<.010	.09	--	.020
JUL 19	1430	110	9.2	32.0	29.0	7.6	.05	.010	.06	--	.040
AUG 29	1320	120	8.5	24.0	19.0	9.5	.20	.010	.21	--	.010
SEP 26	1310	115	8.2	12.0	11.0	11.2	.05	<.010	.05	--	.020
OCT 24	1325	105	8.0	7.0	7.0	13.0	.11	.010	.12	--	<.010
NOV 21	1345	85	7.6	-3.0	2.0	12.4	.13	<.010	.13	0.14	<.010
1979											
APR 17	1240	60	6.7	11.5	4.0	12.5	.17	<.010	.17	.18	<.010
MAY 15	1210	84	8.8	16.0	15.0	10.8	.12	<.010	.12	--	<.010
JUN 14	1250	87	8.4	--	16.0	10.6	.07	<.010	.07	--	.010
JUL 19	1220	135	9.3	24.0	24.0	9.4	.14	<.010	.14	--	.020
AUG 16	1150	118	9.0	18.0	18.0	10.1	.01	<.010	.01	--	.010
SEP 13	1200	122	9.2	21.0	17.0	11.1	.02	<.010	.02	--	.080
OCT 25	1000	83	7.5	6.5	8.5	12.0	.04	.000	.04	--	.010
NOV 13	1110	75	7.3	7.0	5.5	13.2	.13	.000	.13	--	.010
1980											
APR 24	1115	65	6.4	11.0	6.8	11.9	.30	.000	.30	--	.000
MAY 20	1120	116	8.7	22.0	14.5	12.6	.13	.000	.13	--	.150
JUN 24	1105	138	7.6	23.0	20.0	9.8	.15	.000	.15	--	.100
JUL 24	1300	102	7.9	24.0	25.1	9.4	.13	.000	.13	--	.020
AUG 19	1000	155	6.7	18.0	17.0	10.6	.02	.000	.02	--	.050
SEP 23	1100	125	8.7	21.0	18.0	10.6	.02	.000	.02	--	.190
OCT 28	0945	--	7.0	1.5	4.0	13.2	.21	.000	.21	--	.030
NOV 20	1145	95	7.0	1.0	.0	15.7	.28	.000	.28	--	.010

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS NH4)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN AMMONIA+ ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHATE, TOTAL (MG/L AS PO4)	PHOSPHORUS TOTAL (MG/L AS PO4)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)
1976											
NOV 11	--	0.14	0.15	0.35	1.5	0.030	--	--	0.010	25	10
1977											
APR 28	--	.63	.64	1.8	8.1	.010	--	--	<.010	12	0
JUN 22	--	.37	.41	.49	2.2	.010	--	--	<.010	--	--
AUG 25	--	.11	.11	.32	1.4	.040	--	--	.010	40	0
OCT 27	--	.16	.16	.31	1.4	.010	--	--	<.010	--	--
1978											
MAY 23	--	.19	.20	.32	1.4	.010	--	--	<.010	19	0
JUN 27	--	.30	.32	.41	1.8	.010	--	--	<.010	--	--
JUL 19	--	.50	.54	.60	2.7	.010	--	--	<.010	27	0
AUG 29	--	.17	.18	.39	1.7	.030	--	--	<.010	--	--
SEP 26	--	.26	.28	.33	1.5	.020	--	--	<.010	--	--
OCT 24	--	.15	.15	.27	1.2	.010	--	--	<.010	--	--
NOV 21	--	.09	.09	.22	.97	.010	--	--	<.010	--	--
1979											
APR 17	--	.00	<.10	.17	.75	.010	--	--	<.010	--	--
MAY 15	0.00	.12	.12	.24	1.1	.080	0.25	0.25	<.010	--	--
JUN 14	.01	.19	.20	.27	1.2	<.010	.00	.00	<.010	--	--
JUL 19	.02	.15	.17	.31	1.4	.010	.00	.03	<.010	33	4
AUG 16	.01	.08	.09	.10	.44	<.010	.00	.00	<.010	--	--
SEP 13	.10	.86	.94	.96	4.2	.010	.00	.03	<.010	--	--
OCT 25	.01	.99	1.00	1.0	4.6	.010	.00	.03	.000	--	--
NOV 13	.01	.25	.26	.39	1.7	.010	.00	.03	.000	25	4

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 3. 01152798 - BLACK RIVER NEAR HAWK MOUNTAIN, BELOW CAVENDISH, VT (CONTINUED)

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS NH4)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN AMMONIA+ ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)	PHOS-PHORUS TOTAL (MG/L AS PO4)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	HARD-NESS (MG/L AS CACO3)	HARDNESS, NONCAR-BONATE (MG/L CACO3)
1980											
APR 24	0.00	0.19	0.19	0.49	2.2	0.010	0.00	0.03	0.000	21	8
MAY 20	.18	.10	.25	.38	1.7	.210	.40	.64	.130	--	--
JUN 24	.12	.19	.29	.44	1.9	.040	.00	.12	.000	--	--
JUL 24	.02	.16	.18	.31	1.4	.010	.00	.03	.000	29	7
AUG 19	.06	.18	.23	.25	1.1	.010	.00	.03	.000	--	--
SEP 23	.23	.05	.24	.26	1.2	.030	.03	.09	.010	--	--
OCT 28	.04	.08	.11	.32	1.4	.020	.00	.06	.000	--	--
NOV 20	.01	.12	.13	.41	1.8	.000	.03	.00	.010	25	5

DATE	CALCIUM, DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DISSOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PER-CENT SODIUM	SODIUM AD-SORP-TION RATIO	SODIUM+ POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE FET-FLD (MG/L AS HCO3)	CAR-BONATE FET-FLD (MG/L AS CO3)	ALKA-LINITY FIELD (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)
1976											
NOV 11	6.8	2.0	4.8	28	0.4	--	0.9	19	--	16	--
1977											
APR 28	2.0	1.6	4.4	42	.6	--	1.2	12	0	10	6.0
JUN 22	--	--	--	--	--	--	--	--	--	--	--
AUG 25	11	3.0	12	38	.9	--	1.5	30	0	25	.2
OCT 27	--	--	--	--	--	--	--	--	--	--	--
1978											
MAY 23	5.3	1.5	4.2	31	.4	--	.8	22	0	18	11
JUN 27	--	--	--	--	--	--	--	--	--	--	--
JUL 19	7.5	2.1	8.3	38	.7	--	1.4	31	0	25	.0
AUG 29	--	--	--	--	--	--	--	--	--	--	--
SEP 26	--	--	--	--	--	--	--	--	--	--	--
OCT 24	--	--	--	--	--	--	--	--	--	--	--
NOV 21	--	--	--	--	--	--	--	--	--	18	.9
1979											
APR 17	--	--	--	--	--	--	--	--	--	9.0	3.5
MAY 15	--	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--	--
JUL 19	8.9	2.6	11	41	.9	12	1.2	35	--	29	.0
AUG 16	--	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--	--
NOV 13	6.7	2.0	4.9	29	.4	5.7	.8	--	--	21	2.0
1980											
APR 24	5.7	1.6	5.1	34	.5	--	.9	--	--	13	10
MAY 20	--	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--	--
JUL 24	7.7	2.3	7.4	35	.6	--	1.1	--	--	22	.5
AUG 19	--	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--	--
NOV 20	6.5	2.1	6.0	34	.5	--	.8	--	--	--	3.9

DATE	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CON-STITUENTS, DISSOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	CARBON, ORGANIC, TOTAL (MG/L AS C)	CARBON, INORGANIC, TOTAL (MG/L AS C)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	ALGAL GROWTH POTEN-TIAL (MG/L)
1976										
NOV 11	8.6	7.4	--	5.3	45	0.06	6.0	--	--	0.4
1977										
APR 28	4.3	6.9	--	3.2	30	.04	--	--	--	--
JUN 22	--	--	--	--	--	--	--	--	--	--
AUG 25	8.4	20	--	3.2	74	.10	6.3	6.9	--	7.7
OCT 27	--	--	--	--	--	--	--	--	--	--
1978										
MAY 23	6.5	7.2	--	3.5	40	.05	5.7	9.1	--	3.8
JUN 27	--	--	--	--	--	--	--	--	0.00	--
JUL 19	6.7	13	--	3.1	57	.08	2.1	3.8	.00	1.1
AUG 29	--	--	--	--	--	--	--	--	.00	--
SEP 26	--	--	--	--	--	--	--	--	.00	--
OCT 24	--	--	--	--	--	--	--	--	.00	--
NOV 21	6.9	9.0	<0.1	4.5	--	--	1.7	5.1	--	1.8

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 3. 01152798 - BLACK RIVER NEAR HAWK MOUNTAIN, BELOW CAVENDISH, VT (CONTINUED)

DATE	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	CARBON, ORGANIC, TOTAL (MG/L AS C)	CARBON, INORGANIC, TOTAL (MG/L AS C)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	ALGAL GROWTH POTENTIAL (MG/L)
1979										
APR 17	6.3	7.6	<0.1	4.2	--	--	2.4	9.7	--	.4
MAY 15	--	--	--	--	--	--	--	--	--	1.5
JUN 14	--	--	--	--	--	--	--	--	--	--
JUL 19	7.4	20	--	3.3	72	0.10	2.6	--	--	1.8
AUG 16	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--
NOV 13	6.2	7.5	--	4.2	45	.06	7.5	.0	--	2.9
1980										
APR 24	7.1	8.7	--	4.3	41	.06	2.4	3.8	--	3.5
MAY 20	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--
JUL 24	6.9	11	--	2.5	52	.07	2.1	5.6	--	3.4
AUG 19	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--
NOV 20	7.0	12	--	4.1	51	.07	2.0	5.4	--	2.3

DATE	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	CADMIUM TOTAL, RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)
1976										
NOV 11	--	--	120	50	--	<1	--	ND	--	<20
1977										
APR 28	--	--	80	--	--	--	--	--	--	--
JUN 22	--	--	--	--	--	--	--	--	--	--
AUG 25	--	--	30	--	--	--	--	--	--	--
OCT 27	--	--	--	--	--	--	--	--	--	--
1978										
MAY 23	--	--	80	--	--	--	--	--	--	--
JUN 27	--	--	--	--	--	--	--	--	--	--
JUL 19	--	--	100	50	--	<1	--	ND	--	<2
AUG 29	--	--	--	--	--	--	--	--	--	--
SEP 26	--	--	--	--	--	--	--	--	--	--
OCT 24	--	--	--	--	--	--	--	--	--	--
NOV 21	--	--	--	--	--	--	--	--	--	--
1979										
APR 17	--	--	--	--	--	--	--	--	--	--
MAY 15	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--
JUL 19	210	140	70	--	3	--	2	--	<20	--
AUG 16	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--
NOV 13	--	--	70	--	--	--	--	--	--	--
1980										
APR 24	--	--	40	--	--	--	--	--	--	--
MAY 20	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--
JUL 24	1800	1700	60	--	0	--	3	--	<10	--
AUG 19	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--
NOV 20	--	--	50	--	--	--	--	--	--	--

DATE	COBALT, DISSOLVED (UG/L AS CO)	COPPER TOTAL RECOVERABLE (UG/L AS CU)	COPPER DISSOLVED (UG/L AS CU)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE DISSOLVED (UG/L AS MN)	MERCURY TOTAL, RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL DISSOLVED (UG/L AS NI)
1978											
JUL 19	ND	--	3	--	2	--	<10	--	0.5	1	ND
1979											
JUL 19	--	ND	--	10	--	30	--	<0.5	--	--	--
NOV 13	--	--	--	--	--	--	--	--	--	--	--
1980											
APR 24	--	--	--	--	--	--	--	--	--	--	--
JUL 24	--	6	--	10	--	210	--	<.1	--	--	--
NOV 20	--	--	--	--	--	--	--	--	--	--	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 3. 01152798 - BLACK RIVER NEAR HAWK MOUNTAIN, BELOW CAVENDISH, VT (CONTINUED)

DATE	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, TOTAL (MG/L AS C)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)
1978											
JUL 19	--	<1	--	<20	--	0.00	0.00	0.00	0.00	0.00	0.00
1979											
JUL 19	<1	--	20	--	--	.00	.00	.00	.00	.00	.00
NOV 13	--	--	--	--	7.5	--	--	--	--	--	--
1980											
APR 24	--	--	--	--	6.2	--	--	--	--	--	--
JUL 24	0	--	30	--	7.7	.00	.00	.00	.00	.00	.00
NOV 20	--	--	--	--	7.4	--	--	--	--	--	--

DATE	DDT, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)
1978										
JUL 19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0
1979										
JUL 19	.00	.00	.00	.00	.00	.00	.00	--	0.00	0
NOV 13	--	--	--	--	--	--	--	--	--	--
1980										
APR 24	--	--	--	--	--	--	--	--	--	--
JUL 24	.00	.00	.00	.00	.00	.00	.00	.00	.00	0
NOV 20	--	--	--	--	--	--	--	--	--	--

INFORMAL STATION NUMBER 4. 01152800 - BLACK RIVER AT COVERED BRIDGE, AT WEATHERSFIELD, VT

DATE	TIME	STREAMFLOW, INSTAN-TANEOUS (CFS)	SPECIFIC CONDUCT-ANCE (UMHOS)	PH (STAND-ARD UNITS)	TEMPERA-TURE, AIR (DEG C)	TEM-PERA-TURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN NO2+NO3 DISSOLVED (MG/L AS N)
1976											
NOV 11	1020	239	--	--	--	--	--	0.19	0.010	0.20	--
1977											
JAN 17	1315	72	--	--	--	0.0	--	--	--	--	--
APR 28	1330	438	68	6.6	16.0	11.0	11.0	.37	<.010	.37	--
MAY 18	1315	194	--	--	--	19.0	--	--	--	--	--
JUN 14	1135	115	--	--	--	18.5	--	--	--	--	--
JUN 22	1115	72	122	6.6	--	17.0	8.9	.08	<.010	.08	--
JUL 12	1210	69	--	--	--	19.0	--	--	--	--	--
AUG 16	1110	35	--	--	--	18.5	--	--	--	--	--
AUG 25	1300	30	170	7.7	18.0	16.0	9.5	.22	.020	.24	--
OCT 17	1530	4040	--	--	--	--	--	--	--	--	--
OCT 27	1315	250	100	7.2	--	14.0	9.2	.14	<.010	.14	--
NOV 30	1500	223	--	--	--	2.0	--	--	--	--	--
1978											
FEB 01	1215	277	--	--	--	.0	--	--	--	--	--
MAR 20	1300	178	--	--	--	--	--	--	--	--	--
MAY 23	1340	381	125	6.7	27.0	16.0	9.9	.11	<.010	.11	--
MAY 30	1120	281	63	--	--	19.0	--	--	--	--	--
JUN 27	1310	52	130	7.9	28.0	24.0	8.4	.06	<.010	.06	--
JUL 18	1205	182	85	--	--	21.0	--	--	--	--	--
JUL 19	1345	50	105	8.5	30.0	28.0	7.1	.04	.010	.05	--
AUG 15	1300	85	100	--	--	25.5	--	--	--	--	--
AUG 29	1255	63	120	7.4	25.0	19.0	8.6	.23	.010	.24	--
SEP 25	1220	39	151	--	--	13.5	--	--	--	--	--
SEP 26	1255	44	125	7.1	13.0	10.0	10.8	.06	<.010	.06	--
OCT 11	1145	54	97	--	--	9.0	--	--	--	--	--
OCT 24	1305	65	105	7.3	6.0	6.0	13.2	.11	<.010	.11	--
NOV 21	1315	116	85	7.6	-1.0	2.0	13.8	.14	.010	.15	0.12
DEC 11	1215	107	--	--	--	.5	--	--	--	--	--
1979											
APR 17	1140	551	58	6.6	11.0	4.0	12.8	.17	<.010	.17	.17
MAY 15	1100	151	78	7.6	16.0	14.0	10.5	.09	<.010	.09	--
JUN 14	1130	125	84	7.1	18.0	15.5	10.6	.06	<.010	.06	--
JUL 19	1115	40	134	8.2	23.5	21.0	9.5	.20	<.010	.20	--
AUG 16	1030	54	117	8.0	18.0	15.0	10.0	.01	<.010	.01	--
SEP 13	1050	50	122	8.0	21.0	13.5	10.7	.01	<.010	.01	--
OCT 10	1330	168	82	--	--	8.0	--	--	--	--	--
OCT 25	1020	136	83	6.9	8.0	8.5	11.7	.03	.000	.03	--
NOV 13	1045	--	--	--	--	--	--	--	--	--	--
DEC 04	1105	170	73	--	--	1.0	--	--	--	--	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 4. 01152800 - BLACK RIVER AT COVERED BRIDGE, AT WEATHERSFIELD, VT (CONTINUED)

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (UMHOS)	PH (STANDARD UNITS)	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN NO2+NO3 DISSOLVED (MG/L AS N)
1980											
JAN 15	1105	178	82	--	--	1.0	--	--	--	--	--
MAR 04	1140	33	126	--	--	.0	--	--	--	--	--
APR 17	1115	498	62	--	--	4.0	--	--	--	--	--
APR 24	1100	270	64	6.8	11.0	6.8	12.3	0.29	0.000	0.29	--
MAY 20	1050	186	108	8.5	20.0	13.5	11.4	.10	.000	.10	--
JUN 17	1100	71	100	--	--	17.0	--	--	--	--	--
JUN 24	1125	62	134	7.2	25.0	20.0	8.9	.17	.000	.17	--
JUL 22	1200	11	128	--	--	--	--	--	--	--	--
JUL 24	1110	128	114	7.3	24.0	21.1	9.7	.10	.020	.12	--
AUG 19	1025	7.1	160	5.8	18.0	17.0	10.2	.03	.000	.03	--
SEP 23	1040	10.0	99	8.4	22.0	19.0	10.2	.03	.000	.03	--
OCT 21	1115	65	93	--	--	8.0	--	--	--	--	--
OCT 28	1010	267	--	7.2	4.0	5.0	13.1	.21	.000	.21	--
NOV 20	1115	121	96	6.9	.0	.4	15.0	.28	.000	.28	--

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN AMMONIA TOTAL (MG/L AS NH4)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA+ ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHATE, TOTAL (MG/L AS PO4)	PHOSPHORUS TOTAL (MG/L AS PO4)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	HARDNESS (MG/L AS CACO3)
1976											
NOV 11	0.010	--	0.19	0.20	0.40	1.8	0.030	--	--	0.010	27
1977											
JAN 17	--	--	--	--	--	--	--	--	--	--	--
APR 28	.010	--	.20	.21	.58	2.6	.010	--	--	<.010	18
MAY 18	--	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--	--
JUN 22	.020	--	.21	.23	.31	1.4	.010	--	--	<.010	--
JUL 12	--	--	--	--	--	--	--	--	--	--	--
AUG 16	--	--	--	--	--	--	--	--	--	--	--
AUG 25	<.010	--	.08	.08	.32	1.4	.010	--	--	.010	41
OCT 17	--	--	--	--	--	--	--	--	--	--	--
OCT 27	<.010	--	.16	.16	.30	1.3	.010	--	--	<.010	--
NOV 30	--	--	--	--	--	--	--	--	--	--	--
1978											
FEB 01	--	--	--	--	--	--	--	--	--	--	--
MAR 20	--	--	--	--	--	--	--	--	--	--	--
MAY 23	.010	--	.13	.14	.25	1.1	.010	--	--	<.010	19
MAY 30	--	--	--	--	--	--	--	--	--	--	--
JUN 27	.010	--	.26	.27	.33	1.5	<.010	--	--	<.010	--
JUL 18	--	--	--	--	--	--	--	--	--	--	--
JUL 19	.010	--	.32	.33	.38	1.7	.010	--	--	<.010	28
AUG 15	--	--	--	--	--	--	--	--	--	--	--
AUG 29	.030	--	.30	.33	.57	2.5	.020	--	--	<.010	--
SEP 25	--	--	--	--	--	--	--	--	--	--	--
SEP 26	.030	--	.25	.28	.34	1.5	.010	--	--	<.010	--
OCT 11	--	--	--	--	--	--	--	--	--	--	--
OCT 24	<.010	--	.15	.15	.26	1.2	.010	--	--	<.010	--
NOV 21	.030	--	.06	.09	.24	1.1	<.010	--	--	<.010	--
DEC 11	--	--	--	--	--	--	--	--	--	--	--
1979											
APR 17	<.010	--	.04	.04	.21	.93	.010	--	--	<.010	--
MAY 15	<.010	0.00	.11	.11	.20	.89	.070	0.21	0.21	<.010	--
JUN 14	.010	.01	.14	.15	.21	.93	<.010	.00	.00	<.010	--
JUL 19	<.010	.00	.14	.14	.34	1.5	.010	.00	.03	<.010	36
AUG 16	<.010	.00	.06	.06	.07	.31	<.010	.00	.00	<.010	--
SEP 13	<.010	.00	.40	.40	.41	1.8	<.010	.00	.00	<.010	--
OCT 10	--	--	--	--	--	--	--	--	--	--	--
OCT 25	.000	.00	.23	.23	.26	1.2	.010	.00	.03	.000	--
NOV 13	--	--	--	--	--	--	--	--	--	--	25
DEC 04	--	--	--	--	--	--	--	--	--	--	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 4. 01152800 - BLACK RIVER AT COVERED BRIDGE, AT WEATHERSFIELD, VT (CONTINUED)

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN AMMONIA TOTAL (MG/L AS NH4)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA+ ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITROGEN TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)	PHOS-PHORUS TOTAL (MG/L AS PO4)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	HARDNESS (MG/L AS CACO3)
1980											
JAN 15	--	--	--	--	--	--	--	--	--	--	--
MAR 04	--	--	--	--	--	--	--	--	--	--	--
APR 17	--	--	--	--	--	--	--	--	--	--	--
APR 24	0.000	0.00	0.10	0.10	0.39	1.7	0.010	0.00	0.03	0.000	--
MAY 20	.000	.00	.14	.14	.24	1.1	.320	.58	.98	.190	--
JUN 17	--	--	--	--	--	--	--	--	--	--	--
JUN 24	.040	.05	.06	.10	.27	1.2	.020	.00	.06	.000	--
JUL 22	--	--	--	--	--	--	--	--	--	--	--
JUL 24	.010	.01	.24	.25	.37	1.6	.020	.00	.06	.000	33
AUG 19	.060	.07	.22	.28	.31	1.4	.090	.25	.28	.080	--
SEP 23	.140	.17	.01	.15	.18	.80	.020	.03	.06	.010	--
OCT 21	--	--	--	--	--	--	--	--	--	--	--
OCT 28	.000	.00	.13	.13	.34	1.5	.020	.00	.06	.000	--
NOV 20	.000	.00	.08	.08	.36	1.6	.000	.03	.00	.010	30

DATE	HARDNESS NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORP-TION RATIO	SODIUM+ POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE FET-FLD (MG/L AS HCO3)	CAR-BONATE FET-FLD (MG/L AS CO3)	ALKA-LINITY FIELD (MG/L AS CACO3)
1976											
NOV 11	10	7.2	2.1	4.9	28	0.4	--	0.9	20	--	16
1977											
JAN 17	--	--	--	--	--	--	--	--	--	--	--
APR 28	0	4.7	1.4	4.4	34	.5	--	.9	15	0	12
MAY 18	--	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--	--
JUN 22	--	--	--	--	--	--	--	--	--	--	--
JUL 12	--	--	--	--	--	--	--	--	--	--	--
AUG 16	--	--	--	--	--	--	--	--	--	--	--
AUG 25	0	11	3.4	12	38	.8	--	1.6	33	0	27
OCT 17	--	--	--	--	--	--	--	--	--	--	--
OCT 27	--	--	--	--	--	--	--	--	--	--	--
NOV 30	--	--	--	--	--	--	--	--	--	--	--
1978											
FEB 01	--	--	--	--	--	--	--	--	--	--	--
MAR 20	--	--	--	--	--	--	--	--	--	--	--
MAY 23	0	5.1	1.5	4.1	31	.4	--	.8	19	0	16
MAY 30	--	--	--	--	--	--	--	--	--	--	--
JUN 27	--	--	--	--	--	--	--	--	--	--	--
JUL 18	--	--	--	--	--	--	--	--	--	--	--
JUL 19	13	7.6	2.2	7.6	36	.6	--	1.3	8	13	28
AUG 15	--	--	--	--	--	--	--	--	--	--	--
AUG 29	--	--	--	--	--	--	--	--	--	--	--
SEP 25	--	--	--	--	--	--	--	--	--	--	--
SEP 26	--	--	--	--	--	--	--	--	--	--	--
OCT 11	--	--	--	--	--	--	--	--	--	--	--
OCT 24	--	--	--	--	--	--	--	--	--	--	--
NOV 21	--	--	--	--	--	--	--	--	--	--	18
DEC 11	--	--	--	--	--	--	--	--	--	--	--
1979											
APR 17	--	--	--	--	--	--	--	--	--	--	8.0
MAY 15	--	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--	--
JUL 19	8	9.5	2.9	12	41	.9	13	1.4	34	--	28
AUG 16	--	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--	--
OCT 10	--	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--	--
NOV 13	4	6.6	--	--	37	.4	5.6	--	--	--	--
DEC 04	--	--	--	--	--	--	--	--	--	--	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 4. 01152800 - BLACK RIVER AT COVERED BRIDGE, AT WEATHERSFIELD, VT (CONTINUED)

DATE	HARDNESS NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORP-TION RATIO	SODIUM+ POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE FET-FLD (MG/L AS HCO3)	CAR-BONATE FET-FLD (MG/L AS CO3)	ALKA-LINITY FIELD (MG/L AS CACO3)
1980											
JAN 15	--	--	--	--	--	--	--	--	--	--	--
MAR 04	--	--	--	--	--	--	--	--	--	--	--
APR 17	--	--	--	--	--	--	--	--	--	--	--
APR 24	--	--	--	--	--	--	--	1.0	--	--	33
MAY 20	--	--	--	--	--	--	--	--	--	--	--
JUN 17	--	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--	--
JUL 22	--	--	--	--	--	--	--	--	--	--	--
JUL 24	7	8.9	2.6	7.9	33	0.6	--	1.1	--	--	26
AUG 19	--	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--	--
OCT 21	--	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--	--
NOV 20	10	7.7	2.5	6.6	32	.5	--	.9	--	--	--

DATE	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CON-STITUENTS, DISSOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, INORGANIC, TOTAL (MG/L AS C)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	ALGAL GROWTH POTEN-TIAL (MG/L)
1976											
NOV 11	--	6.4	7.4	--	5.2	44	0.06	7.1	--	--	0.8
1977											
JAN 17	--	--	--	--	--	--	--	--	--	--	--
APR 28	6.0	5.9	7.7	--	3.6	36	.05	--	--	--	--
MAY 18	--	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--	--
JUN 22	--	--	--	--	--	--	--	--	--	--	--
JUL 12	--	--	--	--	--	--	--	--	--	--	--
AUG 16	--	--	--	--	--	--	--	--	--	--	--
AUG 25	1.0	7.9	20	--	3.0	75	.10	4.8	9.2	--	1.0
OCT 17	--	--	--	--	--	--	--	--	--	--	--
OCT 27	--	--	--	--	--	--	--	--	--	--	--
NOV 30	--	--	--	--	--	--	--	--	--	--	--
1978											
FEB 01	--	--	--	--	--	--	--	--	--	--	--
MAR 20	--	--	--	--	--	--	--	--	--	--	--
MAY 23	6.0	6.0	6.3	--	3.5	37	.05	7.6	10	--	15
MAY 30	--	--	--	--	--	--	--	--	--	--	--
JUN 27	--	--	--	--	--	--	--	--	--	0.00	--
JUL 18	--	--	--	--	--	--	--	--	--	--	--
JUL 19	.0	6.7	12	--	2.8	71	.10	2.3	4.3	.00	.8
AUG 15	--	--	--	--	--	--	--	--	--	--	--
AUG 29	--	--	--	--	--	--	--	--	--	.00	--
SEP 25	--	--	--	--	--	--	--	--	--	--	--
SEP 26	--	--	--	--	--	--	--	--	--	.00	--
OCT 11	--	--	--	--	--	--	--	--	--	--	--
OCT 24	--	--	--	--	--	--	--	--	--	.00	--
NOV 21	.9	7.0	9.1	<0.1	4.5	--	--	1.8	5.8	--	1.1
DEC 11	--	--	--	--	--	--	--	--	--	--	--
1979											
APR 17	3.9	6.5	7.0	<.1	4.1	--	--	1.9	4.5	--	.4
MAY 15	--	--	--	--	--	--	--	--	--	--	3.5
JUN 14	--	--	--	--	--	--	--	--	--	--	--
JUL 19	.3	7.4	18	--	2.7	71	.10	3.6	--	--	1.3
AUG 16	--	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--	--
OCT 10	--	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--	--
NOV 13	--	--	--	--	--	45	.06	--	--	--	--
DEC 04	--	--	--	--	--	--	--	--	--	--	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 4. 01152800 - BLACK RIVER AT COVERED BRIDGE, AT WEATHERSFIELD, VT (CONTINUED)

DATE	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CON-STITUENTS, DISSOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, INORGANIC, TOTAL (MG/L AS C)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	ALGAL GROWTH POTEN-TIAL (MG/L)
1980											
JAN 15	--	--	--	--	--	--	--	--	--	--	--
MAR 04	--	--	--	--	--	--	--	--	--	--	--
APR 17	--	--	--	--	--	--	--	--	--	--	--
APR 24	10	7.4	8.6	--	--	17	0.02	1.6	3.3	--	2.6
MAY 20	--	--	--	--	--	--	--	--	--	--	--
JUN 17	--	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--	--
JUL 22	--	--	--	--	--	--	--	--	--	--	--
JUL 24	2.5	8.8	13	--	1.4	59	.08	2.2	7.4	--	3.1
AUG 19	--	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--	--
OCT 21	--	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--	--
NOV 20	4.9	7.4	11	--	4.7	53	.07	2.0	6.0	--	2.6

DATE	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)
1976										
NOV 11	--	--	140	70	--	<1	--	ND	--	<20
1977										
JAN 17	--	--	--	--	--	--	--	--	--	--
APR 28	--	--	150	--	--	--	--	--	--	--
MAY 18	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--
JUN 22	--	--	--	--	--	--	--	--	--	--
JUL 12	--	--	--	--	--	--	--	--	--	--
AUG 16	--	--	--	--	--	--	--	--	--	--
AUG 25	--	--	30	--	--	--	--	--	--	--
OCT 17	--	--	--	--	--	--	--	--	--	--
OCT 27	--	--	--	--	--	--	--	--	--	--
NOV 30	--	--	--	--	--	--	--	--	--	--
1978										
FEB 01	--	--	--	--	--	--	--	--	--	--
MAR 20	--	--	--	--	--	--	--	--	--	--
MAY 23	--	--	60	--	--	--	--	--	--	--
MAY 30	--	--	--	--	--	--	--	--	--	--
JUN 27	--	--	--	--	--	--	--	--	--	--
JUL 18	--	--	--	--	--	--	--	--	--	--
JUL 19	--	--	100	60	--	1	--	ND	--	ND
AUG 15	--	--	--	--	--	--	--	--	--	--
AUG 29	--	--	--	--	--	--	--	--	--	--
SEP 25	--	--	--	--	--	--	--	--	--	--
SEP 26	--	--	--	--	--	--	--	--	--	--
OCT 11	--	--	--	--	--	--	--	--	--	--
OCT 24	--	--	--	--	--	--	--	--	--	--
NOV 21	--	--	--	--	--	--	--	--	--	--
DEC 11	--	--	--	--	--	--	--	--	--	--
1979										
APR 17	--	--	--	--	--	--	--	--	--	--
MAY 15	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--
JUL 19	230	180	50	--	3	--	2	--	20	--
AUG 16	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--
OCT 10	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--
NOV 13	--	--	--	--	--	--	--	--	--	--
DEC 04	--	--	--	--	--	--	--	--	--	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 4. 011528D0 - BLACK RIVER AT COVERED BRIDGE, AT WEATHERSFIELD, VT (CONTINUED)

DATE	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)
1980										
JAN 15	--	--	--	--	--	--	--	--	--	--
MAR 04	--	--	--	--	--	--	--	--	--	--
APR 17	--	--	--	--	--	--	--	--	--	--
APR 24	--	--	--	--	--	--	--	--	--	--
MAY 20	--	--	--	--	--	--	--	--	--	--
JUN 17	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--
JUL 22	--	--	--	--	--	--	--	--	--	--
JUL 24	280	250	30	--	D	--	D	--	<10	--
AUG 19	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--
OCT 21	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--
NOV 20	--	--	7D	--	--	--	--	--	--	--

DATE	COBALT, DISSOLVED (UG/L AS CO)	COPPER TOTAL RECOVERABLE (UG/L AS CU)	COPPER DISSOLVED (UG/L AS CU)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE DISSOLVED (UG/L AS MN)	MERCURY TOTAL, RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL DISSOLVED (UG/L AS NI)
1978											
JUL 19	--	<1	--	<20	--	0.00	D.00	0.D0	D.D0	0.00	0.D0
1979											
JUL 19	--	3	--	ND	--	20	--	<.5	--	--	--
198D											
APR 24	--	--	--	--	--	--	--	--	--	--	--
JUL 24	--	2	--	1	--	3D	--	<.1	--	--	--
NOV 20	--	--	--	--	--	--	--	--	--	--	--

DATE	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, TOTAL (MG/L AS C)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)
1978											
JUL 19	--	<1	--	<2D	--	0.0D	D.DD	0.D0	0.0D	0.00	0.D0
1979											
JUL 19	<1	--	4D	--	--	.00	.0D	.00	.00	.00	.00
198D											
APR 24	--	--	--	--	4.9	--	--	--	--	--	--
JUL 24	D	--	1D	--	9.6	.D0	.00	.D0	.0D	.00	.DD
NOV 20	--	--	--	--	8.0	--	--	--	--	--	--

DATE	DDT, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)
1978										
JUL 19	0.00	0.0D	0.00	D.0D	0.D0	0.0D	D.00	0.DD	--	D
1979										
JUL 19	.00	.00	.00	.0D	.00	.0D	.00	--	0.00	0
1980										
APR 24	--	--	--	--	--	--	--	--	--	--
JUL 24	.00	.00	.00	.00	.00	.00	.00	.00	.00	0
NOV 20	--	--	--	--	--	--	--	--	--	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 5. 01152850 - BLACK RIVER AT TOLLES HILL DAM, NEAR WEATHERSFIELD, VT

DATE	TIME	SPECIFIC CONDUCT-ANCE (UMHDS)	PH (STAND-ARD UNITS)	TEMPER-ATURE, AIR (DEG C)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	NITRDGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)
1976											
NOV 11	1105	--	--	--	--	--	0.20	0.010	0.21	--	0.040
1977											
APR 28	1300	--	6.6	16.0	10.0	10.6	1.5	<.010	1.5	--	.010
JUN 22	1210	122	6.7	--	16.0	7.9	.23	.030	.26	--	<.010
AUG 28	113D	185	6.9	18.0	16.0	8.2	.19	<.01D	.19	--	<.010
OCT 27	1130	120	6.8	--	14.0	8.7	.17	<.010	.17	--	<.010
1978											
MAY 23	1310	85	6.6	28.0	16.5	9.6	.11	<.01D	.11	--	.010
JUN 27	1245	145	6.7	22.0	22.0	8.1	.14	<.010	.14	--	.020
JUL 19	1300	10D	7.1	30.0	23.0	8.2	.10	.010	.11	--	.160
AUG 28	1130	--	--	--	--	--	--	--	--	--	--
AUG 29	1135	140	6.8	25.0	19.0	8.6	.34	.010	.35	--	.020
SEP 26	1120	125	6.8	11.0	10.0	11.8	.04	<.010	.04	--	.010
OCT 24	1240	105	7.5	9.0	7.0	11.8	.13	<.010	.13	--	<.010
NOV 21	1240	85	7.3	-2.0	1.0	14.4	.11	.010	.12	0.13	.020
1979											
APR 17	1115	58	6.6	11.0	4.5	13.2	.18	<.010	.18	.17	<.010
MAY 15	1020	81	7.2	15.5	14.0	10.5	.10	<.010	.10	--	<.010
JUN 14	1100	87	6.6	17.0	15.5	10.7	.07	<.010	.07	--	<.010
JUL 19	1040	134	7.5	23.0	21.0	9.0	.19	<.010	.19	--	.010
AUG 16	1000	123	7.5	18.0	15.0	9.7	.02	<.010	.02	--	.010
SEP 13	1020	122	7.5	17.0	15.0	10.0	.00	.010	.01	--	.020
OCT 25	1045	87	6.9	8.5	9.0	11.7	.03	.000	.03	--	.010
NOV 13	1015	77	6.5	7.0	6.0	12.7	.12	.000	.12	--	.010
1980											
APR 24	1020	65	6.4	12.5	6.8	12.2	.30	.000	.30	--	.000
MAY 20	1025	112	6.7	24.0	14.0	10.6	.10	.000	.10	--	.090
JUN 24	1145	138	6.6	25.0	20.0	9.3	.24	.000	.24	--	.050
JUL 24	1030	119	6.7	23.0	21.0	9.4	.17	.000	.17	--	.010
AUG 19	1100	155	6.8	20.0	19.0	8.9	.04	.000	.04	--	.040
SEP 23	1010	136	7.2	22.0	18.5	9.2	.04	.000	.04	--	.170
OCT 28	1035	--	7.3	4.5	5.0	13.2	.21	.000	.21	--	.010
NOV 20	1025	96	6.7	.0	.5	14.9	.29	.000	.29	--	.000

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS NH4)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN AMMONIA+ ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)	PHOS-PHORUS TOTAL (MG/L AS PO4)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	HARD-NESS (MG/L AS CACO3)	HARDNESS, NONCAR-BONATE (MG/L CACO3)
1976											
NOV 11	--	0.29	0.33	0.54	2.4	0.080	--	--	0.020	27	12
1977											
APR 28	--	.18	.19	1.7	7.5	<.010	--	--	<.010	14	0
JUN 22	--	.48	.48	.74	3.3	.040	--	--	<.010	--	--
AUG 28	--	.10	.10	.29	1.3	.010	--	--	<.010	44	0
OCT 27	--	.26	.26	.43	1.9	.020	--	--	<.010	--	--
1978											
MAY 23	--	.17	.18	.29	1.3	.010	--	--	<.010	21	0
JUN 27	--	.22	.24	.38	1.7	<.010	--	--	<.010	--	--
JUL 19	--	.38	.54	.65	2.9	.010	--	--	.110	29	0
AUG 28	--	--	--	--	--	--	--	--	--	--	--
AUG 29	--	.13	.15	.50	2.2	.020	--	--	<.010	--	--
SEP 26	--	.25	.26	.30	1.3	.020	--	--	<.010	--	--
OCT 24	--	.22	.22	.35	1.5	.010	--	--	<.010	--	--
NOV 21	--	.14	.16	.28	1.2	<.010	--	--	<.010	--	--
1979											
APR 17	--	.00	<.10	.18	.80	<.010	--	--	<.010	--	--
MAY 15	0.00	.19	.19	.29	1.3	.010	0.03	0.03	<.010	--	--
JUN 14	.00	.15	.15	.22	.97	<.010	.00	.00	<.010	--	--
JUL 19	.01	.10	.11	.30	1.3	<.010	.00	.00	<.010	37	5
AUG 16	.01	.17	.18	.20	.89	<.010	.00	.00	<.010	--	--
SEP 13	.02	.15	.17	.18	.80	<.010	.00	.00	<.010	--	--
OCT 25	.01	.99	1.00	1.0	4.6	.010	.00	.03	.000	--	--
NOV 13	.01	.25	.26	.38	1.7	.010	.00	.03	.000	25	0

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 5. 01152850 - BLACK RIVER AT TOLLES HILL DAM, NEAR WEATHERSFIELD, VT (CONTINUED)

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS NH4)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN AMMONIA+ ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)	PHOS-PHORUS TOTAL (MG/L AS PO4)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	HARD-NESS (MG/L AS CACO3)	HARDNESS, NONCAR-BONATE (MG/L CACO3)
1980											
APR 24	0.00	0.07	0.07	0.37	1.6	0.010	0.00	0.03	0.000	22	8
MAY 20	.11	.14	.23	.33	1.5	.000	.00	.00	.000	--	--
JUN 24	.06	.15	.20	.44	1.9	.010	.00	.03	.000	--	--
JUL 24	.01	.11	.12	.29	1.3	.010	.00	.03	.000	33	6
AUG 19	.05	.17	.21	.25	1.1	.050	.00	.15	.000	--	--
SEP 23	.21	.18	.35	.39	1.7	.020	.00	.06	.000	--	--
OCT 28	.01	.05	.06	.27	1.2	.030	.00	.09	.000	--	--
NOV 20	.00	.15	.15	.44	1.9	.000	.00	.00	.000	31	11

DATE	CALCIUM, DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DISSOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PER-CENT SODIUM	SODIUM AD-SORP-TION RATIO	SODIUM+ POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE FET-FLD (MG/L AS HCO3)	CAR-BONATE FET-FLD (MG/L AS CO3)	ALKA-LINITY FIELD (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)
1976											
NOV 11	7.4	2.1	5.1	28	0.4	--	1.0	19	--	16	--
1977											
APR 28	2.5	1.8	4.7	40	.6	--	1.1	9	0	7.0	3.9
JUN 22	--	--	--	--	--	--	--	--	--	--	--
AUG 28	12	3.4	12	36	.8	--	1.7	41	0	34	8.2
OCT 27	--	--	--	--	--	--	--	--	--	--	--
1978											
MAY 23	6.0	1.5	4.0	28	.4	--	.8	22	0	18	8.8
JUN 27	--	--	--	--	--	--	--	--	--	--	--
JUL 19	8.0	2.3	7.2	33	.6	--	1.4	31	0	25	3.9
AUG 28	--	--	--	--	--	--	--	--	--	--	--
AUG 29	--	--	--	--	--	--	--	--	--	--	--
SEP 26	--	--	--	--	--	--	--	--	--	--	--
OCT 24	--	--	--	--	--	--	--	--	--	--	--
NOV 21	--	--	--	--	--	--	--	--	--	17	1.6
1979											
APR 17	--	--	--	--	--	--	--	--	--	8.0	3.9
MAY 15	--	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--	--
JUL 19	10	2.9	12	40	.9	13	1.4	39	--	32	2.0
AUG 16	--	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--	--
NOV 13	6.9	2.0	4.9	29	.4	5.8	.9	--	--	25	15
1980											
APR 24	5.9	1.7	5.1	33	.5	--	.9	--	--	14	11
MAY 20	--	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--	--
JUL 24	8.9	2.6	8.8	36	.7	--	1.2	--	--	27	10
AUG 19	--	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--	--
NOV 20	8.2	2.6	6.3	30	.5	--	1.0	--	--	--	7.7

DATE	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CON-STITUENTS, DISSOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	CARBON, ORGANIC, TOTAL (MG/L AS C)	CARBON, INORGANIC, TOTAL (MG/L AS C)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	ALGAL GROWTH POTEN-TIAL (MG/L)
1976										
NOV 11	6.5	8.1	--	5.3	45	0.06	--	--	--	0.5
1977										
APR 28	6.9	9.5	--	3.3	34	.05	--	--	--	--
JUN 22	--	--	--	--	--	--	--	--	--	--
AUG 28	8.0	19	--	2.6	79	.11	8.4	6.8	--	--
OCT 27	--	--	--	--	--	--	--	--	--	--
1978										
MAY 23	5.8	5.9	--	3.4	38	.05	6.9	7.9	--	.8
JUN 27	--	--	--	--	--	--	--	--	0.00	--
JUL 19	6.7	11	--	2.4	54	.07	1.6	5.7	.00	.6
AUG 28	--	--	--	--	--	--	--	--	--	.4
AUG 29	--	--	--	--	--	--	--	--	.00	--
SEP 26	--	--	--	--	--	--	--	--	.00	--
OCT 24	--	--	--	--	--	--	--	--	.00	--
NOV 21	6.9	9.1	<0.1	4.3	--	--	1.8	5.5	--	1.0

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 5. 01152850 - BLACK RIVER AT TOLLES HILL DAM, NEAR WEATHERSFIELD, VT (CONTINUED)

DATE	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	CARBON, ORGANIC, TOTAL (MG/L AS C)	CARBON, INORGANIC, TOTAL (MG/L AS C)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	ALGAL GROWTH POTENTIAL (MG/L)
1979										
APR 17	6.4	7.0	<0.1	4.2	--	--	1.9	5.5	--	0.4
MAY 15	--	--	--	--	--	--	--	--	--	3.8
JUN 14	--	--	--	--	--	--	--	--	--	--
JUL 19	7.4	18	--	2.5	73	0.10	2.6	--	--	1.3
AUG 16	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--
NOV 13	6.8	7.3	--	3.9	48	.06	.8	4.7	--	2.3
1980										
APR 24	7.3	8.6	--	4.3	42	.06	1.6	3.1	--	2.7
MAY 20	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--
JUL 24	7.0	13	--	1.9	60	.08	1.8	6.9	--	3.3
AUG 19	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--
NOV 20	6.8	9.8	--	4.6	51	.07	2.0	6.6	--	1.4

DATE	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	CADMIUM TOTAL, RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)
1976										
NOV 11	--	--	230	160	--	<1	--	ND	--	<20
1977										
APR 28	--	--	50	--	--	--	--	--	--	--
JUN 22	--	--	--	--	--	--	--	--	--	--
AUG 28	--	--	<10	--	--	--	--	--	--	--
OCT 27	--	--	--	--	--	--	--	--	--	--
1978										
MAY 23	--	--	90	--	--	--	--	--	--	--
JUN 27	--	--	--	--	--	--	--	--	--	--
JUL 19	--	--	100	30	--	<1	--	ND	--	2
AUG 28	--	--	--	--	--	--	--	--	--	--
AUG 29	--	--	--	--	--	--	--	--	--	--
SEP 26	--	--	--	--	--	--	--	--	--	--
OCT 24	--	--	--	--	--	--	--	--	--	--
NOV 21	--	--	--	--	--	--	--	--	--	--
1979										
APR 17	--	--	--	--	--	--	--	--	--	--
MAY 15	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--
JUL 19	210	140	70	--	1	--	6	--	20	--
AUG 16	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--
NOV 13	--	--	70	--	--	--	--	--	--	--
1980										
APR 24	--	--	50	--	--	--	--	--	--	--
MAY 20	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--
JUL 24	230	160	70	--	0	--	0	--	<10	--
AUG 19	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--
NOV 20	--	--	50	--	--	--	--	--	--	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 5. 01152850 - BLACK RIVER AT TOLLES HILL DAM, NEAR WEATHERSFIELD, VT (CONTINUED)

DATE	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER TOTAL RE-COVERABLE (UG/L AS CU)	COPPER DIS-SOLVED (UG/L AS CU)	LEAD, TOTAL RE-COVERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGANESE, TOTAL RE-COVERABLE (UG/L AS MN)	MANGANESE DISSOLVED (UG/L AS MN)	MERCURY TOTAL, RE-COVERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DISSOLVED (UG/L AS MO)	NICKEL DIS-SOLVED (UG/L AS NI)
1978											
JUL 19	ND	--	2	--	5	--	30	--	0.5	1	<2
1979											
JUL 19	--	3	--	ND	--	60	--	<0.5	--	--	--
NOV 13	--	--	--	--	--	--	--	--	--	--	--
1980											
APR 24	--	--	--	--	--	--	--	--	--	--	--
JUL 24	--	2	--	1	--	50	--	<.1	--	--	--
NOV 20	--	--	--	--	--	--	--	--	--	--	--

DATE	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, TOTAL (MG/L AS C)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)
1978											
JUL 19	--	<1	--	<20	--	0.00	0.00	0.00	0.00	0.00	0.00
1979											
JUL 19	<1	--	20	--	--	.00	.00	.00	.00	.00	.00
NOV 13	--	--	--	--	5.5	--	--	--	--	--	--
1980											
APR 24	--	--	--	--	4.7	--	--	--	--	--	--
JUL 24	0	--	10	--	8.7	.00	.00	.00	.00	.00	.00
NOV 20	--	--	--	--	8.6	--	--	--	--	--	--

DATE	DDT, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)
1978										
JUL 19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0
1979										
JUL 19	.00	.00	.00	.00	.00	.00	.00	--	0.00	0
NOV 13	--	--	--	--	--	--	--	--	--	--
1980										
APR 24	--	--	--	--	--	--	--	--	--	--
JUL 24	.00	.00	.00	.00	.00	.00	.00	.00	.00	0
NOV 20	--	--	--	--	--	--	--	--	--	--

INFORMAL STATION NUMBER 6. 01153000 - BLACK RIVER AT NORTH SPRINGFIELD, VT

DATE	TIME	STREAMFLOW, INSTAN-TANEOUS (CFS)	SPECIFIC CONDUCT-ANCE (UMHOS)	PH (STAND-ARD UNITS)	TEMPERA-TURE, AIR (DEG C)	TEM-PERA-TURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN NO2+NO3 DISSOLVED (MG/L AS N)
1976											
NOV 11	0800	314	--	--	--	--	--	0.18	0.010	0.19	--
DEC 06	1430	155	--	--	--	0.5	--	--	--	--	--
1977											
JAN 03	1400	131	--	--	--	1.0	--	--	--	--	--
FEB 09	1135	87	--	--	--	.5	--	--	--	--	--
MAR 07	1425	236	--	--	--	1.0	--	--	--	--	--
APR 28	1145	765	75	6.5	14.0	9.0	10.2	.59	<.010	.59	--
JUN 14	1330	164	--	--	--	19.0	--	--	--	--	--
JUN 22	1345	102	130	6.7	--	20.0	8.9	.13	<.010	.13	--
AUG 16	1250	53	--	--	--	23.0	--	--	--	--	--
AUG 28	1105	39	170	7.1	18.0	18.0	9.1	.16	<.010	.16	--
OCT 27	1105	358	75	7.2	--	12.0	10.4	.17	<.010	.17	--
1978											
FEB 06	1210	284	--	--	--	.0	--	--	--	--	--
MAR 20	1430	229	--	--	--	8.0	--	--	--	--	--
MAY 23	1220	472	80	6.6	27.0	19.0	9.1	.15	<.010	.15	--
JUN 27	1130	110	130	6.7	25.0	23.0	8.1	.06	<.010	.06	--
JUL 19	1100	94	130	6.8	29.0	25.0	7.7	.18	.010	.19	--
AUG 01	1425	74	117	--	--	20.0	--	--	--	--	--
AUG 11	1200	55	--	--	--	25.0	--	--	--	--	--
AUG 29	1100	67	140	6.8	25.0	20.0	9.2	.14	.010	.15	--
SEP 26	1100	49	145	6.6	13.0	13.0	11.2	.03	<.010	.03	--
OCT 11	1310	77	108	--	--	10.0	--	--	--	--	--
OCT 24	1140	72	110	7.1	6.0	7.0	12.8	.08	<.010	.08	--
OCT 31	1220	18	--	--	--	8.0	--	--	--	--	--
NOV 21	1100	136	100	7.1	.0	2.0	14.0	.12	<.010	.12	.13
DEC 11	1315	151	73	--	--	1.0	--	--	--	--	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 6. 01153000 - BLACK RIVER AT NORTH SPRINGFIELD, VT

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (UMHOS)	PH (STANDARD UNITS)	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN NO2+NO3 DISSOLVED (MG/L AS N)
1976											
NOV 11	0800	314	--	--	--	--	--	0.18	0.010	0.19	--
DEC 06	1430	155	--	--	--	0.5	--	--	--	--	--
1977											
JAN 03	1400	131	--	--	--	1.0	--	--	--	--	--
FEB 09	1135	87	--	--	--	.5	--	--	--	--	--
MAR 07	1425	236	--	--	--	1.0	--	--	--	--	--
APR 28	1145	765	75	6.5	14.0	9.0	10.2	.59	<.010	.59	--
JUN 14	1330	164	--	--	--	19.0	--	--	--	--	--
JUN 22	1345	102	130	6.7	--	20.0	8.9	.13	<.010	.13	--
AUG 16	1250	53	--	--	--	23.0	--	--	--	--	--
AUG 28	1105	39	170	7.1	18.0	18.0	9.1	.16	<.010	.16	--
OCT 27	1105	358	75	7.2	--	12.0	10.4	.17	<.010	.17	--
1978											
FEB 06	1210	284	--	--	--	.0	--	--	--	--	--
MAR 20	1430	229	--	--	--	8.0	--	--	--	--	--
MAY 23	1220	472	80	6.6	27.0	19.0	9.1	.15	<.010	.15	--
JUN 27	1130	110	130	6.7	25.0	23.0	8.1	.06	<.010	.06	--
JUL 19	1100	94	130	6.8	29.0	25.0	7.7	.18	.010	.19	--
AUG 01	1425	74	117	--	--	20.0	--	--	--	--	--
AUG 11	1200	55	--	--	--	25.0	--	--	--	--	--
AUG 29	1100	67	140	6.8	25.0	20.0	9.2	.14	.010	.15	--
SEP 26	1100	49	145	6.6	13.0	13.0	11.2	.03	<.010	.03	--
OCT 11	1310	77	108	--	--	10.0	--	--	--	--	--
OCT 24	1140	72	110	7.1	6.0	7.0	12.8	.08	<.010	.08	--
OCT 31	1220	18	--	--	--	8.0	--	--	--	--	--
NOV 21	1100	136	100	7.1	.0	2.0	14.0	.12	<.010	.12	0.13
DEC 11	1315	151	73	--	--	1.0	--	--	--	--	--
1979											
APR 17	1030	664	67	6.8	10.5	4.5	13.0	.16	<.010	.16	.18
MAY 15	0955	223	95	7.0	15.0	14.5	10.0	.13	<.010	.13	--
JUN 14	1020	190	98	6.6	17.0	16.0	10.2	.09	<.010	.09	--
JUL 19	1010	64	135	7.4	--	23.0	--	.17	<.010	.17	--
AUG 16	0915	69	133	7.4	17.5	17.0	9.4	.06	<.010	.06	--
SEP 13	0940	58	121	7.4	16.0	17.0	9.4	.02	.010	.03	--
OCT 25	1110	210	100	6.6	9.0	12.0	10.8	.04	.000	.04	--
NOV 13	0950	258	83	6.5	6.0	6.0	12.7	.10	.000	.10	--
DEC 04	1205	209	86	--	--	.5	--	--	--	--	--
1980											
JAN 15	1300	193	88	--	--	.5	--	--	--	--	--
MAR 04	1330	54	138	--	--	.0	--	--	--	--	--
APR 24	0950	391	77	6.5	11.5	7.2	12.1	.29	.020	.31	--
MAY 20	1005	251	112	6.4	23.0	14.0	10.6	.15	.000	.15	--
JUN 17	1250	108	108	--	--	21.0	--	--	--	--	--
JUN 24	1205	71	148	7.2	27.0	22.0	9.4	.16	.000	.16	--
JUL 24	0950	62	120	6.6	23.0	24.8	8.6	.13	.000	.13	--
AUG 19	1130	37	170	6.4	21.0	19.0	9.4	.09	.010	.10	--
SEP 23	0945	53	144	8.3	21.0	19.0	9.3	.05	.000	.05	--
OCT 21	1400	78	105	--	--	10.0	--	--	--	--	--
OCT 28	1100	358	--	7.3	9.0	5.0	14.2	.19	.000	.19	--
NOV 20	1000	95	105	6.7	-1.0	.8	14.5	.25	.000	.25	--

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN AMMONIA TOTAL (MG/L AS NH4)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA+ ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHATE, TOTAL (MG/L AS PO4)	PHOSPHORUS TOTAL (MG/L AS PO4)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	HARDNESS (MG/L AS CACO3)
1976											
NOV 11	0.010	--	0.12	0.13	0.32	1.4	0.020	--	--	0.010	31
DEC 06	--	--	--	--	--	--	--	--	--	--	--
1977											
JAN 03	--	--	--	--	--	--	--	--	--	--	--
FEB 09	--	--	--	--	--	--	--	--	--	--	--
MAR 07	--	--	--	--	--	--	--	--	--	--	--
APR 28	.010	--	.21	.22	.81	3.6	.010	--	--	<.010	20
JUN 14	--	--	--	--	--	--	--	--	--	--	--
JUN 22	.060	--	.58	.64	.77	3.4	.060	--	--	<.010	--
AUG 16	--	--	--	--	--	--	--	--	--	--	--
AUG 28	<.010	--	.07	.07	.23	1.0	.010	--	--	.010	51
OCT 27	<.010	--	.34	.34	.51	2.3	.190	--	--	.170	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 6. 01153000 - BLACK RIVER AT NORTH SPRINGFIELD, VT (CONTINUED)

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN AMMONIA TOTAL (MG/L AS NH4)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA+ ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITROGEN TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)	PHOS-PHORUS TOTAL (MG/L AS PO4)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	HARDNESS (MG/L AS CACO3)
1978											
FEB 06	--	--	--	--	--	--	--	--	--	--	--
MAR 20	--	--	--	--	--	--	--	--	--	--	--
MAY 23	0.020	--	0.18	0.20	0.35	1.5	0.030	--	--	<0.010	23
JUN 27	.060	--	.21	.27	.33	1.5	.020	--	--	<.010	--
JUL 19	.130	--	.44	.57	.76	3.4	.030	--	--	<.010	36
AUG 01	--	--	--	--	--	--	--	--	--	--	--
AUG 11	--	--	--	--	--	--	--	--	--	--	--
AUG 29	.070	--	.23	.30	.45	2.0	.020	--	--	<.010	--
SEP 26	.030	--	.20	.23	.26	1.2	.010	--	--	<.010	--
OCT 11	--	--	--	--	--	--	--	--	--	--	--
OCT 24	.010	--	.15	.16	.24	1.1	.010	--	--	<.010	--
OCT 31	--	--	--	--	--	--	--	--	--	--	--
NOV 21	.080	--	.14	.22	.34	1.5	.010	--	--	<.010	--
DEC 11	--	--	--	--	--	--	--	--	--	--	--
1979											
APR 17	<.010	--	.00	<.10	.16	.71	<.010	--	--	<.010	--
MAY 15	.020	0.02	.21	.23	.36	1.6	.020	0.06	0.06	<.010	--
JUN 14	.030	.04	.18	.21	.30	1.3	.010	.03	.03	<.010	--
JUL 19	.060	.07	.32	.38	.55	2.4	.020	.00	.06	<.010	44
AUG 16	.040	.05	.10	.14	.20	.89	.010	.00	.03	<.010	--
SEP 13	.030	.04	.37	.40	.43	1.9	.010	.00	.03	<.010	--
OCT 25	.050	.06	.41	.46	.50	2.2	.010	.00	.03	.000	--
NOV 13	.010	.01	.13	.14	.24	1.1	.010	.03	.03	.010	29
DEC 04	--	--	--	--	--	--	--	--	--	--	--
1980											
JAN 15	--	--	--	--	--	--	--	--	--	--	--
MAR 04	--	--	--	--	--	--	--	--	--	--	--
APR 24	.060	.07	.12	.18	.49	2.2	.010	.03	.03	.010	27
MAY 20	.100	.12	.10	.20	.35	1.5	.090	.21	.28	.070	--
JUN 17	--	--	--	--	--	--	--	--	--	--	--
JUN 24	.080	.10	.16	.24	.40	1.8	.020	.00	.06	.000	--
JUL 24	.090	.11	.50	.59	.72	3.2	.020	.00	.06	.000	42
AUG 19	.130	.16	.18	.31	.41	1.8	.030	.00	.09	.000	--
SEP 23	.190	.23	.12	.31	.36	1.6	.030	.00	.09	.000	--
OCT 21	--	--	--	--	--	--	--	--	--	--	--
OCT 28	.000	.00	.15	.15	.34	1.5	.020	.00	.06	.000	--
NOV 20	.000	.00	.12	.12	.37	1.6	.000	.03	.00	.010	36

DATE	HARDNESS NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORP-TION RATIO	SODIUM+ POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE FET-FLD (MG/L AS HCO3)	CAR-BONATE FET-FLD (MG/L AS CO3)	ALKA-LINITY FIELD (MG/L AS CACO3)
1976											
NOV 11	1	8.9	2.1	4.6	24	0.4	--	1.0	37	--	30
DEC 06	--	--	--	--	--	--	--	--	--	--	--
1977											
JAN 03	--	--	--	--	--	--	--	--	--	--	--
FEB 09	--	--	--	--	--	--	--	--	--	--	--
MAR 07	--	--	--	--	--	--	--	--	--	--	--
APR 28	0	5.4	1.6	3.5	27	.4	--	.6	17	0	14
JUN 14	--	--	--	--	--	--	--	--	--	--	--
JUN 22	--	--	--	--	--	--	--	--	--	--	--
AUG 16	--	--	--	--	--	--	--	--	--	--	--
AUG 28	0	15	3.4	10	29	.6	--	1.8	51	0	42
OCT 27	--	--	--	--	--	--	--	--	--	--	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 6. 01153000 - BLACK RIVER AT NORTH SPRINGFIELD, VT (CONTINUED)

DATE	HARDNESS NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORP-TION RATIO	SODIUM+ POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE FET-FLD (MG/L AS HCO3)	CAR-BONATE FET-FLD (MG/L AS CO3)	ALKA-LINITY FIELD (MG/L AS CACO3)
1978											
FEB 06	--	--	--	--	--	--	--	--	--	--	--
MAR 20	--	--	--	--	--	--	--	--	--	--	--
MAY 23	0	6.7	1.6	3.8	25	0.4	--	1.1	21	0	17
JUN 27	--	--	--	--	--	--	--	--	--	--	--
JUL 19	0	10	2.7	9.5	35	.7	--	1.6	31	0	25
AUG 01	--	--	--	--	--	--	--	--	--	--	--
AUG 11	--	--	--	--	--	--	--	--	--	--	--
AUG 29	--	--	--	--	--	--	--	--	--	--	--
SEP 26	--	--	--	--	--	--	--	--	--	--	--
OCT 11	--	--	--	--	--	--	--	--	--	--	--
OCT 24	--	--	--	--	--	--	--	--	--	--	--
OCT 31	--	--	--	--	--	--	--	--	--	--	--
NOV 21	--	--	--	--	--	--	--	--	--	--	25
DEC 11	--	--	--	--	--	--	--	--	--	--	--
1979											
APR 17	--	--	--	--	--	--	--	--	--	--	14
MAY 15	--	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--	--
JUL 19	11	13	2.9	9.3	30	.6	11	1.5	41	--	34
AUG 16	--	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--	--
NOV 13	4	8.4	1.9	4.5	25	.4	5.4	.9	--	--	25
DEC 04	--	--	--	--	--	--	--	--	--	--	--
1980											
JAN 15	--	--	--	--	--	--	--	--	--	--	--
MAR 04	--	--	--	--	--	--	--	--	--	--	--
APR 24	11	7.9	1.8	4.6	26	.4	--	.9	--	--	16
MAY 20	--	--	--	--	--	--	--	--	--	--	--
JUN 17	--	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--	--
JUL 24	6	12	2.9	8.8	30	.6	--	1.5	--	--	36
AUG 19	--	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--	--
OCT 21	--	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--	--
NOV 20	14	10	2.7	6.0	26	.5	--	1.1	--	--	--

DATE	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CON-STITUENTS, DISSOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, INORGANIC, TOTAL (MG/L AS C)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	ALGAL GROWTH POTEN-TIAL (MG/L)
1976											
NOV 11	--	6.7	7.1	--	5.4	54	0.07	7.1	--	--	0.3
DEC 06	--	--	--	--	--	--	--	--	--	--	--
1977											
JAN 03	--	--	--	--	--	--	--	--	--	--	--
FEB 09	--	--	--	--	--	--	--	--	--	--	--
MAR 07	--	--	--	--	--	--	--	--	--	--	--
APR 28	8.5	5.9	7.0	--	3.9	36	.05	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--	--
JUN 22	--	--	--	--	--	--	--	--	--	--	--
AUG 16	--	--	--	--	--	--	--	--	--	--	--
AUG 28	6.4	8.3	17	--	2.2	83	.11	8.1	9.1	--	.5
OCT 27	--	--	--	--	--	--	--	--	--	--	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 6. 01153000 - BLACK RIVER AT NORTH SPRINGFIELD, VT (CONTINUED)

DATE	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CON-STITUENTS, DISSOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, INORGANIC, TOTAL (MG/L AS C)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	ALGAL GROWTH POTEN-TIAL (MG/L)
1978											
FEB 06	--	--	--	--	--	--	--	--	--	--	--
MAR 20	--	--	--	--	--	--	--	--	--	--	--
MAY 23	8.4	6.6	6.0	--	3.5	40	0.05	6.4	7.0	--	2.8
JUN 27	--	--	--	--	--	--	--	--	--	0.00	--
JUL 19	7.8	7.1	16	--	3.3	66	.09	1.8	6.3	.00	1.3
AUG 01	--	--	--	--	--	--	--	--	--	--	--
AUG 11	--	--	--	--	--	--	--	--	--	--	--
AUG 29	--	--	--	--	--	--	--	--	--	.00	--
SEP 26	--	--	--	--	--	--	--	--	--	.00	--
OCT 11	--	--	--	--	--	--	--	--	--	--	--
OCT 24	--	--	--	--	--	--	--	--	--	.00	--
OCT 31	--	--	--	--	--	--	--	--	--	--	--
NOV 21	3.8	7.9	9.1	<0.1	4.5	--	--	3.2	6.8	--	.9
DEC 11	--	--	--	--	--	--	--	--	--	--	--
1979											
APR 17	4.3	6.7	7.4	<.1	4.3	--	--	1.5	6.4	--	.4
MAY 15	--	--	--	--	--	--	--	--	--	--	1.6
JUN 14	--	--	--	--	--	--	--	--	--	--	--
JUL 19	2.6	7.1	14	--	3.1	71	.10	4.1	--	--	2.0
AUG 16	--	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--	--
NOV 13	15	6.7	6.8	--	4.2	48	.07	1.1	5.4	--	2.5
DEC 04	--	--	--	--	--	--	--	--	--	--	--
1980											
JAN 15	--	--	--	--	--	--	--	--	--	--	--
MAR 04	--	--	--	--	--	--	--	--	--	--	--
APR 24	9.8	6.6	8.2	--	4.5	44	.06	2.0	4.8	--	4.5
MAY 20	--	--	--	--	--	--	--	--	--	--	--
JUN 17	--	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--	--
JUL 24	18	7.5	14	--	2.3	71	.10	3.7	7.8	--	4.2
AUG 19	--	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--	--
OCT 21	--	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--	--
NOV 20	8.5	7.0	9.8	--	4.4	54	.07	2.1	8.4	--	1.9

DATE	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)
1976										
NOV 11	--	--	70	20	--	<1	--	ND	--	<20
DEC 06	--	--	--	--	--	--	--	--	--	--
1977										
JAN 03	--	--	--	--	--	--	--	--	--	--
FEB 09	--	--	--	--	--	--	--	--	--	--
MAR 07	--	--	--	--	--	--	--	--	--	--
APR 28	--	--	50	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--
JUN 22	--	--	--	--	--	--	--	--	--	--
AUG 16	--	--	--	--	--	--	--	--	--	--
AUG 28	--	--	<10	--	--	--	--	--	--	--
OCT 27	--	--	--	--	--	--	--	--	--	--
1978										
FEB 06	--	--	--	--	--	--	--	--	--	--
MAR 20	--	--	--	--	--	--	--	--	--	--
MAY 23	--	--	130	--	--	--	--	--	--	--
JUN 27	--	--	--	--	--	--	--	--	--	--
JUL 19	--	--	210	20	--	<1	--	<2	--	ND
AUG 01	--	--	--	--	--	--	--	--	--	--
AUG 11	--	--	--	--	--	--	--	--	--	--
AUG 29	--	--	--	--	--	--	--	--	--	--
SEP 26	--	--	--	--	--	--	--	--	--	--
OCT 11	--	--	--	--	--	--	--	--	--	--
OCT 24	--	--	--	--	--	--	--	--	--	--
OCT 31	--	--	--	--	--	--	--	--	--	--
NOV 21	--	--	--	--	--	--	--	--	--	--
DEC 11	--	--	--	--	--	--	--	--	--	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 6. 01153000 - BLACK RIVER AT NORTH SPRINGFIELD, VT (CONTINUED)

DATE	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)
1979										
APR 17	--	--	--	--	--	--	--	--	--	--
MAY 15	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--
JUL 19	620	470	150	--	1	--	<2	--	<20	--
AUG 16	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--
NOV 13	--	--	80	--	--	--	--	--	--	--
DEC 04	--	--	--	--	--	--	--	--	--	--
1980										
JAN 15	--	--	--	--	--	--	--	--	--	--
MAR 04	--	--	--	--	--	--	--	--	--	--
APR 24	--	--	80	--	--	--	--	--	--	--
MAY 20	--	--	--	--	--	--	--	--	--	--
JUN 17	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--
JUL 24	870	700	170	--	0	--	0	--	10	--
AUG 19	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--
OCT 21	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--
NOV 20	--	--	70	--	--	--	--	--	--	--

DATE	COBALT, DISSOLVED (UG/L AS CO)	COPPER TOTAL RECOVERABLE (UG/L AS CU)	COPPER DISSOLVED (UG/L AS CU)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE DISSOLVED (UG/L AS MN)	MERCURY TOTAL, RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL DISSOLVED (UG/L AS NI)
1978											
JUL 19	ND	--	2	--	14	--	110	--	0.5	1	ND
1979											
JUL 19	--	3	--	ND	--	160	--	<0.5	--	--	--
NOV 13	--	--	--	--	--	--	--	--	--	--	--
1980											
APR 24	--	--	--	--	--	--	--	--	--	--	--
JUL 24	--	13	--	6	--	150	--	<.1	--	--	--
NOV 20	--	--	--	--	--	--	--	--	--	--	--

DATE	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, TOTAL (MG/L AS C)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)
1978											
JUL 19	--	<1	--	<20	--	0.00	0.00	0.00	0.00	0.00	0.00
1979											
JUL 19	<1	--	20	--	--	.00	.00	.00	.00	.00	.00
NOV 13	--	--	--	--	6.5	--	--	--	--	--	--
1980											
APR 24	--	--	--	--	6.8	--	--	--	--	--	--
JUL 24	0	--	100	--	12	.00	.00	.00	.00	.00	.00
NOV 20	--	--	--	--	11	--	--	--	--	--	--

DATE	DDT, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)
1978										
JUL 19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0
1979										
JUL 19	.00	.00	.0D	.00	.00	.00	.00	--	0.00	0
NOV 13	--	--	--	--	--	--	--	--	--	--
1980										
APR 24	--	--	--	--	--	--	--	--	--	--
JUL 24	.00	.00	.00	.00	.00	.00	.00	.00	.00	0
NOV 20	--	--	--	--	--	--	--	--	--	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 7. 01153025 - BLACK RIVER AT GILMAN DAM, SPRINGFIELD, VT

DATE	TIME	SPECIFIC CONDUCT-ANCE (UMHOS)	PH (STAND-ARD UNITS)	TEMPER-ATURE, AIR (DEG C)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)
1976											
NOV 11	0940	--	--	--	--	--	0.19	0.010	0.20	--	0.010
1977											
APR 28	1115	65	6.7	13.0	9.0	9.2	.33	<.010	.33	--	.010
JUN 22	1425	150	6.8	--	19.0	8.4	.17	.010	.18	--	.110
AUG 28	1045	185	7.1	17.0	17.0	9.9	.27	<.010	.27	--	<.010
OCT 27	1045	120	6.9	--	11.0	10.2	.18	<.010	.18	--	<.010
1978											
MAY 23	1130	85	6.7	19.0	16.0	9.8	.11	<.010	.11	--	.010
JUN 27	1110	140	6.8	23.0	21.0	8.7	.16	<.010	.16	--	.080
JUL 19	1025	130	6.8	26.0	23.0	8.2	.21	.020	.23	--	.110
AUG 29	1045	200	6.6	23.0	18.0	8.8	.28	.010	.29	--	.090
SEP 26	1035	135	6.8	11.0	12.0	12.2	.06	.010	.07	--	.140
OCT 24	1125	115	7.1	6.0	7.0	13.4	.12	<.010	.12	--	<.010
NOV 21	1030	125	7.1	.0	2.0	13.8	.15	<.010	.15	0.15	.030
1979											
APR 17	0955	66	6.5	10.0	4.5	12.7	.16	<.010	.16	.16	.010
MAY 15	0905	94	6.9	15.5	14.0	10.2	.16	<.010	.16	--	.020
JUN 14	0915	105	7.0	15.0	15.0	9.8	.14	<.010	.14	--	.020
JUL 19	0945	140	7.5	21.0	22.5	8.9	.23	.010	.24	--	.080
AUG 16	0830	138	7.5	15.0	15.5	9.5	.12	<.010	.12	--	.060
SEP 13	0920	130	7.6	16.0	17.0	9.7	.08	.010	.09	--	.040
OCT 25	1210	105	6.9	9.5	12.0	10.6	.05	.000	.05	--	.010
NOV 13	0935	85	6.7	6.0	6.0	12.6	.12	.000	.12	--	.020
1980											
APR 24	0930	77	6.3	10.5	7.4	12.2	.28	.000	.28	--	.020
MAY 20	0945	116	6.5	24.0	14.0	10.4	.15	.000	.15	--	.120
JUN 24	1230	150	7.1	29.0	22.0	9.0	.19	.000	.19	--	.130
JUL 24	0930	154	6.8	23.0	23.4	8.7	.13	.000	.13	--	.070
AUG 19	1225	190	6.6	22.0	20.0	10.4	.07	.010	.08	--	.090
SEP 23	0840	168	7.3	20.5	18.0	9.1	.07	.000	.07	--	.150
OCT 28	1130	--	7.3	4.0	5.0	13.0	.20	.000	.20	--	.070
NOV 20	0935	117	7.0	-3.0	.5	14.9	.26	.000	.26	--	.010

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS NH4)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN AMMONIA+ ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)	PHOS-PHORUS TOTAL (MG/L AS PO4)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	HARD-NESS (MG/L AS CACO3)	HARDNESS, NONCAR-BONATE (MG/L CACO3)
1976											
NOV 11	--	0.07	0.08	0.28	1.2	0.020	--	--	0.010	36	8
1977											
APR 28	--	.30	.31	.64	2.8	.010	--	--	<.010	19	0
JUN 22	--	.17	.28	.46	2.0	.020	--	--	.010	--	--
AUG 28	--	.21	.21	.48	2.1	.090	--	--	.020	51	0
OCT 27	--	.12	.12	.30	1.3	.020	--	--	.010	--	--
1978											
MAY 23	--	.24	.25	.36	1.6	.030	--	--	<.010	24	0
JUN 27	--	.21	.29	.45	2.0	.040	--	--	.010	--	--
JUL 19	--	.37	.48	.71	3.1	.040	--	--	<.010	41	0
AUG 29	--	.24	.33	.62	2.7	.080	--	--	.010	--	--
SEP 26	--	.50	.64	.71	3.1	.090	--	--	<.010	--	--
OCT 24	--	.21	.21	.33	1.5	.040	--	--	.010	--	--
NOV 21	--	.14	.17	.32	1.4	.020	--	--	<.010	--	--
1979											
APR 17	--	.06	.07	.23	1.0	.010	--	--	<.010	--	--
MAY 15	0.02	.12	.14	.30	1.3	.020	0.06	0.06	<.010	--	--
JUN 14	.02	.16	.18	.32	1.4	.020	.06	.06	<.010	--	--
JUL 19	.10	.25	.33	.57	2.5	.040	.03	.12	.010	44	3
AUG 16	.07	.23	.29	.41	1.8	.030	.00	.09	<.010	--	--
SEP 13	.05	.24	.28	.37	1.6	.040	.03	.12	.010	--	--
OCT 25	.01	.69	.70	.75	3.3	.020	.00	.06	.000	--	--
NOV 13	.02	.09	.11	.23	1.0	.020	.00	.06	.000	30	14

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 7. 01153025 - BLACK RIVER AT GILMAN DAM, SPRINGFIELD, VT (CONTINUED)

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS NH4)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN AMMONIA+ ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)	PHOS-PHORUS TOTAL (MG/L AS PO4)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	HARD-NESS (MG/L AS CACO3)	HARDNESS, NONCAR-BONATE (MG/L CACO3)
1980											
APR 24	0.02	0.04	0.06	0.34	1.5	0.010	0.00	0.03	0.000	--	--
MAY 20	.15	.10	.22	.37	1.6	.010	.00	.03	.000	--	--
JUN 24	.16	.39	.52	.71	3.1	.050	.00	.15	.000	--	--
JUL 24	.08	.32	.39	.52	2.3	.040	.03	.12	.010	45	6
AUG 19	.11	.17	.26	.34	1.5	.030	.03	.09	.010	--	--
SEP 23	.18	.28	.43	.50	2.2	.050	.03	.15	.010	--	--
OCT 28	.08	.19	.26	.46	2.0	.030	.00	.09	.000	--	--
NOV 20	.01	.12	.13	.39	1.7	.020	.09	.06	.030	26	5

DATE	CALCIUM, DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DISSOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PER-CENT SODIUM	SODIUM AD-SORP-TION RATIO	SODIUM+ POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE FET-FLD (MG/L AS HCO3)	CAR-BONATE FET-FLD (MG/L AS CO3)	ALKA-LINITY FIELD (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)
1976											
NOV 11	11	2.1	4.9	22	0.4	--	1.1	34	--	28	--
1977											
APR 28	5.2	1.4	3.5	28	.4	--	.8	17	0	14	5.4
JUN 22	--	--	--	--	--	--	--	--	--	--	--
AUG 28	15	3.4	12	33	.8	--	2.0	50	0	41	6.3
OCT 27	--	--	--	--	--	--	--	--	--	--	--
1978											
MAY 23	6.9	1.6	4.5	28	.4	--	1.0	26	0	21	8.2
JUN 27	--	--	--	--	--	--	--	--	--	--	--
JUL 19	12	2.8	10	33	.7	--	1.7	34	0	28	8.6
AUG 29	--	--	--	--	--	--	--	--	--	--	--
SEP 26	--	--	--	--	--	--	--	--	--	--	--
OCT 24	--	--	--	--	--	--	--	--	--	--	--
NOV 21	--	--	--	--	--	--	--	--	--	27	4.2
1979											
APR 17	--	--	--	--	--	--	--	--	--	11	6.7
MAY 15	--	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--	--
JUL 19	13	2.8	12	36	.8	14	1.5	50	--	41	2.5
AUG 16	--	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--	--
NOV 13	8.6	2.0	5.4	28	.4	6.4	1.0	--	--	16	6.2
1980											
APR 24	--	--	--	--	--	--	1.0	--	--	33	32
MAY 20	--	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--	--
JUL 24	13	3.0	10	32	.7	--	1.6	--	--	39	12
AUG 19	--	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--	--
NOV 20	7.2	1.9	5.7	31	.5	--	1.7	--	--	--	4.1

DATE	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CON-STITUENTS, DISSOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	CARBON, ORGANIC, TOTAL (MG/L AS C)	CARBON, INORGANIC, TOTAL (MG/L AS C)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	ALGAL GROWTH POTEN-TIAL (MG/L)
1976										
NOV 11	6.5	7.9	--	5.6	56	0.08	7.2	--	--	1.2
1977										
APR 28	6.1	8.4	--	4.1	38	.05	--	--	--	--
JUN 22	--	--	--	--	--	--	--	--	--	--
AUG 28	8.3	20	--	2.6	88	.12	11	11	--	4.1
OCT 27	--	--	--	--	--	--	--	--	--	--
1978										
MAY 23	7.3	7.4	--	3.8	45	.06	6.3	11	--	14
JUN 27	--	--	--	--	--	--	--	--	0.00	--
JUL 19	7.1	18	--	3.2	72	.10	1.6	8.4	.00	2.7
AUG 29	--	--	--	--	--	--	--	--	.00	--
SEP 26	--	--	--	--	--	--	--	--	.10	--
OCT 24	--	--	--	--	--	--	--	--	.00	--
NOV 21	8.1	25	<0.1	4.6	--	--	1.8	.0	--	5.2

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 7. 01153025 - BLACK RIVER AT GILMAN DAM, SPRINGFIELD, VT (CONTINUED)

DATE	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	CARBON, ORGANIC, TOTAL (MG/L AS C)	CARBON, INORGANIC, TOTAL (MG/L AS C)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	ALGAL GROWTH POTENTIAL (MG/L)
1979										
APR 17	6.8	7.7	<0.1	4.4	--	--	1.9	5.9	--	--
MAY 15	--	--	--	--	--	--	--	--	--	4.0
JUN 14	--	--	--	--	--	--	--	--	--	--
JUL 19	7.7	17	--	3.7	82	0.11	4.2	--	--	6.1
AUG 16	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--
NOV 13	7.0	8.1	--	4.5	46	.06	.5	5.6	--	6.8
1980										
APR 24	8.9	9.2	--	--	19	.03	1.6	4.5	--	6.4
MAY 20	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--
JUL 24	7.4	16	--	2.4	77	.10	2.1	8.9	--	9.1
AUG 19	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--
NOV 20	7.5	13	--	3.2	53	.07	2.3	7.9	--	5.8

DATE	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)
1976										
NOV 11	--	--	60	20	--	<1	--	ND	--	<20
1977										
APR 28	--	--	80	--	--	--	--	--	--	--
JUN 22	--	--	--	--	--	--	--	--	--	--
AUG 28	--	--	30	--	--	--	--	--	--	--
OCT 27	--	--	--	--	--	--	--	--	--	--
1978										
MAY 23	--	--	120	--	--	--	--	--	--	--
JUN 27	--	--	--	--	--	--	--	--	--	--
JUL 19	--	--	200	10	--	<1	--	<2	--	ND
AUG 29	--	--	--	--	--	--	--	--	--	--
SEP 26	--	--	--	--	--	--	--	--	--	--
OCT 24	--	--	--	--	--	--	--	--	--	--
NOV 21	--	--	--	--	--	--	--	--	--	--
1979										
APR 17	--	--	--	--	--	--	--	--	--	--
MAY 15	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--
JUL 19	480	390	90	--	1	--	<2	--	20	--
AUG 16	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--
NOV 13	--	--	100	--	--	--	--	--	--	--
1980										
APR 24	--	--	--	--	--	--	--	--	--	--
MAY 20	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--
JUL 24	710	600	110	--	0	--	0	--	<1D	--
AUG 19	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--
NOV 20	--	--	60	--	--	--	--	--	--	--

DATE	COBALT, DISSOLVED (UG/L AS CO)	COPPER TOTAL RECOVERABLE (UG/L AS CU)	COPPER DISSOLVED (UG/L AS CU)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE DISSOLVED (UG/L AS MN)	MERCURY TOTAL, RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL DISSOLVED (UG/L AS NI)
1978											
JUL 19	ND	--	2	--	ND	--	70	--	0.5	<1	ND
1979											
JUL 19	--	4	--	2	--	130	--	<0.5	--	--	--
NOV 13	--	--	--	--	--	--	--	--	--	--	--
1980											
APR 24	--	--	--	--	--	--	--	--	--	--	--
JUL 24	--	5	--	3	--	120	--	<.1	--	--	--
NOV 20	--	--	--	--	--	--	--	--	--	--	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 7. 01153025 - BLACK RIVER AT GILMAN DAM, SPRINGFIELD, VT (CONTINUED)

DATE	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, TOTAL (MG/L AS C)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)
1978											
JUL 19	--	<1	--	<20	--	0.00	0.00	0.00	0.00	0.00	0.00
1979											
JUL 19	<1	--	30	--	--	.00	.00	.00	.00	.00	.00
NOV 13	--	--	--	--	6.1	--	--	--	--	--	--
1980											
APR 24	--	--	--	--	6.1	--	--	--	--	--	--
JUL 24	0	--	20	--	11	.00	.00	.00	.00	.00	.00
NOV 20	--	--	--	--	10	--	--	--	--	--	--

DATE	DDT, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)
1978										
JUL 19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0
1979										
JUL 19	.00	.00	.00	.00	.00	.00	.00	--	0.00	0
NOV 13	--	--	--	--	--	--	--	--	--	--
1980										
APR 24	--	--	--	--	--	--	--	--	--	--
JUL 24	.00	.00	.00	.00	.00	.00	.00	.00	.00	0
NOV 20	--	--	--	--	--	--	--	--	--	--

INFORMAL STATION NUMBER 8. 01153050 - BLACK RIVER BELOW COMTU FALLS DAM, SPRINGFIELD, VT

DATE	TIME	SPECIFIC CONDUCT-ANCE (UMHOS)	PH (STAND-ARD UNITS)	TEMPER-ATURE, AIR (DEG C)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)
1976											
NOV 11	0900	--	--	--	--	--	0.21	0.010	0.22	--	0.020
1977											
APR 28	1100	100	6.7	13.0	10.0	10.9	.44	<.010	.44	--	.010
JUN 22	1430	150	6.9	--	19.0	9.1	.28	<.010	.28	--	<.010
AUG 25	1025	180	7.4	16.0	17.0	9.2	.47	<.010	.47	--	<.010
OCT 27	1030	120	6.8	--	11.0	8.9	.18	<.010	.18	--	.010
1978											
MAY 23	1100	115	6.6	20.0	18.0	9.2	.10	.010	.11	--	.020
JUN 27	1055	140	6.9	24.0	22.0	8.3	.15	.010	.16	--	.070
JUL 19	0950	150	7.3	25.0	21.0	8.8	.20	.010	.21	--	.140
AUG 29	1035	150	6.4	22.0	19.0	8.6	.27	.020	.29	--	.070
SEP 26	1015	130	6.4	9.0	12.0	12.0	.05	.010	.06	--	.030
OCT 24	1110	115	7.3	5.0	6.0	13.0	.11	.010	.12	--	<.010
NOV 21	1010	115	7.2	.0	2.0	14.0	.16	<.010	.16	0.16	.120

DATE	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA+ ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)
1976											
NOV 11	0.06	0.08	0.30	1.3	0.030	0.010	30	1	8.7	2.1	5.2
1977											
APR 28	.28	.29	.73	3.2	.070	<.010	21	0	5.9	1.5	4.1
JUN 22	.35	.35	.63	2.8	.030	.010	--	--	--	--	--
AUG 25	.59	.59	1.1	4.7	.890	.020	54	0	16	3.5	12
OCT 27	.25	.26	.44	1.9	.020	.010	--	--	--	--	--
1978											
MAY 23	.21	.23	.34	1.5	.020	<.010	24	0	6.9	1.6	4.5
JUN 27	.22	.29	.45	2.0	.050	.010	--	--	--	--	--
JUL 19	.34	.48	.69	3.1	.040	<.010	42	0	12	2.9	11
AUG 29	.20	.27	.56	2.5	.090	.010	--	--	--	--	--
SEP 26	.19	.22	.28	1.2	.050	.020	--	--	--	--	--
OCT 24	.19	.19	.31	1.4	.040	.010	--	--	--	--	--
NOV 21	.05	.17	.33	1.5	.020	.010	--	--	--	--	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 8. 01153050 - BLACK RIVER BELOW COMTU FALLS DAM, SPRINGFIELD, VT (CONTINUED)

DATE	PERCENT SODIUM	SODIUM ADSORPTION RATIO	POTASSIUM DISSOLVED (MG/L AS K)	BICARBONATE FET-FLD (MG/L AS HCO3)	CARBONATE FET-FLD (MG/L AS CO3)	ALKALINITY FIELD (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE DISSOLVED (MG/L AS CL)	FLUORIDE DISSOLVED (MG/L AS F)	SILICA DISSOLVED (MG/L AS SIO2)
1976											
NOV 11	26	0.4	1.1	36	--	30	--	6.8	7.7	--	5.7
1977											
APR 28	29	.4	.9	19	0	16	6.0	6.1	8.2	--	4.0
JUN 22	--	--	--	--	--	--	--	--	--	--	--
AUG 25	31	.7	2.1	44	0	36	2.8	8.7	19	--	2.9
OCT 27	--	--	--	--	--	--	--	--	--	--	--
1978											
MAY 23	28	.4	1.0	23	0	19	9.2	6.6	7.0	--	3.9
JUN 27	--	--	--	--	--	--	--	--	--	--	--
JUL 19	35	.8	1.8	47	0	39	3.7	7.1	18	--	3.1
AUG 29	--	--	--	--	--	--	--	--	--	--	--
SEP 26	--	--	--	--	--	--	--	--	--	--	--
OCT 24	--	--	--	--	--	--	--	--	--	--	--
NOV 21	--	--	--	--	--	30	3.7	8.0	11	<0.1	4.4

DATE	SOLIDS, SUM OF CONSTITUENTS DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, INORGANIC, TOTAL (MG/L AS C)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	ALGAL GROWTH POTENTIAL (MG/L)	IRON, DISSOLVED (UG/L AS FE)	ALUMNIUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)
1976											
NOV 11	55	0.07	5.9	--	--	4.0	70	30	<1	ND	<20
1977											
APR 28	40	.05	--	--	--	--	100	--	--	--	--
JUN 22	--	--	--	--	--	--	--	--	--	--	--
AUG 25	86	.12	13	12	--	8.2	<10	--	--	--	--
OCT 27	--	--	--	--	--	--	--	--	--	--	--
1978											
MAY 23	43	.06	4.9	5.8	--	5.4	120	--	--	--	--
JUN 27	--	--	--	--	0.00	--	--	--	--	--	--
JUL 19	79	.11	1.3	7.1	.00	.6	160	20	<1	ND	ND
AUG 29	--	--	--	--	.00	--	--	--	--	--	--
SEP 26	--	--	--	--	.10	--	--	--	--	--	--
OCT 24	--	--	--	--	.00	--	--	--	--	--	--
NOV 21	--	--	1.7	8.0	--	5.7	--	--	--	--	--

DATE	COBALT DISSOLVED (UG/L AS CO)	COPPER DISSOLVED (UG/L AS CU)	LEAD DISSOLVED (UG/L AS PB)	MANGANESE DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM DISSOLVED (UG/L AS MO)	NICKEL DISSOLVED (UG/L AS NI)	SELENIUM DISSOLVED (UG/L AS SE)	ZINC, DISSOLVED (UG/L AS ZN)	PCB TOTAL (UG/L)	NAPTHALENES POLY-CHLOR TOTAL (UG/L)
1978											
JUL 19	ND	12	2	70	0.5	1	ND	<1	ND	0.00	0.00

DATE	ALDRIN TOTAL (UG/L)	CHLORDANE TOTAL (UG/L)	DDD TOTAL (UG/L)	DDE TOTAL (UG/L)	DDT TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN TOTAL (UG/L)	ENDRIN TOTAL (UG/L)	HEPTACHLOR TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MIREX TOTAL (UG/L)	TOXAPHENE TOTAL (UG/L)
1978													
JUL 19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0

INFORMAL STATION NUMBER 9. 01153075 - BLACK RIVER BELOW SPRINGFIELD, VT

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	PH STANDARD UNITS)	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN AMMONIA TOTAL (MG/L AS N)
1976											
NOV 11	0815	--	--	--	--	--	0.20	0.040	0.24	--	0.020
1977											
APR 28	1030	100	6.7	13.0	10.0	9.9	.84	<.010	.84	--	<.010
JUN 22	1450	160	7.0	--	20.0	8.5	.45	.140	.59	--	<.010
AUG 28	0950	190	7.4	15.0	16.0	8.4	.50	<.010	.50	--	<.010
OCT 27	1000	160	7.2	--	11.0	10.0	.20	<.010	.20	--	.060
1978											
MAY 23	0945	160	6.9	18.0	16.0	9.2	.11	.010	.12	--	.020
JUN 27	1015	150	7.4	22.0	21.0	9.4	.15	.010	.16	--	.100
JUL 19	0840	160	7.2	18.0	21.0	8.9	.18	.020	.20	--	.190
AUG 29	1010	180	6.5	21.0	19.0	8.6	.30	.020	.32	--	.160
SEP 26	0950	140	7.1	10.0	11.0	11.8	.10	.010	.11	--	.160
OCT 24	1045	130	7.5	5.0	6.0	13.4	.13	.010	.14	--	.170
NOV 21	0935	125	7.1	.0	2.0	14.2	.31	<.010	.31	0.30	.080

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 9. 01153075 - BLACK RIVER BELOW SPRINGFIELD, VT (CONTINUED)

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	PH STANDARD UNITS)	TEMPERATURE, AIR (DEG C)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN AMMONIA TOTAL (MG/L AS N)
1979											
APR 17	0930	77	6.7	10.0	4.5	12.5	0.17	0.010	0.18	0.17	0.030
MAY 15	0830	108	6.9	15.5	14.0	10.4	.20	.010	.21	--	.050
JUN 14	0840	123	6.7	13.5	14.5	10.8	.19	.060	.25	--	.040
JUL 19	0915	157	7.5	20.5	22.0	8.8	.34	.010	.35	--	.040
AUG 16	0750	153	7.5	14.0	15.0	9.6	.19	.010	.20	--	.090
SEP 13	0750	143	7.2	13.5	15.0	9.6	.19	.010	.20	--	.050
OCT 25	1230	114	7.4	9.5	12.0	10.9	.09	.000	.09	--	.010
NOV 13	0920	96	6.7	5.0	6.0	12.6	.19	.000	.19	--	.010
1980											
APR 24	0910	90	6.5	10.0	7.8	12.2	.35	.000	.35	--	.010
MAY 20	0910	136	6.7	25.0	14.0	11.2	.20	.010	.21	--	.110
JUN 24	1300	150	8.0	30.0	23.0	9.9	.44	.010	.45	--	.150
JUL 24	0900	165	7.1	23.0	22.5	8.7	.18	.010	.19	--	.050
AUG 19	1245	215	6.5	23.0	20.0	9.1	.30	.010	.31	--	.220
SEP 23	0820	198	6.8	20.5	18.0	9.2	.10	.010	.11	--	.240
OCT 28	1145	--	7.3	5.0	5.0	12.9	.21	.000	.21	--	.090
NOV 20	0915	140	7.1	-3.0	.5	14.9	.28	.000	.28	--	.130

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS NH4)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN AMMONIA+ ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHATE, TOTAL (MG/L AS PO4)	PHOSPHORUS TOTAL (MG/L AS PO4)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)
1976											
NOV 11	--	0.13	0.15	0.39	1.7	0.030	--	--	0.010	34	2
1977											
APR 28	--	.18	.18	1.0	4.5	.010	--	--	<.010	20	0
JUN 22	--	.91	.91	1.5	6.6	.080	--	--	.070	--	--
AUG 28	--	.19	.19	.69	3.1	.160	--	--	.100	60	0
OCT 27	--	.21	.27	.47	2.1	.050	--	--	.010	--	--
1978											
MAY 23	--	.29	.31	.43	1.9	.020	--	--	<.010	26	0
JUN 27	--	.22	.32	.48	2.1	.050	--	--	.020	--	--
JUL 19	--	.34	.53	.73	3.2	.070	--	--	<.010	48	0
AUG 29	--	.23	.39	.71	3.1	.080	--	--	.020	--	--
SEP 26	--	.33	.49	.60	2.7	.080	--	--	.030	--	--
OCT 24	--	.30	.47	.61	2.7	.050	--	--	.020	--	--
NOV 21	--	.14	.22	.53	2.3	.070	--	--	.030	--	--
1979											
APR 17	--	.07	.10	.28	1.2	.010	--	--	<.010	--	--
MAY 15	0.06	.15	.20	.41	1.8	.030	0.09	0.09	<.010	--	--
JUN 14	.05	.18	.22	.47	2.1	.020	.06	.06	.010	--	--
JUL 19	.05	.33	.37	.72	3.2	.060	.06	.18	.020	47	5
AUG 16	.11	.23	.32	.52	2.3	.030	.06	.09	.020	--	--
SEP 13	.06	.31	.36	.56	2.5	.050	.06	.15	.020	--	--
OCT 25	.01	.65	.66	.75	3.3	.030	.03	.09	.010	--	--
NOV 13	.01	.21	.22	.41	1.8	.020	.03	.06	.010	32	11
1980											
APR 24	.01	.07	.08	.43	1.9	.020	.03	.06	.010	32	0
MAY 20	.13	.29	.40	.61	2.7	.150	.28	.46	.090	--	--
JUN 24	.18	.23	.38	.83	3.7	.070	.09	.21	.030	--	--
JUL 24	.06	.31	.36	.55	2.4	.030	.03	.09	.010	45	5
AUG 19	.27	.19	.41	.72	3.2	.050	.09	.15	.030	--	--
SEP 23	.29	.30	.54	.65	2.9	.080	.12	.25	.040	--	--
OCT 28	.11	.30	.39	.60	2.7	.030	.03	.09	.010	--	--
NOV 20	.16	.14	.27	.55	2.4	.060	.12	.18	.040	39	17

DATE	CALCIUM, DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	SODIUM+ POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE FET-FLD (MG/L AS HCO3)	CARBONATE FET-FLD (MG/L AS CO3)	ALKALINITY FIELD (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)
1976											
NOV 11	10	2.3	5.8	26	0.4	--	1.2	40	--	33	--
1977											
APR 28	6.0	1.2	4.3	31	.4	--	.8	18	0	15	5.7
JUN 22	--	--	--	--	--	--	--	--	--	--	--
AUG 28	18	3.7	14	33	.8	--	2.2	42	0	34	2.7
OCT 27	--	--	--	--	--	--	--	--	--	--	--

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 9. 01153075 - BLACK RIVER BELOW SPRINGFIELD, VT (CONTINUED)

DATE	CALCIUM, DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DISSOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PER-CENT SODIUM	SODIUM AD-SORP-TION RATIO	SODIUM+ POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE FET-FLD (MG/L AS HCO3)	CAR-BONATE FET-FLD (MG/L AS CO3)	ALKA-LINITY FIELD (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)
1978											
MAY 23	7.6	1.7	5.0	28	0.4	--	1.1	22	0	18	4.4
JUN 27	--	--	--	--	--	--	--	--	--	--	--
JUL 19	14	3.1	12	34	.8	--	1.8	43	0	35	4.3
AUG 29	--	--	--	--	--	--	--	--	--	--	--
SEP 26	--	--	--	--	--	--	--	--	--	--	--
OCT 24	--	--	--	--	--	--	--	--	--	--	--
NOV 21	--	--	--	--	--	--	--	--	--	29	4.5
1979											
APR 17	--	--	--	--	--	--	--	--	--	16	6.2
MAY 15	--	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--	--
JUL 19	14	3.0	11	33	.7	13	1.6	52	--	43	2.6
AUG 16	--	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--	--
NOV 13	9.5	2.1	6.1	28	.5	7.2	1.1	--	--	21	8.1
1980											
APR 24	9.7	1.9	7.1	32	.6	--	1.2	--	--	32	20
MAY 20	--	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--	--
JUL 24	13	3.0	11	34	.7	--	1.6	--	--	40	6.2
AUG 19	--	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--	--
NOV 20	11	2.9	10	35	.7	--	1.3	--	--	--	3.4

DATE	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CON-STITUENTS, DISSOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	CARBON, ORGANIC, TOTAL (MG/L AS C)	CARBON, INORGANIC, TOTAL (MG/L AS C)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	ALGAL GROWTH POTEN-TIAL (MG/L)
1976										
NOV 11	6.9	9.4	--	5.7	61	0.08	6.5	--	--	3.5
1977										
APR 28	6.7	10	--	4.0	42	.06	--	--	--	--
JUN 22	--	--	--	--	--	--	--	--	--	--
AUG 28	9.2	24	--	2.8	95	.13	9.0	7.8	--	.5
OCT 27	--	--	--	--	--	--	--	--	--	--
1978										
MAY 23	6.5	7.7	--	4.0	45	.06	7.0	6.3	--	8.5
JUN 27	--	--	--	--	--	--	--	--	0.00	--
JUL 19	7.4	19	--	2.9	82	.11	2.1	7.6	.00	11
AUG 29	--	--	--	--	--	--	--	--	.00	--
SEP 26	--	--	--	--	--	--	--	--	.10	--
OCT 24	--	--	--	--	--	--	--	--	.00	--
NOV 21	8.6	11	<0.1	4.3	--	--	2.3	7.7	--	11
1979										
APR 17	7.2	9.1	<.1	4.5	--	--	1.8	4.8	--	4.0
MAY 15	--	--	--	--	--	--	--	--	--	9.2
JUN 14	--	--	--	--	--	--	--	--	--	--
JUL 19	7.7	20	--	3.4	86	.12	4.0	--	--	14
AUG 16	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--
NOV 13	7.1	9.4	--	4.5	52	.07	5.4	6.4	--	9.1
1980										
APR 24	8.0	12	--	4.7	64	.09	2.3	4.7	--	13
MAY 20	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--
JUL 24	7.5	18	--	2.4	81	.11	2.7	8.2	--	9.9
AUG 19	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--
NOV 20	6.9	15	--	4.5	65	.09	2.5	9.3	--	12

TABLE A-1.--WATER-QUALITY DATA COLLECTED ALONG THE LOWER BLACK RIVER, WATER YEARS 1977-81 (CONTINUED)

INFORMAL STATION NUMBER 9. 01153075 - BLACK RIVER BELOW SPRINGFIELD, VT (CONTINUED)

DATE	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)
1976										
NOV 11	--	--	90	40	--	<1	--	ND	--	<20
1977										
APR 28	--	--	50	--	--	--	--	--	--	--
JUN 22	--	--	--	--	--	--	--	--	--	--
AUG 28	--	--	30	--	--	--	--	--	--	--
OCT 27	--	--	--	--	--	--	--	--	--	--
1978										
MAY 23	--	--	110	--	--	--	--	--	--	--
JUN 27	--	--	--	--	--	--	--	--	--	--
JUL 19	--	--	140	20	--	<1	--	ND	--	ND
AUG 29	--	--	--	--	--	--	--	--	--	--
SEP 26	--	--	--	--	--	--	--	--	--	--
OCT 24	--	--	--	--	--	--	--	--	--	--
NOV 21	--	--	--	--	--	--	--	--	--	--
1979										
APR 17	--	--	--	--	--	--	--	--	--	--
MAY 15	--	--	--	--	--	--	--	--	--	--
JUN 14	--	--	--	--	--	--	--	--	--	--
JUL 19	600	540	60	--	3	--	2	--	20	--
AUG 16	--	--	--	--	--	--	--	--	--	--
SEP 13	--	--	--	--	--	--	--	--	--	--
OCT 25	--	--	--	--	--	--	--	--	--	--
NOV 13	--	--	90	--	--	--	--	--	--	--
1980										
APR 24	--	--	70	--	--	--	--	--	--	--
MAY 20	--	--	--	--	--	--	--	--	--	--
JUN 24	--	--	--	--	--	--	--	--	--	--
JUL 24	580	530	50	--	0	--	0	--	<10	--
AUG 19	--	--	--	--	--	--	--	--	--	--
SEP 23	--	--	--	--	--	--	--	--	--	--
OCT 28	--	--	--	--	--	--	--	--	--	--
NOV 20	--	--	80	--	--	--	--	--	--	--

DATE	COBALT, DISSOLVED (UG/L AS CO)	COPPER TOTAL RECOVERABLE (UG/L AS CU)	COPPER DISSOLVED (UG/L AS CU)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE DISSOLVED (UG/L AS MN)	MERCURY TOTAL, RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL DISSOLVED (UG/L AS NI)
1978											
JUL 19	ND	--	ND	--	ND	--	80	--	0.5	<1	ND
1979											
JUL 19	--	3	--	10	--	<10	--	<0.5	--	--	--
NOV 13	--	--	--	--	--	--	--	--	--	--	--
1980											
APR 24	--	--	--	--	--	--	--	--	--	--	--
JUL 24	--	3	--	2	--	130	--	<.1	--	--	--
NOV 20	--	--	--	--	--	--	--	--	--	--	--

DATE	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, TOTAL (MG/L AS C)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)
1978											
JUL 19	--	<1	--	<20	--	0.00	0.00	0.00	0.00	0.00	0.00
1979											
JUL 19	<1	--	30	--	--	.00	.00	.00	.00	.00	.00
NOV 13	--	--	--	--	12	--	--	--	--	--	--
1980											
APR 24	--	--	--	--	7.0	--	--	--	--	--	--
JUL 24	0	--	10	--	11	.10	.00	.00	.00	.00	.00
NOV 20	--	--	--	--	12	--	--	--	--	--	--

DATE	DDT, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)
1978										
JUL 19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0
1979										
JUL 19	.00	.00	.00	.00	.00	.00	.00	--	0.00	0
NOV 13	--	--	--	--	--	--	--	--	--	--
1980										
APR 24	--	--	--	--	--	--	--	--	--	--
JUL 24	.00	.00	.00	.00	.00	.00	.00	.00	.00	0
NOV 20	--	--	--	--	--	--	--	--	--	--

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