1966

Water Resources Data for Maryland and Delaware

Part 2. Water Quality Records

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Prepared in cooperation with the States of Maryland and Delaware and with other agencies

United States Department of the Interior
Geological Survey-Water Resources Division

WATER RESOURCES DATA FOR MARYLAND AND DELAWARE

1966

Part 2. Water Quality Records

Prepared in cooperation with

Delaware Geological Survey
Maryland Geological Survey
Maryland National Capital Park and Planning Commission
District of Columbia Department of Sanitary Engineering
Washington Suburban Sanitary Commission

Copies of this report may be obtained from
District Chief, Water Resources Division
U.S. Geological Survey
724 York Road
Towson, Maryland 21204

Streamflow records for most of the water quality stations in this report are contained in:

Water Resources Data for Maryland and Delaware, 1966

Part 1. Surface Water Records

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[*Symbols after station name designate type of data: c, chemical; t, water temperature; s, sediment*]

ILLUSTRATION

WATER RESOURCES DATA FOR MARYLAND AND DELAWARE, 1966

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INTRODUCTION

Water-resources investigations of the U.S. Geological Survey include the collection of water quality data on the chemical and physical characteristics of surface- and ground-water supplies of the Nation. These data for the 1966 water year for the quality of surface waters in Maryland and Delaware are presented in this report. The data were collected by the Water Resources Division of the U.S. Geological Survey under the direction of J. W. Wark, district chief, Towson, Md., and N.H. Beamer, district chief, Harrisburg, Pa.

Water quality information is presented for chemical quality, fluvial sediment, and water temperatures. The chemical quality includes concentrations of individual dissolved constituents and certain properties or characteristics such as hardness, specific conductance, and pH. Fluvial-sediment information is given for suspended-sediment discharges and concentrations and for particle size distribution of suspended sediment. Water-temperature data represent once-daily observations except for stations where a continuous temperature recorder furnishes information from which daily minimums and maximums are obtained.

The Geological Survey has published the annual series of water-supply papers, "Quality of Surface Waters of the United States," from 1941 through 1963 which contained the chemical quality, temperature, and suspended-sediment data of the water. Each volume covered an area whose boundaries coincided with those of certain natural drainage areas. The records for Maryland and Delaware are contained in Parts 1 and 3 of the water-supply paper series. (See table, p. 10.) These publications are available in most public libraries. Beginning with the 1964 water year, water quality records for surface water obtained by the Geological Survey were published in

a new series of annual releases on a state boundary basis. This report is primarily for local and immediate use, and its distribution is limited. The data for the 1964 and 1965 water years will be published in Geological Survey Water-Supply Papers.

COOPERATION

The work was done under cooperative agreements between the U.S. Geological Survey and the following organizations:

Delaware: Delaware Geological Survey,
J. J. Groot, State geologist
Maryland: Maryland Geological Survey,
Kenneth N. Weaver, director
Maryland National Capital Park and Planning Commission,
William J. Stevens, chairman succeeded by W. C. Dutton, Jr.
District of Columbia: Department of Sanitary Engineering,
Roy L. Orndorff, director
Washington Suburban Sanitary Commission,
John J. McBurney, chairman.

Several stations were operated from funds appropriated directly to the Geological Survey.

DEFINITION OF TERMS AND ABBREVIATIONS

The terms and abbreviations of water-quality and hydrologic data, as used in the text and tabular data of this report, are as follows:

Cfs-day is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It equals 86,400 cubic feet, 1.983471 acre-feet, or 646,317 gallons.

Cubic feet per second (cfs) is a unit expressing rates of discharge. One cubic foot per second is equal to the discharge of a stream of rectangular cross section, 1 foot wide and 1 foot deep, flowing water at an average velocity of 1 foot per second.

Discharge, in its simplest concept, means outflow; therefore, the use of this term is not restricted as to course or location. In this report it represents the total fluids measured in the stream.

Daily mean discharge is the mean discharge for one day.

Mean daily discharge is the arithmetic mean discharge for the same day during a specific period of years.

Mean discharge is the arithmetic mean of individual daily mean discharges during a specific period.

Instantaneous discharge (at time of sampling). If the discharge at the time of sampling is reported instead of the daily mean, the heading of the discharge column is "Discharge (cfs)."

Drainage area is that area, in a specified location, measured in a horizontal plane, which is enclosed by a drainage divide.

Drainage basin is a part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

Equivalents per million (epm) is a unit for expressing the concentration of chemical constituents in solution in terms of the interreacting values of the electrically charged particles, or ions. One equivalent per million of a positively charged ion will react with one equivalent per million of a negatively charged ion. Parts per million is converted to equivalents per million by multiplying by the reciprocal of the combining weight of the ion. (See table, p. 4.)

Gage height is the water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term "stage," although gage height is more appropriate when used with a reading on a gage.

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of gage height or discharge are obtained. When used in connection with a discharge record, the term is applied only to those gaging stations where a continuous record of discharge is obtained.

Conversion factors: Parts per million to equivalents per million

Ion	Multiply by
Aluminum (Al^{+3})	0.11119
Barium (Ba^{+2})	.01456
Bicarbonate (HCO_3^{-1})	.01639
Bromide (Br^{-1})	.01251
Calcium (Ca^{+2})	.04990
Carbonate (CO_3^{-2})	.03333
Chloride (Cl^{-1})	.02821
Chromium (Cr^{+6})	.11539
Cobalt (Co^{+2})	.03394
Copper (Cu^{+2})	.03148
Fluoride (F^{-1})	.05264
Hydrogen (H^{+1})	.99209
Hydroxide (OH^{-1})	.05880
Iodide (I^{-1})	.00788
Iron (Fe^{+3})	.05372
Lead (Pb^{+2})	.00965
Lithium (Li^{+1})	.14411
Magnesium (Mg^{+2})	.08226
Manganese (Mn^{+2})	.03640
Nickel (Ni^{+2})	.03406
Nitrate (NO_3^{-1})	.01613
Nitrite (NO_2^{-1})	.02174
Phosphate (PO_4^{-3})	.03159
Potassium (K^{+1})	.02557
Sodium (Na^{+1})	.04350
Strontium (Sr^{+2})	.02283
Sulfate (SO_4^{-2})	.02082
Zinc (Zn^{+2})	.03060

Hardness of water is the property of water attributable to the presence of alkaline earths and is expressed as equivalent calcium carbonate ($CaCO_3$). Hardness is a physical-chemical characteristic, not a substance.

Particle size is the diameter, in millimeters (mm) of suspended sediment or bed material determined by sieve and sedimentation methods.

Particle-size classification agrees closely with recommendations made by the American Geophysical Union Subcommittee on sediment terminology (Lane and others, 1947, p. 937). The classification is as follows:

Clay:	Smaller than 0.004 mm.
Silt:	Between 0.004 and 0.062 mm.
Sand:	Betwen 0.062 and 2.0 mm.
Gravel:	Between 2.0 and 64.0 mm.

The particle-size distributions given in this report are not necessarily representative of the particle sizes of sediment in transport in the natural stream. Most of the organic matter is removed and the sample is subjected to mechanical and chemical dispersion before analysis of the silt and clay.

Parts per million (ppm) is a unit for expressing the concentration of chemical constituents by weight, usually as grams of constituents per million grams of solution. In the laboratory the results are expressed in weights of solutes in a given volume of water. To express the results in parts per million, the data must be converted. For most waters, this conversion is made by assuming that a liter of water weighs 1 kilogram; thus milligrams per liter is equivalent to parts per million. Parts per million, for suspended sediment, is computed as 1 million times the ratio of the weight of sediment to the weight of the mixture of water and sediment.

Sediment is solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water; it includes chemical and biochemical precipitates and decomposed organic material such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are influenced by environmental factors. Some major factors are degree of slope, length of slope, soil characteristics, land usage, and quantity and intensity of precipitation.

Sediment discharge is the rate at which dry weight of sediment passes a section of a stream or is the quantity of sediment, as measured by dry weight, or by volume, that is discharged in a given time.

Solute is any substance derived from the atmosphere, vegetation, soil, or rocks and is dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current and is expressed in micromhos per centimeter at 25°C. Because the specific conductance is related to the number and specific chemical types of ions in solution, it can be used for approximating the dissolved-solids content in the water. The following general relations are applicable:

Specific conductance x (0.65±0.05)=ppm dissolved solids;

$$\frac{\text{Specific conductance}}{100} = \frac{\text{total epm}}{2}$$

Streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff." Streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

Suspended sediment is the sediment that at any given time is maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid.

Thermograph is a thermometer that continuously and automatically records, on a chart, the water temperature of a stream. "Temperature recorder" is the term used to indicate the location of the thermograph.

Tons per day is the quantity of a substance in solution or suspension that passes a stream section during a 24-hour period.

Water year in Geological Survey reports dealing with surface water supply is the 12-month period, October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1966, is called the "1966 water year."

STATION NUMBERS

A station number has been assigned as an added means of identification for each stream location where regular measurements of streamflow and determinations of water quality have been made. The numbers have been assigned to conform with the standard downstream order of listing gaging stations. The numbering system consists of 2 digits followed by a hyphen and a 6 digit number. The notation to the left of the hyphen identifies the Part or hydrologic region used by the Geological Survey for reporting hydrologic data. The number to the right of the hyphen represents the position of the location in the standard downstream order listing the stations within each of the parts. The assigned numbers are in numerical order but are not consecutive. They are so selected from the complete 6-digit-number scale that intervening numbers will be available for future assignments to new locations. The identification number for each station in this report is printed to the left of the station name and contains only the essential digits. For example, the number is printed as 1-4821 whose complete identification number is 01-4821.00.

COLLECTION AND EXAMINATION OF SAMPLES

Water samples for analyses usually are collected at or near points on streams where gaging stations are maintained by the U.S. Geological Survey for measurement of water discharge. Discharge records for streams in Maryland and Delaware have been released in the report "Water Resources Data for Maryland and Delaware, 1966, Part 1. Surface Water Records." Most of these records are used in conjunction with the computations of the chemical constituents and sediment loads in this report.

Data on the quality of surface water were collected daily at some sites and less frequently at other sites; the locations of the sites are shown on the map on page 79.

Solutes

The methods of collecting and compositing water samples for determining the kinds and concentrations

of solutes are described by Rainwater and Thatcher (1960). One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled at several verticals across the channel to determine accurately the solute load.

The daily chemical-quality data in this report, were collected by continuous recorders of selected water-quality parameters--specific conductance and dissolved oxygen. At sites where chemical quality data were collected less frequently than daily, the data represent the conditions only at the time of sampling.

Temperature

Water temperatures were measured at most of the water-quality stations. For daily stations, the water temperatures were taken at about the same time each day in order that the data would not reflect normal variations in water temperature. Most large streams have a small diurnal variation in water temperature; small, shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. The thermometers used for determining the water temperature were accurate to plus or minus 0.5°F.

At stations where thermographs are located, the records consist of maximum and minimum temperatures for each day and the monthly averages of maximum daily and minimum daily temperatures.

Sediment

At some stations, suspended-sediment samples were collected daily with depth-integrating cable-suspended samplers from a fixed sampling point at one vertical in the cross section. A hand sampler was used at many stations during periods of low flow. Depth-integrated samples were collected periodically at many verticals in the cross section to determine the ratio of the cross sectional distribution of the concentration of suspended sediment to the daily sampling verticals.

During periods of high or rapidly changing flow, samples were taken twice or more often throughout the day at most stations. For periods when no samples were collected, daily loads of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

At other stations, suspended-sediment samples were collected periodically with depth-integrating cable-suspended or hand samplers at many verticals in the stream cross section. Although data collected periodically may represent conditions only at the time of observations, such data are useful in establishing seasonal relations between quality and streamflow in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of the quantities of suspended sediment, records of periodic measurements of the particle-size distribution of the suspended sediment are included.

WATER SUPPLY PAPERS

The table below shows the annual series of Water-Supply Papers that give information on quality of surface waters in Maryland and Delaware. Data for North Atlantic slope basins are given in part 1, and for Ohio River basin in part 3.

Water-supply paper numbers and parts, water years 1941-65

Year	Parts 1-14	Parts 1-4	Year	Parts 1-4	Parts 1-2	Parts 3-4
1941	942	----	1954	1350	----	----
1942	950	----	1955	1400	----	----
1943	970	----	1956	1450	----	----
1944	1022	----	1957	1520	----	----
1945	1030	----	1958	1571	----	----
1946	1050	----	1959	----	1641	1642
1947	1102	----	1960	----	1741	1742
1948	----	1132	1961	----	1881	1882
1949	----	1162	1962	----	1941	1942
1950	----	1186	1963	----	1947	1948
1951	----	1197	1964	----	A1954	A1955
1952	----	1250	1965	----	A1961	A1962
1953	1290	----				

A In preparation.

SELECTED REFERENCES

American Society for Testing Materials, 1954, Manual on industrial water: Am. Soc. for Testing Mat., Philadelphia, Pa., p. 356.

Colby, B. R., 1963, Fluvial sediments--a summary of source, transportation, deposition, and measurement of sediment discharge: U.S. Geol. Survey Bull. 1181-A, 47 p.

Colby, B. R., and Hubbell, D. W., 1961, Simplified methods for computing total sediment discharge with the modified Einstein procedure: U.S. Geol. Survey Water-Supply Paper 1593, 17 p.

Hem, J. D., 1959, Study and interpretation of the chemical characteristics of natural water: U.S. Geol. Survey Water-Supply Paper 1473, 269 p.

Lane, E. W. and others, 1947, Report of subcommittee on sediment terminology: Am. Geophys. Union Trans., v. 28, no. 6, p. 936-938.

Langbein, W. B., and Iseri, K. T., 1960, General introduction and hydrologic definitions: U.S. Geol. Survey Water-Supply Paper 1541-A, 29 p.

Rainwater, F. H., and Thatcher, L. L., 1960, Methods for collection and analysis of water samples: U.S. Geol. Survey Water-Supply Paper 1454, 301 p.

U.S. Inter-Agency Committee on Water Resources, A study of methods used in measurement and analysis of sediment loads in streams:

Report 11, 1957, The development and calibration of visual accumulation tube: Minneapolis, Minn., St. Anthony Falls Hydraulic Lab.,
Report 12, 1957, Some fundamentals of particle-size analysis: Washington, U.S. Govt. Printing Office, 55 p.
Report AA, 1959, Federal Inter-agency sedimentation instruments and reports: Minneapolis, Minn., St. Anthony Falls Hydraulic Lab., 41 p.
Report 13, 1961, The single stage sampler for suspended sediment: Washington, U.S. Govt. Printing Office, 105 p.
Report 14, 1963, Determinations of fluvial sediment discharge: Washington, U.S. Govt. Printing Office, 151 p.

1-4785. WHITE CLAY CREEK ABOVE NEWARK, DEL.

LOCATION.--Lat 39°42'50", long 75°45'35", at gaging station on right bank at downstream wingwall of abandoned bridge, 0.9 mile downstream from small tributary, 1.7 miles southeast of Delaware-Maryland-Pennsylvania State corner, 2.1 miles downstream from Delaware State Line, and 2.2 miles north of Newark, New Castle County. Sediment samples collected at bridge, 0.8 mile upstream from gaging station.
DRAINAGE AREA.--66.7 square miles.
RECORDS AVAILABLE.--Sediment records: October 1964 to September 1966 (periodic).

Periodic determinations of suspended-sediment discharge, water year October 1965 to September 1966

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Mean discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Percent finer than size indicated, in millimeters										Method of analysis
Oct. 1, 1965				23	9	0.6											
Oct. 4				15	9	.4											
Oct. 6				17	2	.1											
Oct. 11				26	7	.5											
Oct. 15				23	1	.1											
Oct. 18				22	1	.1											
Oct. 22				22	1	.1											
Oct. 26				20	1	.1											
Oct. 29				19	2	.1											
Nov. 1				19	1	.1											
Nov. 5				19	2	.1											
Nov. 8				22	6	.4											
Nov. 12				21	1	.1											
Nov. 15				20	2	.1											
Nov. 19				26	2	.1											
Nov. 22				29	2	.2											
Nov. 26				24	1	.1											
Nov. 29				22	1	.1											
Dec. 3				21	1	.1											
Dec. 6				21	2	.1											
Dec. 10				23	1	.1											
Dec. 17				26	1	.1											
Dec. 20				24	1	.1											
Dec. 24				24	2	.1											
Dec. 31				25	6	.4											
Jan. 3, 1966				45	4	.5											
Jan. 7				52	8	A1.1											
Jan. 10				31	3	.3											
Jan. 14				27	3	.2											
Jan. 17				19	3	.2											
Jan. 24				35	1	.1											
Jan. 28				25	3	.2											
Feb. 4				30	1	.1											
Feb. 7				26	4	.3											
Feb. 21				55	7	1.0											
Feb. 25				60	1	.2											
Mar. 4				70	12	2.3											
Mar. 7				60	1	.2											
Mar. 11				50	1	.1											
Mar. 14				47	1	.1											

A Computed from partly estimated-concentration graph.

1-4785. WHITE CLAY CREEK ABOVE NEWARK, DEL.--Continued

Periodic determinations of suspended-sediment discharge, water year October 1965 to September 1966--Continued

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Mean discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Percent finer than size indicated, in millimeters										Method of analysis
Mar. 18, 1966				44	3	0.4											
Mar. 21				43	1	.1											
Mar. 28				46	13	1.6											
Apr. 1				38	7	.7											
Apr. 4				37	1	.1											
Apr. 8				35	1	.1											
Apr. 11				34	2	.2											
Apr. 15				60	3	.5											
Apr. 18				40	1	.1											
Apr. 22				40	1	.1											
Apr. 29				60	10	1.6											
May 9				47	4	.5											
May 13				43	8	.9											
May 16				37	3	.3											
May 20				80	3	.6											
May 23				90	29	7.0											
May 27				70	26	4.9											
May 30				70	30	5.7											
June 6				39	13	1.4											
June 13				28	13	1.0											
June 17				27	6	.4											
June 20				24	9	.6											
June 24				19	10	.5											
June 27				20	11	.6											
July 4				13	13	.5											
July 11				14	12	.5											
July 15				12	13	.4											
July 18				12	14	.5											
July 22				12	10	.3											
July 25				11	12	.4											
July 29				30	11	.9											
Aug. 8				10	8	.2											
Aug. 12				19	7	.4											
Aug. 19				7.0	12	.2											
Aug. 22				7.0	10	.2											
Aug. 26				6.6	6	.1											
Sept. 2				6.6	8	.1											
Sept. 5				6.6	6	.1											
Sept. 12				5.8	8	.1											
Sept. 19				15	8	.3											
Sept. 26				20	6	.3											
Sept. 30				40	4	.4											

1-4800. RED CLAY CREEK AT WOODDALE, DEL.

LOCATION.--Lat 39°45'52", long 75°38'08", temperature recorder at gaging station on right bank 12 feet upstream from bridge on State Highway 48, 0.3 mile south of Wooddale, New Castle County, and 2.3 miles north of Marshallton.
DRAINAGE AREA.--47.0 square miles.
RECORDS AVAILABLE.--Water temperatures: April 1953 to September 1966.
EXTREMES, 1965-66.--Water temperatures: Maximum, 85°F July 3, 13; minimum, freezing point Feb. 21, 22.
EXTREMES, 1953-66.--Water temperatures: Maximum, 87°F July 17, Aug. 2, 6, 1955, and July 19, 1963; minimum, freezing point on many days during winter months.

Temperature (°F) of water, water year October 1965 to September 1966

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October																																
Maximum	66	66	63	59	55	54	59	60	59	59	58	62	60	59	62	64	61	57	57	61	63	64	64	62	58	56	57	55	52	52	53	59
Minimum	63	62	59	55	51	50	51	58	57	57	55	57	58	56	56	61	56	54	52	56	59	62	62	57	54	53	53	51	48	47	48	55
November																																
Maximum	54	52	53	56	54	53	56	57	57	53	52	55	56	56	52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Minimum	51	48	48	51	50	49	52	56	53	50	51	52	54	52	49	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
December																																
Maximum	44	43	46	47	46	47	45	41	40	40	41	44	47	48	47	47	45	43	41	39	37	36	38	41	44	44	38	37	38	39	42	42
Minimum	41	40	42	45	45	45	41	37	38	38	39	41	44	47	46	45	43	40	39	36	35	34	34	37	39	37	35	35	36	36	38	40
January																																
Maximum	45	45	45	44	40	44	43	43	36	36	37	34	34	34	36	36	34	35	35	38	38	37	36	36	35	34	33	34	34	33	34	37
Minimum	41	44	44	40	38	39	42	36	34	34	34	34	34	34	34	34	34	34	34	35	36	36	35	34	34	33	33	33	33	33	33	36
February																																
Maximum	33	33	33	33	33	34	33	33	33	35	38	38	38	40	42	41	40	38	40	38	35	35	37	37	38	39	40	40	--	--	--	37
Minimum	33	33	33	33	33	33	33	33	33	33	35	35	35	36	40	39	38	36	37	34	32	32	34	34	34	36	36	36	--	--	--	35
March																																
Maximum	40	42	45	46	49	49	43	42	41	44	45	49	51	50	52	51	48	50	50	50	51	54	57	56	52	47	48	46	47	48	51	48
Minimum	36	39	40	44	46	43	40	38	38	39	43	44	47	49	47	45	43	44	48	48	45	48	52	52	47	43	44	42	40	43	46	44
April																																
Maximum	49	48	48	49	49	48	51	50	51	50	52	49	46	49	52	56	56	54	56	58	63	62	58	58	59	61	60	52	50	50	--	53
Minimum	46	46	44	48	44	45	45	47	47	46	45	46	44	44	46	49	50	52	52	53	55	58	57	56	56	54	52	47	47	49	--	49
May																																
Maximum	55	55	58	58	59	64	64	62	61	57	57	57	64	62	63	62	65	64	63	69	70	69	68	67	67	70	69	68	68	66	64	63
Minimum	50	53	50	53	52	57	57	59	53	50	50	55	56	58	55	58	59	61	61	62	64	64	62	62	65	66	68	67	65	62	60	59
June																																
Maximum	61	63	65	69	72	74	72	72	76	75	71	68	67	71	72	70	69	70	69	71	74	76	77	78	80	77	78	80	80	82	--	73
Minimum	58	58	59	62	66	69	68	68	71	71	66	64	65	65	68	66	67	66	67	64	67	70	69	72	73	74	72	75	76	74	--	68
July																																
Maximum	81	82	85	84	79	80	82	80	81	79	82	82	85	83	79	78	78	79	80	78	76	76	75	77	78	79	79	77	80	77	76	80
Minimum	74	73	75	77	77	76	77	77	74	74	75	75	77	78	74	71	70	70	74	74	68	66	69	69	69	71	73	74	75	71	68	73
August																																
Maximum	78	76	78	75	74	78	77	80	78	80	80	81	77	73	75	79	80	81	80	79	80	79	79	77	74	75	75	77	77	79	79	78
Minimum	69	73	72	69	70	70	72	72	74	76	76	77	73	71	72	74	75	73	74	75	73	76	75	72	69	68	68	70	71	72	73	72
September																																
Maximum	77	76	77	76	76	74	72	70	70	--	--	--	--	--	68	65	64	65	65	64	64	64	64	62	61	60	57	57	59	62	--	67
Minimum	72	70	71	74	73	71	67	67	66	--	--	--	--	--	65	62	59	59	61	64	63	63	62	59	59	57	56	56	57	59	--	64

1-4810. BRANDYWINE CREEK AT CHADDS FORD, PA.

LOCATION.--Lat 39°52'10", long 75°35'35", at gaging station located on left bank 27 feet upstream from Pennsylvania Railroad bridge at Chadds Ford, Delaware County, and 1,200 feet downstream from highway bridge on U.S. Highway 1. Sediment samples collected at U.S. Highway 1 Bridge.
DRAINAGE AREA.--287 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1964 to September 1966.
Sediment records: July 1963 to September 1966.
EXTREMES, 1965-66.--Water temperatures: Maximum, 68°F July 14, 22-24, 26, 27, 29, and Aug. 8, 29; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 910 ppm Feb. 13; minimum daily, 1 ppm Apr. 16-21 and May 18.
Sediment loads: Maximum daily, 11,000 tons Feb. 13; minimum daily, less than 0.50 ton Dec. 22, Aug. 16, and Sept. 9, 10.
EXTREMES, 1963-66.--Water temperatures(1964-65): Maximum, 84°F Aug. 9 and 17, 1965; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 2,000 (estimated) ppm Feb. 8, 1965; minimum daily, 1 ppm on several days in February and March 1964.
Sediment loads: Maximum daily, 20,000 (estimated) tons Feb. 8, 1965; minimum daily, less than 0.50 ton Dec. 22, Aug. 16, and Sept. 9, 10, 1966.
REMARKS.--Records of specific conductance, and pH, of sediment samples available in the district office at Harrisburg, Pa. Flow affected by ice Jan. 8-13, 15-19, Jan. 24 to Feb. 12, and Feb. 20-22.

Chemical analyses, in parts per million, water year October 1965 to September 1966

Date of collection	Discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Total acidity as H^{+1}	Specific conductance (micromhos at 25°C)	pH	Color
Oct. 7, 1965..	182	11		0.00	0.00	20	6.6	15	3.4	72	26	16	0.2	8.8	150	76	18		244	7.2	15
Nov. 29.....	114	12		A.43	.00	18	6.6	15	2.8	66	25	15	.1	11	144	74	18		228	6.8	5
Dec. 7.....	95	13		.04	.00	20	7.3	11	4.0	67	26	13	.2	9.7	148	79	25		243	6.8	4
Feb. 13, 1966.	3250	--		--	--	--	--	B8.7	--	17	18	8.8	--	7.4	89	32	18		117	6.6	20
Feb. 14C.....	4760	--		--	--	--	--	B6.0	--	14	18	7.0	--	6.7	85	33	27		114	6.1	25
Feb. 14D.....	4760	--		--	--	--	--	B8.0	--	18	21	8.5	--	8.2	91	38	23		126	6.4	22
Mar. 1.....	3100	6.0		.00	.01	9.0	3.3	5.8	3.4	18	19	9.5	.1	6.4	87	36	21		122	7.0	15

A Total
B Calculated Na plus K, reported as Na.
C Sample collected at 0400.
D Sample collected at 1200.

1-4810. BRANDYWINE CREEK AT CHADDS FORD, PA.--Continued

Specific conductance (micromhos at 25°C), water year October 1965 to September 1966

Day	October	November	December	January	February	March	April	May	June	July	August	September
1.....	268	262	238	216	233	140	195	163	189	225	257	261
2.....	--	--	--	--	--	--	--	--	195	220	253	285
3.....	--	--	--	--	--	--	--	--	195	221	248	281
4.....	--	--	--	--	--	--	--	--	215	221	253	281
5.....	--	--	--	--	--	--	--	--	200	225	259	285
6.....	--	--	--	--	--	--	--	--	202	220	255	283
7.....	259	--	--	--	--	--	--	--	200	209	255	280
8.....	190	--	--	--	--	--	--	--	222	211	253	280
9.....	--	--	--	--	--	--	--	--	195	219	250	279
10.....	--	--	--	--	--	--	--	--	205	215	247	250
11.....	233	249	215	224	228	192	193	191	195	215	268	251
12.....	--	--	--	--	--	--	--	--	220	235	268	278
13.....	--	--	--	--	118	--	--	--	210	239	268	278
14.....	--	--	--	--	--	--	--	--	215	225	265	174
15.....	--	--	--	--	--	--	--	--	208	230	253	278
16.....	--	--	--	--	--	--	--	--	208	245	260	238
17.....	--	--	--	--	--	--	--	--	208	255	216	239
18.....	--	--	--	--	--	--	--	--	215	252	230	236
19.....	--	--	--	--	--	--	--	--	203	230	230	233
20.....	--	--	--	--	--	--	--	--	205	245	263	253
21.....	255	241	230	246	202	190	197	173	220	235	261	240
22.....	--	--	--	--	--	--	--	--	220	242	230	197
23.....	--	--	--	--	--	--	--	--	215	242	267	231
24.....	--	--	--	--	--	--	--	190	215	245	267	240
25.....	--	--	--	--	--	--	--	200	225	261	265	240
26.....	--	--	--	--	--	--	--	189	210	250	265	244
27.....	--	--	--	--	--	--	--	192	205	245	265	241
28.....	--	--	--	--	--	--	--	180	215	208	275	245
29.....	--	--	--	--	--	--	--	190	220	200	266	250
30.....	--	--	--	--	--	200	--	175	211	212	265	239
31.....	--	--	--	--	--	--	--	183	--	248	261	--
Average	--	--	--	--	--	--	--	--	208	230	256	253

1-4810. BRANDYWINE CREEK AT CHADDS FORD, PA.--Continued

Hydrogen-ion concentration (pH), water year October 1965 to September 1966

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.7	7.9	7.8	7.9	7.9	7.0	7.4	7.5	7.6	7.6	7.7	8.1
2	--	--	--	--	--	--	--	--	--	--	8.0	--
3	--	--	--	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--	--	--	--	8.0	--
7	7.8	--	--	--	--	--	--	--	--	--	8.0	--
8	7.5	--	--	--	--	--	--	--	--	--	--	--
9	--	--	--	--	--	--	--	--	--	--	--	8.1
10	--	--	--	--	--	--	--	--	--	--	--	8.0
11	7.7	7.9	7.7	7.9	7.8	7.3	7.5	7.4	7.5	7.7	8.1	8.1
12	--	--	--	--	--	--	--	--	--	--	--	8.1
13	--	--	--	--	7.4	--	--	--	--	--	--	8.1
14	--	--	--	--	--	--	--	--	--	--	--	7.6
15	--	--	--	--	--	--	--	--	--	--	--	8.0
16	--	--	--	--	--	--	--	--	--	--	8.0	--
17	--	--	--	--	--	--	--	--	--	--	7.9	--
18	--	--	--	--	--	--	--	--	--	--	7.9	--
19	--	--	--	--	--	--	--	--	--	--	--	--
20	--	--	--	--	--	--	--	--	--	--	--	--
21	7.7	7.9	7.8	7.8	7.8	7.3	7.4	7.4	7.5	7.6	8.0	7.8
22	--	--	--	--	--	--	--	--	--	--	7.9	7.7
23	--	--	--	--	--	--	--	--	--	--	8.1	--
24	--	--	--	--	--	--	--	--	--	--	--	--
25	--	--	--	--	--	--	--	--	--	--	8.1	--
26	--	--	--	--	--	--	--	--	--	--	--	--
27	--	--	--	--	--	--	--	--	--	--	8.1	--
28	--	--	--	--	--	--	--	--	--	--	--	--
29	--	--	--	--	--	--	--	--	--	--	--	--
30	--	--	--	--	--	--	--	--	--	--	8.1	--
31	--	--	--	--	--	--	--	--	--	--	--	--
Average												

1-4810. BRANDYWINE CREEK AT CHADDS FORD, PA.--Continued

Temperature (°F) of water, water year October 1965 to September 1966

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October	65	63	64	59	55	54	54	59	58	59	59	59	57	57	61	63	62	60	59	60	61	63	60	59	56	56	55	52	50	48	44	58
November	48	46	46	46	46	47	48	52	52	51	52	51	51	50	48	47	47	47	48	48	47	46	45	45	43	44	48	48	44	44	--	48
December	39	40	40	42	43	41	39	40	--	40	41	40	40	40	42	41	40	39	33	34	33	39	38	38	39	32	--	--	--	--	--	39
January	--	--	--	--	38	40	42	33	32	32	32	32	32	32	33	33	35	34	34	34	34	34	34	33	33	32	33	33	32	32	32	34
February	32	32	32	32	32	32	33	34	34	35	35	35	36	37	39	35	37	38	36	35	34	37	38	37	37	38	38	38	--	--	--	35
March	38	40	42	44	46	43	39	39	40	40	43	45	48	45	52	48	48	48	48	48	50	52	50	51	45	--	--	--	--	46	44	45
April	46	43	43	45	45	45	46	46	46	44	46	46	42	44	43	43	44	44	44	43	46	45	45	45	46	47	44	44	46	46	--	45
May	46	46	45	47	47	49	50	50	50	49	49	48	48	52	53	53	54	56	60	61	64	63	63	62	62	63	63	61	61	62	61	55
June	62	60	61	61	63	61	61	--	61	62	62	61	60	62	--	62	62	62	61	63	62	63	63	63	64	64	63	64	65	65	--	62
July	64	65	66	66	65	--	66	66	67	67	67	66	67	68	67	65	64	62	62	--	66	68	68	68	67	68	68	60	68	--	--	66
August	65	67	67	66	66	--	66	68	65	--	--	--	--	--	--	65	--	65	65	--	66	66	66	66	66	67	--	67	68	67	66	--
September	--	64	--	65	64	64	--	--	--	--	64	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

1-4810. BRANDYWINE CREEK AT CHADDS FORD, PA.--Continued

Suspended sediment, water year October 1965 to September 1966

Day	OCTOBER			NOVEMBER			DECEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	110	12	4	101	C 6	2	98	C 2	1
2	176	15	7	95	C 6	2	98	C 2	1
3	124	12	4	98	C 6	2	98	C 2	1
4	98	8	2	98	C 6	2	101	C 2	1
5	89	6	1	95	C 6	2	101	C 2	1
6	86	7	2	98	C 5	1	98	C 3	1
7	182	30 S	43	98	C 5	1	95	C 3	1
8	815	210 S	580	104	C 5	1	92	C 3	1
9	258	38	26	104	C 5	1	95	C 3	1
10	180	18	9	104	C 5	1	95	3	1
11	137	C 11	4	104	C 5	1	95	3	1
12	133	C 11	4	104	C 5	1	110	3	1
13	130	C 11	4	107	C 5	1	161	18 A	8
14	124	C 11	4	114	C 5	2	191	25 A	13
15	114	C 11	3	104	C 5	1	137	9 A	3
16	110	C 11	3	114	C 4	1	124	C 3	1
17	107	C 11	3	169	C 4	2	114	C 3	1
18	104	C 11	3	133	C 4	1	107	C 3	1
19	101	10	3	107	C 4	1	107	C 3	1
20	101	10	3	104	C 4	1	101	C 3	1
21	101	9	2	101	C 4	1	98	C 2	1
22	101	10	3	117	C 4	1	89	C 2	T
23	104	8	2	140	C 4	2	95	C 2	1
24	101	10	3	120	C 4	1	101	C 2	1
25	95	8	2	110	C 4	1	138	4	1
26	95	7	2	107	C 4	1	203	8	4
27	95	9	2	117	C 4	1	130	4	1
28	98	4	1	127	C 4	1	114	3	1
29	98	C 4	1	114	C 4	1	110	C 6	2
30	95	C 4	1	104	C 4	1	110	C 6	2
31	101	C 4	1	---	---	---	120	C 6	2
Total	4363	---	732	3312	---	38	3526	---	57

Day	JANUARY			FEBRUARY			MARCH		
1	124	5	2	88	6	1	3100	510 S	4700
2	137	6	2	100	4	1	1100	55	160
3	278	13 A	10	110	4	1	627	22	37
4	206	10	6	100	4	1	560	16	24
5	154	7	3	100	4	1	670	25 B	45
6	316	24 S	26	96	3	1	532	15 B	22
7	446	36	43	94	3	1	462	4	5
8	250	11	7	94	3	1	356	C 2	2
9	190	7	2	94	5	1	330	C 2	2
10	130	9	3	100	4	1	317	C 2	2
11	120	7	2	500	69 S	150	304	3	2
12	110	7	2	1080	150 S	470	295	4	3
13	110	7	2	3250	910 S	11000	291	C 5	4
14	130	6	2	4760	330 S	5200	282	C 5	4
15	120	5	2	1320	65	230	269	C 5	4
16	110	7	2	845	28	64	253	5	3
17	100	4	1	714	22	42	240	4	3
18	100	4	1	528	14	20	236	C 6	4
19	100	5	1	457	10	12	240	C 6	4
20	117	5	2	370	9	9	240	C 6	4
21	114	6	2	310	8	7	224	5	3
22	104	7	2	300	12	10	220	6	4
23	162	7	3	295	7	6	224	8	5
24	130	6	2	308	7	6	284	18 A	14
25	120	6	2	343	10	9	643	55 A	95
26	110	6	2	325	15	13	352	10	10
27	100	5	1	312	9	8	304	9	7
28	96	5	1	559	63 S	270	269	8	6
29	94	3	1	---	---	---	261	7	5
30	90	4	1	---	---	---	257	7	5
31	88	6	1	---	---	---	252	3	2
Total	4496	---	139	17472	---	17536	13994	---	5190

S Computed by subdividing day.
T Less than 0.50 ton.
A Computed from partly estimated-concentration graph.
B Computed from estimated-concentration graph.
C Composite period.

1-4810. BRANDYWINE CREEK AT CHADDS FORD, PA.--Continued

Suspended sediment, water year October 1965 to September 1966--Continued

Day	APRIL			MAY			JUNE		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	244	C 2	1	815	54	S 120	257	14	10
2..	240	C 2	1	514	15	21	240	8	5
3..	232	C 2	1	411	13	14	220	6	4
4..	232	C 2	1	366	7	7	216	4	2
5..	228	C 2	1	334	8	7	208	8	4
6..	220	C 2	1	326	17	15	197	8	4
7..	216	C 2	1	308	C 13	11	197	8	4
8..	220	C 2	1	304	C 13	11	201	8	4
9..	212	C 2	1	304	C 13	11	193	10	5
10..	208	3	2	295	11	9	197	14	7
11..	204	2	1	274	9	7	189	16	8
12..	208	3	2	274	C 9	7	170	14	6
13..	495	11	15	291	C 9	7	170	12	6
14..	438	8	9	278	C 9	7	185	14	7
15..	295	2	2	265	C 3	2	189	18	9
16..	257	1	1	253	C 3	2	166	15	7
17..	236	C 1	1	370	C 3	3	166	18	8
18..	228	C 1	1	308	1	1	166	18	8
19..	224	C 1	1	1100	230	S 930	163	17	7
20..	216	1	1	594	25	40	159	17	7
21..	212	1	1	361	13	13	148	14	6
22..	321	16	14	575	--	E 30	138	10	4
23..	321	22	19	379	35	36	138	11	4
24..	457	36	44	304	20	16	134	10	4
25..	642	34	59	282	13	10	130	9	3
26..	288	14	11	276	6	4	127	14	5
27..	308	11	9	261	6	4	134	12	4
28..	704	34	S 64	299	10	8	152	10	4
29..	523	12	17	384	22	23	178	17	8
30..	438	10	12	274	11	8	130	10	4
31..	--	--	--	244	10	7	--	--	--
Total	9267	--	295	11623	--	1391	5258	--	168

Day	JULY			AUGUST			SEPTEMBER		
1..	120	4	1	84	10	2	55	6	1
2..	116	10	3	84	8	2	52	9	1
3..	113	8	2	100	11	3	52	6	1
4..	107	14	4	84	12	3	91	8	2
5..	120	14	5	87	10	2	66	8	1
6..	138	11	4	87	8	2	53	5	1
7..	138	16	6	81	8	2	49	5	1
8..	127	15	5	78	7	1	47	6	1
9..	110	13	4	75	8	2	44	4	T
10..	103	11	3	81	13	3	44	2	T
11..	113	10	3	91	11	3	44	8	1
12..	107	10	3	120	14	4	42	6	1
13..	103	8	2	78	11	2	44	9	1
14..	97	8	2	75	8	2	481	--	E 80
15..	100	8	2	78	5	1	938	--	E 500
16..	97	8	2	81	2	T	193	16	8
17..	87	8	2	249	30	A 20	127	11	4
18..	84	8	2	113	13	4	107	11	3
19..	87	12	3	84	4	1	97	18	5
20..	163	15	7	75	3	1	130	12	4
21..	100	11	3	69	9	2	570	85	210
22..	87	9	2	69	12	2	415	73	82
23..	81	8	2	72	6	1	265	22	16
24..	78	8	2	78	4	1	174	18	8
25..	75	6	1	69	7	1	138	10	4
26..	72	5	1	64	7	1	127	6	2
27..	75	6	1	61	4	1	120	10	3
28..	356	47	S 52	61	6	1	123	11	4
29..	134	12	4	58	5	1	144	12	5
30..	103	8	2	58	4	1	155	13	5
31..	94	4	1	55	4	1	--	--	--
Total	3485	--	136	2599	--	73	4987	--	956

Total discharge for year (cfs-days)..... 84382
Total load for year (tons)..... 26711

E Estimated.
S Computed by subdiviving day.
T Less than 0.50 ton.
A Computed from partly estimated-concentration graph.

1-4810. BRANDYWINE CREEK AT CHADDS FORD, PA.--Continued

Particle-size analyses of suspended sediment, water year October 1965 to September 1966
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters										Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Oct. 8, 1965.....	1200	60		853	186			68	87	93	99	100	--				SCBW
Feb. 13, 1966.....	2200	35		6790	1030			36	50	64	74	80	86	91	98	100	--	SCPW
Mar. 1.....	1245	38		3680	367			35	51	65	79	86	90	94	98	100		SCBW

Particle-size analyses of bed material, water year October 1965 to September 1966
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Bed material: Percent finer than size indicated, in millimeters											Method of analysis
							0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.00	32.00	64.00	
Dec. 12, 1965.....	1000		A 1	98			2	8	18	34	48	71	83	93	100			S

A Sample collected 275 feet upstream from gaging station.

1-4815. BRANDYWINE CREEK AT WILMINGTON, DEL.

LOCATION.--Lat 39°46'10", long 75°34'20", at gaging station on right bank 0.2 mile downstream from Henry Clay Bridge, in Wilmington, New Castle County, and 4.2 miles upstream from mouth. Sediment samples are collected at the Henry Clay Bridge.
DRAINAGE AREA.--314 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1950, November 1951 to September 1952, October 1956 to September 1966.
Water temperatures: November 1956 to September 1961.
Sediment records: December 1946 to September 1961, July 1962 to September 1966.
EXTREMES, 1965-66.--Sediment concentrations: Maximum daily, 1,700 ppm Feb. 14; minimum daily, 1 ppm Jan. 11.
Sediment loads: Maximum daily, 33,000 tons Feb. 14; minimum daily, less than 0.50 ton Jan. 11.
EXTREMES, 1946-61, 1962-66.--Water temperatures (1956-61): Maximum, 86°F June 17, 1957; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 1,700 ppm Feb. 14, 1966; minimum daily, 1 ppm on many days.
Sediment loads: Maximum daily, 33,000 tons Feb. 14, 1966; minimum daily, less than 0.50 ton on many days.
REMARKS.--The stage discharge relation was affected by ice Jan. 28-30.

Chemical analyses, in parts per million, water year October 1965 to September 1966

Date of collection	Discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$		Total acidity as H^{+1}	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
Oct. 28, 1965.	100	12		0.00	0.03	20	7.3	16	3.5	76	28	14	0.1	7.5	160	80	18		244	7.1	3
Nov. 24.....	14	15		.00	.00	18	9.5	15	3.1	66	28	16	.1	11	154	84	30		235	7.6	3
Dec. 28.....	15	11		.00	.00	18	5.8	12	2.8	56	23	12	.1	11	140	70	23		209	6.9	3
Jan. 27, 1966.	88	--		--	--	--	--	A17	--	58	25	19	--	14	160	74	27		238	7.0	5
Feb. 14.....	7410	--		--	--	--	--	A7.8	--	17	21	8.0	--	8.2	103	37	23		124	6.5	20
Feb. 17.....	770	--		--	--	--	--	A9.7	--	35	28	12	--	9.1	153	61	33		186	7.2	15
Mar. 30.....	299	--		--	--	--	--	A11	--	51	25	11	--	8.9	137	67	25		191	7.0	8
Apr. 28.....	7.1	--		--	--	--	--	A10	--	50	24	10	--	6.2	--	63	22		177	7.2	15
June 28.....	129	--		--	--	--	--	A15	--	64	25	14	--	9.2	--	72	20		212	7.0	10
July 28.....	--	--		--	--	--	--	A19	--	72	31	18	--	4.3	--	79	20		242	7.3	15
Aug. 31.....	60.8	--		--	--	--	--	A19	--	82	31	19	--	5.9	--	90	23		266	6.7	4
Sept. 29.....	151	--		--	--	--	--	A13	--	61	29	16	--	7.4	--	80	30		230	6.8	5

A Sodium (Na) and potassium (K) calculated as sodium.

1-4815. BRANDYWINE CREEK AT WILMINGTON, DEL.--Continued

Suspended sediment, water year October 1965 to September 1966
(Where no daily concentrations are reported, loads are estimated)

Day	OCTOBER			NOVEMBER			DECEMBER		
		Suspended sediment			Suspended sediment			Suspended sediment	
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1..	111	--	4	101	10	3	112	6	2
2..	170	--	10	100	10	3	111	5	1
3..	135	--	6	100	10	3	111	5	1
4..	106	--	4	100	9	2	114	6	2
5..	94	13	3	102	9	2	113	6	2
6..	91	11	3	102	9	2	113	7	2
7..	139	19	A 7	103	9	3	108	7	2
8..	866	140	S 320	107	9	3	104	6	2
9..	299	45	36	111	9	3	106	6	2
10..	184	27	13	109	9	3	107	6	2
11..	146	22	9	110	9	3	108	6	2
12..	136	18	7	110	9	3	120	8	3
13..	136	15	6	109	9	3	174	18	8
14..	124	12	4	112	9	3	219	22	B 13
15..	121	12	4	109	9	3	160	15	6
16..	116	12	4	111	13	4	140	13	5
17..	112	11	3	145	--	7	129	9	3
18..	109	10	3	146	--	6	122	9	3
19..	106	10	3	119	8	3	121	8	3
20..	104	12	3	113	7	2	117	8	3
21..	104	14	4	112	8	2	113	8	2
22..	104	13	4	124	9	3	106	8	2
23..	106	13	4	153	10	4	107	6	2
24..	104	12	3	139	8	3	112	7	2
25..	102	11	3	123	8	3	149	--	7
26..	101	11	3	120	8	3	233	--	20
27..	101	10	3	129	10	3	157	8	3
28..	101	9	2	138	10	4	134	5	2
29..	101	9	2	130	8	3	134	8	3
30..	101	9	2	116	7	2	129	8	3
31..	101	10	3	--	--	--	131	6	2
Total	4531	--	485	3503	--	94	4014	--	115

	JANUARY			FEBRUARY			MARCH		
1..	139	6	2	152	6	2	3410	550	S 5300
2..	152	6	2	155	6	3	1290	95	330
3..	330	12	11	151	6	2	737	20	40
4..	280	9	7	149	5	2	652	12	21
5..	192	6	3	146	5	2	691	14	26
6..	355	6	6	139	4	2	641	8	14
7..	566	18	28	138	4	1	541	6	9
8..	337	28	B 25	142	4	2	485	5	7
9..	183	15	7	144	4	2	454	5	6
10..	181	6	3	157	6	3	436	5	6
11..	172	1	T	479	55	A 71	426	6	7
12..	126	4	1	877	240	570	419	6	7
13..	141	5	2	3520	380	S 4600	409	6	7
14..	155	5	2	6500	1700	S 33000	396	6	6
15..	142	4	2	1380	170	S 700	386	8	8
16..	135	4	1	868	40	94	364	7	7
17..	125	3	1	743	22	44	349	7	7
18..	128	3	1	594	15	24	345	7	7
19..	124	3	1	534	10	14	347	8	7
20..	133	3	1	476	8	10	352	7	7
21..	129	3	1	384	6	6	325	6	5
22..	124	3	1	389	4	4	315	5	4
23..	179	6	3	371	4	4	313	7	6
24..	180	6	3	371	5	5	337	10	B 9
25..	145	4	2	412	6	7	719	--	200
26..	140	4	2	414	6	7	458	--	30
27..	124	4	1	384	5	5	384	6	6
28..	140	5	2	694	--	200	340	5	5
29..	110	4	1	--	--	--	323	4	3
30..	110	4	1	--	--	--	314	5	4
31..	103	3	1	--	--	--	314	6	5
Total	5580	--	124	20863	--	39386	17272	--	6106

S Computed by subdividing day.
T Less than 0.50 ton.
A Computed from partly estimated-concentration graph.
B Computed from estimated-concentration graph.

1-4815. BRANDYWINE CREEK AT WILMINGTON, DEL.--Continued

Suspended sediment, water year October 1965 to September 1966--Continued
(Where no daily concentrations are reported, loads are estimated)

Day	APRIL			MAY			JUNE		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	299	6	5	894	70	B 170	277	12	9
2	294	6	5	638	22	38	260	11	8
3	278	5	4	529	15	21	236	11	7
4	279	6	5	475	12	15	223	10	6
5	276	7	5	438	10	12	213	10	6
6	264	8	6	430	10	12	205	9	5
7	258	9	6	404	12	13	198	8	4
8	260	8	6	393	10	11	199	8	4
9	254	7	5	395	10	11	190	7	4
10	252	7	5	386	10	10	195	16	8
11	245	6	4	362	8	8	193	18	9
12	251	6	4	358	7	7	164	17	8
13	552	14	21	375	8	8	164	17	8
14	556	13	20	368	8	8	169	17	8
15	396	8	9	356	7	7	184	16	8
16	335	7	6	337	7	6	161	14	6
17	308	7	6	433	30	35	160	15	6
18	289	7	5	405	15	16	162	16	7
19	282	7	5	1250	120	S 520	157	16	7
20	275	7	5	734	70	140	154	17	7
21	270	6	4	431	10	12	147	18	7
22	369	--	10	620	65	S 120	137	19	7
23	429	--	20	458	60	74	134	20	7
24	583	--	40	360	32	31	130	18	6
25	816	60	S 130	333	32	29	126	17	6
26	562	18	27	327	32	28	124	16	5
27	441	8	10	309	30	B 25	127	15	5
28	776	27	57	354	20	B 19	131	14	5
29	675	15	27	439	30	B 35	189	18	B 9
30	567	7	11	328	20	B 18	134	14	5
31	--	--	--	278	14	11	--	--	--
Total	11691	--	473	14191	--	1470	5243	--	197

	JULY			AUGUST			SEPTEMBER		
1	121	10	3	90	8	2	61	4	1
2	113	8	2	88	7	2	60	4	1
3	110	6	2	101	9	2	60	4	1
4	102	4	1	88	9	2	87	12	3
5	109	4	1	88	9	2	85	12	3
6	131	12	4	90	9	2	70	10	2
7	127	15	5	84	8	2	63	9	2
8	120	14	5	79	7	1	62	8	1
9	104	13	4	77	6	1	63	8	1
10	96	12	3	79	5	1	65	8	1
11	94	10	3	79	3	1	67	8	1
12	98	11	3	125	10	3	70	8	2
13	91	10	2	86	6	1	74	8	2
14	86	8	2	77	6	1	304	65	B 53
15	87	8	2	81	8	2	1160	310	S 1300
16	87	7	2	82	9	2	254	40	27
17	80	6	1	223	12	B 7	147	14	6
18	76	6	1	130	6	2	120	12	4
19	80	12	3	93	6	2	107	10	3
20	130	--	6	79	6	1	133	14	5
21	95	6	2	73	6	1	710	250	S 700
22	80	6	1	73	7	1	565	90	140
23	75	6	1	75	7	1	321	32	28
24	70	6	1	75	7	1	211	14	8
25	68	6	1	75	6	1	155	10	4
26	69	7	1	66	5	1	140	7	3
27	70	8	2	66	5	1	133	7	3
28	327	18	S 19	64	5	1	139	7	3
29	156	11	5	62	6	1	164	12	5
30	111	10	3	62	6	1	181	--	8
31	101	9	2	62	5	1	--	--	--
Total	3264	--	93	2672	--	50	5831	--	2321

Total discharge for year (cfs-days)..... 98655
Total load for year (tons)..... 50914

S Computed by subdividing day.
B Computed from estimated-concentration graph.

1-4815. BRANDYWINE CREEK AT WILMINGTON, DEL.--Continued

Particle-size analyses of suspended sediment, water year October 1965 to September 1966

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Sept. 15, 1966.....	0720	62		1660	377		40	57	76	91	96	97	98	99	100			SCBW

1-4821. DELAWARE RIVER AT DELAWARE MEMORIAL BRIDGE, WILMINGTON, DEL.

LOCATION.--Lat 39°41'21", long 75°31'19", center of the navigational channel at the center of the Delaware Memorial Bridge, 1.9 miles downstream from the mouth of the Christina River.
DRAINAGE AREA.--11,030 square miles.
RECORDS AVAILABLE.--Chemical analyses: July 1955 to September 1966.
Water temperatures: October 1956 to September 1966.
EXTREMES, 1965-66.--Specific conductance: Maximum, 14,000 micromhos Sept. 13; minimum, 165 micromhos May 2.
Dissolved oxygen: Maximum, 11.6 ppm Jan. 26; minimum, 0.0 ppm May 23.
Water temperatures: Maximum, 84°F on several days during July; minimum, freezing point on several days in February.
EXTREMES, 1955-66.--Specific conductance: Maximum, 14,600 micromhos Oct. 1, 1957; minimum, 100 micromhos on several days during spring of most years.
Dissolved oxygen (1962-66): Maximum daily, 12.9 ppm Feb. 13, 19, 1964; minimum daily, 0.1 ppm May 30 and June 2, 13, 1964.
Water temperatures: Maximum, 84°F on several days in September 1961 and July 1966; minimum, freezing point on many days during winter months.

Chemical analyses, in parts per million, December 1965 to September 1966

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$		Total acidity as H^{+1}	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
Dec. 20, 1965.	5440	3.2		0.00	0.90	96	200	1600	50	4	546	2920	0.8	5.0	5690	1060	1060		9680	5.2	5
Mar. 3, 1966..	19100	6.6		.00	.18	20	5.7	16	3.1	7	61	22	.4	15	168	74	68		266	5.6	6
Mar. 31.....	12100	6.2	0.2	.02	.24	17	5.4	15	2.4	6	59	20	.5	9.2	--	65	60		243	5.5	5
July 25.....	2240	1.5		.24	1.00	39	90	640	37	9	266	1100	.8	3.6	2760	468	460		4390	6.1	20
Aug. 18.....	3260	1.3		.02	.80	75	140	1300	55	9	402	2200	.8	4.2	4250	764	756		7000	5.6	5
Sept. 7.....	2530	1.5		.02	.02	68	115	1020	36	4	356	1860	1.2	6.3	3750	643	640		6000	4.8	3

1-4821. DELAWARE RIVER AT DELAWARE MEMORIAL BRIDGE, WILMINGTON, DEL.--Continued

Specific conductance (micromhos at 25°C), dissolved oxygen, in parts per million, and temperature (°F) of water, water year October 1965 to September 1966

Day	OCTOBER									NOVEMBER								
	Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)			Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)		
	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
1	11400	7500	9509	7.5	5.7	6.7	71	70	70	8920	5720	7105	8.4	5.0	6.8	56	55	56
2	10600	6180	7931	7.7	5.1	6.2	71	69	70	10800	5580	7444	9.8	5.6	7.5	55	53	54
3	10100	6480	8348	7.3	5.4	6.6	70	69	69	10700	6250	8128	9.0	6.4	7.8	55	53	54
4	9138	5720	7560	7.3	4.8	6.3	69	66	68	9630	5660	7585	8.7	5.7	7.2	55	54	54
5	9600	5800	7492	7.9	5.0	6.5	67	64	65	9780	5610	7570	9.0	5.4	7.3	54	53	54
6	10600	6220	8054	8.2	5.6	7.0	65	63	64	10100	5980	7874	8.9	5.6	7.3	54	53	54
7	13900	6280	9042	7.8	5.7	7.1	64	62	63	10600	6050	8123	8.7	5.5	7.2	55	53	54
8	12500	6770	9179	8.0	6.2	7.2	64	62	63	11500	6100	8467	8.1	5.2	6.7	54	53	54
9	10800	6040	8386	7.6	5.5	6.7	64	62	63	11300	6440	8768	7.7	5.1	6.6	54	53	54
10	10800	6010	8111	7.0	4.9	5.7	63	62	63	11700	6280	8782	--	--	--	54	53	53
11	10700	5920	8048	6.1	4.4	5.2	63	62	62	12600	6580	9059	--	--	--	53	52	53
12	10800	5570	8009	6.5	3.7	5.2	63	62	62	12400	6980	9609	8.9	5.7	--	53	52	53
13	9950	5520	7751	6.3	3.2	5.3	62	61	62	12700	7520	--	8.2	5.2	7.0	53	52	53
14	10300	5600	7691	6.2	3.0	5.1	62	61	61	11400	7730	--	8.0	4.6	6.6	53	52	53
15	10900	5770	7837	6.7	3.0	5.0	63	61	62	11100	7140	--	8.5	4.6	6.6	53	51	52
16	9800	5320	7352	6.6	2.6	4.7	63	62	63	11800	8190	--	8.5	5.2	7.1	52	51	52
17	10500	5420	7498	7.5	2.9	5.4	63	62	62	10000	6650	--	8.0	5.0	6.8	52	51	52
18	10300	5870	7645	7.3	3.7	5.4	62	61	62	9920	5250	7500	7.9	4.8	--	51	49	50
19	9800	5230	7215	7.1	2.8	4.9	63	61	62	10300	6200	8452	--	--	--	50	48	49
20	10000	5340	7424	7.3	2.8	4.9	63	62	62	10800	6770	8766	--	--	--	49	48	49
21	10100	5740	7756	6.9	2.8	5.0	63	62	62	11700	6950	8970	--	--	--	49	48	48
22	10800	5800	8120	6.8	2.9	5.0	63	62	63	12000	6980	9159	9.4	7.1	--	49	48	48
23	11600	6320	8555	6.8	3.0	5.0	63	62	63	12400	7150	9468	9.6	7.0	8.3	49	48	48
24	11000	5980	8298	6.6	2.7	4.9	63	61	62	11900	6540	8891	9.4	6.4	7.9	49	48	48
25	11300	5620	7899	6.9	2.4	4.9	62	60	61	12200	6800	9035	8.4	6.3	--	48	47	48
26	10400	5730	7834	6.9	3.1	5.1	61	60	60	11500	6840	8965	8.9	6.0	--	49	47	48
27	10300	5810	7752	7.5	3.1	5.2	60	59	60	12400	7210	9498	9.3	6.5	8.0	49	48	48
28	9750	5630	7850	7.1	3.5	5.4	60	58	59	11600	6830	9030	9.3	6.4	8.0	49	48	48
29	10700	5180	7396	8.6	3.6	5.9	58	56	57	10200	6180	8030	9.2	6.7	--	48	47	47
30	10200	5940	7946	8.5	4.8	6.5	57	56	56	9680	6080	7805	9.3	6.5	8.0	48	46	47
31	9570	5520	7486	8.7	4.7	6.5	57	56	56									

Day	DECEMBER									JANUARY								
	Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)			Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)		
	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
1	9400	6080	7684	9.1	6.5	7.9	47	45	46	7380	3810	5298	7.0	4.1	5.5	42	41	42
2	9220	5850	7419	9.2	6.6	7.9	46	45	--	7430	3550	5472	7.2	3.8	5.6	42	41	42
3	9620	5570	7419	9.4	6.4	7.9	46	45	--	8200	4000	5932	7.6	4.3	5.9	42	41	41
4	10200	6120	7876	8.3	6.7	--	--	--	--	6750	2650	4521	6.3	2.8	4.7	43	41	42
5	9300	5600	7451	--	--	--	46	45	--	7100	2400	4356	6.9	2.9	4.7	42	41	42
6	9740	5580	7487	9.1	6.6	--	45	44	45	8650	2650	5085	8.4	3.3	--	43	41	42
7	9200	4970	7084	9.3	6.1	8.0	45	43	44	8650	3100	5413	--	--	--	43	41	42
8	10900	5530	7644	9.2	6.8	8.2	44	42	43	7250	1450	4279	7.0	3.6	5.2	43	41	42
9	11300	5360	7729	9.1	6.4	7.8	44	42	43	6500	1350	2981	9.4	4.2	6.4	41	39	40
10	10400	5500	7493	8.5	5.9	7.1	44	43	43	8400	2350	4860	10.2	6.1	8.2	40	38	39
11	10600	5450	7631	7.8	5.6	--	44	43	43	6500	1700	4033	9.3	5.4	7.6	40	38	39
12	11100	5560	8130	--	--	--	44	43	43	6150	1750	3456	8.8	5.9	--	40	37	38
13	11200	6200	8664	--	--	--	44	43	44	6550	1850	4208	--	--	--	39	36	37
14	10800	6260	8441	--	--	--	45	43	44	6500	2250	4171	--	--	--	39	37	37
15	10600	6030	8162	8.3	5.6	--	45	44	44	6750	2500	4417	--	--	--	38	36	37
16	10300	5880	8099	8.1	5.2	6.7	45	44	44	6300	2350	4029	--	--	--	38	36	37
17	10300	5740	7754	7.7	4.9	6.4	45	44	44	6150	2200	3879	9.3	6.4	--	37	36	36
18	9650	4880	7303	7.9	4.3	6.3	45	43	44	5600	2100	3592	9.9	6.3	8.2	37	35	36
19	10100	5380	7365	8.2	4.9	6.4	44	43	44	6200	2200	4023	10.3	7.0	8.8	36	35	35
20	9780	5040	7238	8.2	4.6	6.4	44	42	43	7600	2750	4763	10.5	7.6	9.1	36	34	35
21	9780	5130	7143	8.0	4.4	6.2	43	42	42	8850	3250	5490	10.7	7.5	9.2	36	34	35
22	9280	4490	--	7.7	3.7	5.6	43	42	42	8700	3050	5646	10.0	7.4	8.9	36	34	35
23	8840	4260	6121	7.2	3.5	5.2	43	41	42	10100	3250	7394	10.8	8.4	9.9	36	34	35
24	8980	4550	6373	7.3	3.6	--	43	42	42	7550	2500	4967	10.8	8.1	9.6	36	35	35
25	9680	4770	6645	--	--	--	43	41	43	10100	3950	6602	11.2	8.8	10.2	35	34	35
26	7440	3420	5369	--	--	--	43	42	42	9400	3900	6654	11.6	9.2	10.7	35	33	34
27	8390	4490	6032	9.1	5.8	--	42	40	41	10100	4450	7206	--	--	--	--	--	--
28	7750	3920	5623	8.8	4.9	6.9	42	40	41	8050	3600	6297	--	--	--	--	--	--
29	7800	3890	5680	8.1	5.1	6.7	41	40	40	--	--	--	--	--	--	--	--	--
30	7400	3900	5504	7.7	4.5	6.1	41	40	40	--	--	--	--	--	--	--	--	--
31	7200	3620	5457	7.2	4.1	5.8	41	40	41	5200	3100	--	--	--	--	--	--	--

1-4821. DELAWARE RIVER AT DELAWARE MEMORIAL BRIDGE, WILMINGTON, DEL.--Continued

Specific conductance (micromhos at 25°C), dissolved oxygen, in parts per million, and temperature (°F) of water, water year October 1965 to September 1966--Continued

Day	FEBRUARY									MARCH								
	Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)			Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)		
	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
1	8100	2650	5024	--	--	--	--	--	--	2050	280	755	9.6	7.9	--	40	38	40
2	10600	4250	--	--	--	--	--	--	--	690	240	344	9.4	8.0	8.7	41	39	40
3	--	--	--	--	--	--	32	31	--	420	250	311	8.9	7.4	8.2	41	40	40
4	--	--	--	--	--	--	32	31	31	950	280	388	8.9	7.2	8.0	42	41	41
5	--	--	--	--	--	--	32	31	32	1600	290	439	8.9	7.0	7.5	43	41	42
6	--	--	--	--	--	--	32	31	32	600	250	339	8.0	7.0	7.3	43	42	42
7	--	--	--	--	--	--	32	31	--	430	240	290	7.6	6.7	7.2	42	41	42
8	--	--	--	--	--	--	--	--	--	320	230	261	7.6	6.8	7.1	42	41	42
9	--	--	--	10.6	7.9	--	33	32	--	360	230	268	7.3	6.7	7.0	43	41	42
10	--	--	--	10.0	7.5	8.8	33	32	33	410	250	304	6.9	6.4	6.7	43	41	42
11	10400	5600	--	8.8	6.9	--	34	33	33	380	260	300	6.7	6.3	6.5	43	42	43
12	10750	5050	--	8.0	6.7	--	35	34	34	425	260	311	6.5	6.1	6.3	44	41	43
13	10400	6000	--	--	--	--	36	34	35	420	260	325	6.5	6.0	6.2	45	43	44
14	6350	1450	--	--	--	--	37	35	36	425	260	316	6.3	5.9	6.1	45	44	44
15	3250	550	1471	4.9	3.4	--	40	37	38	350	260	293	6.2	5.8	6.0	45	44	45
16	2100	450	1089	5.3	3.8	4.3	39	38	39	340	255	288	6.6	6.0	6.3	45	44	45
17	1400	310	706	7.2	4.0	5.2	39	38	38	335	255	286	6.6	6.0	6.3	45	44	45
18	1200	300	566	8.9	5.5	6.4	38	38	38	335	260	--	6.5	6.0	--	45	45	--
19	950	300	503	8.1	5.5	6.6	38	38	38	--	--	--	--	--	--	--	--	--
20	1050	290	492	--	--	--	38	37	38	--	--	--	--	--	--	--	--	--
21	600	280	393	8.7	7.4	--	38	37	37	405	245	--	8.4	5.6	--	46	46	--
22	1620	280	460	9.5	8.1	8.6	38	36	37	425	245	306	6.4	5.1	5.7	47	46	46
23	1630	290	660	8.9	8.2	8.5	37	36	37	435	245	320	6.3	5.1	5.8	47	47	47
24	1550	300	772	8.7	7.9	--	38	36	37	545	249	345	6.7	5.6	6.2	48	47	48
25	2000	320	921	--	--	--	38	36	37	345	225	268	7.0	5.6	--	48	47	47
26	2140	280	731	7.4	6.9	--	38	36	37	380	230	275	7.6	5.5	6.6	48	47	48
27	1680	300	762	8.6	7.3	7.9	38	37	38	300	225	249	7.2	5.7	6.5	48	47	48
28	1980	310	983	--	--	--	39	37	38	290	225	245	7.6	5.6	6.7	47	46	47
29										270	225	246	7.5	5.7	6.7	47	46	47
30										390	225	281	8.0	5.8	6.8	47	46	47
31										725	230	328	8.1	5.7	6.8	48	46	47

Day	APRIL									MAY								
	Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)			Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)		
	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
1	1200	245	450	9.0	5.8	7.1	48	46	47	1290	245	639	5.6	2.3	4.3	57	56	56
2	1200	250	474	8.0	5.6	6.7	48	46	47	1320	165	530	5.4	1.8	3.7	57	56	57
3	1225	245	520	8.1	5.7	6.8	48	46	47	990	240	495	5.1	1.3	3.4	58	56	57
4	2550	250	690	8.1	5.5	6.8	48	46	47	975	215	392	5.0	1.0	2.9	59	57	58
5	1600	265	725	8.0	5.3	6.8	48	47	48	960	225	473	5.3	1.5	3.6	59	57	58
6	1490	280	771	8.1	5.2	6.7	48	47	48	1330	225	493	6.1	2.7	4.4	60	58	59
7	1710	270	790	7.9	5.0	6.5	49	47	48	930	225	480	6.3	3.2	4.5	61	60	60
8	1510	305	779	7.8	5.1	6.4	49	48	49	1330	215	549	6.8	3.4	4.8	61	60	61
9	1670	325	816	7.8	4.9	6.3	49	48	49	900	250	513	6.2	4.4	5.4	61	60	60
10	1540	325	808	7.8	4.8	6.3	49	48	49	670	225	400	6.4	4.1	5.6	61	59	--
11	1610	350	871	7.6	4.6	6.1	50	48	49	695	220	430	--	--	--	--	--	--
12	1440	350	828	7.2	4.8	6.1	49	49	49	710	240	463	6.4	4.1	--	60	60	--
13	1830	465	1061	8.7	5.6	7.4	49	48	48	775	300	473	6.6	3.8	5.3	61	60	61
14	1950	415	1066	8.7	6.1	7.4	49	48	49	745	315	500	6.7	4.2	5.4	61	60	60
15	1620	395	968	7.9	5.9	6.9	50	48	49	900	300	507	6.2	3.3	4.8	62	60	61
16	1900	400	1009	7.6	5.5	6.7	50	49	50	1140	305	565	6.4	3.3	4.6	62	61	62
17	2200	430	1184	7.5	5.2	6.4	51	50	50	1050	300	563	5.7	2.4	4.4	63	62	62
18	2070	405	1117	7.1	4.8	6.1	53	50	52	1250	310	598	5.7	2.5	4.1	63	63	63
19	2510	405	1207	8.0	4.5	6.2	53	53	53	1160	275	573	5.3	1.6	3.8	65	63	64
20	2520	465	1335	8.1	5.3	6.6	54	53	54	940	275	454	4.4	0.6	2.6	66	64	65
21	2270	480	1335	7.8	5.5	6.6	55	53	--	960	275	455	4.1	0.3	2.0	67	65	66
22	2210	375	1174	7.3	4.6	6.0	56	55	--	1050	270	475	3.7	0.4	--	67	66	67
23	2600	450	1327	7.2	4.2	5.7	56	55	56	1030	240	435	3.8	0.0	1.8	68	67	67
24	2750	470	1402	7.3	3.7	5.4	57	56	56	915	275	469	3.6	0.4	1.8	69	67	68
25	2700	375	1305	6.6	2.6	4.8	58	57	57	925	275	474	3.8	0.4	1.8	70	68	69
26	2250	400	1179	5.8	2.4	4.4	58	57	58	950	295	499	3.2	0.2	1.5	70	69	70
27	1830	495	1132	5.8	3.5	--	58	57	57	1000	295	558	2.6	0.2	1.3	71	70	70
28	1960	430	1114	6.6	5.0	--	57	56	56	925	300	564	2.0	0.2	1.1	71	71	71
29	1910	300	914	6.7	4.1	5.5	56	55	56	950	300	536	1.6	0.4	1.0	72	71	71
30	1340	255	770	6.2	3.5	5.0	56	56	56	1040	300	548	1.8	0.2	1.1	72	70	71
31										1010	285	551	1.0	0.3	0.7	71	70	71

1-4821. DELAWARE RIVER AT DELAWARE MEMORIAL BRIDGE, WILMINGTON, DEL.--Continued

Specific conductance (micromhos at 25°C), dissolved oxygen, in parts per million, and temperature (°F) of water, water year October 1965 to September 1966--Continued

Day	JUNE									JULY								
	Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)			Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)		
	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
1	1030	295	526	0.9	0.2	0.5	71	69	70	5300	1230	2724	4.6	1.6	--	82	81	--
2	1020	300	526	1.0	0.3	0.6	70	69	70	4370	1420	2798	4.5	1.2	2.5	82	81	81
3	1050	315	554	1.2	0.3	0.8	71	69	70	5150	1370	3015	4.3	1.5	2.7	83	81	82
4	1150	325	585	1.4	0.2	0.7	72	70	71	5400	1500	3291	4.8	1.7	3.0	84	82	83
5	1200	325	599	0.9	0.1	0.4	72	71	72	5500	1800	3574	4.5	2.0	3.1	84	82	83
6	1200	360	--	0.8	0.1	--	72	72	--	6350	2050	4118	4.4	1.8	3.3	83	82	83
7	--	--	--	--	--	--	--	--	--	6100	2130	3994	4.0	2.0	--	83	83	83
8	--	--	--	--	--	--	--	--	--	6200	2280	4080	4.0	2.4	--	83	83	83
9	1120	370	--	--	--	--	--	--	--	5300	2000	3611	3.5	2.7	--	84	83	83
10	1440	400	816	2.3	1.3	--	76	75	--	6000	2100	3738	--	--	--	83	82	83
11	1310	340	777	4.5	1.4	2.6	75	75	75	5130	2050	3575	4.4	2.8	--	83	82	--
12	1270	405	849	4.8	2.2	3.6	75	74	74	5960	2200	3707	4.8	2.9	3.8	84	83	83
13	1250	380	765	4.8	3.2	4.0	74	73	74	6000	2250	3813	4.1	3.2	--	84	83	84
14	1870	400	841	4.3	2.6	3.4	76	74	75	6200	2200	3740	--	--	--	84	84	84
15	2100	395	849	4.2	2.0	2.8	76	75	76	7100	2360	4028	6.0	3.1	--	84	82	83
16	2400	425	1005	3.0	1.6	--	76	75	--	7400	2450	4214	--	--	--	--	--	--
17	2960	425	1052	--	--	--	--	--	--	7100	2450	4287	--	--	--	--	--	--
18	2410	455	1181	--	--	--	--	--	--	7000	2500	4488	5.7	4.1	--	82	81	--
19	2850	485	1302	--	--	--	--	--	--	7850	2640	5111	5.9	5.9	--	81	81	--
20	3500	575	1592	2.2	0.5	--	75	74	--	6200	2660	--	--	--	--	--	--	--
21	3250	580	1626	3.4	0.2	1.4	76	73	75	8060	2700	4891	6.8	4.4	--	--	--	--
22	3500	670	1810	3.1	0.3	1.6	76	75	75	7980	2820	5185	6.2	6.2	--	--	--	--
23	3600	750	1988	3.5	0.3	1.7	77	75	76	7990	2870	5173	--	--	--	--	--	--
24	3280	755	1948	2.8	0.3	1.6	77	76	77	7920	3120	5345	--	--	--	--	--	--
25	3700	850	2325	3.4	0.4	1.9	79	77	78	7850	3500	5519	7.2	3.0	--	80	80	--
26	3920	900	2352	3.4	0.9	2.1	78	77	78	8150	3520	5542	7.0	2.8	4.7	81	80	80
27	3580	875	2242	3.3	0.9	2.0	79	78	78	8290	3500	5636	7.1	2.6	4.6	81	80	81
28	3900	930	2253	2.7	0.8	--	79	78	--	7440	3950	5713	6.0	2.8	4.5	81	80	81
29	4750	1010	2490	--	--	--	--	--	--	7800	3580	5356	6.1	2.3	4.0	83	80	81
30	4700	1250	2602	--	--	--	--	--	--	7580	3540	5392	5.8	2.1	4.0	81	79	80
31										8050	3740	5449	4.8	2.5	--	80	79	79

Day	AUGUST									SEPTEMBER								
1	7850	3800	5617	5.3	2.6	--	80	78	79	--	--	--	--	--	--	81	80	80
2	8800	3780	5708	6.3	3.2	4.7	80	79	79	--	--	--	--	--	--	81	80	80
3	7590	3700	5539	6.0	2.8	4.7	79	79	79	--	--	--	--	--	--	81	80	80
4	8200	3950	5821	6.1	3.4	--	79	78	79	--	--	--	--	--	--	80	80	80
5	7500	4250	5809	6.1	5.2	--	79	78	78	--	--	--	--	--	--	81	79	80
6	8000	4320	6052	--	--	--	79	78	79	11900	6550	--	--	--	--	80	79	79
7	7770	4420	6132	--	--	--	80	78	79	11500	5750	8427	--	--	--	80	78	78
8	7900	4520	6193	6.5	3.6	--	80	78	79	10900	6050	8244	--	--	--	78	77	78
9	8850	4500	6295	6.2	3.6	4.8	80	79	80	10400	6200	8430	--	--	--	78	76	77
10	8250	4790	6332	6.2	3.4	4.6	81	79	80	11700	6250	8335	--	--	--	77	76	76
11	8290	4770	6372	6.1	3.6	4.7	81	80	80	11700	6150	8629	--	--	--	76	76	76
12	7700	4340	5968	6.5	3.5	4.6	81	80	80	13000	6550	9147	--	--	--	76	75	76
13	8800	4250	5775	4.8	3.7	--	80	80	80	14000	6700	9289	--	--	--	75	74	75
14	9100	4090	6070	--	--	--	80	78	80	12400	7000	9713	--	--	--	75	74	74
15	6900	4060	--	6.2	3.2	--	80	79	79	12200	6900	--	--	--	--	74	73	--
16	--	--	--	6.3	2.8	4.5	80	79	79	12500	6100	--	--	--	--	73	72	--
17	--	--	--	6.4	2.7	4.4	80	79	80	11400	5800	8547	--	--	--	73	71	72
18	--	--	--	5.9	3.2	4.6	81	79	80	11300	5800	8537	--	--	--	73	71	72
19	--	--	--	5.8	3.3	4.6	81	80	81	12200	5760	8855	6.8	3.5	--	73	71	72
20	--	--	--	5.5	3.4	4.5	81	80	80	13000	6500	9604	7.3	3.9	5.8	72	70	71
21	--	--	--	5.0	4.4	--	81	80	81	12000	7900	--	7.4	5.7	--	71	70	70
22	--	--	--	5.8	3.5	--	82	80	81	11800	7800	--	--	--	--	70	70	70
23	--	--	--	5.8	3.3	4.4	81	81	81	8700	4000	6518	6.4	5.6	--	70	69	69
24	--	--	--	6.9	3.3	4.7	81	80	80	9400	3550	5867	5.6	3.1	--	69	67	68
25	--	--	--	7.2	3.8	5.2	81	79	80	8850	3580	5813	--	--	--	68	67	68
26	--	--	--	7.4	4.0	5.3	80	79	79	11200	3650	6161	7.0	3.1	--	68	66	67
27	--	--	--	7.7	4.1	5.6	80	79	79	11000	4050	6757	6.3	2.8	4.6	67	66	66
28	--	--	--	7.2	4.4	5.8	80	79	80	10500	4100	7075	5.6	2.3	--	66	65	66
29	--	--	--	6.8	4.4	5.8	80	79	80	10900	4750	7558	5.6	2.8	--	66	65	65
30	--	--	--	--	--	--	81	80	80	11500	4500	7819	5.7	2.7	4.4	66	65	66
31	--	--	--	--	--	--	81	80	80									

1-4828. DELAWARE RIVER AT REEDY ISLAND JETTY, DEL.

LOCATION.--Lat 39°30'5", long 75°34'10", specific conductance recorder on platform in river at Reedy Island Jetty, New Castle County. Installation is approximately 4.7 miles south of Chesapeake and Delaware Canal and 5.7 miles north of Liston Point.
DRAINAGE AREA.--11,222 square miles, approximately.
RECORDS AVAILABLE.--Specific conductance: October 1963 to September 1966.
EXTREMES, 1965-66.--Specific conductance: Maximum, 25,220 micromhos Nov. 22; minimum, 1,000 micromhos Mar. 27.
EXTREMES, 1963-66.--Specific conductance: Maximum, 35,400 micromhos Nov. 7, 1963; minimum, 300 micromhos Mar. 18, 19, 1964.

Chemical analyses, in parts per million, January to July 1966

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$		Total acidity as H^{+1}	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
Jan. 11, 1966..		4.5		0.00	0.47	96	249	2040	85	15	628	3690	0.7	9.2	7430	1260	1250		11700	5.7	7
Apr. 5.....		5.8		.01	.00	36	150	1240	50	20	370	2240	.4	3.0	4300	708	691		7300	6.2	5
July 21.....		1.8		.02	.28	69	218	1800	78	24	526	3200	.8	1.4	6520	1070	1050		9920	6.5	15
Sept. 9		2.0		.02	.02	141	373	3430	25	38	867	5960	.8	.4	11300	18900	18600		17200	--	3

1-4828. DELAWARE RIVER AT REEDY ISLAND JETTY, DEL.--Continued

Specific conductance (micromhos at 25°C), water year October 1965 to September 1966

Day	OCTOBER									NOVEMBER								
	Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)			Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)		
	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
1	19000	15200	17125							18200	12100	14450						
2	18200	11900	14588							18900	12100	15413						
3	19300	12900	15992							20500	14300	17546						
4	18800	12400	15304							19000	13400	16504						
5	20000	12700	16317							23900	13100	17629						
6	21300	14400	17704							22500	16400	19363						
7	22200	14900	18396							22300	16400	19113						
8	20300	14200	17213							22500	15800	18750						
9	18800	13300	16742							21600	16100	18942						
10	18600	14100	16467							22700	16200	18625						
11	18600	13700	16329							22700	16300	18708						
12	19000	13600	16167							24000	17000	19696						
13	18900	15200	--							23900	17700	20725						
14	19300	13000	15654							22100	17600	20004						
15	17800	13700	--							22900	17100	19121						
16	19000	14100	--							22200	18000	20142						
17	19200	13100	15258							21000	16400	18429						
18	18900	13500	16096							20900	14100	16200						
19	17600	12700	14825							24600	14800	19413						
20	18800	12300	15021							24600	16200	20113						
21	19300	13000	15721							24300	16500	20171						
22	19000	13900	16225							25200	16900	20454						
23	19300	14300	16792							24900	17800	20954						
24	17900	13800	15900							23600	16800	19650						
25	17500	13200	15325							23600	16700	19263						
26	16500	13300	14958							22400	16800	19233						
27	15800	13300	14717							23500	17200	19958						
28	17900	13700	15358							23100	16700	19129						
29	18800	13200	15254							21500	15500	17846						
30	19000	13900	16163							22300	14600	17946						
31	18600	11200	14846															

Day	DECEMBER									JANUARY								
	Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)			Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)		
	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
1	23400	14500	18954							21400	13600	16988						
2	23000	15400	19042							22200	13300	17179						
3	23800	14400	18933							22590	14700	18513						
4	24400	16400	20221							19100	12700	15763						
5	23600	15900	19429							19100	12000	14913						
6	22900	15500	19350							21900	12500	16450						
7	22700	15000	18433							21700	13700	17383						
8	25000	15400	19329							18500	11500	15383						
9	24000	15700	19038							17600	10500	12854						
10	22800	15400	18863							22900	12300	16933						
11	23100	15800	18633							18200	13400	--						
12	23900	16300	19013							--	--	--						
13	23500	16300	19725							--	--	--						
14	22600	16200	19263							--	--	--						
15	22100	16200	18867							--	--	--						
16	21400	16000	18688							--	--	--						
17	21300	16200	18400							--	--	--						
18	21300	15500	17925							--	--	--						
19	21600	15200	17879							--	--	--						
20	22000	15000	17913							--	--	--						
21	21300	15000	17558							--	--	--						
22	20000	13500	16513							--	--	--						
23	19400	13000	15533							--	--	--						
24	20500	13000	15883							--	--	--						
25	21100	14200	16858							--	--	--						
26	18700	12500	14825							--	--	--						
27	22300	13300	17146							--	--	--						
28	20500	12900	16513							--	--	--						
29	21200	13400	16500							--	--	--						
30	19600	12900	16183							--	--	--						
31	21600	12600	16633							--	--	--						

1-4828. DELAWARE RIVER AT REEDY ISLAND JETTY, DEL.--Continued

Specific conductance (micromhos at 25°C), water year October 1965 to September 1966--Continued

Day	FEBRUARY									MARCH								
	Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)			Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)		
	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
1										--	--	--						
2										--	--	--						
3										--	--	--						
4										--	--	--						
5										--	--	--						
6										--	--	--						
7										--	--	--						
8										--	--	--						
9										--	--	--						
10										--	--	--						
11										--	--	--						
12										--	--	--						
13										--	--	--						
14										2290	1320	--						
15										3650	1200	2096						
16										5390	1200	--						
17										7300	1700	3788						
18										7200	1490	3610						
19										6000	1540	3179						
20										7100	1690	3492						
21										6700	1500	3305						
22										5100	1600	3002						
23										5200	1640	3029						
24										5700	1800	3467						
25										3750	1200	2448						
26										5100	1300	2302						
27										4400	1000	1917						
28										4250	1100	2206						
29										6500	1050	3005						
30										9200	1350	4706						
31										11200	2300	6590						

Day	APRIL									MAY								
	Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)			Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)		
	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
1	12400	3400	7133							--	--	--						
2	11400	4100	6827							--	--	--						
3	10300	3450	6127							8650	3500	--						
4	10400	3700	6092							7150	2850	4335						
5	9400	3550	6246							7150	2700	4048						
6	9850	3650	5846							7100	2450	3892						
7	9400	3600	5648							4600	2300	3154						
8	8900	3500	5431							7400	2550	3708						
9	8650	3500	5217							5900	2450	3350						
10	8800	3400	5446							6100	2200	3723						
11	9750	3750	5800							7250	2200	4354						
12	8400	3750	5358							7800	2700	4583						
13	10900	4550	7108							7600	2650	4488						
14	11600	4700	8104							8100	2750	4969						
15	10900	4700	7775							10700	3050	6038						
16	11800	4800	8148							13000	3300	6988						
17	12100	5500	8398							10000	4200	6713						
18	10100	5200	7858							12100	4000	6579						
19	11800	5900	7826							9000	3850	6304						
20	10600	5500	8288							8300	2900	4700						
21	9700	5750	--							8400	2800	4390						
22	--	--	--							7950	2600	4125						
23	--	--	--							7900	2500	4161						
24	--	--	--							7500	2450	3990						
25	--	--	--							5900	2450	3663						
26	--	--	--							6400	2650	3846						
27	--	--	--							7400	2700	4173						
28	--	--	--							6300	2550	4140						
29	--	--	--							6800	2550	4052						
30	--	--	--							7000	2400	3838						
31										7300	2250	3823						

1-4828. DELAWARE RIVER AT REEDY ISLAND JETTY, DEL.--Continued

Specific conductance (micromhos at 25°C), water year October 1965 to September 1966--Continued

Day	JUNE									JULY								
	Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)			Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)		
	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
1	7400	2200	3777							14500	7100	9327						
2	8500	2200	3821							13400	6910	9203						
3	8650	2450	4040							13600	6870	9181						
4	8700	2450	3856							14400	7540	9694						
5	7400	2300	3754							14000	7780	9898						
6	8100	2500	4088							14700	7800	10433						
7	8800	2800	4488							13900	8260	10489						
8	8650	2770	4673							13800	8400	10866						
9	8800	2940	4800							14100	8540	11338						
10	10000	3080	5664							15500	9500	11956						
11	10000	3120	5411							14900	9100	11327						
12	10200	4440	6927							16900	9300	12240						
13	11700	4620	7663							17100	9200	12594						
14	14100	4850	8766							16700	8850	12006						
15	14100	4300	8354							18700	9700	12650						
16	14800	4930	8808							19000	10400	13208						
17	14800	5560	8706							18700	10700	13333						
18	14400	5440	8682							17800	10700	13183						
19	14500	5550	8533							18200	10100	12933						
20	14900	6240	9042							17700	10100	12492						
21	14600	6000	8852							17400	10000	13246						
22	14200	6240	8817							18600	10400	13808						
23	14000	6460	9371							17000	10800	13575						
24	12800	6740	9049							17100	10800	13396						
25	13200	6580	9571							17600	11400	13604						
26	13300	7000	9783							16900	11000	13388						
27	13000	6920	9290							17900	10700	13129						
28	13000	6800	8797							16100	11000	13379						
29	13900	6730	9068							16900	10300	12592						
30	14500	6800	9135							17700	10500	12904						
31										17800	11200	13313						

Day	AUGUST									SEPTEMBER								
1	17100	11100	13538							--	--	--						
2	16500	10800	13042							--	--	--						
3	16000	10400	12583							--	--	--						
4	17600	10600	13246							--	--	--						
5	16700	11400	13479							--	--	--						
6	17800	10900	13850							--	--	--						
7	17100	11700	13896							--	--	--						
8	15900	11300	13525							--	--	--						
9	17800	12000	13804							22900	15000	--						
10	17400	11900	14042							22900	15100	17988						
11	17300	11400	13917							23000	14400	17933						
12	17000	10400	12854							22400	15500	18446						
13	18100	10100	12679							21900	15500	18167						
14	18200	10400	13375							21300	16500	18500						
15	18800	11200	13850							20600	15100	17763						
16	18300	11100	13792							21300	14400	17396						
17	17700	11100	13725							20500	14100	17192						
18	17600	11200	--							19600	14300	16783						
19	--	--	--							20500	13900	16858						
20	--	--	--							21500	15000	17717						
21	--	--	--							22000	16300	18746						
22	--	--	--							20000	14200	16725						
23	--	--	--							17900	13400	15367						
24	--	--	--							19200	12700	15371						
25	--	--	--							19000	12600	15617						
26	--	--	--							19700	12800	15417						
27	--	--	--							20400	12300	16117						
28	--	--	--							19800	13400	16650						
29	--	--	--							20100	14100	17050						
30	--	--	--							20900	14000	17338						
31	--	--	--															

WICOMICO RIVER BASIN

1-4865. BEAVERDAM CREEK NEAR SALISBURY, MD.

LOCATION.--Lat 38°21'05", long 75°34'11", at gaging station 0.8 mile upstream from Beaglin Branch and 2 miles southeast of Salisbury, Wicomico County.
DRAINAGE AREA.--19.5 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1965 to September 1966.

Chemical analyses, in parts per million, water year October 1965 to September 1966

Date of collection	Discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$		Phosphate (PO_4)	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
Oct. 6, 1965..	14	17		0.09	0.00	4.0	0.7	7.9	1.8	17	4.2	8.5	0.2	1.9	66	13	0	0.03	70	6.7	--
Dec. 10.....	7.2	20		.08	00	4.8	1.5	9.0	1.6	22	2.6	8.5	.1	4.3	72	18	0		75	7.1	3
Jan. 10, 1966.	.9	20		.15	03	4.8	1.5	9.0	1.8	18	3.0	8.5	.1	8.2	29	18	3		82	6.5	15
Feb. 8.....	11	21		.06	00	4.2	1.2	8.0	1.7	22	3.8	8.8	.1	4.3	75	16	0		79	7.0	2
Mar. 17.....	17	14		.11	00	4.5	1.7	8.0	1.6	19	6.8	9.5	.2	3.8	69	18	3		81	7.0	25
Apr. 25.....	16.9	12		.26	00	4.8	1.5	7.6	1.6	19	5.8	9.4	.0	3.0	52	18	3		80	6.5	35
June 7.....	15.4	--		--	--	--	--	A8.0	--	17	6.6	8.0	--	2.6	--	17	3		72	6.5	60
Sept. 2.....	4.3	--		--	--	--	--	A11	--	28	2.9	9.0	--	1.7	--	16	0		77	7.3	2

A Sodium (Na) and potassium (K) calculated as sodium.

NANTICOKE RIVER BASIN

1-4870. NANTICOKE RIVER NEAR BRIDGEVILLE, DEL.

LOCATION.--Lat 38°43'42", long 75°33'44", at gaging station, 800 feet downstream from Gum Branch, and 2.5 miles southeast of Bridgeville, Sussex County.
DRAINAGE AREA.--75.4 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1961 to September 1966.

Chemical analyses, in parts per million, water year October 1965 to September 1966

Date of collection	Discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Total acidity as H^{+1}	Specific conductance (micromhos at 25°C)	pH	Color
Oct. 8, 1965..	41	22		0.19	0.00	7.6	1.5	16	7.2	44	6.0	12	0.0	9.0	101	25	0		155	6.4	12
Nov. 4.....	35	23		.26	00	6.8	2.4	20	9.0	76	2.6	11	.0	.1	109	27	0		177	6.5	17
Dec. 10.....	25	21		.00	00	6.4	2.9	12	2.6	40	4.6	8.0	.1	6.9	92	28	0		121	6.6	5
Jan. 6, 1966..	35	18		.05	00	4.0	1.7	8.2	2.8	13	6.6	7.0	.0	12	65	17	7		86	6.3	5
Feb. 9.....	23	--		--	--	--	--	A9.0	--	12	8.2	8.5	--	15	111	23	13		100	6.1	5
Mar. 16.....	56	--		--	--	--	--	A12	--	15	19.6	12	--	9.1	105	20	8		107	6.5	10
Apr. 26.....	82	--		--	--	--	--	A9.4	--	14	11	7.5	--	8.5	98	20	9		94	6.4	25
June 8.....	77.2	--		--	--	--	--	A10	--	16	8.6	8.0	--	9.5	--	19	6		89	6.4	20
Sept. 7.....	23.2	--		--	--	--	--	A26	--	36	6.5	32	--	6.1	--	30	1		185	7.1	2

A Sodium (Na) and potassium (K) calculated as sodium.

CHOPTANK RIVER BASIN

1-4910. CHOPTANK RIVER NEAR GREENSBORO, MD.

LOCATION.--Lat 38°59'50", long 75°47'10", at gaging station, 0.1 mile upstream from Gravelly Branch and 2.0 miles northeast of Greensboro, Caroline County.
DRAINAGE AREA.--113 square miles.
RECORDS AVAILABLE.--Chemical analyses: February 1965 to September 1966.

Chemical analyses, in parts per million, water year October 1965 to September 1966

Date of collection	Discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$		Total acidity as H^{+1}	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
Oct. 13, 1965.	11	14		0.00	0.00	12	2.7	6.0	2.9	32	16	9.8	0.2	1.3	85	41	15		123	7.0	--
Nov. 30.....	12	16		.13	.00	12	2.7	7.3	2.6	34	16	10	.0	1.4	88	42	13		130	6.7	7
Dec. 29.....	14	17		.00	.00	13	2.9	7.8	2.0	30	17	12	.1	3.0	90	44	20		130	6.6	5
Feb. 3, 1966..	13	17		.07	.00	13	2.8	9.6	4.2	32	19	12	.0	3.7	100	44	18		140	7.2	7
Feb. 28.....	46	16		.14	.00	12	3.3	6.9	2.0	16	29	11	.1	3.4	105	44	31		139	6.9	8
Mar. 31.....	35	12		.08	.00	12	2.6	7.2	1.8	26	22	10	.1	1.5	94	41	19		129	7.0	15
Apr. 28.....	62	17		.62	.00	10	2.7	6.4	1.6	20	22	9.0	.1	2.1	100	36	20		120	6.5	40
May 31.....	68.8	--		--	--	--	--	A6.4	--	17	18	7.5	--	3.9	--	32	18		99	6.5	80
June 29.....	18.3	--		--	--	--	--	A8.7	--	32	13	10	--	4.1	--	38	12		119	6.8	60
July 29.....	5.9	--		--	--	--	--	A9.0	--	39	11	9.0	--	7.0	--	42	10		121	6.8	25
Aug. 29.....	1.5	--		--	--	--	--	A16	--	44	11	9.5	--	.6	--	45	9		126	7.0	3
Sept. 28.....	31.5	--		--	--	--	--	A 8.7	--	20	35	12	--	1.4	--	52	36		153	6.3	3

A Sodium (Na) and potassium (K) calculated as sodium.

PATAPSCO RIVER BASIN

1-5875. SOUTH BRANCH PATAPSCO RIVER AT HENRYTON, MD.

LOCATION.--Lat 39°21'05", long 76°54'50", at gaging station at State Highway 101 at Henryton, Carroll County, 1.3 miles upstream from Piney Run 2.3 miles upstream from confluence with North Branch, and 3.2 miles southeast of Sykesville.
DRAINAGE AREA.--64.4 square miles.
RECORDS AVAILABLE.--Chemical analyses: November 1965 to September 1966.

Chemical analyses, in parts per million, November 1965 to September 1966

Date of collection	Discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$		Phosphate (PO_4)	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
Nov. 12, 1965.	17	7.6		0.01	0.00	7.9	2.4	3.9	1.9	30	4.0	6.3	0.0	3.1	55	30	5	0.12	91	6.5	4
Nov. 30.....	16	6.0		.01	.00	7.5	2.4	3.9	1.7	27	5.4	6.2	.0	3.2	52	29	7	.06	89	6.7	5
Jan. 4, 1966..	20	7.5		.01	.00	7.2	2.5	3.6	1.8	24	5.8	6.2	.0	5.0	54	28	8	.00	89	6.7	3
Feb. 4.....	13	7.5		.00	.00	5.8	1.5	3.4	1.0	17	4.2	5.7	.1	4.0	37	20	6	.05	64	6.2	2
Mar. 2.....	136	7.1		.05	.00	7.8	2.6	3.5	2.2	15	13	6.3	.1	7.4	57	30	18	.00	93	6.4	--
Apr. 5.....	28	5.3		.01	.02	7.1	1.9	4.0	1.2	23	5.6	7.0	.0	3.1	48	26	6	.01	75	6.5	3
May 13.....	40	7.0		.00	.02	7.9	2.2	3.8	1.4	20	8.4	6.5	.1	4.9	52	28	12	.05	87	6.7	3
June 8.....	27	7.6		.01	.00	7.6	2.4	4.6	2.8	28	5.6	6.0	.1	4.0	--	29	6	.02	87	6.6	--
July 22.....	8.3	4.6		.00	.00	10	2.8	5.1	2.2	40	6.2	7.8	.1	.4	76	37	4	.05	105	6.4	5
Sept. 10.....	.4	8.3		.06	.00	13	3.1	35	3.7	88	16	18	.3	12	167	46	0	--	278	7.3	40

1-5947. PATUXENT RIVER AT BENEDICT, MD.

LOCATION.--Lat 38°30'46", long 76°40'10", on bridge at State Highway 231 at Benedict, Charles County, about 2 miles downstream from Swanson Creek.
DRAINAGE AREA.--742 square miles.
RECORDS AVAILABLE.--Chemical analyses: June 1963 to April 1964.
Water temperatures: October 1963 to September 1966.
EXTREMES, 1965-66.--Water temperatures: Maximum, 90°F June 28, 29 and July 13,14; minimum, freezing point on several days during January and February.
EXTREMES, 1963-66.--Water temperatures: Maximum, 90°F June 28, 29 and July 13, 14, 1965; minimum, freezing point on several days during winter months.

Temperature (°F) of water, water year October 1965 to September 1966
(Recorder with temperature sensor attachment, thermocouple probe at river surface)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October																																
Maximum	72	73	72	69	68	66	66	65	65	65	64	64	64	65	67	68	66	65	66	--	--	--	--	--	--	--	61	60	59	56	56	--
Minimum	72	70	69	67	64	62	64	64	63	64	62	63	62	62	64	65	64	63	63	64	--	--	--	--	--	--	58	58	54	53	54	--
November																																
Maximum	55	54	54	57	56	57	57	59	57	56	56	56	57	57	55	54	54	50	49	49	49	49	50	49	49	50	51	51	49	47	--	53
Minimum	54	52	53	54	54	54	55	56	57	55	55	55	55	55	53	53	51	46	46	46	48	49	48	49	46	48	49	49	47	45	--	51
December																																
Maximum	46	47	47	47	46	46	45	44	44	45	46	46	46	47	47	48	47	46	46	43	42	42	42	42	45	44	41	40	40	40	42	44
Minimum	44	43	46	46	44	44	42	41	42	42	44	44	45	45	45	46	45	45	44	42	41	40	40	41	42	42	38	38	38	39	40	43
January																																
Maximum	45	46	45	45	44	44	44	44	--	--	--	--	--	--	--	--	--	--	35	36	36	35	36	35	34	34	33	32	32	32	32	--
Minimum	42	44	44	43	42	43	43	40	--	--	--	--	--	--	--	--	--	--	34	34	34	34	35	34	33	32	32	32	32	32	32	--
February																																
Maximum	32	32	32	33	33	33	33	33	33	35	36	37	39	42	42	40	40	40	43	39	38	38	40	38	39	40	42	41	--	--	--	37
Minimum	32	32	32	32	32	32	32	32	32	32	34	35	36	38	40	39	38	37	38	37	35	35	36	37	37	38	38	40	--	--	--	35
March																																
Maximum	45	46	--	50	51	48	47	45	45	46	47	50	50	48	50	49	50	51	51	52	53	54	57	55	54	52	52	49	49	51	49	50
Minimum	41	43	--	45	47	46	43	42	41	41	43	44	46	46	47	46	45	46	49	49	49	49	52	52	50	48	48	48	46	47	48	46
April																																
Maximum	50	50	51	51	51	52	53	53	53	53	54	53	51	52	55	56	58	57	58	61	62	63	62	67	66	65	63	59	58	58	--	57
Minimum	48	48	47	49	48	49	50	50	51	50	49	51	49	49	50	52	52	54	55	55	57	60	60	60	62	61	58	57	56	57	--	53
May																																
Maximum	62	60	62	62	62	66	67	68	67	63	63	63	68	66	68	66	69	70	74	74	77	76	76	76	76	80	77	77	78	76	74	70
Minimum	58	57	56	58	57	60	62	62	63	57	57	60	62	62	61	63	64	66	67	70	71	72	71	71	72	73	73	74	74	73	71	65
June																																
Maximum	72	71	72	76	79	80	79	81	84	82	80	74	76	76	80	80	80	79	80	81	83	83	84	87	89	88	89	90	90	89	--	81
Minimum	69	70	68	70	72	74	75	75	77	78	73	72	70	73	75	76	76	76	76	76	77	78	79	80	83	83	84	85	85	84	--	76
July																																
Maximum	88	87	88	88	87	87	87	88	88	85	87	88	90	90	86	85	84	84	84	85	83	83	83	83	84	84	86	84	85	83	81	86
Minimum	82	83	83	83	82	82	83	83	81	82	83	83	85	85	82	80	81	81	81	82	79	79	80	80	80	81	82	82	82	80	78	82
August																																
Maximum	81	81	82	81	79	81	80	83	83	83	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Minimum	78	78	78	78	77	77	78	78	79	80	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
September																																
Maximum	--	--	--	--	--	--	--	78	78	79	80	78	76	--	--	--	--	--	--	71	72	73	73	71	70	69	68	67	67	68	--	--
Minimum	--	--	--	--	--	--	--	77	77	76	76	76	75	74	--	--	--	--	--	70	70	70	71	68	67	67	67	66	66	66	--	--

1-5955. NORTH BRANCH POTOMAC RIVER AT KITZMILLER, MD.

LOCATION.--Lat 39°23'38", long 79°10'55", temperature recorder at gaging station on left bank 0.6 mile downstream from bridge on State Highway 38 in Kitzmiller, Garrett County, and 1.5 miles downstream from Wolfden Run.
DRAINAGE AREA.--225 square miles.
RECORDS AVAILABLE.--Water temperatures: August 1961 to September 1966.
EXTREMES, 1965-66.--Water temperatures: Maximum, 86°F July 2; minimum, freezing point on many days during winter months.
EXTREMES, 1961-66.--Water temperatures: Maximum, 89°F Aug. 15, 16, 18, 1965; minimum, freezing point on many days during winter months.
REMARKS.--Records fair, probably because of friction in recorder.

Temperature (°F) of water, water year October 1965 to September 1966
(Continuous ethyl alcohol-actuated thermograph)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October																																
Maximum	67	64	60	63	56	58	54	58	53	53	57	59	56	59	63	64	62	59	60	62	64	61	58	52	51	52	51	51	47	46	51	57
Minimum	63	57	52	50	47	45	51	52	53	53	53	53	49	49	52	56	54	50	48	52	54	58	52	48	46	46	47	43	39	36	42	50
November																																
Maximum	48	49	51	50	48	50	52	53	51	45	46	46	51	46	42	48	48	38	37	39	37	40	43	41	40	42	44	39	35	32	--	44
Minimum	44	41	42	46	41	42	46	50	45	41	44	46	45	40	37	41	37	36	35	33	35	37	39	38	35	40	39	35	32	32	--	40
December																																
Maximum	32	32	35	36	38	36	33	33	35	35	40	42	41	41	40	39	39	37	35	33	33	34	34	38	38	38	34	34	33	34	43	36
Minimum	32	32	32	34	34	33	33	33	33	33	35	40	41	40	38	39	37	35	33	33	33	33	34	34	36	34	34	33	33	33	34	35
January																																
Maximum	43	43	42	39	36	40	40	40	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34
Minimum	43	42	39	36	35	35	40	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33
February																																
Maximum	32	32	32	32	32	32	32	32	32	32	32	35	35	37	37	37	37	35	36	34	32	32	33	33	33	34	35	34	--	--	--	34
Minimum	32	32	32	32	32	32	32	32	32	32	32	32	35	35	37	36	35	33	34	32	32	32	32	33	33	33	33	34	--	--	--	33
March																																
Maximum	36	38	40	42	42	40	36	36	38	41	42	44	46	46	46	46	46	50	50	48	46	54	56	55	44	43	41	40	43	41	44	44
Minimum	34	35	37	40	40	36	34	34	34	36	40	40	44	45	44	42	40	43	48	43	40	46	50	44	39	37	39	36	35	40	39	40
April																																
Maximum	48	46	43	43	43	43	44	43	44	44	45	44	37	43	43	45	46	46	49	52	52	52	51	53	52	51	51	46	46	48	--	46
Minimum	41	42	40	41	40	41	41	41	42	40	40	37	37	37	41	41	40	42	45	48	49	51	49	50	51	47	46	44	45	46	--	43
May																																
Maximum	48	49	52	51	54	60	58	61	60	52	49	50	55	55	60	59	65	63	65	65	67	68	69	68	69	72	70	72	70	67	62	61
Minimum	48	48	46	46	46	54	52	54	49	43	44	47	50	53	53	54	57	61	61	59	59	60	59	61	63	63	64	64	64	59	56	55
June																																
Maximum	56	63	68	71	74	73	72	74	78	75	73	75	78	71	74	69	73	74	75	76	79	82	81	82	83	79	84	83	80	80	--	75
Minimum	52	49	52	58	60	64	66	64	65	64	58	58	59	65	62	63	63	61	63	63	64	65	66	69	69	70	70	70	73	71	--	63
July																																
Maximum	82	86	84	83	77	78	80	80	81	81	83	79	83	85	79	81	83	83	79	82	82	83	81	78	83	84	83	78	80	74	80	81
Minimum	68	70	70	70	72	70	72	70	65	69	72	72	71	74	71	67	67	68	71	71	63	63	67	71	71	70	72	74	74	69	62	70
August																																
Maximum	81	73	80	74	78	82	81	81	75	76	74	73	69	68	77	79	79	80	79	76	79	82	80	74	72	76	75	75	75	71	70	76
Minimum	66	69	66	64	66	66	69	69	69	69	70	69	65	67	68	70	71	68	69	70	72	72	72	67	64	62	62	62	61	62	60	67
September																																
Maximum	72	73	75	71	71	67	62	68	69	68	70	67	65	62	60	61	62	65	65	62	60	62	61	59	56	56	55	54	55	52	--	64
Minimum	60	62	64	65	64	60	55	53	53	56	55	56	62	60	57	52	52	53	60	57	57	60	57	54	54	55	54	53	52	51	--	57

1-5985. NORTH BRANCH POTOMAC RIVER AT LUKE, MD.

LOCATION.--Lat 39°28'45", long 79°03'55", temperature recorder at gaging station on right bank, 0.2 mile downstream from Savage River, and 0.5 mile northwest of Luke, Allegany County.
DRAINAGE AREA.--404 square miles.
RECORDS AVAILABLE.--Water temperatures: December 1961 to December 1962, July to September 1963, December 1963 to September 1966.
EXTREMES, 1965-66.--Water temperatures: Maximum, 91°F July 3; minimum, freezing point on many days during December to February.
EXTREMES, 1961-66.--Water temperatures: Maximum, 91°F July 3, 1966; minimum, freezing point on many days during winter months.
REMARKS.--Records fair, probably because of friction in recorder.

Temperature (°F) of water, water year October 1965 to September 1966
(Continuous ethyl alcohol-actuated thermograph)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October																																
Maximum	65	62	59	54	52	51	51	55	53	53	55	56	56	56	60	62	60	56	55	57	57	57	57	53	52	52	52	50	50	50	50	55
Minimum	61	58	54	48	49	46	51	50	52	53	53	54	50	50	52	56	56	54	54	53	54	57	53	52	52	52	50	50	50	50	49	52
November																																
Maximum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	39	38	40	37	39	41	40	38	41	43	39	38	35	--	--
Minimum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	37	36	34	34	37	38	37	36	38	39	38	35	33	--	--
December																																
Maximum	33	34	34	34	36	36	34	34	35	35	40	41	41	41	41	41	41	40	39	36	33	35	35	37	37	38	34	34	35	34	39	37
Minimum	32	32	33	34	33	34	32	32	33	35	35	40	41	40	41	41	40	39	36	32	32	33	34	34	36	34	34	34	34	33	33	35
January																																
Maximum	41	42	42	40	36	36	37	36	34	34	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
Minimum	39	41	40	36	35	35	36	34	34	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33
February																																
Maximum	32	32	32	32	32	32	32	32	33	34	35	35	35	37	37	37	37	35	36	36	32	32	32	32	32	32	34	34	--	--	--	34
Minimum	32	32	32	32	32	32	32	32	32	33	34	35	35	35	37	37	35	34	34	32	32	32	32	32	32	32	32	34	--	--	--	33
March																																
Maximum	39	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Minimum	34	39	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
April																																
Maximum	45	45	45	46	45	45	45	45	46	46	46	45	44	45	45	47	48	48	49	53	54	54	53	55	55	55	53	52	50	50	--	48
Minimum	43	44	44	45	44	44	44	45	45	45	45	44	42	41	45	44	45	48	47	49	53	53	53	53	55	53	52	50	50	50	--	47
May																																
Maximum	50	50	50	51	53	59	58	61	60	52	52	51	58	58	62	62	65	65	67	68	69	70	71	70	72	74	72	74	73	70	66	62
Minimum	50	50	48	49	49	53	55	56	52	50	50	50	51	57	57	59	61	65	65	64	64	66	64	66	68	68	69	69	69	64	60	59
June																																
Maximum	61	65	69	72	74	74	72	72	77	74	72	74	77	72	73	69	73	74	76	77	77	79	80	79	80	77	80	82	81	84	--	75
Minimum	57	53	57	62	65	68	68	67	67	66	62	62	63	68	65	66	65	64	66	66	67	69	69	72	71	72	72	74	74	74	--	66
July																																
Maximum	84	87	91	82	78	80	83	79	80	82	80	76	81	82	78	80	79	80	78	74	74	73	71	70	78	81	79	78	78	78	79	79
Minimum	74	75	70	73	73	75	77	74	70	73	76	72	71	76	70	70	70	70	72	71	66	64	66	67	65	73	73	73	73	71	67	71
August																																
Maximum	76	74	75	70	75	75	75	75	73	78	77	78	73	70	76	79	79	80	77	75	77	81	81	76	73	74	74	74	75	73	72	75
Minimum	69	70	68	67	69	69	71	71	71	73	76	72	70	70	70	73	74	71	71	72	73	74	76	69	68	66	68	67	67	68	67	70
September																																
Maximum	72	72	77	71	69	68	64	62	63	63	62	62	60	61	61	61	61	62	61	60	56	58	58	56	54	53	53	51	52	52	--	61
Minimum	65	69	69	69	68	63	58	54	55	56	56	57	60	59	57	53	53	54	59	56	55	56	56	53	53	53	51	51	51	52	--	57

1-6030. NORTH BRANCH POTOMAC RIVER NEAR CUMBERLAND, MD.

LOCATION.--Lat 39°37'16", long 78°46'24", at gaging station, at Wiley Ford Bridge, 2 miles south of Cumberland, Allegany County, and 2.1 miles downstream from Wills Creek.
DRAINAGE AREA.--875 square miles.
RECORDS AVAILABLE.--Chemical analyses: December 1964 to September 1966.
Water temperatures: October 1964 to September 1966.
Sediment records: October 1964 to September 1966.
EXTREMES, 1965-66.--Water temperatures: Maximum, 91°F July 13,14; minimum, freezing point Jan. 28 to Feb. 3.
Sediment concentrations: Maximum daily, 1,600 ppm Feb. 13; minimum daily, 10 ppm May 22.
Sediment loads: Maximum daily, 47,000 tons Feb. 13; minimum daily, 4 tons Sept. 9.
EXTREMES, 1964-66.--Water temperatures: Maximum, 91°F July 13, 14, 1966; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 1,600 ppm Feb. 13, 1966; minimum daily, 10 ppm July 24, 1965, May 22, 1966.
Sediment loads: Maximum daily, 47,000 tons Feb. 13, 1966; minimum daily, 4 tons July 24, 25, 28, Sept. 11, 1965 and Sept. 9, 1966.

Chemical analyses, in parts per million, water year October 1965 to September 1966

Date of collection	Discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$		Phosphate (PO_4)	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
Oct. 1, 1965..	191	6.2		0.02	0.00	47	43	72	5.3	86	240	94	0.3	1.6	600	295	224	0.22	906	6.9	--
Nov. 1.....	115	5.8		.02	.01	115	17	75	5.4	91	241	129	.2	.3	692	357	282	.09	1040	7.5	35
Dec. 1.....	138	6.4		.01	.00	120	15	77	4.9	82	243	142	.3	.6	674	362	295	.04	1080	7.0	45
Jan. 1, 1966..	187	4.5		.02	.00	88	15	92	6.3	85	244	107	.2	.3	619	280	210	.03	994	6.9	20
Feb. 1.....	182	5.2		.01	.00	93	12	50	3.7	81	199	83	.3	.4	524	282	216	.04	811	7.1	12
Feb. 13.....	14200	4.9		--	--	44	3.2	4.5	2.0	86	52	6.6	.3	3.9	167	123	53	.00	277	7.6	--
Mar. 2.....	4950	4.0		.01	.00	31	4.6	5.9	1.2	54	54	8.6	.1	3.1	157	97	52	.07	227	7.0	--
Apr. 1.....	560	4.4		.00	.00	57	8.2	23	2.3	54	122	39	.1	1.4	300	176	131	.01	487	6.8	2
May 1.....	12500	4.3		.00	.00	63	3.0	3.8	1.4	144	45	6.0	.1	2.1	207	168	50	.06	344	7.4	3
June 1.....	499	5.2		.00	.00	47	9.4	28	2.9	56	120	30	.2	.7	302	156	110	.04	441	6.9	3
July 1.....	187	6.3		.02	.00	76	12	102	8.4	105	230	107	.3	.9	634	239	153	.03	961	6.8	25
Aug. 1.....	124	8.0		.03	.01	118	18	66	3.7	88	244	136	.3	.4	702	370	298	.01	1060	6.5	35
Sept. 2.....	111	2.6		.03	.00	127	17	76	3.8	88	274	142	.4	.4	747	385	313	.25	1090	7.0	30

1-6030. NORTH BRANCH POTOMAC RIVER NEAR CUMBERLAND, MD.--Continued

Temperature (°F) of water, water year October 1965 to September 1966
(Once-daily measurement at approximately 1800)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October	74	72	70	60	60	62	60	60	60	60	64	68	66	70	70	70	68	68	68	70	70	70	66	62	60	62	62	60	60	60	60	65
November	56	60	64	60	60	60	60	60	56	58	60	60	60	52	50	55	48	50	50	50	50	50	50	50	50	50	50	50	46	46	--	54
December	46	48	50	48	50	47	44	50	50	50	50	50	50	50	52	50	48	47	44	44	44	48	48	50	50	43	44	46	44	50	52	48
January	50	48	50	42	42	43	46	37	33	40	37	35	40	38	38	34	34	34	36	42	40	37	34	37	38	34	34	32	32	32	32	38
February	32	32	32	36	38	36	36	42	46	44	42	38	38	40	40	38	40	40	40	34	34	36	38	38	38	40	40	40	--	--	--	38
March	42	41	48	50	45	40	38	40	42	44	50	50	50	50	50	50	50	52	54	50	50	58	60	50	48	48	46	42	46	50	50	48
April	54	50	50	50	50	47	48	50	50	50	50	46	44	47	48	50	52	50	54	58	60	58	58	60	62	58	50	48	48	50	--	52
May	50	52	54	52	60	68	64	65	54	58	54	55	62	60	64	65	70	70	70	68	70	72	72	74	72	75	76	74	70	68	70	65
June	66	70	73	75	76	80	78	78	84	78	78	80	83	78	80	74	80	80	82	84	84	86	88	86	88	86	90	86	86	90	--	81
July	90	90	90	87	80	88	87	85	88	88	90	88	91	91	86	88	86	88	86	86	86	88	85	84	88	88	90	88	88	80	84	87
August	80	78	86	80	86	86	84	86	84	90	84	85	80	77	86	86	86	88	88	86	84	88	88	88	80	86	82	83	82	84	80	84
September	84	84	88	80	80	76	75	80	76	76	78	75	76	73	70	72	72	73	72	66	68	68	68	68	64	66	64	66	66	62	--	73

1-6030. NORTH BRANCH POTOMAC RIVER NEAR CUMBERLAND, MD.--Continued

Suspended sediment, water year October 1965 to September 1966

Day	OCTOBER			NOVEMBER			DECEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	190	120	62	124	46	15	152	60	25
2	185	110	55	119	67	22	143	63	24
3	157	68	29	138	89	33	143	140	54
4	147	35	14	134	74	27	166	120	54
5	129	70	24	129	86	30	157	77	33
6	124	43	14	138	70	26	147	39	15
7	226	42	S 33	134	61	22	138	78	29
8	384	130	130	152	45	18	147	62	25
9	295	77	61	161	49	21	134	70	25
10	225	58	35	152	62	25	175	90	43
11	175	89	42	166	59	26	180	84	41
12	185	73	36	152	56	23	271	100	S 81
13	180	53	26	134	80	29	447	100	120
14	161	52	23	124	74	25	346	84	78
15	161	52	23	119	30	10	353	110	100
16	138	51	19	147	63	25	284	72	55
17	129	52	18	138	62	23	246	52	35
18	143	76	29	134	70	25	210	52	29
19	138	63	23	161	79	34	190	38	19
20	129	48	17	152	71	29	166	40	18
21	129	39	14	129	64	22	152	68	28
22	166	37	17	138	93	35	175	58	27
23	185	51	25	147	97	38	175	64	30
24	170	41	19	161	66	29	147	84	33
25	180	38	18	185	53	26	157	50	21
26	175	39	18	157	49	21	161	40	17
27	180	69	34	157	77	33	152	48	20
28	175	62	29	152	94	39	138	78	29
29	143	48	19	252	95	65	134	60	22
30	134	55	20	200	74	40	161	66	29
31	134	59	21	--	--	--	170	60	28
Total	5372	--	947	4486	--	836	5917	--	1187

	JANUARY			FEBRUARY			MARCH		
1	175	88	42	170	38	17	3600	360	S 3600
2	185	84	42	205	39	22	5080	160	2200
3	847	380	S 1300	185	46	23	4330	70	820
4	896	190	460	170	47	22	4330	70	860
5	590	120	190	157	39	17	6110	150	2500
6	664	220	S 440	152	39	16	5380	87	1300
7	1720	460	S 890	152	38	16	3560	43	410
8	1500	220	890	152	43	18	2750	33	250
9	1130	92	280	166	42	19	1760	33	160
10	1030	78	220	200	48	26	1520	35	140
11	621	70	120	1300	620	S 5100	1420	32	120
12	557	66	100	4540	1300	S 16000	1400	25	94
13	384	72	75	9460	1600	S 47000	1880	30	150
14	415	140	160	10800	560	S 18000	1820	31	150
15	428	90	100	8010	310	6700	1630	29	130
16	359	42	41	6470	260	4500	1430	22	85
17	312	54	45	5400	180	2600	1260	21	71
18	230	66	41	3620	86	820	1150	22	68
19	161	62	27	2840	44	340	1020	22	61
20	175	64	30	2220	36	220	959	17	44
21	175	84	40	1430	46	180	887	20	48
22	170	90	41	1190	38	120	806	36	78
23	210	78	44	1050	34	96	753	25	51
24	195	52	27	968	47	120	710	18	35
25	180	62	30	959	40	100	710	32	61
26	152	37	15	914	34	84	685	25	46
27	195	46	24	824	27	60	645	18	31
28	157	46	19	946	94	S 330	621	24	40
29	138	46	17	--	--	--	568	24	37
30	129	43	15	--	--	--	545	23	34
31	161	47	20	--	--	--	568	28	43
Total	14241	--	5785	64650	--	102566	59987	--	13717

S Computed by subdividing day.

1-6030. NORTH BRANCH POTOMAC RIVER NEAR CUMBERLAND, MD.--Continued

Suspended sediment, water year October 1965 to September 1966--Continued

Day	APRIL			MAY			JUNE		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	575	34	53	10500	635	S 18000	520	43	60
2	568	33	51	7080	190	3600	464	31	39
3	669	19	34	4870	84	1100	430	23	27
4	669	22	40	3720	56	560	396	18	19
5	977	36	95	2500	38	260	358	16	15
6	923	34	85	1860	43	220	340	22	20
7	860	28	65	1560	24	100	340	72	66
8	815	30	66	1370	12	44	322	48	42
9	753	20	41	1260	34	120	316	34	29
10	719	13	25	1150	40	120	306	39	32
11	702	18	34	986	54	140	278	29	22
12	710	33	63	914	54	130	253	22	15
13	1050	69	200	1080	55	160	224	17	10
14	1680	100	450	1530	58	240	210	22	12
15	2950	150	1200	1510	32	130	205	23	13
16	3510	89	840	1230	48	160	196	27	14
17	3540	56	540	1170	95	300	214	15	9
18	3140	51	430	1070	92	270	201	13	7
19	2500	47	320	1500	74	300	214	18	10
20	1980	35	190	1760	52	250	191	14	7
21	1620	33	140	1520	20	82	173	14	7
22	1580	29	120	1260	10	34	173	14	7
23	2230	94	570	1080	41	120	164	15	7
24	3070	110	910	950	35	90	160	19	8
25	3580	78	750	869	20	47	151	23	9
26	4420	110	1300	770	33	69	151	14	6
27	3790	56	570	689	20	37	142	17	7
28	5870	130	2100	664	26	47	155	19	8
29	6430	190	3300	689	39	73	160	20	9
30	5800	100	1600	689	24	45	196	18	10
31	--	--	--	600	38	62	--	--	--
Total	67680	--	16182	58400	--	26910	7603	--	546

Day	JULY			AUGUST			SEPTEMBER		
1	210	13	7	124	22	7	115	26	8
2	178	14	7	119	19	6	111	30	9
3	147	14	6	115	19	6	119	31	10
4	133	21	8	115	17	5	115	32	10
5	133	28	10	115	17	5	107	40	12
6	160	21	9	115	16	5	119	41	13
7	224	19	11	111	29	9	124	43	14
8	205	17	9	115	26	8	119	35	11
9	160	33	14	129	19	7	107	15	4
10	124	30	10	155	17	7	129	30	10
11	133	23	8	293	33	26	111	34	10
12	133	19	7	205	38	21	111	29	9
13	142	22	8	390	59	62	124	30	10
14	147	25	10	289	50	39	289	49	38
15	182	22	11	214	43	25	584	70	110
16	160	25	11	238	37	24	396	56	60
17	142	31	12	182	42	21	229	34	21
18	133	29	10	138	38	14	169	32	15
19	133	19	7	138	42	16	142	28	11
20	129	19	7	124	44	15	352	61	S 65
21	133	27	10	139	43	16	1120	160	S 490
22	124	28	9	160	40	17	1040	92	260
23	129	31	11	164	39	17	648	56	98
24	129	24	8	147	45	18	492	40	53
25	133	17	6	115	37	11	352	24	23
26	142	16	6	115	26	8	272	22	16
27	160	12	5	115	34	11	248	20	13
28	133	14	5	107	43	12	393	38	S 52
29	133	23	8	119	42	13	1020	85	S 280
30	133	23	8	124	30	10	648	33	58
31	155	19	8	107	25	7	--	--	--
Total	4612	--	266	4836	--	468	9905	--	1793

Total discharge for year (cfs-days)..... 307689
Total load for year (tons)..... 171203

S Computed by subdividing day.

1-6030. NORTH BRANCH POTOMAC RIVER NEAR CUMBERLAND, MD.--Continued

Particle-size analyses of suspended sediment, water year October 1965 to September 1966
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters											Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Feb. 13, 1966.....	1600	44		12970	1980		--	32	45	60	73	79	90	98	100			SPWC
Feb. 13.....	2000	40		15140	1818		7	9	16	20	37	99	100	--	--			SBN
Feb. 13.....	2000	40		15140	1818		23	33	45	59	75	85	93	98	100			SBWC
May 1.....	0940	--		12090	974		21	30	44	58	72	81	88	95	100			SBWC
May 1.....	1240	50		12620	983		20	31	41	53	66	76	82	89	97	99	100	SBWC

1-6130. POTOMAC RIVER AT HANCOCK, MD.

LOCATION.--Lat 39°40'49", long 78°10'39", temperature recorder at gaging station on left bank 0.2 mile downstream from Little Tonoloway Creek, 0.5 mile downstream from bridge on U.S. Highway 522 at Hancock, Washington County, and 1.1 miles upstream from Tonoloway Creek (formerly called Great or Big Tonoloway Creek).
DRAINAGE AREA.--4,073 square miles.
RECORDS AVAILABLE.--Water temperatures: July 1952 to February 1964, July 1966 to September 1966.
EXTREMES, July 1966 to September 1966.--Water temperatures: Maximum, 92°F July 3; minimum, 60°F Sept. 27-30.
EXTREMES, 1952 to February 1964, July 1966 to September 1966.--Water temperatures: Maximum, 93°F July 22, 1952; minimum, freezing point on many days during winter months.
REMARKS.--Records fair, probably because of friction in recorder.

Temperature (°F), of water, July to September 1966
(Continuous ethyl alcohol-actuated thermograph)

Month	Day																														Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
June																																
Maximum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	85	86	--	--
Minimum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	80	77	--	--
July																																
Maximum	88	90	92	87	86	86	86	86	85	87	87	85	88	88	85	86	85	87	85	86	84	85	82	84	86	88	88	86	88	83	84	86
Minimum	78	79	81	83	81	79	80	78	77	78	80	80	80	82	80	77	77	78	80	79	74	74	77	77	78	80	81	82	81	77	73	79
August																																
Maximum	84	80	84	79	81	82	80	83	83	87	84	84	79	76	79	84	86	86	86	85	83	87	87	82	78	80	81	82	83	83	82	83
Minimum	74	76	74	74	74	74	75	76	77	78	80	78	75	74	74	76	77	76	77	79	79	79	82	77	74	72	73	74	74	75	75	76
September																																
Maximum	84	82	82	78	80	76	73	76	77	77	78	75	73	71	69	69	67	69	68	67	63	64	64	64	64	63	63	60	61	62	--	71
Minimum	75	74	74	75	73	71	69	67	67	69	69	71	71	66	67	63	65	65	67	63	63	63	63	62	63	62	60	60	60	60	--	67

POTOMAC RIVER BASIN--Continued

1-6145. CONOCOCHEAGUE CREEK AT FAIRVIEW, MD.

LOCATION.--Lat 39°42'29", long 77°50'00", at bridge on State Highway 494 in Fairview, Washington County, 0.7 mile downstream from gaging station, 1.3 miles upstream from Rockdale Run.
DRAINAGE AREA.---494 square miles, upstream from gaging station.
RECORDS AVAILABLE.--Chemical analyses: October 1965 to September 1966.

Chemical analyses, in parts per million, water year October 1965 to September 1966

Date of collection	Discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$		Phosphate (PO_4)	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
Oct. 19, 1965.	99	2.8		0.00	0.00	55	12	12	3.1	191	30	14	0.2	4.7	231	185	29	0.27	405	7.2	--
Nov. 16.....	90	.4		.00	.00	53	14	14	3.1	197	26	18	.1	4.0	232	191	30	.49	429	7.8	3
Dec. 28.....	75	.6		.01	.00	54	10	12	2.6	184	27	17	.2	.1	215	176	26	.46	396	6.9	4
Mar. 16, 1966.	502	1.8		.00	.00	42	9.4	5.0	1.6	137	22	8.2	.2	8.8	192	144	31	.02	302	7.5	--
May 5.....	782	5.8		.00	.01	34	6.3	4.6	1.6	102	20	8.0	.1	7.1	145	110	26	.17	243	7.3	3
June 14.....	123	3.8		.10	.00	51	11	7.0	2.2	176	24	9.9	.1	7.1	227	172	28	.19	350	7.8	7
July 29.....	40	4.2		.01	.00	51	13	9.7	3.2	196	24	15	.3	.2	215	181	20	.40	382	7.2	10
Sept. 8.....	27	.9		.01	.01	54	15	23	3.6	214	29	27	.2	.2	262	194	19	.44	480	7.6	7

1-6195. ANTIETAM CREEK NEAR SHARPSBURG, MD.

LOCATION.--Lat 39°27'01", long 77°43'52", temperature recorder at gaging station on left bank, 400 feet downstream from Burnside Bridge, 1 mile southeast of Sharpsburg, Washington County, and 4 miles upstream from mouth.
DRAINAGE AREA.--281 square miles.
RECORDS AVAILABLE.--Chemical analyses: August 1965 to September 1966.
Water temperatures: October 1962 to September 1966.
EXTREMES, 1965-66.--Water temperatures: Maximum, 82°F July 3; minimum, freezing point on many days during January and February.
EXTREMES, 1962-66.--Water temperatures: Maximum, 83°F June 28 and July 1-3, 1963; minimum, freezing point on many days during winter months.
REMARKS.--Records poor, probably because of friction in recorder.

Chemical analyses, in parts per million, water year October 1965 to September 1966

Date of collection	Discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$		Phosphate (PO_4)	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
Oct. 19, 1965.	65	5.2		0.01	0.00	36	35	18	4.8	250	35	23	0.4	2.4	336	233	28	2.60	523	7.0	--
Nov. 16.....	65	3.2		.01	.00	62	19	18	4.5	239	33	26	.3	6.6	303	234	38	1.30	531	7.4	4
Dec. 28.....	54	3.4		.00	.00	57	25	19	4.5	241	36	26	.3	12	311	244	47	2.80	545	8.1	3
Mar. 16, 1966.	165	.2		.00	.00	60	13	8.0	3.3	A201	30	12	.3	11	261	203	39	.12	404	8.6	--
Apr. 29.....	371	7.6		.00	.00	42	9.0	6.0	3.0	130	24	8.7	.2	12	199	142	36	.34	297	7.3	5
June 15.....	106	4.8		.00	.00	66	13	8.7	3.8	220	27	12	.2	11	285	218	38	.42	438	7.8	7
July 28.....	80	5.7		.01	.00	67	14	13	4.5	232	36	20	.4	14	288	225	35	1.80	495	7.6	5
Sept. 8.....	54	4.4		.01	.01	72	15	17	4.1	232	42	24	.4	13	311	242	52	.38	540	7.6	5

A Includes equivalent of 7 parts per million of carbonate (CO_3).

1-6195. ANTIETAM CREEK NEAR SHARPSBURG, MD.--Continued

Temperature (°F) of water, water year October 1965 to September 1966
(Continuous ethyl alcohol-actuated thermograph)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October																																
Maximum	65	65	65	64	60	57	54	57	58	58	58	59	59	58	60	63	63	60	57	57	57	58	58	58	56	54	53	51	50	47	48	58
Minimum	64	65	64	60	57	54	54	54	57	58	57	58	57	56	57	60	60	57	55	55	57	57	58	56	54	52	51	50	47	45	46	56
November																																
Maximum	48	48	50	52	52	49	49	51	52	51	49	49	51	50	48	46	46	45	43	43	43	44	45	45	44	45	48	48	45	42	--	47
Minimum	48	48	48	50	49	47	47	49	51	49	49	49	49	48	46	46	45	43	43	42	42	43	44	44	43	43	45	45	42	39	--	46
December																																
Maximum	39	39	41	41	41	41	41	40	40	41	43	45	46	46	46	46	46	45	43	40	39	38	38	41	45	45	41	38	36	37	40	42
Minimum	39	38	39	41	41	41	40	39	39	40	41	43	45	46	46	46	45	43	40	39	38	37	37	38	41	41	38	36	35	35	37	40
January																																
Maximum	42	43	43	42	40	39	40	40	37	33	33	33	32	32	32	32	32	32	32	32	33	33	32	32	32	32	32	32	32	32	32	35
Minimum	40	42	42	40	38	38	39	37	33	33	33	32	32	32	32	32	32	32	32	32	32	33	32	32	32	32	32	32	32	32	32	34
February																																
Maximum	32	32	32	32	32	32	32	32	32	32	32	41	42	40	42	42	42	43	43	43	39	40	41	42	42	45	44	45	--	--	--	38
Minimum	32	32	32	32	32	32	32	32	32	32	32	32	42	40	40	42	42	42	42	39	39	39	40	41	41	42	44	44	--	--	--	37
March																																
Maximum	48	48	50	53	53	53	50	48	46	48	49	52	55	55	54	54	52	54	57	56	53	57	60	60	54	50	49	47	47	47	49	52
Minimum	45	46	47	50	53	49	48	45	46	46	48	49	52	54	53	52	51	52	54	53	51	53	57	54	50	49	47	45	44	46	47	50
April																																
Maximum	50	50	50	49	49	50	51	51	51	51	50	49	48	48	50	52	55	55	56	58	63	63	61	60	62	62	60	55	53	52	--	54
Minimum	49	50	48	49	48	48	49	50	51	49	48	48	46	46	48	50	52	55	54	56	58	61	59	59	60	59	55	52	50	50	--	52
May																																
Maximum	56	56	58	58	60	64	65	65	65	58	57	57	63	63	64	66	68	68	70	71	73	73	72	72	74	76	75	75	72	70	68	66
Minimum	52	56	55	56	56	60	62	64	58	55	57	57	57	62	61	64	65	68	68	70	71	71	70	70	72	72	74	72	70	68	66	64
June																																
Maximum	66	67	70	74	75	76	75	75	78	78	76	74	76	75	75	74	73	72	75	76	76	76	77	77	78	79	80	81	80	80	--	75
Minimum	64	64	65	68	71	73	74	73	74	76	72	71	71	74	73	72	70	70	71	72	74	73	74	75	76	77	78	79	79	77	--	73
July																																
Maximum	80	81	82	81	80	79	79	79	78	77	78	78	79	79	79	77	74	75	75	75	75	72	72	74	75	76	77	77	77	76	73	77
Minimum	77	78	80	80	79	77	78	77	76	76	77	78	77	79	77	73	73	73	75	75	72	70	71	72	73	75	76	76	76	72	70	75
August																																
Maximum	74	73	75	73	73	74	73	76	76	78	78	77	75	73	73	76	78	77	77	77	77	78	79	77	71	71	72	73	73	74	74	75
Minimum	70	73	72	71	71	71	72	73	75	75	77	75	73	72	72	73	75	74	74	76	76	76	77	74	60	69	69	70	72	73	74	73
September																																
Maximum	75	75	74	74	73	72	70	67	66	66	67	68	68	68	67	65	63	64	64	64	64	64	62	61	60	60	59	59	58	59	--	66
Minimum	73	72	72	73	72	70	67	65	64	64	66	67	68	66	65	63	63	63	64	64	64	62	61	60	60	59	59	58	58	58	--	65

1-6385. POTOMAC RIVER AT POINT OF ROCKS, MD.

LOCATION.--Lat 39°16'25", long 77°32'35", at gaging station at bridge on U.S. Highway 15 at Point of Rocks, Frederick County, 0.3 mile downstream from Catoctin Creek (Virginia), and 6 miles upstream from Monocacy River.
DRAINAGE AREA.--9,651 square miles.
RECORDS AVAILABLE.--Chemical analyses: December 1964 to September 1966.
Water temperatures: October 1960 to September 1966.
Sediment records: October 1960 to September 1966.
EXTREMES, 1965-66.--Water temperatures: Maximum, 91°F July 3; minimum, freezing point on several days in January and February.
Sediment concentrations: Maximum daily, 710 ppm Feb. 14; minimum daily, 1 ppm on many days.
Sediment loads: Maximum daily, 110,000 tons Feb. 15; minimum daily, 2 tons on several days during July to September.
EXTREMES, 1960-64.--Water temperatures: Maximum, 92°F Aug. 24, 1964; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 1,180 ppm Feb. 20, 1961; minimum daily, 1 ppm on many days.
Sediment loads: Maximum daily, 276,000 tons Feb. 20, 1961; minimum daily, 2 tons on several days during September 1964 and July to September 1966.

Chemical analyses, in parts per million, water year October 1965 to September 1966

Date of collection	Discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$		Phosphate (PO_4)	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
Oct. 5. 1965..	1360	1.1		0.00	0.00	51	12	38	3.2	144	90	36	0.2	0.0	314	175	57	0.02	523	7.3	--
Nov. 7.....	1080	.7		.00	.00	54	13	26	3.4	155	67	28	.1	1.8	277	186	60	.15	482	7.6	8
Dec. 10.....	1160	.4		.00	.01	61	14	33	3.3	171	82	33	.1	.6	317	208	68	.02	550	7.6	6
Jan. 19, 1966.	A1300	2.2		.01	.00	48	7.4	14	1.3	112	72	13	.2	.5	227	151	59	.05	363	6.8	--
Feb. 9,.....	A1500	2.1		.01	.00	55	12	37	2.3	152	108	24	.2	.0	328	187	62	.09	515	7.2	--
Feb. 15.....	A63800	6.1		.01	.00	33	3.9	3.4	2.2	83	26	6.0	.1	1.9	129	98	30	.02	222	6.6	5
Mar. 4.....	30000	4.6		.01	.00	23	4.6	4.7	1.8	54	31	6.5	.2	3.2	129	77	32	.10	183	6.9	--
Apr. 8.....	3300	.3		.03	.00	44	7.3	9.2	1.8	111	46	14	.2	1.8	183	140	49	.04	330	7.0	5
May 8.....	13400	4.7		.00	.00	25	3.9	3.4	1.4	66	26	5.5	.0	1.2	103	80	26	.02	185	7.3	5
June 2.....	4540	.1		.27	.01	35	7.2	7.6	2.4	100	34	9.1	.1	2.2	173	117	35	.01	265	7.4	7
July 7.....	1240	1.6		.00	.00	40	9.7	26	3.5	118	65	20	.1	1.8	239	140	44	.08	379	7.8	10
Aug. 4.....	731	.6		.01	.01	44	13	52	2.4	124	130	29	.2	.2	340	164	62	.06	570	7.2	5
Sept. 1.....	675	.5		.00	.00	46	13	34	2.6	108	96	41	.2	.4	301	169	80	.11	507	7.5	4

A Daily mean discharge.

1-6385. POTOMAC RIVER AT POINT OF ROCKS, MD.--Continued

Temperature (°F) of water, water year October 1965 to September 1966
(Once-daily measurement at approximately 0830)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October	67	64	65	56	48	42	51	53	52	59	58	59	58	55	60	63	60	56	55	57	60	61	59	52	50	51	52	52	45	45	55	55
November	50	47	48	55	48	46	52	55	53	42	48	49	50	54	43	42	45	40	40	40	45	45	45	43	42	42	49	42	40	36	--	46
December	36	38	41	43	40	39	35	34	39	38	42	44	44	44	42	42	45	39	40	35	35	32	34	39	45	40	33	35	33	33	35	39
January	44	43	41	37	34	40	40	36	34	33	--	33	32	33	32	32	33	32	33	30	34	32	34	32	32	30	--	--	--	--	--	35
February	--	--	--	--	--	--	--	--	--	--	--	--	--	34	37	--	37	32	38	35	33	35	34	35	37	35	40	38	--	--	--	--
March	40	40	40	45	45	44	42	38	36	39	42	40	50	45	46	43	44	47	50	51	42	50	52	54	44	45	47	42	42	45	45	44
April	45	46	50	48	45	46	48	47	--	47	42	48	48	45	47	50	53	49	51	52	54	52	56	69	59	53	51	53	54	50	--	50
May	56	51	51	52	55	58	58	65	59	54	55	60	60	58	65	60	61	65	68	70	69	71	69	68	70	73	72	72	74	70	69	63
June	65	65	63	68	--	75	72	72	76	72	72	72	--	71	76	75	73	75	72	76	--	--	78	80	--	84	82	85	80	82	--	74
July	83	85	91	87	81	81	82	80	81	86	82	82	85	85	80	73	85	82	80	82	79	--	78	79	72	80	80	80	80	75	77	81
August	70	77	75	74	72	75	78	72	78	78	80	78	76	76	75	78	79	77	80	80	84	80	82	77	74	72	75	80	75	77	72	77
September	77	76	78	79	75	74	69	61	67	70	75	75	70	--	68	64	66	63	62	65	66	64	65	62	63	60	60	60	60	61	--	67

1-6385. POTOMAC RIVER AT POINT OF ROCKS, MD.--Continued

Suspended sediment, water year October 1965 to September 1966
(Where no daily concentrations are reported, loads are estimated)

Day	OCTOBER			NOVEMBER			DECEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	1400	C 5	19	1150	10	31	1370	C 1	4
2	1370	C 5	19	1210	13	42	1290	C 1	3
3	1300	C 5	18	1200	11	36	1130	C 1	3
4	1330	C 4	14	1180	13	41	1140	C 1	3
5	1360	C 4	15	1140	9	28	1220	C 1	3
6	1320	C 4	14	1110	6	18	1210	C 1	3
7	1410	C 4	15	1080	5	15	1160	C 1	3
8	1800	6	29	1070	8	23	1190	C 1	3
9	1700	8	37	1100	C 1	3	1180	C 1	3
10	2430	8	52	1160	C 1	3	1170	C 1	3
11	2390	11	71	1170	C 1	3	1140	C 1	3
12	2410	8	52	1200	C 1	3	1140	C 1	3
13	2050	9	50	1210	C 2	7	1200	C 1	3
14	1900	8	41	1240	C 2	7	1220	C 1	3
15	1760	7	33	1240	C 2	7	1230	6	20
16	1620	3	13	1210	C 2	7	1310	2	7
17	1520	3	12	1230	4	13	1420	8	31
18	1480	23	92	1150	9	28	1490	--	10
19	1400	10	38	1170	3	9	1460	1	4
20	1380	7	26	1100	C 1	3	1400	1	4
21	1290	19	66	1040	C 1	3	1400	1	4
22	1190	15	48	1050	C 1	3	1390	--	8
23	1230	12	40	1130	C 1	3	1320	C 1	4
24	1140	17	52	1130	C 1	3	1260	C 1	3
25	1290	21	73	1150	C 1	3	1290	C 1	3
26	1340	16	58	1200	C 1	3	1220	C 1	3
27	1350	11	40	1220	C 1	3	1230	C 1	3
28	1340	16	58	1210	C 1	3	1190	C 1	3
29	1280	17	59	1220	C 1	3	1170	C 1	3
30	1270	22	75	1260	C 1	3	1190	C 1	3
31	1260	8	27	--	--	--	1100	C 1	3
Total	47310	--	1256	34930	--	357	38830	--	159

Day	JANUARY			FEBRUARY			MARCH		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	1160	C 3	9	1100	--	20	10300	23 S	730
2	1240	C 3	10	1200	--	20	29500	78	6200
3	1280	C 3	10	1200	--	20	37400	140	14000
4	1220	C 3	10	1300	--	20	28800	120	9300
5	1310	C 3	11	1300	--	20	22500	55	3300
6	1660	6	27	1200	--	20	21100	38	2200
7	2640	5	36	1300	--	20	20700	31	1700
8	3030	7	57	1400	--	20	16800	25	1100
9	3930	11	120	1500	--	20	13300	20	720
10	4450	9	110	1600	--	20	11100	15	450
11	3860	24	250	1800	--	20	9350	10	250
12	3310	46	410	2500	--	80	8340	10	230
13	2850	31	240	11400	--	500	7640	12	250
14	2380	6	39	44800	710	S 96000	7300	11	220
15	2000	7	38	63800	610	110000	7350	13	260
16	1900	21	110	40900	270	30000	7080	13	250
17	1900	14	72	28100	140	11000	6620	12	210
18	1400	9	34	22600	72	4400	5980	13	210
19	1300	5	18	18600	49	2500	5810	15	240
20	1900	5	26	14700	32	1300	5360	14	200
21	1600	5	22	12000	20	650	4910	11	150
22	1500	5	20	9820	16	420	4660	11	140
23	1350	5	18	8120	12	260	4430	12	140
24	1400	4	15	7130	11	210	4390	12	140
25	1450	7	27	6830	9	170	4220	12	140
26	1300	10	35	6390	9	160	3850	9	94
27	1100	12	36	6070	9	150	3780	9	92
28	1050	--	30	6280	11	190	3740	10	100
29	1100	--	30	--	--	--	3540	9	86
30	1200	--	30	--	--	--	3320	9	81
31	1000	--	20	--	--	--	3330	9	81
Total	58770	--	1920	324940	--	258210	326500	--	43264

S Computed by subdividing day.
C Composite period.

1-6385. POTOMAC RIVER AT POINT OF ROCKS, MD.--Continued

Suspended sediment, water year October 1965 to September 1966--Continued
(Where no daily concentrations are reported, loads are estimated)

Day	APRIL			MAY			JUNE		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	3140	8	68	31200	84	7100	4960	44	590
2	3200	8	69	39900	150	S 16000	4430	29	350
3	3060	6	50	37600	190	19000	3960	29	310
4	3130	8	68	31900	100	8600	3690	22	220
5	3000	7	57	26400	59	4200	3450	21	200
6	3040	9	74	20200	47	2600	3200	20	170
7	3110	11	92	15800	37	1600	2980	21	170
8	3250	12	110	13300	32	1100	2940	22	170
9	3150	14	120	11400	24	740	2870	17	130
10	3130	11	93	10000	19	510	2770	20	150
11	2990	10	81	8980	24	580	2890	20	160
12	2930	13	100	8000	19	410	2510	18	120
13	4010	16	170	7380	17	340	2490	--	120
14	5340	31	450	6900	15	280	2390	18	120
15	10200	55	S 1600	6930	19	360	2280	17	100
16	21600	83	S 4900	7310	12	240	2080	15	84
17	19400	70	3700	7510	12	240	2030	17	93
18	15800	47	2000	7220	12	230	1920	16	83
19	13500	37	1300	6860	14	260	1860	14	70
20	11600	32	1000	6730	15	270	1740	18	85
21	9870	25	670	6980	12	230	1690	32	150
22	8860	23	550	7150	19	370	1610	29	130
23	9530	25	640	6430	18	310	1530	20	80
24	12500	35	1200	5850	16	250	1500	--	70
25	20100	75	4100	5460	16	240	1480	15	60
26	24000	90	5800	4980	13	170	1420	13	50
27	21800	53	3100	4650	10	130	1300	14	49
28	19800	44	2400	4610	1	120	1320	14	50
29	24600	66	4400	5390	100	1500	1260	10	34
30	30800	85	7100	4830	40	520	1510	10	41
31	--	--	--	5110	55	760	--	--	--
Total	320440	--	46062	372960	--	69260	72060	--	4209

Day	JULY			AUGUST			SEPTEMBER		
1	1390	11	41	652	3	5	675	C 1	2
2	1300	9	32	629	8	14	657	C 1	2
3	1300	6	21	675	16	29	640	C 1	2
4	1290	8	28	717	6	12	646	C 2	3
5	1280	8	28	745	4	8	629	C 2	3
6	1280	7	24	773	5	10	554	C 2	3
7	1240	9	30	759	5	10	608	C 2	3
8	1230	10	33	731	5	10	643	C 2	3
9	1480	9	36	1040	3	8	646	C 2	3
10	1280	14	48	773	3	6	602	C 2	3
11	1300	--	30	787	4	8	547	C 2	3
12	1280	6	21	1000	6	16	548	C 2	3
13	1310	6	21	1020	3	8	560	C 2	3
14	1170	6	19	1570	3	13	4330	73	S 1600
15	1110	6	18	1280	5	17	6850	150	S 3100
16	1040	3	8	1240	6	20	5850	67	S 1100
17	908	3	7	1220	2	7	4060	25	270
18	963	4	10	1300	1	4	4470	30	360
19	1060	1	3	1280	3	10	3760	21	210
20	908	1	2	1120	2	6	3230	22	190
21	815	3	7	982	1	3	4120	31	340
22	834	4	9	1160	2	6	12700	120	S 4100
23	870	3	7	1000	2	5	14200	70	2700
24	834	2	4	920	3	7	12800	49	1700
25	787	4	8	828	2	4	9930	38	1000
26	745	5	10	799	2	4	7280	26	510
27	731	3	6	790	3	6	5810	22	350
28	773	5	10	772	2	4	4700	25	320
29	773	5	10	772	3	6	4450	21	250
30	775	7	14	776	C 1	2	4950	22	290
31	717	4	8	697	C 1	2	--	--	--
Total	32743	--	553	28797	--	270	121445	--	18426

Total discharge for year (cfs-days)..... 1779725
Total load for year (tons)..... 443946

S Computed by subdividing day.
C Composite period.

POTOMAC RIVER BASIN--Continued

1-6385. POTOMAC RIVER AT POINT OF ROCKS, MD.--Continued

Particle-size analyses of suspended sediment, water year October 1965 to September 1966
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters											Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Feb. 15, 1966.....	0740	37		68200	649		38	52	70	84	92	96	99	100	--			SBWC
Feb. 15.....	0740	37		68200	649		--	12	25	42	80	96	99	100	--			SBN
Feb. 15.....	1230	37		64700	552		38	49	68	81	90	95	97	98	99	99		SBWC
Feb. 15.....	1230	37		64700	582		38	54	69	83	92	96	98	99	100			SBWC
Mar. 3.....	0745	40		39000	159		45	53	68	84	93	98	99	100	--			SBWC
Apr. 30.....	2000	54		31000	90		40	46	63	73	87	94	98	100	--			SBWC
May 2.....	1530	53		42300	135		33	40	50	64	80	91	97	100	--			SBWC

1-6430. MONOCACY RIVER AT JUG BRIDGE, NEAR FREDERICK, MD.

LOCATION.--Lat 39°23'16", long 77°22'48", at Reich's Ford Bridge, 1 mile downstream from U.S. Highway 40, 1.2 miles downstream from gaging station, and 2 miles southeast of Frederick, Frederick County.
DRAINAGE AREA.--817 square miles upstream from gaging station.
RECORDS AVAILABLE.--Chemical analyses: December 1964 to September 1966.
Water temperatures: October 1960 to September 1966.
Sediment records: October 1960 to September 1966.
EXTREMES, 1965-66.--Water temperatures: Maximum, 87°F July 2, 12-13, 26, Aug. 22; minimum, 33°F on several days during January.
Sediment concentrations: Maximum daily, 1,000 ppm Feb. 13; minimum daily, 1 ppm Dec. 5-8, July 10-11.
Sediment loads: Maximum daily, 24,000 tons Feb. 14; minimum daily, less than 0.50 ton on many days.
EXTREMES, 1960-66.--Water temperatures: Maximum, 87°F July 2, 12-13, 26, Aug. 27, 1966; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 1,180 ppm July 13, 1964; minimum daily, 1 ppm on many days.
Sediment loads: Maximum daily, 29,000 tons Feb. 8, 1965; minimum daily, less than 0.50 ton on many days.
REMARKS.--Flow affected by ice Jan. 10 to Feb. 10. No appreciable inflow between sampling point and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1965 to September 1966

Date of collection	Discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$		Phosphate (PO_4)	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
Oct. 2, 1965..	171	5.2		0.03	0.01	29	5.0	7.5	4.8	92	16	12	0.1	7.3	137	93	18	0.89	232	7.3	--
Nov. 1.....	78	2.6		.01	.00	41	4.2	8.5	3.8	118	20	14	.2	6.9	166	120	23	.85	297	7.2	5
Dec. 2.....	92	1.6		.01	.00	38	5.6	9.0	3.0	116	18	14	.1	5.0	155	116	22	.22	282	6.9	7
Jan 2, 1966...	150	1.7		.00	.00	37	4.5	8.1	3.0	108	19	14	.1	1.7	145	110	22	.62	265	6.6	7
Feb. 14.....	16500	5.0		.01	.00	14	2.3	2.2	3.3	20	18	6.3	.1	8.3	78	44	27	.27	121	6.1	12
Mar. 5.....	2910	8.1		.02	.00	20	5.2	4.7	2.3	42	27	8.0	.2	10	130	72	37	.14	174	6.4	--
Apr. 7.....	242	1.6		.00	.00	28	4.9	6.1	1.7	85	18	12	.1	.2	124	90	21	.12	214	6.6	5
May 2.....	2540	7.2		.00	.00	21	5.2	4.3	2.3	52	27	7.0	.1	5.7	123	74	32	.04	173	6.7	13
Aug. 1.....	34	3.1		.01	.01	46	7.7	14	3.5	152	22	18	.2	5.2	202	146	21	.54	357	7.2	5
Sept. 4.....	24	8.4		.01	.00	53	9.3	26	7.4	174	25	35	.3	13	274	170	27	.61	463	6.9	5

1-6430. MONOCACY RIVER AT JUG BRIDGE, NEAR FREDERICK, MD.--Continued

Temperature (°F) of water, water year October 1965 to September 1966
(Once-daily measurement at approximately 1700)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October	69	62	64	60	58	58	56	56	58	54	61	63	57	63	63	65	60	58	62	63	63	63	62	55	54	57	57	53	49	48	55	59
November	51	51	57	57	52	54	57	55	51	48	48	50	52	49	46	50	43	43	43	47	45	47	47	43	42	47	54	47	41	40	--	49
December	38	44	44	43	43	40	38	42	43	43	47	45	46	46	45	46	43	42	37	36	36	37	42	45	47	42	35	35	34	43	46	42
January	46	42	--	--	--	--	--	35	34	38	34	33	33	35	36	35	33	33	33	37	37	33	34	33	34	33	--	--	--	--	--	--
February	--	--	--	--	--	--	--	--	--	--	38	38	36	35	38	38	37	39	40	37	35	36	38	36	38	42	40	39	--	--	--	--
March	40	44	48	49	48	45	41	40	43	45	47	49	53	--	52	49	51	54	56	51	54	62	60	53	48	48	47	42	47	47	46	49
April	51	50	50	48	48	50	51	50	51	50	52	42	43	47	49	54	56	56	55	60	61	57	57	59	60	62	55	48	47	50	--	52
May	55	55	58	60	61	66	65	66	56	57	56	59	63	63	65	68	69	70	71	72	75	72	73	73	73	75	75	--	69	71	68	66
June	65	67	68	72	75	75	76	77	81	75	72	71	78	74	76	72	74	75	74	78	80	83	78	85	82	81	83	83	85	85	--	80
July	82	87	85	85	82	83	80	81	--	85	82	87	87	84	84	85	83	85	80	84	84	77	81	79	85	87	85	80	81	71	80	83
August	80	78	83	78	78	81	75	85	80	80	78	76	78	74	79	78	83	82	82	85	82	87	84	75	77	80	82	78	84	83	85	80
September	82	85	--	78	79	77	73	72	75	71	75	73	72	64	--	65	66	67	66	62	60	63	63	63	60	61	57	57	56	62	--	68

1-6430. MONOCACY RIVER AT JUG BRIDGE, NEAR FREDERICK, MD.--Continued

Suspended sediment, water year October 1965 to September 1966
(Where no daily concentrations are reported, loads are estimated)

Day	OCTOBER			NOVEMBER			DECEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	125	--	20	78	25	5	90	20	5
2..	168	70	32	78	15	3	92	20	5
3..	186	110	55	84	C 8	2	90	30	7
4..	171	90	42	84	C 8	2	90	10	2
5..	120	40	13	84	C 8	2	90	C 1	T
6..	92	20	5	86	C 2	T	90	C 1	T
7..	152	46	S 31	88	C 2	T	88	C 1	T
8..	926	250	S 670	95	C 2	1	88	C 1	T
9..	894	260	S 720	100	C 5	1	88	5	1
10..	303	84	69	92	C 5	1	88	9	2
11..	186	80	40	125	C 5	2	90	8	2
12..	148	75	30	118	C 5	2	92	8	2
13..	130	65	23	108	11	3	112	15	5
14..	108	53	15	102	11	3	125	12	4
15..	98	32	8	100	8	2	135	10	4
16..	92	15	4	98	20	5	145	9	4
17..	88	15	4	100	20	5	132	7	2
18..	84	15	3	90	10	2	118	7	2
19..	80	15	3	88	5	1	110	8	2
20..	76	19	4	88	5	1	105	10	3
21..	80	10	2	88	15	4	102	6	2
22..	90	10	2	95	18	5	98	20	5
23..	98	10	3	98	20	5	98	18	5
24..	102	7	2	98	9	2	98	7	2
25..	146	14	6	95	22	6	115	8	2
26..	118	10	3	90	5	1	140	10	4
27..	105	10	3	98	3	1	158	12	5
28..	92	5	1	100	2	1	132	12	4
29..	88	4	1	100	4	1	120	12	4
30..	84	9	2	95	12	3	112	10	3
31..	82	8	2	--	--	--	112	11	3
Total	5312	--	1818	2843	--	73	3343	--	92
	JANUARY			FEBRUARY			MARCH		
1..	115	9	3	90	--	3	8280	520	S 13000
2..	130	10	4	120	--	3	6390	415	S 8300
3..	158	10	4	150	--	3	2470	69	S 470
4..	216	13	8	180	--	3	2040	30	170
5..	242	16	10	210	--	3	2250	75	S 550
6..	266	25	18	210	--	3	2700	90	660
7..	472	59	S 100	200	--	3	2000	33	180
8..	535	55	71	190	--	3	1500	23	93
9..	279	16	12	174	--	2	1200	15	49
10..	183	15	7	168	--	6	1000	10	27
11..	189	10	5	255	30	S 24	800	10	22
12..	190	10	5	629	130	S 230	700	11	21
13..	190	12	6	3260	1000	S 12000	600	13	21
14..	180	10	5	13400	660	24000	500	13	18
15..	171	14	6	5120	190	S 2700	450	13	16
16..	168	16	7	2620	72	S 520	400	12	13
17..	160	7	3	2570	52	360	380	14	14
18..	155	5	2	1710	31	140	360	14	14
19..	160	6	3	1320	22	78	340	15	14
20..	155	7	3	1110	17	51	320	12	10
21..	152	6	2	710	10	19	300	16	13
22..	130	5	2	635	9	15	300	15	12
23..	140	12	5	605	11	18	300	14	11
24..	140	7	3	580	10	16	385	26	27
25..	145	5	2	595	10	16	734	56	110
26..	145	--	2	615	6	10	620	21	35
27..	150	--	2	610	4	7	450	13	16
28..	160	--	2	966	60	S 250	385	8	8
29..	150	--	2	--	--	--	342	7	6
30..	110	--	2	--	--	--	324	7	6
31..	100	--	2	--	--	--	324	7	6
Total	5836	--	308	39002	--	40486	39444	--	23912

S Computed by subdividing day.
T Less than 0.50 ton.
C Composite period.

1-6430. MONOCACY RIVER AT JUG BRIDGE, NEAR FREDERICK, MD.--Continued

Suspended sediment, water year October 1965 to September 1966--Continued
(Where no daily concentrations are reported, loads are estimated)

Day	APRIL			MAY			JUNE		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	328	7	6	3200	130	S 1200	274	56	41
2	302	5	4	2040	50	280	250	53	36
3	274	4	3	1470	27	110	223	48	29
4	270	6	4	1170	18	57	206	38	21
5	274	6	4	958	12	31	189	33	17
6	266	7	5	844	13	30	183	26	13
7	246	5	3	738	19	38	180	20	10
8	238	6	4	655	17	30	180	17	8
9	230	6	4	620	14	23	202	20	11
10	226	4	2	575	12	19	186	24	12
11	220	3	2	520	10	14	165	17	8
12	238	--	6	470	10	13	150	15	6
13	701	40	S 80	475	10	13	150	24	10
14	1580	71	300	470	8	10	169	35	S 20
15	1300	32	110	455	7	9	196	180	95
16	870	20	47	420	11	12	157	55	23
17	710	16	31	375	9	9	148	45	18
18	595	17	27	351	9	9	140	46	17
19	530	12	17	440	32	S 40	135	25	9
20	475	10	13	488	72	S 98	132	45	16
21	430	12	14	358	13	13	125	20	7
22	607	25	S 46	365	27	27	115	15	5
23	1460	64	250	310	22	18	108	28	8
24	1140	36	110	274	15	11	108	15	4
25	1550	47	200	311	13	11	100	8	2
26	1320	38	140	297	13	10	108	15	4
27	886	24	57	274	10	7	120	25	8
28	2600	130	S 1100	408	--	300	110	--	4
29	2230	65	S 420	838	460	S 1100	120	5	2
30	1790	29	140	542	150	S 240	115	5	2
31	--	--	--	338	67	61	--	--	--
Total	23886	--	3149	21049	--	3843	4744	--	466

	JULY			AUGUST			SEPTEMBER		
1	110	8	2	34	9	1	25	--	1
2	105	5	1	35	24	2	25	9	1
3	95	3	1	35	18	2	24	--	1
4	92	5	1	33	10	1	24	26	2
5	109	7	2	35	20	2	23	10	1
6	112	10	3	38	12	1	23	12	1
7	102	21	6	34	7	1	19	13	1
8	108	18	5	32	5	T	19	11	1
9	86	--	1	34	15	1	19	8	T
10	76	1	T	37	15	1	19	10	1
11	76	1	T	61	31	5	19	9	T
12	25	2	T	43	450	52	19	9	T
13	68	3	1	46	50	6	19	8	T
14	63	7	1	56	10	2	5260	870	S 15000
15	63	27	5	56	6	1	20100	--	20000
16	62	10	2	46	10	1	3180	80	S 900
17	50	3	T	43	21	2	752	25	51
18	48	6	1	37	25	2	505	18	25
19	47	11	1	33	20	2	390	19	20
20	42	14	2	33	30	3	646	31	54
21	41	13	1	33	14	1	4440	150	S 1900
22	40	--	1	33	9	1	3710	82	S 930
23	40	--	1	33	17	2	1680	40	180
24	37	--	1	32	20	2	958	23	59
25	34	2	T	32	13	1	670	25	45
26	32	--	T	29	6	T	565	19	29
27	35	15	1	29	5	T	500	13	18
28	34	20	2	28	6	T	530	13	19
29	40	17	2	26	8	1	690	34	63
30	41	13	1	26	10	1	880	38	90
31	38	11	1	25	9	1	--	--	--
Total	2001	--	49	1127	--	100	45733	--	39394

Total discharge for year (cfs-days)..... 194320
Total load for year (tons)..... 113690

S Computed by subdividing day.
T Less than 0.50 ton.

1-6430. MONOCACY RIVER AT JUG BRIDGE, NEAR FREDERICK, MD.--Continued

Particle-size analyses of suspended sediment, water year October 1965 to September 1966
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Oct. 8, 1965.....	1720	56		1080	182		53	68	84	95	98	100	--	--		--	--	BWC
Feb. 14, 1966.....	0800	35		13300	782		--	52	71	87	91	97	99	100		--	--	SPWC
Feb. 14.....	1100	34		16500	684		41	54	70	83	93	96	97	98		99	100	SBWC
Feb. 14.....	1100	34		16500	684		6	16	35	59	94	96	97	98		99	100	SBN
Mar. 1.....	1700	40		10400	555		--	49	67	82	88	98	99	100		--	--	SPWC
Apr. 14.....	1730	47		1760	75		43	58	72	81	89	96	100	--		--	--	SBWC
Apr. 28.....	1905	48		3760	190		29	41	55	70	83	97	99	100		--	--	SBWC

1-6450. SENECA CREEK AT DAWSONVILLE, MD.

LOCATION.--Lat 39°07'41", long 77°20'13", at gaging station 60 feet downstream from bridge on State Highway 28, 150 feet downstream from mouth of Great Seneca Creek and 0.5 mile east of Dawsonville, Montgomery County.
DRAINAGE AREA.--101 square miles.
RECORDS AVAILABLE.--Chemical analyses: November 1965 to August 1966.

Chemical analyses, in parts per million, November 1965 to August 1966

Date of collection	Discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$		Phosphate (PO_4)	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
Nov. 1, 1965..	24	9.3		0.00	0.00	9.0	2.0	4.1	2.1	36	2.8	5.9	0.0	1.5	53	30	1	0.00	89	6.9	3
Nov. 30.....	22	8.8		.01	.00	8.0	2.3	4.8	1.7	31	2 8	7.6	.1	2.3	54	30	4	.01	92	6.7	4
Jan. 3, 1966..	35	8.3		.01	.00	7.2	2.4	4.2	1.5	30	4.4	5.9	.0	4.6	52	28	4	.00	89	6.8	3
Feb. 21.....	A50	9.7		.01	.00	7.8	3.3	5.4	1.7	23	10	8.6	.1	7.0	78	33	14	.05	102	6.5	--
Mar. 1.....	336	7.4		.10	.00	9.4	3.1	3.9	2.6	18	18	7.0	.1	5.4	71	37	22	.04	109	6.2	--
Mar. 31.....	48	7.8		.00	.00	7.4	2.7	4.6	1.3	27	5.9	6.2	.1	5.0	59	30	8	.03	85	6.7	--
Apr. 29.....	101	6.7		.02	.00	9.6	2.4	6.1	2.4	29	8.8	11	.1	2.6	59	34	10	.00	109	7.7	7
July 6.....	42	6.7		.00	.00	10	2.8	9.5	4.8	29	11	17	.1	5.9	102	37	13	.03	138	6.7	17
Aug. 8.....	7.9	4.9		.01	.01	9.8	3.4	4.7	2.2	45	4.0	4.8	.1	1.7	59	38	2	.00	129	7.3	5
Aug. 30.....	4.8	6.0		.01	.00	8.8	2.8	5.2	2.4	41	4.0	5.8	.1	1.0	60	34	0	.00	102	6.8	5

A Daily mean discharge.

1-6452. WATTS BRANCH AT ROCKVILLE, MD.

LOCATION.--Lat 39°05'03", long 77°10'38", temperature recorder at gaging station on left bank, 0.2 mile south of State Highway 28, and 1.3 miles west of post office in Rockville, Montgomery County.
DRAINAGE AREA.--3.70 square miles.
RECORDS AVAILABLE.--Water temperatures: September 1957 to September 1966.
EXTREMES, 1965-66.--Water temperatures: Maximum, 85°F July 3; minimum, freezing point Jan. 23, Feb. 2-11.
EXTREMES, 1957-66.--Water temperatures: Maximum, 88°F June 29, 30, 1959; minimum, freezing point on many days during winter months.

Temperature (°F) of water, water year October 1965 to September 1966
(Continuous ethyl alcohol-actuated thermograph)

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October																																
Maximum	66	65	64	60	56	57	59	60	58	58	59	60	58	59	64	64	60	58	59	60	62	61	61	57	55	54	55	54	51	50	52	59
Minimum	63	59	56	54	50	50	53	56	53	54	54	55	53	52	55	58	55	52	53	53	56	59	57	52	49	48	48	48	45	43	44	53
November																																
Maximum	52	51	54	56	52	53	56	57	56	49	51	52	55	52	48	51	51	45	47	47	46	49	49	47	46	48	54	47	44	43	--	50
Minimum	48	46	48	50	47	46	49	53	49	47	49	50	52	47	44	47	43	40	42	41	43	46	45	43	41	44	47	43	41	38	--	46
December																																
Maximum	42	43	45	45	43	43	42	42	43	44	47	47	49	49	48	47	47	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Minimum	38	37	42	42	41	39	39	38	39	40	44	47	47	47	44	44	43	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
January																																
Maximum	--	--	44	42	40	43	44	42	36	37	37	36	35	35	35	35	35	34	34	35	37	34	34	34	34	33	33	34	33	33	33	36
Minimum	--	--	40	37	35	40	40	35	35	35	35	35	34	33	33	33	33	33	33	33	33	33	32	33	33	33	33	33	33	33	33	34
February																																
Maximum	33	33	32	32	32	32	32	32	32	32	33	38	38	43	42	40	41	41	45	38	37	39	40	37	38	42	43	39	--	--	--	37
Minimum	33	32	32	32	32	32	32	32	32	32	32	33	34	37	39	37	36	34	37	33	33	33	33	33	33	35	34	36	--	--	--	34
March																																
Maximum	46	46	49	49	53	45	44	43	44	47	46	51	52	48	52	50	50	53	54	51	52	58	60	52	49	46	46	45	49	48	49	49
Minimum	37	38	39	45	45	39	37	35	34	35	40	41	45	44	44	40	38	40	46	44	40	45	49	43	40	39	38	37	36	40	41	40
April																																
Maximum	48	50	49	47	48	48	49	50	51	49	51	47	42	50	52	55	58	52	56	60	63	58	53	65	63	58	52	46	49	51	--	52
Minimum	41	42	40	42	40	40	41	41	43	41	40	42	41	41	40	44	43	46	46	48	51	53	51	52	54	49	46	46	47	48	--	45
May																																
Maximum	59	53	62	60	63	68	65	68	59	59	57	58	66	58	67	66	69	65	68	70	71	68	69	67	66	70	66	68	70	66	67	65
Minimum	50	49	46	47	46	52	51	54	48	45	45	50	53	53	50	52	54	58	60	58	58	59	54	55	60	60	62	61	60	57	56	54
June																																
Maximum	62	65	69	72	74	71	66	72	75	72	69	70	73	72	73	69	69	68	73	76	77	78	78	79	81	79	80	81	82	81	--	74
Minimum	53	52	53	56	60	62	62	61	64	63	59	57	60	62	62	60	62	61	62	61	63	65	64	66	67	69	70	70	71	68	--	62
July																																
Maximum	84	84	85	81	78	81	82	83	83	81	84	81	84	83	78	79	78	79	79	78	76	76	74	79	80	80	80	76	79	73	79	80
Minimum	69	70	70	71	72	72	72	71	69	71	73	73	70	72	69	65	66	66	69	68	62	61	64	64	68	68	71	72	71	67	62	69
August																																
Maximum	77	74	82	75	71	78	75	79	78	83	84	82	76	71	78	82	82	82	82	83	84	84	81	80	74	79	81	84	82	82	83	80
Minimum	63	68	68	66	66	63	65	69	71	71	73	72	67	70	70	70	72	68	71	73	73	75	76	70	67	65	66	68	70	71	71	69
September																																
Maximum	83	82	81	77	81	79	75	73	76	75	74	73	71	69	68	66	66	65	66	64	63	65	63	63	59	60	58	58	59	64	--	69
Minimum	71	71	70	73	70	68	66	64	61	61	61	65	66	68	63	58	57	58	61	63	62	61	58	56	57	58	57	57	58	58	--	63

1-6505. NORTHWEST BRANCH ANACOSTIA RIVER NEAR COLESVILLE, MD.

LOCATION.--Lat 39°03'55", long 77°01'48", at gaging station 400 feet upstream from bridge on State Highway 183, 1.5 miles southwest of Colesville, Montgomery County, 3 miles upstream from Burnt Mills, and 10 miles upstream from Sligo Branch.
DRAINAGE AREA.--21.1 square miles.
RECORDS AVAILABLE.--Sediment records: October 1962 to September 1966.
EXTREMES, 1965-66.--Sediment concentrations: Maximum daily, 3,130 ppm Sept. 14; minimum daily, no flow on several days during August and September.
Sediment loads: Maximum daily, 3,810 tons Sept. 14; minimum daily, 0 tons on several days during August and September.
EXTREMES, 1962-66.--Sediment concentrations: Maximum daily, 4,340 ppm Aug. 26, 1965; minimum daily, no flow on several days during August and September 1966.
Sediment loads: Maximum daily, 4,670 tons Mar. 5, 1965; minimum daily, 0 tons on several days during August and September 1966.

Suspended sediment, water year October 1965 to September 1966
(Where no daily concentrations are reported, loads are estimated)

Day	OCTOBER			NOVEMBER			DECEMBER		
		Suspended sediment			Suspended sediment			Suspended sediment	
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1	7.0	28	S 0.6	5.0	--	T	4.9	--	T
2	4.9	--	.3	4.7	--	T	4.7	--	T
3	3.4	16	.1	4.7	--	T	5.0	--	T
4	2.8	--	.1	4.9	--	T	5.1	--	T
5	2.7	--	.1	4.9	--	T	5.0	--	T
6	2.7	--	.1	4.9	3	T	5.0	--	T
7	292	1900	S 2970	5.0	--	T	4.7	1	T
8	75	290	S 66	5.4	--	T	4.9	--	T
9	12	30	1	5.0	--	T	4.7	--	T
10	8.4	--	.5	4.7	--	T	4.8	--	T
11	7.1	--	.3	4.7	--	T	4.9	--	T
12	6.8	--	.2	5.0	--	T	5.0	6	.1
13	5.7	--	.2	5.4	--	T	6.1	7	.1
14	5.4	--	.1	5.4	1	T	5.7	--	.1
15	5.7	40	B .6	4.9	--	T	5.2	--	.1
16	6.8	35	A .6	5.5	--	T	5.1	--	.1
17	5.7	--	.3	6.8	--	T	5.0	--	.1
18	5.7	--	.2	5.1	--	T	4.9	5	.1
19	5.7	--	.2	5.3	--	T	5.0	--	.1
20	5.4	--	.1	5.2	--	T	4.7	--	.1
21	5.4	--	.1	5.4	--	T	4.9	--	.1
22	5.4	--	.1	6.6	1	T	4.8	--	.1
23	5.4	6	.1	6.2	--	T	4.8	--	.1
24	5.4	--	.1	5.3	--	T	4.9	4	.1
25	5.0	--	.1	5.4	--	T	6.4	--	.2
26	5.0	--	T	5.5	1	T	7.4	--	.2
27	5.0	--	T	6.8	--	T	5.1	--	.1
28	5.0	--	T	6.3	--	T	5.0	--	.1
29	4.7	--	T	5.4	--	T	4.8	--	.1
30	4.7	1	T	5.0	--	T	4.8	--	.1
31	5.0	--	T	--	--	--	5.1	--	--
Total	526.9	--	3042.2	160.4	--	0.6	158.4	--	2.3

S Computed by subdividing day.
T Less than 0.05 ton.
A Computed from partly estimated-concentration graph.
B Computed from estimated-concentration graph.

1-6505. NORTHWEST BRANCH ANACOSTIA RIVER NEAR COLESVILLE, MD.--Continued

Suspended sediment, water year October 1965 to September 1966--Continued
(Where no daily concentrations are reported, loads are estimated)

Day	JANUARY			FEBRUARY			MARCH		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	5.3	--	0.1	6.0	--	0.1	129	320	S 160
2	7.2	9	.2	5.8	--	.1	26	--	2
3	7.6	--	.2	5.4	--	.1	19	--	.8
4	6.0	--	.1	5.4	--	.1	17	--	.5
5	5.7	--	.2	5.4	--	.1	17	--	.4
6	34	370	S 40	5.6	--	T	15	--	.3
7	15	--	1	5.6	2	T	13	5	.2
8	8.6	9	.2	6.0	--	T	12	--	.2
9	7.0	--	.2	6.0	--	T	12	--	.2
10	6.9	--	.2	8.0	60	1	11	--	.2
11	6.5	--	.1	107	890	S 360	11	--	.2
12	5.9	--	.1	66	320	S 54	11	--	.2
13	5.6	--	.1	456	1940	S 2500	11	18	.5
14	5.4	--	.1	76	150	S 38	11	--	.2
15	5.2	--	.1	28	45	3	11	--	.1
16	5.0	4	.1	30	87	S 7	10	--	.1
17	4.9	--	.1	23	--	2	9.7	--	.1
18	4.9	--	.1	16	--	.6	9.8	--	.1
19	4.9	--	.1	14	--	.4	9.9	5	.1
20	4.9	--	.1	12	15	.5	9.4	--	.1
21	4.8	--	.1	10	20	B .5	9.1	--	.1
22	5.3	6	.1	9.5	20	B .5	9.5	--	.1
23	11	16	.5	9.0	20	B .5	9.3	--	.1
24	8.2	--	.1	11	20	A .6	23	190	S 23
25	6.4	--	.1	15	30	A 1	17	25	A 1
26	5.1	--	.1	16	35	A 2	12	--	.5
27	6.5	--	.1	18	40	A 2	11	--	.4
28	5.5	--	.1	178	1470	S 1380	10	--	.3
29	5.4	13	.2	--	--	--	9.7	--	.2
30	5.5	--	.2	--	--	--	10	--	.2
31	6.0	--	.1	--	--	--	10	--	.2
Total	226.2	--	45.1	1153.7	--	4354.2	505.4	--	192.6

Day	APRIL			MAY			JUNE		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	9.6	--	0.2	44	52	S 7	9.6	--	0.8
2	9.2	7	.2	33	55	A 5	8.7	--	.6
3	8.8	--	.2	22	--	2	8.2	23	.5
4	9.7	--	.2	17	--	.9	8.0	--	.5
5	8.9	--	.1	15	--	.6	7.4	--	.4
6	8.6	--	.1	14	--	.6	6.7	--	.4
7	8.6	--	.1	12	--	.5	6.9	--	.3
8	8.4	--	.1	12	13	.4	8.1	--	.6
9	8.6	--	.1	12	--	.4	10	--	1
10	8.3	--	.1	12	--	.4	6.8	32	.6
11	8.2	25	.6	11	--	.3	6.0	--	.5
12	30	650	S 190	11	--	.3	5.7	--	.4
13	139	1360	S 720	10	--	.2	5.4	--	.3
14	51	100	14	12	11	.4	6.3	--	.4
15	23	15	.9	10	--	.3	6.6	--	.6
16	18	11	.5	9.5	--	.2	7.0	--	.5
17	15	--	.4	9.0	--	.2	7.2	--	.4
18	14	--	.3	26	840	B 80	6.1	--	.4
19	13	--	.2	38	1360	S 240	5.8	--	.3
20	12	--	.2	14	40	2	5.1	23	.3
21	12	--	.2	11	27	.8	4.5	--	.2
22	20	61	S 4	14	--	.7	4.5	--	.2
23	14	25	.9	9.6	--	.6	4.0	--	.2
24	13	24	.8	8.8	--	.6	4.0	--	.1
25	24	44	A 3	8.9	--	.5	4.1	--	.1
26	16	--	.9	8.5	--	.5	3.4	--	.1
27	15	--	.4	21	1170	S 150	3.7	--	.1
28	39	86	A 12	31	450	S 160	7.5	760	S 37
29	20	10	A .5	50	1190	S 320	4.2	230	S 3
30	66	520	S 140	13	45	2	3.3	--	.2
31	--	--	--	11	--	1	--	--	--
Total	650.9	--	1091.2	530.3	--	978.4	184.8	--	51.0

S Computed by subdividing day.
T Less than 0.05 ton.
A Computed from partly estimated-concentration graph.
B Computed from estimated-concentration graph.

1-6505. NORTHWEST BRANCH ANACOSTIA RIVER NEAR COLESVILLE, MD.--Continued

Suspended sediment, water year October 1965 to September 1966--Continued
(Where no daily concentrations are reported, loads are estimated)

Day	JULY			AUGUST			SEPTEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	3.0	--	0.1	0.9	12	T	0	0	0
2	2.9	--	.1	.5	--	T	.1	--	T
3	2.7	--	.1	.2	--	T	0	0	0
4	2.4	--	.1	.3	--	T	.1	--	T
5	7.8	600	S 52	.9	--	T	0	0	0
6	11	400	S 27	.9	--	T	0	0	0
7	3.9	--	.2	.9	--	T	0	0	0
8	2.9	--	.1	.6	10	T	0	0	0
9	2.2	--	.1	.7	--	T	0	0	0
10	2.1	--	.1	.9	--	T	0	0	0
11	2.3	--	.1	7.8	960	S 63	0	0	0
12	2.7	--	.1	3.2	280	A 4	.2	--	T
13	1.9	--	.1	1.1	--	T	.3	--	T
14	1.8	--	.1	1.2	--	T	637	3130	S 3810
15	5.1	730	S 24	1.7	22	.1	35	210	S 28
16	2.1	--	.1	1.9	--	.1	8.9	25	.6
17	1.9	--	.1	1.4	--	.1	5.4	--	.4
18	1.5	--	.1	.9	--	T	4.2	--	.2
19	1.2	--	.1	.6	--	T	4.0	10	.1
20	1.3	--	.1	.4	--	T	23	240	19
21	1.2	--	T	.6	--	T	106	920	S 540
22	.9	15	T	.5	36	T	17	25	1
23	.9	--	T	.7	--	T	11	--	.6
24	.8	--	T	.3	--	T	6.8	--	.3
25	.6	--	T	1.2	--	T	6.1	--	.2
26	.9	--	T	.2	--	T	5.9	10	.2
27	.6	--	T	.4	--	T	8.3	--	.5
28	.9	--	T	.2	--	T	12	--	.1
29	1.4	--	T	.1	12	T	31	440	S 67
30	1.1	--	T	0	0	0	14	40	2
31	1.3	--	T	0	0	0	--	--	--
Total	73.3	--	105.2	31.2	--	68.0	936.3	--	4471.2

Total discharge for year (cfs-days)..... 5137.8
Total load for year (tons)..... 14402.0

S Computed by subdividing day.
T Less than 0.05 ton.
A Computed from partly estimated-concentration graph.

MISCELLANEOUS ANALYSES OF STREAMS IN NORTH ATLANTIC SLOPE BASINS

Chemical analyses, in parts per million, water year October 1965 to September 1966

Date of collection	Discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Total acidity as H^{+1}	Specific conductance (micromhos at 25°C)	pH	Color
DELAWARE RIVER BASIN																					
1-4774. SOUTH BRANCH NAAMAN CREEK NEAR CLAYMONT, DEL. (lat 39°49'00", long 75°29'40")																					
Oct. 5, 1965..	0.30							8.7		60	29	14		8.1	153	86	37		229	7.8	25
July 27, 1966.	.15							A 12		63	9.6	18		12		70	19		186	7.2	13
1-4795. MILL CREEK AT STANTON, DEL. (lat 39°42'50", long 75°40'00")																					
Oct. 5, 1965..	1.96							9.9		72	15	9.5		4.3	126	70	11		199	8.0	3
July 21, 1966.	2.20							A 9.0		48	18	8.0		5.0		54	15		152	7.0	20
1-4823. RED LION CREEK AT RED LION, DEL. (lat 39°36'20", long 75°39'55")																					
Oct. 5, 1965..	0.11							7.6		10	6.2	11		13	71	24	16		93	6.8	5
July 21, 1966.	.08							A 22		66	2.6	14		1.1		29	0		186	6.5	80
1-4831.5 WIGGINS MILLPOND OUTLET AT TOWNSEND, DEL. (lat 39°24'12", long 75°42'16")																					
Oct. 5, 1965..	1.49							7.1		46	4.6	8.5		4.7	98	43	6		126	6.4	5
July 21, 1966.	.31							A 8.0		38	4.4	7.0		7.4		34	3		104	6.5	12
1-4836.5 FORT BRANCH AT DUPONT, DEL. (lat 39°11'56", long 75°34'40")																					
Oct. 6, 1965..	0.02							13		108	16	8.5		0.7	163	90	2		215	7.1	10
1-4836.8 MAIDSTONE BRANCH AT DUPONT, DEL. (lat 39°11'18", long 75°34'04")																					
Oct. 6, 1965..	1.71							9.7		28	8.6	9.0		4.1	90	27	4		107	6.8	7
July 25, 1966.	0							A 11		42	5.2	11		1.2		33	0		128	6.3	60

A Calculated Na plus K, reported as Na.

MISCELLANEOUS ANALYSES OF STREAMS IN NORTH ATLANTIC SLOPE BASINS--Continued

Chemical analyses, in parts per million, water year October 1965 to September 1966--Continued

Date of collection	Discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Total acidity as H^{+1}	Specific conductance (micromhos at 25°C)	pH	Color
ST. JONES RIVER BASIN																					
1-4837. ST. JONES RIVER AT DOVER, DEL. (lat 39°09'49", long 75°31'10")																					
Oct. 25, 1965.	4.0	31	0.1	0.16	0.24	21	4.9	35	5.0	0	50	64	0.1	33	260	72	72	0.5	450	4.0	15
Nov. 12.....	5.0	33		.00	.03	25	5.4	28	4.3	40	35	33	.1	33	246	84	52		334	6.9	5
Dec. 23.....	.5	31		.14	.13	23	5.4	24	3.5	2	52	40	.0	32	223	80	78		336	4.8	12
Jan. 18, 1966.	.6	27		.06	.06	26	5.8	26	3.6	4	61	41	.2	29	232	88	86		352	5.2	7
Feb. 14.....	50.8	--		--	--	--	--	A 24		4	70	40	--	14	249	92	89		359	5.3	15
Mar. 22.....	8.1	--		--	--	--	--	A 20		4	62	28	--	11	205	74	71		274	5.3	15
May 3.....	14.3	--		--	--	--	--	A 18		10	47	28	--	9.6	--	65	57		237	6.2	15
June 6.....	4.18	--		--	--	--	--	A 22		33	35	30	--	1.7	--	60	33		239	6.5	40
MURDERKILL RIVER BASIN																					
1-4840.2 BROWN BRANCH NEAR HOUSTON, DEL. (lat 38°57'31", long 75°30'33")																					
Oct. 4, 1965..	5.60							15		37	14	12		17	138	42	12		168	6.8	4
July 21, 1966.	4.19							A 15		43	13	14		16		48	13		172	7.0	11
1-4840.5 PRATT BRANCH NEAR FELTON, DEL. (lat 39°00'37", long 75°31'46")																					
Oct. 4, 1965..	0.75							8.0		12	13	8.5		11	91	27	17		104	6.4	3
July 21, 1966.	.43							A 8.0		14	12	9.0		11		28	17		100	6.5	20
Sept. 13.....	.37							A 7.6		16	13	9.5		8.0		30	17		107	6.2	4
1-4840.6 DOUBLE RUN NEAR MAGNOLIA, DEL. (lat 39°03'16", long 75°29'43")																					
Oct. 4, 1965..	1.41	19		0.00	0.00	6.4	2.7	9.0	2.2	16	6.6	13	0.1	13	86	27	14		107	6.4	3
Sept. 13.....	.85							8.0		24	10	13		11		40	21		94	6.4	2
BROADKILL RIVER BASIN																					
1-4842.7 BEAVERDAM CREEK NEAR MILTON, DEL. (lat 38°45'41", long 75°16'03")																					
Oct. 4, 1965..	6.99							12		6	5.8	12		19	95	17	12		108	5.4	5
July 20, 1966.	8.94							A 13		13	5.0	12		19		20	10		108	6.3	20
Sept. 14.....	7.36							A 9.2		8	6.9	12		14		22	16		103	6.5	2
1-4843.7 PEMBERTON BRANCH NEAR MILTON, DEL. (lat 38°46'26", long 75°20'29")																					
Oct. 4, 1965..	2.96							6.4		13	2.6	6.5		3.5	57	11	1		59	6.7	8
July 20, 1966.	5.98							A 5.1		15	.8	6.5		6.9		17	5		56	6.6	35
Sept. 14.....	2.9							A 7.8		16	2.5	8.0		2.5		12	0		61	6.8	2

A Calculated Na plus K, reported as Na.

MISCELLANEOUS ANALYSES OF STREAMS IN NORTH ATLANTIC SLOPE BASINS--Continued

Chemical analyses, in parts per million, water year October 1965 to September 1966--Continued

Date of collection	Discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$		Phosphate (PO_4)	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
INDIAN RIVER BASIN																					
1-4845.5 PEPPER CREEK AT DAGSBORO, DEL. (lat 38°32'50", long 75°14'40")																					
Oct. 4, 1965..	1.56							11		34	18	13		5.5	120	46	18		159	6.7	30
July 20, 1966.	1.46							A 11		41	15	12		6.1		47	14		150	6.9	90
Sept. 14.....	.91							A 9.9		46	10	12		3.0		46	9		140	7.2	3
NANTICOKE RIVER BASIN																					
1-4877. CHIPMAN POND OUTLET NEAR LAUREL, DEL. (lat 38°34'39", long 75°31'42")																					
Oct. 4, 1965..	3.92							7.1		13	3.6	6.0		11	70	16	6		75	6.8	3
July 20, 1966.	2.5							A 7.4		18	3.6	6.0		11		20	5		77	6.7	15
CHESTER RIVER BASIN																					
1-4929.8 CYPRESS BRANCH AT MILLINGTON, MD. (lat 39°15'28", long 75°50'01")																					
July 18, 1966.	0.62							A 12		48	8.2	9.0		0.8		35	0		129	6.7	25
1-4941. OLD MILLSTREAM AT CENTREVILLE, MD. (lat 39°02'23", long 76°04'22")																					
July 22, 1966.	2.30							A 2.3		53	9.2	7.5		9.4		66	23		144	7.2	25
1-4950.2 BIG ELK CREEK AT ELKTON, MD. (lat 39°37'18", long 75°49'45")																					
Feb. 8, 1966..		12		0.15	0.04	7.2	2.3	6.4	1.8	21	8.2	9.4	0.1	5.6	61	28	10		100	6.4	3
1-4955. LITTLE ELK CREEK AT CHILDS, MD. (lat 39°38'30", long 75°52'00")																					
July 27, 1966.								A 130		378	10	14		4.9		60	0		605	7.6	200
NORTHEAST RIVER BASIN																					
1-4960.5. LITTLE NORTHEAST CREEK AT MECHANIC VALLEY, MD. (lat 39°38'26", long 75°55'49")																					
July 19, 1966.	1.43							A 11		33	7.8	8.0		3.2		26	0		94	6.9	20
SUSQUEHANNA RIVER BASIN																					
1-5806.8 SUSQUEHANNA RIVER AT HAVRE DE GRACE, MD.																					
Feb. 8, 1966..		4.6		1.1	0.23	23	7.1	7.9	1.4	32	62	9.5	0.2	3.7	138	86	60	0.02	230	6.5	8

A Calculated Na plus K, reported as Na.

MISCELLANEOUS ANALYSES OF STREAMS IN NORTH ATLANTIC SLOPE BASINS--Continued

Chemical analyses, in parts per million, water year October 1965 to September 1966--Continued

Date of collection	Discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Phosphate (PO_4)	Specific conductance (micromhos at 25°C)	pH	Color
BUSH RIVER BASIN																					
1-5817.5 WINTERS RUN (HEAD OF OTTER POINT CREEK) NEAR BEL AIR, MD. (lat 39°30'55", long 76°22'10")																					
Feb. 8, 1966..	4.41	13		0.12	0.06	6.4	2.8	4.0	1.2	23	4.8	6.2	0.1	7.6	56	28	8	0.03	85	6.6	5
PATAPSCO RIVER BASIN																					
1-5855. CRANBERRY BRANCH NEAR WESTMINSTER, MD. (lat 39°35'35", long 76°58'05")																					
Mar. 3, 1966..	A1.6	7.3		0.16	0.06	16	3.6	3.7	1.8	33	12	10	0.1	12	95	54	28	0.03	145	6.9	5
PATUXENT RIVER BASIN																					
HAWLINGS RIVER NEAR LAYTONSVILLE, MD. (lat 39°13'03", long 77°06'19")																					
June 13, 1966.		12		0.51	0.02	3.5	1.8	3.3	1.0	18	0.2	3.0	0.2	5.6	44	16	1	0.08	53	6.7	
POTOMAC RIVER BASIN																					
1-5990. GEORGES CREEK AT FRANKLIN, MD. (lat 39°29'38", long 79°02'42")																					
Sept. 14, 1966	63	19		365	--	174	70	6.2	0.0		1380	5.3	2.2	4.2	1820	723	723	0.00	1380	2.6	--
Sept. 20.....	57	11		8.4	6.5	142	53	7.5	2.9		768	15	0.7	2.8	1110	572	572	.00	1720	2.8	3
Sept. 27.....	9.0	13		9.1	4.6	158	56	11	3.0		708	11	.5	3.9	1036	624	624	.17	1310	3.7	0
HOFFMAN TUNNEL NEAR CLARYSVILLE, MD.																					
Sept. 14, 1966		11		12	2.6	126	47	4.5	1.6	26	452	6.4	0.4	0.6	772	509	488	0.00	897	6.7	1
Sept. 15.....		--		12	--	--	--	--	--	27	--	4.9	--	--	733	490	468	--	--	6.2	--
Sept. 16.....		--		--	--	--	--	--	--	23	--	4.8	--	--	725	484	465	--	889	6.9	--
Sept. 20.....		12		11	2.7	124	48	4.8	1.7	28	454	6.4	.4	.4	718	509	486	.00	893	6.3	2
Sept. 27.....		12		7.8	2.6	122	46	5.2	1.7	26	442	7.6	.3	.3	709	493	472	.04	--	6.7	2
1-6015. WILLS CREEK NEAR CUMBERLAND, MD. (lat 39°40'07", long 78°47'18")																					
Oct. 1, 1965..	A31		0.2	0.06	0.18					74	203	14		2.0		288	211	0.72	568	8.6	5

A Daily mean discharge.

MISCELLANEOUS ANALYSES OF STREAMS IN NORTH ATLANTIC SLOPE BASINS--Continued

Chemical analyses, in parts per million, water year October 1965 to September 1966--Continued

Date of collection	Discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$		Phosphate (PO_4)	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
POTOMAC RIVER BASIN--Continued																					
1-6125. LITTLE TONOLOWAY CREEK NEAR HANCOCK, MD. (lat 39°42'45", long 78°13'55")																					
June 20, 1966.		4.0		0.20	0.05	62	15	5.7	1.7	200	57	11	0.2	1.0		216	52	0.00	442	7.5	3
HIGH RUN NEAR THURMONT, MD.																					
Mar. 1, 1966..		4.6		0.08	0.00	1.8	0.9	0.6	0.9	3	6.7	1.2	0.1	0.1	18	8	6	0.01	27	6.3	
1-6525.9 POTOMAC RIVER AT ALEXANDRIA, VA. (lat 38°47'34", long 77°02'15")																					
Sept. 21, 1966		4.9		0.03	0.01	24	5.2	14	4.3	49	42	15	0.2	12	158	80	40	0.39	249	6.7	15
Sept. 21.....		5.0		.03	.01	20	4.8	12	4.5	48	34	13	.2	8.2	141	71	31	.37	227	6.4	20
1-6610. CHAPTICO CREEK AT CHAPTICO, MD. (lat 38°22'45", long 76°46'56")																					
Dec. 14, 1965.	3.7	11		0.10	0.00	9.6	1.8	2.5	1.5	32	5.4	5.0	0.1	0.4	59	32	6	0.02	84	6.9	10
Jan. 5, 1966..	1.5	11		.03	.00	9.1	2.1	2.4	1.3	32	5.2	5.0	.1	.2	55	32	6	.01	82	6.7	7
Feb. 2.....	16	10		.02	.00	8.7	1.5	2.8	1.2	25	6.4	6.5	.1	.2	46	28	7	.01	75	6.6	3
Mar. 1.....	26	6.8		.01	.00	6.8	1.9	2.3	1.9	12	15	4.8	.1	1.5	63	25	15	.07	73	6.1	--
Apr. 7.....	4.5	8.1		.02	.02	9.5	1.1	3.0	1.2	26	6.8	5.3	.1	.7	55	28	6	.07	79	6.7	5
May 5.....	7.7	9.3		.03	.01	8.8	1.0	2.7	1.2	24	6.8	5.5	.1	.3	50	26	6	.09	74	6.5	8
June 7.....	1.4	12		.21	.00	8.4	1.9	3.3	3.1	30	6.0	4.7	.1	1.1	--	29	4	.04	80	6.7	--
July 25.....	0	8 8		.13	.00	10	2.2	3.7	2.4	38	5.8	5.1	.1	.5	77	34	3	.04	87	7.4	12

Periodic determinations of suspended-sediment discharge and particle size, water year October 1965 to September 1966
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters										Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
POTOMAC RIVER BASIN																	
1-6504.5. BEL PRE CREEK AT LAYHILL, MD. (lat 39°05'27", long 77°03'11")																	
Jan. 6, 1966	0545	43		13	1610	57	--	--	--	--	--	--	--	--			
Jan. 6	0650	43		20	3530	190	60	76	90	96	98	99	100				SCPW
Jan. 6	0750	44		16	1450	63	--	--	--	--	--	--	--				
Jan. 6	0840	42		13	980	34	--	--	--	--	--	--	--				
Jan. 6	1110	44		6.2	500	8.4	--	--	--	--	--	--	--				
Jan. 6	1615	43		3.6	190	1.8	--	--	--	--	--	--	--				
Feb. 11	0940	34		18	480	23	--	--	--	--	--	--	--				
Feb. 11	1340	32		33	1170	100	--	--	--	--	--	--	--				
Feb. 11	1545	32		29	960	75	--	--	--	--	--	--	--				
Feb. 12	1110	37		4.5	130	1.6	--	--	--	--	--	--	--				
Feb. 12	1630	--		12	690	22	--	--	--	--	--	--	--				
Feb. 13	0200	35		20	930	50	--	--	--	--	--	--	--				
Feb. 13	0300	37		28	1600	120	--	--	--	--	--	--	--				
Feb. 13	0405	39		32	1180	100	--	--	--	--	--	--	--				
Feb. 13	0825	38		33	840	75	--	--	--	--	--	--	--				
Feb. 13	0940	38		80	5380	1160	--	--	--	--	--	--	--				
Feb. 13	1025	35		88	3240	770	47	61	77	88	91	96	99	100			SCPW
Feb. 13	1055	36		94	2510	640	--	--	--	--	--	--	--				
Feb. 13	1125	36		108	2740	800	--	--	--	--	--	--	--				
Feb. 13	1200	37		118	2500	800	--	--	--	--	--	--	--				
Feb. 13	1230	37		116	2370	740	--	--	--	--	--	--	--				
Feb. 13	1315	39		107	1750	510	--	--	--	--	--	--	--				
Feb. 13	1340	39		107	1630	470	--	--	--	--	--	--	--				
Feb. 13	1445	42		117	1490	470	--	--	--	--	--	--	--				
Feb. 13	1525	42		166	4410	1980	--	--	--	--	--	--	--				
Feb. 13	1555	41		180	4590	2230	--	--	--	--	--	--	--				
Feb. 13	1615	41		156	3670	1550	--	--	--	--	--	--	--				
Feb. 13	1655	40		120	2710	880	--	--	--	--	--	--	--				
Feb. 13	1745	43		106	2150	620	--	--	--	--	--	--	--				
Feb. 13	2115	41		55	1110	160	--	--	--	--	--	--	--				

Periodic determinations of suspended-sediment discharge and particle size, water year October 1965 to September 1966--Continued
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters											Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
POTOMAC RIVER BASIN--Continued																		
1-6504.5. BEL PRE CREEK AT LAYHILL, MD. (lat 39°05'27", long 77°03'11")--Continued																		
Feb. 14, 1966	1015	37		3.1	103	0.9		---	---	---	---	---	---	---				
Feb. 15	1430	42		.9	97	.2		--	--	--	--	--	--	--				
Apr. 12	1840	--		5.6	560	8.5		--	--	--	--	--	--	--				
Apr. 12	1945	--		12	1490	48		--	--	--	--	--	--	--				
Apr. 12	2035	--		15	2350	95		--	--	--	--	--	--	--				
Apr. 12	2120	--		21	2720	154		--	--	--	--	--	--	--				
Apr. 12	2215	--		41	5000	550		--	--	--	--	--	--	--				
Apr. 12	2325	--		54	4160	610		--	--	--	--	--	--	--				
Apr. 13	0040	--		50	2200	300		--	--	--	--	--	--	--				
Apr. 13	0300	--		54	1760	260		--	--	--	--	--	--	--				
Apr. 13	0510	--		27	1070	78		---	--	--	--	--	--	--				
Apr. 13	0520	65		11	1870	56		--	--	--	--	--	--	--				
Apr. 13	1220	43		5.6	170	2.6		--	--	--	--	--	--	--				
Apr. 13	1525	44		9.2	430	11		--	--	--	--	--	--	--				
June 8	1940	70		6.1	5730	94		--	--	--	--	--	--	--				
July 5	1425	75		1.1	13	T		--	--	--	--	--	--	--				
July 5	2135	--		32	260	22		--	--	--	--	--	--	--				
July 5	2230	--		25	5400	360		--	--	--	--	--	--	--				
July 5	2250	--		20	3830	210		--	--	--	--	--	--	--				
July 6	0755	--		5.5	400	5.9		--	--	--	--	--	--	--				
July 6	1140	77		1.5	560	2.3		--	--	--	--	--	--	--				
Aug. 11	1620	--		6.6	220	3.9		--	--	--	--	--	--	--				
Aug. 11	1650	--		49	10100	1340		--	--	--	--	--	--	--				
Aug. 11	1730	--		21	6110	350		--	--	--	--	--	--	--				
Aug. 11	1820	74		12	3200	100		--	--	--	--	--	--	--				
Aug. 11	1930	73		5.1	1610	22		--	--	--	--	--	--	--				
Aug. 12	1115	75		E .3	60	T		--	--	--	--	--	--	--				
Aug. 14	0910	68		120	5270	1710		--	--	--	--	--	--	--				
Aug. 14	1015	68		114	2680	820		--	--	--	--	--	--	--				
Aug. 14	1530	67		315	1740	1480		--	--	--	--	--	--	--				
Sept. 14	1650	68		125	1180	400		--	--	--	--	--	--	--				
Sept. 14	1840	68		82	900	200		--	--	--	--	--	--	--				
Sept. 20	1030	62		8	310	6.7		--	--	--	--	--	--	--				
Sept. 20	1200	62		11	1090	32		--	--	--	--	--	--	--				
Sept. 20	1355	63		11	1630	48		--	--	--	--	--	--	--				

E Estimated.
T Less than 0.05 ton.

Periodic determinations of suspended-sediment discharge and particle size, water year October 1965 to September 1966
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspeded sediment: Percent finer than size indicated, in millimeters										Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
POTOMAC RIVER BASIN--Continued																	
1-6504.7. LUTES RUN AT LUTES, MD. (lat 39°04'24", long 77°03'08)																	
Oct. 1, 1965	1135	67		2.6	260	1.8											
Oct. 7	1215	62		3.1	690	5.8											
Oct. 7	1245	59		4.1	1030	11											
Oct. 7	315	60		6.4	2480	43											
Oct. 7	1345	60		12	2500	81											
Oct. 7	1400	60		15	2810	110											
Oct. 7	1430	59		90	3660	890											
Oct. 7	1525	60		31	3250	270											
Oct. 7	1555	60		320	4450	3840											
Oct. 7	1625	60		320	3860	3340											
Oct. 7	1655	60		215	3050	1770											
Oct. 7	1735	60		60	3270	530											
Oct. 7	1910	60		22	3030	180											
Oct. 7	1958	59		6.4	1110	19											
Oct. 8	1300	60		2.2	18	.1											
Jan. 6, 1966	0600	43		5.5	1350	20											
Feb. 10	1325	36		2.2	700	4.2											
Feb. 11	0920	36		2.8	1240	9.4											
Feb. 13	0215	37		1.9	1530	7.8											
Feb. 13	0315	38		2.2	1830	11											
Feb. 13	0835	37		10	3210	87											
Feb. 13	0945	40		9.4	3610	92											
Feb. 13	1040	41		13	2040	72											
Feb. 13	1115	38		64	5460	940		27	34	46	58	70	83	92	99	100		SCPW
Feb. 13	1150	38		56	6500	980											
Feb. 13	1215	38		36	4490	440											
Feb. 13	1245	38		18	4660	230											
Feb. 13	1315	--		18	2990	150											
Feb. 13	1345	--		18	4200	200											
Feb. 13	1415	--		28	3560	270											

Periodic determinations of suspended-sediment discharge and particle size, water year October 1965 to September 1966--Continued
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspeded sediment: Percent finer than size indicated, in millimeters										Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
POTOMAC RIVER BASIN--Continued																	
1-6504.7. LUTES RUN AT LUTES, MD. (lat 39°04'24", long 77°03'08)--Continued																	
Feb. 13, 1966	1500	44		16	5090	220											
Feb. 13	1540	40		210	17000	9640											
Feb. 28	1430	42		12	6090	200											
Feb. 28	2000	--		18	6230	300											
Feb. 28	2240	--		3.2	1550	13											
Apr. 12	1935	--		10	2980	80											
Apr. 12	2025	--		8.6	1820	42											
Apr. 12	2215	44		15	5140	210											
Apr. 12	2320	44		12	4590	150											
Apr. 13	0050	--		10	3450	93											
Apr. 13	0250	--		8.2	2100	46											
Apr. 13	0525	--		3.2	1270	11											
Apr. 13	1315	45		2.1	1370	7.8											
May 19	0340	64		3.2	5620	49											
May 27	1355	--		2.1	1470	8.3											
May 27	2005	69		6.3	7560	130											
May 28	2325	65		27	5560	410											
May 29	0005	65		8.6	3230	75											
July 5	1415	77		5.6	5010	76											
July 5	2215	--		5.6	4290	65											
Aug. 11	1530	80		21	4270	240											
Aug. 11	1550	78		98	4740	1250											
Aug. 11	1610	76		24	11800	760											
Aug. 11	1630	76		10	7620	210											
Aug. 11	1655	76		24	5770	370											
Aug. 11	1720	--		8.5	6160	140											
Aug. 11	1740	75		5.4	4600	67											
Aug. 11	1855	74		3.6	1880	18											
Sept. 14	0920	69		28	6020	460											
Sept. 14	1005	69		22	3270	190											
Sept. 14	1550	67		27	2580	190											
Sept. 14	1640	68		21	890	50											

3-0765. YOUGHIOGHENY RIVER AT FRIENDSVILLE, MD.

LOCATION.--Lat 39°39'13", long 79°24'31", temperature recorder at gaging station on left bank 0.7 mile upstream from bridge on State Highway 42 at Friendsville, Garrett County, and 1.5 miles upstream from Bear Creek.
DRAINAGE AREA.--295 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1962 to September 1966.
EXTREMES, 1965-66.--Water temperatures: Maximum, 83°F July 4; minimum, freezing point on many days in January and February.
EXTREMES, 1962-66.--Water temperatures: Maximum, 83°F July 22, 27, 28, 1964, July 4, 1966; minimum, freezing point on many days during winter months.
REMARKS.--Records fair, probably because of friction in recorder.

Temperature (°F) of water, water year October 1965 to September 1966
(Continuous ethyl alcohol-actuated thermograph)

Month	Day																														Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October																																
Maximum	67	64	60	57	54	57	57	59	57	55	56	56	54	56	59	60	59	56	57	58	58	57	57	52	50	50	50	50	47	47	49	56
Minimum	63	60	56	52	52	51	55	56	55	52	52	54	50	50	55	57	55	52	52	54	55	57	52	47	45	47	48	47	43	43	44	52
November																																
Maximum	48	48	51	51	49	51	51	51	51	48	49	50	50	47	46	49	49	42	42	41	40	42	43	42	41	43	45	42	39	38	--	46
Minimum	45	45	46	48	46	47	48	50	48	45	47	47	47	43	41	46	42	40	39	40	39	39	42	41	39	41	42	39	36	35	--	43
December																																
Maximum	37	38	38	38	37	36	36	37	37	38	39	41	42	41	40	39	39	37	36	35	36	37	37	39	38	37	35	36	35	38	42	38
Minimum	35	36	38	36	36	35	34	35	36	37	38	39	41	40	39	39	37	36	34	33	35	36	35	37	37	33	33	34	34	34	38	36
January																																
Maximum	42	41	42	40	38	40	40	40	34	36	35	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34
Minimum	41	41	40	38	37	38	40	34	34	34	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34
February																																
Maximum	32	32	32	32	32	32	32	32	32	32	34	36	37	38	39	39	38	37	38	37	34	34	36	36	36	35	36	38	--	--	--	35
Minimum	32	32	32	32	32	32	32	32	32	32	32	33	35	37	38	38	37	36	37	34	34	34	34	35	35	35	34	36	--	--	--	34
March																																
Maximum	38	39	42	44	43	42	38	36	38	41	42	44	46	48	48	46	46	49	49	48	46	50	54	53	45	42	41	39	41	40	41	44
Minimum	37	37	39	41	42	38	36	34	34	36	39	39	44	45	45	43	41	42	46	43	41	44	47	45	42	39	39	36	36	39	39	40
April																																
Maximum	43	43	42	41	41	41	41	42	42	42	44	44	40	42	44	46	49	50	51	55	56	55	55	56	55	55	54	49	49	50	--	47
Minimum	40	41	40	40	40	40	40	40	41	40	40	40	40	39	42	42	43	46	48	49	52	52	52	54	53	52	49	47	48	49	--	45
May																																
Maximum	51	51	52	53	55	59	59	61	61	53	51	53	54	58	62	61	64	64	65	64	65	66	67	67	68	68	67	67	68	65	61	61
Minimum	50	49	48	48	48	51	51	55	49	47	47	49	52	54	55	56	57	58	59	58	57	61	61	61	61	62	60	60	65	61	55	55
June																																
Maximum	56	60	62	67	72	72	66	66	71	68	66	72	74	69	68	65	68	71	73	74	72	74	75	76	79	76	80	80	76	77	--	71
Minimum	53	52	54	58	62	66	62	61	60	61	58	61	62	62	60	61	61	61	62	63	63	63	64	67	69	72	71	72	69	65	--	62
July																																
Maximum	77	79	80	83	77	75	74	74	75	78	77	71	72	73	68	71	73	76	72	72	71	71	72	70	76	76	74	69	72	69	71	74
Minimum	65	67	70	73	69	67	68	67	65	68	70	66	65	63	63	60	62	65	64	63	60	60	63	66	65	66	66	65	65	64	60	65
August																																
Maximum	72	67	73	69	72	73	71	76	73	76	71	71	67	68	72	72	73	75	73	71	73	76	71	68	67	70	70	72	73	73	73	72
Minimum	63	63	63	62	62	64	66	67	67	66	66	64	63	64	66	67	66	66	67	65	68	69	67	63	61	61	63	63	64	66	65	65
September																																
Maximum	73	73	73	73	73	69	64	66	68	67	70	68	65	64	64	63	63	63	64	64	61	61	60	59	56	58	57	60	59	58	--	65
Minimum	65	66	66	69	68	64	60	58	59	61	60	61	62	62	58	57	57	56	60	61	60	59	57	55	55	54	56	57	56	56	--	60

3-0780. CASSELMAN RIVER AT GRANTSVILLE, MD.

LOCATION.--Lat 39°42'08", long 79°08'12", at gaging station on left bank at downstream side of highway bridge, 0.3 mile upstream from Slaubough Run, 0.7 mile downstream from U.S. Highway 40, and 1.0 mile northeast of Grantsville, Garrett County.
DRAINAGE AREA.--62.5 square miles.
RECORDS AVAILABLE.--Chemical analyses: August 1965 to September 1966.

Chemical analyses, in parts per million, water year October 1965 to September 1966

Date of collection	Discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$		Phosphate (PO_4)	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
Oct. 25, 1965.	33	4.2		0.01	0.00	20	4.1	3.7	3.1	18	49	7.2	0.2	3.3	111	67	52	1.4	170	6.1	--
Nov. 19.....	24	4.1		.00	.00	23	4.5	4.0	1.5	36	40	10	.1	1.3	118	76	46	.16	195	6.6	4
Dec. 17.....	38	4.1		.00	.00	14	2.2	4.4	1.2	10	32	9.9	.2	1.0	76	44	36	.02	128	5.7	3
Jan. 5, 1966..	92	4.2		.00	.00	11	2.4	2.8	1.0	7	27	6.7	.1	1.2	61	38	32	.00	107	5.8	2
Mar. 17.....	155	2.7		.01	.00	7.1	1.9	2.5	.9	6	19	4.2	.2	1.4	53	26	21	.19	75	6.7	--
Apr. 19.....	197	3.5		.00	.03	8.0	1.6	2.4	.8	6	16	5.5	.1	1.8	45	26	22	.01	81	5.9	5
May 25.....	64	2.8		.01	.00	8.8	2.5	2.7	2.2	12	22	3.8	.1	2.1	50	33	23	1.2	97	6.6	5
July 13.....	2.6	2.8		.01	.00	18	5.2	4.7	1.8	21	49	5.9	.2	.1	100	67	50	.16	172	6.4	7
Aug. 8.....	.9	1.1		.01	.00	27	8.2	7.5	2.4	30	75	8.4	.1	4.2	157	100	76	.00	256	6.9	3
Sept. 6.....	2.3	1.7		.00	.02	34	10	6.8	2.2	32	98	9.0	.1	1.7	185	126	100	.40	297	6.9	3

MISCELLANEOUS ANALYSES OF STREAMS IN OHIO RIVER BASIN

Cheimcal analyses, in parts per million, water year October 1965 to September 1966

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$		Total acidity as H^{+1}	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
MONONGAHELA RIVER BASIN																					
3-0755. YOUGHIOGHENY RIVER NEAR OAKLAND, MD. (lat 39°25'19", long 79°25'32")																					
Oct. 19, 1965,A	20	5.0		0.02	0.15	14	3.4	2.0	1.4		59	2.3	0.2	0.0	99	49	49	0.23	161	4.3	3

A Phosphate (PO_4) 0.37.

INDEX

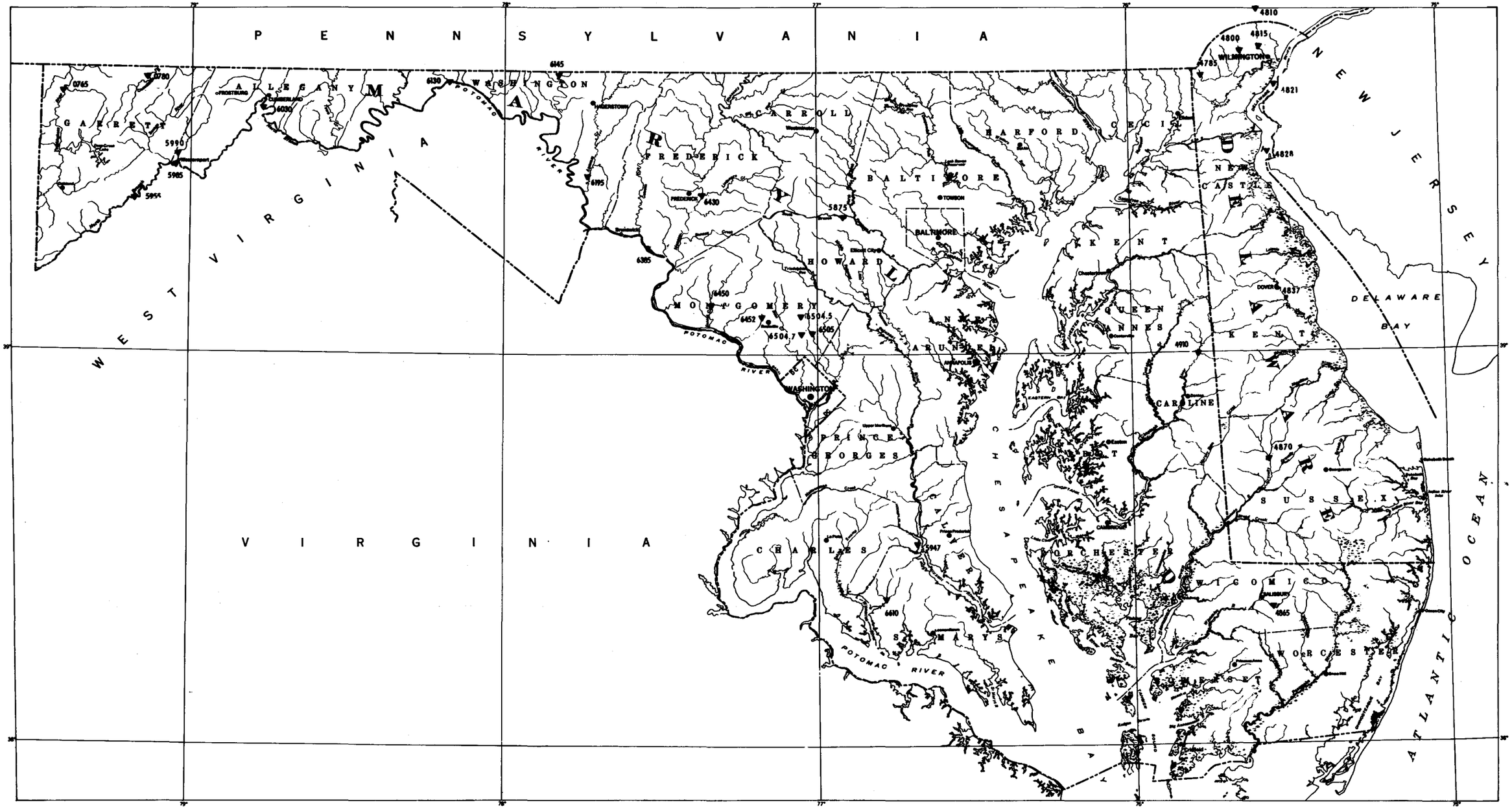

Plate 1. — Map showing location of quality of water stations.