

Quality of Surface Waters of the United States 1952

Parts 1-4. North Atlantic Slope Basins to St. Lawrence River Basin

Prepared under the direction of S. K. LOVE, Chief, Quality of Water Branch

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1250

*Prepared in cooperation with the States
of Delaware, Florida, Kentucky, New
York, North Carolina, Ohio, Pennsyl-
vania, South Carolina, Virginia, and
with other agencies*



UNITED STATES DEPARTMENT OF THE INTERIOR

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**For sale by the Superintendent of Documents, U. S. Government Printing Office
Washington 25, D. C. - Price \$1.25 (paper cover)**

PREFACE

This report was prepared by the Geological Survey in cooperation with the States of Delaware, Florida, Kentucky, New York, North Carolina, Ohio, Pennsylvania, South Carolina, and Virginia and other agencies, by personnel of the Water Resources Division under the direction of:

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CONTENTS

	Page
Introduction	1
Collection and examination of samples	3
Chemical quality	3
Suspended sediment	4
Temperature	5
Expression of results	6
Composition of surface waters	7
Mineral constituents in solution	8
Silica	8
Aluminum	8
Manganese	9
Iron	9
Calcium	9
Magnesium	9
Sodium and potassium	10
Carbonate and bicarbonate	10
Sulfate	10
Chloride	10
Fluoride	11
Nitrate	11
Boron	11
Dissolved solids	12
Properties and characteristics of water	12
Oxygen consumed	12
Color	12
Hydrogen-ion concentration	12
Specific conductance	13
Hardness	13
Total acidity	13
Corrosiveness	14
Percent sodium	14
Sediment	14
Publications	15
Cooperation	16
Division of work	19
Stream flow	19
Literature cited	19
Chemical analyses, water temperatures, and suspended sediment	21
Part 1-B. North Atlantic slope basins, New York to York River	21

Chemical analyses, etc. --Continued

North Atlantic slope basins, New York to York

River--Continued	Page
Hudson River basin	21
Mohawk River at Vischer Ferry Dam, N. Y.	21
Delaware River basin	24
Delaware River at Dingmans Ferry, Pa.	24
Lehigh River at Catasauqua, Pa.	27
Lehigh River at Walnutport, Pa.	30
Delaware River at Trenton, N. J.	33
Delaware River at Bristol, Pa. --Birlington, N. J. Bridge	40
Delaware River at Torresdale Intake, Philadelphia, Pa.	41
Delaware River at Lehigh Ave., Philadelphia, Pa. ..	41
Delaware River at Philadelphia, Pa. --Camden, N. J. Bridge	42
Delaware River at Wharton St., Philadelphia, Pa. ..	43
Delaware River at League Island, Philadelphia, Pa. ..	43
Schuylkill River at Landingville, Pa.	44
Little Schuylkill River at South Tamaqua, Pa.	48
Schuylkill River at Berne, Pa.	52
Perkiomen Creek at Graterford, Pa.	58
Schuylkill River at Manayunk, Philadelphia, Pa. ...	62
Schuylkill River at Belmont Filter Plant, Philadelphia, Pa.	66
Delaware River at Eddystone, Pa.	69
Delaware River at Marcus Hook, Pa.	70
Brandywine Creek at Wilmington, Del.	71
Miscellaneous analyses of streams in Delaware River basin	75
Susquehanna River basin	80
Susquehanna River at Towanda, Pa.	80
Susquehanna River at Falls, Pa.	84
Susquehanna River at Danville, Pa.	87
West Branch Susquehanna River at Lewisburg, Pa. ..	91
Juniata River at Newport, Pa.	94
Susquehanna River at Harrisburg, Pa.	100
Miscellaneous analyses of streams in Susquehanna River basin	102
Potomac River basin	103
Crabtree Creek near Swanton, Md.	103
Potomac River at Hancock, Md.	104
North Fork Shenandoah River near Strasburg, Va.	105
Linganore Creek near Frederick, Md.	106
Miscellaneous analyses of streams in Potomac River basin in Virginia	107
Rappahannock River basin	108
Hazel River at Rixeyville, Va.	108
Rappahannock River at Remington, Va.	113

Chemical analyses, etc.--Continued

North Atlantic slope basins, New York to York

River--Continued

Rappahannock River basin--Continued Page

Rapidan River near Culpeper, Va. 119

York River basin 124

Hudson Creek near Boswells Tavern, Va. 124

Pamunkey River near Hanover, Va. 126

Mattaponi River near Beulahville, Va. 127

Part 2-A. South Atlantic slope basins, James River to

Savannah River 128

James River basin 128

James River at Buchanan, Va. 128

James River at Scottsville, Va. 132

James River near Richmond, Va. 138

Appomattox River near Petersburg, Va. 139

Chowan River basin 140

Blackwater River near Franklin, Va. 140

North Meherrin River near Lunenburg, Va. 141

Roanoke River basin 142

Roanoke River at Lafayette, Va. 142

Otter River near Evinston, Va. 143

Cub Creek at Phenix, Va. 144

Roanoke River at Randolph, Va. 145

Roanoke Creek at Saxe, Va. 148

Dan River at South Boston, Va. 149

Roanoke River at Buggs Island, Va. 152

Miscellaneous analyses of streams in Roanoke

River basin in North Carolina 153

Pamlico River basin. 154

Miscellaneous analyses of streams in Pamlico

River basin in North Carolina 154

Neuse River basin 155

Swift Creek near Vanceboro, N. C. 155

Trent River near Trenton, N. C. 158

Miscellaneous analyses of streams in Neuse River

basin in North Carolina 161

Cape Fear River basin 162

Reedy Fork near Gibsonville, N. C. 162

Miscellaneous analyses of streams in Cape Fear

River basin in North Carolina 165

Lockwoods Folly basin 166

Miscellaneous analyses of streams in Lockwoods

Folly basin in North Carolina 166

Pee Dee River basin 167

Yadkin River at Yadkin College, N. C. 167

Big Bear Creek near Albemarle, N. C. 171

Lynches River at Effingham, S. C. 172

Miscellaneous analyses of streams in Pee Dee

River basin in North Carolina 173

Chemical analyses, etc. --Continued	
South Atlantic slope basins, James River to	
Savannah River--Continued	
Pee Dee River basin--Continued	
Miscellaneous analyses of streams in Pee Dee	Page
River basin in South Carolina	176
Santee River basin	177
Indian Creek near Laboratory, N. C.	177
North Pacolet River at Fingerville, S. C.	178
Santee River near Pineville, S. C.	179
Miscellaneous analyses of streams in Santee River	
basin in North Carolina	180
Miscellaneous analyses of streams in Santee River	
basin in South Carolina	182
Edisto River basin	184
Miscellaneous analyses of streams in Edisto River	
basin in South Carolina	184
Savannah River basin.....	185
Savannah River near Iva, S. C.	185
Miscellaneous analyses of streams in Savannah	
River basin in South Carolina.....	186
Part 2-B. South Atlantic slope and Eastern Gulf of	
Mexico basins, Ogeechee River to Pearl River	187
Lake Okeechobee and the Everglades.....	187
Lake Okeechobee 5 miles north of Clewiston, Fla....	187
West Palm Beach Canal at Loxahatchee, Fla.....	188
Hillsboro Canal at Shawano, Fla.....	190
North New River Canal at Holloway Lateral near	
Fort Lauderdale	191
Miscellaneous analyses of streams in Lake	
Okeechobee and the Everglades in Florida	192
Escambia River basin	197
Escambia River near Century, Fla.	197
Pearl River basin	199
Miscellaneous analyses of streams in Pearl River	
basin in Louisiana.....	199
Part 3-A. Ohio River basin except Cumberland and	
Tennessee River basins	200
Conewango Creek basin	200
Conewango Creek at Russell, Pa.	200
Clarion River basin	203
Clarion River near Piney, Pa.	203
Allegheny River at Kittanning, Pa. (main stem)	206
Allegheny River at Sharpsburg, Pa. (main stem)	209
Monongahela River basin	211
Monongahela River at Charleroi, Pa.	211
Ohio River at Ambridge, Pa. (main stem)	214
Beaver River basin	219
Beaver River at New Brighton, Pa.	219
Mahoning River at Leavittsburg, Ohio	222
Mahoning River at Niles, Ohio	224

Chemical analyses, etc. --Continued

Ohio River basin except Cumberland and Tennessee

River basins--Continued

	Page
Beaver River basin--Continued	
Mahoning River at Youngstown, Ohio.....	225
Mahoning River at Lowellville, Ohio.....	226
Kanawha River basin	230
New River near Galax, Va.	230
New River at Glenlyn, Va.	231
Miscellaneous analyses of streams in Kanawha River basin in North Carolina	232
Raccoon Creek basin	233
Raccoon Creek at Adamsville, Ohio	233
Big Sandy River basin	236
Levisa Fork at Paintsville, Ky.	236
Scioto River basin	239
Scioto River near Prospect, Ohio	239
Olentangy River near Delaware, Ohio	243
Big Walnut Creek at Central College, Ohio	244
Licking River basin	250
Licking River near Salyersville, Ky.....	250
Licking River at Farmers, Ky.	251
South Fork Licking River at Cynthiana, Ky.	252
Miami River basin	253
Miami River at Dayton, Ohio	253
Kentucky River basin.....	257
North Fork Kentucky River at Hazard, Ky.	257
Kentucky River at Lock 4 at Frankfort, Ky.....	258
Eagle Creek at Glencoe, Ky.....	261
Salt River basin	262
Rolling Fork near Boston, Ky.	262
Miscellaneous analyses of streams in Salt River basin in Kentucky	264
Green River basin	265
Green River at Greensburg, Ky.....	265
Green River at Munfordville, Ky.....	266
Barren River at Bowling Green, Ky.....	272
Pond River at Jewel City, Ky.....	273
Rough River at Dundee, Ky.	274
Tradewater River basin	275
Tradewater River at Olney, Ky.....	275
Part 3-B. Cumberland and Tennessee River basins.....	278
Cumberland River basin	278
Cumberland River near Harlan, Ky.	278
Cumberland River at Barbourville, Ky.	279
Cumberland River at Williamsburg, Ky.	280
Rockcastle River at Billows, Ky.	283
Cumberland River near Burkesville, Ky.	284
Cumberland River at Smithland, Ky.....	287
Tennessee River basin	288
Mills River near Mills River, N. C.	288

Chemical analyses, etc. --Continued

Cumberland and Tennessee River basins--Continued

Tennessee River basin--Continued	Page
Mud Creek at Naples, N. C.	291
Big Laurel Creek near Stackhouse, N. C.	292
South Toe River at Newdale, N. C.	295
Cane River near Sioux, N. C.	296
South Fork Holston River at Vestal, Va.	299
North Fork Holston River at Holston, Va.	300
Clinch River at Speers Ferry, Va.	304
Tennessee River near Paducah, Ky.	305
Miscellaneous analyses of streams in Ohio River basin in Pennsylvania (main stem)	306
Part 4. St. Lawrence River basin	307
Streams Tributary to Lake Michigan	307
Black River near Garnet, Mich.	307
East Branch Pine River near Tustin, Mich.	308
Pine River near Hoxeyville, Mich.	309
Streams Tributary to Lake Huron	310
Pigeon River near Vanderbilt, Mich.	310
Au Sable River at Mio, Mich.	311
Au Gres River near National City, Mich.	312
East Branch Au Gres River at McIvor, Mich.	313
Houghton Creek near Lupton, Mich.	314
Rifle River at "The Ranch" near Lupton, Mich.	315
Prior Creek near Selkirk, Mich.	316
Rifle River at Selkirk, Mich.	317
West Branch Rifle River near Selkirk, Mich.	318
Lake Erie	319
Miscellaneous analyses of water, Lake Erie	319
Streams Tributary to Lake Erie	322
Tenmile Creek at Toledo, Ohio	322
Maumee River at Waterville, Ohio	323
Swan Creek at Toledo, Ohio	329
Maumee River at Toledo, Ohio	330
Portage River at Woodville, Ohio	332
Portage River at Elmore, Ohio	336
Sandusky River near Fremont, Ohio	338
Huron River at Milan, Ohio	343
Vermilion River near Vermilion, Ohio	344
Black River near Elyria, Ohio	345
Rocky River at Cleveland, Ohio	347
Cuyahoga River at Brecksville, Ohio	348
Cuyahoga River at Independence, Ohio	349
Cuyahoga River at Cleveland, Ohio	353
Doan Brook at Cleveland, Ohio	355
Euclid Creek at Cleveland, Ohio	356
Chagrin River near Willoughby, Ohio	357
Grand River at Painesville, Ohio	358
Miscellaneous analyses of streams tributary to Lake Erie in Ohio	360

CONTENTS

XI

	Page
Index	361

ILLUSTRATION

Figure 1. Map of the United States showing basins covered by the four water-supply papers on quality of sur- face waters in 1952.	2
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QUALITY OF SURFACE WATERS OF THE UNITED STATES, 1952

PARTS 1-4

INTRODUCTION

The quality-of-water investigations of the United States Geological Survey are concerned with chemical and physical characteristics of the surface and ground water supplies of the Nation. Most of the investigations carried on in cooperation with States and other Federal agencies deal with the amounts of matter in solution and in suspension in streams.

The records of chemical analysis, suspended sediment, and temperature for surface waters given in this volume serve as a basis for determining the suitability of the waters examined for industrial, agricultural, and domestic uses insofar as such use is affected by the dissolved or suspended mineral matter in the waters. The discharge of a stream and, to a lesser extent, the chemical quality are related to variations in rainfall and other forms of precipitation. In general, lower concentrations of dissolved solids may be expected during the periods of high flow than during periods of low flow. The concentration in some streams may change materially with relatively small variations in flow, whereas for other streams the quality may remain relatively uniform throughout large ranges in discharge. The quantities of suspended sediment carried by streams are also related to discharge, and during flood periods the sediment concentrations in many streams vary over wide ranges.

The regular yearly publication of records of chemical analyses, suspended sediment, and water temperature was begun by the Geological Survey in 1941. The annual records prior to 1948 were published in a single volume for the entire country. Beginning in 1948, the records were published in two volumes, and beginning in 1950, in four volumes, covering the drainage basins shown in figure 1. The samples for which data are given were collected from October 1, 1951, to September 30, 1952. Descriptive statements are given for each sampling station for which regular series of chemical analyses or sediment determinations have been made. These statements include the location of the stream-sampling station, drainage area, length of time for which records are available, extremes of dissolved solids, hardness, sediment loads, water temperature, and other pertinent data. Records of water discharge of the streams at, or near, the sampling point for the sampling period are included in most tables of analyses. The records are arranged by drainage basins, according to Geological Survey practice in reporting records of stream flow.

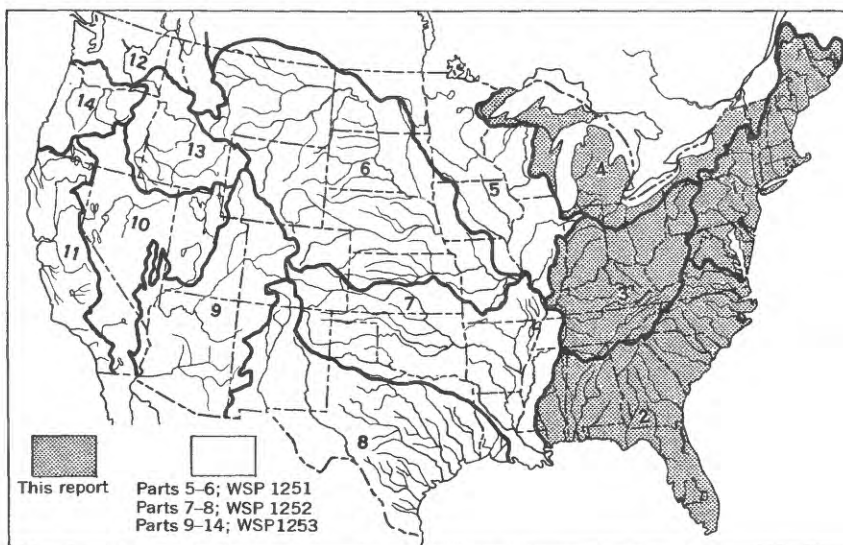


Figure 1. Map of the United States showing basins covered by the four water-supply papers on quality of surface waters in 1952. The shaded portion represents the section of the country covered by this volume; the unshaded portion represents the section of the country covered by other water-supply papers.

Beginning with the series of reports for the water year ending September 30, 1951, the order of listing station records has been changed. In this report, stations on tributary streams are listed between stations on the main stream in the order in which those tributaries enter the main stem. Stations on tributaries to tributaries are inserted in a similar manner.

During the year ended September 30, 1952, 99 regular sampling stations on 77 streams for the study of the chemical character of surface waters were maintained by the Geological Survey in the area covered by this volume. Samples were collected less frequently during the year at many other points. Water temperatures were measured daily at 77 of the regular sampling stations. Not all analyses of samples of surface water collected during the year have been included. Single analyses of an incomplete nature generally have been omitted. Also, determinations made on the daily samples before compositing have not been reported. Specific conductance was usually determined on each daily sample, and pH, chloride, or other determinations were also made on many of the daily samples. As noted in the table headings these data are available for reference at the district offices listed under Division of Work, on pages 17-18.

Quantities of suspended sediment are reported for 25 stations during the year ended September 30, 1952. The sediment samples were collected one or more times daily at most stations, depending on the rate of flow and changes in stage of the

stream. Sediment samples were collected less frequently during the year at many other points. In connection with measurements of sediment discharge, sizes of sediment particles were determined at 21 of the stations. As noted under "Remarks" in the table headings, suspended-sediment concentrations also were determined from the samples collected for chemical analysis in some parts of the country. The data do not provide a reliable basis for computing the loads of suspended sediment carried by the stream but may be of value for design and operation of filtration plants utilizing these stream waters. Records of these infrequent determinations are available for reference in the district offices listed.

Material which is transported essentially in continuous contact with the stream bed is termed bed load and is not considered in this report. All other undissolved material in transport is termed suspended sediment and generally constitutes the major part of the total sediment load. At the present time no reliable method has been developed for determining bed load on a routine basis.

COLLECTION AND EXAMINATION OF SAMPLES

CHEMICAL QUALITY

Samples for chemical analysis were usually collected daily at, or near, points on streams where gaging stations are maintained for measurement of water discharge. Most of the analyses were made on 10-day composites of daily samples collected for a period of a year at each sampling point. Three composite samples were usually prepared each month by mixing together equal volumes of daily samples collected from the 1st to the 10th, from the 11th to the 20th, and during the remainder of the month. For some streams that are subject to sudden and large changes in chemical composition or concentration, samples were composited for shorter periods on the basis of the concentration of dissolved solids indicated by measurements of specific conductance of the daily samples.

The samples were analyzed according to methods regularly used by the Geological Survey. These methods are essentially the same as or are modifications of methods described in recognized authoritative publications for the mineral analysis of water samples (Collins, 1928; Am. Public Health Assoc., 1946).

For those waters containing moderately large quantities of soluble salts, the value reported for dissolved solids is the sum of the quantities of the various determined constituents using the carbonate equivalent of the reported bicarbonate. In other analyses the value reported as dissolved solids is the residue on evaporation after drying at 180°C for 1 hour. Specific conductance is given for most analyses and was determined by means of a conductance bridge using a standard potassium chloride solution as reference.

SUSPENDED SEDIMENT

In general, samples were collected daily with the US D-43 depth-integrating sampler (U. S. Inter-agency, 1948, p. 70-76) from a fixed sampling point at one vertical in the cross section. The US DH-48 hand sampler was used at many stations during periods of low flow. Suspended-sediment samples, consisting of depth-integrated samples at three or more verticals in the cross section were made periodically to determine the cross-sectional distribution of the suspended concentration with respect to that at the daily sampling vertical. In streams where comparatively rapid fluctuations in transverse distribution of water discharge or sediment concentration are encountered at the sampling point, samples were taken regularly at two or more verticals to determine the average concentration across the section. During periods of high flow, samples were taken two or more times throughout the day at many sampling stations, and during periods of rapidly changing flow samples were taken hourly at some stations.

Sediment concentrations were determined by filtration or evaporation of the samples as required. At many stations the mean daily concentration for some days was obtained by plotting the instantaneous concentrations on the original or copies of the original gage-height chart. The plotted concentrations adjusted, if necessary, for cross-sectional distribution with respect to that at the daily sampling vertical, were connected or averaged by continuous curves to obtain a concentration graph. This graph represented the estimated concentration at any time and, for most periods, mean daily concentrations were determined from the graph. When the concentration and water discharge were changing rapidly, the day was often subdivided for this computation. For some periods when the day-to-day variation in the concentration was negligible, the data were not plotted, and the average concentration of the samples was used as the mean concentration for the day. For certain stations, when the discharge and sediment concentrations were relatively low and varied only slightly from day to day, the samples for a number of days were composited and the mean daily concentrations and mean daily loads are shown.

For some periods when no samples were collected, daily sediment loads were estimated on the basis of water discharge, sediment concentrations observed immediately preceding and following the periods, and sediment loads for other periods of similar discharge. The estimates were further guided by weather conditions and sediment discharge for other stations.

In many instances where there were no observations for several days, the sediment loads for individual days are not estimated, as numerous factors influencing the quantities of transported sediment made it very difficult to make accurate estimates of sediment loads for individual days. However, estimated sedi-

ment loads for missing days in an otherwise continuous period of sampling have been included in monthly and annual totals for most streams to provide a complete record.

In addition to the records of total quantities of sediment, records of the particle sizes of sediment are included also. The particle sizes of the suspended sediments were determined periodically for many of the stations. As much of the material carried in suspension can pass through the finest sieves, the bottom-withdrawal tube method (U. S. Inter-agency, 1943, p. 82-90) was used in most of the analyses. Generally, sieves were used in the determination of particle sizes for sediments which were predominantly coarser than 0.062 mm. Size distribution for some sediments was determined by a combination of sieves and pipette methods in which the size fraction 0.062 mm and larger was analyzed by sieves and that smaller than 0.062 mm was analyzed by the pipette method (Kilmer and Alexander, 1949). Native or distilled water, as noted in the tables of analyses, was used as the settling medium. In some instances, chemical dispersing agents were added to the settling medium. As settling diameters of the clay and colloidal fractions are often affected by the chemical character of the settling medium, analyses made using native water may more nearly simulate particle sizes existing in the stream. Results of analyses using distilled water or using a settling medium containing dispersing agents approximate ultimate particle sizes of the finer fractions. The concentration of sediment suspension for analysis was reduced to less than 5,000 parts per million, where necessary, by means of a sample splitter, in order to stay within limits recommended for the bottom-withdrawal tube or pipette method. The concentration of suspended sediment used in the bottom-withdrawal tube or pipette cylinder was often different from the concentration in the original suspension. The concentration at which analyses were made is indicated in the appropriate tables.

TEMPERATURE

For most of the stations, daily water temperatures were obtained at the time that the chemical quality or sediment samples were collected. So far as practicable the water temperatures were observed at about the same time each day for an individual river station in order that the data would be relatively unaffected by diurnal variations in temperature. For most large, swiftly flowing streams the diurnal variation in water temperature is probably small, but for sluggish or shallow streams the daily range in temperature may amount to several degrees and may follow closely changes in air temperature. The thermometers used for determination of water temperature were accurate to plus or minus about 0.5°F.

Records of the thermograph observations consist of maximum and minimum temperatures for each day, and the monthly averages of the maximum daily and minimum daily temperatures.

EXPRESSION OF RESULTS

The dissolved mineral constituents are reported in parts per million. A part per million is a unit weight of a constituent in a million unit weights of water. Equivalents per million are not given in this report although the expression of analyses in equivalents per million is sometimes preferred. An equivalent per million is a unit chemical combining weight of a constituent in a million unit weights of water and is calculated by dividing the concentration in parts per million by the chemical combining weight of the constituent. For convenience in making this conversion the reciprocals of chemical combining weights of the most commonly reported constituents (ions) are given in the following table:

Constituent	Factor	Constituent	Factor
Iron (Fe++)	0.0358	Carbonate (CO_3^{--}) . .	0.0333
Iron (Fe++) . . . . .	.0537	Bicarbonate (HCO_3^-) .	.0164
Calcium (Ca}^{++}) . . . . .	.0499	Sulfate (SO_4^{--}) . . . . .	.0208
Magnesium (Mg}^{++}) . . .	.0822	Chloride (Cl}^-) . . . . .	.0282
Sodium (Na}^+) . . . . .	.0435	Fluoride (F}^-) . . . . .	.0526
Potassium (K}^+) . . . . .	.0256	Nitrate (NO_3^-) . . . . .	.0161

Results given in parts per million can be converted to grains per United States gallon by dividing by 17.12. A calculated quantity of sodium and potassium is given in some analyses and is the quantity of sodium needed in addition to the calcium and magnesium to balance the acid constituents.

The hardness, as calcium carbonate (CaCO_3), is calculated from the equivalents of calcium and magnesium except for a few samples for which the reported values also include equivalents of free mineral acid, aluminum, iron, and manganese when present in significant quantities. The hardness caused by calcium and magnesium (and other ions if significant) equivalent to the carbonate and bicarbonate is called carbonate hardness; the hardness in excess of this quantity is called noncarbonate hardness.

In the analyses of most waters used for irrigation, the quantity of dissolved solids is given in tons per acre-foot as well as in parts per million. Percent sodium has been computed for those analyses where sodium and potassium are reported separately by dividing the equivalents per million of sodium by the sum of the equivalents per million of calcium, magnesium, sodium, and potassium and multiplying the quotient by 100. In analyses where sodium and potassium were calculated and reported as a combined value, the value reported for percent sodium will include the equivalent quantity of potassium. In most waters of moder-

ate to high concentration, the proportion of potassium is much smaller than that of sodium.

Specific conductance values are expressed in reciprocal ohms times 10^6 (micromhos at 25°C). The discharge of the streams is reported in cubic feet per second (See Stream Flow, p. 19) and the temperature in degrees Fahrenheit. Color is expressed in units of the platinum-cobalt scale proposed by Hazen (1892, p. 427-428). Hydrogen-ion concentration (pH) is given as the negative logarithm of the number of moles of ionized hydrogen per liter of water.

An average of analyses (arithmetical or weighted) for the water year is given for most daily sampling stations. An arithmetical average represents the composition of water that would be contained in a vessel or reservoir that had received equal quantities of water from the river each day for the water year. A weighted average represents approximately the composition of water that would be found in a reservoir containing all of the water passing a given station during the year after thorough mixing in the reservoir. The weighted average of the analyses is computed by multiplying the discharge for the sampling period by the quantities of the individual constituents for the corresponding period and dividing the sum of the products by the sum of the discharges. Water as represented by the weighted average is less concentrated than that represented by the average of the individual analyses for most streams because at times of high discharge the rivers generally have lower concentrations of dissolved solids.

Mean daily sediment concentrations are expressed in parts per million by weight. A part per million of sediment is computed as 1,000,000 times the ratio of the weight of sediment to the weight of water-sediment mixture. Daily sediment loads are expressed in tons per day, and except for subdivided days are usually obtained by multiplying daily mean sediment concentration in parts per million by the daily mean discharge, and the appropriate conversion factor, normally 0.0027.

Particle-size analyses are expressed in percentages finer than indicated sizes in millimeters. The size classification used in this report is that recommended by the American Geophysical Union Subcommittee on sediment terminology (Lane, et al; 1947, p. 937). Other data included as pertinent to the size analyses for many streams are the date of collection, the stream discharge and sediment concentration when sample was collected, the concentration of the suspension during analysis, and the method of analysis.

COMPOSITION OF SURFACE WATERS

All natural waters contain dissolved mineral matter. Water in contact with soils or rock, even for only a few hours, will dissolve some rock materials. The quantity of dissolved mineral matter in a natural water depends primarily on the type of rocks or soils through which the water has passed and the length

of time it has been in contact with the rocks or soils. Some streams are fed by both surface runoff and underground water from springs or seeps. Such streams reflect the chemical character of their concentrated underground sources during dry periods and are more dilute during periods of heavy rainfall. Underground water is usually more highly concentrated than surface runoff as it remains in contact with the rocks and soils for much longer periods. The concentration of dissolved solids in a river water is frequently increased by drainage from mines or oil fields, by the addition of industrial or municipal wastes, or--in irrigated regions--by return drain waters.

The mineral constituents and physical properties of natural waters reported in the tables of analyses include those that have a practical bearing on the value of the waters for most purposes. The analyses generally include results for silica, iron, calcium, magnesium, sodium, potassium (or sodium and potassium together as sodium), bicarbonate, sulfate, chloride, fluoride, nitrate, boron, and dissolved solids. Aluminum, manganese, color, pH, acidity, oxygen consumed, and other dissolved constituents and physical properties are reported for certain streams. The source and significance of the different constituents and properties of natural waters are discussed in the following paragraphs.

MINERAL CONSTITUENTS IN SOLUTION

Silica (SiO_2)

Silica is dissolved from practically all rocks. Some natural surface waters contain less than 5 parts per million of silica and few contain more than 50 parts, but the more common range is from 10 to 30 parts per million. Silica affects the usefulness of a water because it contributes to the formation of boiler scale; it usually is removed from feed water for high-pressure boilers. Silica also forms troublesome deposits on the blades of steam turbines.

Aluminum (Al)

Aluminum is usually present only in negligible quantities in natural waters except in areas where the waters have been in contact with the more soluble rocks of high aluminum content such as bauxite and certain shales. Acid waters often contain large amounts of aluminum. It may be troublesome in feed waters where it tends to be deposited as a scale on boiler tubes.

Manganese (Mn)

Manganese is dissolved in appreciable quantities from rocks in some sections of the country. Waters impounded in large reservoirs may contain manganese that has been dissolved from the mud on the bottom of the reservoir by action of carbon dioxide produced by anaerobic fermentation of organic matter. Manganese is not regularly determined in areas where it is not present in the waters in appreciable amounts. It is especially objectionable in water used in laundry work and in textile processing. Concentrations as low as 0.2 part per million may cause a dark-brown or black stain on fabrics and porcelain fixtures. Appreciable quantities of manganese are often found in waters containing objectionable quantities of iron.

Iron (Fe)

Iron is dissolved from many rocks and soils. On exposure to the air, normal basic waters that contain more than 1 part per million of iron soon become turbid with the insoluble reddish ferric oxide produced by oxidation. Surface waters, therefore, seldom contain as much as 1 part per million of dissolved iron, although some acid waters carry large quantities of iron in solution. Iron causes reddish-brown stains on white porcelain or enameled ware and fixtures and on fabrics washed in the water.

Calcium (Ca)

Calcium is dissolved from practically all rocks and soils, but the highest concentrations are usually found in waters that have been in contact with limestone, dolomite, and gypsum. Calcium and magnesium make water hard and are largely responsible for the formation of boiler scale. Most waters associated with granite or silicious sands contain less than 10 parts per million of calcium; waters in areas where rocks are composed of dolomite and limestone contain from 30 to 100 parts per million; and waters that have come in contact with deposits of gypsum may contain several hundred parts per million.

Magnesium (Mg)

Magnesium is dissolved from many rocks, particularly from dolomitic rocks. Its effect in water is similar to that of calcium. The magnesium in soft waters may amount to only 1 or 2 parts per million, but water in areas that contain large quantities of dolomite or other magnesium-bearing rocks may contain from 20 to 100 parts per million or more of magnesium.

Sodium and potassium (Na and K)

Sodium and potassium are dissolved from practically all rocks. Sodium is the predominant cation in some of the more highly mineralized waters found in the western United States. Natural waters that contain only 3 or 4 parts per million of the two together are likely to carry almost as much potassium as sodium. As the total quantity of these constituents increases, the proportion of sodium becomes much greater. Moderate quantities of sodium and potassium have little effect on the usefulness of the water for most purposes, but waters that carry more than 50 or 100 parts per million of the two may require careful operation of steam boilers to prevent foaming. More highly mineralized waters that contain a large proportion of sodium salts may be unsatisfactory for irrigation.

Carbonate and bicarbonate (CO_3 and HCO_3)

Bicarbonate occurs in waters largely through the action of carbon dioxide, which enables the water to dissolve carbonates of calcium and magnesium. Carbonate as such is not usually present in appreciable quantities in natural waters. The bicarbonate in waters that come from relatively insoluble rocks may amount to less than 50 parts per million; many waters from limestone contain from 200 to 400 parts per million. Bicarbonate in moderate concentrations in water has no effect on its value for most uses. Bicarbonate or carbonate is an aid in coagulation for the removal of suspended matter from water.

Sulfate (SO_4)

Sulfate is dissolved from many rocks and soils--in especially large quantities from gypsum and from beds of shale. It is formed also by the oxidation of sulfides of iron and is therefore present in considerable quantities in waters from mines. Sulfate in waters that contain much calcium and magnesium causes the formation of hard scale in steam boilers and may increase the cost of softening the water.

Chloride (Cl)

Chloride is dissolved from rock materials in all parts of the country. Surface waters in the humid regions are usually low in chloride, whereas streams in arid or semiarid regions may contain several hundred parts per million of chloride leached from soils and rocks, especially where the streams receive return drainage from irrigated lands or are affected by ground-water inflow carrying appreciable quantities of chloride. Large quantities of chloride may affect the industrial use of water by in-

creasing the corrosiveness of waters that contain large quantities of calcium and magnesium.

Fluoride (F)

Fluoride has been reported as being present in some rocks to about the same extent as chloride. However, the quantity of fluoride in natural surface waters is ordinarily very small compared to that of chloride. Recent investigations indicate that the incidence of dental caries is less when there are small amounts of fluoride present in the water supply than when there is none. However, excess fluoride in water is associated with the dental defect known as mottled enamel if the water is used for drinking by young children during calcification or formation of the teeth (Dean, 1936, p. 1269-1272). This defect becomes increasingly noticeable as the quantity of fluoride in water increases above 1.5 to 2.0 parts per million.

Nitrate (NO_3)

Nitrate in water is considered a final oxidation product of nitrogenous material and in some instances may indicate previous contamination by sewage or other organic matter. The quantities of nitrate present in surface waters usually amount to less than 5 parts per million (as NO_3) and have no effect on the value of the water for ordinary uses.

It has been reported that as much as 2 parts per million of nitrate in boiler water tends to decrease intercrystalline cracking of boiler steel. Studies made in Illinois indicate that nitrates in excess of 70 parts per million (as NO_3) may contribute to methemoglobinemia ("blue babies") (Faucett and Miller, 1946, p. 593), and more recent investigations conducted in Ohio show that drinking water containing nitrates in the range of 44 to 88 parts per million or more (as NO_3) may be the cause of methemoglobinemia in infants (Waring, 1949). In a report published by the National Research Council, Maxcy (1950, p. 271) concludes that a nitrate content in excess of 44 parts per million (as NO_3) should be regarded as unsafe for infant feeding.

Boron (B)

Boron in small quantities has been found essential for plant growth, but irrigation water containing more than 1 part per million boron is detrimental to citrus and other boron-sensitive crops. Boron is reported in Survey analyses of surface waters in arid and semiarid regions of the Southwest and West where irrigation is practiced or contemplated, but few of the surface waters analyzed have harmful concentrations of boron.

Dissolved solids

The reported quantity of dissolved solids--the residue on evaporation--consists mainly of the dissolved mineral constituents in the water. It may also contain some organic matter and water of crystallization. Waters with less than 500 parts per million of dissolved solids are usually satisfactory for domestic and some industrial uses. Waters containing several thousand parts per million of dissolved solids are sometimes successfully used for irrigation where practices permit the removal of soluble salts through the application of large volumes of water on well-drained lands.

PROPERTIES AND CHARACTERISTICS OF WATER

Oxygen consumed

The value for oxygen consumed furnishes an approximation of the oxidizable matter in the unfiltered and filtered samples and gives a partial measure of polluting materials such as sewage and oxidizable industrial wastes. Naturally highly colored waters may have relatively high oxygen consumed, although waters that are not noticeably colored may contain oxidizable material.

Color

In water analysis the term "color" refers to the appearance of water that is free from suspended solids. Many turbid waters that appear yellow, red, or brown when viewed in the stream show very little color after the suspended matter has been removed. The yellow-to-brown color of some waters is usually caused by organic matter extracted from leaves, roots, and other organic substances in the ground. In some areas objectionable color in water results from industrial wastes and sewage. Clear deep water may appear blue as the result of a scattering of sunlight by the water molecules. Water for domestic use and some industrial uses should be free from any perceptible color. A color less than 10 usually passes unnoticed. Some swamp waters have natural color of 200 to 300 or more.

Hydrogen-ion concentration (pH)

The degree of acidity or alkalinity of water, as indicated by the hydrogen-ion concentration, expressed as pH, is related to the corrosive properties of water, and is useful in determining the proper treatment for coagulation that may be necessary at water-treatment plants. A pH value of 7.0 indicates that the water is neither acid nor alkaline. Waters having pH values progressively lower than 7.0 denote increasing acidity, whereas values progressively higher than 7.0 denote increasing alkalinity.

(See p. 7). The pH of most natural surface waters ranges between 6 and 8. Some alkaline surface waters have pH values greater than 8.0, and waters containing free mineral acid usually have pH values less than 4.5.

Specific conductance (micromhos at 25 C)

The specific conductance of a water is a measure of its capacity to conduct a current of electricity. The conductance varies with the concentration and degree of ionization of the different minerals in solution and with the temperature of the water. When considered in conjunction with results of determinations for other constituents, specific conductance is a useful determination and plays an important part in indicating changes in concentration of the total quantity of dissolved minerals in surface waters. (See p. 7 .)

Hardness

Hardness is the characteristic of water that receives the most attention in industrial and domestic use. It is usually recognized by the increased quantity of soap required to produce lather. The use of hard water is also objectionable because it contributes to the formation of scale in boilers, water heaters, radiators, and pipes, with the resultant decrease in rate of heat transfer, possibility of boiler failure, and loss of flow.

Hardness is caused almost entirely by compounds of calcium and magnesium. Other constituents--such as iron, manganese, aluminum, barium, strontium, and free acid--also cause hardness, although they usually are not present in quantities large enough to have any appreciable effect. Water that has less than 60 parts per million of hardness is usually rated as soft and suitable for many purposes without further softening. Waters with hardness ranging from 61 to 120 parts per million may be considered moderately hard, but this degree of hardness does not seriously interfere with the use of water for many purposes except for use in high-pressure steam boilers and in some industrial processes. Waters with hardness ranging from 121 to 200 parts per million are considered hard, and laundries and industries may profitably soften such supplies. Water with hardness above 200 parts per million usually requires some softening before being used for most purposes.

Total acidity

The total acidity of a natural water represents the content of free carbon dioxide, mineral acids, and salts--especially sulfates of iron and aluminum--that hydrolyze to give hydrogen ions. Acid waters are very corrosive and generally contain excessive amounts of objectionable constituents, such as iron, aluminum, and manganese.

Corrosiveness

The corrosiveness of a water is that property which makes the water aggressive to metal surfaces and frequently results in the appearance of the "red water" caused by solution of iron. The disadvantages of iron in water have been discussed previously. Additionally, corrosion causes the deterioration of water pipes, steam boilers, and water-heating equipment. Many waters that do not appreciably corrode cold-water lines will aggressively attack hot-water lines. Oxygen, carbon dioxide, free acid, and acid-generating salts are the principal constituents in water that cause corrosion. In a general way, very soft waters of low mineral content tend to be more corrosive than hard waters containing appreciable quantities of carbonates and bicarbonates of calcium and magnesium.

Percent sodium

Percent sodium is reported in most of the analyses of waters collected from streams in the western part of the country where irrigation is practiced extensively. The proportion of sodium to all the basic constituents in the water has a bearing on the suitability of a water for irrigation. (See p. 6 .) Waters in which the percent sodium is more than 60 may be injurious when applied to certain types of soils, particularly when adequate drainage is not provided (Magistad and Christiansen, 1944, p. 8-9; Wilcox, 1948, p. 6).

SEDIMENT

Fluvial sediment is generally regarded as that sediment which is transported by, suspended in, or deposited by water. Suspended sediment is that sediment which remains in suspension in water owing to the upward components of turbulent currents or by colloidal suspension. Most fluvial sediment results from the normal process of erosion, which in turn is part of the geologic cycle of rock transformation. In some instances, this normal process may have been accelerated by agricultural practices. Sediment also results from a number of industrial activities. In certain sections, waste materials from mining, logging, oil-field, and other industrial operations introduce large quantities of suspended as well as dissolved material.

The quantity of sediment, transported or available for transportation, is affected by climatic conditions, form or nature of precipitation, vegetal cover, topography, and land use. An important property of fluvial sediment is the fall velocity of the particles in transport. Particle sizes, as determined by various

methods, represent mechanical diameters, which are related to sedimentation diameters indirectly. Sediment particles in the sand-size (larger than 0.062 mm) range do not appear to be affected by flocculation or dispersion resulting from the mineral constituents in solution. The sedimentation diameter of clay and silt particles in suspension may vary considerably from point to point in a stream or reservoir, depending on the mineral matter in solution and in suspension and the degree of turbulence present. The size of sediment particles in transport at any point depends on the type of erodible and soluble material in the drainage area, the degree of flocculation present, time in transport, and characteristics of the transporting flow. The flow characteristics include velocity of water, turbulence, and the depth, width, and roughness of the channel. As a result of these variable characteristics, the size of particles transported, as well as the total sediment load, is in constant adjustment with the characteristics and physical features of the stream and drainage area.

PUBLICATIONS

Reports giving chemical analyses, suspended-sediment loads, and water temperatures of samples of surface water made by the Geological Survey have been published yearly since 1941. Records for the years ended September 30, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, and 1951, for many of the stations listed in this report are given in Water-Supply Papers 942, 950, 970, 1022, 1030, 1050, 1102, 1132, 1162, 1186, and 1197.

Geological Survey reports containing analyses of surface-water samples collected prior to 1941 are listed below. Publications dealing largely with the quality of ground-water supplies and only incidentally covering the chemical composition of surface-waters are not included. Publications that are out of print are preceded by an asterisk.

PROFESSIONAL PAPER

- *135. Composition of river and lake waters of the United States, 1924.

BULLETINS

- *479. The geochemical interpretation of water analyses, 1911.
- 770. The data of geochemistry, 1924.

WATER-SUPPLY PAPERS

- *108. Quality of water in the Susquehanna River drainage basin, with an introductory chapter on physiographic features, 1904.

- *161. Quality of water in the upper Ohio River basin and at Erie, Pa., 1906.
- *193. The quality of surface waters in Minnesota, 1907.
- *236. The quality of surface waters in the United States, Part 1, Analyses of waters east of the one hundredth meridian, 1909.
- *237. The quality of the surface waters of California, 1910.
- *239. The quality of the surface waters of Illinois, 1910.
- *273. Quality of the water supplies of Kansas, with a preliminary report on stream pollution by mine waters in southeastern Kansas, 1911.
- *274. Some stream waters of the western United States, with chapters on sediment carried by the Rio Grande and the industrial application of water analyses, 1911.
- *339. Quality of the surface waters of Washington, 1914.
- *363. Quality of the surface waters of Oregon, 1914.
- *418. Mineral springs of Alaska, with a chapter on the chemical character of some surface waters of Alaska, 1917.
- *596-B. Quality of water of Colorado River in 1925-26, 1928.
- *596-D. Quality of water of Pecos River in Texas, 1928.
- *596-E. Quality of the surface waters of New Jersey, 1928.
- *636-A. Quality of water of the Colorado River in 1926-28, 1930.
- *636-B. Suspended matter in the Colorado River in 1925-28, 1930.
- *638-D. Quality of water of the Colorado River in 1928-30, 1932.
- *839. Quality of water of the Rio Grande basin above Fort Quitman, Tex., 1938.
- *889-E. Chemical character of surface water of Georgia, 1944.
- *998. Suspended sediment in the Colorado River, 1925-41, 1947.
- 1048. Discharge and sediment loads in the Boise River drainage basin, Idaho, 1939-40, 1948.
- 1110-C. Quality of water of Conchas Reservoir, New Mexico, 1939-49, 1952.

Many of the reports listed are available for consultation in the larger public and institutional libraries. Copies of Geological Survey publications still in print may be purchased at a nominal cost from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., who will, upon request, furnish lists giving prices.

COOPERATION

The table on p. 17-18 lists State and local agencies that cooperated in quality-of-water investigations in the drainage basins included in this volume. The locations of quality-of-water district offices responsible for the data collected in the drainage basins are given in the table, also.

In addition to these cooperative programs, many of the stations were operated from funds appropriated directly to the Geo-

State	Cooperating agency	Drainage basin	District office
Delaware	Newcastle County Soil Conservation District Marvin V. Klair, president.	North Atlantic slope.	1302 Custom House, Philadelphia 6, Pa.
Florida	Florida Geological Survey, Herman Gunter, director. Central and Southern Florida Flood Control District.	South Atlantic slope and Eastern Gulf of Mexico.	P. O. Box 607, Ocala, Fla.
Kentucky	Agricultural and Industrial Development Board of Kentucky, George W. Hubley, Jr., executive director.	Ohio River.	2822 East Main Street, Columbus 9, Ohio.
New York	New York State Department of Commerce, Bureau of Business Promotion, Ronald J. Peterson, director.	North Atlantic slope.	P. O. Box 68, Room 348 Federal Building, Albany 1, N. Y.
North Carolina	North Carolina Department of Conservation and Development George R. Ross, director. ^a	South Atlantic slope and Eastern Gulf of Mexico.	P. O. Box 2857, Post Office Building, Raleigh, N. C.

^a Succeeded by Ben. E. Douglas, June 30, 1953 to Dec. 15, 1955, and William P. Saunders, Dec. 15, 1955 to present.

State	Cooperating agency	Drainage basin	District office
Ohio	Ohio Department of Natural Resources, A. W. Marion, director.	Ohio River, St. Lawrence River.	2822 East Main Street, Columbus 9, Ohio.
Pennsylvania	Pennsylvania Department of Commerce, Theodore Roosevelt III, secretary. Pennsylvania Department of Forests and Waters, M. F. Draemel, secretary.	North Atlantic slope, Ohio River, St. Lawrence River.	1302 Custom House, Philadelphia 6, Pa.
South Carolina	South Carolina Research, Planning, and Development Board, L. W. Bishop, director. ^b	South Atlantic slope and Eastern Gulf of Mexico.	P. O. Box 2857, Post Office Building, Raleigh, N. C.
Virginia	Virginia Department of Conservation and Development S. S. Kellam, director. ^c	North Atlantic slope, South Atlantic slope, Ohio River.	P. O. Box 3327, University Station, Charlottesville, Va.

^b Succeeded by R. M. Cooper, director, Sept. 1, 1955.

^c Succeeded by Raymond V. Long, March 1953.

logical Survey for quality-of-water investigations.

Assistance in collecting records was given by many municipal, State, and Federal agencies.

DIVISION OF WORK

The quality-of-water program was conducted by the Water Resources Division of the Geological Survey, Carl G. Paulsen, chief hydraulic engineer, and S. K. Love, chief of the Quality of Water Branch. The records were collected and prepared for publication under the supervision of district chemists as follows: In Florida, Eugene Brown; in North Carolina and South Carolina, G. A. Billingsley; in Virginia, M. E. Schroeder; in Ohio, W. L. Lamar; in Delaware and Pennsylvania, N. H. Beamer; and in New York, F. H. Pauszek. Any additional analytical data on file can be obtained by writing the responsible Survey district office.

STREAM FLOW

Most of the records of stream discharge, used in conjunction with the chemical analyses and in the computation of sediment loads in this volume, are published in Geological Survey reports on the surface-water supply of the United States. The discharge reported for a composite sample is usually the average of the mean daily discharges for the normal composite period. For analyses in which the composite periods differ from the normal 10 or 11-day period, the discharges reported are the averages of the mean daily discharges for the days indicated. The discharges reported in the tables of single analyses either are daily mean discharges or are discharges for the time at which samples were collected, computed from a stage-discharge relation or from a discharge measurement.

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CHEMICAL ANALYSES, WATER TEMPERATURES, AND SUSPENDED SEDIMENT

PART 1-B. NORTH ATLANTIC SLOPE BASINS, NEW YORK TO NEW YORK RIVER

HUDSON RIVER BASIN

MOHAWK RIVER AT VISCHER FERRY DAM, N. Y.

LOCATION --At bridge crossing headrace of Vischer Ferry Dam Power Plant operated by New York State Department of Public Works.

DRAINAGE AREA --3,385 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1951 to September 1952.

Water temperatures: February 1947 to September 1952.

EXTREMES, 1951-52.--Dissolved solids: Maximum, 175 ppm July 1-10; minimum, 82 ppm Apr. 21-30.

Hardness: Maximum, 115 ppm July 1-10, Aug. 11-20; minimum, 53 ppm Apr. 21-30.

Specific conductance: Maximum, 297 micromhos Sept. 18; minimum, 108 micromhos Apr. 24.

Temperatures: Maximum 84° F July 17; minimum, freezing point on many days during winter months.

REMARKS. Records of specific conductance of daily samples available in district office at Albany, N. Y. Records of discharge obtained from New York State Department of Public Works, Vischer Ferry Dam Power Plant.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium, magnesium	Non-carbonate				
Oct. 1-10, 1951..	2,528	5.9	5.9	0.0	0.00	0.00	34	5.1	8.8	1.9	101	28	9.0	0.0	3.3	158	108	23		250	7.4	10
Oct. 11-20	2,852	5.4	5.4	0.0	0.00	0.00	32	5.9	6.8	2.0	101	26	7.5	0.0	2.1	146	104	21		235	7.4	15
Oct. 21-31	2,520	4.7	4.7	0.0	0.00	0.00	34	5.1	7.0	2.0	104	25	8.0	0.0	2.6	149	106	21		240	7.5	15
Nov. 1-10	7,408	5.1	5.1	0.0	0.00	0.00	32	4.9	5.8	2.0	96	24	6.5	0.0	1.8	143	100	21		222	7.4	20
Nov. 11-20	4,215	5.5	5.5	0.06	0.00	0.00	32	4.9	4.9	1.9	99	22	5.5	0.0	1.8	139	100	19		221	7.5	25
Nov. 21-30	4,613	7.1	7.1	0.1	0.00	0.00	32	6.3	4.4	1.3	103	24	5.0	0.0	1.9	148	106	21		230	7.4	5
Dec. 1-10	7,371	6.6	6.6	0.1	0.00	0.00	33	5.0	4.2	1.1	101	22	5.5	0.0	2.0	144	108	20		227	7.5	10
Dec. 11-20	5,910	6.4	6.4	0.1	0.00	0.00	32	5.1	4.0	1.0	96	22	5.0	0.0	2.3	138	96	22		220	7.5	10
Dec. 21-31	5,924	8.6	8.6	0.2	0.00	0.00	31	5.0	4.2	0.9	95	20	6.0	0.0	2.4	136	98	20		218	7.4	10
Jan. 1-10, 1952 ..	10,280	8.7	8.7	0.0	0.00	0.00	30	5.0	3.6	0.9	91	19	4.2	0.0	2.0	136	96	21		202	7.6	15
Jan. 11-20	8,219	8.3	8.3	0.0	0.00	0.00	29	5.0	4.4	0.9	85	21	5.5	0.0	2.1	134	92	23		210	7.5	12
Jan. 21-31	7,866	7.6	7.6	0.0	0.00	0.00	27	6.1	3.9	0.9	83	24	5.8	0.0	2.3	126	92	24		193	7.5	15
Feb. 1-10	8,251	7.0	7.0	0.0	0.00	0.00	25	6.6	3.6	0.9	82	22	5.2	0.0	2.1	120	90	22		188	7.6	30
Feb. 11-20	2,474	6.8	6.8	0.0	0.00	0.00	29	6.2	4.5	0.9	95	23	5.9	0.0	2.0	138	98	20		210	7.5	18
Feb. 21-29	5,564	7.3	7.3	0.0	0.00	0.00	26	6.4	5.9	0.4	87	24	5.7	0.0	2.1	130	91	20		206	7.5	5
Mar. 1-10	2,844	7.7	7.7	0.0	0.00	0.00	27	8.8	3.5	0.4	93	25	6.2	0.0	1.9	142	104	27		226	7.4	5
Mar. 11-20	8,401	6.5	6.5	0.09	0.00	0.00	28	6.8	4.0	0.6	91	23	6.2	0.0	2.1	134	98	23		210	7.4	5
Mar. 21-31	14,002	7.0	7.0	0.10	0.00	0.00	25	5.9	2.9	0.4	85	19	3.0	0.0	1.6	116	87	17		182	7.4	3

HUDSON RIVER BASIN--Continued
 MOHAWK RIVER AT VISCHER FERRY DAM, N. Y.--Continued

Chemical analyses, in parts per million, water year October 1951 to September 1952.--Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180° C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25° C)	pH	Color
																	Calcium, magnesium	Non-carbonate				
Apr. 1-10, 1952...	20,926		7.5	--	0.13	--	22	3.9	3.0	0.4	74	15	1.1	0.1	1.3	102	71	10		137	7.5	5
Apr. 11-20	10,967		7.0	--	.11	--	19	4.9	3.7	.3	64	19	2.6	.1	1.4	100	68	15		149	7.4	5
Apr. 21-31	7,260		5.6	--	.12	--	14	4.4	4.8	.3	52	17	2.1	.1	1.3	82	53	10		128	7.4	5
May 1-10	2,935		7.4	--	.00	--	24	3.4	4.5	1.0	73	18	5.0	.1	1.4	103	54	14		163	7.3	4
May 11-20	6,613		6.9	--	.01	--	27	3.9	3.4	1.0	64	18	3.3	.1	1.1	113	63	11		177	7.4	7
May 21-31	7,131		5.9	--	.02	--	25	3.7	3.9	1.0	74	18	4.4	.1	1.3	109	78	17		168	7.3	4
June 1-10	5,438		5.5	--	.00	--	25	2.8	3.4	1.0	77	16	3.1	.1	1.6	105	74	11		168	7.5	10
June 11-20	2,132		4.7	--	.00	--	32	2.9	5.0	1.1	93	20	5.8	.2	1.3	135	92	16		214	7.4	10
June 21-30	1,648		3.7	--	.00	--	32	4.9	7.6	1.5	107	25	8.1	.1	2.0	156	110	22		249	7.4	8
July 1-10	2,377		3.4	--	.08	--	38	5.0	8.4	1.6	115	28	8.4	.1	2.2	175	115	21		270	7.2	22
July 11-20	3,527		3.8	--	.05	--	31	3.7	4.2	1.6	66	22	4.8	.1	2.5	139	93	22		206	7.2	14
July 21-31	1,636		2.3	--	.04	--	34	4.5	5.7	1.8	99	25	8.2	.1	1.8	142	103	22		239	7.2	20
Aug. 1-10	1,171		1.9	--	.05	--	38	5.0	9.3	1.8	102	32	12	.2	1.6	171	115	32		274	7.3	20
Aug. 11-20	1,214		5.1	--	.01	--	38	4.8	10	1.9	118	28	12	.2	2.1	161	115	18		271	7.4	5
Aug. 21-31	1,287		5.1	--	.00	--	35	4.4	9.6	1.8	101	32	10	.2	2.7	154	108	25		261	7.4	7
Sept. 1-10	1,689		3.8	--	.00	--	32	4.9	8.2	1.8	96	29	9.1	.2	2.9	142	98	19		242	7.2	5
Sept. 11-20	1,185		3.0	--	.00	--	36	4.3	8.6	2.1	100	33	9.1	.2	3.1	152	108	26		258	7.5	5
Sept. 21-30	1,073		2.6	--	.00	--	27	4.5	12	2.2	107	29	12	.2	3.4	160	111	23		274	7.2	5
Average	5,384		5.6	--	0.03	--	30	5.0	5.6	1.2	92	23	6.3	0.1	2.0	136	96	20		216	--	11

HUDSON RIVER BASIN--Continued

Temperature ($^{\circ}\text{F}$) of water, water year October 1951 to September 1952

Twice-daily temperature measurements at approximately 8 a. m. and 4 p. m.

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

DELAWARE RIVER BASIN

DELAWARE RIVER AT DINGMANS FERRY, PA.

LOCATION.--Samples taken from privately-owned toll bridge connecting Dingmans Ferry, Pa. with Layton, N. J., approximately seven miles downstream from nearest gaging station located at Montague, N. J. which is near Milford, Pa.

DRAINAGE AREA, 480 square miles (above gaging station).

RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1952.

TEMPERATURES.--October 1950 to September 1952.

EXTREMES 1951-52.--Hardness: Maximum, 105 ppm Mg, 21-31; minimum, 16 ppm Mar. 21-31, Apr. 1-10.

Specific conductance: Maximum daily, 400 microhos Sept. 27; minimum daily, 40.0 microhos Apr. 29.

Water temperatures: Maximum, 82°F, July 23; minimum, freezing point several days during November and December.

EXTREMES 1950-52.--Dissolved solids (1950-51): Maximum, 46 ppm Oct. 11-20; minimum, 31 ppm Mar. 21-31, Apr. 1-10.

Hardness: Maximum, 34 ppm Oct. 24, 1950; minimum, 15 ppm Apr. 1-10, 1951.

Specific conductance: Maximum daily, 105 microhos Sept. 27, 1952; minimum daily, 38.5 microhos Apr. 1, 1951.

Water temperatures: Maximum, 82°F, July 27, 1951, July 23, 1952; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (microhos at 25°C)	pH	Color
																	Calcium, mg./liter	Non-carbonate				
Oct. 1-10, 1951..			1.9		0.00		7.4	1.7	2.3		18	8.9	4.0	0.1	0.5	44	25	11		66.0	6.9	3
Oct. 11-20			--		--		--	--	2.3		16	8.6	2.5	--	--	--	21	8		62.5	6.7	10
Oct. 21-31			--		--		--	--	.7		16	8.8	2.2	--	.3	--	24	11		61.6	6.6	7
Nov. 1-10			--		--		--	--	.5		12	8.6	.5	--	.7	--	19	9		54.5	6.5	12
Nov. 11-20			--		--		--	--	.1		10	8.6	1.2	--	.4	--	19	11		50.5	6.4	8
Nov. 21-30			--		--		--	--	1.7		9	9.4	1.8	--	1.1	--	17	10		52.9	6.5	5
Dec. 1-10			--		--		--	--	.5		10	9.3	1.8	--	.8	--	20	12		53.0	6.5	5
Dec. 11-20			--		--		--	--	1.6		10	9.5	2.0	--	.6	--	18	10		53.8	6.5	5
Dec. 21-31			--		--		--	--	.6		10	9.2	2.0	--	1.0	--	20	12		51.1	6.5	4
Jan. 1-10, 1952..			--		--		--	--	1.0		10	10	3.5	--	2.0	--	23	15		56.7	6.3	8
Jan. 11-20			--		--		--	--	1.4		10	9.9	3.5	--	2.0	--	22	14		57.7	6.5	10
Jan. 21-31			--		--		--	--	1.3		6	9.7	3.0	--	2.0	--	18	13		47.3	6.5	5
Feb. 1-10			--		--		--	--	2.0		8	9.6	3.0	--	2.0	--	18	11		49.2	6.4	5
Feb. 11-20			--		--		--	--	1.5		10	9.8	4.0	--	1.5	--	22	14		52.8	6.4	5
Feb. 21-29			--		--		--	--	1.4		10	9.1	3.0	--	1.5	--	20	12		55.2	6.5	3
Mar. 1-10			--		--		--	--	1.9		12	9.5	4.0	--	1.0	--	22	12		58.0	6.5	3
Mar. 11-20			--		--		--	--	1.5		8	8.7	3.0	--	1.8	--	18	11		46.6	6.3	3
Mar. 21-31			--		--		--	--	1.1		7	8.2	2.0	--	1.5	--	16	10		43.3	6.3	3
Apr. 1-10			--		--		--	--	.9		8	9.0	.5	--	1.8	--	16	9		44.2	6.7	5
Apr. 11-20			--		--		--	--	1.1		8	9.1	1.5	--	1.3	--	17	10		44.5	6.9	10
Apr. 21-30			--		--		--	--	.9		8	8.8	1.5	--	1.4	--	17	10		44.5	6.8	10

[illegible]

NORTH ATLANTIC SLOPE BASINS

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT DINGMANS FERRY, PA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952
 [Once-daily temperature measurement at approximately 3 p.m.]

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

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT CATASAUQUA, PA.

LOCATION --At Race Street Bridge at Catsauqua, Northampton County, 9.1 miles upstream from gaging station at Bethlehem.

DRAINAGE AREA --1,012 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1944 to September 1952.

Water temperatures: October 1944 to September 1952.

EXTRIMES 1951-52.--Hardness: Maximum, 71 ppm Oct. 1-10; minimum, 27 ppm Apr. 11-20.

Specific conductance: Maximum, 166 microhos Oct. 1-10; minimum, 80.9 microhos Mar. 21-31.

Water temperatures: Maximum, 77°F, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

EXTRIMES 1944-52.--Dissolved solids (1944-47) (1949-52) Maximum, 166 ppm Oct. 1-10, 1944; minimum daily, 82.2 microhos Apr. 1, 1951.

Hardness (1944-47) (1949-52) Maximum, 166 ppm Oct. 1-10, 1944; minimum daily, 82.2 microhos Apr. 1, 1951.

Specific conductance: Maximum daily, 277 microhos Nov. 2, 1947; minimum, 80.9 microhos Apr. 1, 1951.

Water temperatures: Maximum, 77°F, July 2, 1945; June 28, 29, 1952; minimum freezing point on many days during the winter months.

REMARKS --Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1951 to September 1952 based on records for Lehigh River at Bethlehem, which are given in Water-Supply-Paper 1232.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (microhos at 25°C)	pH	Color
																	Calcium	Non-carbonate				
Oct. 1-10, 1951...	724		5.6		0.04		17	6.6	7.4	3.7	23	54	5.0	0.1	4.1	120	71	51		186	7.4	4
Oct. 11-20,	754								3.7	14	14	48	4.0		2.5		61	50		165	6.5	3
Oct. 21-31,	842								3.6	11	11	47	5.0		2.2		59	50		159	6.8	5
Nov. 1-10,	6,582								2.1	8	8	28	3.5		2.5		38	31		106	6.6	5
Nov. 11-20,	3,681								2.3	5	5	30	4.0		1.2		37	33		102	6.3	5
Nov. 21-30,	2,442								1.5	6	6	29	4.0		2.0		39	34		105	6.5	4
Dec. 1-10,	4,090								3.8	6	6	30	3.0		2.2		34	29		103	6.4	4
Dec. 11-20,	2,442								2.5	5	5	31	3.0		2.2		37	33		103	6.4	3
Dec. 21-31,	3,882								1.1	6	6	28	2.5		1.2		34	29		98.3	6.5	4
Jan. 1-10, 1952,	4,093								1.2	7	7	29	3.5		1.8		30	32		103	6.6	5
Jan. 11-20,	2,687								1.2	7	7	29	3.5		1.8		30	32		103	6.6	5
Jan. 21-31,	5,299								1.2	10	10	21	4.0		1.7		34	28		84.5	6.6	5
Feb. 1-10,	4,638								3.9	9	9	23	3.5		1.6		29	22		85.5	6.5	5
Feb. 11-20,	2,466								3.0	10	10	28	4.0		1.8		38	30		103	6.6	5
Feb. 21-29,	1,675								5.1	14	14	33	5.5		1.9		44	33		123	6.9	5
Mar. 1-10,	1,472								5.1	15	15	33	7.0		2.0		47	35		125	6.7	5
Mar. 11-20,	6,478								2.4	8	8	24	3.0		1.7		32	25		87.3	6.4	5
Mar. 21-31,	3,855								4.2	9	9	23	4.0		1.6		28	21		80.9	6.3	5
Apr. 1-10,	5,653								3.8	10	10	21	3.0		2.5		28	20		81.1	6.3	5
Apr. 11-20,	5,773								3.6	8	8	22	2.5		2.4		27	20		82.3	6.8	5
Apr. 21-30,	5,329								2.3	9	9	22	2.0		2.3		30	23		84.4	6.9	5
May 1-10,	3,535								2.1	8	8	28	2.5		1.8		36	29		95.0	7.3	5

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT CATASAUQUA, PA.--Continued

Chemical analyses, in parts per million, water year October 1951 to September 1952 --continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃	Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color
May 11-20, 1952 ..	3,386		--		--		--	--	1.2	8	25	2.0	--	--	1.7	--	34	27	87.6	6.8	5
May 21-31,	4,860		2.0		0.00		7.8	2.8	2.4	10	23	2.0	2.0	0.1	1.3	53	31	23	87.6	6.6	8
June 1-10,	3,095		--		--		--	--	3.0	8	23	2.0	--	--	1.5	--	33	26	92.7	6.6	5
June 11-20,	1,498		--		--		--	--	3.4	13	31	3.0	--	--	1.8	--	42	31	119	6.7	8
June 21-30,	1,110		--		--		--	--	3.2	16	37	3.5	--	--	2.3	--	51	38	139	6.9	8
July 1-9,	1,032		--		--		--	--	3.2	22	44	4.0	--	--	2.9	--	65	47	169	7.3	4
July 10,	16,240		--		--		--	--	6.3	10	28	1.5	--	--	5.3	--	30	22	169.0	6.8	5
July 11-20,	3,460		--		--		--	--	1.3	8	32	3.0	--	--	2.2	--	43	36	107	7.0	5
July 21-31,	1,794		--		--		--	--	4.6	8	40	3.5	--	--	3.4	--	46	39	125	6.4	5
Aug. 1-10,	1,502		--		--		--	--	5.5	12	40	4.0	--	--	3.4	--	48	38	135	6.6	5
Aug. 11-20,	2,644		--		--		--	--	3.1	10	29	2.0	--	--	3.2	--	36	28	101	7.3	5
Aug. 21-31,	1,588		--		--		--	--	5.5	12	36	4.0	--	--	3.6	--	44	34	128	6.7	3
Sept. 1-10,	4,894		--		--		--	--	3.4	12	25	2.0	--	--	3.5	--	34	24	94.6	7.4	10
Sept. 11-20,	1,900		--		--		--	--	5.4	12	34	3.0	--	--	2.7	--	40	30	120	7.1	5
Sept. 21-30,	1,290		--		--		--	--	6.6	17	41	5.0	--	--	3.3	--	52	38	147	7.5	5
Average	3,178		--		--		--	--	3.3	10	31	3.4	--	--	2.4	--	40	32	111	--	5

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT CATASAUQUA, PA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952
(Once-daily temperature measurement at approximately 7:30 a. m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	56	48	36	39	32	38	46	53	59	73	72	70
2	58	46	36	41	37	35	49	52	58	71	72	66
3	61	44	37	40	40	37	49	52	60	70	70	67
4	64	40	39	37	40	37	47	52	62	73	70	63
5	67	40	45	35	41	36	49	53	65	74	73	62
6	68	39	49	36	39	35	46	52	65	74	75	63
7	66	40	47	35	38	35	44	54	68	74	73	65
8	62	44	48	32	37	35	44	54	67	75	72	68
9	56	43	48	35	38	35	44	53	67	73	70	60
10	52	42	45	36	38	37	45	56	68	66	69	60
11	53	42	43	35	39	41	48	58	67	65	70	62
12	52	42	40	34	36	38	46	55	64	65	71	65
13	50	43	37	34	33	38	44	51	63	68	70	67
14	50	44	33	37	31	36	45	50	65	70	69	69
15	51	48	32	--	31	36	48	54	68	72	70	68
16	52	50	32	--	33	35	45	53	70	73	71	65
17	54	46	32	--	34	34	48	56	72	74	70	63
18	56	44	31	--	34	37	50	56	72	75	69	64
19	58	40	31	--	34	39	51	57	71	76	67	66
20	55	36	31	38	35	38	53	58	68	74	67	64
21	55	35	32	36	36	41	56	54	67	75	68	63
22	55	34	32	--	35	44	55	54	65	75	67	60
22	56	36	32	--	35	42	57	56	63	75	65	59
24	57	40	33	--	36	42	55	59	62	75	63	59
25	56	40	34	--	36	40	52	57	65	73	63	58
26	53	39	35	--	35	42	51	55	71	72	64	59
27	53	35	34	37	37	44	50	55	76	73	66	59
28	53	30	32	40	37	45	52	57	77	74	68	58
29	50	34	32	35	38	43	51	60	77	75	70	59
30	49	34	34	31	--	43	53	59	75	74	70	90
31	49	--	36	32	--	44	--	58	--	73	71	--
Average	56	41	37	--	36	39	49	55	67	73	69	63

NORTH ATLANTIC SLOPE BASINS

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT WALNUTPORT, PA.--Continued

LOCATION--At highway bridge, 0.3 mile downstream from gaging station at Walnutport, Northampton County, and 0.1 mile upstream from Trout Creek.

DRAINAGE AREA.--889 square miles.

RECORDS AVAILABLE.--Sediment records: May 1948 to September 1952.

EXTREMES, 1951-52.--Sediment concentrations: Maximum, 871 ppm Mar. 11; minimum, 1 ppm on several days.

Sediment loads: Maximum daily, 50,700 tons Mar. 11; minimum daily, 1.0 ton July 7.

EXTREMES, 1948-52.--Sediment concentrations: Maximum, 2,350 ppm Dec. 30, 1948; minimum, 1 ppm on many days.

Sediment loads: Maximum daily, 131,000 tons Dec. 4, 1950; minimum daily, 1.0 ton on several days.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of water discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1232.

Suspended sediment, water year October 1951 to September 1952

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-----	392	5	5	1,850	80	s 552	1,680	20	91
2-----	399	5	5	2,920	115	907	1,660	16	72
3-----	428	4	5	7,260	509	s 11,500	1,640	10	44
4-----	406	5	5	7,260	130	2,550	1,640	12	53
5-----	385	4	4	4,850	35	458	6,420	222	s 5,280
6-----	344	4	4	3,740	20	202	8,430	95	2,160
7-----	412	3	3	8,340	453	s 15,500	5,950	22	353
8-----	1,350	23	s 85	12,300	220	7,310	4,780	15	194
9-----	920	8	20	7,220	65	1,270	3,890	20	210
10-----	697	7	13	5,200	50	702	3,410	12	110
11-----	674	6	11	4,140	40	447	3,060	10	83
12-----	864	5	12	3,530	15	143	2,800	13	98
13-----	824	5	11	2,950	20	159	2,520	10	68
14-----	708	6	11	2,840	40	307	2,210	8	48
15-----	640	4	7	3,290	35	311	2,400	10	65
16-----	585	6	9	3,450	30	279	2,200	15	89
17-----	555	7	10	3,770	40	407	1,900	20	103
18-----	525	4	6	3,410	38	350	1,950	30	158
19-----	505	5	7	3,060	20	165	2,050	25	138
20-----	480	6	8	2,670	30	216	1,850	28	140
21-----	471	5	6	2,360	20	127	5,300	222	s 3,300
22-----	462	6	7	2,210	40	239	5,650	60	915
23-----	454	4	5	2,130	15	86	4,390	20	237
24-----	505	6	8	2,440	20	132	3,650	20	197
25-----	1,100	10	30	2,420	22	144	3,180	15	129
26-----	1,020	8	22	2,320	20	125	2,950	20	159
27-----	892	6	14	2,170	20	117	2,620	18	127
28-----	948	7	18	1,860	20	100	2,320	15	94
29-----	1,000	7	19	1,810	20	98	2,260	18	110
30-----	892	5	12	1,710	22	102	2,210	18	107
31-----	824	9	20	--	--	--	2,220	22	132
Total--	20,661	--	401	115,480	--	45,005	99,190	--	15,064

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT WALNUTPORT, PA.--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

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-----	2,580	14	98	3,410	18	166	1,200	15	49
2-----	3,770	23	234	3,410	15	138	1,120	11	33
3-----	5,060	28	383	3,410	20	184	1,110	15	45
4-----	4,650	12	151	5,570	64	962	1,110	20	60
5-----	4,140	5	56	6,400	33	570	1,260	12	41
6-----	3,530	3	29	5,060	18	246	1,170	7	22
7-----	3,060	3	25	4,260	19	219	1,100	10	30
8-----	2,690	7	51	3,650	11	108	1,060	5	14
9-----	2,560	11	76	3,410	9	83	1,020	4	11
10-----	2,420	10	65	3,060	6	50	1,040	15	42
11-----	2,190	15	89	2,770	7	52	13,500	871	s 50,700
12-----	1,990	17	91	2,540	8	55	15,700	609	s 30,100
13-----	1,930	15	78	2,210	8	48	8,380	131	2,960
14-----	1,880	10	51	1,950	8	42	5,800	87	1,360
15-----	2,110	15	85	1,850	12	60	4,260	40	460
16-----	2,500	20	135	1,810	18	88	3,650	17	168
17-----	2,400	14	91	1,920	26	135	3,060	11	91
18-----	3,410	32	295	1,850	9	45	2,710	12	88
19-----	3,530	20	191	1,680	14	64	2,820	14	107
20-----	3,410	11	101	1,580	20	85	2,840	13	100
21-----	3,180	8	69	1,550	15	63	3,180	18	155
22-----	2,840	6	46	1,470	18	71	3,890	22	231
23-----	4,390	41	486	1,370	16	59	4,650	30	377
24-----	3,890	14	147	1,340	9	33	5,060	23	314
25-----	3,290	10	89	1,310	9	32	4,390	10	119
26-----	4,680	45	s 657	1,230	11	37	3,890	4	42
27-----	7,620	116	2,390	1,220	17	56	3,410	2	18
28-----	7,800	80	1,680	1,180	13	41	3,180	2	17
29-----	6,100	28	461	1,180	18	57	2,880	3	23
30-----	4,650	18	226	--	--	--	2,620	3	21
31-----	3,890	17	179	--	--	--	2,440	2	13
Total--	112,140	--	8,805	73,650	--	3,949	113,500	--	87,611
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-----	2,320	4	25	5,340	14	202	4,020	16	174
2-----	4,490	61	s 740	4,390	11	130	4,020	14	152
3-----	4,140	8	89	3,770	18	183	3,410	11	101
4-----	3,530	5	48	3,290	17	151	2,950	11	88
5-----	7,080	138	s 3,700	2,950	34	271	2,950	12	96
6-----	11,700	170	5,370	2,750	18	134	2,600	5	35
7-----	7,800	42	885	2,480	20	134	2,280	4	25
8-----	5,650	15	229	2,280	25	154	2,060	4	22
9-----	4,520	13	159	2,110	19	108	1,900	6	31
10-----	3,890	10	105	1,990	15	81	1,950	6	32
11-----	3,410	9	83	2,240	17	103	1,780	5	24
12-----	3,060	8	66	4,390	73	865	1,590	6	26
13-----	2,950	12	96	4,920	37	492	1,470	8	32
14-----	5,710	49	755	3,890	18	189	1,350	7	26
15-----	9,400	101	2,560	3,530	17	162	1,260	5	17
16-----	10,500	105	2,980	3,180	17	146	1,200	5	16
17-----	7,100	29	556	2,730	11	81	1,170	5	16
18-----	5,500	15	223	2,800	8	60	1,110	2	6
19-----	4,520	18	220	2,690	14	102	1,040	5	14
20-----	3,890	19	200	2,860	13	100	1,040	5	14
21-----	3,410	11	101	3,290	18	160	1,962	3	8
22-----	3,060	10	83	2,840	12	92	1,000	6	16
23-----	2,800	11	83	2,540	9	62	1,160	8	25
24-----	2,600	11	77	2,460	18	120	1,180	5	16
25-----	3,080	15	125	7,020	115	s 2,550	1,060	2	6
26-----	4,650	26	328	9,700	80	2,100	962	2	5
27-----	5,060	14	191	6,750	21	383	850	2	5
28-----	8,570	90	s 2,500	5,060	14	191	759	1	2
29-----	10,100	88	2,400	4,140	12	134	720	1	2
30-----	7,100	21	403	3,770	11	112	708	1	2
31-----	--	--	--	3,770	12	122	--	--	--
Total--	161,590	--	24,305	115,930	--	9,524	50,511	--	1,034

s Computed by subdividing day.

NORTH ATLANTIC SLOPE BASINS
DELAWARE RIVER BASIN--Continued
LEHIGH RIVER AT WALNUTPORT, PA.--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

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-----	674	2	4	906	3	7	5,440	210	s 5,290
2-----	628	1	2	906	2	5	9,010	93	2,260
3-----	595	1	2	1,160	4	13	8,150	56	1,230
4-----	595	1	2	934	1	3	5,650	12	183
5-----	585	2	3	850	2	5	4,260	8	92
6-----	565	5	8	1,300	13	46	3,410	7	64
7-----	545	1	1	1,670	15	68	2,800	7	53
8-----	603	1	2	1,230	5	17	2,360	6	38
9-----	5,260	298	s 9,590	1,060	5	14	2,090	8	45
10-----	20,900	604	s 37,100	2,060	33	184	1,880	9	46
11-----	9,580	94	2,430	3,180	44	378	1,710	9	42
12-----	5,200	28	393	2,210	9	54	1,560	8	34
13-----	3,530	20	191	1,850	6	30	1,430	8	31
14-----	2,670	12	87	1,510	6	24	1,320	9	32
15-----	2,220	11	66	1,310	6	21	1,350	14	51
16-----	1,920	12	62	1,560	14	59	1,680	14	64
17-----	1,630	10	44	4,370	112	1,320	1,340	10	36
18-----	1,450	8	31	2,950	12	96	1,220	9	30
19-----	1,370	9	33	2,300	6	37	1,350	9	33
20-----	1,290	10	35	1,860	5	25	1,400	14	53
21-----	1,420	14	54	1,700	4	18	1,200	12	39
22-----	3,000	40	324	1,880	10	51	1,080	6	17
23-----	2,450	27	179	1,560	6	25	1,060	6	17
24-----	1,660	11	49	1,350	4	15	976	6	16
25-----	1,350	9	33	1,220	6	20	892	8	19
26-----	1,200	7	23	1,120	6	18	850	6	14
27-----	1,120	8	24	1,050	6	17	811	8	18
28-----	1,180	7	22	990	4	11	772	7	15
29-----	1,220	7	23	962	4	10	746	6	12
30-----	1,110	8	24	906	5	12	733	6	12
31-----	990	4	11	892	6	14	--	--	--
Total-	78,510	--	50,852	48,806	--	2,617	68,530	--	9,886

Total discharge for year (cfs-days) 1,058,498
Total load for year (tons) 259,153

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued
DELAWARE RIVER AT TRENTON, N. J.

LOCATION.--At Calhoun Street Bridge, Bucks County, Pennsylvania side, 200 feet downstream from gaging station which is half a mile upstream from Assumpink Creek. Chemical quality samples collected at Morrisville filter plant; sediment samples normally collected at midstream from bridge.

DRAINAGE AREA 780 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1952.

Water temperatures: October 1944 to September 1952.
Sediment records: October 1944 to September 1952.

Sediment concentrations: Maximum daily, 1,720 ppm Nov. 26; minimum daily, 1 ppm on several days.
Sediment loads (revised): Maximum daily, 279,000 tons Nov. 26, 1950; minimum daily, 7 tons Oct. 22, Nov. 1, 3, 4, 1950.

EXTREMES, 1951-52.--Hardness: Maximum daily, 218 micromhos Dec. 26; minimum daily, 67.1 micromhos Apr. 7.
Specific conductance: Maximum daily, 37°F on several days during winter months.

Water temperatures: Maximum, 82°F July 23, 31; minimum, 37°F on several days during winter months.
Sediment concentrations: Maximum daily, 483 ppm Nov. 7; minimum daily, 1 ppm on several days.

Sediment loads: Maximum daily, 98,300 tons July 11, 1952; minimum daily, 11 tons Aug. 5, 6, 1952.
Sediment loads (revised): Maximum daily, 119 ppm Oct. 11-20, 1950; minimum, 25 ppm Apr. 1-10, 1950.

Hardness (1944-52).--Dissolved solids (1944-47) (1950-51): Maximum, 119 ppm Oct. 11-20, 1950; minimum, 25 ppm Apr. 1-10, 1950.
Hardness (1944-47) (1949-52): Maximum, 85 ppm Sept. 11-20, 1946; minimum, 25 ppm Apr. 1-10, 1950.

Specific conductance: Maximum, 22 micromhos Sept. 11-20, 1949; minimum daily, 58.2 micromhos Apr. 1, 1951.
Water temperatures: Maximum, 86°F July 30, 1949, Aug. 30, 1948; minimum, 33°F on many days during winter months.

Sediment concentrations: Maximum daily, 1,720 ppm Nov. 26, 1950; minimum daily, 1 ppm on several days.
Sediment loads: Maximum daily, 279,000 tons, Nov. 26, 1950; minimum daily, 7 tons Oct. 22, Nov. 1, 3, 4, 1950.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of water discharge used in computing record for period October 1950 to September 1951 published in Water-Supply Paper 1197 were revised. Corrected records for this period therefore appear in this report. Records of discharge for water year October 1951 to September 1952 based on records for Delaware River at Trenton, N. J. which are given in Water-Supply Paper 1232.

Chemical analyses in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium	Non-carbonate				
Oct. 1-10, 1951...	3,969	65	3.7		0.04		20	7.4	5.4	59	28	8.0	0.1		3.8	116	80	32		198	7.4	5
Oct. 11-20, 1951...	6,510	59								32	22	4.0			3.2		56	30		144	6.8	5
Oct. 21-31, 1951...	6,060	58								36	22	4.5			3.0		60	30		151	6.9	5
Nov. 1-10, 1951...	35,520	49								23	19	3.0			1.0		41	22		111	6.8	5
Nov. 11-20, 1951...	21,370	48								22	19	2.5			2.2		43	25		107	6.8	5
Nov. 21-30, 1951...	13,640	42								28	20	3.0			2.5		48	25		120	7.2	5
Dec. 1-10, 1951...	18,070	46								26	19	3.0			2.5		44	23		117	7.1	5
Dec. 11-20, 1951...	17,700	40								25	20	3.0			2.2		44	24		112	7.0	5
Dec. 21-31, 1951...	23,280	39								25	20	3.0			2.8		44	24		117	7.2	5
Dec. 31, 1951...	22,330	38								20	19	5.0			2.0		46	30		215	9.7	5
Jan. 1-10, 1952...	21,510	40								35	22	3.0			3.0		50	30		137	7.2	5
Jan. 11-20, 1952...	16,930	41								30	21	3.0			3.0		52	27		150	7.0	5
Jan. 21-31, 1952...	31,320	39								28	18	4.5			3.5		40	20		106	7.4	5

a Carbonate (CO₃), 55 parts per million; hydroxyl (OH), 6 parts per million.

DELAWARE RIVER BASIN--Continued
DELAWARE RIVER AT TRENTON, N. J.--Continued

Chemical analyses, in parts per million, water year October 1951 to September 1952--Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium	Non-carbonate				
Feb. 1-10, 1952...	28,860	41	--	--	--	--	--	--	--	--	21	17	3.0	--	3.1	--	38	21	--	97.5	6.8	5
Feb. 11-20	14,340	40	--	--	--	--	--	--	--	--	30	19	5.0	--	3.4	--	48	23	--	119	7.9	5
Feb. 21-29	10,000	42	--	--	--	--	--	--	--	--	36	21	6.0	--	3.9	--	56	26	--	138	7.1	5
Mar. 1-10	8,960	42	--	--	--	--	--	--	--	--	38	21	6.0	--	3.5	--	58	27	--	142	7.3	6
Mar. 11-20	32,570	42	--	--	--	--	--	--	--	--	23	16	4.5	--	3.2	--	39	20	--	101	7.3	8
Mar. 21-31	28,830	46	--	--	--	--	--	--	--	--	20	14	3.5	--	2.5	--	38	18	--	87.7	7.2	9
Apr. 1-10	41,520	50	--	--	--	--	--	--	--	--	17	15	2.5	--	2.5	--	34	20	--	82.1	7.2	5
Apr. 11-20	35,970	52	--	--	--	--	--	--	--	--	23	16	2.0	--	2.5	--	38	19	--	94.4	7.4	5
Apr. 21-30	27,730	57	--	--	--	--	--	--	--	--	26	18	3.0	--	3.0	--	44	23	--	107	7.2	8
May 1-10	18,830	57	--	--	--	--	--	--	--	--	32	17	5.0	--	2.3	--	47	21	--	117	7.2	5
May 11-20	19,000	58	--	--	--	--	--	--	--	--	29	16	3.0	--	1.9	--	42	18	--	109	7.3	3
May 21-31	27,120	61	1.9	--	0.00	--	10	3.5	2.0	--	26	16	3.0	0.1	1.6	59	39	18	--	100	6.8	5
June 1-10	23,390	67	--	--	--	--	--	--	--	--	28	14	4.0	--	1.9	--	39	16	--	101	7.3	4
June 11-20	9,650	73	--	--	--	--	--	--	--	--	42	19	5.0	--	1.1	--	56	22	--	141	7.2	5
June 21-30	6,100	73	--	--	--	--	--	--	--	--	48	23	5.5	--	2.6	--	70	31	--	165	7.6	3
July 1-10	6,390	76	--	--	--	--	--	--	--	--	60	25	6.0	--	2.7	--	82	33	--	191	7.6	5
July 11-20	23,500	76	--	--	--	--	--	--	--	--	24	18	3.5	--	3.4	--	39	19	--	104	7.3	5
July 21-31	6,680	79	--	--	--	--	--	--	--	--	40	24	4.0	--	3.7	--	71	24	--	147	7.1	5
Aug. 1-10	5,100	76	--	--	--	--	--	--	--	--	45	27	6.5	--	4.5	--	60	34	--	178	7.0	6
Aug. 11-20	8,350	75	--	--	--	--	--	--	--	--	43	24	3.0	--	3.6	--	60	25	--	156	7.4	8
Aug. 21-31	13,450	73	--	--	--	--	--	--	--	--	47	25	3.5	--	3.9	--	70	32	--	169	7.1	5
Sept. 1-10	17,950	69	--	--	--	--	--	--	--	--	44	21	5.5	--	4.0	--	54	26	--	138	7.3	13
Sept. 11-20	7,350	71	--	--	--	--	--	--	--	--	44	24	5.5	--	3.6	--	66	30	--	163	7.6	5
Sept. 21-30	5,710	63	--	--	--	--	--	--	--	--	49	25	6.0	--	3.9	--	70	30	--	173	7.4	5
Average	17,620	56	--	--	--	--	--	--	--	--	33	20	4.2	--	2.9	--	51	24	--	132	7.3	6

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT TRENTON, N. J.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

(Once-daily temperature measurement at approximately 9:30 a.m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	61	56	40	41	37	41	48	57	63	75	76	75
2	63	56	41	42	38	41	50	58	62	75	77	73
3	65	50	42	42	40	42	53	56	63	75	75	71
4	68	47	43	40	43	42	54	57	65	77	77	70
5	69	45	46	40	43	43	51	57	67	78	78	68
6	69	44	50	41	42	42	51	57	68	78	79	67
7	67	47	50	39	42	41	48	57	70	78	76	68
8	64	50	50	38	41	41	49	58	70	78	76	67
9	61	49	51	39	43	42	47	59	70	76	75	67
10	60	46	50	39	43	43	48	60	71	74	75	67
11	58	47	47	39	43	46	50	61	70	76	75	70
12	58	46	45	38	41	46	50	60	68	69	76	70
13	57	46	44	39	41	42	50	57	68	71	76	72
14	57	48	42	40	37	42	50	55	69	74	75	73
15	57	52	39	42	40	40	52	56	71	76	76	71
16	58	53	38	42	39	41	--	59	77	78	75	69
17	59	51	37	42	40	40	51	59	75	76	75	69
18	64	49	37	43	40	41	54	59	77	78	75	70
19	62	47	37	41	40	42	54	59	76	80	73	73
20	59	44	37	41	40	43	57	60	76	79	74	69
21	59	42	39	39	41	47	58	59	72	80	75	67
22	59	41	39	39	40	46	58	60	68	60	72	66
23	59	45	38	40	40	47	61	60	67	82	71	65
24	59	43	37	39	41	45	59	62	65	78	70	64
25	60	43	38	38	41	44	59	62	70	76	70	65
26	62	43	38	40	42	44	55	60	75	78	71	65
27	59	43	39	42	43	46	56	59	78	79	73	64
28	59	40	40	42	44	48	54	61	78	79	74	64
29	56	42	38	40	43	47	55	63	77	80	76	65
30	56	40	40	37	--	47	55	63	77	78	76	66
31	55	--	39	37	--	47	--	62	--	82	76	--
Average	61	46	42	40	41	44	53	59	71	77	75	68

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT TRENTON, N. J.--Continued

Suspended sediment, water year October 1950 to September 1951									
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-----	3,070	1	8	2,600	1	7	22,600	35	2,140
2-----	3,020	5	41	2,550	2	14	19,000	25	1,280
3-----	2,840	4	31	2,440	1	7	16,500	20	891
4-----	2,600	2	14	2,550	1	7	18,000	100	4,860
5-----	2,820	4	31	3,680	6	60	83,500	870	196,000
6-----	3,070	7	58	5,280	24	342	94,200	300	76,300
7-----	3,040	5	41	7,180	43	833	54,100	115	16,800
8-----	2,740	4	30	8,120	55	1,210	53,300	100	14,400
9-----	2,790	6	45	6,770	24	439	61,500	175	29,100
10-----	2,930	4	32	5,880	13	206	51,500	130	18,100
11-----	3,160	5	43	5,380	9	130	39,000	70	7,379
12-----	3,980	9	97	4,970	6	80	32,800	33	2,920
13-----	3,750	9	91	4,640	4	50	27,600	30	2,230
14-----	4,140	10	112	4,360	4	47	23,600	17	1,080
15-----	4,010	8	87	4,180	4	45	20,600	14	779
16-----	3,650	5	49	4,040	3	33	19,300	12	625
17-----	3,430	4	37	3,940	3	32	17,500	10	472
18-----	3,100	4	33	3,940	2	21	15,200	8	328
19-----	3,190	3	26	3,810	3	31	13,100	8	283
20-----	2,990	2	16	3,720	4	40	13,200	9	321
21-----	2,840	1	8	3,810	7	72	12,200	11	362
22-----	2,520	1	7	4,530	8	98	11,100	8	240
23-----	2,760	3	22	5,880	12	191	10,400	4	112
24-----	2,960	2	16	7,310	18	355	10,600	4	114
25-----	3,070	2	17	15,800	250	s 22,600	9,890	4	107
26-----	3,520	4	38	66,500	1,720	s 279,000	9,410	4	102
27-----	3,490	1	9	107,200	560	162,000	8,000	3	65
28-----	3,220	1	9	62,300	275	46,300	7,500	4	81
29-----	3,100	1	8	36,900	110	11,000	8,500	14	321
30-----	2,990	2	16	27,400	40	2,960	11,000	12	356
31-----	2,820	2	15	--	--	--	12,700	7	240
Total-	97,610	--	1,087	427,640	--	528,210	807,400	--	378,379
January			February			March			
1-----	9,840	8	212	15,000	7	284	21,000	10	567
2-----	8,670	9	211	23,200	100	6,280	19,600	3	159
3-----	8,210	6	133	36,400	130	12,800	18,300	3	148
4-----	9,350	8	202	27,700	24	11,790	19,300	10	521
5-----	13,000	18	632	20,800	20	1,120	19,500	12	632
6-----	25,300	93	6,350	18,400	12	596	17,500	5	236
7-----	21,100	50	2,850	24,600	119	s 11,700	18,300	4	198
8-----	17,600	17	808	47,800	272	35,100	18,300	2	99
9-----	14,700	15	595	41,500	60	6,720	19,500	2	105
10-----	13,400	6	217	28,400	20	1,530	20,600	8	445
11-----	12,200	6	198	23,000	18	1,120	18,000	5	243
12-----	11,900	5	161	19,500	22	1,160	15,400	3	125
13-----	12,200	4	132	20,400	22	1,210	14,600	2	79
14-----	11,500	4	124	25,800	37	2,580	17,100	3	139
15-----	21,000	96	5,440	29,100	46	3,610	21,300	5	288
16-----	19,200	87	4,510	25,700	14	971	24,200	6	392
17-----	18,700	32	1,620	21,800	3	177	22,200	3	180
18-----	18,000	12	583	25,100	28	1,900	19,400	1	52
19-----	15,800	9	384	22,300	23	1,380	17,200	2	93
20-----	15,900	7	301	23,100	16	998	22,600	51	3,110
21-----	17,200	19	882	28,900	48	3,750	30,400	44	3,610
22-----	18,200	18	885	42,600	110	12,700	29,200	13	1,020
23-----	17,200	11	511	48,700	138	18,100	25,400	6	411
24-----	21,800	62	s 4,240	36,600	57	5,630	22,200	10	599
25-----	43,900	288	34,100	27,600	14	1,040	21,400	8	462
26-----	43,900	168	19,900	23,500	6	381	24,200	8	523
27-----	31,400	60	5,090	22,300	8	482	22,500	11	668
28-----	24,700	28	1,870	21,600	9	525	19,800	8	428
29-----	21,500	17	987	--	--	--	19,000	4	205
30-----	19,200	11	570	--	--	--	32,500	10	878
31-----	18,900	6	274	--	--	--	89,600	310	75,000
Total-	573,470	--	94,972	771,400	--	135,614	720,100	--	91,615

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT TRENTON, N. J.--Continued

Suspended sediment, water year October 1950 to September 1951--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-----	120,700	325	106,000	13,000	7	246	11,100	5	150
2-----	71,500	110	21,200	12,400	5	167	9,890	2	53
3-----	53,100	26	3,730	11,400	8	246	8,870	5	120
4-----	46,100	13	1,620	10,600	8	229	8,560	4	92
5-----	39,300	16	1,700	10,000	6	162	9,300	36	904
6-----	33,100	12	1,070	9,520	6	154	9,680	28	732
7-----	28,300	13	993	8,560	5	116	8,670	3	70
8-----	24,900	9	605	8,010	4	86	7,520	1	20
9-----	21,800	13	765	8,410	6	136	6,820	2	37
10-----	20,600	16	890	8,010	8	173	6,460	3	52
11-----	20,700	13	727	7,960	7	150	6,180	2	33
12-----	21,400	16	924	8,510	12	276	5,970	3	48
13-----	28,800	100	7,780	8,820	6	143	6,100	3	49
14-----	41,400	100	11,200	7,860	2	42	7,520	10	203
15-----	36,200	30	2,930	7,380	2	40	9,520	18	463
16-----	29,200	6	473	7,570	2	41	10,500	18	510
17-----	26,200	11	778	7,240	2	39	9,570	5	129
18-----	23,500	8	508	6,870	4	74	7,960	2	43
19-----	21,100	5	285	6,680	4	72	6,820	2	37
20-----	19,300	7	365	6,410	7	121	6,640	2	36
21-----	17,500	8	378	5,750	7	109	6,320	1	17
22-----	16,000	6	259	5,500	4	59	5,750	1	16
23-----	15,500	9	377	6,100	4	66	9,760	130	s 3,750
24-----	17,700	12	573	8,060	6	131	10,700	130	s 3,760
25-----	18,800	15	761	9,140	11	271	8,560	35	609
26-----	17,000	10	459	8,610	8	186	7,280	20	393
27-----	15,600	8	337	7,430	5	100	7,570	22	450
28-----	15,000	9	365	6,360	4	69	6,870	28	519
29-----	13,900	5	188	7,470	14	282	7,280	33	649
30-----	13,700	4	148	12,000	24	778	7,720	26	542
31-----	--	--	--	12,900	19	662	--	--	--
Total--	887,900	--	168,388	264,530	--	5,426	241,460	--	14,686

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-----	9,080	14	343	12,400	29	971	3,950	2	21
2-----	9,250	33	824	10,300	24	667	3,810	7	72
3-----	9,680	34	889	8,670	30	702	4,090	7	77
4-----	8,820	34	810	7,380	28	558	3,850	6	62
5-----	9,190	43	1,070	6,820	28	516	3,680	6	60
6-----	9,250	34	849	6,050	27	441	3,810	5	52
7-----	8,410	20	454	5,460	27	398	4,810	3	37
8-----	7,280	12	236	5,170	8	112	5,080	6	82
9-----	6,540	24	424	5,330	16	230	4,450	4	48
10-----	5,880	6	95	5,210	6	85	3,950	3	32
11-----	5,420	11	161	6,460	6	105	3,780	5	51
12-----	5,970	4	65	7,050	16	305	3,620	7	68
13-----	6,280	17	288	6,140	41	680	4,020	10	109
14-----	6,100	22	362	6,910	25	467	3,880	9	94
15-----	6,140	19	315	6,360	30	515	4,950	10	134
16-----	5,750	7	109	8,520	57	1,310	6,730	15	273
17-----	5,210	1	14	11,100	124	3,720	5,500	16	238
18-----	5,250	2	28	9,940	61	1,640	5,920	15	240
19-----	5,500	5	74	10,400	40	1,120	5,670	21	322
20-----	6,910	27	504	8,980	22	534	4,880	18	237
21-----	6,820	27	497	7,380	10	199	4,420	7	83
22-----	8,360	54	1,220	6,870	6	111	3,920	3	32
23-----	8,560	31	717	6,590	2	36	3,460	3	28
24-----	7,760	22	461	5,880	6	95	3,280	3	27
25-----	6,970	12	222	5,250	7	99	3,160	3	26
26-----	6,360	14	240	4,760	15	193	3,100	3	25
27-----	5,290	15	214	4,490	4	49	3,310	7	63
28-----	9,290	33	s 1,960	4,420	1	12	3,590	4	39
29-----	26,800	219	15,800	4,050	2	22	3,950	3	32
30-----	15,700	127	5,380	4,420	3	36	3,750	4	41
31-----	14,700	67	2,660	4,340	4	47	--	--	--
Total--	258,420	--	37,285	213,100	--	15,975	126,170	--	2,705

Total discharge for year (cfs-days)..... 5,389,200

Total load for year (tons)..... 1,474,342

s Computed by subdividing day.

NORTH ATLANTIC SLOPE BASINS

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT TRENTON, N. J.--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1-----	3,040	2	16	9,120	142	3,500	11,600	8	251
2-----	2,990	2	16	13,100	79	2,790	11,500	10	310
3-----	2,900	8	63	22,400	106	6,410	11,200	9	270
4-----	3,370	7	64	37,000	160	16,000	11,100	7	210
5-----	3,430	5	46	39,800	155	16,700	12,500	10	338
6-----	3,460	5	47	28,100	105	7,960	26,100	35	2,470
7-----	3,620	13	127	37,700	483	s 55,300	33,400	20	1,800
8-----	4,720	11	140	63,800	150	25,800	27,000	10	729
9-----	5,420	15	220	67,300	115	20,900	22,700	12	734
10-----	6,960	15	282	47,800	51	6,580	20,400	11	605
11-----	7,280	26	511	34,200	50	4,620	21,700	12	702
12-----	7,190	10	194	26,800	20	1,450	20,000	6	324
13-----	7,470	7	141	22,500	10	608	17,800	8	383
14-----	7,520	8	163	19,900	7	375	16,200	8	351
15-----	8,060	8	174	19,900	10	537	15,300	10	413
16-----	6,730	7	127	20,400	29	1,600	14,300	9	348
17-----	6,320	7	119	22,300	10	602	11,500	8	248
18-----	5,710	6	93	21,000	10	587	10,500	9	255
19-----	5,250	4	57	18,900	8	408	10,000	10	a 270
20-----	5,250	3	43	16,900	9	410	10,000	8	a 216
21-----	5,040	3	41	15,500	5	209	20,000	9	486
22-----	4,570	3	37	14,200	6	230	33,300	10	899
23-----	4,090	3	33	12,800	4	138	33,400	10	902
24-----	4,190	11	124	12,400	8	268	28,600	9	694
25-----	5,290	12	171	13,600	2	73	24,100	10	651
26-----	6,820	14	258	16,300	5	220	22,100	10	597
27-----	7,620	14	288	16,500	10	446	19,000	9	462
28-----	8,360	7	158	14,600	15	591	16,500	9	400
29-----	7,910	6	128	13,200	11	392	14,900	10	402
30-----	7,430	3	60	12,500	10	338	14,600	8	316
31-----	6,820	3	55	--	--	--	14,900	11	443
Total-	174,830	--	3,996	730,520	--	176,022	576,200	--	17,479
Day	January			February			March		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1-----	15,900	6	258	24,100	7	455	9,570	2	52
2-----	21,800	16	942	22,200	35	3,000	9,350	2	50
3-----	30,500	80	6,590	22,800	10	616	8,410	1	23
4-----	32,100	160	13,900	32,600	28	2,460	7,670	2	41
5-----	26,900	30	2,180	39,800	50	5,370	9,730	2	53
6-----	23,900	5	324	43,400	40	4,690	10,800	2	58
7-----	20,900	14	791	36,900	9	897	9,940	2	54
8-----	18,200	10	491	29,900	13	1,050	9,250	2	50
9-----	16,300	12	529	26,600	9	646	9,140	1	25
10-----	15,600	9	378	22,700	11	674	8,460	1	23
11-----	15,100	8	327	20,500	11	609	20,100	182	s 14,300
12-----	14,400	11	427	19,000	5	256	61,300	480	79,400
13-----	12,900	9	313	17,800	2	96	69,000	230	42,800
14-----	12,100	13	424	15,100	3	122	46,200	104	13,000
15-----	13,000	18	632	13,500	3	109	32,800	50	4,430
16-----	15,100	14	570	12,500	2	68	25,500	22	1,520
17-----	18,100	23	1,120	12,900	2	70	21,400	13	751
18-----	20,600	41	2,280	13,000	2	70	19,100	8	413
19-----	21,400	26	1,500	12,200	2	66	19,800	15	802
20-----	24,300	22	1,440	12,400	1	33	21,100	19	1,080
21-----	22,400	16	967	11,800	1	32	19,800	8	427
22-----	21,400	10	578	11,900	2	64	20,700	15	640
23-----	24,900	23	1,550	11,400	1	31	33,300	46	4,140
24-----	25,200	8	545	10,200	2	55	38,000	59	6,050
25-----	23,700	2	128	9,780	3	79	41,000	58	6,420
26-----	25,300	9	615	9,350	2	50	35,900	27	2,620
27-----	34,000	49	4,500	9,680	2	52	32,200	21	1,820
28-----	59,900	85	13,700	9,460	1	26	31,700	22	1,880
29-----	64,100	42	6,130	9,350	1	25	29,400	25	1,980
30-----	37,600	10	1,020	--	--	--	25,400	12	824
31-----	28,500	2	154	--	--	--	22,300	7	421
Total-	746,100	--	59,103	541,820	--	21,771	758,320	--	186,347

s Computed by subdividing day.

a Computed from estimated concentration graph.

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT TRENTON, N. J.--Continued

Suspended sediment, water year October 1951 to September 1952--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-----	20,800	2	112	32,800	22	1,950	26,500	20	1,430
2-----	22,700	6	368	27,000	14	1,020	35,100	63	5,970
3-----	35,200	80	7,600	23,500	5	317	35,600	46	4,420
4-----	38,800	90	9,430	20,700	3	188	26,800	26	1,880
5-----	40,900	450	49,700	18,700	20	1,010	24,800	21	1,410
6-----	69,800	252	47,500	16,600	44	1,970	23,100	23	1,430
7-----	74,500	220	44,300	16,200	7	306	21,100	18	1,020
8-----	52,500	90	12,800	14,800	3	120	18,100	27	1,320
9-----	39,700	40	4,290	13,800	2	75	15,700	8	339
10-----	32,400	24	2,100	13,100	4	141	14,900	12	483
11-----	27,400	17	1,260	12,600	2	68	14,200	12	460
12-----	23,800	9	578	14,200	4	153	12,700	8	274
13-----	21,200	8	458	21,500	32	1,860	11,600	7	219
14-----	25,900	14	979	27,900	33	2,490	10,500	4	113
15-----	47,400	134	17,100	25,400	19	1,300	9,730	6	158
16-----	67,700	183	33,500	22,300	15	903	8,670	4	94
17-----	57,200	100	15,400	20,400	11	606	8,010	3	65
18-----	41,000	41	4,540	18,700	12	606	8,510	4	92
19-----	32,600	20	1,760	17,800	12	577	8,160	4	88
20-----	27,200	13	955	17,300	26	1,210	7,570	2	41
21-----	23,800	12	771	19,500	12	632	7,050	2	38
22-----	21,000	11	624	19,800	13	695	6,500	3	53
23-----	19,200	10	518	18,500	13	649	6,500	6	105
24-----	17,900	7	338	16,500	10	446	6,730	8	145
25-----	17,000	10	459	22,300	46	2,770	7,190	7	136
26-----	24,200	28	1,830	46,700	265	33,400	6,820	4	74
27-----	32,200	50	4,350	52,500	118	16,700	6,320	3	51
28-----	46,600	104	13,100	37,500	40	4,050	5,500	3	45
29-----	45,700	79	9,750	29,000	28	2,190	4,960	8	107
30-----	40,500	50	5,470	25,200	39	2,650	4,880	7	92
31-----	--	--	--	22,400	19	11,150	--	--	--
Total--	1,086,800	--	291,940	705,200	--	82,182	405,500	--	22,152
	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-----	4,380	4	47	4,960	1	13	7,160	20	387
2-----	4,300	4	46	4,880	2	26	27,500	390	33,600
3-----	4,270	8	92	5,170	2	28	32,000	142	14,200
4-----	3,810	2	21	4,880	8	105	27,100	61	5,180
5-----	3,720	2	20	4,050	1	11	20,200	38	2,070
6-----	3,560	3	29	4,020	1	11	15,800	58	2,470
7-----	3,370	2	18	5,920	3	48	13,000	18	632
8-----	3,280	2	18	6,230	4	67	10,900	10	294
9-----	5,120	15	207	5,420	2	29	9,410	5	127
10-----	28,100	214	s 24,300	5,420	3	44	8,460	4	91
11-----	81,300	448	98,300	7,760	7	147	7,910	6	128
12-----	44,600	174	21,000	7,860	20	424	7,240	2	39
13-----	25,800	60	4,180	7,570	18	368	7,050	2	38
14-----	18,800	22	1,120	7,050	12	228	6,870	5	93
15-----	14,700	14	556	6,140	5	83	6,100	1	16
16-----	12,400	8	268	5,840	2	32	5,970	2	32
17-----	10,900	6	177	8,700	31	728	7,000	3	57
18-----	9,730	3	79	12,400	71	2,380	6,500	3	53
19-----	8,770	2	47	9,030	39	951	7,760	22	461
20-----	8,010	3	65	8,160	12	264	10,100	162	4,420
21-----	8,160	9	198	7,380	7	139	8,560	18	370
22-----	7,280	29	570	8,950	167	4,030	6,870	8	148
23-----	8,980	18	456	7,570	29	583	6,230	6	101
24-----	8,770	13	308	6,960	7	132	6,320	5	85
25-----	7,570	7	143	5,880	1	16	6,010	5	81
26-----	6,360	5	86	4,960	1	13	5,130	7	97
27-----	5,540	2	30	4,450	2	24	4,840	15	196
28-----	5,370	2	29	4,380	2	24	4,680	6	76
29-----	4,920	2	27	4,490	4	48	4,420	4	48
30-----	5,080	3	41	4,570	4	49	4,020	5	54
31-----	5,420	3	44	4,490	3	36	--	--	--
Total--	372,370	--	152,502	195,520	--	11,091	301,110	--	65,644
Total discharge for year (cfs-days).....									6,594,290
Total load for year (tons).....									1,090,229

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued
DELAWARE RIVER AT BRISTOL, PA.-BURLINGTON, N. J. BRIDGE

RECORDS AVAILABLE --Chemical analyses: August 1949 to September 1952.
REMARKS --Samples taken at center of stream approximately 13 feet from bottom. Additional data are published in Water-Supply Paper 1262, Chemical characteristics of Delaware River Water, Trenton, N. J., to Marcus Hook, Pa.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Temperature (°F)	Silica (SiO ₂)	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 on evaporation at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color	Biochemical oxygen demand	Dissolved oxygen
															Calcium, magnesium	Non-carbonate						
Cct. 2, 1951.....	67	6.0	0.05		21	7.3	8.3	2.4	62	37	10	0.0	5.2	130	a82			209	7.9	9	2.9	7.8
Nov. 7.....	44	5.3	.02		9.8	3.1	2.4	1.6	20	19	3.1	.1	4.6	75	b37			97.2	7.0	8	1.8	11.4
Dec. 5.....	44	5.7	.02		13	4.3	3.4	1.2	34	23	3.8	.0	3.5	87	c50			128	7.6	8	2.8	12.2
Jan. 3, 1952.....	39	4.9	--		14	6.0	1.0		31	26	4.0	.0	4.5	77	d60			118	7.2	5	1.0	11.1
Feb. 5.....	41	5.7	.07		9.2	4.5	1.9	1.3	21	20	3.5	.1	3.4	76	d41			104	6.0	12	2.7	12.1
Mar. 5.....	38	4.6	.10		14	5.0	5.8	--	38	26	5.9	.1	4.8	86				147	7.9	3	.7	10.0
Apr. 2.....	48	4.6	.06		9.8	3.6	2.2	--	23	19	3.2	.0	3.5	66				98.9	7.1	3	.5	9.7
May 5.....	57	5.4	.04		12	3.9	3.3	--	34	20	3.0	.0	3.0	76				112	7.0	5	.8	9.2
June 4.....	67	5.4	.02		8.6	2.6	2.2	--	20	16	2.5	.1	2.1	52				83.8	6.9	16	1.1	8.1
July 7.....	80	5.0	.03		19	7.1	5.4	--	60	29	6.0	.1	5.1	108				188	7.3	7	1.3	4.7
Aug. 6.....	79	4.1	.01		17	6.0	5.6	--	46	29	6.6	.1	4.9	101				171	7.3	5	5.6	6.3
Sept. 3.....	74	3.6	.02		14	6.4	.6		32	27	3.0	.1	4.8	86				137	7.3	6	1.9	7.1

a Non carbonate hardness 39 ppm.

b Non carbonate hardness 21 ppm.

c Non carbonate hardness 23 ppm.

d Non carbonate hardness 24 ppm.

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT TORRESDALE INTAKE, PHILADELPHIA, PA.

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1952.

REMARKS.--Samples taken at center of stream approximately 3 feet from bottom. Additional data are published in Water-Supply Paper 1262, Chemical characteristics of Delaware River water, Trenton, N. J., to Marcus Hook, Pa.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date	Temperature (°F)	Chloride (Cl)	Specific conductance (micromhos at 25°C)	pH	Biochemical oxygen demand	Dissolved oxygen
Oct. 2, 1951	70	3.0	207	7.3	4.2	4.7
Nov. 7	45	3.0	94.3	6.6	1.8	11.1
Dec. 5	42	5.0	134	6.9	3.6	12.4
Jan. 3, 1952	38	4.0	128	7.2	.9	10.5
Feb. 5	41	2.0	112	6.6	3.1	12.4
Mar. 5	39	6.0	157	6.7	2.2	10.7
Apr. 2	49	2.0	97.0	6.7	.8	9.6
May 5	58	3.0	115	6.8	.8	8.8
June 4	69	2.0	90.2	6.7	1.4	7.9
July 7	81	6.0	180	6.6	2.2	4.8
Aug. 6	80	7.0	163	6.7	6.1	5.2
Sept. 3	75	5.0	160	6.3	2.3	6.8

DELAWARE RIVER AT LEHIGH AVENUE, PHILADELPHIA, PA.

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1952.

REMARKS.--Samples taken at center of stream approximately 3 feet from bottom. Additional data are published in Water-Supply Paper 1262, Chemical characteristics of Delaware River water, Trenton, N. J., to Marcus Hook, Pa.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date	Temperature (°F)	Chloride (Cl)	Specific conductance (micromhos at 25°C)	pH	Biochemical oxygen demand	Dissolved oxygen
Oct. 2, 1951	70	11	229	6.3	0.0	4.0
Nov. 7	47	4.0	120	6.3	2.7	10.7
Dec. 5	42	7.0	147	6.4	3.4	9.2
Jan. 3, 1952	38	4.0	133	6.8	1.5	10.4
Feb. 5	39	4.0	122	6.6	3.5	12.4
Mar. 5	40	7.0	170	6.9	3.3	9.3
Apr. 2	50	3.0	97.3	6.5	.7	9.2
May 5	58	3.0	118	6.5	2.0	7.6
June 4	67	3.0	110	6.7	.5	6.7
July 7	81	8.0	184	6.8	.0	2.0
Aug. 6	82	12	215	6.7	9.2	.5
Sept. 3	76	7.0	173	6.5	1.6	7.0

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT PHILADELPHIA, PA.--CAMDEN, N. J. BRIDGE

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1952.
 REMARKS.--Samples taken at center of stream approximately 3 feet from bottom. Additional data are published in Water-Supply Paper 1262, Chemical Characteristics of Delaware River water, Trenton, N. J., to Marcus Hook, Pa.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Temp- era- ture (°F)	Silica (SiO ₂)	Iron (Fe)	Man- gan- ese (Mn)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids (residue on evap- oration at 180° C)	Hard- ness (micro- mbars at 25° C)	pH	Biochemical oxygen demand	Dissolved oxygen		
Oct. 2, 1951.....	69	2.0	0.05	6.9	20	6.9	14		54	43	14	0.1	7.0	142	78	261	7.8	9	2.5	
Nov. 7.....	48	5.1	.01		10	3.1	3.3		17	23	4.0	.1	3.3	79	38	107	7.3	11	10.0	
Dec. 5.....	43	7.2	.01		13	4.1	7.2		25	30	7.5	.1	5.4	104	49	151	7.4	11	9.0	
Jan. 3, 1952.....	38	6.6	.01		14	5.1	1.5		24	25	6.0	.1	6.3	86	56	129	7.2	5	10.2	
Feb. 5.....	38	6.2	.06		11	4.6	2.3		25	22	4.0	.1	3.8	94	46	120	6.6	7	12.5	
Mar. 5.....	40	7.0	.08		17	5.2	8.3		44	30	8.2	.1	7.6	108	64	181	7.9	4	9.2	
Apr. 2.....	49	5.0	.05		9.2	2.7	6.4		21	22	3.8	.1	4.0	72	34	91.6	6.9	6	8.3	
May 5.....	58	6.0	.06		11	3.6	3.1		18	26	3.4	.1	5.4	78	42	112	6.8	7	7.6	
June 4.....	67	5.8	.04		11	3.7	3.6		20	26	20	3.8	.1	4.9	68	43	110	6.9	12	6.7
July 7.....	79	6.4	.02		13	6.2	9.0		51	33	8.2	.1	3.0	116	70	194	7.4	6	1.0	
Aug. 7.....	82	4.6	.02		16	6.0	5.5		33	29	9.5	.1	8.7	106	62	173	7.2	6	1.2	
Sept. 3.....	76	2.1	.01		17	7.9	4.3		47	28	7.0	.2	7.8	108	75	181	7.5	2	6.7	

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT WHARTON STREET, PHILADELPHIA, PA.

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1952.

REMARKS.--Samples taken at center of stream approximately 3 feet from bottom. Additional data are published in Water-Supply Paper 1262, Chemical characteristics of Delaware River water, Trenton, N. J., to Marcus Hook, Pa.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date	Temperature (°F)	Chloride (Cl)	Specific conductance (micromhos at 25°C)	pH	Biochemical oxygen demand	Dissolved oxygen
Oct. 1, 1951.....	72	25	351	6.5	5.1	1.2
Nov. 5	48	6.0	148	6.5	4.3	9.3
Dec. 4	42	6.0	146	6.5	4.8	9.6
Jan. 2, 1952.....	38	5.0	139	6.9	4.1	11.6
Feb. 6	40	4.0	122	6.5	4.0	12.2
Mar. 3	40	8.0	187	6.3	3.8	8.2
Apr. 1	50	3.0	96.0	6.5	1.2	9.1
May 6	59	5.0	128	6.3	2.9	6.1
June 3	68	4.0	118	6.5	2.2	5.5
July 8	79	13	249	6.8	8.4	.1
Aug. 7	81	11	210	6.7	5.2	.2
Sept. 4	78	9.0	188	6.6	3.4	4.1

DELAWARE RIVER AT LEAGUE ISLAND, PHILADELPHIA, PA.

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1952.

REMARKS.--Samples taken at center of stream approximately 3 feet from bottom. Additional data are published in Water-Supply Paper 1262, Chemical characteristics of Delaware River water, Trenton, N. J., to Marcus Hook, Pa.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date	Temperature (°F)	Chloride (Cl)	Specific conductance (micromhos at 25°C)	pH	Biochemical oxygen demand	Dissolved oxygen
Oct. 1, 1951.....	72	38	396	7.6	3.0	0.9
Nov. 5	48	7.0	164	6.7	4.8	7.6
Dec. 4	45	8.0	170	6.3	4.2	7.4
Jan. 2, 1952.....	37	5.0	131	6.9	3.5	10.8
Feb. 6	40	5.0	129	6.3	4.1	12.2
Mar. 3	40	10	202	6.3	3.1	7.7
Apr. 1	51	5.0	105	6.5	1.3	8.0
May 6	61	4.0	132	6.3	2.1	6.2
June 3	69	4.0	113	6.6	2.0	6.0
July 8	79	13	264	6.8	7.2	.2
Aug. 7	82	12	231	6.6	6.5	.0
Sept. 4	77	10	194	6.6	1.2	3.4

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT LANDINGVILLE, PA.--Continued

LOCATION.--At gaging station at highway bridge at Landingville, Schuylkill County, 0.1 mile upstream from Mahannon Creek, 5 miles downstream from mouth of West Branch Schuylkill River.

DRAINAGE AREA.--133 square miles.

RECORDS AVAILABLE.--Sediment records: September 1947 to September 1952.

EXTREMES, 1951-52.--Sediment concentrations: Maximum, 1,590 ppm Mar. 11; minimum, 11 ppm Mar. 10.

Sediment loads: Maximum daily, 17,600 tons Mar. 11; minimum daily, 5 tons Mar. 10.

EXTREMES, 1947-52.--Sediment concentrations: Maximum, 9,740 ppm Feb. 15, 1948; minimum, 11 ppm Mar. 10, 1952.

Sediment loads: Maximum daily, 18,740 tons Dec. 30, 1948; minimum daily, 5 tons Mar. 10, 1952.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of water discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1232.

Suspended sediment, water year October 1951 to September 1952

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-----	90	43	10	460	675	s 994	232	90	56
2-----	86	55	13	398	280	301	235	105	67
3-----	82	130	29	1,490	637	s 2,780	209	45	25
4-----	73	87	17	1,120	195	590	202	100	55
5-----	65	127	22	760	320	657	1,980	918	s 5,440
6-----	94	170	43	581	220	345	1,500	320	1,300
7-----	207	721	s 958	1,280	808	s 3,290	1,040	235	660
8-----	240	750	486	1,180	720	1,020	802	169	366
9-----	130	168	59	865	145	339	657	74	131
10-----	124	140	47	697	80	151	544	65	95
11-----	140	130	49	600	65	105	472	56	71
12-----	128	141	49	508	75	103	438	68	80
13-----	120	160	52	438	65	77	388	78	82
14-----	130	42	15	455	80	98	350	83	78
15-----	125	120	41	438	100	118	369	90	90
16-----	121	125	41	600	275	446	315	42	36
17-----	113	92	28	600	95	154	260	40	28
18-----	106	91	26	562	40	61	250	36	24
19-----	112	100	30	490	41	54	300	60	49
20-----	121	112	37	438	55	65	290	92	72
21-----	122	60	20	391	80	84	898	113	s 270
22-----	103	62	17	375	60	61	710	156	299
23-----	100	65	18	346	65	61	605	186	304
24-----	132	171	s 95	366	115	114	505	32	44
25-----	202	386	s 260	327	60	53	451	35	43
26-----	119	62	20	312	70	59	412	38	42
27-----	117	210	66	280	135	102	353	39	37
28-----	190	280	144	256	160	111	314	95	81
29-----	164	65	29	240	160	104	298	72	58
30-----	138	89	33	224	100	60	314	65	55
31-----	124	60	20	--	--	--	314	66	56
Total-	3,918	--	2,774	17,077	--	12,557	16,010	--	10,094

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT LANDINGVILLE, PA.--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

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-----	406	71	78	565	72	110	188	68	35
2-----	710	148	284	565	74	113	180	62	30
3-----	1,000	295	796	505	58	79	164	63	28
4-----	912	316	778	840	518	s 1,240	169	105	48
5-----	778	132	277	688	236	438	222	121	73
6-----	645	67	117	625	99	167	190	127	65
7-----	525	90	128	565	97	148	180	120	58
8-----	473	85	109	525	105	149	175	85	40
9-----	420	64	73	493	71	95	175	50	24
10-----	402	88	96	434	45	53	170	11	5
11-----	364	90	88	392	88	93	3,370	1,590	s 17,600
12-----	340	60	55	367	72	71	2,420	550	3,590
13-----	327	30	26	321	85	74	1,440	235	914
14-----	311	72	60	292	79	62	1,060	78	223
15-----	340	219	201	283	68	52	822	50	111
16-----	334	206	186	283	61	47	688	40	74
17-----	317	190	163	314	39	33	585	48	76
18-----	525	210	298	278	40	30	489	69	91
19-----	462	121	151	255	142	98	545	140	206
20-----	491	98	127	243	155	102	565	310	473
21-----	415	69	77	228	143	88	605	102	167
22-----	395	41	44	222	97	58	625	126	213
23-----	530	134	192	220	98	58	755	125	255
24-----	460	91	113	217	55	32	710	61	117
25-----	420	122	138	191	103	53	665	216	388
26-----	740	310	619	177	112	54	585	46	73
27-----	980	512	1,350	183	96	47	525	60	85
28-----	1,150	163	506	169	79	36	473	60	77
29-----	920	80	199	183	67	33	430	50	58
30-----	732	72	142	--	--	--	388	36	38
31-----	625	85	143	--	--	--	340	108	98
Total-	17,439	--	7,614	10,621	--	3,713	19,898	--	25,334
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-----	377	134	136	935	68	172	493	34	45
2-----	840	446	s 958	778	42	88	420	103	117
3-----	605	88	144	665	42	75	412	120	133
4-----	545	66	97	605	45	74	423	138	158
5-----	959	181	489	525	51	72	402	175	190
6-----	980	170	450	473	56	72	353	94	90
7-----	822	61	135	430	72	94	327	82	72
8-----	688	76	141	395	66	70	295	91	72
9-----	605	100	163	357	66	64	270	195	142
10-----	525	55	78	350	225	213	252	398	271
11-----	485	30	39	599	448	s 782	222	152	91
12-----	444	28	34	1,500	340	1,380	211	138	79
13-----	430	29	34	1,260	95	323	199	147	79
14-----	933	158	s 399	980	64	169	197	40	21
15-----	1,060	110	315	822	78	173	185	45	22
16-----	958	76	197	688	70	130	167	120	54
17-----	822	52	115	605	54	88	164	156	69
18-----	710	38	73	625	48	81	161	157	68
19-----	625	30	51	505	85	116	174	75	35
20-----	565	43	66	585	50	79	174	108	51
21-----	481	44	57	565	60	92	172	35	16
22-----	434	57	67	505	46	63	183	70	35
23-----	406	90	99	469	48	61	199	154	83
24-----	381	33	34	493	70	93	185	183	91
25-----	558	64	s 104	1,350	438	s 1,850	174	160	75
26-----	585	55	87	1,100	90	267	164	132	58
27-----	822	87	193	890	52	125	144	120	47
28-----	1,810	190	s 895	755	40	82	154	140	58
29-----	1,800	300	1,460	665	42	75	144	115	45
30-----	1,260	70	238	605	60	98	139	100	38
31-----	--	--	--	565	30	46	--	--	--
Total-	22,515	--	7,328	21,644	--	7,157	7,159	--	2,405

s Computed by subdividing day.

NORTH ATLANTIC SLOPE BASINS

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT LANDINGVILLE, PA.--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

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-----	132	66	24	119	46	15	1,740	1,390	s 9,240
2-----	123	18	6	182	32	16	1,190	1,250	s 4,050
3-----	123	17	6	169	52	24	1,000	525	1,420
4-----	114	32	10	139	55	21	745	230	463
5-----	114	32	10	129	160	56	619	200	334
6-----	106	20	6	258	1,240	s 879	559	140	211
7-----	95	35	9	186	1,390	698	503	98	133
8-----	142	142	s 56	164	505	224	417	97	109
9-----	885	1,110	s 3,360	161	390	170	365	166	164
10-----	614	1,000	1,660	351	614	653	337	309	281
11-----	350	440	416	294	880	s 764	310	402	336
12-----	289	135	105	249	390	262	281	370	281
13-----	246	54	36	228	165	102	275	398	296
14-----	208	29	16	199	160	86	266	700	503
15-----	199	135	73	183	350	173	303	938	s 808
16-----	194	68	36	237	345	235	314	610	s 566
17-----	185	56	28	617	1,030	s 2,120	245	430	294
18-----	180	26	13	311	280	235	226	440	268
19-----	175	26	12	264	335	239	257	282	196
20-----	170	31	14	220	250	148	240	150	97
21-----	180	33	16	217	225	132	229	118	73
22-----	250	117	79	228	228	140	197	140	74
23-----	177	130	62	222	148	89	192	120	62
24-----	159	288	124	202	60	33	183	152	75
25-----	167	40	18	188	83	42	178	330	159
26-----	164	30	13	185	86	43	171	346	160
27-----	149	53	21	177	50	24	180	238	116
28-----	143	91	35	172	57	26	171	215	99
29-----	146	126	50	174	43	20	151	440	179
30-----	132	110	39	159	60	26	149	500	201
31-----	125	205	69	156	50	21	--	--	--
Total-	6,436	--	6,422	6,740	--	7,716	11,993	--	21,238

Total discharge for year (cfs-days) 161,450
 Total load for year (tons) 114,352

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued
SCHUYLKILL RIVER AT LANDINGVILLE, PA.--Continued

Particle-size analyses of suspended sediment, water year October 1951 to September 1952

(Methods of analysis: B, bottom withdrawal tube; D, decantation; F, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Water temperature per- discharge ature (° F)	Suspended sediment											Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters								1.000		
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500
Nov. 3, 1951	10:00 a. m.	2,070		1,310	2,320			22	32	47	70	94	98		100	BWC
Nov. 7	3:30 p. m.	1,830		1,900	1,740			24	36	47	62	89	95		97	BWC
Dec. 5	2:45 p. m.	2,880		940	1,260			23	37	50	65	78	97		100	BWC
Aug. 1, 1952	12:30 p. m.	114		34	1,680			50	66	84	92	98	99		100	BWC
Aug. 5	10:00 a. m.	134		180	1,120			50	69	76	84	94	98		100	BWC
Aug. 18	12:15 p. m.	298		250	1,380			46	62	70	77	88	96		100	BWC

NORTH ATLANTIC SLOPE BASINS

DELAWARE RIVER BASIN--Continued

LITTLE SCHUYLKILL RIVER AT SOUTH TAMAQUA, PA.--Continued

LOCATION.--At State Rt. 443 Highway Bridge, 3½ miles downstream from Panther Creek.

DRAINAGE AREA.--69.6 square miles.

RECORDS AVAILABLE.--Sediment records: April 1950 to September 1952.

EXTREMES, 1951-52.--Sediment concentrations: Maximum, 6,240 ppm July 9; minimum, 20 ppm Mar. 16.

Sediment loads: Maximum daily, 23,300 tons Mar. 11; minimum daily, 8 tons Oct. 6.

EXTREMES, 1950-52.--Sediment concentrations: Maximum, 6,400 ppm July 28, 1951; minimum, 20 ppm Mar. 18, 1951 and Mar. 16, 1952.

Sediment loads: Maximum daily, 27,700 tons Nov. 25, 1950; minimum daily 5 tons June 1, 1951.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of water discharge are not published. Records of discharge for water year October 1951 to September 1952 for the Little Schuylkill River at Tamaqua, Pa. given in Water-Supply Paper 1232.

Suspended sediment, water year October 1951 to September 1952

Suspended sediment, water year October 1951 to September 1952									
Day	October			November			December		
	Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment	
		Mean con- centration (ppm)	Tons per day		Mean con- centration (ppm)	Tons per day		Mean con- centration (ppm)	Tons per day
1-----	57	140	22	261	1,230	s 1,030	110	175	52
2-----	56	160	24	202	408	222	112	50	15
3-----	56	140	21	1,070	1,630	s 5,120	112	350	106
4-----	57	142	22	608	200	328	108	275	60
5-----	53	115	16	388	90	94	1,630	1,990	s 9,300
6-----	49	60	8	285	145	112	1,070	280	810
7-----	152	1,460	s 1,300	1,140	1,360	s 7,310	626	80	135
8-----	149	400	161	1,070	210	607	468	60	76
9-----	87	140	33	685	148	274	369	25	25
10-----	78	162	34	468	90	114	306	120	99
11-----	94	312	79	381	50	51	272	138	101
12-----	89	200	48	301	50	41	249	130	87
13-----	78	108	23	258	110	77	202	93	51
14-----	77	78	16	262	300	212	184	100	50
15-----	80	150	32	267	200	144	215	70	41
16-----	77	249	52	317	425	364	176	30	14
17-----	80	246	53	262	115	81	166	40	18
18-----	77	220	46	258	60	42	159	340	146
19-----	78	225	48	236	180	115	146	150	59
20-----	77	198	41	211	135	77	125	320	108
21-----	69	100	19	187	150	76	514	470	652
22-----	71	175	33	166	85	38	394	175	186
23-----	73	60	12	173	775	362	327	55	49
24-----	100	675	162	184	150	75	290	140	110
25-----	105	360	102	166	50	21	244	55	36
26-----	80	270	58	159	200	86	240	170	110
27-----	69	160	30	140	230	87	202	120	65
28-----	89	210	50	125	200	68	180	125	61
29-----	87	80	14	118	240	76	162	130	57
30-----	82	150	33	115	350	a 109	176	75	36
31-----	84	260	59	--	--	--	187	245	124
Total-	2,510	--	2,671	10,453	--	17,413	9,721	--	12,859

s Computed by subdividing day.

a Computed from estimated concentration graph.

DELAWARE RIVER BASIN--Continued

LITTLE SCHUYLKILL RIVER AT SOUTH TAMAQUA, PA.--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

Day	January			February			March		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	215	100	58	301	92	75	91	78	19
2-----	338	281	258	290	95	75	94	41	10
3-----	499	360	486	267	60	43	84	160	36
4-----	454	198	243	636	1,020	s 2,050	96	200	52
5-----	407	150	165	499	182	245	103	610	170
6-----	338	48	44	414	130	145	89	260	67
7-----	285	142	109	363	115	113	87	100	23
8-----	254	83	57	312	120	101	78	160	34
9-----	227	98	60	276	90	67	60	50	11
10-----	211	78	45	258	50	35	87	195	46
11-----	187	140	71	236	80	51	2, 870	3, 260	s 23, 300
12-----	162	135	59	206	78	43	1, 490	280	1, 170
13-----	162	47	21	184	78	39	746	135	272
14-----	187	280	141	166	76	34	491	60	80
15-----	184	300	149	152	93	38	363	46	45
16-----	180	180	87	143	100	39	312	20	17
17-----	191	250	129	173	52	24	262	55	39
18-----	312	460	404	156	245	103	232	82	51
19-----	262	188	133	133	220	79	244	90	59
20-----	290	160	141	120	300	97	258	230	160
21-----	249	236	159	118	270	86	276	162	121
22-----	240	206	133	110	125	37	301	130	106
23-----	306	245	202	100	80	22	375	210	213
24-----	244	160	105	105	48	14	369	120	120
25-----	219	125	74	98	85	22	375	140	142
26-----	483	830	1,080	103	230	64	301	100	81
27-----	617	441	734	94	110	28	287	150	108
28-----	645	238	416	91	80	20	240	215	139
29-----	530	145	207	89	102	25	206	80	44
30-----	420	130	147	--	--	--	198	35	19
31-----	344	102	95	--	--	--	184	60	30
Total--	9, 642	--	6, 210	6, 193	--	3, 814	11, 249	--	26, 784
Day	April			May			June		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	219	140	83	434	190	223	290	80	63
2-----	434	475	557	338	198	181	249	100	67
3-----	327	270	238	280	90	68	215	90	52
4-----	280	165	125	254	50	34	232	115	72
5-----	694	1, 530	s 3, 430	219	120	71	219	185	109
6-----	746	226	56	202	162	88	184	210	104
7-----	563	150	228	176	159	76	156	75	32
8-----	420	84	95	159	198	85	152	43	16
9-----	327	72	64	136	120	44	152	125	51
10-----	272	66	50	136	55	20	140	117	44
11-----	227	48	29	240	215	139	125	97	33
12-----	198	41	22	641	698	s 1, 300	118	130	41
13-----	198	52	28	506	170	232	115	107	33
14-----	520	520	s 564	407	160	176	105	62	18
15-----	779	392	824	344	140	130	105	45	13
16-----	617	210	350	285	160	123	105	156	44
17-----	441	180	214	254	85	58	105	139	39
18-----	338	142	130	258	78	54	103	128	36
19-----	267	80	58	223	100	60	110	560	166
20-----	227	42	26	276	295	220	94	160	41
21-----	202	587	320	258	190	132	84	100	23
22-----	166	150	67	211	132	75	89	91	22
23-----	152	160	66	191	140	72	103	730	203
24-----	136	212	78	232	300	188	98	216	57
25-----	240	695	450	1, 100	1, 200	s 3, 920	89	180	43
26-----	249	220	148	880	280	665	87	175	41
27-----	363	245	240	599	135	218	80	194	42
28-----	1, 150	1, 280	s 4, 370	454	105	129	77	96	20
29-----	996	400	1, 080	381	155	159	75	63	13
30-----	626	220	372	333	95	85	75	310	63
31-----	--	--	--	338	120	110	--	--	--
Total--	12, 374	--	14, 751	10, 745	--	9, 135	3, 931	--	1, 603

s Computed by subdividing day.

NORTH ATLANTIC SLOPE BASINS

DELAWARE RIVER BASIN--Continued

LITTLE SCHUYLKILL RIVER AT SOUTH TAMAQUA, PA.--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

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-----	69	76	14	89	180	43	942	2,290	s 8,830
2-----	68	72	13	140	650	246	599	210	340
3-----	68	57	10	108	70	20	537	190	275
4-----	68	52	10	87	122	29	427	180	208
5-----	64	49	9	82	120	27	338	160	146
6-----	63	52	9	128	950	328	285	90	69
7-----	61	65	11	98	136	36	249	50	34
8-----	84	400	91	89	162	39	232	120	75
9-----	791	6,240	s 16,600	84	95	22	202	130	71
10-----	655	1,200	2,120	287	1,650	s 1,510	191	98	51
11-----	285	335	258	280	332	251	180	115	56
12-----	211	145	83	215	274	159	166	95	43
13-----	176	92	44	180	242	118	152	92	38
14-----	162	208	91	149	216	87	143	33	13
15-----	149	220	89	130	225	79	184	345	171
16-----	149	170	68	214	658	s 658	194	190	100
17-----	133	180	65	590	1,090	1,740	156	140	59
18-----	122	280	92	338	315	287	140	120	45
19-----	115	150	47	258	230	180	156	390	164
20-----	115	340	106	215	220	128	122	65	21
21-----	122	600	198	215	360	209	115	45	14
22-----	545	1,420	s 2,890	215	520	302	108	160	47
23-----	236	140	89	149	365	147	110	150	45
24-----	187	85	43	133	262	94	103	150	42
25-----	146	80	32	128	585	202	91	160	39
26-----	125	80	27	118	242	77	84	180	41
27-----	128	110	38	112	410	124	80	80	17
28-----	125	160	54	105	380	108	80	40	9
29-----	112	115	35	100	110	30	91	120	29
30-----	98	110	29	94	85	22	89	118	28
31-----	108	1,300	430	94	74	19	--	--	--
Total-	5,540	--	23,695	5,224	--	7,301	6,546	--	11,120

Total discharge for year (cfs-days)..... 94,128
 Total load for year (tons)..... 137,366

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

LITTLE SCHUYLKILL RIVER AT SOUTH TAMAQUA, PA.--Continued

Particle-size analyses of suspended sediment, water year October 1951 to September 1952

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Suspended sediment											Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500	1.000
Nov. 7, 1951.....	1:00 p. m.	3,100	2,000	1,600		28	39	53	66	98	100		--	--	BWC
July 9, 1952.....	2:00 p. m.	333	2,100	13,600		32	43	61	84	93	98		99	99	BWC
Aug. 5, 1952.....	1:00 p. m.	84	150	1,100		24	44	63	90	91	98		99	100	BWC
Aug. 18, 1952.....	2:00 p. m.	344	370	2,310	21	34	46	62	80	90	97		99	100	BWC
Sept. 1, 1952.....	11:30 a. m.	2,320	8,280	17,100		20	30	43	61	85	93		98	96	BWC

DELAWARE RIVER BASIN--Continued
SCHUYLKILL RIVER AT BERNE, PA.

LOCATION --At gaging station at highway bridge at Berne, Berks County, half a mile upstream from Mill Creek, and 6½ miles downstream from Little Schuylkill River.

DRAINAGE AREA --355 square miles.

RECORDS AVAILABLE --Chemical analyses: December 1947 to September 1952.

Water temperatures: February 1948 to September 1952.

Sediment records: October 1947 to September 1952.

EXTREMES, 1951-52. --Dissolved solids: Maximum, 725 ppm July 1-8; minimum, 212 ppm Nov. 2-10.

Hardness: Maximum, 362 ppm July 1-8; minimum, 117 ppm Jan. 21-31, Apr. 1-10.

Specific conductance: Maximum daily, 1040 micromhos Oct. 23; minimum daily, 190 micromhos Apr. 29.

Water temperatures: Maximum, 87°F June 26; minimum, freezing point Dec. 16.

Sediment concentrations: Maximum, 976 ppm Mar. 11; minimum, 0 ppm on many days.

EXTREMES, 1947-52. --Dissolved solids: Maximum, 755 ppm Sept. 11-20, 1948; minimum, 164 ppm May 5-10, 1948.

Hardness: Maximum, 501 ppm Sept. 11-20, 1948; minimum, 93 ppm Mar. 21-31, 1950.

Specific conductance (1949-52): Maximum daily, 1040 micromhos Oct. 23, 1951; minimum daily, 189 micromhos Dec. 4, 1950.

Water temperatures (1948-52): Maximum, 87°F June 26, 1952; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum, 8,030 ppm Nov. 4, 1947; minimum, 0 ppm on many days.

REMARKS --Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1232.

Chemical analyses. In parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium	Non-carbonate				
Oct. 1-10, 1951...			15	17	0.13	5.8	67	47	17	2.6	--	469	6.5	0.0	2.9	707	360	360	183	889	3.90	3
Oct. 11-20			14	16	20	5.2	66	42	13	2.5	0	444	4.5	1	3.6	685	337	337	216	889	3.70	3
Oct. 21-31			13	16	14	5.7	71	44	15	2.5	0	465	5.5	1	3.1	724	358	358	202	915	3.75	2
Nov. 1			--	--	--	--	238	--	--	--	--	276	4.0	--	4.9	--	228	228	--	569	3.70	3
Nov. 2-10			8.2	3.4	0.6	1.8	20	13	4.8	1.8	0	126	2.0	0	4.9	212	103	103	44	309	4.20	4
Nov. 11-20			9.7	6.5	0.5	2.3	29	17	7.0	1.6	0	192	2.0	0	3.1	312	142	142	58	430	4.35	2
Nov. 21-30			9.3	8.9	0.6	3.2	41	27	10	1.7	0	285	3.5	0	2.5	424	213	213	101	557	4.30	3
Dec. 1-4			11	9.7	0.6	3.2	45	39	11	1.8	0	298	4.0	1	2.5	466	236	236	--	615	4.20	2
Dec. 5			--	--	--	--	--	--	13	--	1	199	2.5	--	1.5	--	176	176	--	427	4.7	2
Dec. 5-10			8.0	3.4	0.6	1.4	16	14	5.1	1.6	0	124	2.5	0	3.0	204	97	97	41	300	4.40	3
Dec. 11-20			11	7.1	0.6	2.6	37	24	9.6	1.5	0	233	2.5	0	2.4	366	191	191	86	506	4.25	3
Dec. 21-31			9.6	4.8	0.8	2.1	30	19	7.4	1.5	0	178	3.0	0	2.5	288	153	153	57	402	4.45	3
Jan. 1-10, 1952			9.1	3.2	0.6	1.6	26	17	7.4	1.4	--	151	3.0	0	2.9	238	135	135	38	350	4.6	2
Jan. 11-20			11	5.0	1.1	2.4	35	23	10	1.6	0	222	3.0	0	2.4	341	182	182	61	473	4.35	3
Jan. 21-31			8.3	4.1	0.3	1.7	22	15	6.1	1.5	--	138	4.0	1	3.9	215	117	117	38	327	4.40	1
Feb. 1-10			6.4	4.5	0.5	2.0	26	17	6.8	1.4	--	159	4.5	1	3.0	251	135	135	52	364	4.45	1
Feb. 11-20			9.7	5.8	0.8	3.1	39	25	10	1.6	--	248	4.5	1	2.5	375	200	200	86	523	4.30	1
Feb. 21-28			10	6.2	0.9	3.8	50	31	13	1.7	--	304	5.0	1	2.9	455	250	250	98	631	4.10	2
Mar. 1-10			10	4.8	0.8	3.8	49	32	14	1.5	--	304	5.0	1	2.9	455	256	256	100	635	4.15	1
Mar. 11-12			--	--	--	--	--	--	3.4	--	1	56	1.5	--	2.7	--	56	56	--	159	4.7	3

Mar. 13-20	8.4	3.7	.03	3.6	27	17	6.8	1.4	0	162	3.0	.1	2.5	246	137	137	52	366	4.30	2
Mar. 21-31	8.4	2.5	.04	2.2	28	17	7.2	1.4	0	162	2.5	.1	2.5	255	140	140	64	372	4.35	2
Apr. 1-10	7.4	3.5	.04	1.8	24	14	6.0	1.2	0	142	2.5	.1	1.7	218	117	117	35	333	4.40	5
Apr. 11-20	7.8	3.5	.04	1.8	27	15	6.4	1.4	0	152	3.0	.1	1.5	234	129	129	40	351	4.40	5
Apr. 21-27	8.4	4.7	.07	2.4	32	19	8.3	1.4	0	194	3.5	.1	1.1	293	158	158	46	429	4.35	3
Apr. 28 - May 2	7.4	3.9	.03	1.4	18	12	4.7	1.2	--	107	3.0	.1	2.1	187	94	94	35	264	4.45	3
May 3-11	10	5.6	.06	2.7	36	26	10	1.5	--	240	5.5	.0	1.5	356	187	187	82	513	4.20	2
May 12-20	8.9	2.2	.03	2.0	27	19	7.4	1.5	--	170	4.0	.1	1.7	260	145	145	56	380	4.35	2
May 21-31	9.0	1.9	.03	1.9	27	18	7.4	1.3	--	164	4.0	.1	1.7	250	141	141	55	380	4.35	2
June 1-10	11	5.9	.06	3.0	38	25	10	1.5	0	239	3.0	.1	1.2	402	198	198	99	516	4.25	2
June 11-20	12	7.8	.11	4.4	54	38	15	1.8	0	358	4.5	.1	1.8	562	291	291	108	718	4.15	3
June 21-30	13	9.7	.15	5.1	62	42	17	2.1	0	404	5.0	.1	2.1	675	327	327	192	823	4.00	3
July 1-10	14	16	.21	6.3	66	48	17	2.0	0	464	4.0	.1	2.2	725	362	362	254	921	3.80	2
July 11-20	8.8	6.5	.05	2.5	27	17	4.4	1.6	0	108	2.5	.0	3.3	287	137	137	86	385	4.20	2
July 21-30	12	11	.13	4.0	43	30	7.4	1.5	0	292	4.0	.1	2.7	461	231	231	162	616	3.90	1
July 31	12	11	.19	4.2	46	32	8.8	1.7	0	350	4.0	.0	2.5	506	246	246	186	673	3.80	1
Aug. 1-10	14	12	.04	4.2	51	34	10	1.9	--	350	6.0	.1	2.4	538	267	267	176	712	4.05	5
Aug. 11-20	9.2	7.7	.04	2.4	31	20	16.0	1.7	--	210	5.0	.0	2.4	320	165	165	102	453	4.25	2
Aug. 21-31	13	10	.05	2.8	46	29	10	1.7	--	216	5.0	.1	2.1	367	194	194	166	551	3.95	5
Sept. 1-10	10	4.8	.05	1.8	30	18	7.2	1.8	0	178	3.0	.1	2.5	286	140	140	80	399	4.20	3
Sept. 11-20	9.2	8.5	.06	3.5	50	31	11	1.8	0	307	4.0	.0	2.0	416	232	232	157	533	3.80	15
Sept. 21-30	13	10	.07	4.1	58	36	14	1.8	0	345	5.0	.1	2.1	544	283	283	184	743	3.80	15
Average	10	7.1	.08	3.1	44	25	9.5	1.6	0	245	3.8	0.1	2.5	399	198	198	103	522	--	3

NORTH ATLANTIC SLOPE BASINS

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BERNE, PA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952
(Once-daily temperature measurement at approximately 5 p.m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	87	--	44	47	41	42	51	58	64	81	79	69
2	79	--	44	44	43	39	53	58	66	82	76	70
3	71	46	45	46	44	38	53	58	63	81	80	69
4	73	46	51	45	44	38	51	55	70	81	80	68
5	73	48	69	43	42	38	52	57	71	84	82	67
6	72	47	44	42	43	39	47	60	72	84	77	68
7	65	52	54	40	42	39	52	60	74	82	78	67
8	63	--	55	42	43	37	47	57	74	76	74	65
9	57	45	53	44	42	39	49	59	73	72	74	65
10	58	46	47	44	42	42	53	61	73	70	75	66
11	55	50	46	42	42	46	53	60	70	73	75	69
12	58	50	43	45	38	46	47	56	70	73	72	70
13	--	--	36	43	35	41	46	52	71	77	74	75
14	56	52	36	45	35	43	52	57	70	79	75	74
15	60	56	34	47	37	43	59	60	79	79	74	69
16	63	52	32	44	38	41	54	60	79	79	72	68
17	69	49	34	43	37	41	58	60	81	81	70	69
18	60	--	42	44	39	44	58	62	81	60	72	69
19	60	44	33	45	37	40	58	59	77	81	72	68
20	64	40	34	42	39	46	61	56	77	79	71	67
21	57	42	--	38	41	50	62	58	68	83	70	65
22	69	43	37	37	38	48	62	62	66	80	71	63
23	62	47	42	38	44	47	59	60	65	81	69	65
24	63	--	42	38	49	45	52	59	73	80	71	66
25	57	46	42	39	39	47	52	59	78	78	72	65
26	57	44	40	43	40	50	52	60	87	79	73	65
27	59	49	39	43	41	51	54	63	86	--	74	65
28	55	--	38	42	47	49	53	65	84	82	73	64
29	53	42	40	37	44	48	56	64	83	80	74	66
30	55	43	44	36	--	50	58	61	82	81	73	66
31	69	--	45	36	--	52	--	60	--	89	74	--
Average	61	--	43	42	41	44	54	59	74	79	74	67

DELAWARE RIVER BASIN

55

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BERNE, PA.--Continued

Suspended sediment, water year October 1951 to September 1952

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-----	230	2	1	874	49	s 150	642	3	5
2-----	214	1	1	940	155	393	633	3	5
3-----	198	1	1	3,520	300	s 2,840	625	2	3
4-----	192	1	1	2,800	55	416	608	4	7
5-----	170	1	1	1,800	20	97	5,650	474	s 10,000
6-----	170	2	1	1,300	10	35	5,130	118	1,630
7-----	225	2	1	3,950	262	s 3,930	3,030	31	254
8-----	726	8	s 18	4,140	102	1,140	2,300	20	124
9-----	370	1	1	2,680	32	232	1,810	11	54
10-----	304	1	1	2,010	21	114	1,520	8	33
11-----	310	1	1	1,620	17	74	1,310	9	32
12-----	352	1	1	1,360	19	70	1,170	6	19
13-----	292	2	2	1,190	11	35	1,050	9	26
14-----	304	1	1	1,120	8	24	923	10	25
15-----	292	2	2	1,220	17	56	1,010	11	30
16-----	286	2	2	1,420	20	77	920	10	25
17-----	280	1	1	1,620	15	66	760	5	10
18-----	280	2	2	1,440	10	39	700	6	11
19-----	269	1	1	1,290	9	31	840	5	11
20-----	280	1	1	1,130	11	34	820	10	22
21-----	280	2	2	1,010	9	25	2,750	277	s 2,150
22-----	269	5	4	914	5	12	2,440	35	231
23-----	264	8	6	896	6	15	1,880	10	51
24-----	274	5	4	951	10	26	1,550	9	38
25-----	460	6	7	868	8	19	1,330	9	32
26-----	316	3	3	850	8	18	1,240	9	30
27-----	274	6	4	815	8	18	1,090	10	29
28-----	346	7	7	736	5	10	960	10	26
29-----	382	5	5	693	4	7	905	9	22
30-----	334	5	5	667	5	9	886	8	19
31-----	310	6	5	--	--	--	923	5	12
Total-	9,253	--	93	45,824	--	10,012	47,405	--	14,966
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-----	1,070	9	26	1,460	13	51	413	8	9
2-----	2,040	27	149	1,380	16	60	406	6	7
3-----	3,120	55	463	1,280	10	35	390	3	3
4-----	2,600	22	154	2,410	85	s 627	382	2	2
5-----	2,150	15	87	2,220	25	150	526	6	9
6-----	1,740	8	38	1,810	12	56	469	2	3
7-----	1,440	8	31	1,540	16	67	437	1	1
8-----	1,200	5	16	1,340	18	65	429	2	2
9-----	1,150	5	16	1,210	19	62	421	2	2
10-----	1,080	10	29	1,070	10	29	406	2	2
11-----	969	8	21	997	10	27	8,980	976	s 34,100
12-----	877	9	21	886	11	26	7,960	301	s 7,570
13-----	841	10	23	788	11	23	3,810	60	617
14-----	850	9	21	710	11	21	2,680	36	260
15-----	886	10	24	719	9	17	2,010	22	119
16-----	914	8	20	642	8	14	1,680	18	82
17-----	896	8	19	701	17	32	1,440	14	54
18-----	1,480	15	60	693	11	21	1,240	14	47
19-----	1,420	10	38	608	10	16	1,330	20	72
20-----	1,440	15	58	558	10	15	1,430	20	77
21-----	1,250	12	41	534	11	16	1,620	22	96
22-----	1,140	10	31	517	10	14	1,620	15	66
23-----	1,560	12	51	485	10	13	1,940	21	110
24-----	1,350	11	40	469	8	10	1,940	18	94
25-----	1,190	15	48	453	7	9	1,810	14	88
26-----	1,920	64	332	421	10	11	1,560	11	46
27-----	2,940	50	397	406	9	10	1,380	12	45
28-----	3,400	50	459	390	10	11	1,230	10	33
29-----	2,760	25	186	382	8	8	1,120	11	33
30-----	2,080	17	95	--	--	--	1,030	9	25
31-----	1,740	10	47	--	--	--	951	7	18
Total-	49,493	--	3,041	27,079	--	1,519	53,040	--	43,672

s Computed by subdividing day.

NORTH ATLANTIC SLOPE BASINS

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BERNE, PA.--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

	April			May			June		
1-----	914	7	17	2,520	18	122	1,260	3	10
2-----	2,130	67	s 403	2,010	11	60	1,070	5	14
3-----	1,740	16	75	1,680	13	59	932	5	13
4-----	1,520	12	49	1,440	6	23	932	2	15
5-----	2,410	80	s 632	1,260	6	20	1,140	4	12
6-----	3,120	60	505	1,200	6	19	914	1	2
7-----	2,440	23	152	1,020	8	22	815	2	4
8-----	1,940	22	115	960	4	10	744	2	4
9-----	1,620	18	79	886	4	10	693	2	4
10-----	1,400	10	38	823	4	9	650	1	2
11-----	1,250	7	24	1,080	7	20	591	1	2
12-----	1,140	6	18	2,870	44	s 359	542	0	0
13-----	1,100	9	27	2,760	22	164	517	0	0
14-----	2,260	68	s 388	2,150	13	75	493	0	0
15-----	2,850	41	315	1,810	8	39	469	0	0
16-----	2,680	28	203	1,490	6	24	445	0	0
17-----	2,220	12	72	1,300	5	18	421	0	0
18-----	1,880	8	41	1,360	7	26	410	3	3
19-----	1,620	7	31	1,140	7	22	430	1	1
20-----	1,430	8	31	1,240	7	23	430	1	1
21-----	1,250	7	24	1,280	6	21	420	10	11
22-----	1,120	15	45	1,110	7	21	430	10	12
23-----	1,050	15	43	1,050	7	20	450	15	18
24-----	988	14	37	1,050	8	23	440	22	26
25-----	1,250	21	71	3,610	72	s 759	410	14	15
26-----	1,620	23	101	3,500	30	284	380	17	17
27-----	2,150	32	186	2,440	6	40	330	11	10
28-----	5,490	204	s 3,610	1,940	7	37	330	9	8
29-----	5,920	94	s 1,600	1,620	23	101	300	4	3
30-----	3,500	44	416	1,480	7	28	280	12	9
31-----	--	--	--	1,380	2	7	--	--	--
Total-	62,002	--	9,348	51,459	--	2,465	17,668	--	206

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-----	260	16	11	344	1	1	5,360	445	s 9,870
2-----	235	5	3	421	1	1	4,220	55	627
3-----	221	1	1	493	1	1	2,890	24	187
4-----	210	0	0	352	1	1	1,940	3	16
5-----	210	1	1	322	0	0	1,510	2	8
6-----	200	2	1	473	1	1	1,260	11	37
7-----	187	2	1	587	0	0	1,130	5	15
8-----	228	8	5	413	0	0	932	1	3
9-----	2,490	141	s 928	382	4	4	823	1	2
10-----	3,650	74	s 1,010	695	28	53	736	1	2
11-----	1,470	1	4	1,100	10	30	693	1	2
12-----	1,020	1	3	771	1	2	633	0	0
13-----	823	1	2	719	0	0	575	0	0
14-----	667	1	2	583	0	0	558	1	2
15-----	575	1	2	509	0	0	617	10	17
16-----	558	0	0	616	6	10	828	12	27
17-----	501	0	0	1,600	22	s 103	558	3	5
18-----	477	0	0	1,280	3	10	509	3	4
19-----	469	0	0	877	2	5	550	3	4
20-----	453	0	0	736	0	0	534	6	9
21-----	477	0	0	659	1	2	469	3	4
22-----	882	3	7	744	1	2	453	2	2
23-----	650	1	2	575	1	2	429	5	3
24-----	517	0	0	526	0	0	421	1	1
25-----	461	0	0	469	0	0	390	2	2
26-----	421	0	0	437	1	1	367	3	3
27-----	413	0	0	413	1	1	352	1	1
28-----	453	0	0	390	1	1	344	4	4
29-----	406	0	0	382	1	1	329	4	4
30-----	352	0	0	359	1	1	314	2	2
31-----	314	1	1	359	1	1	--	--	--
Total-	20,250	--	1,984	18,586	--	140	30,724	--	7,653

Total discharge for year (cfs-days) 432,793
 Total load for year (tons) 85,099

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BERNE, PA.--Continued

Particle-size analyses of suspended sediment, water year October 1951 to September 1952
(Methods of analysis: B, bottom withdrawal tube; D, decantation; F, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

w, in surface waves; C, chemically unpoisoned; an, anemometer temperature																
Date of collection	Time	Instantaneous discharge (cfs)	Water tem- per- ature (° F)	Suspended sediment												Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500		1.000
Mar. 11, 1952...	8:30 a.m.	3,550		400	2,250			12	25	39	60	83	96		99	100 BWC

DELAWARE RIVER BASIN--Continued

PERKIOMEN CREEK AT GRATERFORD, PA.

LOCATION.--At Highway Bridge, at Graterford, Montgomery County, 1,650 feet downstream from gaging station, 2½ miles north of Collegeville.

DRAINAGE AREA.--279 square miles.

RECORDS AVAILABLE.--Sediment records: April 1948 to September 1952.

EXTREMES, 1951-52.--Sediment concentrations: Maximum daily, 477 ppm Sept. 19; minimum daily, 1 ppm on many days.

Sediment loads: Maximum daily, 13,800 tons Mar. 11; minimum daily, 0.1 ppm on several days.

EXTREMES, 1948-52.--Sediment concentrations: Maximum daily, 551 ppm Jan. 24, 1951; minimum daily, 0 ppm Sept. 24, 1950.

Sediment loads: Maximum daily, 19,600 tons Mar. 23, 1950; minimum daily, 0.0 tons Sept. 24, 1950.

REMARKS.--Records of specific conductance and pH of daily samples available in field office at Philadelphia, Pa. Records of water discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1232.

Suspended sediment, water year October 1951 to September 1952

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-----	34	12	1.1	1,670	245	s 1,730	193	5	2.6
2-----	34	12	1.1	684	88	163	185	4	2.0
3-----	35	13	1.2	3,980	42	451	170	4	1.6
4-----	36	18	1.7	1,230	48	159	163	3	1.3
5-----	31	8	0.7	566	28	43	1,230	82	s 413
6-----	30	5	0.4	356	32	31	984	47	125
7-----	36	4	0.4	6,400	374	s 10,200	521	7	9.8
8-----	296	26	21	2,060	128	712	400	5	5.4
9-----	113	48	15	715	140	270	335	5	4.5
10-----	66	26	4.6	471	152	193	285	3	2.3
11-----	76	5	1.0	366	32	32	239	3	1.9
12-----	181	7	3.4	290	6	4.7	226	3	1.8
13-----	107	5	1.4	252	8	5.4	201	4	a 2.2
14-----	72	2	0.4	273	12	8.8	163	3	a 1.3
15-----	63	1	0.2	649	20	35	185	5	a 2.5
16-----	60	2	0.3	553	10	15	155	5	a 2.1
17-----	54	2	0.3	623	11	19	120	4	a 1.3
18-----	49	1	0.1	372	10	10	130	5	a 1.8
19-----	51	2	0.3	260	8	6.0	760	10	a 21
20-----	45	3	0.4	230	10	6.2	560	5	a 7.6
21-----	46	2	0.2	189	19	9.7	10,000	99	s 3,300
22-----	49	1	0.1	178	20	9.6	2,640	22	157
23-----	46	2	0.2	174	8	3.8	897	4	9.7
24-----	53	2	0.3	189	7	3.6	637	3	5.2
25-----	126	1	0.3	189	19	9.7	514	8	11
26-----	111	2	0.6	675	65	118	1,210	20	65
27-----	75	2	0.4	471	34	43	885	9	22
28-----	66	2	0.4	275	20	15	464	6	7.5
29-----	114	4	1.2	234	12	7.6	423	5	5.7
30-----	84	2	0.5	214	8	4.6	406	5	5.5
31-----	70	1	0.2	--	--	--	679	7	13
Total--	2,309	--	59.4	24,808	--	14,318.7	25,960	--	4,212.8

s Computed by subdividing day.

a Computed from estimated concentration graph.

DELAWARE RIVER BASIN--Continued

PERKIOMEN CREEK AT GRATERFORD, PA.--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

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-----	1,040	21	59	458	9	11	205	1	0.6
2-----	1,730	27	126	471	7	8.9	189	2	1.0
3-----	1,760	38	181	483	6	7.8	201	2	1.1
4-----	848	18	41	3,750	180	s 2,280	246	3	2.0
5-----	672	8	14	1,550	32	134	1,220	54	178
6-----	637	3	5.2	782	29	61	888	24	58
7-----	434	3	3.5	568	15	24	590	3	4.8
8-----	361	6	5.8	483	3	3.9	464	2	2.5
9-----	350	5	4.7	440	1	1.2	417	3	3.4
10-----	502	4	5.4	377	1	1.0	483	1	1.3
11-----	502	10	14	372	2	2.0	8,020	426	s 13,800
12-----	340	6	5.5	350	3	2.8	1,820	55	270
13-----	340	6	5.5	285	2	1.5	874	15	35
14-----	388	5	5.2	245	2	1.3	722	9	18
15-----	592	5	8.0	248	2	1.3	502	4	5.4
16-----	604	7	11	234	2	1.3	440	5	5.9
17-----	411	7	7.8	455	5	6.1	372	4	4.0
18-----	1,660	40	s 198	534	8	12	335	11	9.9
19-----	677	30	55	356	3	2.9	1,480	168	s 1,200
20-----	602	21	34	285	1	0.8	1,350	100	364
21-----	487	8	11	285	1	0.8	700	39	74
22-----	454	28	34	275	2	1.5	554	30	45
23-----	2,070	128	s 854	244	1	0.7	1,240	46	s 187
24-----	662	44	79	230	2	1.2	1,010	26	71
25-----	423	130	148	222	1	0.6	760	13	27
26-----	3,500	323	s 3,750	210	1	0.6	547	8	12
27-----	2,190	265	s 1,620	210	1	0.6	452	8	9.8
28-----	3,080	135	s 1,280	201	1	0.5	388	8	8.4
29-----	1,220	52	171	193	2	1.0	345	8	7.5
30-----	593	20	32	--	--	--	314	6	5.1
31-----	483	8	10	--	--	--	285	7	5.4
Total--	29,612	--	8,778.6	14,816	--	2,572.3	27,413	--	16,397.1
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-----	275	8	5.9	775	7	15	4,290	140	1,620
2-----	400	7	7.6	609	13	21	1,980	126	674
3-----	340	5	4.6	508	13	18	691	24	45
4-----	280	5	3.8	429	12	14	369	8	8.0
5-----	2,880	333	s 3,660	379	15	15	327	5	4.4
6-----	1,460	160	631	348	14	13	262	7	5.0
7-----	679	26	48	313	14	12	213	9	5.2
8-----	508	19	26	279	26	20	213	7	4.0
9-----	423	10	11	266	15	11	201	9	4.9
10-----	366	5	4.9	245	10	6.8	186	8	4.0
11-----	329	3	2.7	258	13	9.1	162	5	2.2
12-----	295	2	1.6	744	40	80	150	5	2.0
13-----	290	1	0.8	459	20	25	140	4	1.5
14-----	1,750	122	s 694	308	9	7.5	131	2	0.7
15-----	2,740	185	s 1,420	270	9	6.6	128	3	1.0
16-----	1,760	31	147	245	8	5.3	117	2	0.6
17-----	807	12	26	209	12	6.8	111	2	0.6
18-----	588	4	6.4	322	15	13	106	2	0.6
19-----	471	3	3.8	284	20	15	103	4	1.1
20-----	400	3	3.2	664	26	47	123	3	1.0
21-----	345	1	0.9	675	14	26	109	4	1.2
22-----	309	1	0.8	358	7	6.8	117	5	1.6
23-----	290	2	1.6	280	5	3.5	134	3	1.1
24-----	275	2	1.5	240	3	1.9	158	3	1.3
25-----	674	5	s 17	4,500	185	2,250	131	3	1.1
26-----	3,060	55	454	3,900	310	3,260	109	2	0.6
27-----	3,770	37	377	1,030	18	50	91	2	0.5
28-----	10,600	230	s 7,630	581	5	7.8	84	4	0.9
29-----	2,500	36	243	447	2	2.4	81	2	0.4
30-----	1,200	10	32	540	1	1.5	79	3	0.6
31-----	--	--	--	618	4	6.7	--	--	--
Total--	40,064	--	15,466.1	21,081	--	5,977.5	11,094	--	2,395.1

s Computed by subdividing day.

NORTH ATLANTIC SLOPE BASINS

DELAWARE RIVER BASIN--Continued

PERKIOMEN CREEK AT GRATERFORD, PA.--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

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-----	73	2	0.4	54	4	0.6	2,080	390	s 3,350
2-----	66	2	0.4	97	12	3.1	703	100	190
3-----	62	2	0.3	215	28	16	2,250	87	529
4-----	60	4	0.6	102	8	2.2	542	11	16
5-----	62	4	0.7	74	5	1.0	272	8	5.9
6-----	58	2	0.3	124	11	3.7	194	3	1.6
7-----	56	3	0.5	196	46	24	169	2	0.9
8-----	76	5	1.0	208	30	17	159	1	0.4
9-----	2,180	38	224	194	32	17	125	2	0.7
10-----	4,140	189	s 2,420	391	42	44	111	3	0.9
11-----	403	47	51	228	25	15	103	2	0.6
12-----	197	24	13	153	14	5.8	93	1	0.3
13-----	146	13	5.1	145	7	2.7	87	1	0.2
14-----	114	19	5.8	130	21	7.4	81	1	0.2
15-----	101	14	3.8	103	12	3.3	79	1	0.2
16-----	93	23	5.8	229	44	27	154	1	0.4
17-----	89	18	4.3	352	100	95	108	3	0.9
18-----	81	8	1.7	148	14	5.6	81	5	1.1
19-----	77	50	10	109	18	5.3	825	477	s 1,390
20-----	77	14	2.9	89	10	2.4	344	182	169
21-----	81	6	1.3	86	3	0.7	176	55	26
22-----	111	6	1.8	79	5	1.1	131	12	4.2
23-----	91	8	2.0	71	4	0.8	131	6	2.1
24-----	73	2	0.4	62	1	0.2	140	7	2.6
25-----	60	3	0.5	58	2	0.3	114	7	2.2
26-----	54	6	0.9	52	2	0.3	96	5	1.3
27-----	51	5	0.7	52	1	0.1	80	3	0.6
28-----	73	4	0.8	47	1	0.1	77	2	0.4
29-----	86	10	2.3	51	1	0.1	79	2	0.4
30-----	74	4	0.8	53	1	0.1	71	2	0.4
31-----	60	8	1.3	49	3	0.4	--	--	--
Total-	9,025	--	2,764.4	4,001	--	302.3	9,655	--	5,698.5
Total discharge for year (cfs-days).....									219,818
Total load for year (tons)									78,942.8

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued
PERKIOMEN CREEK AT GRATERFORD, PA.--Continued

Particle-size analyses of suspended sediment, water year October 1951 to September 1952
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, settling; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Water temperature (° F)	Suspended sediment											Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000
Aug. 16, 1952	2:30 p. m.	390		12	848		22	45	73	88	95	97	99		100	BWC
Aug. 16	2:30 p. m.	390		14	1,440		24	39	62	95	97	99	99		100	BWC

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT MANAYUNK, PHILADELPHIA, PA.

LOCATION.--At Green Lane Avenue Bridge, 5 miles upstream from gaging station at Fairmount, Dam, Philadelphia County.

DRAINAGE AREA.--1,893 square miles (above gaging station).

RECORDS AVAILABLE.--Sediment records: November 1947 to September 1952.

EXTREMES, 1951-52.--Sediment concentrations: Maximum daily, 2,040 ppm Apr. 28; minimum daily, 2 ppm on several days.

Sediment loads: Maximum daily, 244,000 tons Apr. 28; minimum daily, 4 tons Oct. 1.

EXTREMES, 1947-52.--Sediment concentrations: Maximum daily, 4,910 ppm Dec. 30, 1948; minimum daily, 1 ppm on several days.

Sediment loads: Maximum daily, 537,000 tons Nov. 26, 1950; minimum daily, 2 tons on several days.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1951 to September 1952 based on records for Schuylkill River at Philadelphia (Fairmount Dam) which are given in Water-Supply Paper 1232, and includes water diverted by the city of Philadelphia for municipal water supply.

Suspended sediment, water year October 1951 to September 1952

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-----	651	2	4	3,110	125	1,050	2,120	10	57
2-----	643	5	9	5,060	192	2,620	2,060	5	28
3-----	653	6	11	9,740	880	23,100	1,960	6	32
4-----	619	7	12	11,400	910	28,000	1,890	7	36
5-----	600	13	21	6,630	260	4,650	3,250	16	140
6-----	598	10	16	4,570	50	617	14,300	1,080	41,700
7-----	662	28	50	16,500	630	28,100	9,520	380	9,770
8-----	1,230	40	133	19,900	1,220	65,600	6,870	100	1,860
9-----	1,860	30	151	9,830	420	11,100	5,460	52	767
10-----	1,170	15	47	6,480	118	2,060	4,480	43	520
11-----	1,100	15	45	4,970	50	671	3,800	28	267
12-----	1,100	11	33	4,100	30	332	3,420	20	185
13-----	1,100	14	42	3,470	20	167	3,130	15	127
14-----	905	12	29	3,170	15	126	2,750	10	74
15-----	804	10	22	3,660	15	148	2,890	11	86
16-----	794	18	39	3,760	16	183	3,300	18	160
17-----	770	18	37	4,250	25	267	2,310	11	69
18-----	727	15	29	4,170	32	380	2,190	9	53
19-----	735	15	30	3,650	30	296	2,760	14	104
20-----	704	12	23	3,220	23	174	3,080	11	a 91
21-----	668	9	16	2,830	10	76	26,000	1,280	a 89,900
22-----	678	10	18	2,550	5	34	16,900	830	a 37,900
23-----	682	11	20	2,370	5	32	9,290	220	5,520
24-----	758	20	41	2,350	2	13	6,870	55	1,020
25-----	1,010	19	52	2,420	2	13	5,720	40	a 618
26-----	1,120	20	60	3,270	20	177	6,230	42	706
27-----	1,060	15	43	3,520	30	285	6,040	40	652
28-----	870	16	38	2,760	10	75	4,470	28	338
29-----	868	10	23	2,310	10	62	3,900	20	211
30-----	1,110	12	36	2,200	20	119	3,730	15	151
31-----	941	28	71	--	--	--	4,160	20	225
Total--	27,190	--	1,201	158,220	--	170,549	174,850	--	193,387

a Computed from estimated concentration graph.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT MANAYUNK, PHILADELPHIA, PA--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

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-----	4,850	38	498	6,240	40	674	2,280	5	31
2-----	7,880	95	2,020	5,930	30	480	2,310	6	37
3-----	11,100	188	5,630	5,690	28	430	2,240	4	24
4-----	11,100	210	6,290	13,900	531	s 25,300	2,300	8	50
5-----	9,350	106	2,680	12,800	420	14,500	4,680	45	569
6-----	7,920	65	1,390	8,490	130	2,980	5,200	45	632
7-----	6,270	55	931	7,280	58	1,140	3,940	16	170
8-----	5,160	35	488	6,260	50	845	3,410	7	64
9-----	4,610	25	311	5,630	35	532	3,140	5	42
10-----	4,590	29	359	5,100	38	523	3,050	5	41
11-----	4,900	42	556	4,710	25	318	20,400	1,210	s 112,000
12-----	4,200	26	295	4,450	25	300	29,500	1,750	139,400
13-----	3,600	15	146	4,000	10	108	14,700	450	17,900
14-----	3,390	16	146	3,480	15	141	10,300	175	4,870
15-----	3,600	15	146	3,200	25	216	7,690	85	1,760
16-----	4,100	17	188	3,160	10	85	6,290	68	1,150
17-----	3,800	15	154	3,960	20	214	5,490	42	623
18-----	6,300	70	1,190	4,500	35	425	4,880	38	501
19-----	6,490	88	1,540	3,780	10	102	6,440	92	1,600
20-----	5,640	55	838	3,220	5	43	9,520	178	4,580
21-----	5,480	40	592	3,010	4	33	6,370	53	912
22-----	4,890	25	330	2,970	7	56	8,960	35	563
23-----	8,150	100	2,200	2,760	4	30	6,820	59	1,090
24-----	6,740	75	1,360	2,610	4	28	8,310	65	1,460
25-----	5,160	31	432	2,620	10	71	6,940	37	693
26-----	9,700	310	8,120	2,500	5	34	6,240	26	438
27-----	14,200	530	20,300	2,390	5	32	5,590	20	302
28-----	17,000	670	30,800	2,330	5	31	5,040	15	204
29-----	13,500	325	11,800	2,280	6	37	4,560	11	135
30-----	9,230	120	2,990	--	--	--	4,320	12	140
31-----	7,220	70	1,360	--	--	--	3,990	8	86
Total--	220,120	--	106,080	139,250	--	49,708	211,900	--	292,067
	April			May			June		
1-----	3,590	9	87	11,400	136	4,190	14,800	340	13,600
2-----	3,830	8	83	8,990	75	1,820	11,000	180	5,350
3-----	5,760	42	653	7,410	50	1,000	6,130	40	662
4-----	4,680	20	253	6,440	39	678	4,970	30	403
5-----	8,740	233	s 8,330	5,660	25	382	4,710	16	203
6-----	12,100	280	9,150	5,200	24	337	4,550	15	184
7-----	8,670	120	2,810	4,790	22	285	3,950	18	192
8-----	7,070	45	859	4,310	35	407	3,460	13	121
9-----	5,920	28	448	4,010	20	217	3,210	10	87
10-----	5,190	25	350	3,820	18	186	2,980	10	80
11-----	4,700	21	266	3,960	19	203	2,830	15	115
12-----	4,240	15	172	5,520	60	894	2,530	8	55
13-----	3,920	9	95	7,860	115	2,440	2,330	14	88
14-----	6,460	41	715	6,240	52	876	2,220	8	48
15-----	12,800	355	12,300	5,310	25	358	2,110	8	46
16-----	13,100	260	9,200	4,750	20	257	1,990	9	48
17-----	9,340	110	2,770	4,130	10	112	1,940	7	37
18-----	7,620	55	1,130	4,140	10	112	1,830	6	30
19-----	6,360	35	601	4,580	21	260	1,830	8	40
20-----	5,580	30	452	4,300	25	290	1,820	11	54
21-----	5,020	26	352	5,620	42	637	1,800	15	73
22-----	4,530	25	308	4,480	18	219	1,750	19	90
23-----	4,160	15	168	3,690	10	100	1,920	15	78
24-----	3,920	5	53	3,410	10	92	2,060	15	83
25-----	4,260	19	219	9,100	326	s 14,000	2,010	11	60
26-----	11,100	192	5,750	21,700	952	s 57,700	1,730	12	56
27-----	14,200	280	10,700	11,400	190	5,850	1,510	11	45
28-----	40,400	2,040	s 244,000	7,690	55	1,140	1,380	12	45
29-----	26,200	801	56,700	6,250	36	608	1,280	16	55
30-----	16,200	450	19,700	5,790	35	547	1,230	16	53
31-----	--	--	--	5,730	32	495	--	--	--
Total--	269,660	--	388,672	197,680	--	96,691	97,860	--	22,081

s Computed by subdividing day.

NORTH ATLANTIC SLOPE BASINS

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT MANAYUNK, PHILADELPHIA, PA--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

[illegible]

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT MANAYUNK, PHILADELPHIA, PA.--Continued

Particle-size analyses of suspended sediment, water year October 1951 to September 1952
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Water temperature (°F)	Suspended sediment										Methods of analysis			
				Concentration of sample (ppm)	Concentration of suspension analysed (ppm)	Percent finer than indicated size, in millimeters											
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Aug. 11, 1952..	3:00 p.m.	2,300		24	215			45	85	93	96	98			100	BWC	
Sept 2	12:30 p.m.	20,800		1,460	9,150			27	36	48	64	80	87		91	94	BWC

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BELMONT FILTER PLANT, PHILADELPHIA, PA.

LOCATION --At Belmont Filter Plant, Philadelphia, Philadelphia County, 1.6 miles upstream from gaging station at Fairmount Dam in Philadelphia.

RECORDS AVAILABLE --1,800 square miles of watershed; October 1945 to September 1952.

Water temperatures --October 1945 to September 1952.

EXTREMES 1951-52 --Dissolved solids: Maximum, 358 ppm Oct. 4-9; minimum, 89 ppm Mar. 11-20.

Hardness: Maximum, 231 ppm Oct. 4-9; minimum, 89 ppm Mar. 11-20.

Specific conductance: Maximum, 588 microhos Oct. 7; minimum daily, 154 microhos Apr. 29.

Water temperatures: Maximum, 86°F July 19-24; minimum, freezing point January 27, 31.

EXTREMES 1944-52 --Dissolved solids: Maximum, 358 ppm Oct. 11-20, 1947; minimum, 94 ppm Feb. 1-10, Feb. 21-28, 1951.

Hardness: Maximum, 231 ppm Oct. 4-9, 1951; minimum, 80 ppm Feb. 11-20, 1951.

Specific conductance: Maximum daily, 588 microhos Oct. 7, 1951; minimum daily, 154 microhos Apr. 29, 1952.

Water temperatures: Maximum, 86°F July 17, 1951, July 19-24, 1952; minimum, freezing point on many days during winter months.

REMARKS --Samples collected at raw-water intake on west side of river at Belmont Filter Plant by City of Philadelphia. Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1951 to September 1952 based on records for Schuylkill River at Philadelphia which are given in Water-Supply Paper 1232.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium	Non-carbonate				
Oct. 4-9, 1951 ...	610	70	7.2		0.08	--	48	27	21		57	188	20	0.2	6.2	356	231	184		555	6.9	4
Oct. 11-20 ...	540	61	12		.07	--	42	23	17		46	165	16	.2	5.8	312	199	162		490	6.9	3
Oct. 21-31 ...	560	63	10		.08	--	44	24	20		56	169	18	.2	5.8	330	208	163		522	6.9	4
Nov. 2 ...	4,740	58	--		--	--	--	--	30		52	168	17	--	1.2	--	178	135		504	7.0	3
Nov. 3-10 ...	1,030	50	4.1		.06	--	25	11	8.7		31	82	8.5	.1	4.4	169	108	82		247	6.8	7
Nov. 11-20 ...	3,540	49	11		.16	--	24	12	5.6		25	81	7.5	.1	7.2	172	109	89		270	6.8	3
Nov. 21-30 ...	2,360	42	11		.08	--	28	14	7.9		32	96	9.0	.1	6.8	194	127	101		308	7.1	3
Dec. 1-10 ...	4,890	46	9.2		.11	--	26	12	5.0		27	83	8.0	.1	6.2	177	114	92		280	7.1	5
Dec. 11-20 ...	2,650	42	12		.09	--	26	13	3.7		28	85	7.0	.1	5.9	181	118	95		290	7.1	5
Dec. 21-31 ...	8,200	37	8.5		.08	--	22	10	8.5		34	63	11	.1	6.6	149	96	68		252	6.9	8
Jan. 1-10, 1952 ...	6,960	40	8.5		.09	--	22	10	4.7		33	60	8.0	.1	6.3	143	96	69		241	7.2	10
Jan. 11-20 ...	4,300	40	8.4		.09	--	26	12	5.3		39	73	8.0	.1	7.8	170	114	82		286	7.2	8
Jan. 21-31 ...	8,900	39	7.5		.12	--	21	9.5	5.1		32	56	9.0	.1	6.2	137	91	65		232	7.1	5
Feb. 1-10 ...	7,430	40	7.3		.11	--	21	9.7	3.9		33	56	7.0	.1	6.5	136	92	65		234	7.0	5
Feb. 11-20 ...	3,540	39	8.4		.13	--	22	13	5.2		42	77	8.5	.1	7.4	196	110	94		291	7.3	5
Feb. 21-29 ...	2,900	42	8.0		.12	--	29	11	6.1		40	83	8.0	.2	6.9	133	133	85		312	7.3	5
Mar. 1-10 ...	2,960	41	8.6		.08	--	26	13	7.3		30	55	8.0	.1	5.7	187	123	85		283	7.3	8
Mar. 11-20 ...	11,220	44	7.8		.14	--	20	9.4	4.3		30	55	8.0	.1	6.1	133	103	76		248	7.3	8
Mar. 21-31 ...	5,540	47	7.4		.07	--	23	11	3.0		32	64	8.0	.1	6.1	150	103	76		248	6.3	8

Apr. 1-10	6,270	52	6.9	.11	--	22	11	6.5	36	67	7.0	.1	6.0	154	100	71	252	7.3	5
Apr. 11-20	7,120	56	6.5	.06	--	21	10	3.5	33	59	6.0	.1	4.9	140	94	66	231	7.1	5
Apr. 21-30	12,700	62	6.5	.06	--	22	9.9	1.5	34	57	5.0	.1	5.4	136	96	68	229	7.0	5
May 1-10	5,930	57	6.9	.07	--	23	11	1.8	37	62	5.0	.1	5.5	148	103	72	246	7.0	5
May 11-20	4,800	62	6.5	.05	--	25	13	1.7	36	78	6.0	.1	3.2	171	118	89	277	7.1	5
May 21-31	7,430	64	6.9	.03	--	23	11	1.6	37	62	6.0	.1	3.2	150	103	72	244	7.0	5
June 1-10	5,680	70	7.9	.06	--	24	12	1.5	44	63	6.0	.1	2.8	157	109	73	259	7.2	5
June 11-20	1,820	77	4.8	.07	--	32	17	1.7	56	88	9.0	.2	3.4	206	150	104	339	7.3	5
June 21-30	1,340	77	6.8	.08	--	36	18	6.9	61	104	12	.2	3.9	240	164	114	390	7.2	5
July 1-10	2,940	81	9.6	.01	--	40	18	12	75	103	11	.2	6.8	282	174	112	396	7.2	2
July 11-20	2,800	81	10	.00	--	27	12	6.2	45	73	6.0	.1	7.0	202	117	80	273	6.9	7
July 21-31	1,280	85	8.8	.01	--	38	15	10	52	111	9.0	.1	6.3	262	156	114	367	7.1	5
Aug. 1-10	1,430	82	3.5	.02	--	37	17	11	58	111	12	.1	6.8	257	162	115	382	7.1	5
Aug. 11-20	2,120	80	5.8	.01	--	34	15	9.2	48	94	10	.1	6.6	226	147	107	340	7.0	5
Aug. 21-31	1,130	78	3.1	.00	--	34	15	10	45	104	10	.1	5.4	229	147	110	349	7.0	5
Sept. 1-10	6,510	73	13	.01	0.00	25	11	6.6	43	104	6.0	.2	6.0	137	108	172	237	7.0	5
Sept. 11-20	1,940	73	7.0	.02	.00	26	15	12	52	111	10	.2	6.6	226	132	109	362	7.0	5
Sept. 21-30	1,170	70	4.9	.01	.00	35	15	12	59	102	11	.2	6.6	228	149	101	338	7.0	8
Average	4,756	58	7.9	0.07	--	29	14	8.2	43	89	9.3	0.1	5.7	196	130	95	315	--	5

NORTH ATLANTIC SLOPE BASINS

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BELMONT FILTER PLANT, PHILADELPHIA, PA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	--	--	41	36	--	52	51	66	82	84	81
2	--	58	--	41	36	43	54	55	64	80	85	78
3	--	58	35	42	41	43	55	57	62	80	83	75
4	70	50	40	42	41	43	56	57	67	80	84	73
5	70	58	45	40	42	40	56	57	69	81	81	72
6	70	45	47	40	41	41	55	58	72	82	82	72
7	71	48	51	40	43	40	53	58	74	82	82	72
8	71	48	51	37	42	40	50	58	74	82	80	70
9	68	48	50	37	41	40	46	58	75	80	79	70
10	--	48	52	38	42	41	48	58	76	79	79	69
11	--	47	50	37	43	41	52	63	77	75	78	71
12	60	47	49	37	--	43	55	64	75	75	79	73
13	60	48	45	38	--	46	55	63	74	77	80	75
14	--	47	41	39	39	45	56	59	74	80	81	77
15	60	52	39	40	37	44	58	60	75	82	80	76
16	--	52	--	40	38	44	53	61	77	83	81	75
17	62	54	36	42	38	44	58	62	79	84	80	75
18	62	51	38	42	38	42	--	60	80	83	80	75
19	60	59	40	41	39	43	64	60	82	86	80	75
20	62	43	41	41	39	44	58	63	80	36	80	74
21	64	44	35	40	40	44	62	63	78	86	80	73
22	64	43	34	40	40	44	68	61	76	86	80	72
23	64	43	34	--	41	44	68	63	73	86	78	71
24	65	42	34	39	42	47	68	63	70	86	76	69
25	64	43	42	37	42	46	64	65	72	84	75	69
26	64	42	42	38	42	46	62	64	75	85	75	69
27	63	41	40	31	42	41	60	63	80	83	76	69
28	62	41	37	41	43	49	60	62	83	83	77	69
29	61	40	37	39	43	50	55	65	84	83	78	69
30	60	40	37	51	--	51	56	67	81	84	78	69
31	59	--	37	31	--	51	--	66	--	85	81	--
Average	--	47	37	39	40	44	57	61	75	82	80	73

DELAWARE RIVER BASIN

69

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT EDDYSTONE, PA.

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1952.

REMARKS.--Samples taken at center of stream approximately 3 feet from surface and 3 feet from bottom. Additional data are published in Water-Supply Paper 1262, Chemical characteristics of Delaware River water, Trenton, N. J., to Marcus Hook, Pa.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date	Sampling station	Temperature (°F)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	pH	Biochemical oxygen demand	Dissolved oxygen
Oct. 1, 1951	Top	71	200	1,040	6.4	10.2	1.7
	Bottom	71	225	1,140	6.5	--	--
Nov. 5	Top	51	10	196	6.5	3.2	6.6
	Bottom	51	10	198	7.5	--	--
Dec. 4	Top	44	10	196	6.3	4.3	5.8
	Bottom	45	10	201	6.3	--	--
Jan. 2, 1952	Top	38	8.0	156	6.6	4.3	11.0
	Bottom	38	7.0	158	6.6	--	--
Feb. 6	Top	38	5.0	136	7.6	4.0	11.6
	Bottom	38	6.0	137	6.2	--	--
Mar. 3	Top	40	10	208	6.3	3.0	8.0
	Bottom	40	10	212	6.2	--	--
Apr. 1	Top	49	6.0	133	6.4	1.5	7.6
	Bottom	50	5.0	132	6.5	--	--
May 6	Top	60	6.0	145	6.3	1.7	6.2
	Bottom	61	5.0	147	6.3	--	--
June 3	Top	68	4.0	122	6.5	19	5.3
	Bottom	69	4.0	123	6.5	--	--
July 8	Top	80	16	258	6.4	3.0	.6
	Bottom	79	17	276	6.8	--	--
Aug. 7	Top	82	13	233	6.8	1.8	.4
	Bottom	81	14	245	6.7	--	--
Sept. 4	Top	77	10	228	6.5	.2	1.7
	Bottom	77	11	235	6.5	--	--

DELAWARE RIVER BASIN--Continued
DELAWARE RIVER AT MARCUS HOOK, PA.

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1952.
REMARKS.--Samples taken at center of stream approximately 3 feet from surface and 3 feet from bottom. Additional data are published in Water-Supply Paper 1262, Chemical characteristics of Delaware River water, Trenton, N. J., to Marcus Hook, Pa.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Sampling station	Temperature (°F)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃	Specific conductance (micro-mhos at 25°C)	pH	Color	Biochemical oxygen demand	Dissolved oxygen
Oct. 1, 1951	Top	70	--	--	--	--	--	--	--	--	520	--	--	--	--	2,180	6.2	--	12.9	2.0
	Bottom	70	2.6	0.05	50	69	520	--	24	228	930	0.2	3.6	1,900	408	3,330	7.4	10	--	--
Nov. 5	Top	54	--	--	--	--	--	--	--	--	12	--	--	--	--	333	6.5	--	1.2	3.8
	Bottom	52	5.5	.01	20	7.0	9.2	--	34	50	12	.1	6.6	154	79	229	7.6	10	--	--
Dec. 4	Top	44	--	--	--	--	--	--	--	--	9.0	--	--	--	--	196	7.4	--	3.7	5.8
	Bottom	44	7.9	.01	16	5.3	9.2	--	22	46	10	.2	6.2	133	62	191	7.3	14	--	--
Jan. 2, 1952	Top	38	--	--	--	--	--	--	--	--	7.0	--	--	--	--	182	6.6	--	3.2	9.3
	Bottom	38	5.9	.01	15	5.5	4.5	--	20	34	8.0	.1	8.0	99	60	155	7.0	5	--	--
Feb. 6	Top	39	--	--	--	--	--	--	--	--	6.0	--	--	--	--	150	6.2	--	4.2	10.9
	Bottom	38	6.7	.05	12	5.1	5.4	--	20	33	5.5	.1	5.6	108	51	149	6.4	9	--	--
Mar. 3	Top	40	--	--	--	--	--	--	--	--	10	--	--	--	--	212	6.2	--	1.7	8.1
	Bottom	40	10	.06	17	6.0	10	--	24	48	10	.2	8.2	126	67	205	7.6	5	--	--
Apr. 1	Top	49	--	--	--	--	--	--	--	--	6.0	--	--	--	--	141	6.3	--	1.7	6.5
	Bottom	49	7.0	.08	12	3.8	6.6	--	20	30	5.9	.1	7.4	92	46	134	6.8	3	--	--
May 6	Top	59	--	--	--	--	--	--	--	--	5.0	--	--	--	--	151	6.3	--	3.0	7.0
	Bottom	58	8.2	.02	13	4.1	5.1	--	17	35	5.4	.1	5.6	88	49	137	6.7	6	--	--
June 3	Top	69	--	--	--	--	--	--	--	--	6.0	--	--	--	--	143	6.5	--	1.2	4.4
	Bottom	68	6.9	.04	13	4.5	4.9	--	23	32	5.0	.1	6.6	90	51	138	6.8	7	--	--
July 6	Top	80	--	--	--	--	--	--	--	--	20	--	--	--	--	268	6.6	--	3.4	1.0
	Bottom	79	6.0	.03	20	7.3	17	--	36	55	18	.2	12	157	80	262	7.1	7	--	--
Aug. 7	Top	82	--	--	--	--	--	--	--	--	14	--	--	--	--	237	6.7	--	2.8	1.1
	Bottom	81	6.2	.03	17	6.1	12	--	32	38	13	.3	14	135	68	219	7.4	13	--	--
Sept. 4	Top	78	--	--	--	--	--	--	--	--	14	--	--	--	--	250	6.5	--	1.2	2.1
	Bottom	78	3.9	.03	20	9.4	7.6	--	32	54	12	.1	6.9	149	89	240	7.4	7	--	--

NORTH ATLANTIC SLOPE BASINS

DELAWARE RIVER BASIN--Continued

BRANDYWINE CREEK AT WILMINGTON, DEL.

LOCATION.--At Henry Clay Bridge at Wilmington, New Castle County, 0.2 mile upstream from gaging station, and 4.4 miles upstream from mouth.

DRAINAGE AREA.--314 square miles.

RECORDS AVAILABLE.--Sediment records: December 1946 to September 1952.

EXTREMES, 1951-52.--Sediment concentrations: Maximum, 1,420 ppm July 9; minimum, 1 ppm Feb. 25-26.

Sediment loads: Maximum daily, 15,400 tons July 9; minimum, 1 ton Oct. 5 and Feb. 26. EXTREMES, 1946-52.--Sediment concentrations: Maximum, 1,420 ppm July 9, 1952; minimum, 1 ppm on several days.

Sediment loads: Maximum daily, 17,300 tons Nov. 25, 1950; minimum daily, 0.3 ton on many days.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of water discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1232.

Suspended sediment, water year October 1951 to September 1952

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-----	101	11	3	868	266	s 1,010	247	10	7
2-----	104	10	3	603	100	163	247	7	5
3-----	104	10	3	1,140	225	693	235	9	6
4-----	101	10	3	676	225	411	230	15	9
5-----	98	5	1	373	30	30	998	107	s 364
6-----	95	6	2	283	40	31	770	75	156
7-----	103	9	3	3,060	1,040	s 11,900	428	23	27
8-----	322	28	24	2,470	325	2,170	361	18	18
9-----	198	15	8	564	80	122	325	14	12
10-----	140	12	5	397	30	32	301	8	7
11-----	160	15	6	331	20	18	283	5	4
12-----	239	23	15	289	15	12	265	6	4
13-----	176	15	7	271	18	13	247	7	5
14-----	136	8	3	283	20	15	215	9	5
15-----	128	5	2	397	23	25	340	4	4
16-----	128	8	3	385	21	22	330	2	2
17-----	121	8	3	361	18	18	215	5	3
18-----	119	11	4	295	11	9	330	6	5
19-----	114	10	3	253	8	5	480	8	10
20-----	114	13	4	235	7	4	560	277	s 505
21-----	117	10	3	220	8	5	5,000	365	s 5,030
22-----	114	9	3	215	6	3	2,480	100	670
23-----	117	5	2	220	5	3	994	10	27
24-----	118	7	2	235	6	4	834	6	14
25-----	339	19	17	230	5	3	730	8	16
26-----	212	15	9	502	21	28	938	11	28
27-----	153	10	4	460	20	25	788	8	17
28-----	149	11	4	313	18	15	606	5	8
29-----	153	12	5	277	13	10	592	10	16
30-----	140	19	7	259	11	8	592	9	14
31-----	136	26	10	--	--	--	655	11	19
Total-	4,549	--	171	16,465	--	16,807	21,614	--	7,017

s Computed by subdividing day.

NORTH ATLANTIC SLOPE BASINS

DELAWARE RIVER BASIN--Continued

BRANDYWINE CREEK AT WILMINGTON, DEL.--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

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-----	655	5	9	818	8	18	550	6	9
2-----	930	40	100	826	8	18	543	4	6
3-----	882	36	86	810	10	22	550	5	7
4-----	676	11	20	3,220	484	s 4,860	622	2	3
5-----	669	2	4	1,600	190	s 926	1,210	55	s 182
6-----	655	4	7	1,090	38	112	914	27	67
7-----	578	3	5	988	10	27	770	3	6
8-----	529	7	10	946	6	15	648	5	9
9-----	529	2	3	890	5	12	620	3	5
10-----	680	4	7	826	5	11	613	7	12
11-----	707	10	19	810	7	15	3,250	436	s 5,650
12-----	564	5	8	748	6	12	2,180	248	s 1,900
13-----	550	5	7	698	4	8	1,010	56	153
14-----	564	8	12	662	2	4	938	17	43
15-----	578	5	8	641	3	5	858	5	12
16-----	564	4	6	641	2	3	802	7	15
17-----	529	4	6	1,060	19	54	738	2	4
18-----	922	24	60	866	14	33	698	2	4
19-----	664	22	39	683	5	9	1,650	75	s 510
20-----	585	9	14	641	5	9	1,490	109	s 455
21-----	550	11	16	634	3	5	978	55	145
22-----	594	14	22	606	2	3	954	18	46
23-----	1,290	111	s 406	578	2	3	1,180	16	51
24-----	732	37	73	571	2	3	1,130	14	43
25-----	592	10	16	564	1	2	1,010	19	52
26-----	1,460	89	s 541	550	1	1	890	11	26
27-----	1,570	150	s 671	550	2	3	810	4	9
28-----	1,960	174	s 1,120	536	4	6	770	2	4
29-----	1,430	146	s 628	529	2	3	730	5	10
30-----	910	26	64	--	--	--	746	4	8
31-----	820	8	13	--	--	--	690	5	9
Total--	24,918	--	4,003	24,578	--	6,202	30,542	--	9,455
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-----	676	3	5	1,130	34	104	2,910	184	s 1,630
2-----	722	8	16	1,010	15	41	1,540	56	233
3-----	676	9	16	922	16	40	1,050	38	108
4-----	613	3	5	890	16	38	954	23	59
5-----	1,400	90	s 489	898	16	39	970	74	194
6-----	1,410	109	s 424	866	17	40	834	50	113
7-----	882	65	155	786	9	19	762	22	45
8-----	778	60	126	722	6	12	706	15	29
9-----	730	12	24	706	11	21	683	7	13
10-----	690	11	20	676	8	15	676	13	24
11-----	662	8	14	858	18	42	627	12	20
12-----	627	6	10	1,540	154	s 745	606	7	11
13-----	620	3	5	994	145	389	585	4	6
14-----	931	12	30	738	14	28	571	4	6
15-----	1,340	74	268	683	14	26	564	4	6
16-----	1,450	77	301	648	7	12	543	4	6
17-----	919	38	94	606	10	16	529	6	9
18-----	746	20	40	669	11	20	641	18	31
19-----	676	15	27	648	13	23	508	18	25
20-----	641	15	26	830	30	67	522	14	20
21-----	613	13	22	954	50	129	515	12	17
22-----	592	14	22	655	15	27	543	7	10
23-----	592	10	16	585	12	19	585	9	14
24-----	599	12	19	571	12	18	585	18	28
25-----	642	16	36	2,370	196	s 1,950	522	8	11
26-----	1,710	82	s 393	3,610	352	s 3,640	474	8	10
27-----	1,890	93	475	1,350	68	249	441	9	11
28-----	4,070	409	s 4,780	930	18	45	428	6	7
29-----	2,990	165	s 1,490	866	12	28	428	6	7
30-----	1,470	90	357	1,070	40	116	428	5	6
31-----	--	--	--	1,150	52	161	--	--	--
Total--	32,557	--	9,705	30,931	--	8,118	21,730	--	2,709

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

BRANDYWINE CREEK AT WILMINGTON, DEL.--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

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-----	409	6	7	301	7	6	1,280	300	1,020
2-----	391	9	10	404	6	7	866	130	304
3-----	385	4	4	619	43	72	978	130	343
4-----	379	10	10	343	4	4	529	48	69
5-----	491	32	42	301	4	3	367	20	20
6-----	391	17	18	431	16	19	313	15	13
7-----	367	11	11	588	28	44	289	14	11
8-----	544	58	s 164	864	117	s 337	283	15	11
9-----	3,580	1,420	s 15,400	550	322	s 517	271	10	7
10-----	2,330	292	s 1,840	634	64	110	265	8	6
11-----	858	80	185	480	48	62	259	3	2
12-----	599	20	32	385	24	25	247	5	3
13-----	515	19	26	373	16	16	241	9	6
14-----	454	12	15	361	16	16	235	14	9
15-----	422	8	9	313	16	14	249	15	10
16-----	403	9	10	313	16	14	361	20	19
17-----	467	22	28	373	16	16	253	18	12
18-----	403	42	46	295	14	11	230	12	7
19-----	457	43	53	277	12	9	597	82	132
20-----	460	42	52	265	13	9	418	95	107
21-----	415	10	11	265	12	9	301	45	37
22-----	385	16	17	271	7	5	259	18	13
23-----	343	13	12	247	9	6	277	15	11
24-----	325	6	5	230	10	6	277	10	7
25-----	295	6	5	225	10	6	259	9	6
26-----	295	11	9	225	8	5	235	10	6
27-----	289	12	9	215	8	5	230	8	5
28-----	283	12	9	230	8	5	225	10	6
29-----	289	5	4	259	5	3	225	7	4
30-----	271	9	7	241	6	4	225	7	4
31-----	259	14	10	220	20	12	--	--	--
Total-	17,754	--	18,060	11,090	--	1,377	11,024	--	2,210

Total discharge for year (cfs-days) 247,760

Total load for year (tons) 85,634

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued
BRANDYWINE CREEK AT WILMINGTON, DEL.--Continued

Particle-size analyses of suspended sediment, water year October 1951 to September 1952
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Suspended sediment											Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000
Sept. 2, 1952	1:15 p. m.	683	85	2,960	--	11	24	40	60	90	99	100		--	BWC

DELAWARE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN DELAWARE RIVER BASIN IN PENNSYLVANIA

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color
SCHUYLKILL RIVER AT POTTSVILLE																						
Oct. 2, 1951	42	56	22	21	2.7	6.7	54	42	22	0	520	5.0	0.0	0.0	1.1	738	340	340	326	1,010	3.30	4
Oct. 9	59	50	23								0	484	16	.0	1.2		307	307	312	1,000	3.20	5
Oct. 16	50	52	27								0	600	4.5	.0	1.7		415	415	404	1,160	3.25	4
SCHUYLKILL RIVER AT MOUNT CARBON																						
Oct. 2, 1951	48	57	21	16	1.2	6.6	70	43	11		0	464	6.0	0.0	1.1	706	328	326	280	892	3.55	4
Oct. 9	67	51	21								0	469	5.0	.0	.9		351	351	258	872	3.50	10
Oct. 16	57	53	22								0	567	4.5	.0	1.0		425	425	312	1,020	3.70	32
SCHUYLKILL RIVER AT LANDINGVILLE																						
Oct. 8, 1951		57							20		320	4.0			1.5		296	296	138	701	4.3	2
SCHUYLKILL RIVER AT PORT CLINTON																						
Oct. 2, 1951	110	62	17								0	547	9.0	0.0	1.1		447	447	232	1,010	4.05	3
Oct. 9	169	56	16	7.2	0.27	6.6	83	55	34		0	534	6.0	.0	1.1	791	433	433	218	981	3.90	6
Oct. 16	149	54	14								0	416	7.0	.0	1.7		366	366	152	816	4.25	4
SCHUYLKILL RIVER AT HAMBURG																						
Oct. 2, 1951	170	63	16								0	568	8.0	0.0	2.3		408	408	256	939	4.10	2
Oct. 9	312	58	13	11	0.45	4.7	62	40	12		0	399	6.5	.0	1.7	587	319	319	190	772	3.75	6
Oct. 16	261	57	15								0	459	6.0	.0	1.8		395	395	258	913	3.60	4
SCHUYLKILL RIVER AT BERNE																						
Oct. 2, 1951	176	64	16								0	507	7.5	0.0	2.0		398	398	250	939	4.00	3
Oct. 9	322	58	13	7.1	0.44	4.8	63	40	19		0	393	6.0	.0	1.7	581	322	322	188	767	3.85	5
Oct. 16	269	56	16								0	458	6.5	.0	2.2		385	385	254	898	3.65	6
SCHUYLKILL RIVER AT LEESPORT																						
Oct. 2, 1951	188	63	16								0	483	7.5	0.0	2.5		384	384	228	894	4.25	4
Oct. 9	378	58	13	8.2	0.36	5.0	63	41	19		0	402	6.0	.0	2.0	612	326	326	180	778	3.90	6
Oct. 16	279	56	20								0	426	6.0	.0	2.5		356	356	216	839	4.05	5

DELAWARE RIVER BASIN--Continued
 MISCELLANEOUS ANALYSES OF STREAMS IN DELAWARE RIVER BASIN IN PENNSYLVANIA--Continued
 Chemical analyses, in parts per million, water year October 1951 to September 1952--Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 residue on evaporation at 180°C	Hardness as CaCO ₃	Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color
SCHUYLKILL RIVER AT MONOCACY																					
Oct. 3, 1951	4.75	72	9.2				54	20	16		28	241	14	0.0	5.8		254	231	590	7.2	5
Oct. 10	651	60	10	0.05						5	259	12			7.1	420	268	254	595	6.1	10
Oct. 12	500	64	8.8							35	200	14			4.2		249	220	514	7.0	5
SCHUYLKILL RIVER AT SANATOGA																					
Oct. 3, 1951	544	70	9.2				51	28	15		36	218	11	0.0	6.3		229	200	549	7.3	4
Oct. 10	801	58	10	0.05						10	241	9.0			7.8	414	242	234	599	6.9	2
Oct. 17	639	63	9.0							36	175	12			5.9		209	180	475	6.9	6
SCHUYLKILL RIVER ABOVE PHOENIXVILLE																					
Oct. 3, 1951	558	69	8.8				48	24	12		36	234	11	0.0	6.8		245	216	566	7.1	5
Oct. 10	821	57	9.2	0.03						16	205	8.5			7.7	352	218	205	499	6.9	4
Oct. 17	655	62	6.5							34	170	9.0			5.5		206	178	456	6.7	5
SCHUYLKILL RIVER BELOW PHOENIXVILLE																					
Oct. 3, 1951	595	71	6.8				53	29	12		28	239	12	0.0	6.3		245	222	576	7.0	4
Oct. 10	975	59	9.6	0.03						13	238	7.5			7.4	365	247	237	552	6.8	5
Oct. 17	698	63	6.7							30	170	10			5.8		209	184	466	7.0	5
SCHUYLKILL RIVER AT PORT KENNEDY																					
Oct. 3, 1951	629	67	5.1				48	25	12		40	218	14	0.0	5.6		243	210	552	6.7	6
Oct. 10	960	59	8.8	0.03						36	194	8.0			8.0	328	223	193	499	7.5	6
Oct. 17	761	60	6.5							36	159	10			5.3		194	164	445	7.3	6
SCHUYLKILL RIVER AT CONSHOHOCKEN																					
Oct. 3, 1951	670	75	6.2				41	19	15		65	192	19	0.0	5.0		235	182	568	6.8	7
Oct. 10	1,020	62	8.4	0.01						54	139	13			7.7	291	180	136	436	7.4	6
Oct. 17	811	66	7.4							46	166	16			4.3		202	164	493	7.1	7
SCHUYLKILL RIVER AT GIRARD AVENUE, PHILADELPHIA																					
Oct. 3, 1951	315	71	4.3				4.4	22	15		70	172	18	0.0	4.7		225	168	531	7.1	9
Oct. 10	720	63	5.4	0.02						57	155	14			6.7	311	200	154	472	7.8	7
Oct. 17	455	64	9.8							49	147	18			4.4		198	158	475	7.4	10

DELAWARE RIVER BASIN--Continued
 MISCELLANEOUS ANALYSES OF STREAMS IN DELAWARE RIVER BASIN IN PENNSYLVANIA--Continued
 Chemical analyses, in parts per million, water year October 1951 to September 1952--Continued

Date of collection	Mean discharge (cfs)	Tem- per- ature (° F)	Silica (SiO ₂)	Alum- inum (Al)	Iron (Fe)	Mang- anese (Mn)	Cal- cium (Ca)	Mag- nes- ium (Mg)	Sod- ium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO ₃	Total acid- ity as H ₂ SO ₄	Specific conduct- ance (micro- mhos at 25°C)	pH	Color	
SCHUYLKILL RIVER AT PASSAYUNK AVENUE, PHILADELPHIA																						
Oct. 3, 1951.....		79	6.7								88	197	41	0.0	17		241	189		679	6.6	40
Oct. 10.....		67	5.4		0.04	0.25	52	24	27		46	196	27	0.0	9.1	400	228	191		588	7.1	8
Oct. 17.....		67	9.8								69	205	28	0.0	13		229	172		608	7.2	50
WEST BRANCH SCHUYLKILL RIVER AT CRESSONA																						
Oct. 2, 1951.....	20	57	14			8.7	136	99	18		0	1,200	4.0	0.0	1.2		1,070	1,070	272	2,020	3.75	2
Oct. 9.....	36	50	13	13	0.42						0	852	3.5	0.0	1.4	1,250	746	746	255	1,500	3.45	3
Oct. 16.....	26	52	14								0	1,130	4.0	0.0	1.0		1,020	1,020	242	1,880	3.90	3
LITTLE SCHUYLKILL RIVER ABOVE TAMAQUA																						
Oct. 2, 1951.....	23	58	8.9			0.50	9.0	3.3	4.2		0	64	4.5	0.0	2.5		44	44	44	176	4.30	2
Oct. 9.....	47	48	8.2	0.7	0.50						0	48	2.5	0.0	2.4	85	36	36	38	138	4.10	6
Oct. 16.....	23	50	9.0								0	56	1.0	0.0	2.7		40	40	44	164	4.45	5
LITTLE SCHUYLKILL RIVER BELOW TAMAQUA																						
Oct. 2, 1951.....	44	59	16			6.3	72	51	14		0	633	9.0	0.0	1.6		456	456	398	1,170	3.60	4
Oct. 9.....	79	52	16	17	1.7						0	535	5.0	0.0	1.4	814	389	389	330	1,020	3.20	5
Oct. 16.....	72	54	17								0	803	4.5	0.0	1.3		573	573	508	1,480	3.15	4
Dec. 5.....	1,630								8.3	1	67	1.5	--	--	4		55	54	--	179	4.7	3
LITTLE SCHUYLKILL RIVER AT PORT CLINTON																						
Oct. 2, 1951.....	59	60	15			3.5	41	24	7.9		0	459	7.0	0.0	2.7		330	330	264	872	3.60	3
Oct. 9.....	129	53	12	11	0.94						0	286	4.0	0.0	3.9	432	201	201	172	613	3.45	5
Oct. 16.....	120	56	17								0	559	5.5	0.0	4.4		415	415	380	1,100	3.25	2
PANTHER CREEK AT TAMAQUA																						
Oct. 2, 1951.....	35	58	28			13	175	111	19		0	1,210	8.0	0.0	3.7		781	781	814	1,940	3.10	5
Oct. 9.....	38	54	27	52	6.4						0	1,250	8.0	0.0	2.0	1,880	893	893	800	1,950	3.05	5
Oct. 16.....	43	58	23								0	1,260	5.0	0.0	1.7		978	978	842	2,060	3.10	5

DELAWARE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN DELAWARE RIVER BASIN IN PENNSYLVANIA--Continued

Chemical analyses, in parts per million, water year October 1951 to September 1952--Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 100°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Total	Non-carbonate				

WYOMISSING CREEK AT WEST READING

Oct. 2, 1951	5	73	12									217	50	30	0.0	1.1	153	0		549	7.0	40
Oct. 9	6	66	11				12	55				210	55	26	0	7	147	0		516	7.6	50
Oct. 16	7	64	11								259	47	65	0	1.1		200	0		700	7.2	85

ANGELICA CREEK AT READING

Oct. 2, 1951	1	75	38				22	8.3	7.4		1,080	15	78	0.0	2.6		311	0		2,080	7.5	160
Oct. 9	3	64	14								84	20	8.5	0	4.2	129	89	20		216	7.2	5
Oct. 16	2	58	13								96	21	10	0	4		93	19		232	7.3	15

SCHUYLKILL RIVER BELOW READING

Oct. 2, 1951	460	69	9.2				55	31	5.3		42	238	13	0.0	5.5		258	224		592	7.5	6
Oct. 9	605	64	10								2	281	8.5	0	2.7	440	265	263		609	5.6	4
Oct. 16	470	60	8.7								26	197	12	0	4.4		223	202		520	7.2	5

ANTIETAM CREEK AT LORANE

Oct. 3, 1951	5	59	11				28	13			160	27	18	0.0	5.4		146	25		365	7.7	7
Oct. 10	8	50	16								128	22	12	0	8.5	177	123	18		301	7.2	5
Oct. 17	7	52	14								129	21	8.0	0	5.6		134	18		280	7.5	8

MANATAWNY CREEK AT POTTSTOWN

Oct. 3, 1951	18	63	11				20	7.3	5.5		120	18	4.5	0.0	3.8		113	15		246	7.6	7
Oct. 10	31	51	13								66	25	6.0	0	4.2	121	80	26		192	7.2	21
Oct. 17	29	54	12								103	21	5.0	0	2.6		111	27		228	7.2	7

PERKIMON CREEK AT OAKS

Oct. 3, 1951	27	67	6.5				25	8.5	10		164	34	12	0.0	0.5		108	23		273	7.9	8
Oct. 16	75	57	9.4								69	29	11	0	2.6	149	97	24		213	7.7	10
Oct. 17	55	59	9.5								85	35	12	0	2.4		107	37		260	7.9	10

NORTH ATLANTIC RIVER BASINS

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT TOWANDA, PA.

LOCATION.--At gaging station Bridge Street Bridge at Towanda, Bradford County, 1½ miles upstream from Towanda Creek.

DRAINAGE AREA.--7,797 square miles.

RECORDS AVAILABLE.--Sediment records: January 1951 to September 1952.

EXTREMES, 1951-52.--Sediment concentrations: Maximum daily, 1,010 ppm Mar. 12; minimum daily, 1 ppm on several days.

Sediment loads: Maximum daily, 272,000 tons Mar. 12; minimum daily, 3 tons on several days.

EXTREMES, January 1951 to September 1952.--Sediment concentrations: Maximum, 1,670 ppm Mar. 31, 1951; minimum daily, 1 ppm on several days.

Sediment loads: Maximum daily, 417,000 tons Mar. 31, 1951; minimum daily, 3 tons on several days.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1232.

Suspended sediment, water year October 1951 to September 1952

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-----	1,320	2	7	1,490	4	a 16	7,200	7	136
2-----	1,260	2	7	1,560	4	a 17	7,020	5	95
3-----	1,220	2	7	1,770	6	a 29	7,380	3	60
4-----	1,200	3	10	3,080	14	a 116	7,950	6	129
5-----	1,120	2	6	7,990	44	a 949	12,900	37	s 1,840
6-----	1,190	2	6	7,200	22	a 428	27,800	185	13,900
7-----	1,080	1	3	5,650	16	a 244	21,300	65	3,740
8-----	1,120	2	6	7,750	85	a 1,780	16,800	40	1,810
9-----	1,150	2	6	14,400	275	a 10,700	17,300	90	4,200
10-----	1,350	1	4	13,000	70	a 2,460	26,600	120	8,620
11-----	1,910	1	5	9,750	10	a 263	21,800	59	3,470
12-----	1,910	2	10	7,750	8	a 167	17,300	23	1,070
13-----	1,680	2	9	6,680	8	a 144	13,900	13	488
14-----	1,630	2	a 9	5,980	8	a 129	11,600	7	219
15-----	2,150	4	a 23	5,500	8	119	9,550	6	a 155
16-----	1,970	4	a 21	5,650	10	153	7,950	6	a 129
17-----	1,740	2	a 9	7,200	17	330	6,150	6	a 100
18-----	1,610	1	4	8,950	22	532	5,800	8	125
19-----	1,530	5	21	7,950	15	322	5,500	6	89
20-----	1,430	4	15	6,850	16	296	5,800	7	110
21-----	1,360	3	11	5,980	7	113	8,440	6	137
22-----	1,330	5	18	5,350	3	43	19,900	30	a 1,610
23-----	1,280	6	21	5,200	3	42	23,000	100	a 6,210
24-----	1,260	7	24	6,630	7	s 134	19,300	70	a 3,650
25-----	1,240	7	23	13,600	55	s 2,110	14,800	62	2,480
26-----	1,270	5	17	13,400	40	1,450	12,100	43	1,400
27-----	1,280	4	a 14	11,000	20	594	10,800	41	1,200
28-----	1,410	6	23	9,350	13	328	9,550	51	1,320
29-----	1,630	7	31	8,150	9	198	8,550	52	a 1,200
30-----	1,530	4	17	7,200	10	194	8,750	50	a 1,180
31-----	1,490	2	8	--	--	--	17,800	201	s 10,500
Total--	44,560	--	395	222,010	--	24,400	410,590	--	71,372

s Computed by subdividing day.

a Computed from estimated concentration graph.

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT TOWANDA, PA.--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

Day	January			February			March		
	Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment	
		Mean con- cen- tration (ppm)	Tons per day		Mean con- cen- tration (ppm)	Tons per day		Mean con- cen- tration (ppm)	Tons per day
1-----	33,000	118	10,500	13,000	16	562	5,350	5	72
2-----	56,300	163	24,800	13,900	12	450	5,050	5	68
3-----	47,400	33	4,220	18,800	12	609	4,900	6	79
4-----	33,800	14	1,280	25,800	28	1,950	4,750	7	90
5-----	25,400	4	274	41,800	243	27,400	4,900	8	106
6-----	20,300	11	693	33,800	66	6,020	5,650	6	92
7-----	16,800	51	2,310	26,000	27	1,900	5,800	2	31
8-----	13,400	50	a 1,810	19,800	24	1,280	5,650	4	a 61
9-----	11,600	43	1,350	17,800	17	817	5,200	4	56
10-----	11,200	56	1,690	16,300	13	572	5,050	3	41
11-----	10,800	33	962	14,400	14	544	31,900	775	s 71,400
12-----	9,750	14	369	13,000	12	421	101,000	1,010	s 272,000
13-----	8,950	4	97	11,000	10	297	67,800	171	s 32,000
14-----	8,950	11	266	8,950	9	217	42,400	81	s 9,300
15-----	12,000	25	810	7,380	9	a 179	29,000	40	3,130
16-----	24,800	85	5,690	7,550	8	a 163	21,800	12	706
17-----	24,200	58	3,790	7,950	7	a 150	17,300	10	a 467
18-----	34,200	174	s 18,700	7,550	6	a 122	14,400	9	350
19-----	41,900	310	s 37,700	7,200	5	a 97	13,900	7	263
20-----	30,200	45	3,070	6,680	5	90	14,800	8	320
21-----	26,000	30	2,110	6,680	4	72	28,600	82	s 6,690
22-----	18,800	18	914	6,320	5	85	44,600	156	s 19,700
23-----	16,300	15	660	5,980	4	65	43,900	127	a 15,100
24-----	16,800	15	680	5,800	3	47	45,300	84	10,300
25-----	14,400	10	389	5,500	2	30	38,300	47	4,860
26-----	12,600	15	510	5,350	2	29	32,600	32	2,820
27-----	37,600	126	s 14,600	5,050	3	41	30,800	27	2,250
28-----	56,300	196	s 30,400	5,200	4	56	30,800	18	1,500
29-----	39,000	30	3,160	5,200	5	70	27,800	28	2,100
30-----	23,000	11	a 683	--	--	--	22,400	20	1,210
31-----	15,300	13	a 537	--	--	--	19,300	18	a 938
Total-	751,050	--	175,534	369,740	--	44,335	771,000	--	458,100
Day	April			May			June		
	Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment	
		Mean con- cen- tration (ppm)	Tons per day		Mean con- cen- tration (ppm)	Tons per day		Mean con- cen- tration (ppm)	Tons per day
1-----	18,300	18	889	7,200	11	214	10,800	12	350
2-----	21,300	23	1,320	6,680	9	162	9,750	12	316
3-----	29,600	62	4,960	5,980	9	145	9,350	8	202
4-----	31,400	69	5,850	5,500	8	119	8,950	8	193
5-----	29,600	47	3,760	5,050	8	109	7,750	5	a 105
6-----	58,400	500	a 78,800	4,750	6	77	6,850	3	a 55
7-----	52,900	143	20,400	4,450	6	72	6,150	2	33
8-----	38,300	70	7,240	4,300	5	58	5,980	5	81
9-----	29,600	45	3,600	4,000	3	32	6,150	8	133
10-----	23,600	32	2,040	3,860	12	125	5,800	6	94
11-----	19,800	29	1,550	3,710	64	641	5,500	4	59
12-----	17,800	30	1,440	8,770	55	1,300	4,900	5	66
13-----	16,800	72	3,270	21,800	62	3,650	4,450	3	36
14-----	26,900	72	5,230	19,800	36	1,920	4,000	3	32
15-----	39,200	250	a 26,500	16,300	32	1,410	3,630	2	20
16-----	39,600	150	a 16,000	14,400	18	700	3,320	2	18
17-----	26,000	33	2,320	13,000	15	526	3,030	5	41
18-----	19,300	28	a 1,460	11,600	15	a 470	2,610	7	53
19-----	15,800	25	a 1,070	10,600	14	401	2,680	6	43
20-----	13,400	23	832	9,950	14	376	2,610	8	56
21-----	11,600	18	564	16,500	45	2,000	2,610	6	42
22-----	10,400	12	337	17,800	58	2,790	2,430	6	39
23-----	9,550	7	180	15,300	30	1,240	2,230	7	42
24-----	9,150	7	173	13,000	27	948	2,210	8	48
25-----	8,750	8	189	22,200	81	4,860	2,130	7	40
26-----	9,350	10	252	46,700	202	25,500	2,050	6	33
27-----	9,550	14	361	37,600	129	s 13,900	1,990	9	48
28-----	8,550	26	600	23,600	35	2,230	1,890	8	41
29-----	7,950	4	86	17,300	22	1,030	1,770	9	43
30-----	7,380	6	120	14,400	17	661	1,670	9	41
31-----	--	--	--	12,100	14	457	--	--	--
Total-	659,830	--	191,393	418,200	--	68,123	135,440	--	2,403

s Computed by subdividing day.

a Computed from estimated concentration graph.

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT TOWANDA, PA.--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

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-----	1,580	3	13	2,030	12	66	1,210	5	a 16
2-----	1,580	6	26	1,890	14	71	1,160	4	a 13
3-----	1,510	7	29	1,760	7	33	1,530	3	a 12
4-----	1,580	8	34	1,680	7	32	1,910	10	52
5-----	1,490	9	36	1,670	8	36	2,710	18	132
6-----	1,380	11	41	1,600	5	22	2,590	14	98
7-----	1,330	12	43	1,670	3	14	2,170	2	12
8-----	1,320	8	29	1,770	6	20	1,810	2	10
9-----	1,440	22	86	1,700	4	18	1,530	2	8
10-----	6,860	181	s 3,880	1,650	2	9	1,360	1	4
11-----	11,600	110	3,450	1,600	3	13	1,300	1	4
12-----	13,400	62	2,240	1,560	2	8	1,200	1	3
13-----	9,350	32	808	1,760	2	10	1,120	2	6
14-----	5,980	29	468	2,030	4	22	1,000	3	8
15-----	4,150	22	247	2,320	6	38	1,000	2	5
16-----	3,320	18	161	2,430	7	46	1,030	1	3
17-----	2,880	18	140	2,390	9	58	930	2	5
18-----	2,520	17	116	2,090	11	62	972	3	8
19-----	2,210	14	84	2,610	10	70	1,400	2	8
20-----	2,990	15	85	2,320	8	50	1,360	1	4
21-----	2,190	25	148	2,360	10	64	1,280	1	3
22-----	4,720	92	1,170	2,390	9	58	1,270	1	3
23-----	6,680	63	1,140	2,170	8	47	1,240	1	3
24-----	4,600	34	422	1,990	7	38	1,240	2	7
25-----	3,630	22	216	1,810	6	29	1,120	4	12
26-----	3,300	20	178	1,670	5	23	986	5	13
27-----	3,710	24	240	1,530	5	21	1,030	3	8
28-----	2,930	17	134	1,400	4	15	1,000	3	8
29-----	2,590	17	119	1,300	3	11	902	2	5
30-----	2,280	16	111	1,270	5	17	832	2	4
31-----	2,130	15	86	1,210	5	a 16	--	--	--
Total-	116,330	--	15,980	57,630	--	1,046	40,132	--	477

Total discharge for year (cfs-days) 3,996,572

Total load for year (tons) 1,053,558

s Computed by subdividing day.

a Computed from estimated concentration graph.

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT TOWANDA, PA.--Continued

Particle-size analyses of suspended sediment, water year October 1951 to September 1952

(Methods of analysis: B, bottom withdrawal tube; D, decantation; F, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Water temperature per- centage saturated (° F)	Suspended sediment											Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analysed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500	1.000
Mar. 11, 1952 ..	11:30 a. m.	23,600		1,150	2,000			30	49	70	93	98	100			BWC
Mar. 11.....	5:30 p. m.	50,200		760	1,370			39	57	79	92	97	100			BWC
Mar. 12	4:45 p. m.	109,700		1,140	2,470			41	59	76	92	99	100			BWC

SUSQUEHANNA RIVER BASIN

SUSQUEHANNA RIVER AT FALLS, PA.

LOCATION.--At bridge on State Highway 92, 400 feet upstream from Buttermilk Creek, Wyoming County, and approximately 17 miles upstream from gaging station at Wilkes-Barre, Luzerne County.

DRAINAGE AREA.--9,440 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1952.

Water temperatures: October 1944 to September 1952.

EXTREMES, 1951-52.--Hardness: Maximum, 109 ppm Oct. 1-10; minimum, 40 ppm Mar. 21-31.

Specific conductance: Maximum daily, 271 micromhos Oct. 15; minimum daily, 76.9 micromhos Mar. 16.

Water temperatures: Maximum, 84°F June 30, July 18, 21; minimum, freezing point on several days in December.

EXTREMES, 1944-52.--Dissolved solids (1944-47): Maximum, 156 ppm Oct. 1-10, 1951; minimum, 58 ppm May 21-31, 1946.

Hardness: Maximum, 109 ppm Oct. 1-10, 1951; minimum, 36 ppm May 21-31, 1946.

Specific conductance: Maximum daily, 282 micromhos Oct. 21-31, 1947; minimum daily, 80.0 micromhos Dec. 6, 1950.

Water temperatures (1944-49) (1950-52): Maximum, 84°F June 30, July 18, 21; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of water discharge for water year October 1951 to September 1952 based on records for Susquehanna River at Wilkes-Barre which are given in Water-Supply Paper 1232.

October 1951 to September 1952 based on records for Susquehanna River at Wilkes-Barre which are given in Water-Supply Paper 1232.

Chemical analyses in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃	Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color
Oct. 1-10, 1951..	1,508		8.8		0.03		34	5.9	11	1.8	108	23	12	0.0	1.3	156	109	21	255	7.8	5
Oct. 11-20	2,012								9.0		108	20	12		1.6		108	20	287	7.7	4
Oct. 21-31	1,587								9.1		100	22	10		1.0		100	18	240	7.7	5
Nov. 1-10	9,752								7.1		82	20	9.0		2.2		87	20	208	7.7	9
Nov. 11-20	9,752								4.4		57	24	4.5		2.1		66	19	161	7.5	10
Nov. 21-30	10,450								4.4		57	20	4.0		1.8		65	18	150	7.3	7
Dec. 1-10	16,440								2.2		45	18	3.2		2.0		57	20	132	7.2	10
Dec. 11-20	13,520								2.8		46	20	3.5		2.0		59	21	133	7.2	6
Dec. 21-31	17,620								3.4		44	18	4.0		2.5		55	19	130	7.4	8
Jan. 1-10, 1952 ..	31,470								4.0		35	16	3.0		2.5		43	14	110	7.1	10
Jan. 11-20	22,680								3.7		43	18	3.5		2.5		53	18	129	7.3	7
Jan. 21-31	29,900								4.3		33	18	2.5		2.4		42	15	107	7.0	10
Feb. 1-10	26,860								1.9		36	14	3.0		3.5		47	18	114	7.1	8
Feb. 11-20	12,100								3.0		54	16	3.5		3.3		62	18	146	7.3	5
Feb. 21-29	7,101								2.4		70	16	4.5		3.5		78	21	177	7.3	3
Mar. 1-10	6,528								6.0		71	22	6.0		3.1		79	21	184	7.5	5
Mar. 11-20	46,150	4.7			.11		13	2.8	3.0	1.4	31	16	2.0	.1	2.2	66	44	19	98.9	7.0	15
Mar. 21-31	39,040								3.2		31	16	2.0		2.5		40	15	98.3	7.0	15
Apr. 1-10	38,230								2.3		36	14	1.5		1.3		42	12	98.4	7.3	10
Apr. 11-20	33,110								2.4		53	17	1.0		1.3		46	15	110	7.2	7
Apr. 21-30	14,440								3.2		53	18	3.0		.5		60	17	140	7.4	5

May 1-10	7,756	--	--	--	--	66	13	5.0	--	5	--	68	14	164	7.5	7
May 11-20	19,170	--	--	--	--	47	10	3.5	--	1.3	--	52	14	125	7.1	5
May 21-31	28,610	3.5	.01	14	3.1	41	14	2.5	.1	.5	64	46	14	109	6.9	10
June 1-10	11,120	--	--	--	--	57	16	4.5	--	1.0	--	59	12	144	7.3	5
June 11-20	4,973	--	--	--	--	78	16	5.5	--	1.2	--	80	16	187	7.3	5
June 21-30	3,009	--	--	--	--	90	19	8.0	--	1.7	--	89	15	212	7.7	5
July 1-10	2,898	--	--	--	--	78	19	11	--	1.3	--	88	24	220	7.3	8
July 11-20	7,562	--	--	--	--	54	14	5.5	--	2.6	--	62	18	159	7.7	8
July 21-31	5,974	--	--	--	--	51	14	5.0	--	2.2	--	62	20	158	7.8	8
Aug. 1-10	2,577	--	--	--	--	76	17	7.0	--	1.4	--	83	21	206	7.9	5
Aug. 11-20	2,702	--	--	--	--	92	20	11	--	1.3	--	96	21	231	8.0	6
Aug. 21-31	2,572	--	--	--	--	77	17	7.0	--	1.3	--	87	24	215	7.9	5
Sept. 1-10	4,342	--	--	--	--	58	15	8.0	--	1.9	--	66	18	173	7.7	10
Sept. 11-20	1,982	--	--	--	--	74	16	9.5	--	2.1	--	84	23	206	7.4	5
Sept. 21-30	1,852	--	--	--	--	98	20	12	--	1.8	--	104	24	237	7.9	5
Average	13,880	--	--	--	--	82	17	5.6	--	1.9	--	88	18	165	--	7

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT FALLS, PA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952
 (Once-daily temperature measurement at approximately 5 p. m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	59	44	36	35	34	37	46	58	64	79	79	74
2	58	44	42	36	36	37	49	59	69	79	--	72
3	59	47	37	34	36	37	49	59	72	79	79	71
4	66	42	40	34	36	37	49	59	72	78	79	75
5	70	42	43	34	36	36	47	58	72	80	78	76
6	69	47	45	33	38	37	48	58	72	79	79	74
7	60	42	46	34	36	38	48	58	74	78	78	71
8	60	39	47	34	36	37	49	59	74	77	76	71
9	58	42	45	34	37	39	49	59	72	76	76	70
10	--	42	45	34	38	38	49	60	72	76	77	79
11	56	43	45	34	38	38	49	58	72	77	76	78
12	56	43	40	34	34	36	48	57	--	77	76	75
13	56	46	40	34	34	36	48	58	75	77	--	79
14	55	46	33	35	34	36	47	59	77	79	--	79
15	56	48	33	39	34	35	49	58	75	81	77	77
16	58	46	33	38	34	35	49	58	75	83	77	70
17	59	45	33	36	34	35	50	58	80	83	76	70
18	--	43	33	37	34	38	52	58	75	84	77	70
19	59	42	33	37	35	38	54	58	72	83	77	70
20	58	--	33	37	35	40	58	58	71	83	76	69
21	57	--	38	34	36	44	60	59	68	84	76	66
22	57	47	32	39	36	41	62	60	65	81	75	66
23	58	40	33	39	37	41	64	60	--	81	74	67
24	60	39	32	34	37	42	59	--	--	79	70	67
25	56	40	32	34	38	41	59	60	--	79	70	79
26	58	37	33	36	37	41	52	61	81	80	76	60
27	55	35	32	33	37	44	52	62	83	81	77	60
28	55	36	33	34	37	43	53	64	83	80	77	60
29	58	36	32	34	37	44	53	64	--	80	77	60
30	58	35	35	34	--	44	58	64	84	79	76	60
31	58	--	35	34	--	45	--	65	--	79	75	--
Average	59	42	37	35	36	39	52	60	74	80	76	70

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT DANVILLE, PA.

LOCATION --At gaging station at Mill Street Bridge at Danville, Montour County, 0.8 mile upstream from Mahoning Creek.

DRAINAGE AREA --11,260 square miles, approximately.

RECORDS AVAILABLE --Chemical analyses: September 1906 to September 1952.

Water temperatures: October 1945 to September 1952.

EXTREMES, 1951-52. --Hardness: Maximum, 192 ppm Sept. 21-30; minimum 45 ppm Mar. 12-15

Specific conductance: Maximum daily, 463 micromhos Sept. 23, Sept. 30; minimum daily, 83.1 micromhos Mar. 12.

Water temperatures: Maximum, 85°F June 28, July 18; minimum, freezing point on several days during December and January.

EXTREMES, 1945-52. --Dissolved solids (1945-47): Maximum, 334 ppm Sept. 11-20, 1946; minimum, 68 ppm May 21-31, 1946.

Hardness (1945-47) (1949-52): Maximum, 223 ppm Sept. 11-20, 1946; minimum, 42 ppm Apr. 1-10, 1950.

Specific conductance: Maximum daily, 557 micromhos Oct. 13, 1948; minimum daily, 93.6 micromhos Dec. 6, 1950.

Water temperatures: Maximum, 87°F Aug. 9, 10, 1949; minimum, freezing point on many days during winter months.

REMARKS. --Samples collected daily at midstream 1906-07 and at point 465 feet from north end of bridge, 1945-52. Due to cross-sectional differences in concentration of dissolved solids, water samples also collected three times a month at points 120, 650, 880 and 1,180 feet from north end of bridge (1945-50); cross-sectional studies made on monthly samples during parts of 1950-51 and 1952. Records of specific conductance of daily samples, October 1945 to September 1952 available in district office at Philadelphia, Pa. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1232.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micromhos at 25°C)	pH	Color
																	Calcium	Non-carbonate				
Oct. 1-10, 1951.....	2,142		3.5		0.05		45	17	12	2.2	39	157	9.5	0.2	2.7	283	182	150		424	7.2	3
Oct. 11-20.....	2,398		--		--		--	--	--	14	47	140	11	--	2.9	--	172	134		404	7.2	7
Oct. 21-31.....	2,089		--		--		--	--	--	11	40	148	9.5	--	2.1	--	178	145		412	6.9	6
Nov. 1-4.....	6,203		--		--		--	--	--	11	31	123	8.0	--	2.9	--	144	119		345	6.9	4
Nov. 5-10.....	13,420		--		--		--	--	--	7.3	31	62	6.0	--	3.1	--	85	60		213	6.9	5
Nov. 11-20.....	12,930		--		--		--	--	--	5.9	33	48	4.0	--	2.7	--	72	45		181	6.5	6
Nov. 21-30.....	12,810		--		--		--	--	--	4.9	39	56	4.0	--	2.2	--	87	55		202	7.1	5
Dec. 1-10.....	20,260		--		--		--	--	--	3.3	31	48	3.5	--	2.3	--	73	48		173	7.0	5
Dec. 11-20.....	17,140		--		--		--	--	--	3.6	33	48	3.0	--	2.1	--	73	46		175	7.1	7
Dec. 21-31.....	21,750		--		--		--	--	--	3.6	35	42	4.5	--	2.6	--	73	44		177	7.1	5
Jan. 1-10, 1952.....	37,930		--		--		--	--	--	3.6	31	28	3.0	--	2.4	--	53	28		138	7.1	5
Jan. 11-20.....	25,750		--		--		--	--	--	2.7	36	38	4.0	--	2.6	--	71	42		170	7.1	7
Jan. 21-31.....	38,090		--		--		--	--	--	3.7	26	32	2.5	--	2.5	--	52	31		130	6.9	10
Feb. 1-10.....	32,680		--		--		--	--	--	4.1	29	36	3.0	--	3.0	--	56	35		143	6.8	5
Feb. 11-20.....	15,120		--		--		--	--	--	6.0	36	53	3.5	--	2.8	--	81	52		165	6.8	2
Feb. 21-29.....	6,530		--		--		--	--	--	4.3	48	72	4.5	--	3.2	--	113	73		286	7.1	3
Mar. 1-11.....	8,941		--		--		--	--	--	6.1	49	72	5.0	--	3.9	--	112	72		285	7.1	5

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT DANVILLE, PA.--Continued

Chemical analyses, in parts per million, water year October 1951 to September 1952--Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporating at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium, magnesium	Non-carbonate				
Mar. 12-15, 1952.	94,500		4.0		0.07		12	3.6	2.6	1.6	17	28	1.5	0.1	3.5	62	45	31		91.4	6.8	30
Mar. 16-20	29,080		--		--		--	--	1.6	--	25	32	1.5	--	3.2	--	55	34		134	7.0	8
Mar. 21-31	43,940		--		--		--	--	2.3	--	26	26	2.0	--	2.4	--	48	27		118	6.9	8
Apr. 1-10	43,320		--		--		--	--	.5	--	28	24	1.5	--	2.4	--	51	28		121	6.8	8
Apr. 11-20	39,630		--		--		--	--	2.6	--	28	33	2.0	--	2.0	--	56	33		133	6.9	7
Apr. 21-30	19,050		--		--		--	--	4.3	--	36	50	2.5	--	1.5	--	77	48		186	7.4	5
May 1-10	10,620		--		--		--	--	5.8	--	35	76	4.0	--	1.5	--	102	73		242	6.7	7
May 11-13	19,090		--		--		--	--	2.4	--	32	65	4.0	--	2.1	--	96	70		232	6.8	6
May 14-20	26,960		--		--		--	--	1.6	--	30	33	3.0	--	1.7	--	61	36		148	6.8	5
May 21-31	35,450		3.5		0.1		16	4.7	3.2	1.2	35	35	2.0	.2	1.3	82	59	35		141	6.9	7
June 1-10	13,820		--		--		--	--	5.5	--	35	57	3.5	--	1.3	--	82	53		205	6.8	2
June 11-20	6,154		--		--		--	--	8.3	--	42	97	5.5	--	1.3	--	126	92		289	7.0	2
June 21-30	3,601		--		--		--	--	11	--	38	139	7.0	--	1.2	--	162	131		380	7.0	5
July 1-10	3,263		--		--		--	--	12	--	24	169	9.5	--	1.2	--	184	164		438	7.2	8
July 11-20	9,360		--		--		--	--	7.8	--	26	78	5.0	--	1.8	--	94	73		245	6.9	5
July 21-31	8,654		--		--		--	--	8.8	--	16	97	5.5	--	4.1	--	106	93		268	6.9	5
Aug. 1-10	3,200		--		--		--	--	13	--	6	163	7.0	--	3.5	--	160	155		393	6.7	8
Aug. 11-20	3,793		--		--		--	--	10	--	10	168	6.0	--	3.2	--	172	168		401	7.1	3
Aug. 21-31	3,270		--		--		--	--	14	--	20	162	18.0	--	2.5	--	155	145		392	7.1	5
Sept. 1-10	4,110		--		--		--	--	16	--	18	181	18.0	--	2.3	--	184	171		441	6.5	5
Sept. 2-10	7,762		--		--		--	--	10	--	9	104	6.0	--	5.2	--	109	101		775	6.7	5
Sept. 11-20	2,784		--		--		--	--	12	--	8	168	9.0	--	3.4	--	170	--		398	6.8	5
Sept. 21-30	2,277		--		--		--	--	13	--	8	190	9.0	--	3.6	--	192	--		445	6.5	3
Average	16,970		--		--		--	--	6.8	--	29	84	5.1	--	2.6	--	106	78		253	--	6

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT DANVILLE, PA.--Continued

Chemical analyses of cross-section samples, water year October 1951 to September 1952

Date	Station	Time	Temperature (°F)	Parts per million					Specific conductance (micro- mhos at 25°C)	pH	Color
				Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Ni- trate (NO ₃)	Hard- ness as CaCO ₃			
Oct. 15, 1951.	1180	4:30 pm.	58	29	130	8.0	3.2	150	359	6.9	2
	880	4:30 pm.	58	37	150	9.5	3.3	174	408	6.7	3
	650	4:30 pm.	58	36	154	9.5	1.9	180	419	6.9	3
	465	4:30 pm.	59	33	154	10	3.0	180	418	7.0	2
	120	4:30 pm.	59	43	126	11	3.4	158	376	6.8	3
Nov. 15	1180	1:30 pm.	52	1	87	3.0	1.4	87	217	4.6	2
	880	1:30 pm.	50	2	86	3.5	2.0	87	218	5.3	2
	650	1:30 pm.	50	15	70	4.5	2.3	83	200	6.4	2
	465	1:30 pm.	52	22	46	4.0	2.9	67	166	6.5	2
	120	1:30 pm.	51	26	62	4.0	2.5	81	198	6.5	3
Dec. 15	1180	3:00 pm.	34	10	60	3.0	2.4	71	170	6.3	2
	880	3:00 pm.	34	23	52	3.5	2.3	67	168	6.6	3
	650	3:00 pm.	34	30	42	4.0	2.3	67	157	6.8	4
	465	3:00 pm.	35	32	38	3.5	2.3	65	152	6.8	5
	120	3:00 pm.	35	29	32	4.0	2.8	59	141	6.9	4
Jan. 15, 1952.	1180	1:30 pm.	38	19	64	4.0	2.5	81	193	6.6	2
	880	1:30 pm.	38	31	58	4.0	3.1	87	202	6.9	2
	650	1:30 pm.	--	40	50	4.0	3.1	85	197	7.4	2
	465	1:30 pm.	37	41	46	4.5	3.2	83	193	6.9	5
	120	1:30 pm.	38	35	40	4.5	4.0	73	169	7.0	3
Feb. 15	1180	11:00 am.	34	16	62	3.0	2.5	79	188	6.7	2
	880	11:00 am.	34	28	56	2.5	2.5	83	192	6.7	4
	650	11:00 am.	33	34	54	3.5	2.6	81	187	6.8	2
	465	11:00 am.	32	34	52	3.0	3.0	79	184	6.7	4
	120	11:00 am.	32	32	42	2.5	3.3	71	164	6.8	2
Mar. 15	1180	5:00 pm.	36	14	32	2.0	2.5	44	110	6.3	5
	880	5:00 pm.	36	15	30	2.0	3.0	42	106	6.5	15
	650	5:00 pm.	36	19	26	2.0	3.1	42	103	6.6	15
	465	5:00 pm.	36	18	28	1.5	3.1	40	98.9	6.5	20
	120	5:00 pm.	36	18	24	2.0	3.4	36	93.3	6.7	20
Apr. 15	1180	2:00 pm.	48	20	38	1.5	2.5	56	137	6.6	3
	880	2:00 pm.	47	29	36	2.0	2.3	59	142	6.7	4
	650	2:00 pm.	47	33	30	2.0	2.3	59	140	7.0	4
	465	2:00 pm.	47	35	30	2.0	2.6	57	136	7.0	5
	120	2:00 pm.	47	31	24	2.0	2.5	50	118	6.9	5
May 1	1180	3:10 pm.	59	2	62	2.5	2.1	62	163	4.9	4
	880	3:05 pm.	60	11	70	3.0	1.2	79	191	6.3	5
	650	3:00 pm.	59	27	58	3.5	1.1	83	197	6.6	5
	465	3:00 pm.	61	31	56	3.0	1.2	82	194	6.6	5
	120	3:00 pm.	59	28	44	3.0	1.9	66	165	6.6	6
May 15	1180	12:45 pm.	55	21	37	3.0	2.2	56	138	6.6	5
	880	12:45 pm.	55	30	34	3.5	1.7	61	148	6.6	5
	650	12:45 pm.	55	35	31	3.0	1.7	60	147	6.8	5
	465	12:45 pm.	56	36	31	3.5	1.9	59	143	6.7	7
	120	12:45 pm.	56	30	20	3.0	2.3	49	121	6.8	7
June 15	1180	8:00 am.	71	16	101	3.5	.0	110	265	6.3	3
	880	8:00 am.	71	29	107	3.5	.5	126	284	6.8	5
	650	8:00 am.	--	42	91	4.0	.4	120	282	7.2	4
	465	8:00 am.	72	46	85	4.0	.0	118	275	7.0	3
	120	8:00 am.	72	46	66	4.0	.4	104	242	6.9	3
July 15	1180	11:00 am.	80	--	--	--	--	--	230	--	--
	880	11:00 am.	79	--	--	--	--	--	216	--	--
	650	11:00 am.	79	--	--	--	--	--	200	--	--
	465	11:00 am.	80	--	--	--	--	--	193	--	--
	120	11:00 am.	80	--	--	--	--	--	190	--	--

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT DANVILLE, PA.--Continued

Chemical analyses of cross-section samples, water year October 1951 to September 1952--Continued

Date	Station	Time	Temperature (°F)	Parts per million					Specific conductance (micro- mhos at 25°C)	pH	Color
				Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Ni- trate (NO ₃)	Hard- ness as CaCO ₃			
Aug. 15, 1952.	1180	11:15 am	76	--	--	--	--	--	403	--	--
	880	11:15 am	77	--	--	--	--	--	414	--	--
	650	11:15 am	77	--	--	--	--	--	425	--	--
	465	11:15 am	78	--	--	--	--	--	417	--	--
	120	11:15 am	78	--	--	--	--	--	373	--	--
Sept. 15	1180	10:00 am	72	--	--	--	--	--	331	--	--
	880	10:00 am	74	--	--	--	--	--	373	--	--
	650	10:00 am	75	--	--	--	--	--	378	--	--
	465	10:00 am	75	--	--	--	--	--	379	--	--
	120	10:00 am	75	--	--	--	--	--	328	--	--
Sept. 30	a1080	7:30 pm	64	--	--	--	--	--	406	--	--
	880	7:30 pm	64	--	--	--	--	--	432	--	--
	650	7:30 pm	64	--	--	--	--	--	486	--	--
	465	7:30 pm	64	--	--	--	--	--	463	--	--
	120	7:30 pm	64	--	--	--	--	--	377	--	--

a No water at station 1180.

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	60	49	38	36	34	39	46	58	65	80	80	73
2	69	48	38	35	35	39	48	59	61	78	78	74
3	70	40	38	35	36	38	48	58	69	79	79	71
4	71	57	39	34	34	38	49	59	70	78	80	68
5	72	60	40	34	38	38	50	58	69	78	77	66
6	73	50	41	34	37	39	46	62	74	79	78	69
7	64	55	42	34	37	37	45	59	72	83	79	66
8	59	49	43	33	38	38	44	59	75	80	78	67
9	57	47	47	33	37	38	45	62	75	78	75	65
10	57	43	39	34	38	40	45	62	75	79	76	65
11	55	44	44	34	38	43	48	61	70	78	79	67
12	56	45	40	35	38	37	46	55	72	72	77	70
13	57	46	38	35	35	37	46	54	72	75	79	75
14	57	50	35	36	34	36	49	56	73	80	78	75
15	59	50	35	37	--	36	47	56	72	80	77	75
16	61	48	32	33	34	35	49	55	78	81	77	68
17	62	46	33	37	33	37	50	58	80	83	77	62
18	62	42	32	38	34	39	51	59	79	85	75	67
19	60	40	32	37	35	38	54	--	75	80	74	68
20	59	39	32	36	35	40	53	59	75	82	75	67
21	56	49	35	35	36	44	60	58	70	84	74	65
22	57	48	32	34	36	43	61	61	68	80	73	62
23	60	40	33	34	37	43	60	62	68	84	73	62
24	60	40	33	33	37	41	58	60	75	80	69	64
25	58	40	32	33	37	41	55	60	79	80	75	63
26	57	38	33	34	38	42	51	60	79	83	70	65
27	57	37	32	35	39	43	50	60	84	79	73	63
28	53	36	32	35	41	45	55	64	85	78	75	65
29	60	37	33	32	40	44	57	64	80	81	70	62
30	54	38	34	33	--	45	60	64	80	78	80	64
31	55	--	34	33	--	45	--	64	--	80	75	--
Average	60	45	36	35	36	40	51	60	74	80	76	67

SUSQUEHANNA RIVER BASIN--Continued

WEST BRANCH SUSQUEHANNA RIVER AT LEWISBURG, PA.

LOCATION --At gaging station at Market Street Bridge at Lewisburg, Union County, 560 feet from east bank of river, 0.2 mile downstream from Buffalo Creek, and 7.4 miles upstream from mouth.

DRAINAGE AREA --6,847 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1944 to September 1952.

Water temperatures: October 1944 to September 1952.

EXTREMES 1951-52 --Hardness: Maximum, 156 ppm Oct. 1-10; minimum, 32 ppm Apr. 1-10, 11-20.

Specific conductance: Maximum daily, 408 microhos Oct. 4; minimum daily, 67.1 microhos Mar. 12.

Water temperatures: Maximum, 80°F on many days during summer months; minimum, freezing point on many days during winter months.

EXTREMES 1944-52 --Dissolved solids (1944-47): Maximum, 219 ppm Oct. 1-10, 1944; minimum, 46 ppm May 1-10, 1945.

Hardness: Maximum, 156 ppm Oct. 1-10, 1951; minimum, 26 ppm May 21-31, 1946.

Specific conductance: Maximum daily, 408 microhos Oct. 4, 1951; minimum daily, 64.4 microhos Apr. 1, 1951.

Water temperatures: Maximum, 90°F July 28, Aug. 10, 1949; minimum, freezing point on many days during winter months.

REMARKS --Records of specific conductance and pH of daily samples available in district office in Philadelphia, Pa. Record of discharge for water year October 1951 to September 1952 based on records for Susquehanna River at Renova which are given in Water-Supply Paper 1232.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 (freezing point at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (microhos at 25°C)	pH	Color
																	Calcium, mg./l.	Non-carbonate				
Oct. 1-10, 1951.	317		2.3		0.04		41	13	14	2.3	29	138	12	0.1	2.1	246	156	132		385	7.0	3
Oct. 11-20	258						--	--	14		33	129	10	--	2.0	--	147	120		368	7.0	3
Oct. 21-31	293						--	--	17		34	132	10	--	2.1	--	144	116		352	7.0	4
Nov. 1-10	696						--	--		9.8	27	102	9.0	--	2.7	--	122	100		309	6.9	4
Nov. 11-20	946						--	--	8.1		9	90	5.5	--	2.2	--	93	86		245	6.5	5
Nov. 21-30	2,160						--	--		8.2	14	76	4.7	--	2.0	--	81	70		215	6.8	5
Dec. 1-5	1,982						--	--		6.1	4	75	4.0	--	1.6	--	75	72		196	6.1	5
Dec. 6-10	7,668						--	--	5.1		7	41	2.0	--	2.3	--	42	36		115	6.3	7
Dec. 11-20	4,959						--	--	4.7		7	38	4.0	--	1.7	--	42	36		108	6.5	5
Dec. 21-31	6,059						--	--	1.3		7	37	3.0	--	1.7	--	47	41		120	6.4	3
Jan. 1-10, 1952.	16,800						--	--	.6		5	43	2.0	--	1.5	--	40	36		104	6.0	3
Jan. 11-20	15,010						--	--	1.2		5	36	2.0	--	1.5	--	43	39		115	6.2	4
Jan. 21-31	23,640						--	--	.4		3	28	1.0	--	1.2	--	33	31		87.0	5.9	5
Feb. 1-10	14,990						--	--	1.0		2	34	1.0	--	1.4	--	38	36		91.5	5.4	2
Feb. 11-20	6,445						--	--	1.6		4	40	1.5	--	1.7	--	45	42		112	5.7	3
Feb. 21-29	3,112						--	--	2.8		5	52	2.5	--	1.7	--	57	53		145	6.1	3
Mar. 1-11	4,247						--	--	2.9		5	54	3.0	--	2.0	--	63	56		161	6.6	1
Mar. 12-20	19,900						--	--	1.4		5	29	1.0	--	1.7	--	34	30		90.3	6.2	2
Mar. 21-31	17,060		4.7		.02		8.9	3.2	1.8	1.0	4	30	1.0	1	1.3	52	35	32		86.4	6.2	3

SUSQUEHANNA RIVER BASIN--Continued
 WEST BRANCH SUSQUEHANNA RIVER AT LEWISBURG, PA.--Continued
 Chemical analyses, in parts per million, water year October 1951 to September 1952--Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium	Non-carbonate				
Apr. 1-10, 1952...	12,390		--		--		--	--		0.7	5	26	1.0	--	1.3	--	32	28		87.5	6.3	2
Apr. 11-20	21,030		--		--		--	--	1.1	1.1	5	27	1.0	--	1.0	--	32	28		86.0	6.3	2
Apr. 21-30	7,107		--		--		--	--	1.1		6	34	1.5	--	1.1	--	41	36		108	6.4	2
May 1-12	3,887		--		--		--	--	1.9		10	44	3.0	--	1.2	--	55	47		139	6.6	5
May 13-20	11,300		--		--		--	--	1.5		6	29	1.0	--	.9	--	36	31		92.8	6.2	4
May 21-31	22,700		4.6		0.00		8.6	3.0	1.7	1.0	5	30	1.0	0.1	.7	54	34	30		86.1	6.1	7
June 1-10	4,455		--		--		--	--	3.1		7	42	2.5	--	1.0	--	47	41		123	6.2	3
June 11-20	1,552		--		--		--	--	5.2		14	57	4.0	--	1.3	--	66	55		172	6.4	4
June 21-30	966		--		--		--	--	5.2		20	65	5.0	--	1.3	--	95	65		207	6.8	3
July 1-10	618		--		--		--	--	6.9		21	74	6.0	--	2.8	--	90	73		238	7.1	5
July 11-20	457		--		--		--	--	7.2		24	63	6.0	--	3.3	--	81	61		210	7.2	5
July 21-25	471		--		--		--	--	6.5		24	65	6.5	--	3.3	--	85	65		216	7.4	3
Aug. 1-12 a	--		--		--		--	--	--		--	--	--	--	--	--	--	--		--	--	--
Aug. 13-20	1,490		--		--		--	--	8.8		22	92	9.5	--	2.5	--	110	92		281	7.5	5
Aug. 21-31	661		--		--		--	--	9.6		6	99	7.0	--	3.9	--	100	95		257	6.3	5
Sept. 1-10	471		--		--		--	--	6.9		17	56	6.0	--	3.0	--	68	54		186	7.3	5
Sept. 11-20	338		--		--		--	--	7.4		26	78	7.0	--	2.1	--	98	77		252	7.5	5
Sept. 21-30	344		--		--		--	--	11		30	107	9.0	--	2.4	--	126	101		321	7.2	5
Average	6,445		--		--		--	--	5.1		13	61	4.3	--	1.9	--	70	60		180	--	4

a Samples missing.

SUSQUEHANNA RIVER BASIN--Continued

WEST BRANCH SUSQUEHANNA RIVER AT LEWISBURG, PA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	45	35	40	40	40	50	58	61	75	--	75
2	60	45	40	35	40	40	56	55	60	70	--	70
3	68	50	40	30	40	40	50	58	60	75	--	70
4	65	40	40	35	45	40	50	60	65	80	--	65
5	65	40	40	40	40	40	50	60	68	75	--	70
6	65	45	--	40	40	40	50	55	70	75	--	70
7	65	40	50	30	40	40	45	57	70	80	--	70
8	65	40	56	32	40	40	42	58	70	80	--	68
9	60	42	50	35	45	35	45	58	70	70	--	60
10	64	40	50	40	40	40	45	60	70	70	--	65
11	60	40	--	35	40	45	45	60	70	70	--	70
12	60	40	40	35	40	40	48	56	70	70	--	70
13	60	40	40	30	35	40	51	53	65	80	80	70
14	58	60	35	40	40	40	50	51	70	80	75	70
15	62	50	30	40	35	40	49	50	70	80	72	75
16	63	48	30	40	40	40	50	60	70	80	80	70
17	60	40	30	40	40	40	50	58	80	80	75	65
18	65	40	40	40	40	40	52	60	80	80	70	70
19	65	40	30	40	35	40	53	60	71	80	70	70
20	62	35	30	40	35	40	55	60	70	80	70	70
21	62	35	35	40	35	40	60	60	70	80	72	65
22	64	40	--	40	40	40	58	58	65	80	70	73
23	62	40	30	40	35	40	60	55	65	80	69	60
24	63	40	33	40	40	40	59	60	65	80	65	60
25	64	50	40	40	40	40	60	59	70	75	68	60
26	63	40	40	40	40	50	55	60	80	--	70	60
27	64	40	30	40	35	40	52	60	80	--	70	60
28	62	30	30	42	40	40	55	58	80	--	75	60
29	65	35	40	35	40	45	58	60	80	--	75	60
30	60	40	40	35	--	40	60	61	80	--	80	65
31	63	--	40	35	--	50	--	60	--	--	--	--
Average	63	42	38	38	54	41	52	58	70	77	--	69

SUSQUEHANNA RIVER BASIN--Continued

JUNIATA RIVER AT NEWPORT, PA.

LOCATION --At gaging station at highway bridge at Newport, Perry County, 1,000 feet upstream from Little Buffalo Creek and 230 feet from West bank of river.

DRAINAGE AREA --3,354 square miles

RECORDS AVAILABLE --Chemical analyses: October 1944 to September 1952.

Water temperatures: October 1944 to September 1952.

Sediment records: January 1951 to September 1952.

EXTREMES, 1951-52. --Hardness: Maximum, 163 ppm Oct. 21-31; minimum, 57 ppm Mar. 11-20.

Specific conductance: Maximum daily, 439 micromhos Oct. 17; minimum, 109 micromhos Apr. 28, 29.

Water temperatures: Maximum, 89°F July 22; minimum, 33°F Dec. 24.

Sediment concentrations: Maximum, 880 ppm Mar. 12; minimum, 0 ppm on several days.

EXTREMES, 1944-52. --Dissolved solids (1944-47) (1949-51): Maximum, 282 ppm Oct. 1-10, 1944; minimum, 74 ppm Feb. 11-20, 1950.

Hardness (1944-52): Maximum, 167 ppm Oct. 1-10, 1944; minimum, 14 ppm Feb. 21-28, Apr. 1-10, 1951.

Specific conductance: Maximum daily, 465 micromhos Oct. 1, 1944; minimum daily, 74.5 micromhos Nov. 25, 1950.

Water temperatures: Maximum, 89°F July 22, 1952; minimum, freezing point on several days during winter months.

Sediment concentrations: Maximum, 880 ppm Mar. 12, 1952; minimum, 0 ppm on many days.

REMARKS --Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1232.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃	Total acidity as carbonic acid (H ₂ SO ₄)	Specific conductance (micro-mhos at 25°C)	pH	Color
Oct. 1-10, 1951	641		2.6		0.04		40		26	2.3	124	80	16	0.1	1.7	252	153	52	412	7.6	5
Oct. 11-20	622								21		129	70	16		1.8		157	51	403	7.7	4
Oct. 21-31	680								18		135	65	16		2.8		163	52	403	7.7	6
Nov. 1-10	1,594								16		112	60	11		4.0		139	47	342	7.6	10
Nov. 11-20	1,415								10		109	50	9.5		3.4		135	46	313	7.7	15
Nov. 21-30	1,562								12		107	54	10		3.6		135	47	310	7.7	8
Dec. 2-4, 6-8	3,370								9.2		56	44	7.0		2.1		110	37	271	9.3	5
Dec. 15 ^a	1,730								--		78	42	--		--		109	45	257	7.7	5
Dec. 24-31 ^a	3,375								2.0		47	22	3.5		4.1		72	27	169	8.5	5
Jan. 1-10, 1952	12,650								4.0		48	28	3.5		4.3		69	30	161	7.2	8
Jan. 11-20	6,348								3.5		56	23	3.5		4.5		76	30	175	7.3	10
Jan. 21-31	12,380								2.5		45	24	3.0		4.1		64	27	146	7.3	10
Feb. 1-10	10,370								2.2		47	22	2.5		4.7		64	26	150	7.2	7
Feb. 11-20	4,748								2.9		60	22	3.0		4.5		80	31	184	7.7	5
Feb. 21-29	3,167								0.9		76	36	5.5		4.3		96	34	227	7.3	5
Mar. 1-10	12,296								7.6		60	36	6.0		3.6		100	34	243	7.1	5
Mar. 11-20	12,650								2.0		42	20	2.0		3.7		57	23	138	7.3	20
Mar. 21-31	12,090								2.3		45	20	3.0		3.7		60	23	142	7.2	7
Apr. 1-10	10,710								3.7		51	23	3.0		3.9		65	23	153	7.4	5
Apr. 11-20	9,590								2.8		50	21	3.0		3.7		64	23	151	7.4	5

^a Missing record due to freezing.

SUSQUEHANNA RIVER BASIN--Continued

JUNIATA RIVER AT NEWPORT, PA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952
(Once-daily temperature measurement at approximately 4 p. m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	50	--	37	41	48	57	62	67	79	84	78
2	70	58	40	39	45	48	59	63	71	79	82	78
3	74	46	39	40	46	47	58	64	71	81	84	75
4	73	46	39	40	45	47	59	65	73	--	82	78
5	75	44	--	42	45	47	57	62	73	83	79	77
6	75	44	44	42	45	47	54	65	73	83	82	77
7	70	45	49	41	45	47	52	65	72	83	82	76
8	62	45	49	38	45	47	52	64	78	78	79	73
9	60	45	--	41	46	47	53	64	79	78	78	73
10	59	46	--	41	47	48	55	64	79	78	81	75
11	56	46	--	40	46	52	57	65	78	80	80	78
12	59	46	--	42	44	50	55	60	73	82	78	80
13	61	47	--	41	43	50	54	54	74	85	82	82
14	58	52	--	42	43	50	56	54	74	87	80	82
15	60	53	34	39	44	51	55	61	80	85	82	78
16	69	51	--	44	43	48	56	64	83	84	80	75
17	65	50	--	45	43	48	57	62	83	85	82	75
18	66	45	--	44	45	49	58	64	84	85	80	74
19	67	40	--	44	45	48	62	63	84	83	81	72
20	57	38	--	44	45	50	63	61	84	83	79	71
21	58	37	--	43	45	53	65	61	72	87	77	69
22	59	37	--	42	46	54	66	61	69	89	77	--
23	61	41	--	41	47	54	66	63	68	88	77	69
24	62	43	33	39	46	51	68	63	73	85	78	69
25	61	38	37	38	47	55	59	63	81	85	78	69
26	59	38	37	40	47	55	53	63	84	85	80	71
27	58	42	37	42	47	55	57	65	87	87	82	71
28	--	37	38	43	48	55	56	66	88	88	78	71
29	56	37	39	41	48	54	58	66	83	84	81	69
30	56	39	36	40	--	55	61	61	76	83	82	72
31	55	--	38	40	--	56	--	66	--	85	78	--
Average	63	44	--	41	45	51	58	63	77	84	80	72

SUSQUEHANNA RIVER BASIN--Continued

JUNIATA RIVER AT NEWPORT, PA.--Continued

Suspended sediment, water year October 1951 to September 1952

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-----	588	7	11	716	4	88	1,650	16	71
2-----	536	9	13	1,120	25	76	1,430	8	31
3-----	546	5	7	1,660	7	31	1,370	7	26
4-----	610	2	3	1,730	6	28	1,210	8	26
5-----	620	4	7	1,390	8	30	4,050	131	s 1,800
6-----	620	4	7	1,010	10	27	7,460	272	5,480
7-----	599	14	23	2,050	32	s 271	5,670	176	2,690
8-----	834	32	72	2,700	97	707	4,280	68	786
9-----	716	4	8	1,930	25	130	3,650	38	374
10-----	740	2	4	1,630	18	79	3,280	36	319
11-----	704	2	4	1,350	14	51	2,920	27	213
12-----	680	1	2	1,060	6	17	2,610	26	183
13-----	632	1	2	950	6	15	2,450	20	132
14-----	632	1	2	1,010	8	22	2,340	31	196
15-----	568	1	2	1,120	8	24	1,730	35	163
16-----	588	2	3	1,490	14	56	1,060	19	54
17-----	632	2	3	2,200	32	190	2,300	35	a 217
18-----	588	1	2	1,970	26	138	2,000	37	a 200
19-----	588	2	3	1,670	21	95	1,900	25	a 128
20-----	610	1	2	1,330	18	65	1,800	25	a 122
21-----	743	3	6	1,240	18	60	2,300	35	a 217
22-----	792	3	6	1,070	12	35	3,300	38	a 339
23-----	620	2	3	1,140	9	28	4,000	29	a 313
24-----	557	1	2	1,080	8	24	4,400	28	333
25-----	668	2	4	995	7	19	4,200	31	352
26-----	632	2	3	1,550	18	75	4,000	23	248
27-----	632	1	2	2,220	29	174	3,500	17	161
28-----	704	2	4	2,290	29	179	2,800	16	121
29-----	780	1	2	2,180	27	159	2,400	14	91
30-----	728	1	2	1,840	22	109	2,300	18	112
31-----	620	1	2	--	--	--	3,400	33	304
Total--	20,107	--	216	45,701	--	2,922	91,760	--	15,801

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-----	5,200	80	1,120	8,680	37	867	2,750	14	104
2-----	13,000	370	13,000	7,760	27	566	2,750	13	97
3-----	25,600	572	s 38,800	7,020	27	512	2,680	8	58
4-----	26,200	289	s 20,900	12,600	122	s 4,670	2,290	4	25
5-----	17,500	110	s 5,280	17,200	168	7,800	2,820	5	38
6-----	12,200	69	2,270	14,200	53	2,030	2,850	8	62
7-----	8,990	46	1,120	11,200	29	877	3,040	5	41
8-----	6,870	33	612	9,310	17	427	2,920	5	39
9-----	5,740	33	511	8,370	20	452	3,040	8	66
10-----	5,200	31	435	7,310	17	336	2,820	10	76
11-----	4,800	26	337	6,580	10	178	13,600	568	s 27,200
12-----	4,150	22	247	5,880	13	206	51,300	880	s 120,000
13-----	4,020	20	217	5,340	11	159	40,500	308	s 35,600
14-----	3,780	19	194	4,800	8	104	22,000	133	7,900
15-----	4,020	21	228	4,540	6	74	15,200	75	3,080
16-----	5,880	34	540	4,280	3	35	11,600	55	1,720
17-----	7,310	51	1,010	4,020	2	22	9,310	50	1,260
18-----	8,990	85	2,060	4,150	5	56	7,760	38	796
19-----	10,900	102	3,000	4,020	8	87	7,160	33	638
20-----	9,630	74	1,920	3,650	8	79	8,060	34	740
21-----	8,990	43	1,040	3,650	9	89	11,200	72	2,180
22-----	7,460	36	725	3,520	10	95	13,500	75	2,730
23-----	6,580	30	533	3,400	8	73	15,200	107	4,390
24-----	5,880	25	397	3,280	10	89	18,500	175	8,740
25-----	5,200	26	365	3,040	7	57	18,200	75	3,690
26-----	5,820	24	377	2,820	5	38	14,500	38	1,490
27-----	15,300	113	s 5,140	3,040	5	41	11,600	27	846
28-----	28,200	250	s 19,000	2,750	6	45	9,310	20	503
29-----	24,600	126	8,370	2,820	6	46	7,760	16	335
30-----	16,900	101	4,610	--	--	--	6,870	15	278
31-----	11,200	48	1,450	--	--	--	6,300	15	255
Total--	326,110	--	135,808	179,230	--	20,110	347,390	--	224,977

s Computed by subdividing day.

a Computed from estimated concentration graph.

SUSQUEHANNA RIVER BASIN--Continued

JUNIATA RIVER AT NEWPORT, PA.--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

Day	April			May			June		
	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-----	5,740	16	248	11,600	31	971	6,300	22	374
2-----	5,880	22	349	9,310	28	704	5,600	17	257
3-----	6,160	32	532	7,760	27	566	5,060	12	164
4-----	5,740	31	480	6,580	25	444	4,410	13	155
5-----	9,350	75	s 2,580	5,880	20	318	3,890	10	105
6-----	19,600	235	12,400	5,600	20	302	3,640	8	79
7-----	18,900	103	5,260	5,600	24	363	3,120	3	25
8-----	14,800	54	2,160	5,470	17	251	2,830	3	23
9-----	11,600	40	1,250	4,930	18	240	2,280	3	18
10-----	9,310	30	754	4,670	15	189	2,030	2	11
11-----	7,760	31	650	5,400	20	292	2,050	1	6
12-----	7,020	28	531	10,600	90	2,580	2,050	1	6
13-----	6,440	18	313	10,900	62	2,410	2,100	2	11
14-----	7,160	27	522	9,950	62	1,670	1,980	2	11
15-----	10,600	49	1,400	8,370	36	814	1,820	2	10
16-----	13,500	54	1,970	7,460	30	604	1,760	3	14
17-----	13,500	42	1,530	6,440	27	469	1,850	4	20
18-----	11,600	40	1,250	6,160	23	383	1,710	5	23
19-----	9,950	37	994	5,880	20	318	1,520	3	12
20-----	8,370	28	633	6,720	21	381	1,370	3	11
21-----	7,310	23	454	9,310	48	1,210	1,370	3	11
22-----	6,440	20	348	11,600	90	2,820	1,340	3	11
23-----	5,880	22	349	10,600	67	1,920	1,410	3	11
24-----	5,600	23	348	8,680	39	914	1,510	2	8
25-----	8,360	37	835	8,370	30	678	1,670	2	9
26-----	14,500	79	3,090	13,900	107	s 4,270	2,210	2	12
27-----	21,000	90	5,100	16,800	275	12,500	1,780	2	10
28-----	23,900	85	5,490	13,800	94	3,500	1,430	1	4
29-----	19,600	58	3,070	10,900	55	1,620	1,280	1	3
30-----	14,800	36	1,440	8,680	44	1,030	1,410	1	4
31-----	--	--	--	7,310	30	592	--	--	--
Total-	330,370	--	56,330	265,230	--	45,323	72,780	--	1,418

Day	July			August			September		
	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-----	1,160	2	6	842	2	5	2,640	193	s 1,770
2-----	1,650	2	9	829	12	27	7,610	202	4,150
3-----	1,260	1	3	816	12	28	5,470	107	1,580
4-----	1,230	2	7	816	3	7	3,090	27	225
5-----	1,260	1	3	656	1	2	2,440	15	99
6-----	1,180	0	0	644	2	3	1,780	4	19
7-----	1,050	1	3	702	2	4	1,340	2	7
8-----	1,030	0	0	777	4	8	1,030	1	3
9-----	1,320	0	0	816	3	7	971	3	8
10-----	1,390	0	0	1,140	4	12	928	3	8
11-----	1,430	1	4	1,080	4	12	870	2	5
12-----	1,300	0	0	842	3	7	829	5	11
13-----	1,340	0	0	971	3	8	829	2	4
14-----	1,130	1	3	1,000	4	11	803	3	7
15-----	956	1	3	942	5	13	816	1	2
16-----	942	0	0	986	3	8	751	2	4
17-----	971	1	3	1,200	3	10	855	2	5
18-----	1,130	0	0	1,680	6	27	986	2	5
19-----	1,050	1	3	1,430	2	8	1,180	3	10
20-----	956	1	3	1,110	3	9	1,200	7	23
21-----	971	1	3	1,030	3	8	1,050	9	26
22-----	942	2	5	913	3	7	855	7	16
23-----	1,060	1	3	884	4	10	803	3	7
24-----	816	1	2	751	3	6	829	2	4
25-----	702	1	2	702	2	4	777	5	10
26-----	679	0	0	679	3	5	777	5	10
27-----	751	0	0	622	3	5	656	4	7
28-----	738	0	0	644	4	7	656	3	5
29-----	777	1	2	644	3	5	644	4	7
30-----	894	1	2	610	2	3	590	3	5
31-----	790	1	2	702	3	6	--	--	--
Total-	32,845	--	71	27,440	--	280	44,055	--	8,042

Total discharge for year (cfs-days) 1,783,018
Total load for year (tons)..... 511,298

s Computed by subdividing day.

SUSQUEHANNA RIVER BASIN--Continued
JUNIATA RIVER AT NEWPORT, PA.--Continued

Particle-size analyses of suspended sediment, water year October 1951 to September 1952

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Water tem- per- ature (° F)	Suspended sediment										Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Sept. 1, 1952 ...	2:30 p.m.	3.140		193	3,390			60	85	96	100				BWC

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT HARRISBURG, PA.

LOCATION.--At gaging station at Walnut Street Bridge in Harrisburg, Dauphin County.
DRAINAGE AREA.--24,100 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: Composites of daily samples collected from east channel station 1180, October 1944 to September 1946. Cross-section samples, one to three times monthly, October 1944 to September 1949. Monthly cross-section samples November 1950 to September 1952.

Chemical analyses of cross-section samples, water year October 1951 to September 1952

Date	Station	Time	Temperature (°F)	Parts per million					Specific conductance (micro-mhos at 25°C)	pH	Color
				Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Hardness as CaCO ₃			
Oct. 16, 1951	East Channel										
	120	11:00 a.m.	60	1	228	8.0	2.5	227	532	4.6	3
	600	11:00 a.m.	56	15	176	9.0	1.7	178	423	6.3	5
	1180	11:00 a.m.	56	43	115	10	2.1	144	353	7.1	5
	West Channel										
	600	11:00 a.m.	56	81	91	12	1.5	146	365	7.8	8
	1100	11:00 a.m.	56	119	62	15	.9	146	367	7.5	6
	1320	11:00 a.m.	57	149	16	7.0	6.0	124	305	7.7	5
Nov. 14,	East Channel										
	120	12:00 m.	52	2	116	5.0	2.6	113	277	4.9	5
	600	12:00 m.	54	25	60	6.0	2.8	83	201	6.8	4
	1180	12:00 m.	54	38	38	6.5	2.7	75	188	7.1	6
	West Channel										
	600	12:00 m.	48	33	52	6.0	3.0	87	210	7.0	5
	1100	12:00 m.	52	60	54	8.0	3.0	107	247	7.4	8
	1320	12:00 m.	52	111	26	8.0	6.7	130	280	7.5	5
Dec. 14,	East Channel										
	120	11:00 a.m.	35	6	75	2.5	2.9	83	202	6.3	5
	600	11:00 a.m.	--	26	32	4.0	2.7	63	147	6.7	5
	1180	11:00 a.m.	--	19	22	3.5	2.5	55	123	6.7	5
	West Channel										
	600	11:00 a.m.	--	9	28	2.5	1.8	43	110	6.4	3
	1100	11:00 a.m.	--	33	30	3.5	2.8	67	149	6.8	3
	1320	11:00 a.m.	--	104	24	4.5	7.3	117	249	7.4	5
Jan. 14, 1952	East Channel										
	140	11:00 a.m.	38	3	100	3.0	3.7	108	255	5.9	3
	600	11:00 a.m.	37	32	38	3.5	3.8	72	171	6.7	5
	1180	11:00 a.m.	37	12	46	2.0	2.7	52	135	6.7	4
	West Channel										
	600	11:00 a.m.	37	17	34	2.5	3.4	54	135	6.5	3
	1100	11:00 a.m.	38	60	24	3.5	5.0	74	173	6.8	5
	1320	11:00 a.m.	38	126	16	4.5	10	134	278	7.6	5
Feb. 15,	East Channel										
	120	11:00 a.m.	34	13	78	2.5	3.1	96	222	6.6	3
	600	11:00 a.m.	34	28	38	2.5	3.0	66	164	6.7	3
	1180	11:00 a.m.	34	9	35	1.5	2.1	46	121	6.0	2
	West Channel										
	600	11:00 a.m.	34	9	38	2.0	1.7	48	115	6.5	3
	1100	11:00 a.m.	34	52	20	2.5	4.3	70	168	7.2	5
	1320	11:00 a.m.	34	134	18	3.5	10	140	284	7.5	5
Mar. 14,	East Channel										
	140	11:00 a.m.	38	10	32	1.5	4.1	42	109	6.1	30
	600	11:00 a.m.	38	17	24	1.5	4.7	36	951	6.2	60
	1180	11:00 a.m.	39	11	22	2.0	3.9	34	879	6.3	30
	West Channel										
	600	11:00 a.m.	40	10	22	1.5	2.5	34	865	6.3	15
	1100	11:00 a.m.	40	19	22	1.5	5.2	40	102	6.4	15
	1320	11:00 a.m.	40	47	20	2.5	6.8	62	140	6.9	15

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT HARRISBURG, PA.--Continued

Chemical analyses of cross-section samples, water year October 1951 to September 1952--Continued

Date	Station	Time	Temperature (°F)	Parts per million					Specific conductance (micro-mhos at 25°C)	pH	Color
				Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Hardness as CaCO ₃			
Apr. 16, 1952	East Channel										
	120	--	47	13	56	2.0	2.8	69	174	6.2	5
	1180	--	48	19	30	2.0	2.4	48	115	6.3	6
	West Channel										
	600	--	47	14	30	2.0	1.7	40	999.7	6.0	4
	1300	--	48	56	21	3.0	4.6	66	152	7.0	7
May 14.....	East Channel										
	120	11:00 a.m.	53	2	62	4.0	4.0	72	193	-5.5	5
	600	11:00 a.m.	52	15	50	4.0	4.4	60	161	7.3	5
	West Channel										
	600	11:00 a.m.	53	12	29	2.0	3.4	34	96.4	6.3	5
	1100	11:00 a.m.	54	81	19	3.0	6.6	84	189	7.1	5
June 18	East Channel										
	120	11:00 a.m.	77	3	182	4.0	.8	186	423	5.3	5
	600	11:00 a.m.	78	37	97	5.0	1.7	120	290	6.8	7
	West Channel										
	600	11:00 a.m.	77	28	58	3.5	2.1	77	193	6.7	5
	1100	11:00 a.m.	79	46	46	4.0	2.1	79	196	7.1	4
July 15.....	East Channel										
	120	11:00 a.m.	80	2	150	6.0	1.3	148	360	4.8	5
	600	11:00 a.m.	82	29	78	6.0	.9	100	252	6.6	7
	West Channel										
	600	11:00 a.m.	82	44	58	7.0	.8	92	230	7.0	7
	1100	11:00 a.m.	82	43	54	5.0	1.0	86	219	7.0	5
Sept. 16.....	East Channel										
	120	11:00 a.m.	82	74	51	6.0	1.1	100	249	7.3	5
	600	11:00 a.m.	82	136	22	5.5	8.8	130	300	7.6	5
	West Channel										
	600	11:00 a.m.	82	--	--	--	--	--	470	--	--
	1180	11:00 a.m.	68	--	--	--	--	--	364	--	--
	East Channel										
	120	11:00 a.m.	68	--	--	--	--	--	277	--	--
	600	11:00 a.m.	68	--	--	--	--	--	290	--	--
	1320	11:00 a.m.	68	--	--	--	--	--	315	--	--

SUSQUEHANNA RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN SUSQUEHANNA RIVER BASIN IN PENNSYLVANIA
Chemical analyses, in parts per million, water year October 1951 to September 1952

CHEMICAL ANALYSES, IN PARTS PER MILLION, WATER YEAR OCTOBER 1951 TO SEPTEMBER 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃) (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color	
																Total	Non-carbonate					
SUSQUEHANNA RIVER AT TOWANDA																						
Dec. 6, 1951									2.8	41	20	3.0			2.9		55	21		135	6.7	10
LOYALSOCK CREEK AT LOYALSOCK																						
Sept. 30, 1952									1.4	12	9.4	1.9			1.0		20	10		52.1	7.0	2
LYCOMING CREEK NEAR TROUT RUN																						
Sept. 30, 1952									1.9	13	13	2.4			0.7		24	13		65.6	7.1	3
PINE CREEK AT ETNA																						
Apr. 21, 1952			7.4		0.1		25	7.6	20		15	106	10	0.0	122		201	94	81	323	7.0	8
DEER CREEK AT HARMARVILLE																						
Apr. 21, 1952			7.5		0.02		52	16	128		32	409	14	0.1	2.6		670	196	169	997	6.8	5

POTOMAC RIVER BASIN
CRABTREE CREEK NEAR SWANTON, MD.

LOCATION.--Temperature recorder at gaging station 0.9 mile upstream from Middle Fork, 1.0 mile downstream from Springlick Run, and 5.0 miles northeast of Swanton, Garrett County.

DRAINAGE AREA, --16.7 square miles.

RECORDS AVAILABLE, --Water temperatures: February to September 1952.

EXTREMES, 1952.--Water temperatures: Maximum, 79°F July 25; minimum, freezing point on several days during February and March.

REMARKS.--Temperature records from Feb. 21 to June 27 are fair, probably because of friction in recorder. Records of discharge for water year 1951-52 given in Water-Supply Paper 1232.

Temperature ($^{\circ}\text{F}$) of water. February to September 1952

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

POTOMAC RIVER BASIN--Continued
NORTH FORK SHENANDOAH RIVER NEAR STRASBURG, VA.

LOCATION.--At gaging station at bridge on State Highway 55, 1.5 miles southeast of Strasburg, Shenandoah County, 2.2 miles upstream from Cedar Creek, and 0.1 miles upstream from confluence with South Fork.

RECORDS AVAILABLE.--772-Quarterly analyses; April 1929 to March 1930, October 1948 to September 1949, October 1951 to September 1952.

TEMPERATURES.--October 1948 to September 1949. Maximum, 191 ppm Oct. 21-31, 1948; minimum, 108 ppm May 21-31, 1929.

EXTREMES.--1929-30 1948-49--Dissolved solids: Maximum, 86 ppm June 19-30, 1949.

Hardness: Maximum, 174 ppm Sept. 21-30, 1929; minimum, 86 ppm June 19-30, 1949.

Water temperatures (1948-49): Maximum, 86°F July 27-30, 1949; minimum, 34°F Feb. 4-5, 1949.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1232.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 30, 1951	126	7.5	0.06	46	21	2.3	2.3	222	14	6.0	0.1	1.2	223	201	19	375	7.8	8
Nov. 8	163	6.6	.04	49	18	2.9	2.9	216	16	4.9	.0	2.5	216	196	19	357	8.0	5
Dec. 5	200	3.2	.56	46	16	3.8	1.8	188	20	5.1	.1	3.6	204	181	27	332	8.2	6
Jan. 10, 1952	935	6.9	.02	32	8.6	3.0	1.5	113	17	5.0	.1	5.8	139	115	23	231	8.1	11
Mar. 13	3,050	7.2	.06	16	5.6	--	3.6	62	14	1.7	.0	3.7	95	63	12	137	7.8	25
Apr. 10	935	6.4	.10	23	9.5	--	--	101	12	2.8	--	--	--	96	14	187	8.1	4
May 8	1,240	6.9	.08	33	12	--	--	a164	11	2.0	--	--	--	132	0	242	8.5	5
June 10	361	3.2	.00	23	14	24	--	180	10	4.2	--	3.4	--	115	0	309	8.0	2
July 11	750	7.0	.08	27	8.6	1.8	--	106	12	2.7	--	4.3	--	103	16	196	7.6	40
Aug. 7	512	4.0	.10	35	21	5.9	--	b207	9.0	4.0	--	2.3	--	174	4	320	8.5	3
Sept. 11	276	8.4	.02	42	14	4.3	--	186	11	3.6	--	3.4	--	162	10	308	8.0	5

a Includes equivalent of 8 parts per million of carbonate (CO₃).

b Includes equivalent of 10 parts per million of carbonate (CO₃).

POTOMAC RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN POTOMAC RIVER BASIN IN VIRGINIA

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- nesium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)	pH	Color
														Calcium, mg./l.	Non-carbonate, mg./l.			
SOUTH FORK SHENANDOAH RIVER NEAR LURAY																		
Oct. 1-31, 1951		3.1	0.06	40	17	7.0	2.1	187	16	7.5	0.1	0.8	186	170	16	326	8.0	7
Nov. 1-30		2.1	.06	39	16	6.0	2.1	180	14	7.0	.1	.8	179	163	16	314	8.2	6
Dec. 1-31		4.4	.12	31	11	3.9	1.8	130	16	5.5	.2	3.3	152	122	16	241	8.0	5

RAPPAHANNOCK RIVER BASIN

HAZEL RIVER AT RIXEYVILLE, VA.

LOCATION.--At gaging station at bridge on State Highway 229, 0.4 mile upstream from Waterford Run, 1.1 miles northeast of Rixeyville, Culpeper County, and 9.1 miles upstream from mouth.

DRAINAGE AREA.--286 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1946, October 1951 to September 1952.

Water temperatures: October 1951 to September 1952.

Sediment records: October 1951 to September 1952.

EXTREMES, 1951-52.--Water temperatures: Maximum, 82°F July 17; minimum, freezing point Dec. 16, 20, 21, Jan. 5.

Sediment concentrations: Maximum daily, 947 ppm Mar. 11; minimum, daily 1 ppm Oct. 13-19.

Sediment loads: Maximum daily, 12,100 tons Mar. 11; minimum daily, less than 0.50 ton on many days during October, November, and December.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1232.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 23, 1951	43	11	0.08	4.0	1.3	3.1	1.5	22	1.7	2.5	0.0	0.4	38	15	0	45.6	6.7	10
Nov. 5	99	13	.09	4.2	1.5	3.4	1.5	16	4.0	3.1	.1	1.7	42	17	2	49.5	6.9	12
Dec. 20	191	12	.04	3.2	1.2	2.5	.9	13	3.8	2.5	.1	1.5	34	13	2	39.0	7.0	4
Jan. 16, 1952	512	12	.04	3.0	1.2	2.4	.8	12	2.1	1.0	.1	1.7	38	10	1	37.1	7.1	4
Feb. 18	366	12	.03	2.1	2.0	2.9	.8	15	4.4	1.9	.1	2.0	38	14	1	37.1	7.1	5
Mar. 20	1,140	11	.04	3.0	1.3	2.2	1.1	11	4.8	2.2	.1	2.3	36	13	4	35.2	7.3	10
Apr. 1	516	12	.02	2.6	1.3	2.3	.9	13	3.2	1.7	.1	1.2	34	12	1	34.5	7.2	2
May 2	1,020	13	.08	2.9	1.1	--	--	14	4.0	1.6	--	--	12	12	0	34.1	7.5	5
June 4	314	12	.10	3.3	1.8	3.3	3.3	17	2.0	1.6	--	7	--	12	0	36.8	6.9	5
July 25	87	10	.20	4.6	1.5	3.8	3.8	22	3.0	2.5	--	1.4	--	18	0	50.4	7.3	15
Aug. 26	82	12	.10	3.3	1.5	3.4	3.4	20	2.0	2.1	--	1.4	--	14	0	43.6	6.9	5
Sept. 17	89	12	.02	3.8	.8	3.7	3.7	20	1.0	2.0	--	.7	--	13	0	42.3	7.0	4

RAPPAHANNOCK RIVER BASIN--Continued

HAZEL RIVER AT RIXEYVILLE, VA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	54	40	50	42	42	58	60	70	70	73	73
2	68	48	40	50	42	40	60	62	72	65	74	72
3	68	47	41	48	42	38	55	62	72	70	72	70
4	70	45	43	39	43	38	55	64	74	75	74	64
5	76	43	50	32	42	44	56	66	73	80	75	62
6	75	42	47	40	42	42	52	67	76	80	73	60
7	68	50	48	38	44	40	50	66	78	76	72	66
8	65	48	54	34	42	42	46	62	70	74	72	63
9	60	45	56	40	44	36	50	65	77	73	70	60
10	55	48	50	40	42	42	55	64	--	68	70	60
11	58	48	45	40	47	48	58	63	72	68	71	60
12	58	45	42	40	43	42	57	58	70	70	73	62
13	56	47	38	40	43	45	53	60	65	72	73	64
14	56	55	33	48	40	46	54	62	75	73	70	65
15	60	55	35	53	37	43	53	60	74	75	73	71
16	60	60	32	48	38	44	53	63	80	78	75	64
17	60	50	--	42	43	44	60	65	78	82	72	63
18	62	43	--	43	41	45	62	62	75	78	72	64
19	63	40	--	42	44	45	65	58	73	80	73	68
20	60	38	32	47	42	45	67	52	72	78	72	64
21	58	35	32	40	45	58	68	62	70	78	72	63
22	60	36	33	36	--	55	68	65	62	80	72	63
23	62	42	36	36	40	52	70	68	68	80	66	58
24	62	45	40	38	40	50	58	65	68	76	62	60
25	62	40	40	36	43	48	54	62	80	73	62	58
26	57	45	40	42	38	54	52	68	75	--	63	58
27	59	40	35	48	40	52	54	70	78	77	65	60
28	60	36	38	47	42	48	54	70	75	75	70	57
29	56	40	42	36	43	46	55	70	78	80	70	57
30	54	40	40	35	--	50	59	64	77	76	70	60
31	58	--	45	34	--	52	--	63	--	76	74	--
Average	62	45	41	41	42	46	57	63	73	75	71	63

RAPPAHANNOCK RIVER BASIN--Continued

HAZEL RIVER AT RIXEYVILLE, VA.--Continued

Suspended sediment, water year October 1951 to September 1952

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-----	26			131	28	10	79		
2-----	28			152	28	11	77		
3-----	28	2	(t)	212	29	17	74	2	(t)
4-----	27			148	12	5	79	8	2
5-----	27			99	8	2	1,740	472	s 2,680
6-----	24	2	(t)	76	5	1	821	87	112
7-----	25			546	218	s 444	342	25	23
8-----	33			343	62	57	264	15	11
9-----	46			148	13	5	272	16	12
10-----	42	2	(t)	113	6	2	230		
11-----	39			99			193	6	3
12-----	39			90	3	1	176		
13-----	38			87			154		
14-----	38			87			132		
15-----	38	1	(t)	94	3	1	176	6	3
16-----	39			92			172		
17-----	39			84			156	5	a 2
18-----	39	1	(t)	77			186	5	a 3
19-----	39			72	2	(t)	201	5	a 3
20-----	38			71			191	4	2
21-----	37	2	(t)	68			1,030	260	723
22-----	39			74			1,290	275	958
23-----	43			72	2	(t)	875	48	87
24-----	48			74			482	20	26
25-----	57	2	(t)	76			417	13	15
26-----	54			96			374		
27-----	50			110			365		
28-----	47			92	6	2	284		
29-----	46	2	(t)	85			272	7	6
30-----	44			80			255		
31-----	46			--	--	--	284		
Total-	1,201	--	5	3,648	--	574	11,243	--	4,697
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-----	307			466	8	10	276		
2-----	284	10	8	433	7	8	302	4	3
3-----	294			516	36	50	345		
4-----	276	6	4	3,690	562	s 6,100	433		
5-----	563	36	55	1,540	177	736	450	16	19
6-----	621	43	72	1,060	82	235	550		
7-----	603	13	21	864	47	110	354		
8-----	351	9	9	712	29	56	337	7	7
9-----	320	6	5	603			320		
10-----	788	100	213	516			302	11	9
11-----	621	36	60	466	15	21	4,110	947	s 12,100
12-----	550			401			2,170	258	1,510
13-----	466			371			1,340	113	409
14-----	417			342	8	8	1,060	79	226
15-----	371	9	10	315			845	54	123
16-----	331			331	11	10	694	43	81
17-----	299			807	76	166	586	35	55
18-----	312			568	18	28	516	29	40
19-----	276			466			1,300	263	s 1,170
20-----	259	4	3	417	8	9	1,140	104	320
21-----	234			392			921	34	85
22-----	326	42	37	356			788	29	62
23-----	694	62	116	334	4	4	864	39	91
24-----	466			320			788	20	43
25-----	386			302			750	16	32
26-----	389	7	8	279			639	12	21
27-----	401	12	13	279			586	9	14
28-----	639	39	67	264	3	2	731	24	47
29-----	940	91	231	259			621	12	20
30-----	639	21	36	--	--	--	550	7	10
31-----	516	10	14	--	--	--	516	6	8
Total-	13,939	--	1,073	17,669	--	7,655	25,184	--	16,551

s Computed by subdividing day.

t Less than 0.50 ton.

a Computed from estimated concentration graph.

RAPPAHANNOCK RIVER BASIN--Continued

HAZEL RIVER AT RIXEYVILLE, VA.--Continued

Suspended sediment, water year October 1951 to September 1952--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-----	516	8	11	1,220	55	181	486	14	18
2-----	603	16	26	1,020	38	125	397	11	12
3-----	499	9	12	864	28	65	336	7	6
4-----	466	8	10	769	22	46	314	5	4
5-----	807	71	s 201	694	15	28	351	18	17
6-----	883	43	103	883	54	129	283		
7-----	731	15	30	676	20	37	245		
8-----	639	10	17	594	13	21	219	7	5
9-----	568	7	11	562	10	15	210		
10-----	516	6	8	562	11	17	205	6	a 3
11-----	482	6	8	642	29	50	191		
12-----	433	8	9	940	128	325	175	4	2
13-----	433	6	7	642	26	45	167		
14-----	980	327	s 998	562	10	15	154	5	2
15-----	980	130	344	516	9	13	277	219	164
16-----	826	29	65	471	10	13	178	31	15
17-----	750	19	38	441	7	8	156	10	4
18-----	657	12	21	426	5	6	162	18	8
19-----	586	9	14	441	6	7	135	10	4
20-----	550	8	12	547	12	18	117	7	2
21-----	499	7	9	486	7	9	115	6	2
22-----	450	7	9	397	3	3	145	12	5
23-----	433	8	9	354	4	4	769	854	s 2,200
24-----	603	15	24	331	4	4	368	85	84
25-----	1,340	124	s 516	486	15	s 23	272	31	23
26-----	1,720	123	571	532	93	134	196	26	14
27-----	2,270	177	1,060	382	20	21	252	188	s 245
28-----	3,760	263	2,670	331	10	9	282	375	286
29-----	2,170	148	887	322	10	9	160	82	35
30-----	1,580	86	375	562	63	96	162	122	53
31-----	--	--	--	426	19	22	--	--	--
Total-	27,730	--	8,075	18,081	--	1,498	7,479	--	3,322
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-----	294	258	205	60	11	2	1,660	835	s 4,260
2-----	173	68	32	426	512	589	626	69	117
3-----	143	29	11	171	81	37	351	30	28
4-----	131	29	10	96	22	6	245	21	14
5-----	143	62	24	91	13	3	198	14	7
6-----	115	24	7	1,880	397	s 2,380	167	11	5
7-----	108	19	6	426	70	81	156	10	4
8-----	877	506	s 1,030	397	103	110	171	13	6
9-----	594	150	241	412	57	63	150	11	4
10-----	532	220	316	354	52	50	135	8	3
11-----	280	47	36	237	22	14	121		
12-----	207	27	15	187	16	8	110	6	2
13-----	167	22	10	171	16	7	102		
14-----	143	19	7	152	14	6	95		
15-----	123	10	3	141	19	7	93	5	1
16-----	113	11	3	147	35	14	95		
17-----	336	347	315	229	72	45	89	6	1
18-----	171	103	48	141	23	9	89	6	1
19-----	131	22	8	125	12	4	117	15	5
20-----	173	72	34	137	21	8	131	12	4
21-----	113	26	8	117	33	10	98	8	2
22-----	95	18	5	125	10	3	110	13	4
23-----	102	36	10	106			237	50	32
24-----	117	34	11	93			133	14	5
25-----	87	16	4	87	6	1	104		
26-----	77	15	a 3	82			93	6	2
27-----	74			79			87		
28-----	72			79	6	1	84		
29-----	74	11	2	89			82	4	1
30-----	70			91	7	2	84		
31-----	60			87	9	2	--	--	--
Total-	5,695	--	2,412	7,015	--	3,467	6,013	--	4,520
Total discharge for year (cfs-days).....									
Total load for year (tons).....									

s Computed by subdividing day.

a Computed from estimated concentration graph.

RAPPAHANNOCK RIVER BASIN--Continued

HAZEL RIVER AT RIXEYVILLE, VA.--Continued

Particle-size analyses of suspended sediment, December 1951 to September 1952

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Suspended sediment										Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Dec. 5, 1951	1:43 p. m.	1,855	389	312	10	22	42	70	98	100	--	--	ENM	
Feb. 4, 1952	11:52 a. m.	4,240	507	1,530	13	31	48	62	81	93	97	99	100	
Mar. 11	2:12 p. m.	7,030	1,170	3,090	20	36	49	63	83	93	98	100	100	
July 8	12:54 p. m.	883	683	2,010	46	64	82	93	96	97	99	100	100	
Sept. 1	12:00 m.	3,035	1,000	2,560	24	34	50	69	89	95	98	100	100	

RAPPAHANNOCK RIVER BASIN--Continued

RAPPAHANNOCK RIVER AT REMINGTON. VA.

LOCATION: --At gaging station at bridge on U. S. Highway 29 at Remington, Fauquier County, 0.3 mile upstream from Tinpot Run, 0.4 mile downstream from Ruffans Run, 2.5 miles downstream from Hazel River, and at mile 35.2 DRAINAGE AREA. --616 square miles.

DRAINAGE AREA: --616 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952.

Water temperatures: May 1951 to September 1952.

Sediment Records: April 1931 to September 1932.

EXAMINES, 1001-52: --DISSOLVED SOLIDS. Maximum, 39 ppm July 1-10; minimum, 39 ppm Feb. 21-29.
Hardness: Maximum, 22 ppm Oct. 11-20. Aug. 21-31: minimum, 16 ppm Feb. 1-29. Mar. 11-31. Apr. 1-20. May 1-10.

Specific conductance: Maximum daily, 76.3 micromhos Aug. 26; minimum daily, 42.4 micromhos May 2.

Water temperatures: Maximum, 81°F July 23; minimum, freezing point on many days during November to February.

Sediment concentrations: Maximum daily, 1,080 ppm Feb. 4; minimum daily, less than 0.50 ton on many days in October and November.

EXTREMES. May 1951 to September 1952. --Water temperatures: Maximum. 81°F July 23, 1952; minimum. freezing point. Sediment loads: Maximum daily, 10,500 tons Feb. 4; minimum daily, less than 0.50 ton on many days all October.

Sediment concentrations (April 1951 to September 1952): Maximum daily, 1,240 ppm June 10, 1951; minimum daily

December, 1951.

Sediment loads (April 1951 to September 1952): Maximum daily, 23,400 tons June 10, 1951; minimum daily, less than 100 tons October and December 1951

REMARKS.--Records of specific conductance of daily samples available in district office at Charlottesville, Va.

1951 to September 1952 given in Water-Supply Paper 1232.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)	pH	Color
														Calcium, mg./mesum	Non-carbonate, mg./mesum			
Oct. 1-10, 1951.....	51.2	9.4	0.05	5.4	1.7	3.6	1.9	33	1.8	1.5	0.1	0.1	43	20	0	62.2	7.2	5
Oct. 11-20.....	69.2	10	.07	5.7	1.8	3.5	2.0	31	2.2	2.8	.1	.1	45	22	0	62.2	7.1	6
Oct. 21-30.....	81.6	10	.08	5.4	1.7	3.5	2.0	31	2.2	2.9	.1	.1	45	20	0	62.2	7.0	5
Nov. 1-10.....	350	11	.06	5.0	1.4	3.1	2.7	20	5.4	3.4	1.4	1.4	47	18	2	59.5	7.1	6
Nov. 11-20.....	149	13	.07	5.1	1.6	149	1.7	24	3.6	3.0	1.7	.7	46	19	0	57.6	7.3	6
Nov. 21-30.....	152	13	.11	5.0	1.7	3.1	1.4	23	3.1	2.8	.1	.8	45	20	1	55.1	7.2	6
Dec. 1-10.....	655	12	.14	4.6	1.4	3.0	1.5	18	4.7	3.0	.1	1.5	46	17	2	54.0	6.8	6
Dec. 11-20.....	319	13	.11	4.7	1.6	3.0	1.1	19	4.4	3.0	.1	1.7	45	18	3	53.0	6.9	6
Dec. 21-31.....	1,089	11	.21	4.3	1.5	2.6	1.2	14	5.8	3.0	.1	3.2	46	17	5	51.0	7.0	9
Jan. 1-10, 1952.....	944	12	.19	4.7	1.6	2.8	1.1	16	5.8	2.9	.1	2.7	46	18	5	52.9	7.2	7
Jan. 11-20.....	864	13	.04	4.6	1.4	3.4	.9	15	6.1	3.1	.0	2.5	45	17	4	51.4	7.4	5
Jan. 21-31.....	1,098	12	.04	4.2	1.6	3.4	.9	16	5.8	2.9	.0	2.2	43	17	5	51.1	7.3	7
Feb. 1-10.....	1,964	12	.05	3.9	1.5	3.5	.9	15	6.3	2.9	.0	2.7	44	16	4	47.1	7.1	13
Feb. 11-20.....	1,201	12	.03	4.2	1.4	3.5	.8	15	5.8	2.4	.0	2.8	45	16	4	47.5	7.5	9
Feb. 21-29.....	634	12	.03	4.3	1.4	3.1	.7	17	5.5	2.6	.0	2.3	39	16	3	46.4	7.5	5

RAPPAHANNOCK RIVER BASIN--Continued
 RAPPAHANNOCK RIVER AT REMINGTON, VA.--Continued

Chemical analyses, in parts per million, water year October 1951 to September 1952--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Mar. 1-10, 1952	756	12	0.04	4.4	1.5	3.3	0.8	16	5.0	2.8	0.0	2.2	40	17	4	48.7	7.3	8
Mar. 11-20	2,470	11	.06	3.9	1.5	2.9	.8	13	6.2	2.5	.0	2.7	43	16	5	45.8	7.4	14
Mar. 21-31	1,380	12	.03	4.1	1.4	2.0	.8	15	6.3	2.5	.0	2.1	41	16	4	46.9	7.0	9
Apr. 1-10	1,152	12	.03	4.6	1.0	3.2	.8	17	5.3	2.4	.0	1.7	40	16	2	45.8	7.5	9
Apr. 11-20	1,236	12	.03	4.7	1.0	3.4	.8	17	5.0	2.8	.0	1.5	41	16	2	44.8	7.6	9
Apr. 21-30	3,352	11	.04	3.3	2.3	2.5	1.1	16	5.1	1.9	.1	1.9	42	18	5	47.4	8.6	2
May 1-10	1,506	13	.04	3.8	1.6	2.6	1.0	16	4.1	2.1	.3	2.1	41	16	3	45.3	8.7	2
May 11-20	1,176	13	.18	4.0	1.9	2.7	1.0	19	3.5	2.0	.3	1.5	44	18	2	46.6	8.7	2
May 21-31	882	13	.29	4.1	1.8	2.7	1.2	20	4.3	2.1	.2	1.7	44	18	1	49.2	8.6	2
June 1-10	597	14	.03	3.9	1.9	2.9	1.1	22	3.5	2.1	.2	1.6	44	18	0	50.3	8.8	2
June 11-20	355	13	.03	4.5	2.0	3.0	1.3	23	2.6	2.0	.2	1.7	44	19	1	52.6	8.8	2
June 21-30	509	13	.10	4.8	1.7	3.0	1.7	23	5.4	2.2	.0	2.1	50	19	0	51.8	8.9	22
July 1-10	510	13	.10	4.9	1.8	3.1	1.7	24	3.0	2.1	.0	2.0	51	20	0	55.4	7.0	31
July 11-20	354	12	.05	5.2	1.4	3.1	1.9	25	4.7	2.2	.0	1.2	49	19	0	54.4	6.9	24
July 21-31	183	9.8	.05	5.0	2.1	3.3	1.9	28	3.5	2.2	.0	1.0	44	21	0	58.4	7.0	8
Aug. 1-10	591	9.0	.05	4.2	1.9	3.0	2.1	23	4.5	2.0	.0	1.4	44	18	0	52.4	6.9	20
Aug. 11-20	322	12	.10	5.2	1.6	3.2	1.9	25	5.4	2.5	.0	1.4	50	20	0	56.3	7.0	20
Aug. 21-31	175	9.5	.40	5.0	2.3	3.2	1.7	29	4.9	2.4	.0	1.9	50	20	0	55.8	7.0	38
Sept. 1-10	674	12	.10	4.5	1.4	2.9	1.9	23	4.3	2.1	.0	1.5	48	17	0	50.8	6.9	20
Sept. 11-20	181	11	.10	4.8	1.6	3.3	1.5	27	2.1	2.3	.0	.7	42	19	0	52.7	7.1	5
Sept. 21-30	201	11	.10	4.2	1.9	3.2	1.9	26	3.9	2.6	.0	.8	44	18	0	53.9	7.1	7
Average	774	12	0.09	4.6	1.6	3.1	1.4	21	4.4	2.5	0.1	1.6	45	18	2	52.2	--	10

RAPPAHANNOCK RIVER BASIN--Continued

RAPPAHANNOCK RIVER AT REMINGTON, VA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	57	50	32	44	32	38	51	58	64	69	78	74
2	59	47	32	46	37	36	56	57	62	67	74	72
3	62	42	34	45	40	37	53	57	63	69	72	71
4	65	39	40	39	43	37	51	58	67	73	74	65
5	65	37	48	36	44	39	55	60	68	73	75	63
6	68	34	50	36	40	38	52	61	69	73	72	63
7	66	43	49	32	39	36	47	60	73	76	73	67
8	60	43	55	32	36	36	45	60	70	74	72	65
9	53	38	54	35	39	38	44	59	71	73	71	63
10	50	38	49	36	39	36	46	61	72	69	71	59
11	52	39	42	35	41	46	52	60	68	68	72	60
12	49	39	40	36	38	45	53	57	66	70	73	63
13	49	42	34	35	38	44	52	55	63	71	73	64
14	51	50	32	39	40	44	52	54	65	71	71	64
15	54	52	32	43	39	41	54	59	72	73	73	71
16	55	54	32	44	36	39	48	60	72	76	75	66
17	54	49	32	41	37	39	51	59	76	76	71	63
18	58	40	32	42	40	40	53	62	74	77	71	65
19	60	35	32	40	38	43	56	59	73	78	72	69
20	57	32	32	41	39	45	58	56	72	77	72	64
21	54	32	34	38	39	48	61	56	70	78	72	63
22	58	32	33	37	39	53	61	59	67	80	72	60
23	58	35	33	36	37	51	64	61	68	81	66	59
24	61	42	32	34	39	51	60	64	67	78	62	57
25	55	37	34	33	40	46	52	63	70	77	61	56
26	48	38	36	38	37	46	51	65	75	72	62	56
27	50	33	34	45	36	48	52	63	77	76	65	62
28	56	32	32	47	36	43	54	62	76	76	69	57
29	50	32	32	37	37	45	55	66	77	78	69	59
30	51	32	37	32	--	43	55	62	76	76	71	56
31	54	--	40	32	--	46	--	61	--	76	73	--
Average	56	40	37	38	39	42	53	60	70	74	71	63

RAPPAHANNOCK RIVER BASIN--Continued

RAPPAHANNOCK RIVER AT REMINGTON, VA.--Continued

Suspended sediment, water year October 1951 to September 1952

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-----	43			129	19	7	150		
2-----	46			378	85	87	147		
3-----	48	2	(t)	309	22	18	144		
4-----	44			378	32	33	147		
5-----	46			190	6	3	2,430	869	5,700
6-----	46			132	12	4	1,280	228	788
7-----	44	2	(t)	475	49	63	680	53	97
8-----	55			905	196	479	514	31	43
9-----	68			378	23	23	556	29	44
10-----	72			221			502	21	28
11-----	72			185	4	2	397		
12-----	68	1	(t)	157			353		
13-----	68			150			310	8	8
14-----	68			157	4	2	264		
15-----	68			157			326		
16-----	68			160			331	6	5
17-----	72	2	(t)	147			251		
18-----	72			132			291		
19-----	70			123	2	1	370		
20-----	66			120			296	4	3
21-----	68			115			2,010	432	s 3,190
22-----	68	2	(t)	124	3	1	2,920	539	s 4,810
23-----	72			134			1,340	118	427
24-----	81			131			995	41	110
25-----	93	2	(t)	134	2	1	855	29	67
26-----	99			166			771	25	52
27-----	90			214			785	21	44
28-----	81			190	3	1	586		
29-----	77			162			574		
30-----	81	2	(t)	150			538		
31-----	88			--	--	--	604	13	20
Total-	2,102	--	10	6,503	--	745	21,717	--	15,542
Day	January			February			March		
	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-----	722			925	19	47	550		
2-----	666	28	50	890	19	46	592		
3-----	631			890	42	101	708	8	13
4-----	624			6,480	1,080	18,900	960	16	41
5-----	1,340	143	517	3,340	458	4,130	1,030	19	53
6-----	1,450	95	372	2,010	193	1,050	890	13	31
7-----	995	39	105	1,590	74	318	799		
8-----	799	17	37	1,310	55	195	715	7	14
9-----	694	14	26	1,170	38	120	666		
10-----	1,520	160	a 657	1,030	35	97	645		
11-----	1,800	187	909	925	29	72	4,480	745	s 14,000
12-----	1,240	53	177	827	16	36	5,720	541	8,360
13-----	995	26	70	764	13	27	2,500	210	1,420
14-----	855			708	12	23	2,010	138	749
15-----	757			652	10	18	1,520	54	222
16-----	680	17	33	680	12	22	1,310	40	141
17-----	598			1,520	131	a 538	1,170	28	88
18-----	624			1,200	50	162	1,060	21	60
19-----	574			960	19	49	2,430	331	s 2,840
20-----	520	8	12	862	14	33	2,500	190	1,280
21-----	472			813	13	29	1,730	71	332
22-----	630	15	26	736			1,450	47	184
23-----	1,450	103	403	680	8	14	1,590	47	202
24-----	960	36	93	652			1,560	67	282
25-----	792	19	41	617			1,480	36	144
26-----	771	16	33	580			1,280	32	111
27-----	960	32	83	562	6	9	1,170	24	76
28-----	1,560	109	459	544			1,480	40	160
29-----	2,150	161	935	526			1,280	24	83
30-----	1,340	50	181	--	--	--	1,140	15	46
31-----	995	21	56	--	--	--	1,030	13	36
Total-	30,164	--	5,560	34,443	--	26,105	47,445	--	31,031

s Computed by subdividing day.

t Less than 0.50 ton.

a Computed from estimated concentration graph.

RAPPAHANNOCK RIVER BASIN--Continued

RAPPAHANNOCK RIVER AT REMINGTON, VA.--Continued

Suspended sediment, water year October 1951 to September 1952--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-----	995	14	38	2,500	78	526	1,030	28	78
2-----	1,240	33	110	2,010	54	293	813	16	35
3-----	1,060	23	66	1,660	50	224	659	13	23
4-----	960	13	34	1,450	37	145	592	10	16
5-----	1,240	57	s 244	1,340	32	116	604	11	18
6-----	1,590	109	468	1,590	41	176	538	19	28
7-----	1,280	38	131	1,310	38	134	478	10	13
8-----	1,140	14	43	1,140	22	68	430		
9-----	1,060	12	34	1,030	20	56	414		
10-----	960	10	26	1,030	19	53	408	10	11
11-----	925	10	25	1,340	38	137	386		
12-----	848	8	18	2,500	210	s 1,520	353		
13-----	827	6	13	1,380	56	209	342	7	6
14-----	1,760	151	s 908	1,140	25	77	331		
15-----	1,870	183	924	995	18	48	478	22	28
16-----	1,520	50	205	925	15	37	402	20	22
17-----	1,340	29	105	862	14	33	336	13	12
18-----	1,170	26	82	820	13	29	358	22	21
19-----	1,100	18	53	799	12	26	301	13	11
20-----	995	15	40	995	21	56	264	8	6
21-----	925	14	35	960	16	41	247	6	4
22-----	848	12	27	757	11	22	296	10	8
23-----	799	12	26	659	7	12	1,280	764	s 3,120
24-----	1,030	25	70	610	7	12	750	191	387
25-----	2,500	191	1,290	925	117	292	496	37	50
26-----	4,620	265	3,310	1,480	657	s 2,790	380	21	22
27-----	5,100	252	3,470	876	89	210	397	123	s 197
28-----	8,490	376	8,620	680	23	42	538	440	639
29-----	5,800	146	2,290	694	29	54	310	81	68
30-----	3,410	109	1,000	1,170	143	452	397	270	289
31-----	--	--	--	890	40	96	--	--	--
Total-	57,402	--	23,705	36,517	--	7,986	14,608	--	5,157
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-----	586	334	528	131	11	4	2,780	742	s 6,690
2-----	397	106	114	396	51	55	1,420	201	771
3-----	291	36	28	375	88	89	580	37	58
4-----	282	58	44	198	30	16	386	19	20
5-----	310	109	91	178	17	8	310	15	13
6-----	251	53	36	1,910	804	s 6,280	268	12	9
7-----	230	26	16	792	233	498	247	8	5
8-----	658	310	s 733	514	106	147	272	11	8
9-----	960	223	578	820	201	445	251	7	5
10-----	1,140	471	s 1,550	598	76	123	226		
11-----	610	161	265	490	43	57	210		
12-----	331	35	31	348	37	35	190	6	3
13-----	315	21	18	296	23	18	178		
14-----	272	15	11	272	19	14	162		
15-----	247	11	7	238	16	10	154		
16-----	230	15	9	320	31	27	158	4	2
17-----	574	498	772	436	48	a 56	158		
18-----	397	95	102	301	35	28	147		
19-----	272	32	24	238	22	14	206	6	3
20-----	296	38	30	277	26	19	251		
21-----	259	36	25	234			198		
22-----	210	13	7	238	20	12	190	4	2
23-----	186	12	6	222			375	31	31
24-----	238	20	13	178	7	3	264	12	9
25-----	190	14	7	158			202		
26-----	162			150			178	4	2
27-----	158	8	3	144			162		
28-----	154			137	6	2	150		
29-----	150			147			147	2	1
30-----	170	23	11	158			147		
31-----	134	13	5	158	8	3	--	--	--
Total-	10,660	--	5,073	11,052	--	7,999	10,567	--	7,661

Total discharge for year (cfs-days) 283,180

Total load for year (tons) 136,574

s Computed by subdividing day.

a Computed from estimated concentration graph.

RAPPAHANNOCK RIVER BASIN--Continued
RAPPAHANNOCK RIVER AT REMINGTON, VA.--Continued

Particle-size analyses of suspended sediment, December 1951 to March 1952
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Suspended sediment										Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Dec. 5, 1951.....	3:34 p. m.	4,200	892	682	11	20	38	74	94	99	100			BNM
Dec. 22.....	2:10 p. m.	2,430	249	156	10	30	51	76	95	100	--			BWM
Feb. 4, 1952.....	2:16 p. m.	8,490	815	2,560	17	34	51	66	87	96	99		100	BWMC
Mar. 11.....	4:48 p. m.	7,500	1,270	1,870	20	36	51	68	90	98	100			BWMC

RAPPAHANNOCK RIVER BASIN--Continued

RAPIDAN RIVER NEAR CULPEPER, VA.

LOCATION.--At bridge on U.S. Highway 522, 0.7 mile downstream from gaging station, and 8 miles south of Culpeper, Culpeper County.

DRAINAGE AREA.--465 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1946, October 1951 to September 1952.

Water temperatures: October 1945 to September 1946, May 1951 to September 1952.

Sediment records: April 1951 to September 1952.

EXTREMES, 1951-52.--Water temperatures: Maximum, 89°F July 22; minimum, freezing point on several days during November to February.

Sediment concentrations: Maximum daily, 1,220 ppm June 23; minimum daily, 2 ppm on many days during October, November, and December.

Sediment loads: Maximum daily, 12,200 tons Feb. 4; minimum daily, less than 0.50 ton on many days during October.

EXTREMES, 1945-46.--Dissolved solids: Maximum, 47 ppm Sept. 21-30; minimum, 34 ppm Mar. 1-10.

Hardness: Maximum, 19 ppm July 21-31, Sept. 11-20; minimum, 13 ppm Jan. 11-20.

Water temperatures (1945-46, May 1951 to September 1952): Maximum, 91°F Aug. 9, 1951; minimum, freezing point on several days during winter months.

Sediment concentrations (April 1951 to September 1952): Maximum daily, 1,220 ppm June 23, 1952; minimum daily, 2 ppm on many days.

Sediment loads (April 1951 to September 1952): Maximum daily, 16,500 tons June 10, 1951; minimum daily, less than 0.50 ton on many days.

REMARKS.--Records of discharge for water year October 1951 to September 1952.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 5, 1951.....	60	13	0.05	4.3	1.4	4.6		25	1.7	2.5	0.1	0.6	40	16	0	50.0	7.0	5
Nov. 5.....	196	12	.37	4.5	1.7	3.4		16	5.5	3.8	.2	1.3	50	18	5	52.8	7.0	35
Dec. 20.....	410	13	.12	4.2	1.3	2.7	0.9	17	4.1	2.8	.1	1.4	40	16	2	45.0	7.2	9
Jan. 18, 1952.....	635	12	.04	4.0	1.5	2.6	.8	16	4.1	2.4	.0	1.8	40	16	3	44.9	7.3	8
Feb. 18.....	948	12	.06	4.0	1.5	2.2	.9	12	4.3	3.1	.2	2.1	43	16	6	41.1	7.3	28
Mar. 20.....	1,780	11	.08	3.5	2.0	2.3	1.1	13	6.8	2.1	.0	2.1	42	17	6	40.7	7.2	40
Apr. 1.....	752	12	.01	3.8	1.5	2.5	.9	16	3.2	2.1	.0	1.5	38	16	3	40.6	7.3	5
May 2.....	1,280	11	.08	3.4	1.2	--	--	13	4.0	1.6	--	--	--	13	3	38.4	7.3	5
June 4.....	460	13	.20	3.3	1.6	2.6		19	2.0	1.9	--	1.1	--	16	0	44.0	7.1	4
July 23.....	233	11	.10	4.2	1.0	3.7		22	1.0	1.9	--	1.0	--	13	0	43.2	7.3	4
Aug. 26.....	163	14	.10	4.2	1.2	3.4		21	2.0	1.9	--	.9	--	13	0	44.7	7.1	10
Sept. 17.....	181	12	.10	4.2	.8	3.2		20	1.0	1.8	--	.8	--	14	0	42.6	6.9	5

NORTH ATLANTIC SLOPE BASINS

RAPPAHANNOCK RIVER BASIN--Continued

RAPIDAN RIVER NEAR CULPEPER, VA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	67	55	32	48	32	40	59	68	61	73	80	75
2	69	50	40	49	--	38	58	62	70	75	79	80
3	70	45	--	--	32	38	58	63	71	79	--	72
4	70	40	40	40	42	39	55	65	72	75	--	72
5	75	41	40	38	41	40	55	65	75	76	80	70
6	75	41	51	39	40	40	50	68	80	71	79	71
7	65	40	50	35	--	40	45	68	79	--	80	74
8	60	42	50	32	45	40	48	67	74	74	75	70
9	61	40	55	37	45	40	50	65	80	71	75	70
10	60	40	50	40	45	43	55	65	78	71	72	--
11	55	40	45	38	42	45	56	60	75	75	81	72
12	52	40	38	38	41	41	58	60	72	75	80	74
13	50	45	40	--	40	48	50	60	75	80	80	76
14	70	50	32	45	34	48	55	62	75	80	80	78
15	50	50	32	42	--	45	55	65	78	83	80	--
16	55	51	33	42	36	42	49	65	81	82	75	75
17	55	--	32	40	40	42	60	65	79	83	79	72
18	60	40	--	44	40	45	62	60	81	84	79	73
19	60	--	--	40	42	42	65	60	82	81	80	70
20	55	35	32	42	42	45	68	58	75	85	72	70
21	58	32	38	38	40	60	70	65	71	87	76	70
22	60	35	38	40	39	56	70	66	69	89	81	63
23	60	45	36	32	41	53	68	70	70	85	75	60
24	60	46	36	35	40	50	59	55	75	80	75	61
25	55	37	38	--	38	45	52	65	82	82	73	67
26	50	40	39	40	40	51	51	70	85	81	75	69
27	53	40	40	45	40	51	53	73	81	84	73	--
28	60	35	32	48	45	51	55	--	85	86	75	68
29	51	35	37	40	39	49	58	69	80	84	72	64
30	50	32	40	32	--	50	68	63	80	82	70	70
31	54	--	--	32	--	53	--	64	--	81	70	--
Average	60	42	39	40	40	45	57	64	76	80	77	71

RAPPAHANNOCK RIVER BASIN

121

RAPPAHANNOCK RIVER BASIN--Continued

RAPIDAN RIVER NEAR CULPEPER, VA.--Continued

Suspended sediment, water year October 1951 to September 1952

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-----	60			196	14	7	143		
2-----	83			289	34	27	129		
3-----	54	2	(t)	518	58	81	143	2	1
4-----	84			322	34	30	143		
5-----	60			196	13	7	1,610	633	s 4,020
6-----	37			156	11	5	895	115	278
7-----	66	4	1	580	102	160	578	29	45
8-----	69			597	84	135	460	15	19
9-----	98			308	25	21	410	11	12
10-----	76			232	10	6	368	7	7
11-----	74	2	(t)	188			318	6	5
12-----	76			181			298		
13-----	78			166	6	3	276		
14-----	45			186			249		
15-----	78	2	(t)	177			332	4	3
16-----	95			184			363		
17-----	74			170	4	a 2	258		
18-----	76			153			332	6	a 5
19-----	72	2	(t)	156			448	11	a 13
20-----	69			140	3	1	410	14	15
21-----	51			134			3,900	487	s 5,670
22-----	84	2	(t)	126			2,970	282	2,260
23-----	107			143	2	1	1,220	77	254
24-----	76			137			932	45	113
25-----	102	3	1	132			779	20	42
26-----	105			177			706		
27-----	95			188			648		
28-----	57			166	3	1	548	14	22
29-----	93	2	(t)	153			506		
30-----	105			153			489		
31-----	90			--	--	--	489	12	a 16
Total--	2,389	--	18	6,584	--	512	21,350	--	12,908
Day	January			February			March		
	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-----	466			872	19	45	489		8
2-----	438			800	20	a 43	518		
3-----	713	10	16	858	42	97	661	6	25
4-----	706			5,480	778	s 12,200	835	14	
5-----	1,100	85	s 281	2,220	171	1,020	758	29	62
6-----	962	61	158	1,560	95	400	648		
7-----	713	22	42	1,260	50	170	591		
8-----	591	12	19	1,060	38	109	548	9	14
9-----	530	7	10	940	36	91	530		
10-----	1,140	88	271	628	21	47	518		
11-----	1,100	91	270	765	16	33	3,750	625	s 8,970
12-----	828	29	65	687	14	26	3,460	250	2,340
13-----	720	12	a 23	635	10	17	1,740	110	517
14-----	654			604	10	16	1,340	85	308
15-----	610			566	11	a 17	1,060	59	169
16-----	572	12	19	610	20	33	902	40	97
17-----	530			1,380	119	443	786	30	64
18-----	635			948	34	87	706	36	69
19-----	536			772			2,230	358	2,160
20-----	495	9	12	700	12	23	1,780	183	879
21-----	466			661			1,300	65	228
22-----	730	47	93	610			1,100	30	89
23-----	1,380	153	s 599	572	5	8	1,300	52	183
24-----	850	43	99	548			1,340	52	188
25-----	700	28	a 53	536			1,470	106	421
26-----	706	29	55	500			1,140	54	166
27-----	821	21	47	483			970	29	76
28-----	1,650	195	s 1,260	477	4	5	1,060	33	94
29-----	2,410	335	2,180	460			918	26	64
30-----	1,260	68	231	--	--	--	835	14	32
31-----	985	28	74	--	--	--	772	15	31
Total--	25,997	--	6,025	28,392	--	15,015	36,055	--	17,380

s Computed by subdividing day.

t Less than 0.50 ton.

a Computed from estimated concentration graph.

RAPPAHANNOCK RIVER BASIN--Continued

RAPIDAN RIVER NEAR CULPEPER, VA.--Continued

Suspended sediment, water year October 1951 to September 1952--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-----	752	15	30	1,470	50	198	758	48	98
2-----	955	24	62	1,260	35	119	591	43	69
3-----	842	26	59	1,060	28	80	506	27	37
4-----	765	16	33	948	23	59	460	17	21
5-----	1,140	71	219	872	25	59	466	8	10
6-----	1,300	147	516	1,020	35	96	426	13	15
7-----	1,060	50	143	835	24	54	383	12	12
8-----	940	20	51	732	11	22	357	12	12
9-----	850	14	32	700	15	28	342	11	10
10-----	779	12	25	821	23	51	332	12	11
11-----	726	9	18	1,380	88	328	378	42	43
12-----	674	8	15	2,270	330	2,020	313	34	29
13-----	668	6	11	1,100	61	181	289	19	15
14-----	902	27	66	910	29	71	271	15	11
15-----	962	47	122	793	20	43	303	11	9
16-----	865	27	63	713	17	33	294	16	13
17-----	807	14	30	654	12	21	262	12	8
18-----	746	11	22	629	15	25	363	14	14
19-----	706	9	17	604	15	24	258	32	22
20-----	661	8	14	654	14	25	219	18	11
21-----	629	6	10	648	13	23	215	8	5
22-----	591	7	11	542	10	15	236	8	5
23-----	566	4	6	500	8	11	1,500	1,220	s 5,850
24-----	858	24	56	471	11	14	700	332	627
25-----	2,120	151	544	654	28	49	489	39	51
26-----	2,590	151	1,060	786	144	306	383	23	24
27-----	2,750	109	809	536	65	94	337	20	18
28-----	4,120	273	s 3,200	471	17	22	383	150	155
29-----	2,410	114	742	500	20	27	289	36	28
30-----	1,780	68	327	1,220	616	s 2,240	872	559	1,320
31-----	--	--	--	687	124	230	--	--	--
Total--	35,514	--	8,633	26,440	--	6,568	12,975	--	8,553
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-----	1,020	900	s 2,670	196	12	6	2,270	832	s 6,230
2-----	477	196	252	345	38	s 46	1,140	178	548
3-----	373	63	63	394	39	41	694	45	84
4-----	718	211	409	253	29	20	500	25	34
5-----	1,480	1,110	4,440	258	22	15	416	11	12
6-----	578	243	379	276	24	18	363	10	8
7-----	443	90	a 108	416	25	28	327		
8-----	1,660	743	s 5,000	410	36	40	327		
9-----	2,220	472	2,830	495	41	55	289		
10-----	1,830	374	1,850	410	32	35	271	6	a 3
11-----	1,060	78	223	342	17	16	245		
12-----	793	52	111	271	12	9	228		
13-----	635	34	58	253	14	10	211		
14-----	548	26	38	249	12	8	184	6	3
15-----	483	21	27	211	9	5	196		
16-----	432	20	23	327	67	59	184		
17-----	410	17	19	635	249	427	181		
18-----	410	11	11	332	113	101	186	6	3
19-----	357			245	37	24	196		
20-----	332			271	20	15	271		
21-----	313			232	24	15	207	6	a 3
22-----	271	6	5	240			207		
23-----	262			228			368		
24-----	298			181			271		
25-----	253	6	4	177	10	5	203	3	1
26-----	219			163	8	4	188		
27-----	203			153	6	3	170		
28-----	224			150			160		
29-----	196	12	10	163			173		
30-----	294			163			163		
31-----	224			166	6	3	--	--	--
Total--	19,016	--	18,589	8,605	--	1,055	10,769	--	7,019
Total discharge for year (cfs-days).....									234,086
Total load for year (tons).....									102,275

s Computed by subdividing day.

a Computed from estimated concentration graph.

RAPPAHANNOCK RIVER BASIN--Continued

RAPIDAN RIVER NEAR CULPEPER, VA.--Continued

Particle-size analyses of suspended sediment, December 1951 to September 1952
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Suspended sediment										Methods of analysis			
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Dec. 5, 1951.....	11:13 a. m.	3,110	1,520	1,100		15	23	35	64	92	98	100				BN
Dec. 5.....	5:30 p. m.	1,970	745	559		25	48	68	87	98	100					BW
Dec. 22.....	10:43 a. m.	2,670	315	276		7	20	44	56	88	98	100				BNM
Dec. 22.....	10:45 a. m.	2,670	315	216		--	28	40	58	89	97	100				BWM
Feb. 4, 1952.....	5:06 p. m.	5,930	416	1,090		22	35	48	59	76	96	100				BWMC
Mar. 11.....	11:12 a. m.	3,900	736	2,340		19	32	41	55	76	95	100				BWMC
Apr. 25.....	3:06 p. m.	2,500	200	1,550		24	36	50	65	82	95	100				BWMC
June 23.....	11:00 a. m.	2,320	2,040	1,460		52	68	84	92	97	99	100				BWMC
Sept. 1.....	5:01 p. m.	3,390	1,020	3,910		17	29	40	52	85	97	100				BNM
Sept. 1.....	5:00 p. m.	3,390	1,020	3,810		23	35	51	70	89	97	99		100		BWMC

YORK RIVER BASIN

HUDSON CREEK NEAR BOSWELLS TAVERN, VA.

LOCATION.--At gaging station at bridge on U. S. Highway 15, 2.7 miles south of Boswells Tavern, Louisa County, 4.8 miles north of Zion Crossroads, 5 miles upstream from mouth, and 10 miles west of Louisa.

DRAINAGE AREA.--4.1 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952.

Sediment records: Periodic determinations of suspended sediment discharge, September 1951 to September 1952.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1232.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 8, 1951	1.0	19	0.11	4.2	2.6	3.7	1.9	30	2.3	2.1	0.2	0.7	53	21	0	57.1	6.8	25
Nov. 1	7.2	10	.05	2.4	1.4	2.6	2.5	14	4.6	2.4	.2	1.0	40	12	0	39.6	6.7	25
Dec. 20	11	14	.16	3.6	1.3	3.1	.9	17	4.9	2.5	.1	.1	43	14	0	42.6	7.3	28
Jan. 18, 1952	9.0	12	.08	2.9	1.2	2.7	.9	12	4.0	2.4	.3	.2	45	12	2	38.0	7.0	42
Feb. 26	3.8	15	.10	2.0	1.1	5.5	5.5	16	5.4	1.7	.1	.1	42	10	0	34.7	7.2	10
Mar. 19	51	6.9	.07	1.4	2.1	1.8	1.3	11	5.2	1.5	.0	.4	26	12	3	28.5	7.1	45
Apr. 1	6.2	13	.07	3.1	.8	2.5	.9	15	2.8	1.7	.0	.3	34	11	0	31.2	7.1	10
May 9	3.2	15	.25	2.0	2.0	2.5	--	18	1.0	1.5	--	--	--	13	0	35.7	7.8	20
June 4	2.7	16	.40	3.0	1.3	--	5.1	20	5.0	1.6	--	.2	--	13	0	39.2	7.1	18
July 18	1.3	17	.30	3.4	2.0	1.3	3.1	24	1.0	1.6	--	.5	--	17	0	45.7	7.5	25
Aug. 8	15	9.4	.30	3.5	.6	2.6	2.6	13	3.0	1.9	--	.8	--	11	1	30.7	7.0	60
Sept. 6	1.0	19	.30	4.2	1.3	4.3	4.3	26	1.0	1.8	--	.4	--	16	0	45.5	7.1	25
Sept. 8	1.3	18	.30	3.4	1.4	4.0	4.0	22	2.0	1.6	--	.6	--	14	0	42.5	7.0	20

YORK RIVER BASIN--Continued

HUDSON CREEK NEAR BOSWELLS TAVERN, VA.--Continued

Periodic determinations of suspended-sediment discharge, water year October 1951 to September 1952

Date	Instantaneous water discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Instantaneous discharge (pounds per day)
Oct. 1, 1951	0.45	3	7
Oct. 7 .....	.61	13	43
Oct. 8	1.1	3	18
Oct. 9 .....	.61	2	7
Oct. 15 .....	.50	2	5
Oct. 22 .....	.55	1	3
Oct. 24	1.1	4	24
Oct. 30 .....	.67	1	4
Nov. 1	24	191	24,800
Nov. 2	1.6	7	60
Nov. 3	32	42	7,260
Nov. 5	1.7	3	28
Nov. 7	36	51	9,910
Nov. 12	1.5	3	24
Nov. 16	1.9	5	51
Nov. 23	1.4	3	23
Nov. 30	1.3	2	14
Dec. 5	5.4	11	321
Dec. 13	1.4	1	8
Dec. 20	2.9	2	31
Dec. 21	132	212	151,000
Dec. 22	16	30	2,590
Dec. 29	2.7	3	44
Jan. 4, 1952	2.3	2	25
Jan. 15	3.2	2	35
Jan. 18	7.6	12	492
Jan. 22	108	253	148,000
Jan. 23	13	14	983
Jan. 28	38	173	35,500
Feb. 4	35	74	14,000
Feb. 13	4.2	1	23
Feb. 17	12	11	713
Feb. 26	3.8	2	41
Mar. 4	9.3	5	251
Mar. 11	181	376	368,000
Mar. 19	132	186	133,000
Mar. 23	69	72	26,800
Mar. 24	66	154	54,900
Apr. 1	6.9	7	261
Apr. 11	4.5	6	146
Apr. 17	3.6	3	58
Apr. 25	112	56	33,900
Apr. 27	102	90	49,600
May 2	5.3	5	143
May 9	3.5	7	132
May 10	12	40	2,590
May 12	26	24	3,370
May 23	3.5	3	57
May 30	5.4	6	175
June 4	3.2	3	52
June 13	1.9	2	21
June 20	1.6	2	17
June 30	3.3	24	428
July 8	13	75	5,260
July 18	1.4	5	38
July 25 .....	.81	5	22
Aug. 1 .....	.94	5	25
Aug. 8	19	44	4,510
Aug. 11	2.0	9	97
Aug. 20	1.2	7	45
Aug. 26 .....	.75	6	24
Sept. 1	17	62	5,690
Sept. 8	1.4	4	30
Sept. 15 .....	.94	2	10
Sept. 23	1.7	6	55

YORK RIVER BASIN--Continued
PAWUNKY RIVER NEAR HANOVER, VA.

LOCATION.--At gaging station at highway bridge, 0.3 mile upstream from Mechumps Creek, 2.0 miles east of Hanover, Hanover County, and 7.0 miles upstream from Deep Run, York County, 0.72 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1946, October 1951 to September 1952.

EXTREMES 1945-46.--Discharge: October 1945 to September 1946, 61 cpm; Oct. 1-10: minimum, 41 cpm; Feb. 11-19, maximum, 13 cpm; Feb. 11-19, maximum, 21 cpm; May 1-10, minimum, 13 cpm; May 1-10, maximum, 21 cpm.

Water temperatures: Maximum, 79°F July 22; minimum, 33°F on several days in December and January.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1232.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium magnesium	Non-carbonate			
Oct. 1, 1951	124	16	0.20	5.2	2.4	6.1	2.9	29	7.2	2.8	0.2	0.3	57	23	0	66.8	7.4	16
Nov. 5	2,040	12	0.10	6.1	1.1	2.9	1.2	10	10	4.5	2	0.8	57	57	20	54.3	6.9	22
Dec. 4	360	19	0.02	4.4	2.3	4.3	1.3	23	7.3	3.2	1	0.3	57	20	12	61.7	7.2	17
Jan. 15, 1952	1,100	14	0.08	3.6	2.1	3.2	1.2	12	9.1	3.2	2	1.2	51	18	8	53.2	7.3	24
Feb. 4	2,720	12	0.10	3.6	1.1	7.1	5.0	13	13	2.8	1	0.7	51	14	3	47.2	7.1	26
Mar. 10	971	15	0.20	3.5	1.7	5.0	5.0	17	7.6	2.7	2	0.6	50	16	2	53.8	7.1	10
Apr. 8	1,290	13	0.25	3.4	1.9	--	--	17	5.0	2.4	--	--	--	16	2	51.2	7.2	30
May 5	1,180	15	0.50	4.0	1.4	4.1	4.1	17	7.0	2.2	--	0.4	--	16	2	49.7	6.9	20
June 2	1,050	16	0.50	3.8	2.2	5.1	5.1	25	5.0	2.3	--	0.8	--	19	0	54.8	7.1	26
July 7	401	17	0.33	4.6	3.2	2.9	2.9	23	7.0	2.7	--	1.1	--	25	6	61.5	7.2	40
Aug. 11	1,620	14	0.20	3.5	1.8	5.2	5.2	19	8.0	2.0	--	1.0	--	16	1	50.2	7.4	65
Sept. 8	322	15	0.30	5.5	1.0	3.9	3.9	18	7.0	2.4	--	0.8	--	18	3	54.1	7.0	35

YORK RIVER BASIN--Continued

MATTAPONI RIVER NEAR BEULAHVILLE, VA.

LOCATION.--At gaging station at highway bridge, 2.4 miles north of Beulahville, King William County, and 2.7 miles downstream from Maracossic Creek.
DRAINAGE AREA.--619 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1946, October 1951 to September 1952.

Water temperatures: October 1945 to September 1946. Maximum, 41 ppm Oct. 1-10; minimum, 32 ppm Mar. 11-20, Apr. 11-20.

EXTREMES, 1945-46.--Dissolved solids: Maximum, 8 ppm Dec. 1-10, Feb. 11-19.

Hardness: Maximum, 13 ppm Aug. 11-20; minimum, 8 ppm Dec. 1-10, Feb. 11-19.

Water temperatures: Maximum, 76°F on several days in June, July, and August; minimum, 33°F on several days in December and January.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1232.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium-magnesium	Non-carbonate			
Oct. 3, 1951.....	56	9.4	0.72	2.2	1.0	4.0	1.9	13	1.9	3.2	0.3	0.3	37	10	0	35.0	7.1	43
Nov. 1.....	950	9.3	.17	2.4	1.3	2.6	1.9	6	2.2	3.5	.2	.4	45	11	6	40.9	6.7	40
Dec. 5.....	283	12	.33	2.3	1.1	3.0	1.0	8	4.3	3.2	.1	.2	39	10	3	35.7	6.8	27
Jan. 26, 1952.....	1,180	10	.10	2.0	1.2	2.7	.8	5	8.0	2.6	.1	.3	38	10	5	35.5	6.8	13
Feb. 6.....	1,810	8.2	.10	1.8	1.6	4.0	1.1	6	8.0	2.6	.1	.3	38	18	0	29.2	6.6	10
Mar. 11.....	890	9.0	.00	2.0	1.1	3.2	1.1	7	5.9	2.7	.1	.3	36	10	4	33.9	6.8	4
Apr. 8.....	1,220	7.6	.25	1.8	1.2	--	--	7	4.0	2.5	--	--	--	9	4	32.3	6.7	25
June 3.....	604	10	1.1	2.4	.9	2.3	2.3	10	2.0	2.6	--	1.1	--	10	2	33.4	6.7	55
July 8.....	230	11	.80	2.4	1.4	2.7	2.7	12	2.0	3.4	--	1.1	--	12	2	37.6	7.3	60
Aug. 12.....	568	10	.40	2.8	.9	2.4	2.4	9	5.0	3.0	--	.9	--	11	5	36.6	6.2	50
Sept. 10.....	297	11	.50	3.2	.6	2.6	2.6	9	4.0	2.8	--	1.0	--	11	3	35.0	6.2	50

PART 2-A. SOUTH ATLANTIC SLOPE BASINS, JAMES RIVER TO SAVANNAH RIVER

JAMES RIVER BASIN

JAMES RIVER AT BUCHANAN, VA.

LOCATION.--At bridge on U.S. Highway 11 at Buchanan, Botetourt County, 300 feet downstream from gaging station, 700 feet upstream from Purgatory Creek, 1½ miles downstream from Looney Creek, and at mile 301.2.
DRAINAGE AREA.--2,084 square miles.

RECORDS AVAILABLE.--Chemical analyses: April 1929 to March 1930, October 1947 to February 1949, October 1951 to September 1952.

Water temperatures: October 1947 to September 1948, May 1951 to September 1952.

Sediment records: May 1951 to September 1952.

EXTREMES, 1951-52.--Water temperatures: Maximum, 84°F June 27, 28, July 21; minimum, freezing point, Dec. 20.

Sediment concentrations: Maximum daily, 740 ppm Aug. 7; minimum daily, 1 ppm June 1-3.

Sediment loads: Maximum daily, 59,500 tons Mar. 12; minimum daily, 2 tons Oct. 29-31.

EXTREMES, 1929-30, 1947-48.--Dissolved solids: Maximum, 289 ppm Sept. 21-30, 1929; minimum, 77 ppm Mar. 21-31, 1948.

Hardness: Maximum, 163 ppm Sept. 21-30, 1929; minimum, 56 ppm May 1-10, 1929.

Water temperatures (1947-48, May 1951 to September 1952): Maximum, 86°F July 26, Aug. 12, 1951; minimum, freezing point, Dec. 20, 1951.

Sediment concentrations (May 1951 to September 1952): Maximum daily, 740 ppm Aug. 7, 1952; minimum daily, 1 ppm June 1-3, 1952.

Sediment loads (May 1951 to September 1952): Maximum daily, 59,500 tons Mar. 12, 1952; minimum daily, 2 tons Oct. 29-31, 1951.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 1-5, 1951.....	418	4.6	0.08	52	8.5	28	2.4	146	56	34	0.3	0.2	270	165	42	437	8.2	38
Nov. 2.....	883	6.8	.02	45	7.3	31	2.5	128	62	30	.2	.3	253	142	37	409	7.6	20
Dec. 3.....	564	6.0	.04	41	7.6	15	1.8	124	37	17	.1	.2	199	134	32	315	7.9	19
Dec. 19.....	1,430	5.9	.02	27	3.4	8.8	1.4	72	31	8.4	.1	.7	127	61	22	207	7.6	21
Jan. 3, 1952.....	4,430	5.6	.06	17	1.2	4.4	1.0	49	13	3.4	.1	.6	74	47	7	117	7.7	17
Feb. 15.....	3,270	5.3	.04	21	3.5	5.1	1.1	68	17	6.0	.1	.5	95	67	11	162	7.8	5
Mar. 13.....	13,500	5.6	.06	12	3.1	1.4	1.4	39	9.1	2.1	.1	1.5	61	43	11	93.9	7.2	25
Apr. 2.....	2,260	7.4	.00	22	4.3	6.6	1.3	48	16	7.2	.0	.2	101	73	16	162	7.4	15
May 12.....	9,760	7.0	.01	31	4.6	3.4	3.4	114	20	2.2	.2	.5	101	42	6	97.9	7.7	15
June 11.....	868	5.2	.10	36	8.0	11	1.1	114	22	15	--	--	--	114	19	274	7.7	7
July 8.....	628	6.4	.02	43	8.0	11	1.1	133	26	26	--	--	--	143	34	384	8.2	10
Aug. 7.....	1,360	3.5	.10	28	5.9	9.4	9.4	96	24	6.8	--	1.6	--	94	15	208	8.0	100
Sept. 5.....	1,020	2.2	.10	29	6.5	3.5	3.5	106	15	2.7	--	.7	--	99	12	197	7.7	3

JAMES RIVER BASIN--Continued

JAMES RIVER AT BUCHANAN, VA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	67	56	41	47	40	47	52	60	70	76	76	74
2	69	53	36	49	42	45	55	65	69	75	76	70
3	70	51	42	47	43	42	43	64	72	76	75	71
4	70	49	45	45	45	42	54	65	72	78	76	67
5	77	50	43	43	46	44	53	64	74	79	76	68
6	76	45	48	40	--	45	48	67	73	75	77	67
7	74	49	50	40	--	44	47	66	76	76	73	69
8	66	45	54	38	--	42	50	65	75	77	74	68
9	66	46	53	40	--	43	48	65	78	78	75	67
10	61	46	50	41	--	44	55	65	75	74	72	67
11	63	43	46	40	--	48	57	64	75	75	72	66
12	61	46	43	41	--	45	58	57	73	77	74	68
13	61	46	42	44	--	45	59	55	70	76	75	69
14	62	50	--	45	--	47	58	55	74	77	74	70
15	64	52	--	50	42	46	52	60	77	78	76	72
16	62	54	--	50	44	43	50	60	78	78	77	70
17	66	42	--	49	43	42	52	65	82	79	74	68
18	65	44	34	46	45	45	55	65	79	81	74	68
19	67	40	33	45	42	44	56	64	78	81	74	71
20	62	41	32	43	45	48	60	62	78	80	78	68
21	64	40	38	44	--	48	65	62	77	84	76	66
22	62	38	35	44	--	52	69	61	78	83	76	66
23	63	44	36	40	--	55	65	64	79	83	74	64
24	62	44	36	41	45	54	63	66	79	82	70	61
25	63	41	38	39	44	57	58	70	81	79	70	64
26	60	46	41	42	42	48	55	70	81	80	69	63
27	61	43	38	45	44	47	55	68	84	80	70	62
28	60	41	35	47	46	55	54	72	84	81	70	62
29	57	42	37	42	50	51	55	68	80	81	70	64
30	57	43	38	39	--	50	56	66	80	78	73	65
31	58	--	40	38	--	48	--	66	--	78	74	--
Average	64	46	41	43	--	47	55	64	77	79	74	67

SOUTH ATLANTIC SLOPE BASINS

JAMES RIVER BASIN--Continued

JAMES RIVER AT BUCHANAN, VA.--Continued

Suspended sediment, water year October 1951 to September 1952

Suspended sediment, water year October 1901 to September 1902											
Day	October			November			December				
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment			
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		
1	420	4	5	607	23	38	621	3	5		
2	420			883			582				
3	420			1,030			564				
4	420			780			720				
5	409			635			2,590				
6	409	3	3	570	5	8	2,800	65	491		
7	403			642			2,000	50	270		
8	398			847			1,480	23	92		
9	403			874			1,230	15	50		
10	420			780			1,140	5	15		
11	438	3	3	656	3	5	1,090	3	8		
12	414			600			1,010				
13	403			560			928				
14	409			560			874			4	a9
15	409			570			1,130			15	a46
16	414	4	5	580	4	6	2,520	37	a252		
17	420			590			2,060	24	a133		
18	420			600			1,540	20	77		
19	420			800			1,430				
20	420			588			1,330				
21	420	4	5	558	2	3	4,000	57	s925		
22	426			528			14,200	300	11,500		
23	432			504			7,660	87	1,800		
24	444			504			5,000	17	230		
25	462			528			3,030	8	65		
26	456	3	4	546	3	5	2,660	6	40		
27	450			558			2,880				
28	450			588			2,730				
29	444			733			2,320				
30	438			677			2,060				
31	444	--	--	--	--	--	2,120	--	--		
Total	13,155	--	118	19,276	--	244	76,299	--	17,248		
	January			February			March				
1	3,640	22	268	4,900	7	93	1,730	4	20		
2	5,490			4,070	6	66	1,780				
3	4,430			3,890	39	s495	1,950				
4	3,440			14,300	194	7,490	3,320				
5	5,300			601	12,800	55	1,900			6,590	
6	6,590	35	623	8,500	20	459	6,140	15	249		
7	4,620	14	175	6,140	16	265	4,620	8	100		
8	3,270	6	53	4,900	8	108	3,710	4	40		
9	2,650	8	57	3,980	5	54	3,180	3	26		
10	3,440	11	102	3,360	4	33	2,860	526	s36,200		
11	7,280	36	708	3,020			19,000				
12	5,090	17	234	2,860			34,200				
13	3,800	7	72	2,650			13,500				
14	3,020	6	49	2,580			8,750				
15	2,580	7	49	3,270	6,140	14	232				
16	2,400	6	39	3,360	10	91	4,710	7	89		
17	2,220	8	48	5,700	34	523	3,890	6	63		
18	4,090	14	155	6,590	20	356	3,360	5	45		
19	8,750	80	1,890	4,900	6	79	4,810	30	390		
20	5,490	32	474	4,070	3	33	9,000	34	826		
21	4,070	12	132	3,440	2	a19	7,760	17	356		
22	4,160	41	461	2,940	2	a16	6,590	14	249		
23	11,200	75	2,270	2,580	2	a14	6,820	26	516		
24	9,750	36	948	2,340	2	11	11,000	39	1,160		
25	6,140	12	199	2,170			9,000	22	535		
26	5,290	8	114	2,060			6,590	21	374		
27	11,000	43	1,280	1,900			5,290	7	100		
28	18,200	121	5,950	1,780			4,340	4	47		
29	16,700	69	3,110	1,730	--	--	3,710	3	26		
30	10,500	28	794	--			3,180				
31	6,590	15	267	--			2,790				
Total	191,190	--	21,681	126,780	--	12,362	210,310	--	105,786		

s Computed by subdividing day.

a Computed from estimated concentration graph.

JAMES RIVER BASIN--Continued

JAMES RIVER AT BUCHANAN, VA.--Continued

Suspended sediment, water year October 1951 to September 1952--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-----	2,580	2	13	5,920	9	144	1,730		
2-----	2,280			4,620	6	75	1,580	1	4
3-----	3,100	6	50	3,800	4	41	1,430		
4-----	2,720	5	37	3,180	2	17	1,310		
5-----	3,020	4	33	2,720	3	22	1,210		
6-----	4,340	7	82	2,460			1,120	2	6
7-----	3,890	8	84	2,340			1,050		
8-----	3,270	6	53	2,120	2	12	1,020		
9-----	2,860			2,000			924		
10-----	2,580	2	14	2,780	46	s 418	884	2	5
11-----	2,340			10,800	87	2,540	868		
12-----	2,220			9,000	30	729	852		
13-----	2,120	3	18	7,050	11	209	844	2	5
14-----	2,220			5,090	8	110	820		
15-----	3,360	10	91	4,070	3	33	876		
16-----	3,020	10	82	3,360	2	18	860	3	7
17-----	2,580	4	28	3,020	4	33	828		
18-----	2,280	2	12	2,580	3	21	772		
19-----	2,120			2,520	3	20	719		
20-----	2,000			2,520	4	27	684	2	4
21-----	1,900	2	10	2,400			677		
22-----	1,780			2,400	3	19	916		
23-----	1,680			2,170	2	11	916	12	29
24-----	2,000	7	38	2,000			836		
25-----	7,420	54	1,080	2,120	10	57	788		
26-----	10,500	39	1,110	3,440	11	102	712	3	6
27-----	8,500	19	436	3,440	13	121	649		
28-----	13,800	86	3,060	2,720	6	44	807	5	8
29-----	13,800	57	2,120	2,340			916	150	371
30-----	8,500	19	436	2,170	3	17	658	40	71
31-----	--	--	--	1,950			--	--	--
Total-	124,280	--	9,034	109,100	--	4,940	28,054	--	667
Day	July			August			September		
	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-----	628	40	68	468	95	120	4,800	297	3,850
2-----	576	18	29	1,350	442	s 1,900	3,100	97	812
3-----	558	11	17	642	138	239	1,840	32	159
4-----	552	12	18	642	95	165	1,280	20	69
5-----	649	27	47	582	69	108	1,020	13	36
6-----	670	72	130	1,620	358	s 3,080	860		
7-----	628	81	137	1,380	740	2,780	772	10	21
8-----	628	32	54	1,480	420	1,680	733		
9-----	642			3,350	406	s 4,110	698		
10-----	670			3,360	323	2,930	658		
11-----	691	24	43	2,580	85	592	621	8	14
12-----	642			1,630	45	198	594		
13-----	570			1,300	42	147	570	6	9
14-----	534			1,040	31	87	546		
15-----	516	14	20	884	20	48	528		
16-----	534			1,190	60	193	528	6	9
17-----	588			1,530	87	359	516	6	8
18-----	594			1,120	46	139	504	6	8
19-----	621	12	19	1,060	24	69	813	37	s 89
20-----	614			892	14	34	1,040	34	95
21-----	564			828			884	21	s 50
22-----	522	10	14	932			844	12	27
23-----	498			780			828		
24-----	466			748	12	25	820	8	18
25-----	438			712			804		
26-----	414	9	11	642			698		
27-----	414			594			628	6	10
28-----	403			576	9	14	582		
29-----	403	6	7	576			558		
30-----	403			570			540	7	10
31-----	403	10	11	777	55	s 204	--	--	--
Total-	17,035	--	951	35,835	--	19,368	29,205	--	5,457
Total discharge for year (cfs-days).....									980,519
Total load for year (tons).....									198,058

s Computed by subdividing day.

a Computed from estimated concentration graph.

JAMES RIVER BASIN--Continued

JAMES RIVER AT SCOTTSVILLE, VA.

LOCATION --At gaging station at bridge on State Highway 20 at Scottsville, Albemarle County, 6.8 miles upstream from Hardware River, and at mile 184.6.
DRAINAGE AREA, 25.4 square miles; April 1930 to March 1931, October 1947 to September 1948, October 1951 to September 1952.
RECORDS AVAILABLE, 1930-1952.
Water temperatures: Maximum, 93°F June 26-28, July 21; minimum, 35°F Dec. 19.
Sediment records: December 1950 to September 1952.

EXTREMES, 1951-52.--Dissolved solids: Maximum, 197 ppm Oct. 21-31; minimum, 63 ppm Mar. 21-31.
Hardness: Maximum, 107 ppm Oct. 1-31; minimum, 39 ppm Mar. 11-31.
Specific conductance: Maximum daily, 306 micromhos Oct. 7; minimum daily, 70.6 micromhos Mar. 11.
Water temperatures: Maximum, 93°F June 26-28, July 21; minimum, 35°F Dec. 19.
Sediment concentrations: Maximum daily, 915 ppm Mar. 12; minimum daily, 2 ppm June 27-29, July 30.
EXTREMES, 1930-31, 1951-52.--Dissolved solids: Maximum, 235 ppm Sept. 21-30, 1930; minimum, 63 ppm Mar. 21-31, 1952.
Hardness: Maximum, 128 ppm Oct. 1-10, 1930; minimum, 39 ppm Mar. 11-31, 1952.
Water temperatures (May 1951 to September 1952): Maximum, 93°F June 26-28, July 21, 1952; minimum, 35°F Dec. 19, 1951.
Sediment concentrations (December 1950 to September 1952): Maximum daily, 915 ppm Mar. 12, 1952; minimum daily, 2 ppm July 3, 8, 10, 1951, June 27-29, July 30, 1952.

Sediment loads: Maximum daily, 120,000 tons Mar. 12, 1952; minimum daily, 6 tons July 30, 1952.

REMARKS.--Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg-nestum	Non-carbonate			
Oct. 1-10, 1951	920	5.9	0.14	31	7.2	19	2.3	78	63	15	0.2	0.2	189	107	43	295	7.5	32
Oct. 11-20	886	5.4	.26	31	7.2	18	2.3	75	63	14	.2	.2	187	107	46	288	7.4	40
Oct. 21-31	990	7.6	.22	31	7.1	20	2.7	81	63	16	.2	.2	197	107	40	308	7.3	38
Nov. 1-10	3,307	8.8	.52	16	5.0	12	2.3	48	33	9.4	---	.6	113	60	25	179	7.3	30
Nov. 11-20	1,740	9.7	.54	23	5.4	14	2.1	58	47	11	.2	.3	150	80	32	228	7.0	37
Nov. 21-30	1,396	9.4	.36	24	5.2	12	1.8	61	45	8.6	.2	.3	145	81	31	219	7.2	35
Dec. 1-10	3,777	8.4	.28	22	4.7	11	1.8	61	36	9.1	.2	.5	131	74	24	202	7.1	36
Dec. 11-20	3,300	8.6	.66	17	3.6	8.1	1.4	45	30	5.8	.2	.4	103	57	20	154	7.0	35
Dec. 21-31	10,690	7.2	.44	14	2.7	3.5	1.1	39	16	3.4	.2	1.8	72	46	14	109	7.0	31
Jan. 1-10, 1952	7,799	7.7	.64	15	3.0	4.0	.9	44	17	3.9	.2	.7	79	50	14	119	7.0	30
Jan. 11-20	7,776	7.8	.19	13	3.5	3.9	.8	40	16	3.8	.0	1.4	78	47	14	117	7.0	16
Jan. 21-31	17,030	7.2	.07	13	2.6	3.3	.8	38	13	2.8	.0	1.6	71	43	12	107	7.5	6
Feb. 1-10	16,460	7.7	.19	12	3.1	2.8	.7	40	12	2.3	.0	1.6	65	43	10	99.4	7.7	19
Feb. 11-20	8,161	8.0	.49	14	3.7	4.0	.8	46	16	3.1	.0	1.6	71	50	12	122	7.8	15
Feb. 21-29	6,002	8.1	.35	13	3.8	4.2	.7	43	17	2.7	.0	1.0	76	46	13	118	7.7	13
Mar. 1-10	6,704	7.5	.42	15	4.0	4.8	.8	48	18	3.7	.0	.8	85	56	15	133	7.7	19
Mar. 11-20	20,640	6.9	.09	12	2.3	2.5	.8	36	13	2.1	.2	1.0	65	39	10	92.5	7.3	20
Mar. 21-31	15,330	7.5	.12	12	2.1	2.9	.7	37	11	2.2	.2	1.1	63	39	8	91.7	7.3	18

Apr. 1-10.....	7,732	8.5	.16	15	2.5	4.0	.7	45	13	3.1	.1	.7	80	48	11	114	7.4	6
Apr. 11-20.....	6,039	6.5	.20	13	3.8	4.7	.7	40	18	3.3	.0	.5	83	48	15	119	7.6	8
Apr. 21-30.....	14,240	7.1	.06	11	3.4	4.0	.9	39	14	2.8	.0	1.0	65	41	10	101	7.7	7
May 1-10.....	8,564	7.6	.07	13	2.5	3.3	.8	41	15	2.5	.0	.6	65	43	9	102	7.4	4
May 11-20.....	10,330	7.5	.04	12	3.5	4.0	.9	42	15	3.2	.0	.5	70	44	10	107	7.5	8
May 21-31.....	5,688	7.7	.05	14	4.4	5.2	.9	49	17	3.6	.0	.7	82	53	13	130	7.6	7
June 1-10.....	3,482	7.3	.02	14	4.8	6.3	.9	54	20	3.6	.0	.3	88	56	10	141	7.7	9
June 11-20.....	2,332	3.9	.00	18	4.5	8.5	1.5	56	26	5.8	.1	1.0	110	63	18	171	7.0	5
June 21-30.....	2,116	4.0	.00	20	6.1	11	1.8	64	31	7.6	.1	1.1	127	75	23	193	7.1	13
July 1-10.....	2,601	3.2	.20	16	4.4	6.7	1.8	40	29	6.7	.1	1.3	101	58	25	152	6.9	20
July 11-20.....	1,975	3.3	.00	17	4.6	7.6	1.8	46	27	7.1	.1	1.2	98	61	24	164	7.1	5
July 21-31.....	1,401	3.6	.00	21	6.0	12	2.0	56	41	7.9	.2	1.0	137	77	31	209	7.0	10
Aug. 1-10.....	4,646	3.6	.10	24	4.7	11	2.0	63	32	11	.1	1.2	136	79	26	209	7.1	15
Aug. 11-20.....	4,766	6.9	.00	15	4.1	5.4	1.6	49	32	4.2	.0	1.4	119	54	14	133	7.1	43
Aug. 21-31.....	2,151	6.3	.23	23	5.1	7.3	1.7	61	27	6.1	.1	1.3	113	73	21	137	7.2	4
Sept. 1-10.....	6,920	8.0	.23	13	4.2	4.3	1.7	45	17	2.9	.0	1.0	83	50	13	117	6.9	3
Sept. 11-20.....	1,823	8.4	.36	17	4.7	6.1	1.7	52	27	2.2	.0	1.0	101	62	18	152	7.1	3
Sept. 21-30.....	2,116	7.6	.20	20	5.9	7.8	1.7	69	29	3.2	.2	.9	119	74	18	180	7.3	3
Average.....	6,182	7.0	0.22	17	4.3	7.5	1.4	51	26	5.7	0.1	0.9	103	61	19	157	--	18

SOUTH ATLANTIC SLOPE BASINS

JAMES RIVER BASIN--Continued

JAMES RIVER AT SCOTTSVILLE, VA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	61	55	44	48	48	49	60	68	79	75	85	81
2	62	50	49	48	48	45	64	72	76	85	82	82
3	65	48	43	48	45	42	60	69	79	85	86	77
4	69	49	45	42	50	44	60	70	82	78	88	75
5	71	47	49	44	44	50	61	69	83	82	82	75
6	70	46	51	42	43	50	52	75	87	84	80	77
7	70	52	48	44	43	50	55	73	86	82	82	72
8	66	50	58	40	44	45	54	67	83	80	79	68
9	59	50	58	42	47	46	56	73	80	79	75	73
10	66	52	52	42	45	45	61	70	83	80	79	71
11	67	52	48	45	55	54	64	67	60	82	75	76
12	64	50	45	42	49	51	57	66	75	86	81	80
13	55	50	42	44	50	49	55	63	78	86	78	84
14	57	55	42	46	44	50	55	67	83	86	75	81
15	59	58	50	52	43	50	55	70	85	90	88	77
16	58	52	38	49	45	48	60	76	87	90	79	80
17	58	53	42	45	49	52	67	72	86	87	84	76
18	62	48	40	47	49	51	67	65	88	86	84	76
19	63	50	35	47	47	45	70	64	91	84	80	73
20	61	45	36	42	49	49	71	62	79	87	82	77
21	60	40	40	45	52	56	73	72	71	93	80	72
22	62	43	42	45	47	56	74	73	74	92	80	63
23	80	48	40	43	44	56	75	75	80	85	79	69
24	62	47	42	42	43	54	59	69	85	89	80	71
25	57	43	36	44	45	55	57	75	90	85	83	73
26	54	52	43	44	42	59	56	74	93	81	60	75
27	56	45	40	47	46	58	55	76	93	85	78	72
28	61	43	40	49	52	58	57	79	93	89	76	71
29	59	42	40	44	48	57	56	81	90	85	78	70
30	56	45	40	41	--	57	65	71	80	87	80	73
31	54	--	45	43	--	58	--	67	--	86	72	--
Average	61	49	44	45	47	51	61	71	83	85	80	75

JAMES RIVER BASIN--Continued

JAMES RIVER AT SCOTTSVILLE, VA.--Continued

Suspended sediment, water year October 1951 to September 1952

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-----	1,190			3,040	149	s 1,900	1,420		
2-----	730			5,300	355	s 6,000	1,580		
3-----	673	5	12	5,410	177	s 2,870	1,400	7	28
4-----	922			3,810	95	977	1,420	12	46
5-----	770			2,450	28	185	7,470	540	s 14,700
6-----	900			2,060	16	89	7,180	266	5,160
7-----	860	4	10	3,460	38	355	6,010	79	1,280
8-----	1,050			3,120	56	472	4,720	44	561
9-----	1,140			2,210	27	161	3,370	29	264
10-----	966			2,210	13	78	3,200	28	242
11-----	933	7	19	2,360	11	61	2,690	20	145
12-----	911			1,840			2,370	15	96
13-----	840			1,910			2,690	19	138
14-----	820			1,520	9	42	2,210	15	90
15-----	870	5	12	1,690			3,030	19	155
16-----	890			1,840			3,460	28	262
17-----	850			1,890	9	44	3,200	27	233
18-----	850			1,910			4,820	24	312
19-----	850	5	11	1,250			4,720	18	229
20-----	850			1,690			3,810	47	483
21-----	860			1,490	9	35	25,000	785	s 57,300
22-----	900			1,310			20,000	454	24,500
23-----	955	6	16	1,390			17,000	292	13,400
24-----	999			1,520			12,000	186	6,030
25-----	1,090			1,520	9	34	8,000	77	1,660
26-----	1,100			1,250			6,500	41	720
27-----	1,080			1,450			6,400	40	691
28-----	977	5	14	1,410	8	30	6,200	28	469
29-----	1,010			1,230			6,000	15	243
30-----	955			1,390			5,810	12	188
31-----	988	7	19	--	--	--	4,630	6	100
Total-----	28,759	--	425	64,430	--	13,844	188,310	--	129,781
Day	January			February			March		
	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-----	4,540	9	110	13,000	47	1,650	4,720	9	115
2-----	5,410	11	161	10,400	29	814	4,540	9	110
3-----	8,630	34	792	9,850	19	505	4,630	9	113
4-----	7,940	24	515	28,000	268	s 21,400	5,410	17	248
5-----	7,940	22	472	31,400	316	26,800	6,220	19	319
6-----	9,110	46	1,139	23,100	210	13,100	9,350	33	833
7-----	11,200	46	1,390	16,400	84	3,720	9,850	29	771
8-----	8,870	26	623	12,700	60	2,060	8,170	17	375
9-----	7,500	19	385	10,600	38	1,090	7,720	18	375
10-----	6,850	27	499	9,110	27	664	6,430	17	295
11-----	7,720	36	750	8,400	22	499	15,900	495	s 36,000
12-----	11,800	46	1,470	7,720	29	604	48,600	915	120,000
13-----	9,600	45	1,170	6,850	29	536	45,100	599	72,900
14-----	7,940	27	579	6,640	19	341	22,300	243	14,600
15-----	6,850	17	314	6,220	14	235	15,300	112	4,630
16-----	6,010	12	195	6,430	15	260	11,800	58	1,850
17-----	5,410	11	161	8,400	28	635	9,850	42	1,120
18-----	4,820	10	130	9,850	22	585	8,870	33	790
19-----	5,810	19	298	11,500	28	869	13,400	153	5,540
20-----	11,800	57	1,820	9,600	30	778	15,300	182	7,520
21-----	9,110	34	836	8,630	19	443	17,400	88	4,130
22-----	9,110	40	984	7,720	21	438	14,300	63	2,430
23-----	14,000	136	5,140	6,640	14	251	19,600	137	7,250
24-----	19,600	84	4,450	6,220	11	185	21,500	174	10,100
25-----	15,700	118	5,000	5,610	9	136	25,100	184	12,500
26-----	11,800	70	2,230	5,210	9	127	17,800	98	4,710
27-----	11,000	37	1,109	5,010	8	108	14,000	58	2,190
28-----	17,000	176	8,080	4,720	11	140	11,500	38	1,180
29-----	35,000	358	33,600	4,260	9	104	10,100	28	764
30-----	25,000	162	12,300	--	--	--	9,110	33	812
31-----	20,000	65	3,510	--	--	--	8,170	27	596
Total-----	343,070	--	90,194	300,190	--	79,077	442,040	--	315,166

s Computed by subdividing day.

SOUTH ATLANTIC SLOPE BASINS

JAMES RIVER BASIN--Continued

JAMES RIVER AT SCOTTSVILLE, VA.--Continued

Suspended sediment, water year October 1951 to September 1952--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-----	7,500	30	608	16,000	81	3,500	4,820	15	195
2-----	7,280	28	550	12,400	47	1,570	4,440	8	96
3-----	7,060	23	438	10,100	31	845	4,080	11	121
4-----	7,280	24	472	8,870	24	575	3,810	17	175
5-----	7,500	25	506	8,170	22	485	3,280	7	62
6-----	7,500	40	810	6,640	18	323	3,280	3	27
7-----	8,870	34	814	6,430	16	278	3,030	3	25
8-----	8,870	22	527	5,610	14	212	2,610	3	21
9-----	8,400	18	408	5,410	13	190	2,780	3	23
10-----	7,060	27	515	6,010	19	308	2,690	4	29
11-----	6,220	23	366	7,060	71	1,350	2,530	5	34
12-----	6,220	16	269	19,600	231	12,200	2,530	3	20
13-----	5,810	15	235	17,100	129	5,960	2,290	5	31
14-----	5,610	14	212	13,000	53	1,860	2,370	6	38
15-----	5,810	15	235	10,400	32	899	2,450	10	66
16-----	6,640	29	520	8,870	20	479	2,450	12	79
17-----	6,850	36	666	7,940	16	343	2,140	9	52
18-----	6,010	20	325	6,850	20	370	2,370	9	58
19-----	5,810	15	235	6,220	16	269	2,210	9	54
20-----	5,410	15	219	6,220	16	269	1,980	4	21
21-----	4,820	19	247	6,220	15	252	1,910	8	41
22-----	4,820	15	195	5,610	15	227	1,980	5	27
23-----	4,170	9	101	5,410	16	234	2,210	18	107
24-----	5,010	15	203	5,410	15	219	3,370	36	328
25-----	8,860	97	2,320	5,810	34	533	2,060	14	78
26-----	18,500	218	10,900	5,410	44	643	2,290	4	25
27-----	19,600	249	13,200	6,010	27	438	1,980	2	11
28-----	24,300	327	21,500	6,430	21	365	1,690	2	9
29-----	28,400	203	15,600	6,220	21	353	1,760	2	10
30-----	23,900	182	11,700	5,410	31	453	1,910	5	26
31-----	--	--	--	4,630	22	275	--	--	--
Total-	280,090	--	84,916	251,470	--	36,277	79,300	--	1,889
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-----	2,370	41	26	1,360	6	22	22,300	570	s 44,900
2-----	1,840	10	50	1,410	13	49	14,000	286	10,800
3-----	1,620	3	13	3,630	112	1,100	9,110	95	2,340
4-----	1,620	21	92	2,210	37	221	5,810	71	1,110
5-----	2,290	24	148	2,140	15	87	4,170	48	540
6-----	2,060	28	156	2,140	17	98	3,720	37	372
7-----	2,140	19	110	2,780	38	285	2,940	20	159
8-----	2,690	39	283	5,010	191	s 3,330	2,290	9	56
9-----	5,920	847	s 14,400	10,100	533	14,500	2,610	12	85
10-----	3,460	170	159	15,700	488	20,700	2,450	12	79
11-----	2,530	48	328	9,350	253	6,390	1,840	7	37
12-----	2,140	24	139	6,220	143	2,400	2,060		
13-----	1,980	18	96	5,010	65	879	1,980		
14-----	1,910	11	57	3,720	43	432	1,840	5	25
15-----	1,480	9	36	2,610	28	197	1,760	4	19
16-----	1,840	9	45	3,900	45	474	1,690	4	18
17-----	1,980	19	102	4,260	114	1,310	1,620	4	17
18-----	1,760	14	67	3,540	74	707	1,690	4	18
19-----	2,290	19	117	3,370	54	491	1,610		
20-----	1,840	12	60	2,780	32	240	2,140	42	243
21-----	1,690	6	27	3,030	32	262	3,200	40	346
22-----	1,690	5	23	2,450	28	185	2,370	12	77
23-----	1,390	3	11	2,780	28	210	2,290	5	31
24-----	1,530	3	12	2,450	21	139	2,370	8	51
25-----	1,520	3	10	2,370	28	179	1,840	4	20
26-----	1,370			2,060	18	100	2,060	4	22
27-----	1,240			1,690	9	41	2,140	3	17
28-----	1,160	2	6	1,690	9	41	1,690	3	14
29-----	1,160			1,910	8	41	1,610	4	17
30-----	1,120			1,610	4	17	1,590	8	34
31-----	1,540	4	17	1,620	17	74	--	--	--
Total-	61,170	--	16,630	114,900	--	55,201	108,790	--	61,539
Total discharge for year (cfs-days)									2,262,519
Total load for year (tons)									884,939

s Computed by subdividing day.

JAMES RIVER BASIN--Continued
JAMES RIVER AT SCOTTSVILLE, VA.--Continued

Particle-size analyses of suspended sediment, water year October 1951 to September 1952
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Suspended sediment											Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500	1.000
Dec. 21, 1951.....	11:12 a.m.	34,060	888	3,240		8	13	21	37	57	85	91		100	BWM
Jan. 29, 1952.....	3:58 p.m.	36,940	420	1,460		25	38	54	65	86	98	100			BWMC
Feb. 5.....	12:48 a.m.	32,720	323	988		29	48	63	76	88	99	100			BWMC
Mar. 12.....	12:20 p.m.	50,900	1,100	3,940		26	41	53	66	88	99	100			BWMC
Mar. 13.....	4:08 p.m.	40,120	589	2,230		32	50	66	80	89	95	100			BWMC
Mar. 25.....	10:34 p.m.	26,350	157	634		22	35	42	57	74	84	100			BWMC
July 9.....	11:00 a.m.	5,810	1,300	2,540		15	22	38	67	100	--	--			BWM
July 9.....	11:00 a.m.	5,810	1,300	2,380		37	58	78	94	99	100	--			BWMC
Aug. 9.....	3:22 p.m.	11,790	422	1,580		37	50	68	84	97	99	100			BWMC

JAMES RIVER BASIN--Continued

JAMES RIVER NEAR RICHMOND, VA.

LOCATION.--At gaging station 0.1 mile upstream from Huguenot Memorial Bridge, 1.7 miles downstream from Boshier Dam, 2.9 miles west of city limits of Richmond, Henrico County, 3.3 miles upstream from Powhite Creek, and at mile 111.7.

DRAINAGE AREA.--6,757 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952.

REMARKS.--These analyses are considered to be comparable with analyses of the Richmond Waterworks October 1947 to September 1951. There is no appreciable inflow between the two sampling points. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg./nesium	Non-carbonate			
Oct. 30, 1951	627	9.3	0.14	25	6.4	16		68	49	12	0.2	0.2	173	89	33	247	7.5	25
Nov. 28	1,400	10	.47	18	4.4	9.9		56	27	7.0	.2	.2	108	63	17	175	7.4	30
Dec. 11	3,500	8.9	.18	19	4.3	10	1.8	58	28	9.8	.1	.4	116	65	18	174	7.5	21
Jan. 10, 1952	9,300	8.1	.20	13	3.3	3.4	1.1	40	15	3.5	.1	1.2	71	46	13	107	7.3	17
Jan. 24	22,000	7.8	.16	8.0	2.4	2.9	1.3	22	13	2.9	.1	1.6	58	30	12	74.6	7.3	34
Feb. 5	46,400	7.0	.17	6.7	2.8	2.1		22	9.8	2.0	.0	2.2	60	28	10	63.3	7.2	70
Mar. 21	20,400	9.4	.20	10	2.4	2.8	1.2	36	9.2	1.9	.0	1.3	61	35	5	84.6	8.1	20
Apr. 13	7,000	9.0	.22	12	2.3	--	--	38	12	3.1	--	--	--	39	9	106	7.5	3
May 26	7,900	8.3	.10	9.5	6.0	6.3		51	14	3.6	--	.8	--	48	7	121	7.3	2
June 24	2,800	9.0	.10	13	3.8	3.9		36	19	5.2	--	.3	--	45	17	131	7.2	5
July 14	1,580	8.0	.10	13	3.1	6.4		40	22	5.1	--	.8	--	45	12	121	7.6	4
Aug. 27	1,750	8.0	.02	19	4.2	2.9		36	16	5.8	--	.4	--	65	19	155	7.1	4
Sept. 18	1,520	9.7	.10	14	4.3	5.1		50	18	2.6	--	.4	--	53	12	125	7.3	10

JAMES RIVER BASIN--Continued
APOMATTOX RIVER NEAR PETERSBURG, VA.

LOCATION.--At gaging station 2.2 miles upstream from dam of Virginia Electric & Power Co., 4.2 miles downstream from Whipponock Creek, and 5.9 miles west of corporate limits of city of Petersburg, Dinwiddie County.

DRAINAGE AREA.--1,335 square miles.

RECORDS AVAILABLE.--Chemical analyses: April 1929 to March 1930, October 1951 to September 1952.

EXTREMES, 1929-30.--Dissolved solids: Maximum, 71 ppm Oct. 21-31; minimum, 46 ppm Aug. 21-31.

Hardness: Maximum, 31 ppm Aug. 1-10; minimum, 17 ppm Mar. 21-31.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233.

[Chemical analyses, in parts per million, water year October 1951 to September 1952]

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 30, 1951	256	23	0.10	7.7	3.3	6.5	6.6	47	2.3	3.9	0.1	0.2	71	33	0	91.2	7.3	10
Nov. 28	532	24	.28	6.1	2.8	6.6	—	35	4.4	5.0	.2	.3	68	27	0	79.4	6.8	20
Dec. 13	486	24	.21	7.4	1.8	5.4	1.5	36	4.8	4.2	.1	.4	86	26	0	79.1	7.6	13
Jan. 6, 1952	993	19	.18	7.2	1.0	4.4	1.2	26	5.5	3.5	.1	.3	65	22	1	64.0	7.5	9
Mar. 6	3,420	12	.13	3.5	2.6	2.8	—	16	8.5	2.2	.0	.6	40	19	6	48.9	7.6	25
Mar. 21	2,540	15	.00	3.8	1.9	4.3	1.4	20	6.0	3.1	.0	.2	53	17	1	59.0	7.0	25
Apr. 16	1,100	18	.20	5.2	2.1	—	—	30	1.0	2.8	—	—	—	22	0	66.4	7.4	15
May 27	1,080	18	.30	4.8	2.5	5.6	—	30	5.0	2.8	—	—	—	22	0	63.6	7.3	35
June 25	373	22	.14	6.0	4.1	4.4	—	39	3.0	3.7	—	1.3	—	32	0	80.7	7.4	10
July 9	1,030	23	.16	6.5	2.4	7.5	—	37	6.0	3.4	—	1.1	—	26	0	74.3	7.4	30
Aug. 26	318	19	.02	6.2	2.2	6.2	—	34	6.0	2.2	—	.9	—	24	0	68.9	7.0	65
Sept. 19	309	21	.20	6.0	2.8	6.0	—	40	2.0	3.1	—	.3	—	26	0	73.4	7.2	10

CHOWAN RIVER BASIN

BLACKWATER RIVER NEAR FRANKLIN, VA.

LOCATION.--At gaging station 0.4 mile south of town of Burdette, at mouth of Black Creek, 3.3 miles downstream from Corrovaugh Swamp, and 6 miles south of Franklin, Southampton County.

DRAINAGE AREA.--613 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947, November 1951 to September 1952.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233.

Chemical analyses, in parts per million, November 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)	pH	Color
														Calcium magnesium	Non-carbonate			
Nov. 29, 1951	314	11	0.26	8.8	1.4	4.2	4.8	18	11	7.8	0.2	0.4	76	28	13	83.5	6.6	40
Dec. 11	220	11	.15	9.2	2.0	4.2	1.3	23	9.5	8.1	.2	.1	69	31	12	81.2	7.2	39
Jan. 22, 1952	1,210	6.8	.12	6.4	1.5	3.4	1.0	14	10	6.1	.2	.2	56	22	11	58.4	6.7	42
Feb. 12	1,820	5.4	.10	5.8	1.0	3.0	1.0	10	7.2	6.5	.2	.4	50	19	10	51.1	7.0	48
Mar. 11	2,560	4.0	.20	4.6	.8	3.0	1.2	9.8	6.4	4.3	.0	.8	40	15	7	49.1	6.8	35
Apr. 22	391	3.2	.20	8.3	1.0	--	--	25	2.0	5.6	--	--	--	25	4	69.2	7.2	55
May 27	300	8.0	--	9.8	.9	--	2.5	28	2.0	4.9	--	1.8	--	28	5	67.8	7.3	90
July 9	9	8.0	.36	13	1.7	3.0	4.2	42	2.0	6.1	--	1.1	--	40	5	94.4	7.4	35
Aug. 19	19	5.9	.20	11	1.6	4.2	4.2	23	16	8.0	--	.7	--	34	15	88.9	6.9	33
Sept. 17	8	5.6	.20	12	1.3	--	--	32	10	5.2	--	.6	--	35	9	90.5	6.9	23

CHOWAN RIVER BASIN--Continued

NORTH MEHERRIN RIVER NEAR LUNENBURG, VA.

LOCATION.--At gaging station at bridge on State Highway 40, half a mile downstream from Tusekiah Creek, 4 miles upstream from Juniper Creek, and 5 miles northwest of Lunenburg, Lunenburg County.

DRAINAGE AREA.--60 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1951 to September 1952.

Water temperatures: October 1946 to September 1947.

EXTREMES, 1946-47.--Dissolved solids: Maximum, 79 ppm Nov. 1-10; minimum, 51 ppm Mar. 11-20.

Hardness: Maximum, 39 ppm Nov. 1-10; minimum, 19 ppm Mar. 11-20.

Water temperatures: Maximum, 81°F Aug. 23; minimum, freezing point Dec. 19, Feb. 10.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 22, 1951	4.6	23	0.07	6.3	3.9	5.7	6.7	54	1.6	3.5	0.1	0.2	70	37	0	100	7.6	20
Nov. 27	15	24	.28	6.9	3.6	5.7	1.2	44	3.3	3.9	.2	.2	74	32	0	84.2	7.6	22
Dec. 10	18	23	.16	8.0	2.3	3.6	1.2	42	5.4	3.3	.1	.2	73	29	0	86.1	7.8	19
Jan. 21, 1952	23	24	.12	6.4	3.1	3.7	1.6	32	3.1	3.0	0	.2	68	29	0	79.6	7.1	7
Feb. 11	32	19	.31	5.6	2.9	4.7	1.0	32	4.7	3.3	.1	.5	65	23	0	71.9	7.6	23
Mar. 10	48	19	.20	5.0	2.5	5.0	1.0	31	4.2	2.5	0	0	58	23	0	66.8	7.5	15
Apr. 21	26	21	.12	5.9	3.4	--	--	41	1.0	3.0	--	--	--	29	0	78.2	7.5	6
May 26	29	18	.30	5.9	3.5	--	3.8	40	1.0	2.3	--	.4	--	29	0	74.9	7.2	22
July 17	15	12	.10	4.9	2.5	--	9.2	29	14	2.3	--	1.3	--	23	0	63.8	7.1	100
Aug. 18	6.7	17	.02	6.0	2.9	--	5.6	37	5.0	2.1	--	.7	--	27	0	67.8	7.0	100
Sept. 15	6.1	22	.10	6.4	3.1	--	6.1	44	2.0	2.5	--	.3	--	29	0	78.0	7.2	7

ROANOKE RIVER BASIN

ROANOKE RIVER AT LAFAYETTE, VA.

LOCATION--At gaging station at Lafayette, Montgomery County, a third of a mile downstream from confluence of North and South Forks of Roanoke River, and 1½ miles upstream from Mill Branch.

DRAINAGE AREA--257 square miles.

RECORDS AVAILABLE--Chemical analyses: October 1950 to September 1952.

Water temperatures: October 1950 to September 1951.

EXTREMES 1950-51.--Dissolved solids: Maximum 213 ppm Sept. 21-30; minimum, 112 ppm Mar. 21-31.

Hardness: Maximum 202 ppm Sept. 21-30; minimum, 95 ppm June 11-20.

Specific conductance: Maximum daily, 380 micromhos Sept. 26; minimum daily, 105 micromhos Dec. 8.

Water temperatures: Maximum, 76°F July 15; minimum, freezing point on several days during November to February.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 10, 1951	45	8.4	0.08	46	25	2.1	2.0	222	32	4.2	0.1	0.7	236	218	36	402	8.0	5
Nov. 13	67	9.1	.04	42	21	2.0	1.8	a195	28	2.4	.1	1.3	203	191	31	340	8.3	5
Jan. 6, 1952	140	10	.02	33	14	2.0	1.5	149	21	2.1	.1	1.0	153	140	18	265	8.3	4
Feb. 19	286	9.3	.06	26	12	1.8	1.3	120	17	2.4	.1	1.9	127	114	16	223	8.2	4
Mar. 10	290	7.3	.00	28	15	1.9	1.5	136	14	2.0	0	1.7	141	132	20	240	8.0	3
Apr. 12	109	6.9	.08	23	19	--	--	150	12	1.8	--	--	--	136	13	257	7.9	2
Apr. 29	1,360	9.2	.08	16	7.0	--	--	79	9.0	1.4	--	--	--	69	4	141	8.4	7
June 12	100	8.3	.10	35	18	4.0	4.0	178	20	1.7	--	1.2	--	161	16	306	7.9	5
July 2	72	8.7	.00	36	20	1.3	1.3	180	21	3.2	--	1.3	--	172	25	321	7.9	2
Aug. 5	72	9.8	.10	39	23	1.8	1.8	b211	18	2.6	--	1.3	--	192	20	344	8.4	2
Sept. 16	91	9.4	.10	34	19	--	--	171	19	2.0	--	1.0	--	163	23	282	7.9	3

a Includes equivalent of 6 parts per million of carbonate (CO₃).

b Includes equivalent of 8 parts per million of carbonate (CO₃).

ROANOKE RIVER BASIN--Continued
OTTER RIVER NEAR EVINGTON, VA.

LOCATION.--At gaging station at highway bridge, 2 miles upstream from Flat Creek, and 2 miles southwest of Evington, Campbell County.
DRAINAGE AREA.--825 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1952.
REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 9, 1951	105	16	0.14	5.7	2.1	3.3	5.0	32	2.3	3.2	0.1	0.5	51	23	0	64.7	7.1	15
Nov. 16	220	16	.21	4.5	1.8	3.3	1.7	26	3.0	2.8	0.1	0.5	48	19	0	54.1	7.2	15
Jan. 9, 1952	287	15	.10	4.4	1.2	3.0	1.1	20	3.0	2.5	.1	1.4	42	18	0	46.3	7.4	13
Feb. 19	528	13	.10	3.3	1.5	3.2	3.2	17	2.8	2.1	.1	1.6	45	14	0	42.1	7.5	20
Mar. 11	2,250	9.7	.10	4.0	1.5	3.8	3.8	15	7.1	2.6	.2	.7	46	16	4	49.5	7.1	10
Apr. 9	416	13	.20	3.2	1.3	3.0	1.2	18	2.3	1.6	.1	.5	39	13	0	42.1	7.0	5
May 2	607	14	.20	3.3	1.4	--	/	18	1.0	1.8	--	--	--	14	0	43.2	7.6	10
June 12	200	17	.07	3.7	2.2	--	3.0	24	1.0	2.2	--	1.3	--	18	0	53.1	7.4	8
July 2	162	16	.16	5.0	3.1	--	3.6	26	7.0	2.4	--	1.4	--	25	4	54.5	7.3	45
Aug. 8	2,520	5.9	.10	3.8	.8	4.1	4.1	15	6.0	1.2	--	2.1	--	13	1	36.1	7.3	100
Sept. 18	250	14	.10	4.6	1.2	3.4	3.4	24	1.0	1.9	--	.6	--	16	0	49.7	6.9	7

ROANOKE RIVER BASIN--Continued
CUB CREEK AT PHENIX, VA.

LOCATION.--At gaging station at bridge on State Highway 40, 0.9 mile west of Phenix, Charlotte County, 2 miles downstream from Rough Creek, and 6 miles upstream from Louse Creek.

DRAINAGE AREA.--102 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1952.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg./l.	Non-carbonate, mg./l.			
Oct. 5, 1951.....	25	15	0.18	5.2	2.0	5.6	3.8	34	1.4	2.5	0.1	0.4	58	21	0	64.8	6.8	10
Nov. 12.....	60	22	.26	4.6	2.7	4.3	1.0	28	3.0	2.3	.1	.5	54	21	0	58.2	6.9	10
Dec. 10.....	89	21	.26	4.6	1.7	4.4	1.0	28	3.5	2.3	.1	.2	55	21	0	59.5	7.3	9
Jan. 7, 1952.....	87	19	.20	5.0	1.3	4.0	1.8	24	3.0	2.7	.1	.4	55	18	0	53.2	7.4	12
Feb. 7.....	140	18	.18	3.4	1.6	3.8	1.2	19	3.8	2.7	.1	1.4	51	15	0	49.5	7.1	21
Mar. 10.....	98	18	.14	4.4	1.2	4.9		24	3.9	1.9	.0	.3	51	18	0	52.2	7.3	10
Apr. 9.....	95	18	.10	3.4	1.9	--	--	25	4.0	1.6	--	--	--	16	0	51.7	7.4	5
May 12.....	145	17	.28	4.4	2.2	--	--	28	5.0	1.5	--	--	--	20	0	53.3	7.4	25
June 19.....	57	20	.24	5.6	1.6	5.2		28	5.0	2.0	--	1.2	--	21	0	58.1	7.4	37
July 14.....	47	23	.33	4.4	2.6	4.6		32	2.0	2.0	--	--	--	22	0	59.2	7.4	15
Aug. 8.....	53	21	.40	4.7	2.4	5.7		35	2.0	2.0	--	.4	--	22	0	59.1	7.6	15
Sept. 10.....	48	8.0	.30	4.5	2.0	5.1		31	2.0	2.0	--	.4	--	19	0	56.9	7.1	10

ROANOKE RIVER BASIN--Continued

ROANOKE RIVER AT RANDOLPH, VA.

LOCATION.--At gaging station at bridge on State Highway 746 (old 26), 2.8 miles northwest of Randolph, Charlotte County, 3.6 miles upstream from Roanoke Creek, and a little 22,000 square miles, approximately.

DRILLAGE AREA.--22,000 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: April 1929 to March 1930, October 1950 to September 1952.

EXTREMES 1951-52.--Dissolved solids: Maximum, 116 ppm Oct. 1-10; minimum, 59 ppm Feb. 1-10.

Hardness: Maximum, 56 ppm Oct. 1-10; minimum, 30 ppm Mar. 21-31.

Specific conductance: Maximum daily, 209 microhmhos Oct. 1, 4; minimum daily, 48.4 microhmhos Dec. 23.

Water temperatures: Maximum observed, 81°F Aug. 20; minimum, freezing point Dec. 17-20.

EXTREMES 1929-30.--Dissolved solids: Maximum, 116 ppm Dec. 1-10, 1951; minimum, 59 ppm Feb. 1-10, 1952.

Hardness: Maximum, 56 ppm Oct. 1-10, 1951; minimum, 30 ppm Dec. 1-10, 1950, Mar. 21-31, 1952.

Specific conductance (1950-52): Maximum daily, 209 microhmhos Oct. 1, 4, 1951; minimum daily, 48.4 microhmhos Dec. 23, 1951.

Water temperatures (1950-52): Maximum observed, 81°F Aug. 11, 16, 1951, Aug. 20, 1952; minimum, freezing point on several days during some winter months.

REMARKS.--During period 1929-30, samples were collected at site of former gaging station, 3.2 miles downstream. Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (microhmhos at 25°C)	pH	Color
														Calcium, mg-nesium	Non-carbonate			
Oct. 1-10, 1951.....	768	13	0.05	13	5.8	16	2.1	68	24	9.6	0.2	0.2	116	56	1	188	7.6	6
Oct. 11-20.....	871	13	0.07	13	5.4	12	2.1	63	17	8.5	.2	.1	102	55	3	163	7.4	10
Oct. 21-31.....	976	14	0.17	13	5.4	12	2.2	63	16	8.8	.2	.1	101	55	3	161	7.5	10
Nov. 1-10.....	3,069	13	.28	7.9	3.4	6.2	2.3	38	11	5.4	.3	1.3	72	34	3	101	7.6	15
Nov. 11-20.....	1,582	16	.18	9.8	4.2	7.5	1.9	49	10	6.2	.2	.8	83	42	2	118	7.6	18
Nov. 21-30.....	1,279	15	.06	10	4.9	6.8	1.8	51	11	5.5	.1	1.0	82	45	3	124	7.2	6
Dec. 1-10.....	2,738	13	.64	8.8	3.8	6.2	2.0	40	9.5	5.5	.1	1.9	80	38	5	108	7.4	20
Dec. 11-20.....	1,804	15	.15	8.8	3.8	5.8	1.8	41	8.8	4.6	.2	1.3	73	38	4	105	7.3	11
Dec. 21-31.....	8,598	11	.66	7.0	3.0	3.2	1.9	29	7.1	3.1	.1	2.5	63	30	6	78.2	7.0	17
Jan. 1-10, 1952.....	2,412	15	.20	9.3	3.9	5.0	1.8	43	8.8	4.0	.1	1.5	72	39	4	103	7.3	17
Jan. 11-20.....	3,069	14	.42	9.5	3.7	4.5	1.6	42	8.3	3.8	.1	1.6	72	39	4	101	7.3	18
Jan. 21-31.....	7,179	12	.04	8.8	3.4	3.8	1.5	38	7.8	3.8	.1	1.7	63	36	5	92.9	7.3	7
Feb. 1-10.....	7,447	11	.10	8.2	3.0	3.0	1.5	32	7.2	3.2	.1	1.9	59	33	7	83.4	7.3	11
Feb. 11-20.....	3,874	13	.54	9.4	3.8	4.1	1.4	42	7.7	3.8	.1	1.5	71	39	5	97.6	7.3	12
Feb. 21-29.....	2,886	13	.27	9.5	3.9	3.8	1.4	43	7.1	3.4	.1	1.2	68	40	4	96.3	7.3	17
Mar. 1-10.....	4,188	13	.06	8.2	4.5	4.0	1.3	41	8.3	2.8	.2	1.3	69	39	5	93.0	7.5	20
Mar. 11-20.....	7,235	12	.12	7.1	3.3	3.4	1.4	32	9.4	3.1	.2	1.6	64	31	5	79.7	7.2	40
Mar. 21-31.....	7,864	12	.12	7.0	3.0	3.3	1.4	29	8.9	2.3	.0	1.3	63	30	6	74.6	6.9	65
Apr. 1-10.....	3,534	13	.02	8.6	4.0	4.2	1.3	42	6.8	3.0	.0	.9	66	38	4	94.3	7.1	5
Apr. 11-20.....	2,857	11	.00	8.5	4.0	4.3	1.4	43	6.7	3.6	.0	.6	65	38	2	96.6	7.1	3
Apr. 21-30.....	8,416	10	.05	8.0	3.5	3.8	1.5	37	6.7	3.0	.1	1.3	62	34	4	86.6	6.8	25

ROANOKE RIVER BASIN--Continued
 ROANOKE RIVER AT RANDOLPH, VA.--Continued

Chemical analyses, in parts per million, water year October 1951 to September 1952.--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg-nesium	Non-carbonate			
May 1-10, 1952.....	4,167	14	0.03	9.2	4.4	3.8	1.4	44	7.7	3.1	0.0	1.4	69	41	5	98.8	7.0	5
May 11-20.....	2,588	13	.03	10	3.4	3.4	1.6	41	7.5	2.8	.0	1.6	72	39	5	99.6	7.3	35
May 21-31.....	2,764	14	.03	9.9	4.0	4.2	1.6	44	8.0	3.4	.0	1.6	71	41	5	102	6.9	5
June 1-10.....	2,016	14	.02	9.6	4.8	4.5	1.6	47	8.1	3.6	.0	1.0	77	44	5	107	6.9	5
June 11-20.....	1,949	13	.00	9.7	4.3	5.5	1.7	50	8.0	4.1	.1	1.4	82	42	1	108	7.1	10
June 21-30.....	1,838	14	.10	8.6	4.0	4.9	1.9	45	8.0	3.8	.0	1.9	83	38	1	101	7.1	35
July 1-10.....	1,890	13	.00	8.8	3.8	5.1	1.8	48	8.0	4.2	.0	1.0	78	38	0	97.9	7.1	40
July 11-20.....	1,744	13	.00	8.7	4.0	4.9	1.9	44	11	3.9	.0	1.6	83	38	2	100	7.2	45
July 21-31.....	1,068	13	.00	9.8	4.7	6.1	1.9	52	9.9	4.8	.1	.9	69	44	1	113	7.2	10
Aug. 1-9, 18, 20.....	2,539	13	.05	10	4.5	6.6	2.4	54	9.1	5.9	.1	1.1	85	43	0	120	7.4	45
Aug. 10-17, 19, Sept. 2	6,683	12	.01	6.1	4.1	4.2	2.3	36	6.8	3.0	.2	.7	62	32	3	78.6	7.3	--
Aug. 21-31.....	2,427	14	.05	9.0	3.9	5.6	2.3	45	8.3	3.9	.2	1.4	72	39	2	99.0	7.5	70
Sept. 1, 3-10.....	6,773	13	.04	7.4	4.5	4.6	2.2	42	8.1	3.1	.2	1.4	65	37	3	92.5	7.5	55
Sept. 11, 20.....	1,676	15	.05	10	5.4	7.5	2.0	55	10	4.7	.2	.9	81	47	2	123	7.2	5
Sept. 21-30.....	1,565	13	.05	9.8	5.5	8.5	1.9	55	13	5.2	.2	.3	80	47	2	127	7.6	5
Average.....	3,518	13	0.13	9.2	4.1	5.6	1.8	45	9.3	4.3	0.1	1.2	75	40	3	106	--	21

ROANOKE RIVER BASIN--Continued

ROANOKE RIVER AT RANDOLPH, VA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	61	58	38	42	36	43	53	60	69		80	72
2	62	55	37	44	38	42	54	61	70		78	72
3	63	52	38	46	40	43	54	64	70		77	70
4	64	48	39	45	44	42	56	65	72		78	70
5	67	46	42	43	45	41	57	65	74		78	69
6	68	44	41	40	46	40	57	66	75		79	68
7	71	45	45	38	44	42	52	67	77		79	69
8	69	45	50	38	42	42	49	67	77		77	68
9	63	43	53	38	42	43	51	66	79		76	66
10	59	42	50	39	42	43	52	68	79		75	65
11	57	42	50	39	42	46	54	67	--		73	66
12	56	42	46	38	42	48	56	64	--		76	69
13	56	48	41	38	43	48	58	60	--		77	70
14	57	48	38	45	45	48	58	59	--		78	72
15	55	52	38	42	43	48	58	50	--		78	72
16	60	54	33	44	41	46	57	64	--		78	71
17	60	--	32	44	41	45	56	65	--		78	70
18	62	48	32	46	40	44	56	68	--		78	69
19	62	44	32	45	41	45	57	68	--		78	70
20	61	39	32	45	42	46	60	66	--		81	70
21	62	35	34	44	43	48	62	65	--		78	69
22	63	35	35	43	41	50	64	65	--		76	69
23	62	37	35	42	41	56	66	65	--		73	65
24	62	40	36	40	40	58	67	67	--		70	64
25	60	44	36	38	38	52	64	68	--		68	64
26	57	42	38	40	38	49	58	69	--		68	63
27	56	42	38	42	38	48	55	69	--		69	63
28	59	40	36	47	40	50	55	69	--		72	63
29	56	40	35	44	42	50	56	70	--		71	62
30	57	39	37	42	--	52	57	70	--		72	62
31	58	--	39	36	--	52	--	66	--		75	--
Average	61	44	39	42	41	47	57	65	--		76	68

ROANOKE RIVER BASIN--Continued
ROANOKE CREEK AT SAXE, VA.

LOCATION.--At gaging station at highway bridge, 500 feet northwest of Saxe, Charlotte County, and 4 miles upstream from mouth.
DRAINAGE AREA.--162 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1952.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium-magnesium	Non-carbonate			
Oct. 5, 1951	16	20	0.10	7.3	3.5	6.7		48	1.9	3.8	0.1	0.3	71	33	0	89.7	7.0	8
Nov. 14	55	20	.27	5.2	2.7	5.1	2.0	30	5.7	4.4		.2	.3	24	0	72.7	7.2	25
Dec. 12	53	20	.20	7.2	1.9	5.6	1.6	38	3.9	4.4	.2	.1	.1	26	0	80.7	7.7	18
Jan. 8, 1952	90	18	.20	6.0	2.3	4.9	1.2	30	5.6	3.9	.1	.1	.1	24	0	68.4	7.6	37
Feb. 5	830	9.9	.00	3.8	1.6	3.9		16	7.9	2.3	.0	.1	.1	16	3	49.2	7.5	50
Mar. 10	105	15	.10	4.4	2.7	5.9		29	6.1	3.0	.1	.4	.58	22	0	65.4	7.6	10
Apr. 9	87	16	.10	5.9	2.7	5.1	1.2	37	2.4	2.9	.0	.0	.0	26	0	73.6	7.4	5
May 12	132	16	.10	6.4	3.3	4.7		42	2.0	2.1	--	.3	--	30	0	75.9	7.3	5
June 19	42	23	.20	8.9	3.2	5.5		49	2.0	3.3	--	.6	--	35	0	91.9	7.6	10
July 19	26	21	.30	7.8	3.0	5.8		48	1.0	2.8	--	.2	--	32	0	85.7	7.6	10
Aug. 8	102	18	.40	6.4	2.5	5.4		37	3.0	3.1	--	.3	--	26	0	68.3	7.6	50
Sept. 10	35	21	.50	7.0	2.6	5.7		43	1.0	2.8	--	.4	--	28	0	75.8	7.1	24

ROANOKE RIVER BASIN--Continued
DAN RIVER AT SOUTH BOSTON, VA.

LOCATION.--At gaging station at Norfolk & Western Railway bridge at South Boston, Halifax County, 1 mile downstream from Lawsons Creek, 6 miles upstream from Banister River, and at mile 22.6.

DRAINAGE AREA.--2,730 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: April 1929 to March 1930, October 1950 to September 1952.

Water temperatures: October 1951 to September 1952.
EXTREMES, 1951-52.--Dissolved solids: Maximum, 85 ppm Oct. 1-31; minimum, 49 ppm Mar. 21-31, Sept. 1-10.

Hardness: Maximum, 28 ppm Oct. 1-31; minimum, 12 ppm July 9.
Specific conductance: Maximum daily, 140 micromhos Oct. 20; minimum daily, 35.6 micromhos July 9.

Water temperatures: Minimum, 34°F Dec. 19.
EXTREMES, 1929-30, 1950-52.--Dissolved solids: Maximum, 85 ppm Oct. 1-31, 1951; minimum, 45 ppm June 21-30, 1929, Apr. 11-20, 1951.

Hardness: Maximum, 29 ppm Nov. 21-30, 1929; minimum, 12 ppm July 9, 1952.
Specific conductance (1950-52): Maximum daily, 140 micromhos Oct. 20, 1951; minimum daily, 35.6 micromhos July 9, 1952.

REMARKS.--Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 1-31, 1951.....	684	17	0.08	6.7	2.8	14	2.3	56	4.8	6.1	0.2	0.8	85	28	0	117	7.6	8
Nov. 1-30.....	1,298	16	.30	5.2	2.3	11	1.9	42	4.9	5.4	.1	.7	73	22	0	92.9	7.2	30
Dec. 1-10.....	2,125	15	--	4.8	1.9	9.2	1.9	34	5.0	5.0	.2	1.7	75	20	0	85.6	7.3	12
Dec. 11-20.....	1,446	18	.20	4.9	2.0	9.2	1.9	38	5.0	5.0	.1	.8	70	20	0	86.1	7.3	14
Dec. 21-31.....	7,062	14	--	3.8	1.7	4.2	2.0	18	6.0	3.3	.2	2.1	62	16	2	56.5	7.1	8
Jan. 1-10, 1952.....	2,172	17	.32	4.8	1.9	6.5	2.0	29	5.3	4.3	.2	.7	65	20	0	72.9	7.2	32
Jan. 11-20.....	3,568	16	--	4.4	1.9	6.2	1.8	25	6.5	4.2	.2	1.6	76	19	0	70.1	7.3	14
Jan. 21-30.....	4,368	16	--	4.8	2.2	6.2	1.5	20	5.8	4.5	.2	1.8	74	21	0	71.7	7.2	12
Feb. 1-10.....	6,299	13	.11	4.5	1.6	5.2	1.5	21	6.4	4.5	.2	1.3	53	17	0	61.7	7.1	23
Feb. 11-20.....	2,489	15	.57	4.9	2.2	5.8	1.4	29	5.8	4.2	.1	.6	66	20	0	73.1	7.2	32
Feb. 21-29.....	2,127	13	.06	5.0	3.1	7.8	1.4	34	5.7	5.2	.2	.5	66	25	0	77.5	7.2	26
Mar. 1-10.....	7,890	12	.08	4.2	1.6	4.8	1.6	17	6.3	5.5	.3	.7	50	17	3	60.2	7.0	25
Mar. 11-20.....	7,228	13	.04	5.0	2.1	5.7	1.4	25	6.9	4.2	0	1.2	63	21	1	55.9	7.0	25
Mar. 21-31.....	10,181	12	.01	4.6	1.3	4.0	1.1	19	8.6	4.1	0	.2	49	17	1	51.5	6.9	7
Apr. 1-10.....	2,775	15	.10	4.0	2.5	5.5	1.0	27	6.1	3.9	0	1.0	57	20	0	64.1	7.3	12
Apr. 11-20.....	2,305	15	.11	5.0	1.8	5.9	1.0	29	6.7	3.2	0	1.0	59	20	0	66.0	7.6	26
Apr. 21-30.....	6,032	13	.14	5.4	1.6	5.3	1.0	25	8.4	3.0	0	1.2	60	20	0	62.2	7.4	45
May 1-10.....	3,081	15	.05	3.8	2.0	5.8	1.4	27	5.4	3.4	.1	.8	51	18	0	62.2	7.8	15
May 11-20.....	2,415	16	.08	4.6	2.2	5.9	1.4	29	5.4	3.4	.3	.9	56	21	0	65.6	7.0	25
May 21-31.....	3,591	15	.17	4.6	1.7	5.9	1.6	26	8.5	3.3	.2	1.1	66	18	0	63.8	7.3	80

ROANOKE RIVER BASIN--Continued
DAN RIVER AT SOUTH BOSTON, VA.--Continued

Chemical analyses, in parts per million, water year October 1951 to September 1952--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg./l.	Non-carbonate			
June 1-10, 1952	1,722	17	0.05	4.0	2.7	6.5	1.6	32	4.8	3.5	0.3	1.1	59	21	0	71.2	6.9	20
June 11-20	1,522	16	.11	4.8	2.2	9.7	1.7	35	5.8	5.1	.2	1.3	71	21	0	82.7	7.1	45
June 21-30	1,389	16	.14	5.0	2.7	8.8	2.0	34	7.0	4.6	.3	1.5	77	24	0	80.9	7.4	60
July 1-8, 10	1,374	15	.15	6.2	1.5	6.2	1.8	31	6.1	4.0	.0	1.7	71	22	0	73.2	7.2	50
July 9	7,570	6.9	--	2.9	1.2	--	--	13	9.0	--	--	2.1	--	12	2	35.6	6.2	--
July 11-16, 18-20	1,223	16	.24	4.7	2.5	6.7	1.9	29	7.5	4.0	.1	1.9	74	22	0	72.2	7.0	65
July 17	1,390	17	--	4.6	2.4	--	--	40	4.0	13	--	1.1	--	21	0	120	6.9	--
July 21-31	1,105	15	.00	4.9	2.1	9.5	2.0	37	6.0	5.0	.0	1.9	73	21	0	85.4	7.2	90
Aug. 1-10	2,546	12	.00	3.9	1.7	5.9	2.0	24	6.0	3.7	.1	2.0	57	17	0	82.9	6.9	100
Aug. 11-15, 17-20	2,499	13	.00	4.2	1.4	6.8	2.0	26	7.0	4.3	.1	1.7	64	16	0	87.0	7.0	--
Aug. 16	1,310	15	--	4.4	1.9	13	--	36	7.0	7.1	--	.9	--	19	0	93.1	7.0	--
Aug. 21-31	1,509	15	.00	4.9	2.0	8.7	1.9	36	4.0	4.4	.0	1.5	71	20	0	81.8	7.1	100
Sept. 1-10	6,558	7.1	.00	3.8	1.8	4.9	1.9	23	4.0	3.1	.1	1.3	49	17	0	57.9	6.7	--
Sept. 11-20	1,287	7.6	.00	4.9	2.2	9.6	1.8	37	3.0	5.7	.2	1.1	70	21	0	87.9	7.0	10
Sept. 21-25, 27-30	1,250	8.1	.00	5.6	2.1	9.4	1.9	41	3.6	5.6	.1	1.0	77	23	0	91.9	7.1	8
Average	3,012	14	--	4.8	2.1	7.7	1.7	32	5.8	4.5	0.1	1.1	67	21	0	76.5	--	36

ROANOKE RIVER BASIN--Continued

DAN RIVER AT SOUTH BOSTON, VA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	73	63	43	41	41	41	54					73
2	66	59	41	39	37	41	54					73
3	68	57	45	50	39	41	55					73
4	70	52	43	46	39	39	55					73
5	70	50	46	46	39	39	57					73
6	73	48	48	48	39	39	59					72
7	73	48	48	43	41	39	54					72
8	70	48	50	37	39	43	54					72
9	64	46	55	39	39	43	54					72
10	61	46	55	43	39	--	55					68
11	59	46	52	43	41	50	57					70
12	59	46	48	45	41	50	59					73
13	59	48	45	41	43	50	61					73
14	59	52	43	43	43	50	62					75
15	61	55	45	41	41	46	61					77
16	63	61	37	46	41	44	59					75
17	63	57	36	43	39	46	61					75
18	64	50	36	48	39	46	61					73
19	64	46	34	48	39	48	61					75
20	64	43	41	48	39	50	62					73
21	64	41	36	48	41	50	64					73
22	64	43	37	48	41	54	66					73
23	63	43	39	46	41	57	68					68
24	66	46	37	45	41	57	68					66
25	63	48	37	41	39	54	70					66
26	59	45	39	45	39	52	61					--
27	59	50	41	46	37	50	59					66
28	63	45	39	52	37	52	59					66
29	61	43	37	45	39	52	61					64
30	61	41	39	48	--	52	57					64
31	61	--	37	43	--	52	--					--
Average	64	49	42	45	40	48	60					71

ROANOKE RIVER BASIN--Continued
ROANOKE RIVER AT BUGGS ISLAND, VA.

LOCATION.-- At gaging station 0.8 mile downstream from John H. Kerr Dam, 1.9 miles upstream from Allens Creek, 4.8 miles upstream from bridge on U. S. Highway 1, 6.7 miles southeast of Boynton, Mecklenburg County, and at mile 177.9.
DRAINAGE AREA.--7,780 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952.
REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180 °C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25 °C)	pH	Color
														Calcium	Non-carbonate			
Oct. 3, 1951	1,700	13	0.02	9.7	3.6	16		58	15	7.2	0.2	0.7	94	39	0	142	7.1	2
Nov. 13	3,100	15	.31	6.5	2.9	7.6	2.1	39	7.1	5.2	.1	.6	72	28	0	92.1	7.3	26
Dec. 11	4,400	16	.02	6.6	2.0	7.1	2.1	30	7.6	5.2	.2	1.7	69	25	0	84.1	7.5	38
Jan. 8, 1952	5,810	16	.15	6.9	2.6	7.0	1.5	34	6.8	5.2	.2	1.3	71	28	0	88.1	7.6	22
Feb. 7	30,000	11	.08	6.4	2.6	3.4		22	9.5	4.0	.0	.1	73	26	8	76.7	7.2	35
Mar. 11	9,000	15	.04	7.3	1.8	4.4	1.4	31	7.7	3.3	.1	.3	68	26	0	67.4	7.3	65
Apr. 10	6,720	14	.01	7.6	4.0	4.9	1.4	40	7.0	4.0	.1	.8	62	35	3	87.3	7.6	10
May 13	6,300	14	.10	6.5	3.5	5.3		39	5.0	3.1	--	1.7	--	31	0	83.2	7.4	5
June 18	4,000	16	.06	8.2	3.1	6.2		40	6.0	4.7	--	1.2	--	33	0	94.1	7.4	10
July 17	1,900	9.4	.10	6.1	2.0	10		29	16	2.9	--	.9	--	23	0	67.9	7.4	100
Aug. 5	2,500	11	.10	7.2	3.1	9.8		41	10	4.7	--	1.6	--	31	0	92.7	7.1	100
Sept. 15	1,750	9.0	.10	6.0	2.3	10		28	18	2.7	--	1.1	--	24	1	66.7	7.3	100

ROANOKE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ROANOKE RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg-nessium	Non-carbonate			
Dec. 6, 1951.....	3,450	16	0.02	9.1	2.9	12		51	8.2	6.8	0.2	0.1	82	35	0	126	7.1	35
Apr. 22, 1952.....	6,570	13	.15	9.8	2.6	5.6		42	6.0	4.2	.1	.7	67	35	1	94.8	7.3	

ROANOKE RIVER NEAR SCOTLAND NECK

READY BRANCH NEAR WILLIAMSTON

Oct. 25, 1951.....	2.44							28	3	8.8				26	3	89.8	6.5	
Sept. 11, 1952.....	2.56							22	5	7.5				20	2	84.2	6.9	

PAMLICO RIVER BASIN
MISCELLANEOUS ANALYSES OF STREAMS IN PAMLICO RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- nesium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO ₃		Specific conduct- ance (micro- mhos at 25°C)	pH	Color
														Calcium mag- nesium	Non- carbon- ate			
SWIFT CREEK NEAR RED OAK																		
Oct. 17, 1951	26.6							27	3	4.2				18	0	68.6	6.6	
Sept. 10, 1952	80.7							25	4	4.0				18	0	80.0	7.1	
GRINDLE CREEK AT PACTOLUS																		
Oct. 25, 1951	2.85							27	14	9.2				31	9	132	6.5	
Sept. 11, 1952	4.51							23	30	9.2				33	14	134	6.7	
DURHAM CREEK AT EDWARD																		
Oct. 26, 1951	2.18							4	2	5.8				9	6	35.3	5.2	
Sept. 10, 1952	0.17							240	1	5.5				189	0	387	7.0	

NEUSE RIVER BASIN

SWIFT CREEK NEAR VANCEBORO, N. C.

LOCATION --At gaging station on left bank at bridge on county road 2 1/2 miles upstream from bridge on State Highway 118, 2 1/2 miles downstream from Clayroot Drainage Area, 182 square miles, Craven County.

RECORDS AVAILABLE --Chemical analyses: October 1951 to September 1952.

Water temperatures --October 1951 to September 1952: Maximum, 69 ppm Mar. 1-10.

EXTREMES 1951-52 --Dissolved solids: Minimum, 24 ppm Mar. 1-10.

Hardness: Maximum, 70 ppm Oct. 1-10; minimum, 24 ppm Mar. 1-10.

Water temperatures: Maximum, 87°F July 29; minimum, 43°F Nov. 22.

REMARKS --Monthly station water, year 1950-51, daily station water year 1951-52. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		pH	Color	Oxygen consumed	
														Calcium, meq/l.	Non-carbonate, meq/l.			Unfiltered	Filtered
Oct. 1-10, 1951	6.84	10	0.10	23	3.1	23	2.8	76	13	30	0.2	0.4	149	70	8	6.9	29	6.7	5.6
Oct. 11-20	9.10	12	.08	23	2.4	30		76	12	40	.1	.7	169	67	5	6.9	32	7.2	6.6
Oct. 21-31	9.69	11	.10	22	2.3	21		77	10	26	.1	.2	143	64	1	7.1	31	7.6	6.7
Nov. 1-10	157	10	.07	14	4.2	6.3		33	17	14	.2	1.2	98	52	25	6.8	45	8.8	7.6
Nov. 11-20	81.8	11	.08	12	1.7	8.6		22	19	12	.1	.8	90	37	19	6.7	50	9.8	8.2
Nov. 21-30	30.7	14	.15	14	2.0	12		40	16	14	.0	.6	101	43	10	6.8	33	9.0	6.5
Dec. 1-10	39.1	14	.14	14	2.1	12		40	14	16	.0	.6	104	44	11	6.7	40	8.6	7.1
Dec. 11-20	47.5	13	.14	14	2.3	10		39	14	14	.1	.7	99	44	12	7.0	40	9.4	6.5
Dec. 21-31	100	12	.39	10	1.7	8.9	1.5	23	15	12	.1	.5	87	32	13	6.6	40	12	6.7
Jan. 1-10, 1952	112	11	.06	11	1.7			25	15	12	.0	1.2	86	34	14	7.0	35	9.0	6.3
Jan. 11-20	139	11	.06	9.9	1.6	9.1		20	15	13	.1	1.6	83	32	16	6.6	40	6.3	5.6
Jan. 21-31	138	11	.06	10	1.7			21	15	12	.1	1.1	82	32	15	6.5	30	8.3	7.0
Feb. 1-10	200	9.9	.07	12	1.7	5.6		18	15	12	.1	2.1	83	37	22	6.9	25	13	6.3
Feb. 11-20	177	9.5	.11	11	2.0	5.2		16	13	11	.1	1.6	79	36	20	6.9	25	13	7.3
Feb. 21-29	613	7.7	.27	8.0	1.4	6.3		14	13	8.8	.1	2.0	72	26	14	6.8	33	13	7.6
Mar. 1-10	1,000	8.4	.06	6.9	1.7	4.5		9	13	7.6	.1	2.6	66	24	17	6.5	40	12	7.0
Mar. 11-20	249	8.0	.07	7.9	1.6	6.9		13	15	10	.1	1.0	73	26	16	6.1	26	15	7.2
Mar. 21-31	249	7.7	.07	8.4	1.5	7.1		15	13	11	.0	1.5	75	27	15	6.4	30	18	7.5
Apr. 1-10	116	7.1	.11	10	1.9	8.7	1.0	24	13	11	.0	1.2	79	33	13	6.4	25	11	8.4
Apr. 11-20	68.0	9.0	.24	13	1.9	11		35	13	15	.1	.5	97	40	12	7.2	40	6.0	5.5
Apr. 21-30	258	10	.20	13	2.1			33	14	17	.1	.8	108	42	14	6.5	40	8.4	7.0
May 1-10	166	14	.48	10	2.2	9.2		23	16	12	.1	1.3	103	34	15	6.5	40	6.8	6.8
May 11-20	192	9.4	.13	11	1.3	5.9		17	13	12	.1	1.3	89	33	19	6.3	35	9.6	6.2
May 21-31	150	11	.69	12	1.2	5.5		23	11	11	.1	1.1	86	35	16	6.5	40	9.0	7.3

NEUSE RIVER BASIN--Continued
 SWIFT CREEK NEAR VANCEBORO, N. C.--Continued
 Chemical analyses, in parts per million, water year October 1951 to September 1952--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		pH	Color	Oxygen consumed	
														Calcium, mg-nestum	Non-carbonate			Undiluted	Filtrated
June 1-10, 1952	132	11	0.18	11	1.7	10		29	13	13	0.1	1.6	94	34	11	6.5	40	9.0	7.6
June 11-20	36.9	12	.18	15	1.7	19.2		33	14	12	.1	1.0	99	29	12	6.7	35	8.4	6.2
June 21-30	11	10	.10	15	2.1	18		48	14	12	.0	1.0	184	46	7	6.9	40	8.8	7.1
July 1-10	9.85	10	.21	16	2.4	18	1.8	50	13	23	.0	1.2	125	50	9	6.5	33	13	6.9
July 11-20	5.66	9.5	.12	15	2.2	21		44	11	31	.1	1.3	129	46	10	6.7	45	18.2	6.1
July 21-31	10.4	8.1	.08	13	2.0	20		37	14	27	.1	1.5	116	41	10	6.9	35	14	5.2
Aug. 1-10	39.3	7.9	.10	8.8	1.9	9.7		20	14	12	.1	1.9	82	28	12	6.6	45	11	5.9
Aug. 11-20	13.5	8.9	.11	10	1.7	13		27	13	16	.1	2.0	94	32	10	6.9	35	9.8	6.5
Aug. 21-31	22.0	8.3	.44	9.8	1.4	12		25	11	17	.1	1.1	90	30	10	6.2	23	8.9	6.2
Sept. 1-10	21.9	10	.25	11	1.7	12		25	12	18	.1	1.1	100	34	14	6.2	23	9.9	7.8
Sept. 11-20	10.2	10	.22	13	2.0	31		41	12	43	.1	1.3	147	41	7	6.7	40	9.4	6.2
Sept. 21-30	143	11	.10	11	1.8	10	1.4	19	19	13	.1	1.0	98	35	19	6.3	55	14	12
Average	132	10	0.16	12	1.9	12		31	14	17	0.1	1.2	99	38	13	--	36	10	6.9

NEUSE RIVER BASIN--Continued

SWIFT CREEK NEAR VANCEBORO, N. C.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	66	49	59	47	61	68	70	74	80	79	77
2	64	63	50	60	52	61	70	71	74	77	76	77
3	66	60	51	63	57	60	68	72	74	75	72	77
4	68	66	52	57	61	60	69	70	75	75	81	75
5	68	55	57	57	63	60	73	71	76	76	78	72
6	68	53	58	55	57	60	68	73	75	72	78	70
7	72	60	66	50	58	59	65	75	76	71	78	71
8	72	59	63	46	53	57	65	73	78	76	79	71
9	68	54	64	48	55	57	65	73	77	78	80	70
10	65	--	59	56	55	59	66	74	77	76	78	70
11	66	53	59	53	58	66	69	74	77	77	78	71
12	60	55	55	50	58	65	71	72	75	77	80	71
13	60	56	52	53	59	64	76	69	74	77	81	73
14	62	60	49	55	59	65	73	67	74	77	80	73
15	63	53	57	59	55	64	71	68	75	76	80	73
16	67	54	48	60	55	57	68	77	67	77	79	74
17	65	54	44	48	60	55	64	74	78	78	78	76
18	66	54	44	55	51	58	66	74	79	78	78	75
19	67	50	47	57	55	62	69	74	78	79	78	76
20	64	45	46	54	56	64	71	74	80	79	77	75
21	67	45	56	58	60	68	64	74	80	80	76	73
22	66	43	59	56	59	74	72	74	81	83	76	71
23	66	48	52	53	59	75	75	73	80	83	77	68
24	66	52	44	58	55	72	75	75	80	82	73	67
25	67	54	54	54	56	68	75	75	81	80	71	67
26	64	54	57	61	56	65	74	75	82	77	70	69
27	62	55	53	65	55	63	75	75	83	78	70	65
28	65	53	49	66	55	65	67	74	82	80	72	64
29	64	53	50	60	59	65	79	74	82	87	74	65
30	62	50	52	52	--	65	--	74	81	82	75	65
31	63	--	56	45	--	65	--	73	--	82	76	--
Average	65	54	53	55	56	63	70	72	78	78	76	71

NEUSE RIVER BASIN--Continued

TRENT RIVER NEAR TRENTON, N. C.

LOCATION--At gaging station at Free Bridge on first road crossing Trent River upstream from N. C. Highway 12, about 800 feet downstream from Little Chinquapin Branch, 2.5 miles southwest of Phillips Crossroads, and 6 miles west of Trenton, Jones County.

DRAINAGE AREA--168 square miles.

RECORDS AVAILABLE--Chemical analyses: October 1951 to September 1952.

Water temperatures: October 1951 to September 1952. Oct. 1-10 21-31; minimum, 59 ppm Mar. 1-10.

EXTREMES, 1951-52.--Dissolved solids--31; Maximum, 125 ppm Mar. 1-10.

Hardness: Maximum, 99 ppm Oct. 5-7; minimum, 23 ppm Mar. 1-10.

Acidity: Maximum, 55.7; minimum, 38.7; Feb. 1.

REMARKS--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233. No appreciable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
														Calcium	Non-carbonate				Unfiltered	Filtered
Oct. 1-10, 1951.....	7.37	8.6	0.08	35	1.9	5.7	1.1	106	10	7.1	0.1	1.1	128	95	8	213	7.2	28	6.2	5.4
Oct. 11-20.....	5.60	5.0	0.07	34	1.9	5.2	5.2	104	8.9	5.9	1.1	1.1	120	93	7	209	7.2	19	6.1	5.0
Oct. 21-31.....	3.62	5.5	0.03	36	2.3	2.3	2.3	103	10	6.1	1.1	6	128	99	15	223	7.4	16	5.2	4.6
Nov. 1-10.....	153	5.3	0.11	27	1.6	4.9	4.9	75	13	6.5	1.1	2	109	74	12	175	6.8	55	9.5	8.1
Nov. 11-20.....	200	7.7	0.15	16	1.4	4.4	4.4	33	17	7.0	1.1	4	93	46	19	133	6.8	90	16	15
Nov. 21-30.....	44.6	9.4	0.13	22	1.6	5.1	5.1	57	14	7.8	0	5	105	62	15	147	6.8	75	13	9.5
Dec. 1-10.....	95.5	8.7	0.20	17	1.6	12	12	64	11	7.8	0	4	93	49	0	133	6.8	50	13	12
Dec. 11-20.....	101	9.2	0.20	14	1.6	4.3	4.3	36	9.4	8.0	0	3	88	42	12	113	6.8	70	17	14
Dec. 21-31.....	171	8.6	0.09	12	1.5	2.4	2.4	29	5.7	8.0	0	3	75	36	12	95.1	6.7	70	14	12
Jan. 1-10, 1952.....	95.7	7.9	0.09	14	1.2	4.6	1.3	34	7.6	8.8	0	5	79	40	12	102	7.6	70	12	9.4
Jan. 11-20.....	91.2	7.6	0.18	12	1.7	5.6	5.6	36	7.7	8.0	0	5	77	37	7	101	6.9	60	11	10
Jan. 21-31.....	140	7.2	0.16	12	1.4	5.8	5.8	36	7.1	7.8	0	4	76	36	6	95.7	6.7	70	14	12
Feb. 1-10.....	243	7.4	0.15	11	1.4	2.7	2.7	25	6.6	8.2	0	2	72	33	13	84.4	6.7	70	13	12
Feb. 11-20.....	280	5.6	0.17	11	1.2	4.6	4.6	31	6.4	7.2	0	2	70	32	7	84.8	6.8	100	12	11
Feb. 21-29.....	587	4.9	0.18	8.0	1.1	3.7	3.7	20	6.0	6.8	0	2	61	24	8	66.4	6.6	100	13	12
Mar. 1-10.....	687	4.0	0.16	7.4	1.1	3.4	3.4	18	6.4	6.2	0	2	59	23	8	60.7	6.3	100	16	12
Mar. 11-20.....	314	4.0	0.08	9.7	1.1	4.5	4.5	26	6.7	7.1	0	4	63	29	7	78.2	6.7	80	16	11
Mar. 21-31.....	357	3.4	0.14	10	1.0	2.8	2.8	34	5.2	6.8	0	5	65	29	9	77.2	6.6	80	19	14
Apr. 1-10.....	162	3.5	0.20	12	1.3	4.8	4.8	32	5.4	6.8	0	5	70	35	9	91.2	6.9	80	19	13
Apr. 11-20.....	65.7	4.3	0.32	16	1.4	4.4	4.4	46	5.8	7.5	1	8	85	48	8	115	7.2	65	11	9.5
Apr. 21-30.....	52.7	4.7	0.39	21	1.4	2.0	2.0	56	7.3	6.0	1	5	95	58	12	135	7.4	60	14	9.7
May 1-10.....	90.6	6.4	0.27	17	2.5	3.5	3.5	44	7.3	8.8	1	4	100	49	13	114	6.8	90	8.6	8.4
May 11-20.....	71.6	7.1	0.31	17	2.5	2.4	2.4	59	6.7	7.2	1	5	86	44	12	104	6.7	90	11	11
May 21-31.....	115	7.3	0.34	13	1.3	2.4	2.4	35	4.9	6.0	1	5	80	36	9	92.6	6.7	110	13	13

June 1-10.....	39.2	6.9	.22	18	1.5	2.3	51	3.8	6.4	.0	1.4	93	51	9	125	7.2	90	14	11
June 11-20.....	22.7	7.2	.20	22	1.7	2.2	63	4.6	6.4	.0	1.6	107	62	10	141	6.8	110	16	15
June 21-30.....	9.03	6.7	.11	30	2.2	5.5	91	11	6.1	.0	1.5	122	84	9	188	7.3	37	8.0	7.9
July 1-10.....	14.0	5.7	.14	29	2.2	5.2	85	9.2	6.2	.0	.9	111	81	12	182	7.4	27	10	6.5
July 11-20.....	24.1	8.5	.16	22	2.0	3.1	57	13	6.5	.0	.6	104	63	16	149	7.0	45	12	9.0
July 21-31.....	9.10	8.3	.23	27	2.1	3.6	76	12	6.2	.0	.3	117	76	14	179	7.1	45	12	9.1
Aug. 1-10.....	6.95	7.5	.10	28	2.4	3.7	84	10	5.5	.0	.8	116	80	11	183	6.6	23	8.5	6.7
Aug. 11-20.....	17.7	9.1	.18	24	2.1	4.1	70	11	5.8	.0	.7	109	69	11	160	6.8	32	11	9.1
Aug. 21-31.....	16.8	8.3	.19	27	1.9	3.4	73	13	6.2	.0	.7	114	75	15	173	6.7	33	10	7.9
Sept. 1-10.....	11.8	7.4	.19	29	1.9	2.5	79	11	6.2	.0	.8	116	80	15	179	6.7	33	8.5	7.7
Sept. 11-20.....	6.56	6.7	.14	32	2.0	3.3	92	11	5.5	.0	.8	121	88	13	195	6.8	22	6.5	6.1
Sept. 21-30.....	65.7	8.4	.20	26	2.1	5.0	65	18	6.2	.0	1.1	117	74	20	172	6.8	55	15	11
Average.....	117	6.7	0.17	20	1.6	4.2	55	8.9	6.8	0.0	0.6	95	56	11	135	--	65	12	10

SOUTH ATLANTIC SLOPE BASINS

NEUSE RIVER BASIN--CONTINUED

TRENT RIVER NEAR TRENTON, N. C.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	65	45	50	38	50	58	62	69	75	82	79
2	68	65	46	55	40	50	60	62	71	75	81	80
3	68	65	47	55	50	48	58	62	70	75	79	79
4	68	55	48	55	50	48	58	62	69	76	80	80
5	68	55	53	55	55	48	60	62	69	75	81	78
6	70	55	53	50	50	48	60	63	69	75	80	77
7	71	58	55	45	50	48	55	63	70	75	80	75
8	71	55	58	45	45	46	55	64	80	76	80	76
9	70	55	60	45	45	45	55	65	80	76	80	76
10	65	55	60	45	45	45	55	68	80	75	80	70
11	65	50	60	45	48	55	58	68	78	75	80	76
12	60	50	55	45	48	55	63	65	75	75	80	76
13	60	55	53	45	49	54	62	65	72	75	80	76
14	60	55	50	45	50	54	62	65	72	75	80	77
15	63	60	55	48	46	55	62	65	75	75	80	75
16	65	60	40	50	45	48	58	66	75	75	79	75
17	65	60	40	50	50	45	58	66	76	76	80	75
18	65	55	40	50	45	45	58	70	76	76	78	76
19	65	50	45	50	45	50	58	69	78	80	80	75
20	65	45	40	50	47	55	60	66	78	80	80	75
21	65	45	45	50	50	55	60	68	78	80	81	75
22	65	45	50	51	48	55	60	68	78	83	80	75
23	65	45	50	55	49	68	65	69	78	83	75	70
24	65	50	45	45	48	68	65	68	79	80	76	68
25	68	50	50	45	45	70	65	68	79	81	70	68
26	65	50	50	49	45	55	65	69	79	80	71	69
27	64	50	50	55	42	55	64	69	82	85	71	68
28	65	49	45	55	45	55	64	70	82	80	72	67
29	65	48	45	50	48	55	64	70	79	81	75	68
30	65	48	45	45	--	55	64	69	79	81	75	68
31	64	--	50	45	--	55	--	69	--	81	79	--
Average	66	53	49	49	46	52	60	66	76	77	78	74

NEUSE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN NEUSE RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)	pH	Color	
														Calcium, mg-nestum	Non-carbonate				
LOWER BARTON CREEK NEAR BAYLEAF																			
Feb. 12, 1952.....	8.76							52	1	3.2					21	0	62.7	6.6	
Sept. 9.....	6.24							33	2	3.0					24	0	66.9	6.9	
HORSE CREEK NEAR WAKE FOREST																			
Feb. 12, 1952.....	16.1							28	2	3.0					16	0	57.6	6.6	
Sept. 9.....	12.1							29	2	2.8					16	0	59.8	6.9	
MINE CREEK NEAR MILLBROOK																			
Feb. 12, 1952.....	5.10							21	1	3.0					12	0	49.3	6.4	
Sept. 8.....	3.62							23	1	3.0					16	0	50.7	6.8	
BIG BRANCH NEAR MILLBROOK																			
Feb. 12, 1952.....	2.17							28	1	4.0					17	0	64.3	6.4	
Sept. 8.....	1.08							33	1	3.8					22	0	66.7	6.9	
STONY CREEK AT GOLDSBORO																			
Oct. 27, 1951.....	1.80							13	5	7.2					18	7	69.8	6.5	
Sept. 9, 1952.....	2.95							12	10	7.2					15	5	67.2	6.4	
FALLING CREEK AT FALLING CREEK																			
Oct. 27, 1951.....	5.64							21	3	6.2					17	0	70.9	7.1	
Sept. 9, 1952.....	4.81							12	8	6.2					15	5	63.9	7.1	
NAHUNTA SWAMP NEAR SNOW HILL																			
Oct. 25, 1951.....	8.38							15	2	7.2					13	1	64.9	6.3	
Sept. 11, 1952.....	14.5							14	5	6.5					16	5	68.0	6.5	
CORE CREEK NEAR FORT BARNWELL																			
Oct. 27, 1951.....	2.70							145	4	6.2					118	0	251	7.4	
Sept. 11, 1952.....	2.23							106	4	5.8					94	7	214	7.0	

CAPE FEAR RIVER BASIN

REEDY FORK NEAR GIBSONVILLE, N. C.

LOCATION --At bridge near Ruffines Mill on county road a quarter of a mile upstream from gaging station, 1.5 miles upstream from Buffalo Creek, and about 6 miles northwest of Gibsonville, Guilford County.

DRAINAGE AREA--33 square miles. Records available--Chemical analyses: October 1951 to September 1952.

Water temperature--October 1951 to September 1952. Oct. 21-31: minimum, 42 ppm Mar. 1-10, 11-20.

EXTREMES 1951-52--Dissolved solids: Maximum, 69 ppm Oct. 21-31; minimum, 2 ppm Mar. 1-10, 11-20.

Hardness: Maximum, 30 ppm Oct. 21-31; minimum, 2 ppm Mar. 1-10, 11-20.

Water temperatures: Maximum, 88° F. June 27; minimum, 38° F. Feb. 26.

REMARKS --Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233. No appreciable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		pH	Color	Oxygen consumed	
														Calcium	Non-carbonate			Unfiltered	Filtered
Oct. 1-10, 1951.....	8.46	21	0.03	6.8	2.8	5.0	1.7	43	2.6	2.6	0.3	0.3	65	28	0	83.4	7	4.0	3.0
Oct. 11-20.....	6.70	21	0.03	6.8	2.9	6.5		44	2.6	2.6	0.3	0.3	65	28	0	82.9	13	4.0	2.6
Oct. 21-31.....	8.60	22	0.06	7.4	2.8	8.0		43	6.1	3.5	0.2	0.2	69	30	0	85.2	20	4.7	3.6
Nov. 1-10.....	16.0	20	0.03	5.5	2.1	7.8		35	4.2	3.9	0.2	0.2	62	22	0	77.0	23	5.2	4.0
Nov. 11-20.....	16.5	21	0.05	6.0	2.1	6.8		31	5.7	4.5	0.2	0.2	64	24	0	82.5	7.1	4.5	3.7
Nov. 21-30.....	16.4	22	0.03	5.5	2.5	6.5		34	4.9	4.8	0.2	0.2	62	24	0	77.4	7.2	3.0	3.2
Dec. 1-10.....	41.8	18	0.04	5.2	2.2	5.2		26	6.0	3.6	1	0.4	58	22	1	74.8	6.7	4.8	3.8
Dec. 11-20.....	28.1	16	0.02	4.6	2.1	5.0		23	6.4	3.6	0	0.5	56	20	1	69.8	6.6	5.8	3.8
Dec. 21-31.....	35.1	13	0.02	4.1	1.8	4.7		19	6.4	3.4	1	0.7	48	18	2	63.3	6.6	4.6	3.3
Jan. 1-10, 1952.....	92.3	15	0.05	4.4	1.8	4.2	1.8	23	6.7	3.8	1	0.9	52	18	0	64.6	7.1	8	4.1
Jan. 11-20.....	173	14	0.04	4.0	1.7	6.0		20	7.8	3.4	1	0.5	50	17	1	60.3	7.1	28	3.8
Jan. 21-31.....	227	13	0.03	4.2	1.6	4.9		20	5.9	3.0	2	0.6	48	17	7	57.3	6.3	5.4	4.0
Feb. 1-10.....	256	14	0.03	4.1	1.6	3.6		16	6.4	2.9	2	0.4	46	17	4	57.5	6.9	6	3.1
Feb. 11-20.....	101	15	0.07	4.8	1.7	4.5		22	5.4	3.0	2	0.4	49	19	1	60.5	7.1	7	4.3
Feb. 21-28.....	114	13	0.07	4.0	1.8	5.9		25	5.1	2.6	2	0.2	47	17	0	56.3	7.1	6	2.6
Mar. 1-10.....	672	9.5	0.28	3.0	1.2	5.5		18	5.3	2.4	2	0.2	42	12	0	47.8	6.9	8	3.5
Mar. 11-20.....	287	13	0.08	3.6	1.7	4.9		20	5.6	2.6	2	0.4	42	16	0	53.7	6.4	13	4.3
Mar. 21-31.....	479	10	0.04	4.3	1.6	4.0		19	5.1	3.0	2	0.6	45	17	2	53.3	6.5	10	3.4
Apr. 1-10.....	91.8	11	0.06	4.6	1.5	4.5	1.0	23	4.4	2.6	1	0.3	46	18	0	56.1	6.9	4	3.2
Apr. 11-20.....	63.8	13	0.06	4.9	1.9	5.5		29	4.0	2.2	2	0.5	50	20	0	63.0	7.5	4	3.4
Apr. 21-30.....	163	13	0.11	5.6	1.8	5.2		29	3.9	2.8	2	0.3	52	21	0	63.6	7.4	10	4.3
May 1-10.....	99.1	15	0.48	6.0	2.2	5.7		34	3.6	2.8	2	0.3	62	24	0	73.5	7.1	30	2.8
May 11-20.....	44.5	15	0.29	5.9	2.6	5.5		37	2.8	2.4	2	0.2	58	25	0	74.7	6.5	12	2.3
May 21-31.....	65.8	16	0.09	5.8	2.5	4.8		35	2.6	2.2	1	0.5	57	25	0	73.7	6.6	5	2.6

June 1-10.....	40.0	17	.08	7.5	2.2	5.9	40	2.9	2.6	.2	.6	64	28	0	79.4	6.9	10	3.1	3.0
June 11-20.....	24.4	19	.08	6.7	2.8	6.7	43	2.9	2.6	.2	.5	64	28	0	81.8	6.9	25	2.7	2.7
June 21-30.....	22.4	17	.20	6.6	2.6	6.3	42	2.7	2.2	.1	.5	63	27	0	81.3	6.9	19	3.6	2.6
July 1-10.....	19.5	18	.10	7.0	2.7	5.4	40	2.6	2.5	.2	.6	63	29	0	81.7	7.1	17	4.3	3.2
July 11-20.....	12.8	13	.09	7.0	2.8	6.5	42	2.1	2.4	.2	.6	63	29	0	83.2	7.1	27	--	--
July 21-31.....	10.8	20	.09	6.8	2.6	6.2	42	2.9	2.4	.2	.6	66	28	0	86.2	7.3	20	3.4	2.6
Aug 1-10.....	78.5	16	.26	6.2	2.6	5.8	37	3.5	3.0	.1	.4	66	26	0	79.5	7.2	20	4.9	4.2
Aug 11-20.....	29.8	14	.05	5.7	2.4	4.3	31	3.7	2.2	.1	.9	57	24	0	70.2	6.6	8	--	3.8
Aug 21-31.....	91.4	13	.12	4.6	1.9	4.1	25	3.4	1.8	.1	.7	51	19	0	59.1	6.6	9	--	4.4
Sept 1-10.....	252	17	.13	4.8	2.0	4.6	28	3.4	2.1	.1	.5	55	20	0	63.5	6.6	10	--	4.0
Sept 11-20.....	30.0	20	.26	5.6	2.6	4.6	34	3.0	2.2	.1	.3	59	25	0	72.2	6.7	45	4.0	3.7
Sept 21-30.....	80.5	18	.10	5.3	2.3	3.5	28	4.1	2.5	.1	.5	61	23	0	65.3	6.7	18	5.2	4.5
Average.....	115	16	0.10	6.4	2.1	5.5	30	4.3	2.8	0.7	0.4	56	22	0	69.9	--	15	4.4	3.4

CAPE FEAR RIVER BASIN--Continued

REEDY FORK NEAR GIBSONVILLE, N. C.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	59	59	55	61	45	57	66	72	79	79	74
2	63	55	57	--	60	43	59	67	73	78	77	73
3	67	51	56	54	58	44	55	67	74	79	76	75
4	67	48	55	57	55	45	59	67	75	80	78	71
5	69	47	54	59	51	46	60	71	77	79	79	72
6	70	45	60	62	48	45	56	70	78	77	80	73
7	72	47	68	64	45	46	57	71	79	76	82	72
8	68	47	74	62	43	45	55	70	81	78	80	71
9	67	45	70	59	48	46	57	71	84	75	79	70
10	69	45	65	57	49	45	57	70	80	72	80	68
11	69	45	54	56	49	49	60	65	78	79	79	74
12	59	47	56	57	49	52	61	63	74	81	80	73
13	58	45	60	56	45	49	63	64	76	80	82	71
14	57	52	62	55	46	47	60	65	75	79	83	70
15	58	56	64	57	44	46	57	69	76	81	80	69
16	60	58	62	62	46	45	58	70	79	85	78	71
17	62	60	60	66	45	47	59	72	80	85	79	70
18	60	65	61	64	44	52	61	73	81	80	78	71
19	59	65	63	66	43	49	64	69	82	81	80	72
20	60	68	60	65	45	56	66	66	81	85	80	73
21	64	52	55	64	46	59	60	68	83	84	85	72
22	64	55	56	66	45	56	58	70	81	83	83	73
23	65	55	58	67	43	54	55	69	83	82	81	71
24	64	60	59	70	41	55	54	70	84	83	80	--
25	62	62	61	68	39	57	56	69	86	86	81	69
26	60	64	64	66	38	58	58	70	87	84	79	71
27	61	66	65	64	40	56	59	68	88	85	78	72
28	61	68	66	67	45	57	62	69	86	83	76	73
29	58	64	63	68	47	54	55	70	82	82	75	75
30	59	61	60	60	--	55	54	72	78	84	74	77
31	59	--	57	64	--	54	--	73	--	80	75	--
Average	63	55	61	62	46	50	58	68	80	80	79	71

CAPE FEAR RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN CAPE FEAR RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)	pH	Color
														Calcium, magnesium, sodium	Non-carbonate			
DEEP RIVER NEAR SANFORD																		
Jan. 8, 1952 a.....		16	0.03	4.9	1.9	8.5		22	7.7	8.5	0.0	0.6	59	20	2	74.9	7.0	90
Jan. 8 b.....		15	.04	6.3	1.7	9.2		27	8.1	7.8	.1	1.2	62	23	1	102	7.1	80
ROCKFISH CREEK NEAR RAEFORD																		
Oct. 25, 1951.....	50.8							5	1	1.5				4	0	14.4	5.8	
Sept. 8, 1952.....	71.1							2	1	2.2				4	2	12.9	5.8	
TURNBULL CREEK NEAR ELIZABETHTOWN																		
Nov. 1, 1951.....	2.77							4	1	5.2				6	3	36.4	5.2	
Sept. 9, 1952.....	28.2							c.4	1	5.5				4	4	58.3	4.1	
LIVINGSTON CREEK NEAR ACME																		
Oct. 1, 1951.....	8.85							67	8	7.0				67	12	154	6.7	
Oct. 31.....	1.25							79	8	7.8				76	11	176	7.2	
Sept. 10, 1952.....	15.0							27	5	8.5				34	12	96.2	6.9	
HOOD CREEK NEAR LELAND																		
Oct. 1, 1951.....	6.30							20	1	6.2				22	6	60.3	6.3	
Oct. 31.....	.87							46	1	6.8				43	5	103	6.7	
Sept. 10, 1952.....	.26							44	2	7.5				44	8	108	6.7	

a Collected at bridge on U. S. Highway 421.

b Collected at bridge on U. S. Highway 15.

c Acidity as H⁺ 4 parts per million.

LOCKWOODS FOLLY BASIN
MISCELLANEOUS ANALYSES OF STREAMS IN LOCKWOODS FOLLY BASIN IN NORTH CAROLINA
Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- nesium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO ₃		Specific conduct- ance (micro- mhos at 25°C)	pH	Color	
														Calcium, mag- nesium	Non-carbon- ate				
PINCH GUT CREEK NEAR BOLIVIA																			
Oct. 1, 1951	9.43							42	1	7.8					43	9	101	6.5	
Nov. 1	1.96							173	1	11					141	0	299	7.5	
Sept. 10, 1952	2.19							77	1	8.5					73	10	155	7.1	

PEE DEE RIVER BASIN

YADKIN RIVER AT YADKIN COLLEGE, N. C.

LOCATION.--At bridge on U. S. Highway 64, 80 feet upstream from gaging station, which is 1½ miles south of Yadkin College, Davidson County, and 6¼ miles downstream from Reedy Creek.

DRAINAGE AREA.--2,280 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: October 1943 to September 1944, October 1950 to September 1951.

Water temperatures: October 1943 to September 1944, October 1950 to September 1951.

Sediment records: January 1951 to September 1952.

EXTREMES, 1951-52.--Sediment concentrations: Maximum daily, 2,970 ppm May 26; minimum daily, 6 ppm Nov. 23, 26, 28.

Sediment loads: Maximum daily, 81,800 tons Mar. 12; minimum daily, 15 tons Oct. 8.

EXTREMES, 1943-44, 1950-52.--Dissolved solids: Maximum, 85 ppm Nov. 1-10, 1950; minimum, 32 ppm Mar. 21-31, 1944.

Hardness: Maximum, 17 ppm Oct. 1-10, 1943, Oct. 1-10, 1950, Sept. 11-20, 1951; minimum, 10 ppm July 11-20, 1944.

Water temperatures: Maximum, 87°F June 18, 1944; minimum, freezing point Feb. 4, 5, 1951.

Sediment concentrations: Maximum daily, 2,970 ppm May 26, 1952; minimum daily, 6 ppm Nov. 23, 26, 28, 1951.

Sediment loads: Maximum daily, 81,800 tons Mar. 12, 1952; minimum daily, 15 tons Oct. 8, 1951.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233.

Suspended sediment, water year October 1951 to September 1952

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-----	902	18	44	1,230	28	93	1,230	8	27
2-----	895	20	48	3,590	516	s 5,240	1,230	6	20
3-----	925	18	45	2,950	872	4,560	1,230	7	23
4-----	880	14	33	2,100	276	1,570	1,310	11	39
5-----	838	13	29	1,610	137	597	7,670	1,110	s 30,200
6-----	810	14	31	1,430	64	247	6,080	1,070	s 18,200
7-----	817	10	22	1,390	48	180	3,050	751	6,180
8-----	803	7	15	2,360	155	s 940	2,350	282	1,660
9-----	1,030	24	67	2,200	174	1,030	2,200	205	1,220
10-----	918	16	40	1,660	102	456	1,920	104	540
11-----	838	50	113	1,480	48	184	1,740	86	310
12-----	859	22	51	1,390	32	120	1,660	54	242
13-----	831	12	27	1,350	21	77	1,560	60	253
14-----	845	10	23	1,310	25	88	1,520	48	197
15-----	831	10	22	1,480	27	108	1,520	44	181
16-----	852	10	23	1,660	44	197	1,880	76	386
17-----	852	11	25	1,560	34	143	1,740	46	216
18-----	852	12	28	1,480	30	120	1,560	38	160
19-----	838	8	18	1,430	26	100	1,920	113	586
20-----	845	12	27	1,350	16	58	2,500	174	1,170
21-----	810	12	26	1,310	12	42	12,200	944	s 37,200
22-----	845	16	36	1,270	10	34	20,800	750	s 42,900
23-----	880	12	29	1,270	6	21	8,580	468	s 10,900
24-----	940	12	30	1,270	10	34	4,360	380	s 4,510
25-----	1,030	22	61	1,270	8	27	3,350	81	732
26-----	1,070	22	64	1,350	6	22	2,950	59	470
27-----	1,070	20	58	1,350	14	51	2,750	113	840
28-----	1,030	14	39	1,310	6	21	2,500	132	891
29-----	1,010	16	44	1,270	7	24	2,250	54	329
30-----	1,030	16	44	1,230	8	27	2,150	47	273
31-----	1,030	15	42	--	--	--	2,100	42	238
Total--	28,066	--	1,200	47,910	--	16,400	109,860	--	161,000

s Computed by subdividing day.

SOUTH ATLANTIC SLOPE BASINS

PEE DEE RIVER BASIN--Continued

YADKIN RIVER AT YADKIN COLLEGE, N. C.--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

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-----	2,060	47	261	2,950	126	1,000	2,850	156	120
2-----	2,020	41	224	2,450	86	591	3,150	186	1,580
3-----	1,970	49	261	3,880	282	s 3,960	3,150	110	934
4-----	1,880	52	264	16,200	950	s 41,800	14,400	1,080	s 41,500
5-----	1,920	42	218	14,700	650	s 27,100	11,800	492	s 16,200
6-----	1,880	38	193	6,620	384	s 6,880	5,300	380	5,430
7-----	1,880	32	182	4,550	267	3,270	3,950	190	2,020
8-----	1,790	20	97	3,750	210	2,130	3,250	194	1,700
9-----	1,840	30	149	3,350	186	1,680	2,850	138	1,060
10-----	5,140	714	s 9,830	2,950	104	829	2,650	70	502
11-----	4,970	354	4,750	2,750	82	610	11,500	1,260	s 41,200
12-----	3,450	213	1,980	2,500	54	364	22,600	1,340	s 81,800
13-----	2,650	108	772	2,350	280	1,780	13,300	533	s 18,200
14-----	2,300	59	367	2,350	60	381	5,780	426	6,640
15-----	2,200	44	261	2,500	58	392	4,550	248	3,050
16-----	2,060	37	206	2,350	65	413	4,050	209	2,280
17-----	1,970	40	213	2,650	90	643	3,650	196	1,930
18-----	1,880	40	203	2,750	62	459	3,350	105	950
19-----	1,790	26	128	2,450	74	489	5,400	382	s 6,180
20-----	1,790	18	87	2,300	81	502	8,440	634	s 14,800
21-----	1,740	24	113	2,200	44	261	4,970	328	4,400
22-----	1,740	42	197	2,150	45	261	4,250	183	2,100
23-----	2,020	40	218	2,060	42	234	6,840	367	s 8,030
24-----	2,020	36	196	2,100	36	204	21,300	866	s 48,400
25-----	1,840	46	229	2,200	48	286	24,200	479	s 31,300
26-----	1,790	18	87	2,200	216	1,280	9,980	360	s 9,700
27-----	1,880	24	112	2,150	41	238	6,260	352	5,940
28-----	4,090	375	s 5,030	2,250	34	207	5,080	210	2,890
29-----	8,960	611	s 14,800	2,150	21	122	4,150	292	3,270
30-----	5,780	466	7,260	--	--	--	4,050	126	1,380
31-----	3,650	240	2,370	--	--	--	3,750	114	1,160
Total--	82,950	--	65,600	105,910	--	98,300	230,800	--	234,660
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-----	3,650	122	1,200	4,050	128	1,400	2,400	104	675
2-----	3,750	185	1,670	3,650	103	1,020	2,250	92	559
3-----	3,550	98	940	3,350	84	759	2,150	120	697
4-----	3,250	72	632	3,050	72	594	2,150	79	459
5-----	3,050	76	626	2,850	60	462	2,650	100	716
6-----	3,150	67	570	2,750	70	518	2,150	274	1,590
7-----	3,150	66	562	2,650	52	373	1,880	332	1,680
8-----	2,950	58	462	2,500	54	364	1,970	92	489
9-----	2,850	44	338	2,650	46	329	1,920	80	416
10-----	2,750	46	340	2,950	472	3,750	1,920	85	440
11-----	2,750	42	313	4,150	200	2,240	1,920	93	483
12-----	2,650	68	486	5,420	1,100	s 16,100	1,840	84	418
13-----	2,750	46	340	3,550	1,080	10,300	1,840	71	354
14-----	5,080	437	s 9,230	2,850	329	2,530	1,880	57	289
15-----	8,030	1,520	s 33,700	2,550	130	896	2,020	56	305
16-----	4,150	937	10,500	2,500	78	526	2,550	120	826
17-----	3,450	246	2,290	2,350	76	483	2,300	524	3,270
18-----	3,150	182	1,380	2,250	72	437	3,510	1,000	s 11,500
19-----	2,950	101	805	3,150	133	1,130	2,550	1,660	s 11,800
20-----	2,850	72	554	3,350	812	7,340	1,920	486	2,520
21-----	2,750	94	697	3,050	619	5,100	1,740	217	1,020
22-----	2,750	70	518	2,650	163	1,170	2,400	250	1,520
23-----	2,550	48	329	2,400	93	602	1,970	942	4,480
24-----	2,500	58	392	2,250	102	621	1,790	312	1,510
25-----	4,510	571	s 7,850	6,300	2,310	s 48,700	1,660	148	664
26-----	8,180	799	s 18,200	4,550	2,970	36,400	1,520	105	432
27-----	9,120	716	s 17,700	3,450	686	6,400	1,480	78	310
28-----	8,830	460	s 11,000	2,650	570	4,080	1,350	61	222
29-----	6,880	270	s 5,020	2,350	208	1,320	1,350	44	160
30-----	4,860	206	2,700	2,350	151	958	1,790	80	386
31-----	--	--	--	2,500	132	891	--	--	--
Total--	122,840	--	131,000	97,070	--	158,000	60,820	--	50,300

s Computed by subdividing day.

PEE DEE RIVER BASIN--Continued

YADKIN RIVER AT YADKIN COLLEGE, N. C.--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

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-----	1,560	258	1,090	2,450	1,130	7,480	8,900	1,200	s 26,500
2-----	1,520	114	467	2,060	755	4,210	4,140	892	9,960
3-----	1,430	118	456	3,830	730	7,560	2,550	402	2,780
4-----	1,310	96	340	2,650	1,100	7,880	2,300	186	1,160
5-----	1,270	54	185	1,700	709	3,270	1,840	156	775
6-----	1,350	48	175	2,220	422	2,530	1,610	125	543
7-----	1,700	152	697	5,300	1,410	s 20,200	1,560	66	278
8-----	1,520	65	267	3,750	1,410	14,300	1,480	62	248
9-----	1,560	114	481	3,150	740	6,290	1,390	58	218
10-----	1,560	178	751	3,050	452	3,730	1,390	47	176
11-----	1,480	82	327	2,850	598	4,590	1,350	46	168
12-----	1,350	42	153	1,880	436	2,210	1,310	52	184
13-----	1,230	26	86	1,560	178	751	1,230	40	133
14-----	1,230	29	96	1,430	106	410	1,270	33	113
15-----	1,520	376	1,540	1,520	158	648	1,310	38	134
16-----	1,920	186	964	1,560	376	1,580	1,270	33	113
17-----	2,350	1,560	9,910	1,880	190	964	1,310	39	138
18-----	1,880	349	1,770	1,790	277	1,340	1,270	33	113
19-----	1,520	453	1,860	1,520	170	700	1,230	30	100
20-----	1,480	302	1,210	2,690	671	s 5,320	1,270	46	158
21-----	1,350	110	400	5,070	1,360	s 24,100	1,480	50	200
22-----	1,150	98	305	4,790	1,680	s 22,100	1,560	152	640
23-----	1,070	57	165	3,150	932	7,940	1,390	72	270
24-----	1,110	258	772	2,100	333	1,890	1,310	44	156
25-----	985	69	183	1,790	254	1,230	1,230	29	96
26-----	1,180	31	99	1,560	142	599	1,190	19	61
27-----	1,740	989	4,640	1,390	97	384	1,110	28	84
28-----	1,310	519	1,840	1,520	101	416	1,110	36	108
29-----	1,030	116	321	1,840	124	616	1,110	30	90
30-----	1,110	162	486	2,350	208	1,320	1,070	24	69
31-----	1,500	128	518	2,650	284	s 2,440	--	--	--
Total-	44,275	--	32,600	77,050	--	15,900	52,540	--	45,600
Total discharge for year (cfs-days)									1,060,031
Total load for year (tons)									1,010,560

s Computed by subdividing day.

PEE DEE RIVER BASIN--Continued

YADKIN RIVER AT YADKIN COLLEGE, N. C.--Continued

Particle-size analyses of suspended sediment, December 1951 to August 1952

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Suspended sediment										Methods of analysis			
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Dec. 5, 1951.....	7:15 p. m.	11,800	1,850	1,850	20	34	53	71	93							BN
Jan. 29, 1952.....	7:10 a. m.	9,220	739	739	33	42	52	63	68							BN
Feb. 4.....	2:10 p. m.	18,400	1,070	1,070	17	27	36	49	74		69					BN
Feb. 4.....	5:55 p. m.	19,900	913	913	19	31	45	60	85							BN
Mar. 4.....	2:55 p. m.	17,500	1,040	1,040	39	49	61	71	77							BN
Mar. 5.....	7:00 a. m.	14,200	599	599	38	46	57	68	74							BN
Mar. 11.....	2:00 p. m.	20,800	2,000	2,000	35	48	59	75	80							BN
Mar. 12.....	2:00 p. m.	24,300	1,070	1,070	18	33	50	66	95							BN
Mar. 25.....	2:10 a. m.	27,800	523	523	45	52	61	74	79							BN
Apr. 15.....	7:20 a. m.	9,610	2,230	2,230	32	49	64	81	97							BN
May 25.....	2:15 p. m.	9,350	3,580	3,580	40	57	71	88	97							BN
May 26.....	6:30 a. m.	4,450	3,040	3,040	36	53	67	83	97							BN
July 17.....	7:10 a. m.	2,450	1,600	1,600	45	72	88	96	99							BN
July 27.....	8:00 a. m.	2,150	960	960	52	72	85	94	98							BN
Aug. 2.....	7:25 a. m.	2,250	746	746	48	71	85	94	98							BN
Aug. 4.....	7:15 a. m.	2,850	1,080	1,080	43	69	87	95	98							BN
Aug. 7.....	8:07 a. m.	5,080	1,750	1,750	28	49	70	83	90							BN
Aug. 7.....	1:00 p. m.	5,660	1,450	1,450	32	49	71	90	98							BN
Aug. 21.....	7:00 p. m.	7,920	2,750	2,750	23	42	59	78	91							BN

LOCATION.--At gaging station at bridge on N. C. Highway 27, 2½ miles upstream from Stony Run, and 8 miles southwest of Albemarle, Stanly County.
 DRAINAGE AREA.--71.6 square miles.
 RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg./l.	Non-carbonate			
Oct. 15, 1951	1.9	11	0.03	6.8	2.7	6.1	2.2	33	5.8	6.2	0.0	0.2	61	28	1	88.4	6.5	20
Nov. 15	6.1	9.6	.10	5.9	2.9	7.1		32	5.5	7.0	.0	.4	60	27	0	89.2	7.4	25
Dec. 17	6.1	12	.21	5.8	3.0	6.8		27	6.6	8.6	.0	.5	60	27	5	90.5	7.3	18
Jan. 15, 1952	31	11	.04	4.6	2.3	5.5	1.0	17	6.8	7.8	.1	2.0	51	21	7	79.9	7.2	20
Feb. 15	46	10	.08	4.0	2.0	5.1		16	6.4	5.9	.1	1.3	44	18	5	63.4	6.6	10
Mar. 15	94	10	.08	3.3	1.7	4.9		14	6.1	5.0	.1	.9	40	15	4	54.2	6.7	15
Apr. 15	28	10	.04	3.6	1.7	4.9	.4	21	3.6	4.5	.1	.4	41	16	0	60.5	6.6	6
May 19	7.0	13	.03	4.5	2.0	6.1		28	3.3	4.0	.1	.5	49	19	0	65.4	6.8	4
June 18	44	4.8	.11	7.4	2.9	4.7		8	8.1	5.4	.1	22	82	30	24	94.8	5.7	7
July 15	.9	7.9	.10	6.4	2.8	5.0	.9	34	4.1	5.0	.1	1.0	55	27	0	87.3	6.4	17
Aug. 18	6.7	6.8	.12	4.4	1.9	3.7		17	6.1	4.0	.0	1.1	43	19	5	60.5	6.5	9
Sept. 15	3.6	13	.07	4.6	2.1	5.4	.7	26	4.3	5.5	.2	.3	52	20	0	69.1	6.8	8

PEE DEE RIVER BASIN--Continued

LYNCHEES RIVER AT EFFINGHAM, S. C.

LOCATION --At bridge on U. S. Highway 52, 75 feet upstream from Atlantic Coast Line Railroad bridge and 1 mile south of Effingham, Florence County.
 DRAINAGE AREA --1,030 square miles approximately.
 RECORDS AVAILABLE --Chemical analyses October 1951 to September 1952.

REMARKS --Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		pH	Color	Oxygen consumed	
														Calcium, mg-nestum	Non-carbonate			Unfiltered	Filtered
Oct. 31, 1951	148	7.9	0.05	2.0	0.5	3.3	0.9	10	2.0	3.4	0.1	0.4	28	7	0	6.6	55	4.2	3.4
Nov. 29	272	8.6	.14	1.7	.9	3.6	.8	8	2.9	4.2	.0	.3	34	8	1	36.6	25	4.8	4.2
Dec. 29	822	10	.08	2.4	1.2	5.1	6	6	7.7	6.5	.0	.3	50	11	6	54.8	30	8.4	6.3
Jan. 30, 1952	685	9.7	.14	2.8	1.0	4.8	1.4	7	5.8	8.1	.0	.2	54	11	5	51.3	30	9.0	8.2
Feb. 29	1,060	8.2	.04	5.0	1.7	5.4	.9	9	12	7.8	.0	.4	54	20	12	53.8	26	6.4	5.8
Mar. 31	2,580	6.7	.22	2.8	1.0	4.0	.6	8	5.2	5.5	.0	.2	48	11	5	48.3	5.9	11	9.1
Apr. 30	1,240	7.8	.15	3.0	.9	4.9	.6	11	3.5	5.8	.0	.2	50	11	2	46.8	6.1	14	11
May 23	577	8.4	.16	3.3	1.1	1.9	.9	9	3.8	3.6	.0	.6	43	13	5	37.7	6.0	6.4	5.8
June 30	469	8.4	.16	3.3	1.2	4.3	.6	13	4.1	5.0	.0	.7	49	13	3	49.2	6.2	30	8.9
Aug. 14	801	10	.19	2.4	.9	3.8	.7	8	4.2	4.1	.0	.8	46	10	3	42.0	6.1	25	11
Aug. 29	948	8.5	.06	4.8	1.5	2.4	.6	9	9.1	4.5	.0	.3	54	18	11	64.3	6.7	55	9.0
Sept. 30	844	10	.44	2.4	.8	4.4	.6	9	2.5	6.1	.0	.5	52	9	2	48.2	5.9	95	20

PEE DEE RIVER BASIN--Continued
 MISCELLANEOUS ANALYSES OF STREAMS IN PEE DEE RIVER BASIN IN NORTH CAROLINA
 Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg-nesium	Non-carbonate			
ELK CREEK AT ELKVILLE																		
Oct. 4, 1951	21.7								18	1	1.2			11	0	35.4	7.4	
July 24, 1952	21.2								20	1	.8			11	0	35.7	7.1	
MIDDLE FORK REDDIES RIVER AT WILBAR																		
Oct. 4, 1951	10.0								13	3	1.2			10	0	31.9	6.8	
July 28, 1952	10.0								12	1	1.0			9	0	25.0	7.0	
ROARING RIVER NEAR ROARING RIVER																		
Oct. 29, 1951	76.9								14	1	1.5			11	0	33.6	6.4	
Aug. 14, 1952	91.1								17	2	1.0			11	0	33.5	6.8	
LITTLE RIVER NEAR STAR																		
Oct. 29, 1951	7.92								46	1	2.5			24	0	69.7	6.7	
Sept. 9, 1952	50.6								25	2	2.5			18	0	52.2	6.8	
CARTLEDGES CREEK NEAR ROCKINGHAM																		
Oct. 27, 1951	0.87								48	1	6.0			28	0	97.1	7.8	
Sept. 10, 1952	24.5								12	2	4.0			12	2	39.2	6.6	
FALLING CREEK NEAR ROCKINGHAM																		
Oct. 26, 1951	3.54								4	1	2.5			7	4	17.8	5.6	
Sept. 10, 1952	7.94								2	1	2.5			3	1	18.3	5.2	
SOUTH FORK JONES CREEK NEAR MORVEN																		
Oct. 27, 1951	0.56								29	1	6.2			20	0	73.8	6.8	
Sept. 10, 1952	31.6								14	1	6.5			14	3	56.7	6.5	

PEE DEE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN PEE DEE RIVER BASIN IN NORTH CAROLINA--Continued

Chemical analyses, in parts per million, water year October 1951 to September 1952--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
SHOEHEEL CREEK NEAR LAURINEBURG																		
Oct. 25, 1951	21.3								4	1	3.5			6	3	27.9	5.8	
Sept. 9, 1952	63.5								2	1	3.8			8	6	29.8	5.3	
DROWNING CREEK NEAR JACKSON SPRINGS																		
Oct. 26, 1951	12.4								5	1	2.2			6	2	25.7	6.3	
Sept. 10, 1952	38.7								5	1	3.5			5	1	20.2	6.2	
LUMBER RIVER NEAR PEMROKE																		
Oct. 25, 1951	149								6	1	2.8			6	1	23.1	6.0	
Sept. 9, 1952	768								2	1	3.0			5	3	26.5	4.9	
BIG RAFT SWAMP NEAR LUMBERTON																		
Oct. 25, 1951	5.85								7	3	5.0			10	4	47.0	6.0	
Sept. 27, 1952	44.6								4	4	6.5			16	13	50.4	5.4	
MITCHELL RIVER NEAR MOUNTAIN PARK																		
Oct. 29, 1951	23.2	11	0.04	1.8	0.9	2.3		12	1.2	1.4	0.0	0.1	25	8	0	26.0	7.1	4
Sept. 5, 1952	30.6							14	1	1.2				13	2	24.4	6.6	
STEWART CREEK NEAR MOUNT AIRY																		
Oct. 3, 1951	41.2							15	1	1.2				14	2	35.1	6.7	
Sept. 5, 1952	106							18	1	1.5				17	2	38.2	6.8	
MUDDY CREEK NEAR CLEMONS																		
Oct. 3, 1951	13.7							51	3	2.5				39	0	97.1	7.1	
July 22, 1952	23.7							46	4	2.5				35	0	89.9	7.1	
SECOND CREEK NEAR BARBER																		
Oct. 10, 1951	19.1							51	5	2.5				35	0	104	7.0	
July 22, 1952	22.5							48	5	2.0				36	0	101	6.9	

PEE DEE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN PEE DEE RIVER BASIN IN SOUTH CAROLINA

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg./nestum	Non-carbonate			
PEE DEE RIVER NEAR SOCIETY HILL																		
Dec. 12, 1951.....	26,180	9.5	0.02	4.4	1.7	8.5	26	6.2	5.5	0.1	1.0	1.0	53	18	0	78.0	6.5	17
May 15, 1952.....	26,850	11	.09	3.7	1.5	4.5	17	4.9	3.6	.1		1.0	42	15	1	55.5	6.4	10
PEE DEE RIVER AT PEEDEE																		
Dec. 12, 1951.....	5,090	9.8	0.12	4.1	1.5	10	25	6.5	6.9	0.2	0.6	0.6	56	16	0	83.8	6.6	15
May 15, 1952.....	8,380	10	.06	3.6	1.3	6.0	19	5.6	3.4	.1	1.1	1.1	44	14	0	52.8	7.1	11
LYNCHEES RIVER NEAR BISHOPVILLE																		
Dec. 12, 1951.....	295	11	0.04	2.6	0.9	2.5	6	4.5	4.2	0.0	0.2	0.2	37	10	5	39.6	6.0	35
May 15, 1952.....	411	8.6	.13	1.6	.8	4.1	8	3.7	3.9	.0	.5	.5	34	7	1	37.1	5.6	16

Instantaneous discharge.

a Instantaneous discharge.

SANTÉE RIVER BASIN

INDIAN CREEK NEAR LABORATORY, N. C.

LOCATION.--At bridge on county road, half a mile downstream from gaging station, 1 mile upstream from mouth, about 1½ miles south of Laboratory, Lincoln County, and 3¼ miles south of Lincolnton.

DRAINAGE AREA.--88.4 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233. No appreciable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 15, 1951	19	12	0.02	3.6	1.6	3.6	1.2	25	2.7	2.2	0.1	0.4	41	16	0	55.6	6.9	12
Nov. 15	33	14	.02	3.8	1.5	4.6		24	2.5	2.2	.1	.1	2	16	0	51.1	7.0	7
Dec. 15	61	12	.02	3.7	1.6	4.0		21	3.5	2.2	.0	.7	40	16	0	51.8	6.6	15
Jan. 15, 1952	72	13	.06	3.4	1.4	3.1	1.3	19	2.7	2.6	.2	.8	39	14	0	49.4	7.5	3
Feb. 15	74	13	.02	3.2	1.4	4.1		19	2.8	2.4	.1	.6	36	14	0	46.8	6.3	11
Mar. 15	113	11	.03	2.7	1.2	4.0		16	3.0	2.5	.1	.6	33	12	0	42.9	6.4	8
Apr. 15	77	12	.05	3.4	1.5	3.0	.9	20	2.0	2.0	.1	.4	36	15	0	50.1	6.8	5
May 15	48	13	.04	3.8	1.6	3.8		22	2.8	1.9	.1	.7	40	16	0	48.1	6.7	2
June 15	54	13	.12	4.4	1.6	3.7		23	2.9	1.9	.1	1.1	44	18	0	52.1	6.6	4
July 15	26	13	.04	4.0	1.7	3.4	.8	25	1.6	2.5	.1	.7	41	17	0	51.6	6.9	1
Aug. 15	59	14	.19	4.1	1.6	5.0		24	3.3	2.5	.1	1.1	43	17	0	56.4	6.4	23
Sept. 15	95	14	.14	4.2	1.7	3.6	1.2	24	1.9	2.1	.1	.5	44	18	0	54.2	6.6	10

Santee River Basin--Continued

North Pacolet River at Fingerville, S. C.

LOCATION.--At gaging station at McMillin Mill, about 400 feet downstream from Obed Creek, and 1 mile south of Fingerville, Spartanburg County.
DRAINAGE AREA.--116 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952.

REMARKS.--Discharge records for water year October 1951 to September 1952 given in Water-Supply Paper 1233.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		pH	Color	Oxygen consumed	
														Calcium	Non-carbonate			Unfiltered	Filtered
Oct. 15, 1951.....	68	15	0.04	4.5	1.7	6.7	0.9	38	2.2	1.8	0.0	0.2	52	18	0	69.3	16	3.2	1.5
Nov. 15	107	15	.03	3.0	1.1	14		44	3.1	2.1	.1	.1	58	12	0	77.0	7	3.4	2.2
Dec. 15	180	12	.05	2.6	1.3	7.8		27	3.0	2.1	.1	.6	45	12	0	60.7	60	4.6	2.2
Jan. 15, 1952.....	174	14	.08	2.8	1.2	7.5	2.2	29	2.6	3.6	.1	.4	48	12	0	60.7	4	3.6	1.9
Feb. 15	176	14	.10	3.2	1.3	4.2		20	2.5	2.1	.1	.4	38	13	0	45.6	7	2.4	1.2
Mar. 17	300	13	.03	2.6	1.1	4.0		16	2.7	2.2	.1	.5	33	11	0	38.5	6.8	1	1.2
Apr. 16	250	12	.18	3.0	1.2	6.7	.8	23	2.7	3.5	.1	.5	44	12	0	49.4	6.4	4	1.4
May 18	158	15	.08	3.6	1.4	3.7		22	2.3	1.4	.0	.5	41	15	0	46.4	6.5	6	2.6
June 16	140	14	.08	3.1	1.6	6.1		26	2.6	2.0	.0	1.0	46	14	0	53.8	6.8	6	2.5
July 28	93	15	.16	3.8	1.5	4.9	.8	27	1.9	1.9	.1	.7	44	16	0	56.5	6.7	45	3.8
Aug. 30	134	16	.04	4.0	1.6	6.6		30	2.6	2.0	.1	.6	54	17	0	68.5	6.7	22	3.1
Sept. 16	100	15	.10	4.0	1.6	5.8	.7	31	2.1	2.1	.1	.5	46	17	0	60.8	7.0	12	1.9

SANTEE RIVER BASIN--Continued

SANTEE RIVER NEAR PINEVILLE, S. C.

LOCATION.--At gaging station 3.0 miles upstream from Dead River, 3.3 miles downstream from Lake Marion Dam, and 6.7 miles west of Pineville, Berkeley County.

DRAINAGE AREA.--14,700 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
														Calcium, mg./l.	Non-carbonate				Unfiltered	Filtered
Oct. 16, 1951	492	12	0.05	5.2	2.0	9.3	1.7	32	7.0	7.2	0.2	0.5	64	21	0	80.1	6.9	33	3.2	3.0
Nov. 15	492	11	.09	4.6	1.5	10	8.5	31	6.0	5.0	.2	.6	56	18	0	76.4	7.2	8	4.6	3.8
Dec. 15	528	11	.09	4.0	1.9	8.5		28	5.8	4.6	.2	.3	54	18	0	72.2	7.1	10	5.4	2.4
Jan. 15, 1952	545	9.4	.06	3.6	1.4	6.1	1.9	21	6.5	4.1	.1	.8	46	15	0	67.3	6.9	8	3.7	2.8
Feb. 15	594	6.0	.05	4.2	1.6		7.6	24	6.2	4.5	.1	1.1	46	17	0	76.4	6.6	5	3.0	2.7
Mar. 15	12,200	8.7	.10	3.6	1.6		6.3	20	6.3	3.8	.1	.9	44	16	0	63.3	7.0	6	4.2	2.8
Apr. 15	1,050	8.7	.04	3.8	1.4	4.8	1.0	18	5.0	3.4	.0	.8	43	15	0	52.5	6.5	10	5.8	4.1
May 15	671	8.1	.10	4.6	1.6		5.6	24	5.5	3.0	.1	.5	49	18	0	60.8	6.5	6	3.5	1.4
June 16	671	7.0	.10	4.5	1.6		5.8	25	4.2	3.6	.0	.6	45	18	0	65.1	6.4	4	3.8	2.8
July 15	726	9.2	.05	4.8	1.8	6.0	.8	29	3.3	3.6	.2	.6	49	19	0	70.1	6.4	5	4.0	2.9
Aug. 15	545	11	.02	5.6	1.5		6.6	30	5.1	3.0	.2	.5	54	22	0	71.3	6.6	2	2.2	2.0
Sept. 15	528	11	.03	3.9	1.4	6.7	.9	24	4.0	3.9	.2	.8	50	16	0	66.0	6.3	23	3.8	2.4

SANTÉE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN SANTÉE RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)	pH	Color
														Calcium, non-magnesium	Non-carbonate			
SILVER CREEK NEAR GLEN ALPINE																		
Oct. 9, 1951	11.6							24	1	1.2				15	0	45.0	7.1	
July 23, 1952	12.6							22	1	1.0				14	0	41.5	7.4	
JOHNS RIVER AT COLLETTSVILLE																		
Oct. 17, 1951	17.7							15	1	1.2				11	0	32.7	6.6	
July 23, 1952	27.9							17	1	1.0				13	0	32.8	7.0	
LOWER CREEK AT LENOIR																		
Oct. 17, 1951	5.97							32	2	1.8				24	0	66.4	6.8	
July 23, 1952	5.13							41	1	2.0				28	0	77.3	7.1	
LYLE CREEK AT CATAWBA																		
Oct. 9, 1951	21.6							37	3	2.5				27	0	79.7	6.9	
May 5, 1952	67.5							36	1	2.0				22	0	69.0	6.9	
Sept. 3	60.6							33	5	2.8				33	0	67.3	7.1	
DAVIDSON CREEK NEAR CORNELIUS																		
Oct. 10, 1951	2.52							48	3	2.8				35	0	93.5	7.3	
May 14, 1952	13.6							49	2	2.5				36	0	97.5	6.8	
DUTCHMANS CREEK NEAR STANLEY																		
Oct. 10, 1951	13.6							37	2	2.0				26	0	74.7	6.9	
May 14, 1952	59.5							96	1	2.0				25	0	70.2	7.0	
JACOB FORK NEAR STARTOWN																		
Oct. 9, 1951	38.4							17	2	1.5				17	3	38.8	6.4	
May 6, 1952	129							14	1	1.5				10	0	28.1	6.5	

SANTÉE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN SANTÉE RIVER BASIN IN SOUTH CAROLINA

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg-nessum	Non-carbonate			
WATEREE RIVER NEAR CAMDEN																		
Jan. 11, 1952	6,820	8.1	0.06	4.2	1.8	11		31	7.7	5.0	0.1	0.8	62	18	0	87.7	6.8	10
May 14	4,630	7.8	.06	3.9	1.6	6.0		22	5.1	3.6	.1	.8	40	16	0	63.3	6.5	9
BUFFALO CREEK NEAR BLACKSBURG																		
Oct. 15, 1951	b 50.6	14	0.02	4.0	1.5	7.8		26	2.6	6.4	0.0	0.2	50	16	0	69.7	6.6	6
Jan. 8, 1952	a 131	15	.02	4.0	1.6	8.0		22	4.1	7.5	.1	1.0	53	17	0	69.4	7.0	17
Apr. 22	a 164	14	.11	3.0	1.2	5.9		21	2.6	3.4	.0	.8	42	12	0	54.9	6.4	3
June 23	a 96.1	15	.04	3.6	1.3	6.8		21	3.7	4.9	.1	1.1	46	14	0	66.2	6.4	22
BROAD RIVER NEAR GAFFNEY																		
Dec. 17, 1951	1,190	13	0.06	2.7	1.0	6.6		20	2.1	3.8	0.2	0.9	40	11	0	51.3	6.9	8
June 23, 1952	1,360	15	.10	2.9	1.3	4.7		19	2.5	2.5	.1	1.2	41	13	0	48.3	7.1	21
KINGS CREEK AT KINGS CREEK																		
Oct. 15, 1951	a 12.1	15	0.04	12	3.3	17		87	4.7	3.0	0.2	0.2	97	44	0	157	7.1	7
Apr. 22, 1952	a 40.1	13	.07	14	3.2	8.8		72	4.3	2.6	.0	.1	81	46	0	129	7.2	3
BULLOCK CREEK NEAR SHARON																		
Oct. 15, 1951	a 9.55	23	0.02	7.1	2.7	7.3		43	3.1	3.8	0.2	0.3	68	29	0	90.8	6.6	6
Apr. 22, 1952	a 43.0	22	.26	6.9	2.3	6.0		37	4.0	3.2	.1	.5	70	27	0	82.6	6.6	8
BROAD RIVER NEAR CARLISLE																		
Jan. 4, 1952	3,190	14	0.06	3.5	1.4	4.9		20	3.3	3.1	0.1	0.8	43	14	0	52.3	6.8	14
May 5	3,940	15	.07	3.4	1.3	6.3		22	2.8	3.9	.1	1.2	45	14	0	69.7	6.8	15
NORTH TYGER RIVER NEAR MOORE																		
Oct. 16, 1951	85	15	0.07	6.2	1.6	102		175	55	30	0.2	0.2	297	22	0	488	7.5	45
Jan. 4, 1952	192	15	.20	2.6	1.1	40		84	17	7.8	.1	1.0	126	11	0	198	7.0	32
Mar. 18	302	12	.11	2.5	1.0	17		45	3.4	3.9	.1	1.0	72	10	0	104	6.4	18
May 6	209	13	.07	2.4	1.0	27		62	8.8	5.2	.1	1.7	97	10	0	142	6.6	3

a Instantaneous discharge.

TYGER RIVER NEAR DELTA

Oct. 16, 1951	a 155	17	0.06	6.6	1.8	31	70	18	8.8	0.8	1.6	120	24	0	187	7.4	7
Apr. 23, 1952	a 826	15	.11	4.8	1.6	11	35	5.0	4.4	.3	1.5	65	19	0	87.0	6.5	4

ENOREE RIVER NEAR ENOREE

Jan. 5, 1952	300	17	0.05	2.8	1.1	7.8	23	4.4	3.0	0.1	0.5	50	12	0	59.5	6.7	16
May 5	982	15	.06	3.0	1.3	5.8	22	2.6	2.5	.1	1.0	42	13	0	54.7	6.3	14

CONGAREE RIVER AT COLUMBIA

Dec. 13, 1951	5,030	12	0.03	7.5	1.1	5.5	27	4.2	5.1	0.3	0.8	55	23	1	70.5	6.6	9
Apr. 16, 1952	10,400	11	.06	3.4	1.5	8.9	28	5.1	4.5	.1	1.0	53	15	0	77.6	6.5	7

CONGAREE CREEK NEAR CAYCE

Apr. 16, 1952	a 198	3.1	0.08	0.8	0.3	1.2	2	1.1	1.9	0.0	0.4	14	3	2	15.8	5.5	17
June 25	a 145	3.2	.07	1.6	.5	1.1	3	1.0	2.8	.1	.8	17	6	4	26.0	5.2	100

a Instantaneous discharge.

EDISTO RIVER BASIN
MISCELLANEOUS ANALYSES OF STREAMS IN EDISTO RIVER BASIN IN SOUTH CAROLINA

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium-magnesium	Non-carbonate			
Nov. 13, 1951.....	1,300	10	0.11	3.0	0.8		2.0	6	3.3	4.5	0.1	0.3	41	11	6	32.8	5.6	45
Apr. 8, 1952.....	2,850	4.8	.31	2.5	.8	2.5		8	2.0	4.0	.0	.8	a42	10	0	36.9	5.9	70

EDISTO RIVER NEAR BRANCHVILLE

a Large proportion of organic matter present; sum of mineral constituents 22 parts per million.

SAVANNAH RIVER BASIN

SAVANNAH RIVER NEAR IVA, S.C.

LOCATION.--At gaging station at bridge on State Highway 184, half a mile upstream from Little Generostee Creek, 5.8 miles southwest of Iva, Anderson County, and at mile 281.5 upstream from Savannah, Ga.

DRAINAGE AREA.--2,231 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1233.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
														Calcium, mg./mesium	Non-carbonate				Unfiltered	Filtered
Oct. 13, 1951.....	1,820	11	0.02	2.8	0.0	4.8	1.0	19	2.3	3.6	0.1	0.2	40	11	0	48.6	6.6	13	2.4	2.0
Nov. 17.....	3,380	11	.02	2.2	.8	4.4		15	2.0	2.6	.1	.2	32	9	0	36.1	6.3	6	2.6	2.0
Dec. 15.....	5,160	11	.04	2.0	.9	3.9		13	2.0	2.8	.1	.4	31	9	0	36.1	6.3	15	2.6	1.8
Jan. 12, 1952.....	4,540	10	.05	1.8	.6	2.4	1.2	11	1.9	2.1	.2	.6	27	7	0	32.4	7.1	7	3.2	2.2
Feb. 16.....	5,650	9.8	.02	1.6	.7	3.4		11	2.0	1.6	.2	.6	25	7	0	28.2	6.4	11	2.2	1.1
Mar. 13.....	8,650	9.3	.01	1.5	.7	3.1		10	2.1	1.9	.1	.5	24	7	0	28.4	6.4	13	2.6	1.1
Apr. 12.....	6,050	11	.13	2.8	.8	3.2	.7	13	1.4	2.2	.1	.8	33	10	0	30.4	6.3	11	1.9	1.8
May 17.....	4,250	11	.12	2.6	.8	3.6		13	3.3	2.0	.1	.5	34	10	0	31.1	6.3	13	2.4	1.3
June 14.....	3,440	12	.10	2.3	.9	5.0		18	1.6	2.5	.0	.5	35	9	0	34.6	6.7	7	1.9	1.2
July 12.....	2,310	11	.05	2.0	.8	3.3	.8	14	1.2	2.1	.1	.5	30	8	0	35.3	6.2	8	2.8	2.0
Aug. 16.....	3,150	12	.01	2.3	.9	3.9		14	2.2	2.5	.1	.4	32	9	0	38.4	6.2	20	3.8	1.2
Sept. 13.....	2,160	11	.03	2.0	.8	3.3	.7	14	1.4	2.4	.1	.4	31	8	0	36.5	5.9	8	2.8	1.8

SAVANNAH RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN SAVANNAH RIVER BASIN IN SOUTH CAROLINA

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, non-carbonate	Calcium, carbonate			
CONEROSS CREEK AT RICHLAND																		
Oct. 11, 1951	b 27.1	16	0.10	2.8	1.3	7.5		22	4.1	3.9	0.1	0.8	48	12	0	58.3	7.4	6
May 22, 1952	b 57.5	15	.08	2.2	1.0	5.3		18	1.6	3.0	.0	.7	37	10	0	45.0	6.5	3
CANE CREEK NEAR WEST UNION																		
Oct. 4, 1951	b 24.2	15	0.03	1.8	1.1	4.4		17	1.5	1.8	0.0	0.6	35	9	0	38.3	7.4	17
May 21, 1952	b 56.4	14	.08	2.3	1.1	1.9		12	1.7	1.8	.0	.4	33	10	0	34.1	6.6	7
BIG GENEROSTEE CREEK NEAR STARR																		
Oct. 5, 1951	b 26.1	17	0.04	4.1	1.5	17		40	3.1	6.9	1.4	5.0	78	16	0	114	7.2	7
May 28, 1952	b 62.3	16	.14	3.2	1.4	11		25	3.3	5.9	1.0	3.6	58	14	0	81.2	7.2	7
ROCKY RIVER NEAR CALHOUN FALLS																		
Nov. 7, 1951	116	14	0.03	4.2	1.6	7.3		28	3.1	3.9	0.3	0.6	49	17	0	63.5	6.9	8
May 23, 1952	180	14	.01	3.4	1.4	5.6		20	4.1	3.2	.2	.8	44	14	0	55.1	6.2	7
SAVANNAH RIVER AT AUGUSTA, GEORGIA																		
Nov. 6, 1951	4,980	14	0.05	3.4	1.3	5.5		22	2.4	3.0	0.2	0.7	42	14	0	51.3	6.4	15
June 3, 1952	4,540	11	.09	3.9	1.5	6.0		26	3.1	2.4	.1	1.0	43	16	0	53.9	7.3	12

b Measured discharge.

b Measured discharge.

PART 2-B. SOUTH ATLANTIC SLOPE AND EASTERN GULF OF MEXICO BASINS, OKEECHEE RIVER TO PEARL RIVER

LAKE OKEECHOBEE AND THE EVERGLADES

LAKE OKEECHOBEE 5 MILES NORTH OF CLEWISTON, FLA.

LOCATION.--at raw water intake at U. S. Sugar Corporation water plant, 5 miles north of Clewiston, Hendry County.
RECORDS AVAILABLE.--Chemical analyses: July 1950 to July 1952.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)	pH	Color
														Calcium, mg./nesium	Non-carbonate			
Oct. 8, 1951.....		7.2	0.00	35	8.3	21	1.3	122	24	32	0.3	0.3	213	122	22	335	8.2	37
Nov. 5.....		7.8	.00	39	10	24	1.3	132	34	33	.2	.7	240	138	30	368	8.0	50
Dec. 6.....		8.0	.00	32	7.8	18	1.4	106	26	28	.3	1.0	205	112	25	293	7.8	90
Jan. 3, 1952.....		7.6	.00	38	7.3	19	1.5	116	26	30	.2	.8	225	125	30	318	8.0	90
Feb. 5.....		3.4	--	--	--	--	--	132	33	30	.2	.6	--	140	32	345	8.0	--
Mar. 4.....		7.6	.24	34	9.8	18	1.2	120	29	29	.2	.6	223	125	27	316	8.1	65
Mar. 13.....		7.3	.05	37	9.7	22	1.1	126	31	30	.2	.5	222	132	29	348	8.0	60
Apr. 1.....		8.9	.10	38	8.9	22	1.2	128	27	31	.2	.6	225	131	26	347	7.9	45
May 2.....		8.3	.13	40	8.9	22	1.2	132	28	32	.1	.8	229	136	28	352	8.0	32
June 3.....		8.3	.04	41	8.0	22	1.2	130	27	33	.1	.3	234	135	29	360	7.7	27
July 3.....		8.8	.06	39	8.6	22	1.3	128	29	34	.3	.5	274	133	28	348	8.1	27

LAKE OKEECHOBEE AND THE EVERGLADES--Continued

WEST PALM BEACH CANAL AT LOXAHATCHEE, FLA.

LOCATION.--At State Highway 80 Bridge over lateral from north at Loxahatchee, Palm Beach County.

RECORDS AVAILABLE.--Chemical analyses: July to September 1950, November 1950 to June 1952.

EXTREMES, 1951-52.--Dissolved solids: Maximum, 814 ppm Feb. 27-29; minimum, 178 ppm Oct. 15-20.

Hardness: Maximum, 348 ppm Feb. 27-29; minimum, 89 ppm Oct. 15-20.

EXTREMES, 1950-52.--Dissolved solids: Maximum, 814 ppm Feb. 27-29; minimum, 178 ppm Oct. 15-20, 1951.

Hardness: Maximum, 348 ppm Feb. 27-29, 1952; minimum, 89 ppm Oct. 15-20, 1951.

REMARKS.--Records of specific conductance of daily samples available in district office at Ocala, Fla. Values reported for dissolved solids are residue on evaporation at 180°C. No discharge records available for this station.

Chemical analyses, in parts per million, October 1951 to June 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 1-2, 1951.....		17	0.02	57	13	87	2.8	236	34	112	0.4	0.5	--	196	2	800	7.6	200
Oct. 3-10.....	8.3		0.03	41	5.7	35	1.5	126	18	54	.3	3.9	286	126	22	415	7.2	130
Oct. 11-14.....	9.4		.00	51	8.1	38	1.4	166	28	58	.4	.8	336	161	24	490	7.4	120
Oct. 15-20.....	5.2		.22	32	2.2	18	.9	96	8.0	29	.2	1.3	178	89	10	267	7.0	110
Oct. 21-31.....	8.4		.00	46	8.6	46	1.9	156	23	70	.2	1.2	349	150	22	508	7.3	250
Nov. 1-10.....		9.0	.00	58	10	52	1.8	196	26	76	.2	1.6	402	186	25	578	7.5	300
Nov. 11-20.....		10	.00	61	13	66	2.5	220	28	98	.2	2.0	481	206	26	675	7.4	380
Nov. 21-30.....		15	.00	72	19	90	4.0	280	42	128	.5	3.5	592	258	28	a 861	7.6	280
Dec. 1-10.....		18	.04	74	18	105	3.1	286	40	151	.4	3.0	613	258	24	926	7.7	200
Dec. 11-20.....		15	.06	69	16	100	2.8	256	40	146	.3	2.0	570	238	28	883	7.7	200
Dec. 21-31.....		15	.05	62	15	81	2.5	230	38	119	.3	2.0	492	216	28	766	7.8	120
Jan. 1-10, 1952.....		14	.09	61	13	70	2.0	212	39	100	.3	2.3	446	206	32	700	7.7	100
Jan. 11-20.....		14	.07	57	14	65	2.0	204	39	96	.2	1.4	423	200	33	660	7.7	70
Jan. 21-31.....		14	.06	55	13	56	2.0	194	37	84	.1	1.8	398	191	32	618	7.5	70
Feb. 1-10.....		25	.19	82	22	118	3.6	308	67	161	.4	1.8	712	295	42	1,070	7.6	180
Feb. 11-20.....		16	.14	80	16	109	3.5	294	50	149	.2	2.0	609	266	24	965	7.5	90
Feb. 21-26.....		13	.13	63	16	77	2.5	236	37	110	.3	1.8	472	223	30	749	7.6	65
Feb. 27-29.....		25	.15	92	29	143	4.3	368	74	191	.5	3.0	814	348	47	1,220	7.7	140
Mar. 1-10.....		15	.10	72	20	109	3.6	280	51	154	.4	2.0	612	262	32	967	7.6	80
Mar. 11-20.....		11	.08	61	14	87	2.3	210	38	99	.3	1.6	428	210	36	688	7.7	50
Mar. 21-31.....		16	.29	57	18	58	2.0	206	39	95	.1	.7	469	216	47	653	7.8	50
Apr. 1-10.....		15	.22	59	13	52	1.9	202	37	76	.2	1.1	450	201	35	614	7.8	50
Apr. 11-20.....		14	.22	56	11	46	2.0	190	37	70	.2	.8	377	185	29	576	7.8	40
Apr. 21-30.....		14	.15	53	12	44	1.9	186	36	62	.2	.9	366	182	29	546	7.9	55

a Average of 10-day period.

May 1-10.....	13	.06	57	7.1	43	1.7	178	33	62	.2	.8	338	171	25	518	7.8	40
May 11-17, 19, 20.....	18	.08	60	9.9	44	2.0	194	32	66	.2	1.5	366	180	31	554	7.8	55
May 21-31.....	17	.34	77	13	91	2.7	268	37	130	.2	.8	546	246	26	862	7.7	70
June 1-10.....	20	.23	94	15	119	3.3	324	48	173	.3	1.5	670	296	30	1,070	8.0	90
June 11-20.....	18	.64	92	15	136	3.9	318	51	198	.3	1.5	718	291	30	1,150	7.9	100
June 21-30.....	21	.60	73	16	98	3.1	276	40	141	.3	1.2	568	248	22	900	7.9	90
Average.....	15	0.14	64	14	76	2.5	230	38	109	0.3	1.7	486	217	28	742	7.6	124

LAKE OKEECHOBEE AND THE EVERGLADES--Continued

HILLSBORO CANAL AT SEAWANO, FLA.

LOCATION.--At end of State Highway 198, 7 miles southeast from its junction with State Highway 25, and 13½ miles southeast of Belle Glade, Palm Beach County.

RECORDS AVAILABLE.--Chemical analyses: July 1950 to May 1952.

EXTREMES, 1951-52.--Dissolved solids: Maximum, 858 ppm Dec. 11-16; minimum, 326 ppm Jan. 11-20.

Hardness: Maximum 440 ppm Nov. 21-30; minimum, 197 ppm Mar. 21-31.

EXTREMES, July 1950 to May 1952.--Dissolved solids: Maximum, 863 ppm Aug. 21-31, 1951; minimum, 284 ppm Aug. 1-11, 1950.

Hardness: Maximum, 440 ppm Nov. 21-30, 1951; minimum, 153 ppm Dec. 20-21, 1950.

REMARKS.--Records of specific conductance of daily samples available in district office at Ocala, Fla. No discharge records available for this station.

Chemical analyses, in parts per million, October 1951 to May 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg-nestum	Non-carbonate			
Oct. 1-10, 1951.....		22	0.00	82	31	86	4.2	394	44	107	0.9	6.0	688	332	9	829	7.5	300
Oct. 11-20.....		27	.00	99	40	103	4.2	456	73	128	.9	4.8	834	412	38	1,110	7.7	300
Oct. 21-31.....		23	.00	83	35	94	3.7	364	60	122	.7	1.8	732	351	36	894	7.6	320
Nov. 1-10.....		25	.00	90	35	94	4.2	388	80	124	.7	.8	768	368	50	1,000	7.8	420
Nov. 11-20.....		23	.00	104	41	88	4.3	440	95	114	.6	1.8	826	428	58	1,060	7.8	380
Nov. 21-30.....		21	.00	104	44	79	3.8	412	122	102	.7	1.0	804	440	103	1,030	7.8	380
Dec. 1-10.....		25	.07	106	40	82	3.4	436	86	109	.7	1.8	786	429	72	1,050	7.8	280
Dec. 11-16.....		28	.08	104	42	97	3.6	472	73	128	.8	1.8	858	432	45	1,090	7.9	280
Dec. 17-20.....		17	.05	60	20	40	1.5	230	46	60	.4	1.2	--	232	43	806	8.0	280
Dec. 21-31.....		13	.04	59	17	29	1.9	212	41	47	.4	1.0	358	217	44	522	7.8	110
Jan. 1-10, 1952.....		15	.07	59	17	30	2.0	220	41	44	.3	1.3	352	217	37	520	7.6	80
Jan. 11-20.....		15	.05	58	16	28	1.7	210	37	40	.3	1.9	326	210	38	490	7.5	90
Jan. 21-31.....		15	.03	56	15	28	1.7	202	37	42	.3	.7	332	201	36	481	7.6	80
Feb. 1-4.....		17	.12	60	19	38	2.2	240	44	52	.3	.3	362	228	31	570	7.6	120
Feb. 5-10.....		31	.15	99	40	106	4.5	436	92	133	.8	.2	618	412	54	1,150	7.5	240
Feb. 11-20.....		25	.27	74	31	112	3.9	340	63	148	.7	.2	710	312	54	1,042	7.5	180
Feb. 21-29.....		21	.11	70	25	74	2.8	308	48	92	.5	.2	548	276	20	743	7.8	180
Mar. 1-5, 9, 10.....		26	.20	81	33	137	4.6	368	60	183	.6	.5	606	336	20	746	7.7	180
Mar. 6-8, 10.....		23	.19	60	21	37	2.7	370	35	129	.7	.5	583	217	15	507	7.7	110
Mar. 9-14, 17, 18.....		23	.16	59	20	34	3.3	376	33	127	.7	1.8	335	204	32	507	7.7	60
Mar. 15, 16, 19, 20.....		13	.06	59	14	32	1.6	274	36	48	.3	1.0	342	197	33	506	7.7	55
Mar. 21-31.....		13	.08	56	14	34	1.6	200	36	48	.3	1.0	342	197	33	506	7.7	55
Apr. 1-10.....		23	.12	55	16	32	1.6	232	29	36	.3	.5	372	203	13	530	7.8	70
Apr. 11-20.....		25	.15	57	16	26	1.7	228	31	36	.3	.4	354	208	21	500	7.8	80
Apr. 21-30.....		24	.06	53	18	34	1.8	230	33	40	.2	.3	379	206	18	537	7.8	80
May 1-10.....		26	.13	63	15	31	2.0	244	24	43	.2	.2	369	218	18	531	8.1	110
May 11-20.....		28	.11	58	14	30	2.0	238	27	40	.2	.2	348	202	7	511	8.0	100
May 21-26.....		24	.11	50	15	29	1.8	228	17	40	.2	.2	352	211	24	508	7.5	100
Average.....		22	0.09	73	25	63	2.8	306	52	83	0.5	1.2	550	286	35	766	7.7	132

LAKE OKEECHOBEE AND THE EVERGLADES--Continued
NORTH NEW RIVER CANAL AT HOLLOWAY LATERAL, NEAR FORT LAUDERDALE, FLA.

LOCATION.--Approximately 10 miles upstream from Fort Lauderdale, Broward County.

RECORDS AVAILABLE.--Chemical analyses: July 1950 to June 1952.

EXTREMES, 1951-52.--Dissolved solids: Maximum, 864 ppm Mar. 3-7; minimum, 294 ppm June 21-30.

Hardness: Maximum, 438 ppm Feb. 6-10; minimum, 158 ppm Apr. 21-30.

EXTREMES, 1950-52.--Dissolved solids: Maximum, 864 ppm Mar. 3-7, 1952; minimum, 269 ppm Mar. 6-10, 1951.

Hardness: Maximum, 438 ppm Feb. 6-10, 1952; minimum, 145 ppm Mar. 6-10, 1951.

REMARKS.--Records of specific conductance of daily samples available in district office at Ocala, Fla. Extremes for period of record include all three locations of this station. No discharge records available for this station.

Chemical analyses, in parts per million, October 1951 to June 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 1-3, 10, 1951.....		16	0.00	73	18				52	52	0.4	6.8	469	255	54	619	7.7	320
Oct. 11-20.....		12	.15	78	19	37	2.6	247	72	44	.4	2.8	449	288	64	592	7.6	320
Oct. 21-31.....		11	.20	76	13	33	2.6	249	46	36	.4	1.8	414	243	47	537	7.6	500
Nov. 8-10.....		9.9	.04	81	15	22	1.4	274	27	42	.3	2.2	438	264	39	541	7.8	800
Nov. 11-20.....		9.0	.06	80	15	22	1.3	272	29	40	.4	2.0	439	262	39	549	7.8	300
Nov. 21-25.....		8.0	.15	80	17	24	1.6	280	30	41	.4	4.8	496	270	40	555	7.8	400
Dec. 5-10.....		9.9	.05	86	21	28	1.3	304	38	49	.4	2.2	490	301	52	622	7.9	300
Dec. 11-20.....		11	.00	88	20	34	1.6	304	43	52	.3	1.5	462	302	52	662	7.7	280
Dec. 21-30.....		9.9	.00	86	15	29	1.5	230	35	46	.2	1.5	374	226	36	540	7.7	100
Jan. 1-10, 1952.....		12	.06	66	13	31	1.5	224	37	45	.3	.8	396	218	34	525	7.6	110
Jan. 11-20.....		12	.03	57	13	31	1.3	302	37	43	.3	.8	333	196	30	483	7.6	90
Jan. 21-31.....		13	.08	64	14	35	1.6	194	45	47	.5	.5	338	192	34	499	7.6	80
Feb. 1-6.....		13	.05	59	15	34	1.5	202	45	48	.3	.8	358	209	43	518	7.6	90
Feb. 6-10.....		25	.01	113	38	63	2.5	390	125	88	.5	1.5	737	438	113	933	7.5	180
Feb. 11-14, 16-20.....		14	.11	101	33	62	2.2	355	104	86	.4	.8	689	398	100	904	7.7	170
Feb. 21-29.....		14	.01	72	32	49	1.7	268	64	62	.4	.5	466	270	52	673	7.8	90
Mar. 1, 2, 8-10.....		15	.24	68	21	47	1.9	248	64	65	.3	1.2	464	278	57	658	7.7	90
Mar. 3-7.....		24	.04	114	37	88	3.2	400	126	113	.7	2.0	884	436	108	1,090	7.7	140
Mar. 11-20.....		12	.04	68	30	39	1.6	248	59	65	.3	1.2	449	264	52	656	7.7	70
Mar. 21-31.....		8.5	.07	48	14	33	1.8	174	40	48	.1	2.2	308	178	35	473	7.7	45
Apr. 1-10.....		12	.00	53	14	31	1.8	190	41	45	.1	1.0	383	190	34	508	7.8	50
Apr. 11-20.....		11	.00	47	11	29	1.6	158	41	29	.2	.6	162	122	33	443	7.9	40
Apr. 21-30.....		10	.00	47	11	27	1.3	152	39	38	.2	1.1	317	156	34	431	7.8	30
May 1-10.....		10	.02	51	13	34	1.9	176	46	47	.2	1.0	330	180	36	486	8.3	30
May 11-20.....		9.7	.01	58	7.6	29	1.6	174	37	42	.2	1.3	308	176	33	460	8.2	32
May 21-29, 30, 31.....		10	.03	53	14	39	1.9	190	39	45	.2	1.0	325	190	34	477	7.6	50
June 1-10.....		15	.11	65	16	41	1.9	226	51	58	.3	1.0	418	228	43	598	8.0	70
June 11-20.....		12	.06	60	16	38	1.9	308	49	58	.3	1.0	387	216	45	562	8.0	65
June 21-30.....		11	.04	49	11	29	1.5	170	32	44	.2	.6	294	168	28	444	8.0	45
Average.....		12	0.07	69	17	37	1.8	239	51	53	.3	1.6	429	245	49	589	7.8	153

LAKE OKEECHOBEE AND THE EVERGLADES --Continued
MISCELLANEOUS ANALYSES OF STREAMS IN LAKE OKEECHOBEE AND THE EVERGLADES IN FLORIDA

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids at 25°C	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
WEST PALM BEACH CANAL AT CANAL POINT																		
Dec. 6, 1951.....	162			38	10	23		126	30	36		0.6	200	136	33	370	7.4	50
Mar. 13, 1952.....	480			38	10	24		132	32	33		.8	203	136	28	352	7.9	65
June 3.....	0			68	19	54		294	47	52		1.5	366	248	6	622	7.8	--
BIG MOUND CANAL AT WEST PALM BEACH CANAL NEAR CANAL POINT																		
Dec. 6, 1951.....				78	21	192		302	78	260		4.0	782	281	34	1,390	7.3	160
Mar. 13, 1952.....				48	12	26		170	33	36		.7	240	169	30	401	7.8	110
June 3.....				83	27	288		388	121	354		2.0	1,070	318	0	1,820	7.9	--
LATERAL FROM NORTH AT WEST PALM BEACH CANAL, ABOVE CONTROL, LOXAHATCHEE																		
Dec. 6, 1951.....				86	5.8	18		256	13	38		0.3	287	238	28	526	7.1	30
Mar. 13, 1952.....				62	13	70		214	43	98		1.1	392	208	32	666	7.9	80
June 3.....				58	11	47		198	50	55		.5	318	190	28	518	7.6	--
RANGELINE CANAL AT WEST PALM BEACH CANAL ABOVE CONTROL NEAR WEST PALM BEACH																		
Dec. 6, 1951.....				82	16	100		284	42	148		3.5	532	270	38	950	7.2	150
Mar. 13, 1952.....				62	14	72		214	45	104		1.5	405	212	36	710	7.9	75
June 3.....				75	8.7	46		244	41	56		.8	348	223	23	572	7.6	--
WEST PALM BEACH CANAL ABOVE CONTROL AT WEST PALM BEACH																		
Dec. 6, 1951.....	628			80	17	104		294	41	148		3.2	538	270	28	950	7.3	170
Mar. 13, 1952.....	580			64	13	74		222	44	103		1.3	408	213	31	710	7.9	75
June 3.....	400			85	14	106		272	68	146		.5	554	270	46	936	7.8	--
LAKE OKEECHOBEE AT HURRICANE GATE STRUCTURE 4, NEAR BELLE GLADE																		
Dec. 6, 1951.....				42	15	29		148	43	45		0.8	248	166	45	441	7.4	45
Mar. 13, 1952.....				50	15	26		172	40	42		1.3	259	166	46	456	7.9	45
June 3.....				48	13	44		166	61	49		.9	298	174	38	478	8.0	--

a Values reported are sum of determined constituents.

HILLSBORO CANAL AT BELLE GLADE

Dec. 6, 1951.....	102	13	127	356	125	115		2.0	659	308	16	1,080	7.4	160
Mar. 13, 1952.....	47	14	38	180	45	41		.7	255	175	44	441	8.0	45
June 3.....	43	11	38	144	55	42		.8	261	153	35	417	8.0	--

CROSS CANAL AT BEND NEAR BELLE GLADE

Dec. 6, 1951.....	115	45	138	550	124	135		2.8	830	472	22	1,210	7.2	360
Mar. 13, 1952.....	56	22	76	238	61	96		.6	429	230	35	742	7.9	110
June 3.....	66	20	82	238	80	73		.5	418	246	53	680	7.8	--

BOLLES CANAL AT HILLSBORO CANAL, NEAR BELLE GLADE

Dec. 6, 1951.....	143	38	93	506	120	134		1.5	768	513	98	1,230	7.2	400
Mar. 13, 1952.....	57	23	89	246	54	121		1.1	466	286	35	819	8.0	120
June 3.....	54	16	49	192	66	58		.8	338	201	44	558	7.9	--

INDIAN RUN AT HILLSBORO CANAL NEAR DEERFIELD BEACH

Dec. 5, 1951.....	15	1.7	14	38	4.0	28		0.6	82	44	13	152	7.3	140
Mar. 13, 1952.....	20	6.2	47	96	4.5	90		.6	196	175	30	369	7.2	130
June 4.....	44	8.7	122	184	38	156		.2	459	146	0	810	7.3	--

RANGELINE CANAL AT HILLSBORO CANAL, NEAR DEERFIELD BEACH, ABOVE CONTROL

Dec. 5, 1951.....	71	17	72	260	50	97		1.5	436	247	34	762	7.3	200
Mar. 13, 1952.....	76	26	135	244	46	184		1.5	638	296	14	1,120	8.0	150
June 4.....	91	8.7	57	282	62	64		.5	422	263	32	680	7.8	--

HILLSBORO CANAL NEAR DEERFIELD BEACH, ABOVE CONTROL

Dec. 5, 1951.....	69	21	64	264	45	94		1.8	425	258	42	752	7.2	180
Mar. 13, 1952.....	62	18	78	250	40	106		1.2	428	238	24	757	7.8	120
June 4.....	61	15	63	232	50	76		.8	380	214	24	660	7.9	--

a Values reported are sum of determined constituents.

LAKE OKECHOBEE AND THE EVERGLADES--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN LAKE OKECHOBEE AND THE EVERGLADES IN FLORIDA--Continued

Chemical analyses, in parts per million, water year October 1951 to September 1952--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids ^a	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg./l.	Non-carbonate, mg./l.			
NORTH NEW RIVER CANAL AT SOUTH BAY																		
Dec. 6, 1951.....	0			128	4.7	56		396	165	96			691	514	190	1,110	7.3	240
Mar. 13, 1952.....	247			47	13	33		180	44	46			263	171	40	458	8.0	55
June 3.....	420			43	11	45		144	64	46			281	153	35	424	7.9	--
NORTH NEW RIVER CANAL AT BEND 4 MILES SOUTH OF OKEELANTA																		
Dec. 6, 1951.....				77	23	30		266	71	42		1.7	376	286	68	603	6.9	260
Mar. 13, 1952.....				61	21	58		220	70	78		1.1	397	238	58	684	7.9	90
June 3.....				75	21	52		252	79	70		.9	422	274	67	710	7.8	--
NORTH NEW RIVER CANAL LATERAL FROM WEST, 10.0 MILES SOUTH OF OKEELANTA																		
Dec. 6, 1951.....				72	17	19		242	28	44		2.7	302	250	51	504	6.9	460
Mar. 13, 1952.....				91	29	39		322	32	94		1.5	446	346	82	779	7.5	
June 3.....				77	17	53		300	44	61		1.2	401	262	16	693	7.9	
DIKE C BORROW PIT AT NORTH NEW RIVER CANAL AT BROWARD-PALM BEACH COUNTY LINE																		
Dec. 6, 1951.....				67	15	9.4		244	10	27		0.6	249	228	28	429	6.9	220
Mar. 13, 1952.....				82	21	30		314	38	41		.8	368	291	34	601	7.4	
June 3.....				68	19	47		242	57	64		.8	375	248	49	648	7.8	
DIKE E BORROW PIT AT NORTH NEW RIVER CANAL NEAR FORT LAUDERDALE																		
Dec. 6, 1951.....				46	8.1	19		160	14	31		0.6	198	148	17	315	6.9	280
Mar. 13, 1952.....				91	25	64		348	69	79		.3	499	330	45	829	7.4	
June 3.....				77	18	56		268	66	70		1.8	421	266	46	716	8.2	
HOLLOWAY LATERAL AT NORTH NEW RIVER CANAL NEAR FORT LAUDERDALE																		
Dec. 5, 1951.....				85	22	33		308	48	51		0.5	390	302	50	625	7.2	280
Mar. 13, 1952.....				74	22	52		268	69	68		1.3	418	275	58	690	7.8	
June 4.....				65	5.2	29		204	28	36		.8	264	184	16	457	8.2	

^a Values reported are sum of determined constituents.

SNAKE CREEK CANAL AT SOUTH NEW RIVER CANAL, NEAR DAVIE

Dec. 5, 1951.....	120	11	17		340	54	32		1.6	403	344	66	644	7.6	90
Mar. 13, 1952.....	113	9.5	20		334	50	27		.8	393	321	48	632	7.6	
June 4.....	107	3.9	26		334	29	24		1.5	355	263	10	599	8.2	

SOUTH NEW RIVER CANAL AT DAVIE, ABOVE CONTROL

Dec. 5, 1951.....	98	11	23		316	32	32		1.4	347	290	30	555	7.2	90
Mar. 13, 1952.....	92	11	25		294	31	38		2.0	344	274	34	578	8.0	
June 4.....	79	7.4	33		256	30	40		2.0	317	228	18	552	8.2	

MIAMI CANAL AT LAKE HARBOR

Dec. 5, 1951.....	80	22	55		262	90	71		1.1	448	290	76	717	7.2	130
Mar. 13, 1952.....	54	16	33		182	51	49		.8	294	200	52	508	7.9	
June 3.....	71	22	44		254	71	64		1.5	399	266	60	694	8.2	

MIAMI CANAL AT JUNCTION WITH SOUTH NEW RIVER CANAL

Dec. 10, 1951.....	66	7.6	13		224	5.0	24		0.6	226	196	12	363	7.8	130
Mar. 13, 1952.....	89	8.3	14		294	7.0	26		2.1	291	256	15	511	7.3	
June 4.....	89	6.9	17		b300	4.0	26		1.8	293	230	6	527	8.4	

PENNSUCO LATERAL AT PENNSUCO

Dec. 10, 1951.....	96	6.0	11		308	4.0	22		0.9	291	264	12	491	7.3	90
Mar. 13, 1952.....	105	7.5	7.4		332	7.0	26		1.9	314	293	21	540	7.5	
June 3.....	89	16	14		350	12	20		1.0	359	288	1	572	8.2	

MIAMI CANAL AT WATER PLANT, HIALEAH

Dec. 5, 1951.....	878	7.9	11		280	5.0	22		0.3	279	252	15	473	7.3	180
Mar. 13, 1952.....	325	9.2	5.8		288	9.0	23		1.3	280	265	29	492	7.7	
June 5.....	60	10	19		310	5.2	22		1.5	294	250	0	526	8.2	

a Values reported are sum of determined constituents.

b Includes equivalent of 4 parts per million of carbonate (CO₃).

LAKE OKEECHOBEE AND THE EVERGLADES--Continued
 MISCELLANEOUS ANALYSES OF STREAMS IN LAKE OKEECHOBEE AND THE EVERGLADES IN FLORIDA--Continued
 Chemical analyses, in parts per million, water year October 1951 to September 1952--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids a	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg./ml. nesium	Non-carbonate			
TAMIAMI CANAL NEAR CORAL GABLES (FOOTBRIDGE)																		
Dec. 7, 1951.....				59	23	9.4		274	14	16		0.8	257	242	17	452	7.3	65
Mar. 14, 1952.....				87	4.5	9.9		268	8.0	20		1.5	245	236	16	460	7.9	
June 5.....				70	4.2	30		268	10	18		1.8	266	192	0	434	8.5	
TAMIAMI CANAL AT BRIDGE 45, 27 MILES WEST OF MIAMI																		
Dec. 7, 1951.....				67	7.1	12		218	6.0	27		0.7	228	196	18	382	7.3	110
Mar. 14, 1952.....				91	5.8	14		286	9.0	26		1.8	280	251	16	507	7.5	
June 5.....				81	9.2	13		272	6.5	26		2.5	272	240	17	434	8.1	
TAMIAMI CANAL AT BRIDGE 115, 46 MILES WEST OF MIAMI																		
Dec. 7, 1951.....				77	2.9	16		240	10	23		0.4	247	204	7	384	7.3	35
Mar. 14, 1952.....				96	4.1	15		308	4.5	22		.8	294	256	4	518	7.5	
June 5.....				76	2.7	12		224	21	23		1.5	246	200	17	440	8.0	
TAMIAMI CANAL AT BRIDGE 96, MONROE																		
Dec. 7, 1951.....				75	3.1	15		234	7.0	23		0.8	239	200	8	400	7.3	30
Mar. 14, 1952.....				66	2.8	8.9		206	3.5	16		.5	199	176	7	358	7.8	
June 5.....				75	6.7	12		268	5.2	13		1.0	245	214	0	439	8.4	

a Values reported are sum of determined constituents.

b Includes equivalent of 4 parts per million of carbonate (CO₃).

c Includes equivalent of 6 parts per million of carbonate (CO₃).

ESCAMBIA RIVER BASIN

ESCAMBIA RIVER NEAR CENTURY, FLA.

LOCATION:--At gaging station, on left bank 16 feet downstream from bridge on State Highway 4, 1.2 miles downstream from Escambia Creek, and 1 1/2 miles east of Century, Escambia County.

DRAINAGE AREA:--3,810 square miles, approximately.

RECORDS AVAILABLE:--Chemical analyses: January 1952 to September 1952.

Water temperatures: January 1952 to September 1952.

EXTREMES: 1952.--Dissolved solids: Maximum, 70 ppm Sept. 1-10; minimum, 51 ppm Apr. 1-6, 9-10.

Hardness: Maximum, 34 ppm June 11, 13-20; minimum, 14 ppm Mar. 21-31.

Water temperatures: Maximum, 88°F. July 1; minimum, 51°F Jan. 12-30.

REMARKS:--Records of specific conductance of daily samples available in district office at Ocala, Fla. Records of discharge for water year 1951-52 given in Water Supply Paper 1234.

Chemical analyses, in parts per million, January 1952 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg-nesium	Non-carbonate			
Jan. 10-20, 1952.....	2,351	12	0.21	9.1	1.2	2.5	0.8	31	2.5	4.8	0.1	0.5	58	28	2	69.7	7.0	21
Jan. 21-31.....	3,212	11	0.18	8.9	1.2	2.6	9	30	2.5	5.0	0.2	0.6	58	27	3	68.0	6.9	27
Feb. 1-10.....	4,945	9.9	0.23	7.2	1.0	2.4	9	22	3.0	4.6	0.2	0.6	59	23	4	59.4	6.8	45
Feb. 11-20.....	7,599	9.1	0.19	6.8	1.0	2.3	8	20	3.0	4.4	0.2	0.5	55	21	5	54.5	6.6	55
Feb. 21-29.....	9,091	9.0	0.21	5.7	0.9	2.3	7	18	2.8	4.0	0.2	0.5	53	18	3	47.9	6.6	65
Mar. 1-10.....	8,548	9.2	0.24	5.9	1.0	2.3	7	18	3.0	4.0	0.2	0.5	56	19	4	50.1	6.7	65
Mar. 11-20.....	9,654	8.5	0.26	5.9	1.0	2.3	7	18	3.0	4.2	0.3	0.5	60	19	4	50.2	6.7	75
Mar. 21-31.....	21,100	7.4	0.28	4.5	0.7	1.9	8	14	2.2	3.6	0.3	0.4	52	14	3	40.4	6.4	75
Apr. 1-6, 9, 10.....	16,340	8.5	0.24	6.4	1.5	2.2	6	20	3.8	3.7	0.2	0.2	51	22	6	47.2	6.7	60
Apr. 11-20.....	10,590	8.8	0.32	6.6	1.1	2.3	7	21	3.5	4.6	0.2	0.5	56	21	4	49.8	6.7	75
Apr. 21-30.....	5,407	9.9	0.20	8.9	1.1	2.4	6	29	3.5	4.5	0.2	0.4	58	27	3	62.9	6.8	55
May 1-10.....	3,807	9.9	0.30	10	1.0	2.4	6	33	3.0	4.9	0.2	0.4	63	29	2	68.1	6.9	55
May 11-18, 20.....	4,109	8.7	0.32	9.1	1.0	2.4	5	31	2.8	4.0	0.2	0.4	56	27	1	64.1	7.0	60
May 21-31.....	8,227	8.5	0.37	6.6	0.9	2.0	6	22	3.0	3.2	0.2	0.3	59	20	2	48.7	6.8	110
June 1-2, 5-6, 8-10.....	7,597	8.7	0.40	8.8	0.5	2.1	8	28	3.5	2.5	0.1	0.6	62	24	1	62.9	7.1	90
June 11, 13-20.....	4,191	19	0.35	12	0.9	2.4	8	39	4.0	3.5	0.1	0.6	60	34	2	80.7	7.1	55
June 22-25, 27-30.....	2,412	8.4	0.28	11	0.7	2.3	6	38	3.0	3.5	0.2	0.5	57	30	0	76.2	7.1	50
July 1-4, 6-10.....	1,458	7.0	0.08	12	0.8	3.5	8	40	4.2	3.3	0.1	0.8	67	33	0	75.9	7.3	20
July 11-16, 18-20.....	1,519	7.1	0.08	10	1.2	2.6	9	38	4.2	2.5	0.1	0.6	69	30	0	71.5	7.1	30
July 21-25, 28-30.....	1,155	8.2	0.04	11	0.8	2.6	9	40	4.2	2.8	0.1	0.6	68	31	0	76.3	7.1	20
Aug. 3-9.....	2,200	6.3	0.07	9.2	1.1	2.6	9	29	3.8	2.5	0.1	0.6	58	23	0	59.7	7.1	30
Aug. 11-15, 17-20.....	2,708	7.0	0.18	8.3	0.8	2.4	7	31	3.6	2.7	0.4	0.7	64	24	0	60.1	6.9	40
Aug. 21-31.....	1,987	7.5	0.18	9.3	0.8	2.4	7	34	4.0	3.0	0.2	0.7	69	26	0	66.5	6.9	40
Sept. 1-10.....	1,353	7.2	0.13	10	1.1	2.5	6	39	3.2	3.1	0.1	0.5	70	29	0	71.8	7.0	10
Sept. 11-20.....	2,447	6.8	0.12	6.4	0.9	2.4	5	24	3.5	2.8	0.1	0.5	59	20	0	51.6	6.8	30
Sept. 21-30.....	1,819	7.3	0.23	8.7	0.8	2.4	6	32	3.7	2.7	0.1	0.5	65	25	0	63.0	7.0	30
Average.....	5,605	8.9	0.22	8.4	0.9	2.4	0.7	28	3.3	3.6	0.2	0.5	60	25	2	61.4	--	49

ESCAMBIA RIVER BASIN--Continued

ESCAMBIA RIVER NEAR CENTURY, FLA.--Continued

Temperature (°F) of water, January 1952 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				--	54	56	63	72	77	96	--	85
2				--	54	56	63	72	77	88	--	88
3				--	56	60	64	72	--	88	87	--
4				--	57	61	--	74	--	89	82	84
5				--	59	59	--	66	82	--	82	80
6				--	56	59	--	68	80	87	82	--
7				--	55	63	--	69	--	85	82	--
8				--	55	57	--	79	79	85	82	--
9				--	54	57	64	76	79	81	82	89
10				55	55	59	63	73	87	81	--	85
11				53	59	60	66	58	84	84	85	86
12				51	59	61	65	56	--	84	85	81
13				53	62	62	67	55	84	85	85	78
14				69	64	61	65	57	86	80	86	78
15				59	63	61	67	75	88	83	87	--
16				62	61	58	65	75	87	--	--	78
17				64	59	59	63	73	85	--	88	--
18				64	59	59	64	73	84	87	88	81
19				62	63	61	68	--	86	87	--	75
20				64	59	61	64	71	85	87	84	76
21				61	68	65	67	72	--	84	84	76
22				67	56	65	68	74	83	89	86	79
23				62	55	61	68	75	86	89	85	80
24				59	56	52	70	74	87	89	84	60
25				57	56	--	69	73	89	--	81	75
26				69	55	58	68	76	--	--	80	76
27				64	55	56	68	76	89	87	80	77
28				61	55	56	68	76	89	88	82	80
29				58	57	58	70	65	86	87	83	79
30				51	--	59	71	76	89	87	82	73
31				55	--	59	--	75	--	--	82	--
Average				--	58	59	66	71	85	86	84	80

PEARL RIVER BASIN

MISCELLANEOUS ANALYSES OF STREAMS IN PEARL RIVER BASIN IN LOUISIANA

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH or Col-	
													Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Chemical analyses, in parts per million, water year October 1951 to September 1952																					
PEARL RIVER NEAR BOGALUSA																					
Apr. 15, 1952.....	12,700	8.6	0.00	2.4	1.6	7.4	0.4	7	7.5	4.7	0.1	1.5	0.14	38	0.05	13	7	55	0.9	47.1	6.2
Aug. 26.....	1,680	12	.03	2.3	1.8	6.6	3.6	9	9.0	8.5	.1	1.0	--	61	.08	13	6	45	.8	84.3	5.9
Sept. 10.....	1,240	13	.01	2.6	1.5	7.8	.4	12	8.6	8.2	.5	.5	.06	49	.07	13	3	56	1.0	72.1	6.4

PART 3-A. OHIO RIVER BASIN EXCEPT CUMBERLAND AND TENNESSEE RIVER BASINS

CONEWANGO CREEK BASIN

CONEWANGO CREEK AT RUSSELL, PA.

LOCATION.--At highway bridge in Russell, Warren County, 0.4 mile upstream from Ackley Run and 8.0 miles upstream from mouth.

DRAINAGE AREA.--816 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952.

Water temperatures: October 1951 to September 1952.

EXTREMES, 1951-52.--Dissolved solids: Maximum, 195 ppm Aug. 11-20; minimum, 69 ppm Jan. 21-31, Mar. 11-20.

Water temperatures: Maximum, 143 ppm Aug. 11-20; minimum, 48 ppm Mar. 11-20.

Hardness: Maximum, 143 ppm Aug. 11-20; minimum, 48 ppm Mar. 11-20.

Water temperatures: Maximum, 80°F July 22, July 25; minimum, freezing point on many days in December and January, Feb. 13 and Mar. 9.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of water discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium, mg./l.	Non-carbonate				
Oct. 1-10, 1951	206		10		0.00		35	7.1	7.2	3.3	102	22	12	0.0	4.8	168	119	35		274	7.5	6
Oct. 11-20	245		8.2		.02		29	5.9	6.0	2.1	92	18	6.0	.0	3.3	129	97	21		217	7.7	5
Oct. 21-31	221		6.1		.00		28	5.5	5.6	2.3	89	19	7.5	.0	3.0	129	92	20		221	7.7	7
Nov. 1-10	391		4.1		.00		30	6.1	5.7	2.3	91	21	7.0	.0	3.9	133	100	25		230	7.4	7
Nov. 11-20	1,149		4.7		.00		23	4.8	3.4	2.1	59	27	5.0	.0	2.0	106	77	30		178	7.5	8
Nov. 21-30	2,522		4.7		.00		19	3.5	2.6	1.7	44	24	4.0	.0	1.6	92	62	26		148	7.6	7
Dec. 1-10	2,033		1.9		.00		21	4.3	2.2	1.1	53	23	4.0	.0	1.2	93	70	27		155	7.6	10
Dec. 11-20	1,788		5.4		.00		21	4.3	2.3	1.3	53	21	3.5	.0	1.5	91	70	27		157	7.7	10
Dec. 21-31	2,234		4.8		.00		30	3.2	2.6	1.2	47	21	3.5	.1	1.4	90	70	32		157	7.4	9
Jan. 1-10, 1952	4,526		2.3		.00		16	4.2	2.1	1.2	39	18	3.0	.0	1.2	78	57	25		128	6.9	10
Jan. 11-20	3,531		4.8		.00		18	3.5	2.5	1.4	40	18	3.0	.0	1.8	85	59	28		131	7.1	10
Jan. 21-31	4,850		3.7		.00		15	3.2	2.1	1.4	34	17	2.5	.0	1.3	69	51	23		116	7.1	15
Feb. 1-10	4,560		4.5		.00		15	3.4	2.0	1.3	35	16	2.5	.1	1.9	72	51	23		119	7.2	15
Feb. 11-20	2,041		7.4		.00		21	4.1	3.3	1.4	51	18	3.0	.0	1.2	94	69	27		151	7.3	10
Feb. 21-29	1,278		5.6		.00		23	5.0	3.8	1.4	54	20	4.5	.0	1.4	102	78	34		173	7.2	5
Mar. 1-10	1,289		4.2		.00		22	4.3	3.5	1.5	55	19	4.0	.0	2.0	97	73	28		164	7.3	5
Mar. 11-20	4,765		4.2		.00		14	3.1	2.1	1.4	33	15	1.5	.0	1.7	69	48	21		112	7.3	25
Mar. 21-31	3,386		4.2		.00		15	3.0	2.0	1.3	38	15	3.5	.2	1.0	70	50	19		118	6.4	5

Apr. 1-10	1,897	3.9	.00	19	3.7	2.6	1.4	48	17	3.5	.1	1.2	82	63	25	141	6.5	5
Apr. 11-20	1,535	4.6	.02	20	4.2	2.5	1.1	49	18	2.5	.1	1.8	85	67	27	146	7.6	5
Apr. 21-30	1,657	4.8	.04	26	5.5	3.4	1.4	68	21	4.0	.1	2.5	109	87	32	189	7.8	5
May 1-10	324	3.9	.05	31	6.2	5.8	1.5	86	22	5.0	.1	3.8	130	108	32	229	7.1	5
May 11-20	2,782	4.4	.05	20	4.2	2.4	1.2	49	17	2.5	.0	2.2	85	87	27	144	6.9	5
May 21-31	2,375	4.5	.02	20	4.3	2.4	1.0	52	16	2.5	.0	1.7	85	68	25	144	7.2	10
June 1-10	622	3.8	.01	27	5.2	3.6	1.3	72	18	4.0	.0	2.3	110	89	30	191	7.2	8
June 11-20	278	7.8	.02	33	6.8	5.3	1.8	92	20	6.0	.1	4.0	138	110	35	237	7.3	10
June 21-30	162	5.4	.03	38	8.4	6.8	2.3	105	24	7.0	.1	4.2	156	129	43	273	7.4	8
July 1-10	149	6.9	.03	40	7.6	8.0	2.7	111	27	8.0	.1	4.3	173	131	37	296	8.0	6
July 11-20	121	6.4	.03	39	7.8	5.2	2.5	105	24	10	.0	4.8	164	129	42	285	7.9	8
July 21-31	112	6.3	.01	41	8.2	9.8	3.5	118	28	11	.1	4.5	177	136	39	315	7.4	5
Aug. 1-10	95	7.2	.01	42	7.9	9.7	3.4	120	24	10	.1	5.5	180	137	39	315	7.8	8
Aug. 11-20	112	9.3	.05	42	9.4	12	4.3	142	28	12	.2	6.1	195	143	27	344	7.4	8
Aug. 21-31	132	8.2	.05	40	8.3	11	4.0	134	25	11	.1	4.3	182	134	24	318	7.4	8
Sept. 1-10	89	6.9	.05	38	7.5	10	3.2	110	25	9.5	.1	5.1	171	126	36	294	7.8	5
Sept. 11-20	136	7.8	.04	40	8.3	12	4.3	110	24	12	.2	5.8	186	134	37	328	8.3	10
Sept. 21-30	376	6.5	.03	28	6.1	6.6	1.7	78	21	8.5	.1	5.2	134	95	31	228	7.4	10
Average	1,477	5.4	0.02	27	5.5	5.0	2.0	74	21	5.8	0.1	2.9	120	90	29	205	--	8

CONEWANGO CREEK BASIN--Continued

CONEWANGO CREEK AT RUSSELL, PA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	56	47	36	34	34	36	43	55	61	74	77	72
2	62	46	38	34	34	34	44	56	61	74	72	73
3	62	44	38	33	35	35	45	56	63	76	72	69
4	63	41	39	33	36	36	44	55	65	75	74	68
5	63	40	41	33	35	35	45	57	64	74	74	68
6	61	40	41	33	35	33	43	57	65	74	72	68
7	50	40	43	32	33	33	42	55	65	70	73	67
8	57	38	45	33	35	33	40	55	65	77	73	66
9	58	39	44	33	33	32	40	56	68	76	73	66
10	58	38	41	33	33	33	42	58	66	72	74	66
11	58	39	36	33	33	36	44	59	60	72	72	67
12	54	38	35	33	33	34	45	55	64	73	73	68
13	53	41	34	33	32	36	46	50	63	75	71	68
14	52	44	34	35	33	33	45	48	66	77	70	68
15	54	45	32	40	33	33	45	50	68	78	72	70
16	55	45	32	37	35	33	43	53	68	77	73	66
17	56	42	32	36	34	34	44	54	70	75	73	64
18	56	42	32	37	34	33	46	54	70	78	71	66
19	53	36	33	34	34	36	49	55	70	78	73	65
20	52	34	33	35	33	36	54	55	70	77	74	63
21	53	33	33	33	33	39	55	55	69	79	71	62
22	56	34	32	33	34	42	57	53	69	80	70	58
23	58	39	32	32	35	40	58	54	70	79	72	58
24	56	39	32	32	33	40	55	58	71	78	73	56
25	55	36	32	32	33	40	55	58	74	80	73	56
26	54	36	32	33	34	42	54	58	75	76	68	57
27	53	34	32	34	34	40	53	59	76	79	68	57
28	--	33	32	33	35	40	54	60	76	76	70	57
29	52	33	32	32	35	38	56	61	75	76	72	58
30	51	35	33	32	--	38	55	59	75	75	70	60
31	50	--	33	32	--	40	--	60	--	75	72	--
Average	56	39	35	34	34	36	48	56	68	76	72	64

CLARION RIVER BASIN

CLARION RIVER NEAR PINEY, PA.

LOCATION.--At hydroelectric plant of Pennsylvania Electric Company, 2½ miles from Piney, Clarion County, and a quarter of a mile upstream from gaging station.
DRAINAGE AREA.--851 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1952.

Water temperatures: October 1949 to September 1952.

EXTREMES, 1951-52.--Hardness: Maximum, 160 ppm Sept. 11-20; minimum, 32 ppm Mar. 12-20.

Specific conductance: Maximum daily, 531 microhos Nov. 17, 1951; minimum daily, 83.5 microhos Jan. 19, 1952.

Water temperatures: Maximum, 77°F Aug. 8; minimum, 33°F Feb. 2, 3, 4, 5.

EXTREMES, 1946-52.--Dissolved solids (1946-47): Maximum, 317 ppm Sept. 11-20, 1947; minimum, 28 ppm Apr. 1-10, 1947.

Hardness (1946-47) (1949-52): Maximum, 220 ppm Nov. 21-30, 1949; minimum daily, 80.0 microhos Mar. 7, 1951.

Specific conductance: Maximum daily, 874 microhos Nov. 26, 1949; minimum daily, 80.0 microhos Mar. 7, 1951.

REMARKS.--Samples collected by Pennsylvania Electric Company. Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Tem- perature (°F)	Silica (SiO ₂)	Alum- inum (Al)	Iron (Fe)	Man- ganese (Mn)	Cal- cium (Ca)	Mag- nesium (Mg)	So- dium (Na)	Po- tassium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO ₃		Total acid- ities (micro- H ₂ PO ₄)	Specific conduct- ance (micro- mhos at 25°C)	pH	Color
																	Calcium, mag- nesium	Non-carbon- ate				
Oct. 1-10, 1951 ..	109		2.1		0.71		31	7.1	24		30	67	44	0.1	1.3	233	107	82	--	360	6.5	4
Oct. 11-20 ..	94		--		--		--	--	25		32	71	50	--	1.6	--	118	92	--	389	6.5	6
Oct. 21-31 ..	113		--		--		--	--	25		30	76	53	--	1.4	--	126	101	--	411	6.4	7
Nov. 1-10 ..	222		--		--		--	--	26		38	76	54	--	1.3	--	132	101	--	427	6.6	5
Nov. 11-20 ..	480		--		--		--	--	33		42	94	67	--	1.5	--	156	122	--	504	6.7	8
Nov. 21-30 ..	1,260		--		--		--	--	27		27	83	55	--	1.4	--	128	106	--	428	6.5	6
Dec. 1-10 ..	1,793		--		--		--	--	12		9	57	22	--	.4	--	73	66	--	226	6.1	30
Dec. 11-20 ..	1,714		--		--		--	--	5.6		5	38	12	--	.7	--	49	45	--	142	6.1	20
Dec. 21-31 ..	2,307		--		--		--	--	8.5		8	42	14	--	.7	--	52	45	--	160	6.0	5
Jan. 1-10, 1952 ..	5,264		--		--		--	--	6.0		3	37	8.0	--	1.0	--	40	38	--	120	5.4	5
Jan. 11-20 ..	6,423		--		--		--	--	5.5		3	38	11	--	.5	--	46	44	--	137	5.3	5
Jan. 21-31 ..	8,747		--		--		--	--	3.4		2	31	8.0	--	.4	--	38	36	--	105	4.6	5
Feb. 1-10 ..	5,932		--		--		--	--	4.7		2	36	7.5	--	.6	--	40	38	--	119	4.5	5
Feb. 11-20 ..	1,990		--		--		--	--	7.0		2	39	9.0	--	.4	--	40	38	--	132	4.8	5
Feb. 21-29 ..	932		--		--		--	--	5.2		1	48	13	--	.5	--	58	57	--	164	4.9	4
Mar. 1-10 ..	849		--		--		--	--	8.4		5	58	18	--	.5	--	72	68	--	206	6.2	7
Mar. 11 ..	8,310		--		--		--	--	--		12	74	18	--	2.8	--	76	66	--	208	6.2	11
Mar. 12-20 ..	5,489		--		--		--	--	5.9		3	28	9.0	--	.6	--	32	30	--	101	6.0	9
Mar. 21-31 ..	4,536		--		--		--	--	5.6		2	31	8.5	--	.4	--	34	32	--	104	5.8	10
Apr. 1-10 ..	2,640		--		--		--	--	4.1		4	35	9.0	--	.7	--	44	41	--	128	6.2	18
Apr. 11-20 ..	4,651		--		--		--	--	3.6		2	34	7.0	--	.5	--	40	38	--	116	5.6	15
Apr. 21-30 ..	2,943		--		--		--	--	5.0		3	31	7.5	--	.5	--	36	36	--	112	5.5	5
May 1-10 ..	4,941		--		--		--	--	5.4		6	42	10	--	.5	--	40	46	--	146	5.9	8
May 11-20 ..	4,006		--		--		--	--	5.4		6	37	10	--	.5	--	40	41	--	142	5.9	3
May 21-31 ..	5,268		2.2		.00		8.5	3.0	4.5		5	29	6.0	1	.3	62	34	29	--	104	6.0	5

CLARION RIVER BASIN--Continued

CLARION RIVER NEAR PINEY, PA.--Continued

Chemical analyses, in parts per million, water year October 1951 to September 1952--Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium	Non-carbonate				
June 1-10, 1952 ..	1,108		--		--		--	--	1.5	4	34	6.0	6.0	--	0.2	--	44	41	--	121	6.3	5
June 11-20,	331		--		--		--	--	5.4	5	41	9.0	9.0	--	.2	--	48	48	--	142	6.4	5
June 21-30,	272		--		--		--	--	5.7	4	55	14	14	--	.2	--	68	65	--	181	6.6	5
July 1-10,	195		--		--		--	--	7.5	4	61	15	15	--	.4	--	72	69	--	209	6.6	10
July 11-20,	148		--		--		--	--	12	7	70	19	19	--	.4	--	80	74	--	239	6.8	13
July 21-31,	160		--		--		--	--	14	9	73	24	24	--	.7	--	87	80	--	268	6.9	28
Aug. 1-10,	139		--		--		--	--	19	14	81	34	34	--	.9	--	104	93	--	323	6.9	30
Aug. 11-20,	129		--		--		--	--	16	24	82	35	35	--	.9	--	116	96	--	343	7.0	30
Aug. 21-31,	135		--		--		--	--	22	24	86	43	43	--	1.6	--	140	104	--	374	7.1	30
Sept. 1-10,	138		--		--		--	--	22	34	95	57	57	--	1.6	--	146	120	--	459	7.2	54
Sept. 11-20,	97		--		--		--	--	22	40	100	64	64	--	1.8	--	160	127	--	508	7.2	55
Sept. 21-30,	138		--		--		--	--	27	40	95	58	58	--	1.8	--	156	123	--	475	7.0	28
Average	2,036		--		--		--	--	13	13	57	25	25	--	0.8	--	78	67	--	239	--	14

CLARION RIVER BASIN--Continued

CLARION RIVER NEAR PINEY--Continued

Temperature (°F) of water, water year October 1951 to September 1952
(Once-daily temperature measurement at approximately 10:30 a. m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	58	42	38	35	--	43	54	--	63	67	70
2	66	56	38	34	33	--	42	56	60	--	67	70
3	66	56	37	34	33	--	--	--	60	--	67	72
4	66	56	36	36	33	38	43	49	60	--	76	72
5	65	54	36	34	33	--	--	54	63	66	76	72
6	63	54	38	36	34	--	--	57	63	--	76	68
7	64	52	38	36	34	--	45	58	60	64	74	66
8	62	52	36	38	34	--	44	56	60	65	77	68
9	69	50	39	--	--	--	--	58	59	65	68	70
10	62	52	42	--	--	38	44	57	57	64	70	70
11	60	--	42	--	--	38	43	57	57	65	68	70
12	62	--	--	--	38	37	43	57	57	64	68	70
13	62	--	42	--	38	36	44	58	57	62	68	--
14	61	--	40	35	37	38	46	54	--	66	68	--
15	62	50	--	35	--	40	46	53	68	66	70	--
16	60	--	--	--	39	40	46	54	67	67	--	70
17	60	--	--	35	39	40	42	56	71	65	--	70
18	60	--	--	40	39	36	44	56	67	67	--	70
19	60	--	--	40	39	38	46	56	67	--	--	68
20	60	46	--	39	39	37	48	54	52	--	69	--
21	--	46	--	39	39	38	50	54	69	--	--	--
22	59	--	--	38	38	42	52	54	64	--	70	--
23	60	46	--	37	36	44	52	52	69	--	--	69
24	59	46	--	36	34	--	54	52	74	--	--	--
25	59	46	34	36	36	42	50	54	65	--	71	--
26	59	46	--	34	36	44	52	54	64	66	72	--
27	59	46	--	36	36	42	52	54	64	--	71	64
28	58	42	--	37	36	43	52	55	65	66	71	65
29	58	39	34	38	36	43	56	54	64	69	71	65
30	58	38	34	36	--	--	52	43	66	69	70	65
31	58	--	36	36	--	--	--	54	--	69	71	--
Average	61	--	--	37	36	--	47	55	63	--	--	--

OHIO RIVER MAIN STEM

ALLEGHENY RIVER AT KITTANNING, PA.

LOCATION.--At city raw-water intake, about 1,000 feet upstream from bridge on U. S. Highway 422 at Kittanning, Armstrong County and about 1,500 feet downstream from gaging station.

DRAINAGE AREA.--8 973 square miles (above gaging station).

RECORDS AVAILABLE.--Chemical analyses: September 1906 to September 1952.

Water temperatures: October 1944 to September 1952.

EXTREMES, 1951-52.--Hardness: Maximum, 432 ppm Oct. 21-31; minimum, 38 ppm Jan. 21-31, Mar. 21-31.

Specific conductance: Maximum daily, 496 microhos Oct. 21-31; minimum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Water temperatures: Maximum, 81 F July 24; minimum, freezing point Dec. 17, 1944-47; Maximum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Hardness: Maximum, 432 ppm Oct. 21-31; minimum, 38 ppm Jan. 21-31, Mar. 21-31.

Specific conductance: Maximum daily, 496 microhos Oct. 21-31; minimum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Water temperatures: Maximum, 81 F July 24; minimum, freezing point Dec. 17, 1944-47; Maximum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Hardness: Maximum, 432 ppm Oct. 21-31; minimum, 38 ppm Jan. 21-31, Mar. 21-31.

Specific conductance: Maximum daily, 496 microhos Oct. 21-31; minimum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Water temperatures: Maximum, 81 F July 24; minimum, freezing point Dec. 17, 1944-47; Maximum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Hardness: Maximum, 432 ppm Oct. 21-31; minimum, 38 ppm Jan. 21-31, Mar. 21-31.

Specific conductance: Maximum daily, 496 microhos Oct. 21-31; minimum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Water temperatures: Maximum, 81 F July 24; minimum, freezing point Dec. 17, 1944-47; Maximum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Hardness: Maximum, 432 ppm Oct. 21-31; minimum, 38 ppm Jan. 21-31, Mar. 21-31.

Specific conductance: Maximum daily, 496 microhos Oct. 21-31; minimum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Water temperatures: Maximum, 81 F July 24; minimum, freezing point Dec. 17, 1944-47; Maximum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Hardness: Maximum, 432 ppm Oct. 21-31; minimum, 38 ppm Jan. 21-31, Mar. 21-31.

Specific conductance: Maximum daily, 496 microhos Oct. 21-31; minimum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Water temperatures: Maximum, 81 F July 24; minimum, freezing point Dec. 17, 1944-47; Maximum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Hardness: Maximum, 432 ppm Oct. 21-31; minimum, 38 ppm Jan. 21-31, Mar. 21-31.

Specific conductance: Maximum daily, 496 microhos Oct. 21-31; minimum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Water temperatures: Maximum, 81 F July 24; minimum, freezing point Dec. 17, 1944-47; Maximum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Hardness: Maximum, 432 ppm Oct. 21-31; minimum, 38 ppm Jan. 21-31, Mar. 21-31.

Specific conductance: Maximum daily, 496 microhos Oct. 21-31; minimum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Water temperatures: Maximum, 81 F July 24; minimum, freezing point Dec. 17, 1944-47; Maximum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Hardness: Maximum, 432 ppm Oct. 21-31; minimum, 38 ppm Jan. 21-31, Mar. 21-31.

Specific conductance: Maximum daily, 496 microhos Oct. 21-31; minimum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Water temperatures: Maximum, 81 F July 24; minimum, freezing point Dec. 17, 1944-47; Maximum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Hardness: Maximum, 432 ppm Oct. 21-31; minimum, 38 ppm Jan. 21-31, Mar. 21-31.

Specific conductance: Maximum daily, 496 microhos Oct. 21-31; minimum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Water temperatures: Maximum, 81 F July 24; minimum, freezing point Dec. 17, 1944-47; Maximum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Hardness: Maximum, 432 ppm Oct. 21-31; minimum, 38 ppm Jan. 21-31, Mar. 21-31.

Specific conductance: Maximum daily, 496 microhos Oct. 21-31; minimum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

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Hardness: Maximum, 432 ppm Oct. 21-31; minimum, 38 ppm Jan. 21-31, Mar. 21-31.

OHIO RIVER BASIN

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color	
																	Calcium, mg./l.	Non-carbonate					
Oct. 1-10, 1951	1,405		3.3		0.08		34	8.7		34	44	63	66	0.2	0.4	258	121	85		448	6.8	--	
Oct. 11-20	1,493								36		46	69	67	--	.4	--		127	89		466	7.2	4
Oct. 21-31	1,430								36		55	63	70	--	.4	--		132	87		478	7.2	9
Nov. 1-10	2,696								33		55	66	61	--	.3	--		129	84		454	7.4	10
Nov. 11-20	9,098								25		41	46	52	--	.7	--		102	68		356	7.1	8
Nov. 21-30	21,768								11		19	37	21	--	1.3	--		60	44		200	6.8	8
Dec. 1-10	17,180									9.3	19	37	20	--	1.1	--		63	47		197	6.9	5
Dec. 11-20	19,288									5.2	14	31	14	--	1.0	--		53	42		157	6.8	5
Dec. 21-31	23,730									6.8	14	37	14	--	1.4	--		56	45		169	6.7	4
Jan. 1-10, 1952	50,750									4.6	11	30	11	--	1.7	--		47	38		139	6.8	5
Jan. 11-20	41,670									5.5	15	33	13	--	1.3	--		54	42		161	6.9	6
Jan. 21-31	73,264									4.1	8	25	9.5	--	1.3	--		38	31		112	6.1	5
Feb. 1-10	51,370									4.2	11	26	8.5	--	1.4	--		40	31		118	6.4	8
Feb. 11-20	19,640									7.8	19	33	13	--	1.0	--		52	36		161	6.6	8
Feb. 21-29	9,560									9.5	23	38	18	--	1.2	--		64	45		198	6.6	5
Mar. 1-10	10,678									11	28	41	21	--	1.0	--		72	49		215	7.4	5
Mar. 11-12	52,400									8.2	23	35	18	--	1.5	--		64	45		186	6.9	8
Mar. 13-20	44,338									5.6	13	22	9.5	--	1.5	--		36	25		110	6.9	10
Mar. 21-31	40,264									5.4	14	22	10	--	1.5	--		38	27		114	6.9	7
Apr. 1-10	22,780									7.2	16	28	14	--	.8	--		47	34		145	6.7	5
Apr. 11-20	35,550									5.2	14	28	10	--	.8	--		44	33		138	7.1	7

REMARKS.--Records of specific conductance and temperature of daily samples available in district office at Philadelphia, Pa. Temperature records not published because temperature at water plant may be influenced by travel distance in pipe line to plant. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Apr. 21-30	15,640	--	--	--	--	8.0	18	31	12	--	.7	--	47	32	149	7.3	5
May 1-10	8,409	--	--	--	--	9.4	24	30	17	--	.2	--	64	44	200	6.3	8
May 11-20	31,250	--	--	--	--	7.8	19	27	12	--	.4	--	44	28	149	6.3	5
May 21-31	39,290	4.2	08	--	--	2.8	14	28	8.0	.1	.5	75	46	35	130	6.9	3
June 1-10	9,748	--	--	--	--	7.5	22	32	14	--	.3	--	55	37	169	7.3	3
June 11-20	3,981	--	--	--	--	13	36	38	23	--	.3	--	72	42	237	6.9	8
June 21-30	2,772	--	--	--	--	16	41	47	29	--	.2	--	88	54	287	7.1	8
July 1-10	2,306	--	--	--	--	21	44	54	34	--	.2	--	95	59	323	7.8	6
July 11-20	1,824	--	--	--	--	25	50	53	40	--	.4	--	98	57	344	7.8	5
July 21-31	1,439	--	--	--	--	29	52	57	48	--	.6	--	108	65	389	7.4	8
Aug. 1-10	1,031	--	--	--	--	31	52	62	52	--	.5	--	113	70	406	7.5	8
Aug. 11-20	2,231	--	--	--	--	34	60	66	52	--	.3	--	118	69	420	7.3	3
Aug. 21-31	1,955	--	--	--	--	28	56	63	48	--	.6	--	113	67	395	7.3	3
Sept. 1-10	1,100	--	--	--	--	28	55	51	50	--	.8	--	108	63	391	7.7	5
Sept. 11-20	1,552	--	--	--	--	22	56	55	65	--	.8	--	148	102	444	7.8	5
Sept. 21-30	2,774	--	--	--	--	34	90	54	90	--	.2	--	116	67	429	7.3	5
Average	17,550	--	--	--	--	16	31	42	30	--	0.8	--	77	52	259	--	6

OHIO RIVER MAIN STEM--Continued

ALLEGHENY RIVER AT KITTANNING, PA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952
(Once-daily temperature measurement at approximately 8 a.m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	63	54	37	33	34	36	45	57	61	77	80	75
2	63	54	37	35	35	36	46	60	63	77	80	75
3	63	52	36	35	37	36	46	60	64	78	78	75
4	64	47	37	35	37	37	46	60	65	78	78	73
5	64	48	37	35	37	36	46	60	66	78	79	73
6	64	47	38	35	38	36	45	60	68	78	76	73
7	65	47	42	35	37	36	44	60	70	78	76	73
8	64	45	43	35	37	36	43	60	70	78	78	73
9	62	43	38	35	37	35	43	58	70	78	78	73
10	60	43	45	35	37	35	44	58	72	77	78	72
11	60	42	43	35	37	35	45	58	72	77	77	73
12	58	40	40	35	37	38	47	57	72	77	77	73
13	58	40	37	35	37	37	45	56	72	77	77	74
14	58	40	38	35	35	38	46	54	74	78	77	73
15	68	40	35	35	34	37	46	54	74	78	77	73
16	59	43	35	37	34	37	45	55	72	78	77	73
17	58	43	32	40	34	36	45	53	74	78	77	72
18	59	43	33	--	34	35	46	55	74	78	76	72
19	59	42	33	--	34	36	48	55	74	79	76	71
20	58	40	33	39	35	37	50	56	73	79	76	70
21	58	38	33	39	35	40	54	56	74	79	76	70
22	58	37	34	38	35	43	54	55	74	80	76	69
23	58	37	34	--	35	43	56	55	74	80	74	68
24	58	37	35	35	35	44	57	56	74	81	74	66
25	57	38	35	35	35	44	56	57	76	80	73	65
26	56	38	34	38	35	44	54	57	76	80	70	65
27	56	38	34	38	35	43	54	58	77	80	74	64
28	55	36	33	38	36	43	55	58	77	80	75	63
29	55	40	33	37	36	42	56	60	78	80	75	63
30	55	36	33	35	--	42	57	60	78	80	75	63
31	55	--	33	34	--	42	--	60	--	80	75	--
Average	60	42	36	36	36	39	49	57	72	79	76	70

OHIO RIVER MAIN STEM--Continued

ALLEGHENY RIVER AT SHARPSBURG, PA.

LOCATION.--At Sharpsburg bridge, Allegheny County, 18.8 miles below gaging station at Natrona.

RECORDS AVAILABLE.--Chemical analyses: Monthly cross-section samples October 1947 to September 1952.

REMARKS.--Station 100 is approximately 100 feet from north (right) bank and station 800 is approximately 90 feet from south (left) bank.

Chemical analyses of cross-section samples, water year October 1951 to September 1952

Date	Station	Time	Temperature (°F)	Parts per million					Specific conductance (micro- mhos at 25°C)	pH	Color
				Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Ni- trate (NO ₃)	Hard- ness as CaCO ₃			
Oct. 12, 1951	800	12:50 pm	65	--	246	53	2.3	222	728	3.70	4
	600	12:45 pm	65	--	247	54	5.1	226	736	3.90	4
	410	12:40 pm	65	--	244	54	2.5	218	732	3.95	4
	250	12:35 pm	65	--	243	54	3.1	224	735	4.00	4
	100	12:30 pm	65	--	243	54	2.5	222	733	4.10	4
Nov. 13	800	4:25 pm	50	4	232	60	2.5	222	708	4.6	4
	800	4:30 pm	50	4	229	60	2.9	220	705	4.8	5
	410	4:35 pm	50	6	228	60	2.9	218	702	5.4	4
	250	4:40 pm	50	6	231	60	2.8	220	705	4.9	4
	100	4:40 pm	50	6	230	60	2.8	216	699	4.9	5
Dec. 6	600	8:30 am	38	12	60	17	2.1	72	239	5.4	6
	600	8:35 am	37	12	58	17	1.8	70	221	5.3	4
	410	8:40 am	37	14	57	16	1.6	70	217	5.6	5
	250	8:45 am	38	10	55	16	1.8	70	217	5.4	4
	100	8:40 am	38	12	57	16	1.7	72	218	5.6	6
Jan. 18, 1952	800	11:05 am	38	14	46	13	2.0	60	182	5.8	5
	600	11:00 am	38	14	44	12	1.5	56	175	5.8	5
	410	10:55 am	38	14	40	11	1.7	52	165	5.6	4
	250	10:50 am	38	14	37	11	1.5	54	163	5.6	5
	100	10:45 am	38	18	37	12	1.6	56	171	5.9	6
Feb. 14	800	11:35 am	35	4	65	11	2.0	66	196	4.5	6
	800	11:40 am	35	6	62	11	1.9	66	196	4.7	5
	410	11:45 am	35	6	59	10	1.6	64	186	4.9	5
	250	11:50 am	36	6	56	10	1.3	64	183	5.3	5
	100	11:55 am	36	8	52	10	1.5	62	177	5.4	6
Mar. 18	800	10:25 am	41	4	45	8	2.8	50	154	4.8	4
	600	10:30 am	40	4	46	7	2.0	50	149	5.2	3
	410	10:35 am	40	6	41	8	2.0	48	143	5.2	2
	250	10:40 am	39	8	35	8	1.8	46	137	5.3	4
	100	10:45 am	40	8	35	8	1.3	44	135	5.2	5
Apr. 10	800	9:10 am	45	6	50	10	1.3	62	184	5.1	4
	600	9:00 am	45	6	50	10	.9	62	181	5.1	4
	410	8:55 am	45	8	49	12	.9	60	174	5.7	3
	250	8:50 am	45	16	40	11	.8	58	177	5.6	3
	100	8:45 am	46	14	41	12	.6	56	173	5.5	5
May 12	800	4:15 pm	57	4	86	16	1.2	94	274	5.0	5
	800	4:20 pm	56	4	94	14	.9	94	277	4.8	5
	410	4:30 pm	58	4	94	14	.2	94	274	4.9	4
	250	4:35 pm	50	6	93	14	.4	92	274	5.1	6
	100	4:40 pm	58	6	89	14	1.4	92	277	5.1	6
June 9	800	2:00 pm	74	4	79	13	1.8	84	258	4.9	6
	600	2:05 pm	73	6	64	14	1.7	84	260	5.2	3
	410	2:10 pm	73	6	60	13	.6	82	252	5.1	5
	250	2:15 pm	73	6	81	13	.6	82	250	5.0	5
	100	2:20 pm	74	6	80	13	.6	82	256	5.1	5
July 11	800	8:05 am	78	4	163	25	.4	148	468	4.7	4
	600	8:10 am	79	4	159	26	.4	148	468	5.0	5
	410	8:10 am	79	4	157	26	.6	148	466	4.8	5
	250	8:15 am	79	4	160	25	.5	144	464	4.8	4
	100	8:15 am	79	4	161	26	.5	150	465	5.1	3

OHIO RIVER BASIN

OHIO RIVER MAIN STEM--Continued

ALLEGHENY RIVER AT SHARPSBURG, PA.--Continued

Chemical analyses of cross-section samples, water year October 1951 to September 1952--continued

Date	Station	Time	Temperature (°F)	Parts per million					Specific conductance (micro- mhos at 25°C)	pH	Color
				Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Ni- trate (NO ₃)	Hard- ness as CaCO ₃			
Aug. 11, 1952	800	6:45 am	68	--	--	--	--	--	645	--	--
	900	6:40 am	68	--	--	--	--	--	658	--	--
	410	6:35 am	67	--	--	--	--	--	640	--	--
	250	6:30 am	68	--	--	--	--	--	633	--	--
	100	6:25 am	68	--	--	--	--	--	641	--	--
Sept. 17	800	12:25 pm	77	--	--	--	--	--	726	--	--
	900	12:30 pm	77	--	--	--	--	--	698	--	--
	410	12:35 pm	76	--	--	--	--	--	716	--	--
	250	12:40 pm	76	--	--	--	--	--	695	--	--
	100	12:45 pm	76	--	--	--	--	--	706	--	--

MONONGAHELA RIVER BASIN

MONONGAHELA RIVER AT CHARLEROI, PA.

LOCATION.--At Mercantile Bridge Company toll bridge approximately 1½ miles downstream from gaging station at Charleroi, Washington County, and 1 mile downstream from Lock 4.

DRAINAGE AREA.--5,213 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1952.

Water temperatures: October 1944 to September 1952.

EXTREMES, 1951-52.--Hardness: Maximum, 275 ppm Oct. 21-31; minimum, 57 ppm Dec. 21-31.

Specific conductance: Maximum daily, 1,180 microhos Nov. 3; minimum daily, 166 microhos Dec. 28.

Water temperatures: Maximum, 86°F June 29; minimum, 39°F on many days during winter months.

EXTREMES, 1944-52.--Dissolved solids (1944-47): Maximum, 749 ppm Sept. 11-20, 1946; minimum, 99 ppm Feb. 11-20, 1946.

Hardness: Maximum, 399 ppm Sept. 11-20, 1946; minimum, 44 ppm Dec. 1-10, 1949.

Specific conductance: Maximum, 1,210 microhos Sept. 11-20, 1946; minimum, 149 microhos Dec. 1-10, 1949.

Water temperatures: Maximum, 86°F Sept. 1, 1948; June 29, 1952; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for gaging station at Charleroi for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium	Non-carbonate				
Oct. 1-10, 1951	774		4.8	7.6	0.06	1.2	60	22	80	0	371	18	0.3	1.6	566	240	240	86	895	3.90	3	
Oct. 11-20	640		--	--	--	--	--	--	85	--	285	17	--	.8	--	--	220	220	78	886	3.50	5
Oct. 21-31	504		--	--	--	--	--	--	113	--	473	20	--	.4	--	--	275	275	91	1,070	3.50	5
Nov. 1-10	1,768		--	--	--	--	--	--	97	--	436	19	--	.6	--	--	270	270	71	1,010	3.60	6
Nov. 11-20	2,361		--	--	--	--	--	--	68	--	285	16	--	1.7	--	--	180	160	39	749	4.5	5
Nov. 21-26	9,400		--	--	--	--	--	--	45	--	203	17	--	2.4	--	--	140	140	41	561	4.9	6
Nov. 27-30	17,700		--	--	--	--	--	--	8.1	--	1.0	81	7.0	--	3.2	--	80	79	--	259	5.4	6
Dec. 1-10	8,574		--	--	--	--	--	--	14	--	--	76	4.5	--	3.2	--	67	65	12	219	4.8	4
Dec. 11-20	16,280		--	--	--	--	--	--	14	--	3.0	78	5.5	--	2.4	--	64	62	--	196	5.9	4
Dec. 21-31	19,802		--	--	--	--	--	--	7.9	--	3.0	61	4.5	--	2.2	--	57	55	--	181	5.6	7
Jan. 1-10, 1952	33,480		--	--	--	--	--	--	7.9	--	2.0	73	4.0	--	2.2	--	68	66	--	218	5.4	6
Jan. 11-20	14,331		--	--	--	--	--	--	15	--	--	93	4.0	--	.6	--	70	70	25	253	4.20	3
Jan. 21-31	32,460		--	--	--	--	--	--	9.3	--	--	80	6.0	--	.7	--	72	72	18	218	4.5	3
Feb. 1-10	19,375		--	--	--	--	--	--	16	--	--	121	8.0	--	.8	--	104	104	23	318	4.30	3
Feb. 11-20	7,498		--	--	--	--	--	--	23	--	--	156	8.5	--	.2	--	124	124	39	403	4.00	5
Feb. 21-26	6,215		--	--	--	--	--	--	24	--	--	169	8.5	--	.4	--	136	136	28	420	4.30	3
Mar. 1-10	8,096		--	--	--	--	--	--	25	--	--	180	9.5	--	.6	--	146	146	26	445	4.40	3
Mar. 11-20	19,232		--	--	--	--	--	--	13	--	0	107	5.0	--	1.5	--	92	92	20	260	4.5	5
Mar. 21-31	18,630		--	--	--	--	--	--	14	--	2	107	5.5	--	1.8	--	92	90	--	273	5.4	5
Apr. 1-10	8,586		--	--	--	--	--	--	17	--	0	120	5.5	--	1.0	--	96	96	23	301	4.20	6
Apr. 11-20	16,264		--	--	--	--	--	--	8.6	--	0	95	5.0	--	1.0	--	88	88	17	244	4.5	5
Apr. 21-30	15,610		--	--	--	--	--	--	21	--	2	104	5.0	--	.9	--	72	70	25	248	4.6	5

MONONGAHELA RIVER BASIN--Continued

MONONGAHELA RIVER AT CHARLEROI, PA.--Continued

Chemical analyses, in parts per million, water year October 1951 to September 1952--Continued

Date of collection	Mean discharge (cfs)	Tem- perature (°F)	Silica (SiO ₂)	Alum- inum (Al)	Iron (Fe)	Mang- anese (Mn)	Cal- cium (Ca)	Mag- nes- ium (Mg)	Sod- ium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO ₃	Total acid- ity as H ₂ SO ₄	Specific conduct- ance (micro- mhos at 25°C)	pH	Color	
May 1-10, 1952	7,481		--	--	--	--	--	--	8.5	0	96	4.0	--	--	1.0	--	88	88	16	268	4.40	5
May 11-12	12,946		--	--	--	--	20	6.3	13	0	96	4.0	--	--	1.4	--	80	80	17	269	4.40	5
May 21-31	22,318		2.6		0.04	--	--	--	9.3	3	84	3.5	--	.1	1.1	135	76	73	--	220	5.3	5
June 1-10	3,349		--	--	--	--	--	--	22	0	155	5.0	--	--	1.5	--	122	122	26	381	4.5	5
June 11-20	1,891		--	--	--	--	--	--	47	0	249	8.0	--	--	1.7	--	168	168	50	593	4.00	5
June 21-30	2,840		--	--	--	--	--	--	46	0	287	10	--	--	1.3	--	185	185	90	718	3.60	5
July 1-10	2,498		--	--	--	--	--	--	67	--	336	16	--	--	1.5	--	170	170	87	648	3.80	5
July 11-20	1,942		--	--	--	--	--	--	62	--	330	18	--	--	1.5	--	220	220	93	860	3.60	5
July 21-31	1,247		--	--	--	--	--	--	64	--	348	15	--	--	1.2	--	246	246	76	877	3.50	8
Aug. 1-10	1,015		--	--	--	--	--	--	46	0	270	31	--	--	5.6	--	230	230	17	719	4.7	2
Aug. 11-20	2,875		--	--	--	--	--	--	67	0	349	16	--	--	5.8	--	210	210	102	873	3.30	2
Aug. 21-31	2,133		--	--	--	--	--	--	45	--	257	11	--	--	1.0	--	154	154	64	669	3.50	5
Sept. 1-10	901		--	--	--	--	--	--	59	--	297	11	--	--	2.3	--	198	198	66	726	3.70	2
Sept. 11-20	987		--	--	--	--	--	--	65	0	343	15	--	--	3.5	--	240	240	64	842	3.60	2
Sept. 21-31	802		--	--	--	--	--	--	64	0	346	16	--	--	2.3	--	245	245	74	860	3.60	3
Average	9,217		--	--	--	--	--	--	38	1.0	205	10	--	--	1.5	--	146	145	48	518	--	5

MONONGAHELA RIVER BASIN--Continued

MONONGAHELA RIVER AT CHARLEROI, PA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	58	43	40	40	39	46	56	64	--	81	74
2	67	58	42	40	40	40	47	57	64	76	78	74
3	67	--	42	40	39	40	47	58	65	79	80	74
4	69	46	40	40	40	40	48	59	66	--	81	73
5	70	45	40	--	41	40	44	62	64	77	80	72
6	67	45	40	39	--	40	44	61	68	78	78	74
7	77	48	40	39	--	40	43	60	70	78	60	73
8	61	43	41	39	39	40	43	60	74	--	82	71
9	61	48	41	39	43	40	43	61	72	76	80	73
10	61	--	40	39	43	41	42	61	74	76	78	73
11	--	45	39	--	39	43	42	62	71	80	78	73
12	67	45	39	40	40	43	58	60	70	80	76	74
13	62	48	39	42	39	43	58	58	70	80	76	74
14	62	46	39	42	39	43	57	59	71	81	79	74
15	61	45	39	42	41	45	57	61	78	82	60	73
16	62	45	39	42	39	44	57	59	78	82	80	73
17	63	44	40	44	40	43	57	56	75	85	78	73
18	50	44	39	45	40	43	--	58	75	83	78	73
19	--	43	39	43	--	43	53	68	75	84	78	72
20	60	44	39	43	40	43	55	58	75	85	78	--
21	60	45	39	42	41	43	56	57	71	84	77	70
22	60	45	40	42	41	40	57	59	74	85	74	68
23	61	45	--	42	44	--	56	60	74	85	73	68
24	59	42	40	42	40	43	58	60	77	83	72	70
25	59	43	40	41	40	43	54	61	78	85	72	70
26	59	44	40	41	--	44	54	61	80	84	75	68
27	57	43	40	39	40	44	56	61	81	83	76	68
28	57	43	39	38	39	43	57	63	80	81	76	69
29	56	41	40	38	39	44	57	62	86	85	--	67
30	58	41	40	38	--	45	55	--	60	80	74	69
31	--	--	40	39	--	46	--	64	--	80	76	--
Average	62	45	40	41	40	42	52	60	73	81	77	72

OHIO RIVER MAIN STEM--Continued

OHIO RIVER AT AMBRIDGE, PA.

LOCATION --At bridge on State Highway 930 at Ambridge, Beaver County, 1.2 miles downstream from Sewickley Creek and approximately 5 miles below gaging station at Sewickley, Allegheny County.

DRAINAGE AREA --19,560 square miles

RECORDS AVAILABLE --Chemical analyses: October 1945 to September 1952.

WATER TEMPERATURES: October 1945 to September 1952.

EXTREMES, 1951-52 --Hardness: Maximum, 255 ppm Sept. 21-30; minimum, 50 ppm Jan. 21-31.

Specific conductance: Maximum daily, 994 microhos Sept. 25; minimum, 33 $\frac{1}{2}$ Dec. 23.

Water temperatures: Maximum, 86 $\frac{1}{2}$ F July 22, 23; minimum, 33 $\frac{1}{2}$ Dec. 23.

EXTREMES, 1945-52 --Dissolved solids (1945-47): Maximum, 600 ppm Oct. 1-10, 1946; minimum, 79 ppm Apr. 1-10, 1947.

Hardness (1945-47) (1949-52): Maximum, 302 ppm Oct. 1-10, 1946; minimum, 43 ppm Apr. 1-10, 1947.

Specific conductance: Maximum daily, 994 microhos Sept. 25, 1952; minimum, 33 $\frac{1}{2}$ Dec. 23, 1952; minimum, 79 ppm Apr. 1-10, 1947.

Water temperatures: Maximum, 86 $\frac{1}{2}$ F Aug. 20, 21, 1947, July 22, 23, 1952; minimum, 33 $\frac{1}{2}$ Dec. 23, 1952; minimum, 79 ppm Apr. 1-10, 1947.

REMARKS --Samples collected daily from highway bridge at point 400 feet from east bank of river. Due to cross-sectional differences in concentration of dissolved solids, water samples also collected once a month at points 340, 625, 870, 1,090 and 1,390 feet from east bank of river. Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of water discharge for water year October 1951 to September 1952 based on records for Ohio River at Sewickley, which are given in Water-Supply Paper 1235.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (microhos at 25°C)	pH	Color
																	Calcium	Non-carbonate				
Oct. 1-10, 1951...	3,878		4.1		9.00	1.4	66	18	62		00	298	40	0.5	7.2	512	239	239	18	769	4.9	3
Oct. 11-20	3,832								69			313	43		5.5		240	240	22	823	4.9	8
Oct. 21-31	3,712								72			322	45		5.2		246	246	19	854	4.36	9
Nov. 1-10	6,217								73			315	48		5.5		242	242	20	838	4.9	7
Nov. 11-20	14,140								56			283	49		4.2		236	213		730	6.3	6
Nov. 21-25	29,340								31		11	140	38		2.8		143	134		475	5.8	4
Nov. 26-30	53,240								15			77	18		3.8		90	76		372	6.2	5
Dec. 1-10	24,170								13		3	78	15		5.5		79	77		283	6.5	6
Dec. 11-20	44,810								9.4		5	56	13		2.0		62	58		199	6.2	5
Dec. 21-31	56,580								11		6	68	13		2.5		72	67		222	6.1	7
Jan. 1-10, 1952	110,600								6.7		5	47	6.5		2.0		82	48		101	6.2	5
Jan. 11-20	68,940								9.4		6	61	14		1.5		69	64		214	6.3	5
Jan. 21-31	141,800								6.5		6	42	10		1.8		50	45		160	6.0	5
Feb. 1-10	101,100										3	49	10		1.8		54	52		183	5.9	5
Feb. 11-20	39,220								12		2	73	12		1.2		74	69		230	5.9	5
Feb. 21-29	27,080								10		2	113	12		1.0		108	106		324	5.3	5
Mar. 1-10	96,980								16		7	58	17		1.5		110	106		342	5.8	5
Mar. 11-20	96,980								9.6		7	53	11		3.0		59	52		182	5.9	5
Mar. 21-31	82,120								7.6		8	48	10		2.5		54	47		162	6.1	5

Apr. 1-10.....	44,550	--	--	--	10	8	67	11	--	2.5	--	71	64	--	211	6.2	8
Apr. 11-20.....	75,080	--	--	--	10	8	54	11	--	2.0	--	58	51	--	181	6.1	8
Apr. 21-30.....	48,180	--	--	--	16.9	4	73	16.2	--	1.2	--	74	71	--	215	6.5	8
May 1-10.....	27,150	--	--	--	12	2	94	10	--	1.7	--	88	86	--	266	5.8	8
May 11-20.....	57,800	--	--	--	9.1	6	66	12	--	1.5	--	72	67	--	220	6.1	3
May 21-31.....	90,450	.00	15	4.3	7.0	10	49	7.0	.1	1.4	100	55	47	--	165	6.6	5
June 1-10.....	20,290	--	--	--	14	7	87	11	--	2.1	--	64	78	--	264	6.2	5
June 11-20.....	9,177	--	--	--	25	4	147	16	--	2.4	--	126	123	--	398	6.2	5
June 21-30.....	12,350	--	--	--	31	2	187	15	--	1.1	--	151	149	--	476	5.1	5
July 1-10.....	7,415	--	--	--	38	0	214	17	--	2.1	--	166	166	18	531	4.6	3
July 11-20.....	5,810	--	--	--	44	2	234	19	--	2.3	--	178	176	21	586	4.8	4
July 21-31.....	5,232	--	--	--	52	--	251	25	--	10	--	192	192	30	641	4.30	5
Aug. 1-10.....	4,117	--	--	--	51	2	271	30	--	12	--	224	222	--	690	5.3	5
Aug. 11-20.....	8,578	--	--	--	55	--	300	29	--	14	--	246	246	28	763	4.10	5
Aug. 21-31.....	5,960	--	--	--	44	0	283	20	--	9.5	--	215	215	38	715	3.90	2
Sept. 1-10.....	3,607	--	--	--	54	0	248	35	--	14	--	202	202	22	666	4.9	5
Sept. 11-20.....	3,871	--	--	--	49	2	247	34	--	14	--	212	212	--	700	6.1	5
Sept. 21-30.....	5,082	--	--	--	78	0	364	16	--	2.6	--	255	255	76	927	3.40	3
Average.....	37,220	--	--	--	30	5	156	20	--	4.2	--	133	130	28	432	--	5

OHIO RIVER BASIN

OHIO RIVER MAIN STEM--Continued

OHIO RIVER AT AMBRIDGE, PA.--Continued

Chemical analyses of cross-section samples, water year October 1951 to September 1952

Date	Station	Time	Temperature (° F)	Parts per million					Specific conductance (micro- mhos at 25°C)	pH	Color
				Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Ni- trate (NO ₃)	Hard- ness as CaCO ₃			
Oct. 12, 1951	1380	10:15 a.m.	68	0	325	41	5.0	238	845	3.80	4
	1090	10:10 a.m.	68	0	320	44	4.5	238	845	3.90	4
	870	10:05 a.m.	68	0	316	44	5.5	238	847	3.80	5
	625	10:00 a.m.	68	0	317	42	6.0	238	847	3.75	5
	340	9:55 a.m.	68	0	318	42	5.5	238	849	3.80	6
Nov. 9	1380	2:15 p.m.	54	0	328	41	4.0	245	858	3.85	6
	1090	2:20 p.m.	54	0	326	42	3.0	240	818	3.80	5
	870	2:25 p.m.	54	0	325	42	5.5	245	845	3.90	5
	625	2:30 p.m.	54	0	322	42	4.5	240	824	4.2	6
	340	2:35 p.m.	54	0	326	42	6.4	245	851	3.9	6
Dec. 2	1380	4:45 p.m.	41	2	97	8	3.5	78	289	5.4	5
	1090	4:45 p.m.	41	6	96	9	2.5	76	257	5.9	7
	870	4:45 p.m.	41	6	79	9	3.5	76	231	6.5	8
	625	4:45 p.m.	41	8	72	12	3.0	74	216	6.7	10
	340	4:45 p.m.	41	8	72	10	3.0	74	218	6.9	7
Jan. 18, 1952	1380	9:15 a.m.	40	12	72	12	2.8	80	237	6.8	5
	1090	9:10 a.m.	40	10	88	13	2.8	78	229	6.1	5
	870	9:05 a.m.	40	14	60	13	2.5	72	220	6.1	5
	625	9:00 a.m.	40	16	47	13	2.0	72	210	6.5	6
	340	8:55 a.m.	40	20	57	14	2.5	70	208	6.6	6
Feb. 14	1380	--	39	2	102	9	3.2	102	294	4.7	6
	1090	--	38	2	95	9	2.8	90	268	4.8	5
	870	--	38	2	81	9	2.8	80	246	5.0	5
	625	--	37	4	67	9	2.5	70	214	5.8	4
	340	--	37	6	56	9	2.2	62	192	6.0	5
Mar. 18	1380	12:25 p.m.	43	6	80	7.0	1.5	80	229	5.1	5
	1090	12:30 p.m.	41	6	74	7.0	1.5	72	217	5.9	5
	870	12:35 p.m.	41	6	61	6.0	2.5	62	191	6.0	5
	625	12:45 p.m.	40	14	49	6.0	2.5	62	171	6.5	5
	340	12:50 p.m.	39	12	39	5.0	2.0	52	149	6.1	5
Apr. 10	1380	5:30 p.m.	48	4	100	7.0	2.5	86	270	5.1	7
	1090	5:30 p.m.	48	4	91	6.0	1.0	84	257	5.6	6
	870	5:25 p.m.	48	8	76	6.0	1.2	76	227	5.9	5
	625	5:15 p.m.	47	10	60	10	1.5	64	195	6.2	8
	340	5:10 p.m.	45	12	46	8.0	1.5	56	181	6.4	5
May 12	1380	2:30 p.m.	61	8	112	12	3.8	106	324	6.0	7
	1090	2:40 p.m.	61	6	109	13	2.5	106	321	6.0	5
	870	2:45 p.m.	60	8	105	13	2.5	104	314	6.1	8
	625	2:50 p.m.	60	8	95	12	2.0	102	303	6.1	7
	340	2:55 p.m.	59	6	81	11	1.8	98	292	6.0	5
June 9	1380	10:30 a.m.	74	4	118	11	2.1	106	324	4.7	3
	1090	10:35 a.m.	73	4	115	14	2.1	106	328	4.9	4
	870	10:40 a.m.	73	4	113	12	2.4	104	320	4.9	5
	625	10:50 a.m.	74	4	112	11	2.1	102	317	4.8	5
	340	10:55 a.m.	74	4	113	12	2.3	104	320	4.8	4
July 11	1380	9:55 a.m.	80	14	215	19	3.1	172	579	5.9	5
	1090	9:50 a.m.	79	--	216	19	.4	172	565	4.30	4
	870	9:45 a.m.	79	--	220	19	.3	172	564	4.30	2
	625	9:40 a.m.	80	--	219	19	.4	172	563	4.20	2
	340	9:40 a.m.	80	--	215	19	.3	172	563	4.45	3

OHIO RIVER MAIN STEM--Continued

OHIO RIVER AT AMBRIDGE, PA.--Continued

Chemical analyses of cross-section samples, water year October 1951 to September 1952--Continued

Date	Station	Time	Temperature (°F)	Parts per million					Specific conductance (micro- mhos at 25°C)	pH	Color
				Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Ni- trate (NO ₃)	Hard- ness as CaCO ₃			
Aug. 11, 1952	1380	8:10 a.m.	66	--	--	--	--	--	759	--	--
	1090	8:05 a.m.	66	--	--	--	--	--	782	--	--
	870	8:00 a.m.	66	--	--	--	--	--	782	--	--
	625	7:55 a.m.	67	--	--	--	--	--	782	--	--
	340	7:50 a.m.	67	--	--	--	--	--	780	--	--
Sept. 17	1380	7:45 a.m.	77	--	--	--	--	--	703	--	--
	1090	7:40 a.m.	77	--	--	--	--	--	760	--	--
	870	7:35 a.m.	77	--	--	--	--	--	730	--	--
	625	7:30 a.m.	77	--	--	--	--	--	712	--	--
	340	7:25 a.m.	77	--	--	--	--	--	731	--	--

OHIO RIVER BASIN

OHIO RIVER MAIN STEM--Continued

OHIO RIVER AT AMBRIDGE, PA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	62	40	38	36	40	48	60	63	81	82	83
2	72	62	40	35	38	40	49	59	61	78	81	82
3	74	60	41	37	38	42	51	60	66	81	81	81
4	74	57	43	37	40	42	50	59	68	81	83	81
5	75	57	43	36	40	41	49	62	69	81	84	81
6	73	56	44	37	40	40	48	63	69	80	84	80
7	72	55	46	37	40	40	46	64	70	83	84	79
8	71	54	46	37	40	39	46	64	71	84	84	81
9	70	54	46	38	40	40	45	63	74	81	83	78
10	69	54	45	37	40	40	48	63	74	80	83	81
11	68	53	44	37	39	41	48	63	72	80	84	81
12	68	53	42	38	40	40	48	61	72	82	83	79
13	68	54	48	38	39	40	49	58	73	82	83	81
14	77	54	37	40	39	39	50	58	73	81	83	80
15	69	54	37	41	39	39	48	51	73	82	84	81
16	69	53	36	42	39	38	49	52	77	82	83	80
17	69	51	36	41	39	38	48	55	77	83	83	78
18	68	49	36	41	39	39	50	58	78	84	83	78
19	64	44	36	41	39	39	49	58	78	84	82	77
20	68	43	36	41	39	42	50	59	76	83	82	76
21	68	44	37	39	39	44	55	58	77	81	81	76
22	68	44	34	39	39	41	58	58	77	86	79	76
23	69	46	33	38	39	45	58	59	77	86	79	76
24	68	45	34	36	41	45	58	58	79	84	78	75
25	68	41	34	36	40	46	58	60	79	83	81	75
26	67	41	35	38	41	46	58	60	81	84	81	74
27	66	41	35	40	41	45	57	61	81	84	82	73
28	65	40	35	40	42	45	58	61	83	85	81	72
29	--	40	36	37	42	45	58	61	81	83	80	75
30	65	40	36	36	--	44	58	61	81	83	81	73
31	63	--	37	36	--	47	--	62	--	83	80	--
Average	69	50	39	38	40	42	51	60	74	82	82	78

BEAVER RIVER BASIN

BEAVER RIVER AT NEW BRIGHTON, PA.

LOCATION.--At head of intake canal of Beaver Falls Municipal Authority, 2.5 miles downstream from gaging station at Beaver Falls, Beaver County, and 3 miles upstream from mouth.

DRAINAGE AREA.--3,112 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1952.

EXTREMES: Maximum, 81° F July 23; minimum, 34° F Dec. 17, 18, Jan. 30.

Water temperatures: Maximum daily, 632 micromhos Nov. 6; minimum daily, 161 micromhos Jan. 29.

Specific conductance: Maximum, 362 ppm Nov. 21-30, 1946; minimum, 136 ppm Apr. 1-10, 1947.

EXTREMES: Maximum, 236 ppm Dec. 1-10, 1949; minimum, 80 ppm Jan. 21-31, 1952.

Hardness: Maximum, 236 ppm Dec. 1-10, 1949; minimum, 80 ppm Jan. 21-31, 1952.

Specific conductance: Maximum daily, 683 micromhos Feb. 10, 1948; minimum daily, 161 micromhos Jan. 29, 1952.

Water temperatures: Maximum, 88° F July 6, 1949; minimum, freezing point Feb. 7, 11, 1947, Dec. 27, 1946, Feb. 9, 1951.

REMARKS.--Intake canal located on east bank of river. Samples collected by Beaver Falls Municipal Authority. Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1951 to September 1952 based on records for Beaver River at Beaver Falls which are given in Water-Supply Paper 1235.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium, mg./l.	Non-carbonate				
Oct. 1-10, 1951...	--	--	5.6	0.05	--	--	55	17	15	38	149	34	34	0.4	6.4	331	209	176	--	528	6.6	5
Oct. 11-20.....	--	--	--	--	--	--	--	--	23	42	150	31	31	--	10	--	193	159	10	535	6.7	4
Oct. 21-31.....	--	--	--	--	--	--	--	--	23	40	166	35	35	--	10	--	212	179	--	575	6.6	5
Nov. 1-10.....	--	--	--	--	--	--	--	--	27	38	178	37	37	--	9.5	--	218	187	--	597	6.8	5
Nov. 11-20.....	--	--	--	--	--	--	--	--	19	40	138	27	27	--	7.0	--	178	145	--	479	6.8	5
Nov. 21-30.....	--	--	--	--	--	--	--	--	9.5	38	91	19	19	--	5.0	--	136	105	--	356	6.9	4
Dec. 1-10.....	4,337	--	--	--	--	--	--	--	13	35	104	20	20	--	5.5	--	142	113	--	377	6.9	5
Dec. 11-20.....	3,584	--	--	--	--	--	--	--	9.4	29	93	18	18	--	5.5	--	130	106	--	346	6.8	5
Dec. 21-31.....	8,258	--	--	--	--	--	--	--	9.0	31	76	17	17	--	5.0	--	113	88	--	314	6.9	5
Jan. 1-10, 1952..	11,170	--	--	--	--	--	--	--	8.5	32	70	13	13	--	5.0	--	103	77	--	271	6.9	6
Jan. 11-20.....	12,070	--	--	--	--	--	--	--	9.5	35	82	15	15	--	5.5	--	119	90	--	308	6.8	6
Jan. 21-31.....	21,370	--	--	--	--	--	--	--	7.5	24	59	8.0	8.0	--	5.0	--	80	60	--	222	7.1	8
Feb. 1-10.....	17,010	--	--	--	--	--	--	--	5.1	26	65	10	10	--	5.0	--	96	75	--	236	6.9	5
Feb. 11-20.....	7,150	--	--	--	--	--	--	--	7.9	30	74	15	15	--	5.5	--	110	85	--	276	6.9	5
Feb. 21-29.....	4,543	--	--	--	--	--	--	--	9.0	30	79	13	13	--	5.5	--	110	85	--	290	6.8	5
Mar. 1-10.....	4,389	--	--	--	--	--	--	--	8.6	30	84	16	16	--	5.5	--	120	95	--	307	6.9	5
Mar. 11-20.....	10,410	--	--	--	--	--	--	--	5.6	28	74	12	12	--	3.9	--	98	73	--	249	6.9	5
Mar. 21-31.....	6,645	--	--	--	--	--	--	--	7.2	28	71	10	10	--	3.2	--	96	75	--	257	6.9	5

BEAVER RIVER BASIN--Continued

BEAVER RIVER AT NEW BRIGHTON, PA.--Continued

Chemical analyses, in parts per million, water year October 1951 to September 1952.--Continued

Chemicals analyzed, in parts per million, water, for September 1952—Continued																						
Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180° C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25° C)	pH	Color
																	Calcium, mg./l.	Non-carbonate				
Apr. 1-10, 1952 ..	4,121		--		--		--	--	7.9		32	85	13	--	5.0	--	120	94		309	7.2	5
Apr. 11-20 ..	11,160		--		--		--	--	4.5		40	65	10	--	4.0	--	108	75		284	7.4	7
Apr. 21-30 ..	3,925		--		--		--	--	7.9		36	87	14	--	4.2	--	126	96		321	7.4	8
May 1-10 ..	2,183		--		--		--	--	10		45	97	17	--	3.6	--	142	105		375	6.9	5
May 11-20 ..	6,637		--		--		--	--	5.8		30	65	11	--	2.4	--	97	72		254	6.8	5
May 21-31 ..	8,101		3.3		0.00		28	6.7	4.9		34	61	10	0.2	2.6	153	97	70	252	7.0	5	
June 1-10 ..	--		--		--		--	--	10		42	88	15	--	3.6	--	128	94		342	7.0	5
June 11-20 ..	--		--		--		--	--	13		60	91	18	--	3.9	--	145	96		392	7.4	5
June 21-30 ..	--		--		--		--	--	13		64	86	20	--	4.4	--	146	94		388	7.2	5
July 1-10 ..	--		--		--		--	--	15		68	89	21	--	5.0	--	150	94		400	8.0	5
July 11-20 ..	--		--		--		--	--	18		78	95	23	--	4.8	--	160	96		434	7.8	5
July 21-31 ..	--		--		--		--	--	17		70	89	22	--	7.8	--	151	94		425	7.6	8
Aug. 1-10 ..	--		--		--		--	--	20		43	127	26	--	8.3	--	167	132		470	7.2	8
Aug. 11-20 ..	--		--		--		--	--	19		42	124	22	--	12	--	162	128		438	7.1	5
Aug. 21-31 ..	--		--		--		--	--	20		36	134	23	--	9.4	--	165	136		472	7.7	5
Sept. 1-10 ..	--		--		--		--	--	19		34	135	22	--	11	--	168	140		457	7.3	5
Sept. 11-20 ..	--		--		--		--	--	18		40	136	22	--	11	--	175	142		465	7.6	5
Sept. 21-30 ..	--		--		--		--	--	20		42	141	24	--	10	--	179	145		472	7.4	3
Average	--		--		--		--	--	12.8		40	100	19	--	6.2	--	140	108		374	7.1	5

BEAVER RIVER BASIN--Continued

BEAVER RIVER AT NEW BRIGHTON, PA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	56	43	42	38	45	54	65	66	72	74	76
2	64	55	44	42	43	44	56	66	67	72	72	78
3	65	64	44	42	42	44	54	65	68	72	75	74
4	66	52	46	40	41	45	53	62	71	74	76	72
5	68	50	46	41	43	47	53	63	72	74	76	72
6	62	48	50	41	43	42	52	64	72	76	77	72
7	58	47	51	41	40	42	48	64	72	74	76	72
8	67	46	52	40	40	42	46	63	72	76	77	70
9	65	48	52	42	42	42	46	63	74	76	76	70
10	62	46	46	44	40	43	48	63	70	73	78	70
11	60	48	42	42	40	46	49	63	69	72	76	70
12	59	48	42	42	40	43	50	60	68	72	74	--
13	59	50	40	43	40	42	50	54	66	72	74	73
14	58	52	39	42	38	44	52	53	69	71	75	74
15	59	52	40	48	38	44	50	57	70	76	76	76
16	60	56	38	50	41	42	44	61	70	76	76	74
17	60	53	34	48	40	44	48	62	72	77	79	71
18	61	52	34	46	40	43	50	61	72	78	73	67
19	62	47	36	43	41	44	54	62	75	77	73	66
20	61	44	37	43	42	45	58	62	72	78	73	65
21	60	44	40	42	42	48	60	61	73	80	74	62
22	62	44	40	42	42	50	62	59	71	78	73	62
23	62	48	35	42	42	52	65	60	72	81	--	62
24	62	47	35	40	42	51	63	63	70	79	70	--
25	61	44	40	40	42	48	59	65	72	79	70	61
26	60	42	40	41	43	48	59	63	74	76	71	62
27	62	42	36	44	42	50	59	62	77	78	71	62
28	62	40	36	42	43	50	61	64	78	78	73	63
29	59	40	38	40	44	50	62	65	79	77	74	63
30	58	41	41	34	--	46	62	64	77	--	74	64
31	60	--	41	36	--	50	--	64	--	76	77	--
Average	62	48	41	42	41	46	54	62	72	76	74	69

BEAVER RIVER BASIN--Continued

MAHONING RIVER AT LEAVITTSBURG, OHIO

LOCATION.--At gaging station in Leavittsburg, Trumbull County, 350 feet downstream from Duck Creek, and 1½ miles downstream from Eagle Creek.

DRAINAGE AREA.--580 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952.

Water temperatures: April 1943 to December 1945, October 1946 to September 1952.

EXTREMES, 1951-52.--Water temperatures: Maximum, 82°F June 29, 30; minimum, freezing point on several days in December, January, and March.

EXTREMES, 1948-52.--Water temperatures: Maximum, 86°F July 2, 1949; minimum, freezing point on several days during winter months.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium (Cr) hexavalent	Copper (Cu)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
																Calcium	Non-carbonate				Undiluted	Filtered
Oct. 6, 1951....	281	3.4	0.02	0.00	0.0	38	13	12	2.6	79	88	14	0.2	1.2	223	150	84	372	7.6	7	4.3	4.0
Nov. 16	275	3.4	.01	--	--	44	14		18	90	102	17	.3	1.8	255	168	94	402	7.7	5		
Dec. 20	470	4.9	.03	--	--	45	14	14	3.0	83	105	19	.3	2.5	280	171	102	411	7.7	8		
Jan. 5, 1952 ...	991	3.7	.05	--	--	32	10	9.1	2.7	53	78	12	.1	2.9	192	121	78	300	7.6	7		
Feb. 2	3,600	7.2	.12	.00	.0	26	8.0	5.1	1.7	36	63	7.0	.2	3.4	149	98	68	241	7.1	8		
Mar. 15	1,010	5.6	.05	--	--	22	8.5	6.0	2.3	40	56	6.0	.1	3.7	142	91	57	210	7.1	8		
Apr. 11	455	7.1	.14	.00	.0	28	8.4	6.3	2.1	52	65	7.7	.2	2.1	195	104	62	258	7.4	17		
May 10	228	3.8	.09	--	--	36	10	7.9	3.4	74	75	11	.2	.4	195	134	70	318	7.4	22		
June 12	177	9.8	.07	--	--	38	11	8.6	1.6	85	68	13	.1	.1	206	141	70	343	7.5	7		
July 11	132	4.1	.02	--	--	40	13	12	2.0	68	81	12	.2	3.0	224	154	81	370	7.5	5		
Aug. 5	204	5.1	.03	--	--	37	13	7.7	2.4	72	84	10	.2	1.7	206	148	87	331	6.7	5		
Sept. 4	276	4.1	.04	--	--	39	13	11	3.2	77	93	11	.3	2.3	218	150	88	360	7.7	3		

BEAVER RIVER BASIN--Continued

MAHONING RIVER AT LEAVITTSBURG, OHIO--Continued

Temperature (°F) of water, water year October 1951 to September 1952
 (Once-daily temperature measurement at approximately 8 a.m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	50	38	38	34	34	48	59	65	78	72	72
2	63	52	35	38	36	33	47	60	65	78	72	72
3	64	36	38	35	38	33	46	58	68	78	72	70
4	66	34	40	34	38	34	44	58	70	80	74	68
5	66	34	40	34	40	33	48	59	68	76	72	66
6	68	34	40	34	38	34	44	60	70	75	72	64
7	66	42	44	35	38	34	42	62	70	78	73	66
8	62	40	45	34	34	34	41	62	72	80	72	66
9	58	36	45	35	34	34	40	58	70	80	72	66
10	58	38	40	33	34	34	42	60	74	72	73	67
11	56	40	37	33	36	35	46	60	--	72	73	68
12	56	42	35	35	34	35	38	58	--	73	70	68
13	56	42	34	34	33	40	48	58	--	74	70	70
14	58	46	33	37	34	33	48	56	--	76	70	70
15	58	48	33	40	33	33	48	58	--	78	72	72
16	56	45	--	40	36	32	42	56	--	78	73	70
17	58	45	--	40	36	34	46	60	--	78	72	68
18	58	38	34	38	34	32	50	58	--	77	73	68
19	58	36	34	34	36	38	52	60	--	78	70	68
20	58	34	34	40	34	40	54	60	--	78	70	67
21	56	33	34	34	34	48	54	60	--	78	70	64
22	58	37	32	35	34	46	56	58	--	78	70	62
23	58	44	33	33	34	34	58	60	--	78	68	62
24	58	41	33	33	33	44	54	62	--	78	64	62
25	56	34	33	33	33	42	53	64	--	77	64	58
26	56	38	34	36	33	42	52	64	78	76	64	58
27	56	35	33	38	34	32	54	63	80	76	66	60
28	54	33	33	42	33	33	55	64	80	78	68	61
29	54	38	34	34	34	33	56	64	82	77	70	61
30	54	38	36	32	--	33	58	62	82	75	70	64
31	52	--	36	33	--	43	--	64	--	75	71	--
Average	59	39	36	36	35	36	49	60	--	77	70	66

BEAVER RIVER BASIN--Continued
MAHONING RIVER AT NILES, OHIO

LOCATION.--At Belmont Street Bridge in Niles, Trumbull County, 0.3 mile downstream from Meander Creek, 0.7 mile downstream from Mosquito Creek, and 7.7 miles upstream from gaging station at Youngstown.
DRAINAGE AREA.--899 square miles (above gaging station).
RECORDS AVAILABLE.--April 1943 to December 1952.
EXTREMES, 1951-52.--Water temperatures: Maximum, 89°F June 26, July 23; minimum, freezing point on several days in December and January.
EXTREMES, 1949-52.--Water temperatures: Maximum, 89°F June 26, July 23, 1952; minimum, freezing point Dec. 16, 17, 22-31, 1951; Jan. 1-4, 21, 24, 1952.
REMARKS.--Discharge records for gaging station at Youngstown, for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Temperature (°F) of water, water year October 1951 to September 1952
Seven-day, gas-actuated thermograph

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

BEAVER RIVER BASIN--Continued

MAHONING RIVER AT YOUNGSTOWN, OHIO

LOCATION--At Bridge Street Bridge in Youngstown, Mahoning County, 400 feet downstream from gaging station, which is three-quarters of a mile upstream from Mill Creek. --899 square miles.

DRAINAGE AREA. --899 square miles.

RECORDS AVAILABLE. --Chemical analyses: October 1951 to September 1952.

REMARKS. --Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	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 on evaporation at 180°C)	Hardness as CaCO ₃ Calcium, mg./l. Non-carbonate	Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color
Oct. 6, 1951	376		4.9		0.06	--	44	14	20	6.9	23	161	24	1.4	2.8	312	166		496	6.5	7
Nov. 2	235		7.2		.04	--	62	17	31	8.9	30	211	35	1.9	10	417	226		602	6.7	3
Dec. 20	530		6.2		.05	--	58	15	20	6.4	45	168	26	1.1	8.8	347	209		521	7.6	8
Jan. 5, 1952	1,330		7.8		.11	--	38	8.7	11	5.2	14	120	14	.8	6.0	230	131		342	6.8	5
Feb. 2	5,300		6.7		.12	0.00	34	7.1	6.4	3.1	50	68	8.5	.2	3.7	170	113		275	6.4	7
Mar. 1	620		9.4		.04	.80	35	9.5	12	5.8	10	121	16	.8	8.0	232	126		357	6.1	5
Apr. 11	662		7.4		.20	.53	36	12	10	3.1	13	131	12	1.4	.4	236	140		364	6.5	4
May 9	288		4.1		.12	.70	46	13	18	5.4	30	156	22	1.4	.2	294	169		473	6.9	9
June 12	205		8.1		.09	--	44	11	18	3.5	66	115	11	1.8	.2	266	154		439	7.1	7
July 10	278		6.0		.15	--	47	14	21	2.9	77	121	22	.6	10	306	176		476	7.0	7
Aug. 5	498		5.5		.04	--	36	11	11	5.9	14	121	14	.9	5.5	231	135		362	6.1	3
Sept. 19	680		7.4		.06	--	47	14	17	6.3	23	186	14	1.6	4.9	292	175		467	4.7	5

a Total acidity as H₂SO₄, 11 parts per million.

BEAVER RIVER BASIN--Continued

MAHONING RIVER AT LOWELLVILLE, OHIO

LOCATION--At Washington Street Bridge in Lowellville, Mahoning County, 350 feet downstream from gaging station which is 1 mile upstream from Ohio-Pennsylvania State line, and 3 miles downstream from Yellow Creek.

DRAINAGE AREA--1,076 square miles.

RECORDS AVAILABLE--Chemical analyses: October 1951 to September 1952.

Water temperatures October 1943 to November 1944 (incomplete), October 1949 to September 1952.

EXTREMES, 1951-52--Dissolved solids: Maximum, 508 ppm Nov. 8-10; minimum, 182 ppm Feb. 1-10.

Hardness: Maximum, 274 ppm Oct. 2-3; minimum, 107 ppm Feb. 1-10.

Specific conductance: Maximum, 411 micromhos at 25°C, 160 micromhos at 10°C, 108 micromhos at 25°C, 35 P.D. minimum daily, 186 micromhos Jan. 28.

Water temperature: Maximum, 108°F Sept. 12; minimum, 35°F Dec. 28.

EXTREMES, 1949-52--Water temperatures: Maximum, 111°F Aug. 6, 1944; minimum, freezing point Dec. 5, 1950.

REMARKS--Water temperature affected by cooling water from steel mills. Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Tem- perature (°F)	Silica (SiO ₂)	Alum- inum (Al)	Iron (Fe)	Man- gan- ese (Mn)	Cal- cium (Ca)	Mag- nesium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Disolved solids (residue on evap- oration at 180°C)	Hardness as CaCO ₃		Total acid- ity as H ₂ SO ₄	Specific con- ductance (micro- mhos at 25°C)	pH	Color
																	Calcium, mg- nestrum	Non- carbon- ate				
Oct. 1-10, 1951....	397	16			0.04	--	64	18	27	13	77	197	32	1.4	0.2	416	234	171		625	7.5	8
Oct. 11-20.....	302	19			--	--	73	22	33	14	98	223	42	1.5	.2	479	273	192		717	7.6	5
Oct. 21-31.....	303	9.1			.04	--	77	20	35	15	69	247	45	1.8	.3	496	274	218		761	7.3	5
Nov. 1-10.....	429	3.3			.29	--	72	19	38	15	42	264	43	1.4	.2	508	258	223		734	7.0	7
Nov. 11-20.....	511	7.9			.02	--	68	19	30	12	62	225	37	.9	.2	446	248	197		691	7.1	5
Nov. 21-30.....	1,531	7.8			.01	--	55	16	18	12	62	170	26	.7	.4	338	204	152		529	7.4	6
Dec. 1-10.....	1,400	3.1			.07	--	62	17	21	8.8	48	203	27	1.0	.6	394	224	185		586	6.8	5
Dec. 11-20.....	1,040	6.3			.01	--	60	17	28	13	22	223	34	.8	1.0	403	220	202		608	7.1	4
Dec. 21-31.....	2,694	7.6			.02	--	48	14	21	6.6	70	134	27	.6	.8	285	177	120		452	7.2	5
Jan. 1-10, 1952 ..	3,000	7.1			.03	0.60	43	11	13	5.3	49	128	17	.3	.4	276	152	112		411	6.5	13
Jan. 11-20.....	4,248	7.5			.03	.80	43	11	4.4	4.4	67	111	14	.2	.7	248	154	98		390	6.8	5
Jan. 21-31.....	6,223	7.0			.05	40	35	8.3	8.2	3.6	47	85	11	.2	2.8	192	122	83		374	6.7	5
Feb. 1-10.....	6,062	9.8			.04	.00	31	7.0	7.9	3.0	40	40	74	10	.2	4.6	107	73		279	6.7	7
Feb. 11-20.....	2,904	7.9			.03	.40	36	7.5	11	4.2	44	99	12	.2	1.9	212	121	86		332	6.6	5
Feb. 21-31.....	1,290	6.4			.03	.00	43	9.2	14	8.9	40	126	17	.6	1.5	260	145	112		402	6.5	5
Mar. 1-10.....	1,160	9.4			.04	.00	46	11	17	6.0	39	149	22	.6	1.3	297	168	135		437	6.5	5
Mar. 11-20.....	3,179	9.6			.04	.48	35	9.5	11	3.4	32	87	11	.4	.2	271	127	92		334	6.8	17
Mar. 21-31.....	1,626	8.4			.03	.65	40	10	12	3.4	30	127	17	.5	.6	246	143	116		385	6.8	27
Apr. 1-10.....	960	8.9			.04	.38	47	13	17	5.9	24	162	21	.6	.6	316	170	151		468	6.5	4
Apr. 11-20.....	3,332	8.1			.18	.50	39	9.5	11	4.9	48	102	14	.6	.8	295	137	97		385	6.9	7
Apr. 21-30.....	1,162	7.8			.43	.62	44	12	14	5.9	33	141	19	.6	1.0	262	161	133		445	6.5	10
May 1-10.....	539	7.4			.04	.35	54	15	21	8.3	48	170	26	.9	.7	342	194	157		547	6.6	7
May 11-20.....	524	8.2			.04	.65	63	16	25	11	34	217	33	1.2	.8	410	222	195		633	6.6	7
May 21-31.....	994	10			.04	--	54	13	17	4.6	10	186	20	.7	1.5	347	186	180		510	6.1	5

June 1-10	341	8.3	.02	--	51	12	26	3.9	43	153	29	1.2	.2	322	179	141	532	6.9	7
June 11-20	254	8.3	.03	.10	52	13	26	9.4	123	113	28	1.4	.2	322	183	82	531	7.6	17
June 21-30	229	8.2	.04	.00	52	13	25	10	126	107	29	1.0	1.0	317	184	80	529	7.6	17
July 1-10	243	8.4	.03	.00	54	13	37	13	138	115	31	.4	.2	335	190	75	559	7.6	20
July 11-20	320	6.8	.02	.00	55	14	30	10	129	122	31	.4	.2	336	194	89	552	7.6	17
July 21-31	479	7.0	.02	.20	44	11	21	5.6	73	108	22	.8	.4	270	156	95	463	7.1	7
Aug. 1-10	555	8.4	.03	.00	51	12	22	11	38	147	33	1.4	.6	334	176	145	531	6.7	7
Aug. 11-20	639	8.2	.02	.70	52	10	21	9.6	15	172	27	.8	1.0	340	170	189	530	6.1	3
Aug. 21-31	639	10	1.2	1.0	50	12	21	10	16	197	28	.6	.2	342	177	161	531	6.2	3
Sept. 1-10	604	10	1.2	1.3	51	13	22	10	34	175	28	1.2	.2	342	181	161	531	6.2	3
Sept. 11-20	727	8.5	.02	.50	51	12	22	10	34	172	28	1.0	.2	342	176	180	535	6.2	3
Sept. 21-30	480	11	4.0	1.3	73	14	26	12	45	244	30	1.4	.4	431	239	202	676	6.2	20
Average	1,434		0.24	--	52	13	21	8.6	53	159	26	0.8	0.8	329	183	140	514	--	8

a Total acidity as H_2SO_4 , 51 parts per million.

OHIO RIVER BASIN

BEAVER RIVER BASIN--Continued

MAHONING RIVER AT LOWELLVILLE, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, water year October 1951 to September 1952

Date of collection	Time	Mean discharge (second-feet)	Temperature		Dissolved oxygen		Cyanide (CN)	Phenols as C ₆ H ₅ OH	
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million	
Oct. 6, 1951.....	5:00 p. m.		95	35.0	5.1	72	--	--	
Oct. 20.....	11:15 a. m.		92	33.3	3.5	48	0.2	0.075	
Nov. 2.....	6:30 p. m.		92	33.3	3.6	49	.2	.044	
Nov. 16.....	6:30 p. m.		80	26.7	1.8	22	.1	.149	
Nov. 30.....	4:45 p. m.		70	21.1	5.8	65	.5	.557	
Dec. 20.....	11:45 a. m.		60	15.6	7.3	73	.1	.815	
Jan. 5, 1952.....	9:00 a. m.		49	9.4	8.9	78	.0	.297	
Jan. 18.....	5:15 p. m.		39	3.9	6.1	46	.1	.011	
Feb. 2.....	5:30 p. m.		40	4.4	11.0	85	.1	.124	
Feb. 15.....	6:30 p. m.		47	8.3	9.6	82	.2	.210	
Mar. 1.....	10:15 a. m.		63	17.2	2.2	23	.1	.042	
Mar. 14.....	6:15 p. m.		49	9.4	8.8	77	.1	.079	
Mar. 29.....	8:45 a. m.		66	18.9	6.5	69	.1	.242	
Apr. 11.....	2:15 p. m.		65	18.3	10.7	113	.1	.317	
Apr. 25.....	6:00 p. m.		70	21.1	9.2	103	.0	.213	
May 9.....	6:45 p. m.		87	30.6	6.5	86	.0	--	
May 24.....	9:45 a. m.		86	30.0	5.9	77	.0	.016	
June 12.....	9:45 a. m.		70	21.1	7.9	88	.0	.011	
June 27.....	12:20 p. m.		84	28.9	5.4	69	--	.005	
July 10.....	--		76	24.4	5.4	64	.0	.009	
July 24.....	2:30 p. m.		83	28.3	7.0	89	.0	.007	
Aug. 6.....	10:00 a. m.		95	35.0	4.1	58	.1	.009	
Aug. 21.....	10:15 a. m.		96	35.6	5.7	81	.0	.000	
Sept. 5.....	9:00 a. m.		96	35.6	5.0	71	.1	.002	
Sept. 20.....	8:30 a. m.		89	31.7	--	--	--	.001	

BEAVER RIVER BASIN--Continued
 MAHONING RIVER AT LOWELLVILLE, OHIO--Continued

Temperature (°F) of water, water year October 1951 to September 1952
 /Seven-day, gas-actuated thermograph/

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1	98	82	93	87	74	65	41	38	42	39	64	59	75	69	68	59	95	88	79	71	97	86	101	91
2	102	92	91	87	69	62	36	37	43	38	61	57	76	69	66	59	99	85	80	69	101	91	98	90
3	105	94	90	80	71	62	42	37	40	39	63	60	73	69	67	56	98	78	84	75	103	92	94	87
4	106	96	81	76	71	68	51	42	40	65	55	75	69	73	61	78	69	81	75	100	96	96	86	86
5	106	97	84	75	72	67	53	41	42	41	55	45	75	70	82	71	71	65	82	71	99	95	103	91
6	102	96	80	75	72	67	52	47	45	41	48	44	69	59	88	80	76	65	80	71	101	92	104	94
7	97	82	79	69	72	68	41	46	46	42	53	47	59	54	91	81	77	69	82	73	102	93	100	92
8	95	82	70	67	66	58	51	48	43	41	51	53	56	48	97	74	78	65	73	74	104	99	99	89
9	92	85	73	64	59	48	55	53	43	39	51	56	54	46	91	64	73	61	72	69	102	96	100	90
10	94	85	83	71	50	46	52	48	43	38	66	58	61	50	96	91	74	66	76	63	96	92	103	92
11	92	86	84	79	48	44	51	46	42	40	58	38	69	57	91	80	71	65	78	66	101	91	107	95
12	94	87	83	77	53	48	55	49	43	39	46	37	71	65	82	77	67	62	80	69	99	95	108	97
13	96	86	90	81	55	50	52	49	44	39	46	37	70	63	81	74	67	62	83	73	102	94	107	96
14	94	86	90	82	59	54	55	52	45	39	49	45	62	50	90	78	67	62	84	74	103	95	101	93
15	96	86	92	86	61	56	59	52	49	40	52	45	60	45	89	86	67	62	84	77	103	96	97	87
16	98	87	91	79	56	51	51	49	46	43	49	47	49	42	92	85	67	62	82	77	99	93	95	86
17	101	89	79	70	57	48	49	47	44	42	53	48	56	44	89	87	67	62	84	76	98	93	97	87
18	100	91	69	62	60	55	45	43	50	44	57	51	64	53	93	85	67	62	86	78	99	91	95	90
19	95	89	67	62	62	56	44	42	47	43	57	49	68	59	92	84	67	62	83	78	101	93	90	78
20	95	86	69	66	65	59	45	42	47	43	54	47	68	60	85	81	67	62	84	78	103	93	93	85
21	98	89	74	65	66	48	43	40	44	42	58	49	73	61	82	77	67	62	85	76	98	95	93	87
22	98	92	78	72	49	41	46	43	42	38	62	55	76	67	83	77	67	62	85	77	98	92	97	86
23	103	94	76	54	45	39	42	40	46	40	60	54	73	67	88	79	67	62	88	79	100	90	97	91
24	99	86	53	45	45	41	41	38	46	40	54	51	68	65	89	83	64	73	83	77	98	88	96	90
25	95	85	48	43	46	43	39	44	40	62	52	67	65	86	72	88	78	83	74	100	88	98	85	85
26	100	89	51	48	44	40	45	42	51	42	64	57	70	63	75	67	90	80	86	74	103	92	98	90
27	98	94	56	51	40	37	41	39	54	49	63	57	73	62	80	69	90	80	86	81	103	93	98	88
28	96	87	58	51	42	35	39	37	61	53	68	61	80	67	84	75	88	78	86	79	100	92	96	87
29	93	85	64	57	49	42	39	36	65	56	66	63	84	74	90	83	84	78	90	82	96	92	100	88
30	99	91	71	61	49	39	44	38	66	60	78	65	93	81	80	75	94	83	102	92	99	90	90	80
31	96	91	--	--	40	38	43	38	--	--	72	62	--	--	97	87	--	--	97	90	96	91	--	--
Average	98	89	76	68	57	51	47	43	46	42	58	52	68	60	85	77	--	--	84	75	100	92	99	89

KANAWHA RIVER BASIN

NEW RIVER NEAR GALAX, VA.

LOCATION.--At gaging station at bridge on U. S. Highway 58, 500 feet downstream from Meadow Creek, 1.2 miles southwest of Old Town, 3.1 miles southwest of Galax, Carroll County, and 3.6 miles downstream from Elk Creek.

DRAINAGE AREA.--1,131 square miles.

RECORDS AVAILABLE.--Chemical analyses: April 1930 to March 1931, October to December 1949, October 1951 to September 1952.

EXTREMES, 1930-51.--Dissolved solids: Maximum, 38 ppm Aug. 1-10, 21-31; minimum, 27 ppm Apr. 1-10, Mar. 1-10.

Hardness: Maximum, 18 ppm July 21-31; minimum, 11 ppm Jan. 11-20, 21-31.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporated at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg./nequm	Non-carbonate			
Oct. 2, 1951.....	516	10	0.03	3.1	0.9	4.2		20	1.4	1.4	0.1	0.6	33	11	0	36.8	7.4	6
Nov. 1.....	754	14	.14	3.5	1.4	2.9		17	2.1	2.2	.0	1.8	40	14	1	36.4	7.1	10
Dec. 3.....	670	13	.15	3.4	1.5	2.8	0.8	20	1.8	1.2	.1	1.1	39	15	0	38.9	6.5	8
Jan. 1, 1952.....	1,420	13	.08	3.0	1.5	2.3	.9	16	2.5	2.5	.1	1.5	36	13	1	36.9	7.4	5
Feb. 19.....	2,360	12	.05	3.1	1.3	3.1		13	5.5	1.3	.1	2.1	36	13	1	36.5	7.1	15
Mar. 26.....	3,830	10	.00	2.2	1.0	2.2	1.0	12	2.6	1.4	.0	1.6	27	10	0	33.0	6.8	5
Apr. 15.....	2,020	11	.10	3.2	.7	--	--	16	1.0	1.3	--	--	--	11	0	33.1	7.5	5
June 2.....	1,190	13	.04	2.8	1.7	2.4	--	19	1.0	1.1	--	1.3	--	14	0	33.6	7.3	5
July 7.....	1,740	11	.02	3.2	2.1	1.4	1.4	20	1.0	1.5	--	1.9	--	17	1	43.7	7.4	2
Aug. 11.....	1,460	12	.20	4.2	1.3	4.4		23	3.0	1.5	--	--	--	16	0	43.9	7.6	32
Sept. 27.....	586	9.7	.10	3.6	.9	3.4		20	1.0	1.5	--	.3	--	13	0	38.8	7.1	7

KANAWHA RIVER BASIN--Continued

NEW RIVER AT GLENLYN, VA.

LOCATION.--At gaging station at bridge on U. S. Highway 460 at Glenlyn, Giles County, 0.3 mile upstream from East River, and 6.3 miles downstream from Wolf Creek. DRAINAGE AREA.--3,788 square miles.

RECORDS AVAILABLE.--Chemical analyses: April 1930 to March 1931; October 1949 to September 1950, October 1951 to September 1952.

EXTREMES, 1930-31.--Dissolved solids: Maximum, 94 ppm Oct. 21-31; minimum, 58 ppm Mar. 21-31.

Hardness: Maximum, 80 ppm July 11-20, 21-31; minimum, 42 ppm Dec. 11-20.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg-nesium	Non-carbonate			
Oct. 4, 1951	1,920	8.5	0.01	20	6.9	4.2	5.0	72	20	2.5	0.1	6.8	111	78	19	187	7.7	5
Nov. 30	2,180	8.5	.05	18	7.0	3.2	1.4	64	19	3.4	.1	6.3	102	74	21	189	7.8	4
Dec. 5	3,860	8.5	.02	20	4.8	2.5	1.4	60	21	2.5	.1	4.5	100	70	21	184	7.8	6
Jan. 9, 1952	2,110	7.9	.02	13	7.2	2.5	1.4	43	14	1.8	.1	4.2	78	53	13	124	7.6	4
Feb. 20	3,860	8.1	.03	8.4	7.2	2.0	.5	46	18	1.7	.1	4.2	72	53	13	108	7.6	20
Mar. 14	13,800	8.3	.00	12	4.2	2.0	1.2	46	8.6	1.6	.0	2.5	70	47	10	103	7.4	4
Apr. 3	6,600	8.3	.08	13	4.8	--	--	51	7.0	5.4	--	--	--	52	10	113	7.6	5
May 14	5,030	8.4	.08	16	6.2	--	--	62	12	1.7	--	--	--	65	15	132	7.8	2
June 4	3,470	7.3	.00	16	5.8	--	--	61	12	1.5	--	--	--	64	14	136	7.5	3
July 17	1,970	6.8	.10	20	7.0	4.0	4.0	68	24	2.1	--	4.6	--	79	23	170	7.7	3
Aug. 26	2,300	8.5	.10	21	6.3	--	--	62	14	1.8	--	6.9	--	78	28	168	7.3	2
Sept. 25	1,680	7.9	.03	26	7.1	--	1.6	70	27	1.7	--	12	--	64	37	202	7.2	6

KANAWHA RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN KANAWHA RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
NORTH FORK NEW RIVER AT CRESTON																		
Oct. 15, 1951	33.1							23	1	0.8				20	1	47.6	6.8	
Apr. 16, 1952	101							22	1	1.0				15	0	43.2	6.7	
LITTLE RIVER NEAR SPARTA																		
Oct. 4, 1951	12.6							10	1	1.2						32.7	6.3	
July 11, 1952	17.9	8.8	0.07	2.2	0.7	2.4		12	1.4	1.1	0.0	0.9	26	8	0	22.0	6.4	

RACCOON CREEK BASIN
RACCOON CREEK AT ADAMSVILLE, OHIO

LOCATION --At gaging station at bridge on U.S. Highway 35 in Adamsville, Gallia County, 1.3 miles downstream from Indian Creek.

DRAINAGE AREA --587 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1951 to September 1952.

Water temperatures: October 1951 to September 1952.

EXTREMES, 1951-52 --Dissolved solids: Maximum, 485 ppm Oct. 1-10; minimum, 116 ppm Feb. 1-10, Mar. 11-20.

Hardness: Maximum, 179 ppm Oct. 1-10; minimum, 63 ppm Jan. 1-10.

Specific conductance: Maximum daily, 1,300 micromhos Nov. 7; minimum daily, 115 micromhos Mar. 23.

Water temperatures: Maximum, 84°F June 16; minimum, freezing point Dec. 19.

REMARKS --Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO ₂)	Aluminum (Al) ^a	Iron (Fe) ^a	Manganese (Mn) ^a	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium, mg./l.	Non-carbonate, mg./l.				
Oct. 1-10, 1951...	6.64		9.7	--	0.02	2.5	43	17	85	11	13	177	130	0.1	0.6	485	179	167	--	793	6.7	2
Oct. 11-20.....	9.07		8.8		0.0	1.9	37	10	93	5.8	12	136	142	.2	.4	432	136	124	--	774	6.5	5
Oct. 21-31.....	17.2		19	0	.08	.60	37	13	100	6.7	34	124	149	.2	.4	487	146	118	--	798	7.2	5
Nov. 1-10.....	44.3		9.7	0	.05	.20	37	13	97	6.7	34	121	140	.2	.4	448	146	118	--	775	7.2	6
Nov. 11-20.....	71.5		12	0	.04	3.1	41	14	35	3.4	4	175	40	.3	.4	338	160	197	--	537	5.8	7
Nov. 21-30.....	330		17	0	.03	2.7	36	14	23	5.1	4	166	20	.3	2.1	291	148	144	--	435	5.5	5
Dec. 1-10.....	385		13	3.7	.06	3.9	32	15	14	4.1	2	172	16	.3	1.0	282	141	140	--	414	4.7	7
Dec. 11-20.....	785		12	8	.04	2.0	25	8.7	7.4	2.7	0	111	7.5	.2	1.6	186	99	99	--	284	4.8	3
Dec. 21-31.....	1,688		9.3	.3	.03	1.2	17	7.0	4.8	2.1	0	77	5.0	.1	1.6	131	72	72	--	209	5.0	3
Jan. 1-10, 1952..	2,648		9.4	0	.09	1.0	15	6.1	4.1	2.1	2	67	3.8	.1	1.7	118	63	61	--	183	5.5	3
Jan. 11-20.....	887		11	9	.04	1.4	19	8.7	6.3	2.7	1	95	6.5	.2	1.0	158	83	82	--	241	4.8	3
Jan. 21-31.....	2,530		9.5	0	.02	1.0	16	7.0	4.2	2.5	6	67	4.5	.1	.8	119	69	64	--	182	6.1	3
Feb. 1-10.....	2,539		9.5	0	.06	.90	16	6.3	3.6	1.9	2	68	3.0	.2	.8	116	65	64	--	178	5.5	3
Feb. 11-20.....	575		11	1.5	.03	1.5	21	9.5	8.2	2.0	0	112	8.0	.1	.7	183	91	91	--	279	4.5	2
Feb. 21-29.....	445		11	1.5	.04	1.7	23	9.5	9.6	1.9	0	117	9.5	.1	.6	202	97	97	--	303	4.5	2
Mar. 1-10.....	452		11	1.2	.03	1.7	22	10	9.5	1.7	0	116	9.0	.1	.7	198	97	97	--	302	4.5	2
Mar. 11-20.....	1,870		9.8	0	.04	.80	14	6.8	3.9	1.5	4	62	4.0	.1	1.0	116	64	60	--	183	4.9	2
Mar. 21-31.....	2,853		9.8	0	.06	.90	14	8.7	5.6	2.0	7	70	3.9	.1	.6	123	72	65	--	191	4.9	2
Apr. 1-10.....	947		11	.3	.06	1.0	18	9.2	7.9	1.3	6	92	3.8	.1	.4	158	84	78	--	244	4.6	3
Apr. 11-20.....	750		11	.3	.04	1.0	17	7.3	7.1	1.6	4	82	4.2	.1	.4	140	72	69	--	226	4.8	3
Apr. 21-30.....	709		11	.2	.06	1.1	17	7.8	7.1	2.0	1	84	6.5	.2	.6	144	74	74	--	219	4.9	3
May 1-10.....	322		11	.3	.09	1.4	20	9.0	10	2.0	1	98	9.8	.2	.6	169	87	86	--	264	4.7	3
May 11-20.....	364		11	--	.02	1.5	20	9.2	8.6	1.8	2	94	7.8	.1	.6	170	88	86	--	254	5.1	3
May 21-31.....	437		12	--	.03	1.3	22	10	10	1.4	6	98	9.5	.1	.4	180	98	91	--	273	4.9	2

^a In solution when analyzed.

RACCOON CREEK BASIN--Continued
RACCOON CREEK AT ADAMSVILLE, OHIO--Continued

Chemical analyses, in parts per million, water year October 1951 to September 1952--Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO ₂)	Aluminum (Al) ^a	Iron (Fe) ^a	Manganese (Mn) ^a	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25° C)	pH	Color
																	Calcium, mg-nesium	Non-carbonate				
June 1-10, 1952	90.5	12	--	--	0.02	1.4	24	11	15	0.9	5	107	22	0.1	0.8	217	106	101	24	333	5.8	3
June 11-20	44.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	419	6.6	--
June 21-30	129	9.6	0.0	0.03	0.03	1.7	26	11	24	3.3	6	120	25	.2	1.0	238	110	105	6	366	6.5	2
July 1-10	265	9.0	.3	.03	.03	2.6	28	10	12	2.9	1	125	9.8	.2	1.0	217	106	105	30	329	5.0	3
July 11-20	75.6	13	.0	.03	.03	2.0	28	12	20	2.6	4	131	24	.2	.8	249	119	116	8	384	5.5	3
July 21-31	61.9	10	.0	.02	.02	2.4	27	13	24	3.4	2	129	34	.2	.8	252	122	119	12	412	4.9	3
Aug. 1-10	22.6	12	.0	.02	.02	1.7	28	11	38	3.6	9	112	56	.2	1.0	277	115	108	6	458	6.6	0
Aug. 11-20	25.2	12	.0	.02	.02	1.0	26	10	50	3.7	21	96	71	.2	.8	288	108	89	10	490	7.1	3
Aug. 21-31	17.1	17	.0	.02	.02	.70	34	11	34	3.2	15	130	45	.1	1.0	293	132	118	22	462	6.9	3
Sept. 1-10	13.3	13	.0	.02	.02	1.4	36	13	50	2.0	13	141	70	.2	.3	352	144	133	24	560	6.1	3
Sept. 11-20	9.80	11	.0	.02	.02	.00	32	12	65	2.5	23	116	94	.2	.2	356	130	110	14	610	6.5	2
Sept. 21-30	6.72	8.6	.0	.01	.01	.30	31	11	74	2.9	42	100	108	.2	.1	357	124	88	5	632	6.9	0
Average	638	11	0.4	0.04	0.04	1.5	26	10	28	3.1	8	111	37	0.2	0.8	242	106	99	b14	388	--	3

^a In solution when analysed.

^b Average of 19 determinations; acidity not determined on first 16 samples.

RACCOON CREEK BASIN--Continued

RACCOON CREEK AT ADAMSVILLE, OHIO--Continued

Temperature (°F) of water, water year October 1951 to September 1952
 /Once-daily temperature measurement usually between 8 a. m. and 10 a. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	59	50	38	42	37	40	51	60	65	76	77	69
2	60	49	37	45	38	40	52	61	65	76	76	69
3	62	44	37	45	48	41	51	63	65	76	77	69
4	64	41	40	43	47	42	50	64	67	76	77	71
5	64	41	40	40	43	40	50	63	68	77	77	69
6	65	40	41	39	41	40	49	66	68	76	76	68
7	67	42	44	38	40	40	45	66	71	76	75	68
8	61	40	47	38	40	38	45	65	71	76	76	66
9	56	38	48	39	40	40	45	63	74	76	76	63
10	59	39	46	39	40	40	47	59	74	75	--	64
11	54	39	43	39	40	45	48	61	68	71	76	74
12	52	39	43	38	39	43	49	58	69	73	76	75
13	51	44	40	41	40	43	51	57	69	75	76	73
14	52	47	37	42	40	46	52	56	71	76	76	67
15	52	50	36	44	39	42	52	58	72	78	76	68
16	52	50	33	43	39	43	49	61	84	76	76	67
17	53	46	33	--	38	43	50	62	82	76	75	66
18	54	42	33	--	36	41	51	61	75	76	74	65
19	54	38	32	44	35	42	51	60	75	78	74	67
20	52	37	34	44	39	43	50	60	74	78	71	69
21	55	35	35	42	39	45	58	61	75	79	71	66
22	56	37	--	43	39	50	62	61	76	80	69	63
23	57	40	35	38	38	50	68	65	77	81	67	61
24	60	44	34	38	40	50	60	66	78	78	69	60
25	56	41	34	38	39	48	57	65	80	79	69	59
26	52	43	36	41	39	48	57	65	80	79	70	60
27	56	41	35	46	40	48	58	65	81	79	70	60
28	56	40	34	44	40	47	57	68	81	77	72	60
29	58	39	34	41	40	43	59	66	82	77	73	60
30	52	37	38	39	--	42	60	65	78	77	73	62
31	52	--	41	36	--	49	--	65	--	--	74	--
Average	57	42	38	41	40	44	53	62	74	77	74	66

BIG SANDY RIVER BASIN

LEVISA FORK AT PAINTSVILLE, KY.

LOCATION --At gaging station at bridge on State Highway 40 at Paintsville, Johnson County, 700 feet downstream from Paint Creek.

DRAINAGE AREA --143 sq. miles.

RECORDS AVAILABLE --Chemical analyses: October 1949 to September 1952.

Water temperatures: October 1949 to September 1952.

EXTREMES 1951-52 --Dissolved solids: Maximum, 278 ppm Sept. 21-30; minimum, 75 ppm Dec. 11-20.

Hardness: Maximum, 132 ppm Sept. 21-30; minimum, 40 ppm Dec. 11-20.

Specific conductance: Maximum daily, 512 microhos Sept. 1; minimum daily, 79.9 microhos Mar. 26.

Water temperatures: Maximum, 89°F July 21, 23; minimum, 34°F Dec. 19, 20.

EXTREMES 1949-52 --Dissolved solids: Maximum, 278 ppm Sept. 21-30, 1952; minimum, 75 ppm Dec. 11-20, 1951.

Hardness: Maximum, 132 ppm Sept. 21-30, 1952; minimum, 40 ppm Dec. 11-20, 1951.

Specific conductance: Maximum daily, 768 microhos Oct. 16, 1949; minimum daily, 79.9 microhos Mar. 26, 1952.

Water temperatures: Maximum, 89°F July 21, 23, 1952; minimum, freezing point Nov. 26-28, 1950.

REMARKS --Daily water temperatures reported in temperature table are averages of twice-daily measurements. The data reported under extremes are the individual maximum and minimum measurements. Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (microhos at 25°C)	pH	Color
															Calcium	Non-carbonate			
Oct. 1-10, 1951	184		6.7	0.06	23	12	21	3.7	62	85	16	0.2	1.0	200	108	56	333	7.2	1
Oct. 11-20	142		5.2	.04	24	12	24	3.4	66	83	18	.2	1.0	208	110	55	347	7.2	2
Oct. 21-31	98.5		3.4	.04	26	13	29	3.7	72	84	30	.1	.9	229	118	59	399	7.4	2
Nov. 1-10	2,085		7.0	.05	17	8.7	13	3.0	42	57	12	.1	3.6	146	78	44	242	7.5	1
Nov. 11-20	1,748		9.1	.08	14	7.3	10	2.5	34	50	7.0	.1	2.7	124	66	37	200	7.3	3
Nov. 21-30	3,684		7.2	.08	12	6.3	8.5	2.2	30	41	6.0	.1	2.9	103	56	31	167	7.2	2
Dec. 1-10	4,252		7.2	.02	13	5.6	9.0	1.5	30	41	5.8	.2	3.0	104	56	31	168	6.9	3
Dec. 11-20	7,236		7.9	.06	9	9.6	3.0	1.7	20	30	3.0	.3	2.8	75	40	24	117	6.4	6
Dec. 21-31	6,515		8.9	.03	11	4.6	6.5	1.3	24	36	3.2	.3	2.3	89	47	27	134	6.6	4
Jan. 1-10, 1952	4,043		9.6	.02	12	5.6	7.7	1.7	26	42	4.0	.2	2.1	100	53	32	154	6.8	2
Jan. 11-20	6,451		9.2	.05	12	4.6	6.7	1.1	26	38	3.5	.3	1.9	92	49	28	139	6.9	3
Jan. 21-31	12,490		7.6	.04	8.8	4.6	5.2	1.2	20	32	2.5	.3	1.9	77	41	24	118	6.5	4
Feb. 1-10	4,865		7.6	.10	10	4.9	5.9	1.4	20	39	2.5	.0	1.2	85	46	29	139	6.6	6
Feb. 11-20	5,448		9.3	.06	11	6.3	8.2	1.4	23	47	3.1	.0	1.2	102	54	34	185	6.8	3
Feb. 21-29	2,192		26	.05	13	5.1	10	1.7	33	43	3.6	.1	1.1	114	53	26	189	7.0	4
Mar. 1-10	5,722		15	.05	13	6.6	13	2.2	41	50	3.5	.1	1.3	133	59	26	186	7.4	4
Mar. 11-20	4,899		12	.04	10	5.6	7.7	1.3	27	39	2.8	.0	1.5	93	49	26	145	6.8	3
Mar. 21-31	12,320		14	.05	9.2	4.9	6.7	1.5	25	34	2.5	.0	1.4	88	43	23	122	6.9	2
Apr. 1-10	1,812		9.1	.04	15	8.6	10	1.2	28	62	5.6	.0	1.7	134	74	50	213	7.1	5
Apr. 11-20	1,823		8.4	.08	15	8.4	9.8	1.6	30	59	5.4	.0	1.4	130	71	47	199	7.1	4
Apr. 21-30	8,430		9.0	.09	12	7.0	9.1	1.0	28	46	5.1	.1	.8	111	60	36	171	7.1	5

May 1-10.....	2,801	10	.06	12	6.9	7.2	1.0	23	46	4.0	.0	1.0	107	58	39	187	7.2	6
May 11-20.....	4,984	10	.06	12	5.5	7.2	1.0	24	40	3.6	.0	1.2	103	52	33	161	7.1	6
May 21-31.....	3,313	10	.04	12	6.2	8.0	1.0	31	40	4.4	.0	1.0	104	56	30	165	7.0	6
June 1-10.....	1,055	13	.03	14	8.1	13	1.9	39	47	10	.0	1.0	134	68	36	213	7.3	6
June 11-20.....	423	10	.03	20	9.7	21	1.0	52	69	14	.2	1.0	179	91	47	297	7.2	3
June 21-30.....	1,531	15	.06	18	8.3	14	.9	46	57	9.2	.2	2.2	158	80	41	249	7.2	5
July 1-10.....	328	12	.04	19	9.7	19	1.0	53	58	16	.1	.9	170	87	44	283	7.3	5
July 11-20.....	322	8.6	.06	24	11	24	3.0	66	75	21	.2	.9	205	104	51	341	7.2	4
July 21-31.....	208	12	.06	26	13	23	3.1	59	86	22	.2	1.1	225	116	70	360	7.2	5
Aug. 1-10.....	283	14	.04	26	11	32	3.3	75	83	25	.1	1.1	238	110	49	392	7.4	5
Aug. 11-20.....	590	13	.06	23	9.7	17	3.3	55	77	12	.1	1.8	191	98	52	297	7.4	5
Aug. 21-31.....	421	13	.03	21	9.7	18	3.3	53	70	11	.1	4.9	161	92	49	296	6.6	4
Sept. 1-10.....	128	9.3	.03	24	11	30	2.8	66	74	30	.1	3.6	224	104	51	389	6.9	3
Sept. 11-20.....	64.2	4.8	.03	28	12	38	3.0	71	95	35	.2	2.2	264	121	61	459	7.1	3
Sept. 21-30.....	167	9.5	.05	31	13	35	4.0	76	106	21	.1	.6	278	132	68	461	7.3	4
Average	3,183	10	0.05	17	8.1	15	2.1	42	57	11	0.1	1.7	147	76	41	238	--	4

BIG SANDY RIVER BASIN--Continued

LEVISA FORK AT PAINTSVILLE, KY.--Continued

Temperature (°F) of water, water year October 1951 to September 1952
 /Twice-daily measurements at approximately 7 a. m. and 6 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	52	42	47	40	43	56	60	72	84	81	80
2	68	51	44	48	42	43	56	62	73	83	81	79
3	68	48	43	48	45	45	54	62	74	82	82	76
4	72	48	46	46	46	44	56	65	76	82	82	74
5	72	45	46	45	44	44	54	68	76	80	82	72
6	72	46	46	43	42	44	51	70	78	80	81	72
7	70	45	48	42	42	43	50	70	80	82	80	72
8	65	45	48	40	42	42	50	70	82	82	82	74
9	61	45	48	43	43	44	52	72	82	80	80	74
10	58	44	50	42	42	44	56	72	81	78	80	72
11	58	44	48	42	44	44	56	64	80	79	81	72
12	57	45	46	42	44	46	56	62	80	81	82	74
13	57	46	44	44	44	46	58	58	80	80	82	76
14	56	50	43	46	44	46	58	58	81	82	82	78
15	56	52	40	48	45	46	56	60	82	84	80	78
16	60	52	39	48	44	44	53	64	85	82	81	77
17	60	49	36	50	43	44	53	68	82	82	81	75
18	60	45	36	49	42	44	56	68	84	84	82	72
19	60	40	34	48	42	44	57	68	83	85	80	72
20	60	40	36	48	44	46	62	66	83	86	81	71
21	60	40	42	45	42	50	64	66	84	87	81	69
22	62	42	42	44	42	52	67	67	84	87	81	67
23	64	44	41	42	42	52	68	69	81	87	78	67
24	64	44	40	43	44	50	65	70	79	86	78	67
25	56	44	41	--	42	50	66	69	78	84	76	68
26	58	45	40	45	42	49	56	70	82	82	78	68
27	60	45	40	47	40	49	58	70	84	88	77	65
28	58	44	38	49	44	50	56	71	84	85	76	66
29	56	42	40	43	45	51	58	69	86	84	77	66
30	58	43	42	39	--	52	58	70	86	82	78	67
31	57	--	44	35	--	54	--	70	--	82	79	--
Average	62	46	42	45	43	47	57	67	81	83	80	72

SCIOTO RIVER BASIN

SCIOTO RIVER NEAR PROSPECT, OHIO

LOCATION.--At gaging station at Hoskins Bridge, Delaware County, 1½ miles upstream from Ottawa Creek, 2 miles south of Prospect, Marion County, and 2½ miles downstream from Patton Run.

DRAINAGE AREA.--571 square miles.

RECORDS AVAILABLE.--Sediment records: April 1951 to September 1952.

EXTREMES, 1951-52.--Sediment concentrations: Maximum daily, 620 ppm Mar. 12; minimum daily, 1 ppm Oct. 27, 28.

Sediment loads: Maximum daily, 7,860 tons Jan. 28; minimum daily, less than 0.05 ton Oct. 27, 28, Aug. 25.

EXTREMES, April 1951 to September 1952.--Sediment concentrations: Maximum daily, 758 ppm June 9, 1951; minimum daily, 1 ppm Oct. 27, 28, 1951, Aug. 25, 1952.

Sediment loads: Maximum daily, 7,860 tons Jan. 28, 1952; minimum daily, less than 0.05 ton Oct. 27, 28, 1951, Aug. 25, 1952.

REMARKS.--Flow affected by ice Dec. 15, 16. Relative proportions of organic sediments were much greater during the low flow periods May to August. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Suspended sediment, water year October 1951 to September 1952

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-----	11	8	0.2	16	5	0.2	24	7	0.5
2-----	11	25	.7	17	6	.3	22	5	.3
3-----	12	10	.3	17	7	.3	20	4	.2
4-----	13	10	.4	19	7	a.4	29	4	.3
5-----	12	13	.4	16	7	.3	48	5	.6
6-----	12	4	.1	17	8	.4	78	8	1.7
7-----	13	4	.1	52	9	1.3	275	72	s76
8-----	15	4	.2	32	9	.8	903	520	b1,300
9-----	12	4	.1	28	7	.5	1,410	428	1,630
10-----	12	4	.1	29	6	.5	1,620	324	1,420
11-----	14	4	.2	26	4	.3	1,470	196	778
12-----	13	4	.1	20	5	.3	861	80	186
13-----	12	3	.1	21	5	.3	404	42	46
14-----	12	3	.1	37	5	.5	222	24	14
15-----	12	3	.1	34	5	.5	130	14	4.9
16-----	12	3	.1	100	8	2.2	100	12	3.2
17-----	12	3	.1	78	8	1.7	90	11	2.7
18-----	12	3	.1	48	8	1.1	90	10	a2
19-----	13	3	.1	37	6	.6	90	8	1.9
20-----	12	4	.1	28	5	.4	103	6	1.7
21-----	12	5	.2	23	7	.4	211	9	5.1
22-----	14	3	.1	22	6	.4	424	16	18
23-----	14	3	.1	36	4	.4	556	26	39
24-----	26	6	.4	39	4	.4	576	30	47
25-----	22	4	.2	39	5	.5	464	19	24
26-----	15	3	.1	41	4	.4	990	39	s110
27-----	15	1	(t)	35	6	.6	1,410	86	327
28-----	17	1	(a t)	31	7	.8	1,380	72	268
29-----	16	2	.1	28	9	.7	1,180	40	127
30-----	15	3	.1	26	8	.6	1,580	69	s310
31-----	15	4	.2	--	--	--	2,670	172	1,240
Total-	428	--	5.3	992	--	17.9	19,410	--	7,985.1

s Computed by subdividing day.

t Less than 0.05 ton.

a Computed from estimated concentration graph.

b Computed from partly estimated concentration graph.

SCIOTO RIVER BASIN--Continued

SCIOTO RIVER NEAR PROSPECT, OHIO--Continued

Suspended sediment, water year October 1951 to September 1952--Continued									
Day	January			February			March		
	Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment	
		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day
1-----	3,860	271	2,820	1,060	73	209	188	2	1.0
2-----	4,640	158	1,980	1,360	90	330	174	4	1.9
3-----	4,180	82	921	1,980	127	879	168	13	5.9
4-----	2,670	55	396	2,670	129	930	186	8	4.0
5-----	1,360	41	151	3,440	172	1,600	289	5	3.9
6-----	861	30	70	3,580	123	1,190	361	16	16
7-----	875	20	36	2,340	77	486	263	18	13
8-----	537	14	20	1,300	62	218	214	20	12
9-----	464	10	13	1,080	59	172	197	18	a 10
10-----	453	9	11	1,100	70	a 210	205	12	6.6
11-----	393	7	7.4	840	58	132	2,250	350	s 2,520
12-----	334	7	6.3	635	38	65	3,790	620	6,340
13-----	303	7	a 6	494	24	32	5,520	462	7,180
14-----	518	16	s 25	400	23	25	4,560	207	2,560
15-----	1,440	98	s 415	320	17	15	2,740	127	940
16-----	2,100	370	2,100	295	13	10	1,380	102	380
17-----	3,930	578	s 6,080	284	21	16	798	74	159
18-----	5,070	489	6,890	245	12	7.9	596	54	87
19-----	6,220	453	7,610	212	8	4.6	861	103	s 246
20-----	5,820	263	4,130	225	10	6.1	1,440	138	537
21-----	3,930	157	1,670	355	13	12	1,380	120	441
22-----	2,280	116	714	446	17	20	1,040	74	208
23-----	1,260	90	306	346	18	17	2,280	298	s 1,940
24-----	945	68	174	284	15	12	3,090	369	3,080
25-----	655	57	101	250	6	4.0	2,950	213	s 1,740
26-----	2,200	256	s 2,400	223	7	4.2	1,560	106	s 464
27-----	5,620	417	6,330	205	7	3.9	777	59	124
28-----	7,080	411	7,860	201	6	3.3	556	31	47
29-----	7,190	244	4,740	197	4	2.1	442	21	25
30-----	4,720	134	1,710	--	--	--	368	17	17
31-----	2,670	95	685	--	--	--	325	12	11
Total--	84,358	--	60,157.7	26,367	--	6,416.1	40,928	--	29,110.3
Day	April			May			June		
	Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	314	10	8.5	343	16	15	84	120	a 28
2-----	314	9	7.6	286	11	8.5	88	135	32
3-----	289	14	11	237	9	5.8	93	29	7.3
4-----	255	13	9.0	205	8	4.4	95	34	8.7
5-----	504	27	s 39	182	7	3.4	87	27	6.3
6-----	924	64	160	174	7	3.3	98	15	4.0
7-----	1,080	64	187	156	7	2.9	90	14	3.4
8-----	968	49	128	147	7	2.8	74	9	1.8
9-----	695	34	64	134	7	2.5	68	6	1.1
10-----	518	22	31	139	8	3.0	68	23	4.2
11-----	424	18	21	128	8	2.8	67	82	15
12-----	400	15	16	120	12	3.9	54	123	18
13-----	899	46	s 132	106	4	1.1	58	141	22
14-----	2,100	202	1,150	95	7	1.8	56	124	19
15-----	3,160	204	1,740	98	4	1.1	49	128	17
16-----	3,230	124	1,080	92	8	2.0	47	137	17
17-----	2,220	92	551	120	21	6.8	49	110	15
18-----	1,160	54	s 176	132	50	a 18	37	90	a 9
19-----	695	26	49	176	120	57	35	88	8.3
20-----	518	22	31	245	137	91	31	90	7.5
21-----	400	24	a 26	371	148	148	28	112	8.5
22-----	334	27	24	325	141	124	27	120	a 9
23-----	551	49	s 94	237	124	79	26	127	9.6
24-----	2,530	204	s 1,420	190	135	69	32	124	11
25-----	3,860	198	2,060	162	161	70	26	85	6.0
26-----	3,930	94	997	158	159	68	27	69	5.0
27-----	2,340	60	a 380	143	171	66	78	190	b 40
28-----	1,060	44	126	127	170	58	34	40	2.6
29-----	635	26	45	109	200	59	20	30	a 2
30-----	446	19	23	95	163	42	17	30	a 1
31-----	--	--	--	93	121	30	--	--	--
Total--	36,753	--	20,786.1	5,325	--	1,050.1	1,635	--	339.3

s Computed by subdividing day.

a Computed from estimated concentration graph.

b Computed from partly estimated concentration graph.

SCIOTO RIVER BASIN--Continued

SCIOTO RIVER NEAR PROSPECT, OHIO--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

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-----	15	80	3.2	16	135	5.8	10	7	0.2
2-----	15	72	2.9	16	132	5.7	19	7	.4
3-----	19	61	3.1	15	102	4.1	21	5	.3
4-----	32	112	9.7	13	117	4.1	17	4	.2
5-----	33	112	10	14	104	3.9	17	3	.1
6-----	41	140	15	15	82	3.3	16	2	.1
7-----	27	130	a.9	14	84	3.2	14	3	.1
8-----	21	86	4.9	13	79	2.8	12	3	.1
9-----	16	62	2.7	13	11	.4	12	3	.1
10-----	14	80	3.0	14	9	.3	13	5	.2
11-----	16	58	2.5	12	22	.7	13	5	.2
12-----	16	32	1.4	13	18	.6	13	5	.2
13-----	15	15	a.6	12	108	3.5	12	5	.2
14-----	15	7	.3	10	196	5.3	14	6	.3
15-----	18	7	.3	13	178	6.2	24	4	.2
16-----	17	38	1.7	50	119	16	17	4	.2
17-----	17	63	2.9	24	75	4.9	13	6	.3
18-----	17	57	2.6	13	70	a.2	15	8	1.9
19-----	20	63	3.4	14	94	3.6	60	12	a.9
20-----	18	60	a.4	15	50	2.0	29	12	1.7
21-----	16	98	4.2	14	32	1.2	49	13	1.8
22-----	21	93	5.3	16	18	.8	47	14	1.3
23-----	24	80	5.2	11	4	.1	33	15	a.9
24-----	20	70	3.8	9.4	2	a.1	24	14	.4
25-----	19	63	3.2	8.8	2	(0)	19	7	.2
26-----	17	25	1.1	9.4	8	.2	17	5	.2
27-----	18	14	.7	9.4	13	.3	14	5	.2
28-----	17	12	.6	9.4	10	.3	13	6	.2
29-----	17	22	1.0	9.1	12	.3	12	7	.2
30-----	15	92	3.7	9.4	12	.3	13	10	.4
31-----	16	99	4.3	10	11	.3	--	--	--
Total-	602	--	116.3	434.9	--	62.4	602	--	13.7

Total discharge for year (cfs-days) 217,834.9

Total load for year (tons) 116,080.3

t Less than 0.05 ton.

a Computed from estimated concentration graph.

SCIOTO RIVER BASIN--Continued

SCIOTO RIVER NEAR PROSPECT, OHIO--Continued

Particle-size analyses of suspended sediment, January to April 1952

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Suspended sediment											Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500	1.000
Jan. 17, 1952	8:00 a. m.	4,080	690	481	54	75	83	91	100							BNM
Mar. 11	3:10 p. m.	2,740	593	837	72	86	94	98	99							BCVM
Mar. 11	3:10 p. m.	2,740	593	767	43	64	83	95	99							BNM
Apr. 15	12:25 p. m.	3,300	313	63	66	88	95	100								BNM
Apr. 15	5:50 p. m.	3,440	177	303	78	84	96	97	100							BNM

SCIOTO RIVER BASIN--Continued

OLENTANGY RIVER NEAR DELAWARE, OHIO

LOCATION.--At Stone Mill Bridge $1\frac{1}{2}$ miles north of Delaware, Delaware County, and 4 miles downstream from gaging station near Delaware.

DRAINAGE AREA.--387 square miles (above gaging station).

RECORDS AVAILABLE.--Water temperatures: July 1946 to September 1952.

EXTREMES, 1951-52.--Water temperatures: Maximum, 93°F June 29; minimum, freezing point on several days in December.

EXTREMES, 1946-52.--Water temperatures: Maximum, 93°F June 29, 1952; minimum, freezing point on many days during winter months.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Temperature (°F) of water, water year October 1951 to September 1952

/Once-daily temperature measurement at approximately 5 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	50	45	44	37	39	50	61	66	80	76	76
2	69	45	42	44	39	38	50	61	68	79	80	70
3	70	42	45	36	40	40	50	62	72	78	80	69
4	72	40	44	36	40	39	48	66	72	75	78	69
5	75	36	42	38	40	39	45	66	73	75	78	71
6	68	36	45	38	40	39	42	68	74	76	79	76
7	57	36	50	35	39	39	42	60	81	77	77	73
8	59	36	46	35	39	39	47	58	81	78	79	73
9	57	39	40	35	41	38	47	58	78	75	79	75
10	57	49	41	35	44	39	47	57	78	75	78	75
11	56	50	41	35	38	44	47	57	70	80	78	78
12	57	50	39	35	41	44	46	57	70	82	78	78
13	59	49	35	36	37	43	48	59	76	82	78	79
14	59	49	35	36	36	42	48	59	79	83	78	74
15	60	49	33	46	36	44	47	59	85	81	79	74
16	60	49	32	46	36	43	53	59	85	80	79	74
17	62	48	32	43	35	44	54	59	84	80	79	74
18	60	40	32	43	37	44	54	65	84	81	78	70
19	58	40	32	43	38	50	55	60	82	81	75	68
20	58	38	34	43	39	55	55	60	80	86	75	69
21	60	38	33	38	37	45	58	60	80	86	74	67
22	61	41	32	38	37	44	58	64	80	85	73	67
23	64	42	32	36	38	44	55	67	86	84	73	67
24	52	42	32	36	44	44	51	68	87	82	74	66
25	57	36	34	37	37	48	53	68	88	81	77	65
26	57	36	32	38	38	48	54	65	89	84	78	65
27	54	35	32	38	38	45	53	65	89	85	78	65
28	54	35	33	38	47	45	60	65	90	82	78	66
29	50	40	35	37	40	45	60	64	93	80	77	67
30	53	42	34	37	--	50	61	64	88	80	77	70
31	50	--	44	37	--	50	--	64	--	76	76	--
Average	60	42	37	38	39	44	51	62	80	80	77	71

SCIO TO RIVER BASIN--Continued
BIG WALNUT CREEK AT CENTRAL COLLEGE, OHIO

LOCATION.--At gaging station at bridge on Central College Road, a quarter of a mile east of Central College, Franklin County, 3 miles southeast of Westerville, and 3½ miles downstream from Duncan Run.

DRAINAGE AREA.--191 square miles.

RECORDS AVAILABLE.--Chemical analyses: September 1951 to October 1952.

Water temperature records: October 1951 to September 1952.

Sediment records: October 1951 to September 1952.

EXTREMES, 1951-52.--Dissolved solids: Maximum, 705 ppm Oct. 11-20; minimum, 158 ppm Jan. 21-31.

Hardness: Maximum, 515 ppm Oct. 11-20; minimum, 122 ppm Jan. 21-31, Feb. 1-10.

Specific conductance: Maximum daily 944 microhmhos Oct. 12; minimum daily, 139 microhmhos Jan. 27.

Water temperatures: Maximum, 89°F June 29; minimum, freezing point on many days during November to February.

Sediment concentrations: Maximum daily, 664 ppm Jan. 26; minimum daily, 1 ppm Nov. 2.

Sediment loads: Maximum daily 10,700 tons Jan. 27; minimum daily, less than 0.05 ton on many days.

REMARKS.--Stream frozen Dec. 21-29. Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on 45-micron mesh at 180°C)	Hardness as CaCO ₃		Specific conductance (microhmhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 1-10, 1951.....	1.76	11	0.03	107	53	15	5.2	250	294	9.0	0.4	0.8	680	486	280	875	8.2	8
Oct. 11-20.....	1.79	15	.02	117	54	16	5.9	272	310	12	.2	1.7	705	515	291	909	8.0	10
Oct. 21-31.....	2.04	8.4	.04	116	52	14	7.5	283	289	12	.2	.3	682	506	271	888	7.9	20
Nov. 1-10.....	28.5	8.7	.02	107	43	16	6.8	266	248	13	.2	1.0	606	446	226	815	8.0	17
Nov. 11-20.....	156	9.6	.02	55	19	7.7	4.7	130	106	10	.2	8.8	287	216	109	451	7.3	15
Nov. 21-30.....	230	10	.05	50	16	6.0	3.2	111	93	9.0	.2	12	254	189	100	397	7.4	18
Dec. 1-10.....	586	14	.06	46	15	5.0	2.5	109	83	6.8	.2	11	238	176	87	370	7.3	22
Dec. 11-20.....	140	11	.02	60	20	5.7	2.5	153	99	7.0	.2	7.9	295	233	107	457	7.5	10
Dec. 21-28.....	779	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec. 29, 1951-Jan. 10, 1952.....	764	8.9	.11	36	11	3.8	1.9	98	56	5.5	.2	8.3	178	134	55	288	7.4	20
Jan. 11-20.....	678	10	.06	38	12	4.3	2.0	144	59	5.0	.2	8.1	189	144	64	305	7.4	15
Jan. 21-31.....	1,335	9.1	.04	32	10	3.6	2.1	91	48	3.8	.2	6.4	158	122	46	258	7.4	10
Feb. 1-10.....	930	11	.11	32	10	4.1	1.8	91	49	3.5	.2	6.4	164	122	46	262	7.5	20
Feb. 11-20.....	124	13	.04	34	18	6.2	1.8	162	73	3.0	.2	6.3	206	212	76	418	7.8	10
Feb. 21-29.....	136	5	.04	45	17	7.3	2.2	135	73	6.5	.1	5.6	224	161	72	377	7.6	7
Mar. 1-10.....	79.9	6.2	.11	31	8.3	2.9	2.6	161	92	7.0	.1	2.3	132	224	92	437	6.9	7
Mar. 11-20.....	732	6.8	.16	34	12	3.9	2.2	168	55	4.2	.1	6.0	177	132	81	285	6.9	36
Mar. 21-31.....	473	7.3	.03	40	15	5.0	2.0	118	61	4.0	.1	4.9	201	160	85	328	7.8	22
Apr. 1-10.....	289	6.3	.06	41	14	6.1	2.1	117	64	4.5	.1	4.3	208	161	64	337	8.0	20
Apr. 11-20.....	554	6.6	.17	36	12	5.3	2.0	105	57	3.9	.1	4.1	187	145	58	305	7.9	25
Apr. 21-30.....	606	5.8	.08	38	13	5.8	1.7	122	57	3.9	.1	3.2	187	150	48	314	7.9	30

a Includes equivalent of 10 parts per million of carbonate (CO₃).

May 1-10.....	45.1	3.3	.03	55	25	7.0	1.3	185	90	5.6	3	.2	301	238	88	481	7.8	7
May 11-20.....	54.0	4.1	.04	67	26	8.7	2.2	214	102	6.0	.9	.3	344	276	99	543	8.0	10
May 21-31.....	105	6.4	.03	48	17	4.6	1.5	154	64	5.5	.1	3.7	248	187	63	391	7.8	22
June 1-10.....	12.8	5.3	.03	59	22	6.4	3.6	134	69	5.5	.2	1.0	301	236	79	470	8.2	12
June 11-20.....	4.67	7.6	.03	74	24	9.0	4.6	226	112	5.2	.2	.8	381	285	98	571	8.2	12
June 21-30.....	4.36	14	.02	82	34	11	3.0	234	155	6.2	.2	1.0	448	346	153	654	7.9	8
July 1-10.....	25.6	13	.02	70	27	8.8	3.0	196	123	6.3	.2	1.0	374	284	125	564	8.0	15
July 11-20.....	7.06	9.6	.02	46	16	4.4	2.0	144	60	4.5	.2	.8	231	181	63	372	8.1	18
July 21-31.....	1.65	14	.02	46	18	4.8	1.3	161	64	3.2	.2	.6	230	188	57	371	7.8	10
Aug. 1-10.....	.70	15	.03	48	18	5.4	1.6	173	54	4.0	.2	.6	256	194	52	407	7.8	10
Aug. 11-20.....	1.13	11	.02	50	19	5.3	2.0	170	72	4.5	.2	.6	263	201	64	426	7.8	7
Aug. 21-31.....	.66	17	.02	56	24	10	2.7	180	105	5.0	.4	1.0	322	239	91	487	7.5	5
Sept. 1-10.....	.58	10	.02	61	25	10	1.8	168	126	6.5	.4	1.0	347	256	117	519	7.7	5
Sept. 11-20.....	.61	11	.02	67	27	12	3.3	172	148	8.0	.4	1.2	364	278	137	570	7.7	5
Sept. 20-30.....	1.54	17	.02	93	39	15	3.9	207	240	8.5	.4	.5	550	392	223	763	7.8	5
Average.....	252	9.8	0.05	59	23	7.8	2.9	164	111	6.3	0.2	3.5	318	241	106	477	--	14

OHIO RIVER BASIN

SCIOTO RIVER BASIN--Continued

BIG WALNUT CREEK AT CENTRAL COLLEGE, OHIO--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	67	47	39	47	35	38	55	72	73	85	79	84
2	68	44	43	41	38	36	51	67	77	85	82	70
3	70	--	44	34	41	41	53	72	77	82	79	68
4	75	35	44	35	43	42	49	72	79	83	81	70
5	74	35	43	34	40	41	44	76	75	83	80	70
6	67	33	46	34	37	38	40	76	81	85	79	75
7	69	36	50	33	36	38	41	71	83	85	80	73
8	55	35	49	35	37	42	46	67	82	81	84	72
9	66	33	44	34	38	42	57	67	78	76	76	75
10	56	43	39	36	40	43	49	62	78	78	76	75
11	54	44	38	34	39	45	51	61	73	73	78	75
12	55	38	33	35	38	44	49	59	74	81	77	78
13	60	52	32	37	38	44	52	61	79	80	79	78
14	60	52	32	47	34	43	49	67	78	81	78	75
15	57	50	32	41	34	41	45	72	85	82	79	74
16	61	47	32	43	35	38	50	61	87	82	78	71
17	63	38	32	46	32	41	56	67	86	80	81	72
18	61	42	32	43	32	41	60	68	85	85	76	67
19	56	35	32	46	34	42	64	62	81	82	75	66
20	55	32	33	42	38	47	66	61	79	86	77	65
21	65	35	--	37	33	53	68	64	81	87	77	65
22	64	37	--	37	34	48	65	67	83	86	74	65
23	66	42	--	33	35	46	56	72	82	82	70	62
24	57	42	--	33	40	43	50	72	85	78	76	62
25	58	36	--	36	35	45	50	70	86	81	78	64
26	58	37	--	41	38	44	58	68	87	82	78	64
27	56	34	--	42	40	43	61	72	85	87	79	64
28	57	37	--	33	43	43	66	--	87	80	79	67
29	50	37	--	32	42	47	68	68	89	87	79	70
30	52	39	35	32	--	53	65	73	85	78	78	69
31	--	--	--	32	--	55	--	76	--	79	75	--
Average	61	40	a 38	38	37	43	54	68	81	82	78	70

a Includes estimated temperature, 32°F, on missing days.

SCIOTO RIVER BASIN--Continued

BIG WALNUT CREEK AT CENTRAL COLLEGE, OHIO--Continued

Suspended sediment, water year October 1951 to September 1952

Day	October			November			December		
	Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment	
		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day
1-----	2.3			4.2	2	(t)	84	10	2.3
2-----	2.3			4.2	1	(t)	75	9	1.8
3-----	2.0			4.4	2	(t)	87	7	1.3
4-----	1.7			4.4	6	0.1	117	30	a 19
5-----	1.4			4.4	4	(t)	510	110	a 170
6-----	1.4			6.4	3	.1	389	85	37
7-----	1.4			43	17	2.0	925	161	s 580
8-----	1.5	4	(t)	124	31	10	1,060	156	s 507
9-----	1.4			57	16	2.5	1,910	209	s 1,170
10-----	2.2			33	12	1.1	722	58	s 128
11-----	2.3			24	10	.6	321	23	20
12-----	2.3			20	8	.4	220	14	8.3
13-----	2.2			18	10	.5	154	12	5.0
14-----	1.8			507	240	a 420	120	12	3.9
15-----	1.8			308	122	s 115	110	7	2.1
16-----	1.7			161	56	24	100	13	3.5
17-----	1.5			232	52	33	95	13	3.3
18-----	1.5			137	11	4.1	90	8	1.9
19-----	1.4			90	9	2.2	90	4	1.0
20-----	1.4			66	6	1.1	100	7	1.9
21-----	1.3			57	5	.8	500	--	e 70
22-----	1.2			50	4	.5	1,200	--	e 500
23-----	1.3	5	(t)	387	180	b 240	730	--	e 300
24-----	1.6			590	75	b 130	550	--	e 100
25-----	1.7			265	20	14	400	--	e 30
26-----	1.7			303	21	17	1,400	--	e 700
27-----	1.8			286	22	17	1,100	--	e 500
28-----	2.5			159	14	6.0	650	--	e 200
29-----	2.9			116	11	3.4	460	--	e 50
30-----	3.2			92	12	3.0	1,800	207	s 1,310
31-----	3.2			--	--	--	2,650	148	s 1,200
Total-	57.9	--	0.6	4,153.0	--	1,048.5	18,719	--	7,627.3
Day	January			February			March		
	Mean dis- charge (cfs)	Mean concen- tration (ppm)	Tons per day	Mean dis- charge (cfs)	Mean concen- tration (ppm)	Tons per day	Mean dis- charge (cfs)	Mean concen- tration (ppm)	Tons per day
1-----	950	53	136	172	25	12	98	5	1.3
2-----	655	34	80	2,070	270	a 1,900	96	3	.8
3-----	922	60	a 170	1,060	80	s 243	94	3	.8
4-----	444	18	22	3,090	250	a 2,300	116	5	1.6
5-----	434	14	16	1,280	86	s 314	150	5	2.0
6-----	387	9	8.9	530	45	64	102	4	1.1
7-----	244	7	4.6	339	26	24	80	3	.6
8-----	203	5	2.7	270	17	12	62	3	.5
9-----	206	5	2.8	270	21	15	69	7	1.3
10-----	296	6	4.8	218	15	8.8	92	6	1.5
11-----	150	6	2.4	168	14	6.3	3,410	539	s 5,340
12-----	124	6	2.0	132	11	3.9	1,180	135	s 494
13-----	126	8	2.7	112	8	2.4	410	55	61
14-----	213	7	4.0	109	7	1.9	302	33	27
15-----	746	223	s 558	90	7	1.7	225	23	14
16-----	398	121	s 134	95	16	4.1	163	17	7.5
17-----	1,470	212	s 1,270	85	8	1.8	130	12	4.2
18-----	1,700	188	s 970	80	3	.6	128	9	3.1
19-----	518	72	s 109	96	6	1.6	866	60	s 187
20-----	1,330	200	a 850	280	30	a 45	530	55	79
21-----	442	81	s 102	736	65	a 150	283	35	27
22-----	296	47	38	234	30	19	928	158	s 665
23-----	420	77	87	128	17	5.9	2,170	320	a 2,000
24-----	168	40	18	128	13	4.5	630	94	s 180
25-----	130	22	7.7	128	12	4.1	321	38	33
26-----	3,970	664	s 8,980	112	10	3.0	213	28	16
27-----	7,390	434	s 10,700	98	10	2.6	180	22	11
28-----	992	98	s 294	98	8	2.1	140	14	5.3
29-----	420	58	66	98	6	1.6	130	11	3.9
30-----	254	33	23	--	--	--	120	17	5.5
31-----	201	27	15	--	--	--	110	13	3.9
Total-	26,179	--	24,660.6	12,297	--	5,154.9	13,548	--	9,158.9

e Estimated

s Computed by subdividing day.

t Less than 0.05 ton.

a Computed partly from water-sediment discharge curve.

b Computed from water-sediment discharge curve.

SCIOTO RIVER BASIN--Continued

BIG WALNUT CREEK AT CENTRAL COLLEGE, OHIO--Continued

Suspended sediment, water year October 1951 to September 1952--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-----	160	17	s 12	73	13	2.6	22	5	0.3
2-----	259	22	s 18	60	11	1.8	19	4	.2
3-----	148	10	4.0	52	7	1.0	16	5	.2
4-----	128	12	4.1	44	6	.7	14	5	.2
5-----	431	42	s 59	42	3	.3	13	5	.2
6-----	472	19	24	40	5	.5	11	8	.2
7-----	570	24	37	37	6	.6	9.8	8	.2
8-----	324	17	15	34	6	.6	8.7	9	.2
9-----	220	12	7.1	33	6	.5	7.9	7	.1
10-----	174	12	5.6	36	7	.7	6.1	12	.2
11-----	157	9	3.8	45	7	.8	5.8	12	.2
12-----	206	25	s 18	40	8	.9	5.3	19	.3
13-----	1,010	200	a 800	34	10	.9	5.0	17	.2
14-----	1,700	250	a 1,400	30	10	.8	5.6	16	.2
15-----	1,060	85	243	28	10	.8	5.0	14	.2
16-----	610	51	84	28	9	.7	4.4	12	.1
17-----	304	28	23	53	12	1.7	4.4	10	.1
18-----	208	17	9.5	114	18	5.5	4.2	10	.1
19-----	159	13	5.6	66	9	1.6	3.9	10	.1
20-----	124	11	3.7	102	10	2.8	3.1	10	.1
21-----	100	9	2.4	141	13	4.9	2.9	10	.1
22-----	88	9	2.1	110	10	3.0	2.7	9	.1
23-----	688	150	a 650	58	13	2.0	2.7	8	.1
24-----	3,320	210	a 2,000	64	11	1.9	2.5	9	.1
25-----	891	57	s 145	130	60	a 25	2.3	10	.1
26-----	376	32	32	296	56	45	2.2	12	.1
27-----	227	31	19	161	23	10	3.6	19	.2
28-----	161	23	10	78	16	3.4	3.1	15	.1
29-----	118	16	5.1	49	7	.9	3.6	14	.1
30-----	92	14	3.5	35	5	.5	18	15	.7
31-----	--	--	--	28	5	.4	--	--	--
Total-	14,485	--	5,645.5	2,141	--	122.8	217.8	--	5.3
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-----	33	15	1.3	0.8			0.4		
2-----	19	10	.5	.8			.5		
3-----	9.8	7	.2	.7			.6		
4-----	12	12	.4	.7			.5		
5-----	37	12	1.2	.7			.6		
6-----	21	6	.3	.7			.7		
7-----	13	10	.4	.6			.7		
8-----	8.7	16	.4	.6			.7		
9-----	7.2	16	.3	.7			.6		
10-----	94	29	7.4	.7			.5		
11-----	31	12	1.0	.7			.4		
12-----	12	13	.4	.7			.4		
13-----	7.5	16	.3	.7			.3		
14-----	5.0	15	.2	.8			.4		
15-----	3.4	29	.3	.8			.7		
16-----	2.9	32	.2	1.7			.6		
17-----	2.5	17	.1	1.6			.5		
18-----	2.3	16	.1	1.5			.5		
19-----	2.0	11	.1	1.4			1.2		
20-----	2.0	7	(t)	1.4			1.1		
21-----	2.0	8		1.2			1.7		
22-----	2.2	12	(t)	1.0			3.2		
23-----	2.5	17	.1	.8			2.9		
24-----	2.5	25	.2	.8			2.0		
25-----	1.8	12	.1	.7			1.4		
26-----	1.5			.7			1.1		
27-----	1.4			.5			.9		
28-----	1.2			.4			.8		
29-----	1.1			.4			.7		
30-----	1.0			.4			.7		
31-----	.9			.4			--		
Total-	343.4	--	15.8	25.6	--	0.4	27.3	--	0.3
Total discharge for year (cfs-days)									82,194.0
Total load for year (tons)									53,440.9

e Estimated.

s Computed by subdividing day.

t Less than 0.05 ton.

a Computed partly from water-sediment discharge curve.

SCIOTO RIVER BASIN--Continued

BIG WALNUT CREEK AT CENTRAL COLLEGE, OHIO--Continued

Particle-size analyses of suspended sediment, March to April 1952

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Suspended sediment										Methods of analysis			
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Mar. 11, 1952.....	9:00 a.m.	5,380	968	1,320	44	56	69	80	90	96	99					BWC
Mar. 11.....	9:00 a.m.	5,380	968	738	33	52	69	80	90	94	97					BN
Mar. 11.....	1:50 p.m.	1,270	198	344	60	73	81	88	90	97	99	99				BWC
Apr. 23.....	4:50 p.m.	678	184	245	16	37	48	71	92	95	97					BWC

LICKING RIVER BASIN

LICKING RIVER NEAR SALYERSVILLE, KY.

LOCATION.--At gaging station at bridge on State Highway 30, 0.2 mile upstream from Gardner Branch, 1.2 miles west of Salyersville, Magoffin County, and 3.1 miles downstream from State Road Fork.

DRAINAGE AREA.--140 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 19, 1951	3.3	5.0	0.01	16	6.1	17		67	12	23	0.2	1.4	118	64	10	197	7.5	3
Nov. 13	44	7.8	.03	11	4.9	15	3.0	36	16	28	.1	1.0	107	48	18	189	7.4	2
Dec. 14	346	6.7	.08	6.4	2.4	2.4	1.7	16	15	1.5	.1	2.3	46	26	13	70.7	6.7	2
Jan. 28, 1952	2,340	7.0	.02	4.0	2.4	1.9	1.4	14	10	2.6	.0	1.0	41	20	8	52.1	6.6	8
Feb. 27	105	7.4	.09	6.8	3.6	11	1.3	22	13	17	.1	.7	73	32	14	129	7.2	2
Apr. 11	113	7.6	.33	6.4	3.4	9.2	.9	20	12	14	.1	.3	70	30	14	117	7.1	12
May 12	508	7.8	.07	6.0	2.9	5.3	1.9	18	10	9.4	.1	.9	54	27	12	84.4	6.9	8
June 19	18	8.5	.09	11	3.9	7.3	2.0	44	11	11	.1	.7	79	44	7	138	6.9	6
July 28	4.3	6.9	.02	13	5.3	8.4	3.1	64	12	9.5	.1	1.4	97	55	2	160	6.8	4
Sept. 18	1.7	5.9	.02	15	4.6	13	1.6	72	7.7	14	.1	1.0	104	56	0	190	6.7	2

LICKING RIVER BASIN--Continued

LICKING RIVER AT FARMERS, KY.

LOCATION.--At gaging station at bridge on U. S. Highway 60, 300 feet upstream from Chesapeake & Ohio Railway bridge, three-quarters of a mile west of Farmers, Rowan County, and 1.1 miles upstream from Triplett Creek.

DRAINAGE AREA.--826 square miles.

RECORDS AVAILABLE.--Chemical analyses: September 1949 to August 1950.

Water temperatures: October 1949 to September 1952.

EXTREMES, 1951-52.--Water temperatures: Maximum, 87°F July 21; minimum, freezing point Dec. 19.

EXTREMES, 1949-52.--Water temperatures: Maximum, 92°F July 19, 1951; minimum, freezing point at times during winter months.

REMARKS.--Daily water temperatures reported are averages of twice-daily measurements. The data reported under extremes are the individual maximum and minimum measurements. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Temperature (°F) of water, water year October 1951 to September 1952
/Twice-daily measurements at approximately 6:30 a. m. and 3:15 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	50	40	48	39	43	54	62	66	82	76	72
2	64	48	40	49	41	41	52	61	67	80	78	73
3	66	44	41	48	44	42	54	64	68	81	78	70
4	66	42	44	44	45	42	54	65	68	79	81	68
5	68	41	42	42	45	43	50	66	70	79	80	68
6	69	42	44	42	43	42	48	69	72	80	76	70
7	66	40	48	41	41	41	47	67	74	80	74	70
8	61	40	49	41	41	40	48	67	78	80	76	66
9	56	40	50	42	41	42	50	68	76	78	76	70
10	54	42	48	41	42	42	52	68	76	75	76	70
11	54	42	46	40	44	45	52	63	75	75	75	71
12	53	42	42	41	42	46	54	59	72	76	77	72
13	53	46	41	42	42	46	56	58	74	78	78	78
14	54	50	40	45	42	45	54	58	74	78	78	75
15	55	52	38	48	42	44	52	61	76	78	75	75
16	56	50	37	50	40	44	52	63	79	78	80	72
17	57	48	34	52	40	42	52	63	80	79	80	69
18	58	44	34	48	39	43	54	64	79	81	78	68
19	58	40	32	47	39	44	56	64	79	82	77	68
20	55	38	34	46	40	45	58	62	80	83	77	67
21	56	36	38	44	40	48	61	60	76	84	78	66
22	60	40	36	44	40	51	63	61	76	84	74	65
23	62	41	38	42	40	51	64	64	78	84	73	60
24	60	42	37	40	42	50	64	65	76	82	72	62
25	56	44	38	40	42	50	62	66	76	79	72	62
26	56	44	40	43	42	50	60	64	78	80	72	62
27	56	45	40	47	41	48	57	67	79	81	70	63
28	58	43	38	47	42	48	57	68	81	82	71	64
29	53	42	38	43	43	48	58	64	80	82	72	64
30	54	42	40	40	--	50	60	64	82	78	74	64
31	53	--	44	38	--	52	--	68	--	78	74	--
Average	58	43	40	44	42	45	55	64	75	80	76	68

LICKING RIVER BASIN--Continued

SOUTH FORK LICKING RIVER AT CYNTHIANA, KY.

LOCATION.--At gaging station at bridge on State Highways 32 and 36 at Cynthiana, Harrison County, in pool formed by old mill dam 2.6 miles downstream, 0.4 mile downstream from Grays Run, and 48 miles upstream from mouth.

DRAINAGE AREA.--615 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1950 to August 1951.

Water temperatures: October 1949 to September 1952.

EXTREMES, 1951-52.--Water temperatures: Maximum, 87°F June 30; minimum, 33°F Dec. 17.

EXTREMES, 1949-52.--Water temperatures: Maximum, 87°F June 30, 1952; minimum, 33°F on several days in November and December 1950 and in February and December 1951.

REMARKS.--Daily water temperatures reported are averages of twice-daily measurements. The data reported under extremes are the individual maximum and minimum measurements. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Temperature (°F) of water, water year October 1951 to September 1952
/Twice-daily measurements at approximately 6:30 a.m. and 5:30 p.m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	50	43	50	41	42	57	71	70	86	80	76
2	66	46	44	49	44	42	56	74	72	86	78	72
3	68	38	45	48	44	43	54	76	76	86	80	70
4	70	38	46	45	46	42	54	74	76	82	80	68
5	72	38	46	42	46	39	50	74	72	84	78	69
6	72	40	47	40	44	40	46	76	74	82	76	70
7	69	40	48	40	44	41	46	74	76	82	76	72
8	62	40	46	41	43	42	48	74	80	78	76	72
9	58	39	48	42	42	42	52	72	82	78	77	73
10	57	40	46	40	42	44	54	70	80	78	78	74
11	56	40	45	39	42	46	52	67	80	78	77	78
12	56	43	43	42	41	46	54	63	75	76	77	79
13	56	48	40	44	42	47	56	63	76	78	78	80
14	58	52	39	48	41	46	54	64	78	79	78	74
15	58	52	36	51	41	45	52	64	80	79	78	74
16	58	50	34	52	41	44	50	64	82	78	80	72
17	60	46	34	54	40	44	52	66	83	79	80	72
18	60	40	35	48	38	45	54	67	80	79	80	72
19	60	40	34	48	40	46	60	67	81	82	80	70
20	57	36	34	47	43	48	65	66	82	84	80	--
21	58	38	35	44	43	52	66	65	79	84	80	68
22	62	40	34	44	43	55	68	67	79	84	78	--
23	64	42	36	38	42	52	72	68	80	84	74	66
24	62	44	37	37	42	51	68	69	82	82	72	68
25	58	45	38	40	42	50	67	70	82	78	74	66
26	58	45	38	44	42	49	66	72	84	78	76	66
27	58	44	34	47	41	49	64	73	85	80	75	68
28	57	43	36	45	43	48	64	74	85	81	76	66
29	54	42	39	40	43	50	66	70	86	80	76	67
30	55	42	42	36	--	52	68	69	86	80	77	65
31	54	--	46	38	--	54	--	70	--	80	76	--
Average	61	43	40	44	42	46	58	69	79	81	77	71

MIAMI RIVER BASIN

MIAMI RIVER AT DAYTON, OHIO

LOCATION.--At Main Street Bridge in Dayton, Montgomery County, 1,000 feet upstream from gaging station, one-half mile downstream from Mad River, and $1\frac{1}{2}$ miles below Still-water River.

DRAINAGE AREA.--2,513 square miles.

RECORDS AVAILABLE.--Sediment records: October 1951 to September 1952.

EXTREMES, 1951-52.--Sediment concentrations: Maximum daily, 945 ppm Jan. 27; minimum daily, 5 ppm May 18.

Sediment loads: Maximum daily, 88,800 tons Jan. 27; minimum daily, 8 tons Nov. 5.

REMARKS.--Flow affected by ice, Dec. 15-19, 26. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Suspended sediment, water year October 1951 to September 1952

Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1-----	322	38	33	356	29	28	588	14	22
2-----	351	48	45	356	22	21	562	11	17
3-----	362	34	33	356	17	a 16	542	18	26
4-----	356	26	25	367	12	a 12	743	56	112
5-----	302	28	23	351	8	8	816	41	90
6-----	257	30	21	427	21	24	1,400	54	204
7-----	284	32	25	639	37	64	3,500	369	s 5,230
8-----	275	33	24	575	24	37	8,080	750	b 16,000
9-----	262	27	19	535	13	19	9,600	435	11,300
10-----	270	31	23	516	12	17	10,700	270	7,800
11-----	275	27	20	473	8	10	7,210	127	2,470
12-----	280	27	20	461	19	24	3,940	73	777
13-----	270	23	17	529	34	49	2,780	65	488
14-----	266	21	15	677	45	82	2,000	53	286
15-----	270	20	15	1,200	44	143	1,600	27	117
16-----	275	23	17	1,070	32	92	1,400	18	a 70
17-----	280	25	19	844	35	a 80	1,200	18	58
18-----	284	25	19	727	40	79	1,300	18	63
19-----	275	26	19	646	30	52	1,300	34	119
20-----	266	27	19	588	20	32	1,260	25	85
21-----	262	27	19	548	17	25	1,790	16	77
22-----	270	40	29	542	13	19	2,930	16	127
23-----	280	27	20	743	34	68	3,460	30	280
24-----	504	67	91	903	22	54	3,080	32	266
25-----	415	32	36	1,070	11	32	2,700	34	248
26-----	378	29	30	954	13	33	5,500	170	b 3,200
27-----	372	25	25	816	12	26	7,800	157	3,310
28-----	367	25	25	735	14	28	5,360	80	1,160
29-----	351	26	25	677	17	31	3,940	55	585
30-----	341	28	26	632	16	27	7,250	76	s 1,680
31-----	346	30	28	--	--	--	13,600	227	8,340
Total--	9,668	--	805	19,313	--	1,232	117,931	--	64,607

s Computed by subdividing day.

a Computed from partly estimated concentration graph.

b Computed from estimated concentration graph.

MIAMI RIVER BASIN--Continued

MIAMI RIVER AT DAYTON, OHIO--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

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-----	13,200	143	5,100	7,280	117	2,300	2,000	10	54
2-----	10,400	102	2,860	8,920	114	2,750	1,860	9	45
3-----	8,360	72	1,830	9,200	110	2,730	1,860	9	45
4-----	6,020	48	780	16,700	240	10,800	1,930	10	52
5-----	5,150	37	514	15,100	176	7,180	2,490	12	81
6-----	4,380	30	355	10,700	104	3,000	2,210	18	107
7-----	3,620	25	244	7,280	70	1,380	1,860	20	100
8-----	3,160	20	171	5,570	67	1,010	1,720	18	84
9-----	2,930	15	119	5,260	57	810	1,660	16	72
10-----	2,780	14	105	4,850	61	799	1,920	23	s 143
11-----	2,490	15	101	4,120	66	734	12,800	580	s 21,100
12-----	2,280	12	74	3,620	53	518	21,000	441	25,000
13-----	2,140	10	58	3,230	42	366	16,300	295	13,000
14-----	2,590	17	s 128	3,000	34	275	11,700	187	5,910
15-----	5,640	185	s 3,340	2,780	30	225	7,020	147	2,790
16-----	6,260	420	b 7,100	2,560	26	180	4,660	109	1,370
17-----	7,390	261	5,210	2,560	21	145	3,780	81	827
18-----	11,400	460	b 14,000	2,420	20	131	3,230	64	558
19-----	10,400	364	10,200	2,350	20	127	4,380	68	804
20-----	9,500	286	7,340	3,750	58	s 775	5,570	116	1,740
21-----	6,760	207	3,780	8,920	260	b 6,300	4,380	90	1,060
22-----	5,050	148	2,020	5,790	134	2,110	5,200	618	s 16,900
23-----	4,660	113	1,420	3,940	46	489	17,100	700	b 30,000
24-----	3,780	110	1,120	3,160	33	282	12,500	268	9,050
25-----	3,230	112	977	2,780	23	173	7,280	144	2,830
26-----	13,900	869	s 44,000	2,490	19	128	4,950	92	1,230
27-----	34,800	945	88,800	2,350	17	108	4,030	62	675
28-----	36,600	485	47,900	2,210	12	72	3,380	47	429
29-----	21,800	298	17,500	2,140	12	69	3,080	44	366
30-----	15,100	219	8,930	--	--	--	2,780	37	278
31-----	10,700	150	4,330	--	--	--	2,630	30	213
Total--	276,470	--	280,204	155,030	--	45,966	180,260	--	136,913
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-----	3,000	34	275	2,490	14	94	1,280	31	107
2-----	2,930	33	261	2,290	15	92	1,180	29	92
3-----	2,630	23	163	2,070	17	95	1,160	37	116
4-----	2,420	30	196	1,930	18	94	1,240	41	137
5-----	4,360	131	s 1,790	1,720	18	84	1,140	41	126
6-----	6,760	210	3,830	2,420	104	s 720	1,130	35	107
7-----	5,570	95	1,430	2,280	42	259	1,010	29	79
8-----	4,750	65	834	1,860	27	136	933	33	83
9-----	3,780	52	531	1,720	18	84	893	34	82
10-----	3,300	36	339	1,660	11	49	874	29	68
11-----	2,930	26	206	1,650	11	49	825	36	80
12-----	2,780	17	128	1,560	22	93	903	37	90
13-----	6,740	177	s 4,320	1,490	22	88	913	30	74
14-----	15,900	365	15,700	1,380	23	86	976	33	87
15-----	11,400	216	6,650	1,320	24	86	1,050	30	85
16-----	7,800	104	2,190	1,300	19	67	864	32	75
17-----	5,360	75	1,090	1,460	14	55	834	34	77
18-----	4,290	62	718	1,790	5	24	779	34	72
19-----	3,620	47	459	1,790	8	39	727	37	73
20-----	3,160	34	290	1,860	11	55	694	42	79
21-----	2,780	25	188	2,700	32	s 246	677	41	75
22-----	2,560	21	145	2,930	52	411	743	40	80
23-----	2,560	18	124	2,210	33	197	727	40	79
24-----	9,760	231	s 7,270	3,300	52	463	686	41	76
25-----	10,400	204	5,730	2,780	48	360	677	40	73
26-----	7,020	129	2,440	2,700	36	262	685	40	74
27-----	5,050	96	1,310	2,490	28	188	1,860	150	b 750
28-----	3,940	56	596	2,000	27	146	997	134	361
29-----	3,300	35	312	1,720	28	130	718	72	140
30-----	2,860	21	162	1,530	27	112	639	52	90
31-----	--	--	--	1,390	26	98	--	--	--
Total--	153,710	--	59,677	61,780	--	4,962	27,814	--	3,587

s Computed by subdividing day.

b Computed from estimated concentration graph.

MIAMI RIVER BASIN--Continued

MIAMI RIVER AT DAYTON, OHIO--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

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-----	603	50	81	378	25	26	302	27	22
2-----	581	40	63	378	25	26	516	45	63
3-----	581	40	63	372	22	22	388	38	40
4-----	877	45	82	362	22	22	356	37	36
5-----	646	49	85	362	23	22	372	45	45
6-----	548	45	67	362	25	24	341	48	44
7-----	535	33	48	356	27	26	307	35	29
8-----	535	36	52	346	28	26	288	28	22
9-----	510	42	58	356	35	34	288	26	20
10-----	492	38	50	372	33	33	288	23	18
11-----	485	32	42	367	28	28	280	22	17
12-----	473	33	42	367	27	27	280	22	17
13-----	450	32	39	367	26	26	266	26	19
14-----	438	30	35	378	25	26	266	30	22
15-----	467	30	38	378	40	41	312	34	29
16-----	461	30	37	473	52	66	312	34	29
17-----	461	30	37	1,640	91	s 433	322	33	29
18-----	450	31	38	1,360	152	558	312	35	29
19-----	444	34	41	761	125	257	499	104	s 155
20-----	473	30	38	555	90	135	2,100	200	b 1,200
21-----	450	24	29	467	71	90	1,110	200	599
22-----	432	28	33	415	60	67	654	144	254
23-----	427	32	37	362	52	51	516	101	141
24-----	450	39	47	331	45	40	444	77	92
25-----	548	38	56	326	48	42	398	64	67
26-----	485	35	46	317	47	40	362	52	51
27-----	427	40	46	307	40	33	331	45	a 40
28-----	393	36	38	312	33	28	312	35	29
29-----	393	31	33	326	36	32	302	31	25
30-----	378	28	29	293	32	25	293	22	17
31-----	367	25	25	284	25	19	--	--	--
Total-	15,060	--	1,455	14,030	--	2,325	13,107	--	3,200

Total discharge for year (cfs-days) 1,044,173
 Total load for year (tons) 604,933

s Computed by subdividing day.

a Computed from partly estimated concentration graph.

b Computed from estimated concentration graph.

MIAMI RIVER BASIN--Continued

MIAMI RIVER AT DAYTON, OHIO--Continued

Particle-size analyses of suspended sediment, January to March 1952
 (Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
 W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Suspended sediment										Methods of analysis			
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Jan. 26, 1952	2:00 p.m.	20,500	1,360	955	36	51	68	81	94	98	--					BWCM
Jan. 26	2:00 p.m.	20,500	1,360	999	14	29	54	76	92	97	98					BNM
Mar. 11	7:00 p.m.	17,900	568	478	57	83	86	89	95	97	99					BWCM
Mar. 12	7:00 p.m.	18,700	459	754	69	83	91	93	96	98	99					BWCM

KENTUCKY RIVER BASIN

NORTH FORK KENTUCKY RIVER AT HAZARD, KY.

LOCATION.--At gaging station at Woodland Park bridge at eastern limits of Hazard, Perry County, 150 feet upstream from City Waterworks dam, and 4.0 miles upstream from Lots Creek.

DRAINAGE AREA.--465 square miles.

RECORDS AVAILABLE.--Chemical analyses: November 1949 to August 1950.

Water temperatures: October 1949 to September 1952.

Extremes, 1951-52.--Water temperatures: Maximum, 92°F June 20, July 23; minimum, 34°F Dec. 17.

EXTREMES, 1949-52.--Water temperatures: Maximum, 92°F June 20, July 23, 1952; minimum, 33°F Nov. 26, 1950, Feb. 3, 1951.

REMARKS.--Daily water temperatures are averages of twice-daily measurements. Data reported under extremes are the individual maximum and minimum measurements. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Temperature (°F) of water, water year October 1951 to September 1952
/Twice-daily measurements at approximately 7 a. m. and 5 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	54	41	52	41	47	56	63	71	85	86	81
2	72	50	42	54	42	44	56	65	73	84	81	80
3	75	46	44	55	46	44	56	66	72	84	81	78
4	76	45	46	50	48	48	56	66	74	84	82	70
5	78	46	47	46	47	45	53	69	77	82	81	76
6	79	46	49	44	43	44	48	70	78	82	80	78
7	73	45	52	42	42	43	48	72	80	83	80	76
8	68	45	53	45	42	42	50	71	82	84	81	78
9	85	44	53	46	43	44	54	72	82	82	80	80
10	64	44	49	44	44	46	58	70	77	79	82	80
11	64	44	46	42	46	48	56	63	76	79	82	80
12	64	46	44	43	45	46	58	58	74	80	84	78
13	87	49	42	46	46	49	60	57	72	72	84	82
14	64	54	42	51	46	49	58	59	74	84	83	82
15	60	54	44	54	46	46	54	64	78	86	84	80
18	65	52	37	53	46	42	52	68	81	86	84	80
17	71	48	36	50	44	44	55	73	84	84	84	80
18	73	44	37	50	42	45	56	73	87	86	85	75
19	72	41	38	46	42	46	62	72	86	86	85	74
20	72	36	40	47	44	50	63	69	86	87	84	72
21	65	39	45	46	44	53	66	66	82	88	84	70
22	63	40	42	46	42	54	68	67	81	88	80	70
23	72	44	39	45	42	52	67	69	78	90	76	71
24	72	--	40	40	43	48	65	70	78	89	74	71
25	72	--	42	41	45	46	63	72	82	88	74	70
26	69	--	42	46	44	50	58	70	85	85	73	71
27	62	--	42	52	45	50	54	71	88	86	74	72
28	64	--	39	50	46	50	55	73	86	86	77	70
29	59	--	40	42	48	50	59	70	88	86	76	71
30	63	--	44	39	--	52	60	64	88	86	79	72
31	64	--	50	38	--	54	--	68	--	88	80	--
Average	68	--	43	47	44	47	57	68	80	84	81	76

KENTUCKY RIVER BASIN--Continued
KENTUCKY RIVER AT LOCK 4, AT FRANKFORT, KY.

LOCATION.--At gaging station at combination Broadway Street Highway and Louisville & Nashville Railroad Bridge at Frankfort, Franklin County, 300 feet upstream from Benson Creek, and 0.9 mile upstream from lock 4. Records include flow of Benson Creek.

DRAINAGE AREA.--5,430 square miles. Includes that of Benson Creek.

RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1952.

Water temperatures: October 1949 to September 1952.

EXTREMES, 1951-52.--Dissolved solids: Maximum, 177 ppm Nov. 1-10; minimum, 76 ppm May 1-10.

Hardness: Maximum, 108 ppm Oct. 21-31, Nov. 1-10; minimum, 44 ppm May 1-10.

Specific conductance: Maximum daily, 372 microhos Nov. 9; minimum daily, 84.1 microhos May 24.

Water temperatures: Maximum, 85°F on many days in June and July; minimum, 43°F Feb. 22, 23.

EXTREMES, 1949-52.--Dissolved solids: Maximum, 224 ppm Nov. 21-30, 1949; minimum, 44 ppm May 1-10, 1952.

Hardness: Maximum, 121 ppm Nov. 21-30, 1949; minimum, 44 ppm May 1-10, 1952.

Specific conductance: Maximum daily, 443 microhos Nov. 29, 1949; minimum daily, 79.8 microhos Feb. 4, 1951.

Water temperatures: Maximum, 85°F July 29, Aug. 1, 2, 4, 1951, and on many days in June and July, 1952; minimum, 34°F Feb. 8, 1951.

REMARKS.--Daily water temperatures reported in temperature table are averages of twice-daily measurements from October 1951 through March 1952. The data reported under extremes are the individual maximum and minimum measurements. Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1951 to September 1952 are given in Water-Supply Paper 1235.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)		Hardness as CaCO ₃		Specific conductance (microhos at 25°C)	pH	Color
															Calcium	Non-carbonate			
Oct. 1-10, 1951	541	5.1	0.02	30	7.8	10	2.7	98	29	12	0.1	1.5	146	106	106	27	263	8.0	5
Oct. 11-30	298	11	.03	30	8.3	11	2.5	106	30	12	.2	1.6	161	108	108	22	268	7.2	2
Nov. 1-10	4,327	6.2	.05	30	8.3	16	3.1	90	37	25	.2	1.3	177	108	108	35	302	7.7	2
Nov. 11-20	10,020	11	.06	24	8.3	14	2.8	78	31	24	.2	3.0	197	94	94	32	268	7.8	5
Nov. 21-30	16,360	10	.22	25	5.8	5.7	1.7	66	19	12	.1	3.4	112	80	25	173	7.7	5	
Dec. 1-10	17,620	7.5	.11	25	4.9	3.6	1.7	80	16	3.5	.1	3.7	118	82	17	164	7.3	10	
Dec. 11-20	20,550	6.3	.08	16	4.4	3.5	1.7	54	17	3.0	.1	3.4	86	58	14	138	7.4	6	
Dec. 21-31	27,400	5.8	.06	22	5.3	3.9	1.8	74	17	3.5	.1	3.1	111	76	16	173	7.1	10	
Jan. 1-10, 1952	21,080	8.7	.16	11	4.3	4.2	1.4	58	21	4.5	.1	3.5	103	96	16	198	7.2	4	
Jan. 11-20	13,990	7.8	.20	21	5.6	4.0	1.4	72	23	4.0	.1	3.1	91	76	16	176	7.2	4	
Jan. 21-31	30,580	7.6	.12	18	3.9	3.0	1.4	55	19	3.2	.1	3.1	81	61	16	141	7.2	6	
Feb. 1-10	17,770	7.4	.11	23	5.1	3.5	1.2	77	19	3.4	.0	2.5	105	78	15	180	7.3	7	
Feb. 11-20	11,170	13	.11	21	5.1	5.1	1.2	69	22	3.6	.1	2.0	114	74	17	182	7.5	7	
Feb. 21-29	7,121	6.3	.08	21	4.9	3.8	1.2	66	26	3.8	.0	1.9	101	73	18	174	7.3	6	
Mar. 1-10	12,550	22	.03	22	5.3	6.7	1.0	75	20	5.2	.1	3.5	124	77	15	183	7.2	6	
Mar. 11-20	17,380	10	.02	25	6.3	6.7	1.8	75	28	6.5	.1	2.6	129	80	27	208	7.2	4	
Mar. 21-25	51,530	13	.09	17	3.9	6.9	1.0	57	17	3.5	.1	3.2	100	61	12	139	7.0	8	
Mar. 26-31	34,420	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 1-16	6,343	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 17-20	4,765	9.2	.03	22	6.8	7.8	1.5	66	33	7.0	.0	2.4	130	84	29	198	7.0	6	

Apr. 21-20	7,951	9.1	.03	20	5.6	6.8	1.7	61	29	7.0	.1	2.2	113	74	23	183	7.0	3
May 1-10	5,754	8.2	.07	11	2.4	4.3	1.5	24	22	3.8	.1	1.6	16	44	16	152	6.9	2
May 11-20	6,134	10	.02	16	3.4	5.3	1.5	47	25	6.0	.0	1.4	94	57	20	153	7.2	6
May 21-31	11,570	8.9	.09	15	3.6	5.8	1.4	41	17	11	.1	1.3	80	53	19	128	7.2	10
June 1-10	3,653	11	.06	15	4.6	5.2	1.7	49	21	5.8	.1	1.7	91	58	16	149	7.2	5
June 11-20	1,843	13	.04	17	4.9	6.5	1.6	59	21	6.8	.1	1.2	102	63	16	187	7.3	6
June 21-30	5,265	17	.02	19	5.3	7.8	1.3	65	24	7.5	.1	1.6	119	70	16	183	7.2	7
July 1-10	1,011	12	.01	23	7.3	10	1.4	63	43	10	.1	1.7	148	87	36	234	6.9	5
July 11-20	1,849	10	.01	21	7.0	11	1.6	67	32	12	.1	1.4	134	82	26	218	7.0	7
July 21-31	445	11	.01	20	5.6	4.5	1.0	67	19	6.2	.1	1.6	111	72	18	174	7.2	8
Aug. 1-10	905	10	.04	20	4.6	4.7	1.7	71	15	5.0	.1	3.7	105	68	11	175	6.8	4
Aug. 11-20	899	8.2	.03	24	4.6	3.2	2.0	81	15	3.5	.2	4.2	110	78	12	186	7.0	3
Aug. 21-31	632	14	.03	24	5.6	5.3	1.9	92	16	4.0	.1	2.8	128	83	8	204	7.2	4
Sept. 1-10	831	9.7	.02	25	5.1	5.5	2.2	87	18	5.2	.1	3.0	123	83	12	206	7.2	5
Sept. 11-20	375	7.4	.02	27	5.6	5.8	2.0	91	20	6.2	.1	2.3	128	90	16	223	7.2	5
Sept. 21-30	299	7.9	.03	27	6.1	6.2	2.3	93	23	7.0	.1	1.5	132	92	16	225	7.5	5
Average	9,423	9.9	0.06	22	5.6	6.4	1.6	70	23	7.3	0.1	2.4	117	78	21	190	--	6

KENTUCKY RIVER BASIN--Continued

KENTUCKY RIVER AT LOCK 4, AT FRANKFORT, KY.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	60	47	46	45	44	--	65	70	85	83	80
2	--	58	47	46	45	45	--	65	70	85	84	79
3	--	58	47	46	45	44	--	65	72	85	84	78
4	--	--	48	46	45	44	--	65	72	85	84	78
5	--	--	48	46	45	44	--	66	73	85	84	78
6	--	50	48	46	45	44	--	68	75	85	83	78
7	--	50	49	46	45	44	--	67	76	85	84	78
8	--	50	49	46	45	44	--	67	77	85	84	78
9	--	50	50	46	45	44	--	69	78	84	84	78
10	--	50	50	46	45	44	--	66	77	84	83	78
11	84	51	50	47	45	47	--	66	78	84	81	78
12	84	51	50	47	45	46	--	65	78	84	80	78
13	84	51	50	47	45	46	--	66	78	84	80	78
14	84	52	49	47	45	46	--	67	78	85	82	78
15	84	51	49	47	45	46	--	70	78	84	81	77
16	65	50	49	47	45	46	--	69	80	84	82	77
17	66	50	50	47	45	46	56	70	81	85	82	75
18	66	48	49	46	44	46	55	69	81	85	81	75
19	64	47	48	46	44	46	59	69	81	85	82	74
20	84	46	48	47	44	46	59	68	82	85	82	74
21	65	46	48	47	44	48	60	69	82	85	81	74
22	66	47	48	47	43	49	61	67	81	85	81	74
23	66	47	48	46	44	49	61	69	81	85	80	73
24	64	47	48	46	44	49	61	66	80	85	81	72
25	64	47	48	46	44	51	60	66	82	85	80	72
26	63	47	48	46	44	--	60	67	82	85	80	72
27	64	47	48	46	44	--	60	68	84	85	79	72
28	63	47	48	46	44	--	63	68	85	85	80	72
29	62	47	48	45	45	--	65	69	85	83	80	72
30	62	47	47	45	--	--	68	68	85	82	80	72
31	61	--	47	45	--	--	--	70	--	84	80	--
Average	--	50	48	46	45	46	--	67	79	85	82	76

KENTUCKY RIVER BASIN--Continued

EAGLE CREEK AT GLENCOE, KY.

LOCATION.--At gaging station at bridge on State Highway 16 at Gallatin-Owen County line, half a mile south of Glencoe, Gallatin County, 5.9 miles downstream from Tenmile Creek, and 22 miles upstream from mouth.

DRAINAGE AREA.--438 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1952.

EXTREMES, 1951-52.--Water temperatures: Maximum, 90°F Aug. 2, 3; minimum, freezing point Dec. 16, 19, 21, 22.

EXTREMES, 1949-52.--Water temperatures: Maximum, 90°F July 17, Aug. 2, Sept. 1, 1951, Aug. 2, 3, 1952; minimum, freezing point at times during winter months.

REMARKS.--Daily water temperatures are averages of twice-daily measurements. Data reported under extremes are the individual maximum and minimum measurements. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Temperature (°F) of water, water year October 1951 to September 1952

/Twice-daily measurements at approximately 8 a. m. and 6 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	48	41	48	40	40	59	68	70	84	80	80
2	68	46	40	46	42	38	55	68	70	84	83	74
3	68	39	40	44	44	41	54	68	74	84	85	66
4	70	38	47	40	44	41	50	70	74	83	82	66
5	70	39	44	38	44	--	49	70	74	82	84	68
6	68	40	46	38	44	38	46	78	76	84	82	68
7	48	38	53	36	43	38	44	72	83	85	82	68
8	60	40	52	36	40	46	51	72	82	82	83	70
9	56	40	48	38	41	42	53	69	82	76	79	71
10	58	44	45	36	41	43	54	64	79	74	78	73
11	54	--	43	36	42	48	52	62	78	74	78	72
12	55	--	38	37	40	48	54	62	72	74	76	74
13	57	--	36	40	40	48	56	62	71	79	76	74
14	56	--	36	44	40	48	53	60	74	79	78	72
15	60	--	34	50	40	44	50	68	76	76	76	74
16	60	--	32	46	38	42	49	66	83	79	76	68
17	62	--	34	49	40	42	52	66	80	79	80	70
18	62	--	33	46	37	44	58	62	78	80	76	70
19	56	--	34	46	38	44	61	62	80	82	78	68
20	55	--	41	46	41	46	60	61	81	85	76	66
21	57	--	32	40	40	54	62	62	80	86	78	66
22	66	--	35	42	40	52	65	66	80	84	76	66
23	54	--	42	34	40	52	68	69	83	86	70	62
24	56	--	44	36	40	50	61	72	82	82	75	66
25	56	--	46	40	41	49	60	69	84	82	74	70
26	55	--	36	43	42	50	56	70	84	82	75	64
27	56	--	33	48	42	48	58	74	84	82	75	66
28	54	40	34	44	42	47	60	72	86	85	74	66
29	49	40	38	34	42	50	68	69	87	82	78	69
30	54	40	40	34	--	56	68	69	87	80	80	67
31	52	--	46	35	--	56	--	76	--	78	80	--
Average	59	--	40	41	41	46	56	68	79	81	78	69

SALT RIVER BASIN

ROLLING FORK NEAR BOSTON, KY.

LOCATION--At gaging station at bridge on U. S. Highway 62 and State Highway 61, three-eighths of a mile downstream from Beech Fork, and 2½ miles southwest of Boston, Nelson County.

DRAINAGE AREA--1,290 square miles, approximately.

RECORDS AVAILABLE--Chemical analyses: October 1950 to September 1952.

Water temperatures: October 1949 to September 1952.

EXTREMES, 1951-52.--Water temperatures: Maximum, 87°F several days in July and September; minimum, freezing point Nov. 4, Dec. 15, 17, 19, 22.

EXTREMES, 1949-52.--Water temperatures: Maximum, 88°F Sept. 2, 1951; minimum, freezing point on several days in February, November, and December 1951.

REMARKS--Daily water temperatures reported in temperature table are averages of twice-daily measurements. The data reported under extremes are the individual maximum and minimum measurements. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg./residue	Non-carbonate			
Oct. 24, 1951.....	278	3.9	0.02	34	9.2	3.3	5.3	134	19	3.8	0.2	1.7	153	124	13	256	7.8	15
Nov. 29	4,820	6.3	.26	28	8.3	5.2	2.2	104	23	5.8	.0	4.9	145	104	19	234	7.3	27
Jan. 7, 1952	8,000	6.9	.18	28	6.3	3.4	1.2	100	18	2.0	.1	3.7	128	96	14	206	7.5	11
Feb. 7	4,650	6.1	.07	33	7.8	2.6	.8	120	19	1.6	.1	4.2	133	115	16	234	7.4	8
Mar. 13	18,400	4.9	.09	21	4.4	2.3	.7	71	13	1.0	.0	3.6	94	71	12	149	7.2	17
Apr. 17	1,160	6.2	.05	45	12	3.8	2.4	160	33	2.8	.1	1.2	194	161	31	317	7.5	5
May 21	304	7.1	.03	46	13	5.0	2.3	175	31	4.0	.1	2.1	202	170	25	347	7.3	7
June 25	626	4.1	.01	38	6.1	2.6	2.3	112	23	3.4	.1	5.2	160	119	28	253	7.0	18
July 28	30	3.9	.02	43	9.0	5.2	2.3	171	15	3.8	.1	1.7	179	145	4	302	6.9	8
Sept. 4	24	5.6	.04	41	8.3	3.6	3.1	154	14	3.0	.2	2.1	161	136	10	286	7.1	5

SALT RIVER BASIN--Continued

ROLLING FORK NEAR BOSTON, KY.--Continued

Temperature (°F) of water, water year October 1951 to September 1952
 (Twice-daily measurements at approximately 8:00 a.m. and 4:30 p.m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	52	43	54	40	40	53	66	75	86	86	79
2	65	47	44	48	39	44	54	68	74	86	77	77
3	68	38	45	46	40	43	54	68	72	64	82	68
4	68	33	43	46	41	40	52	70	75	85	79	66
5	64	36	46	48	39	42	50	74	76	86	80	65
6	64	37	50	46	38	42	50	74	76	86	77	66
7	64	42	50	42	40	41	52	74	76	86	78	66
8	63	42	50	43	42	40	54	72	80	84	79	70
9	58	43	49	49	40	42	54	73	81	82	80	70
10	56	42	44	40	44	44	54	69	81	64	81	71
11	56	44	43	37	45	46	54	65	82	82	80	72
12	56	44	43	39	44	46	56	64	83	84	78	72
13	56	48	41	42	46	50	56	62	82	79	80	72
14	56	50	39	48	44	50	54	65	83	86	80	70
15	55	50	34	49	44	50	55	64	82	86	82	75
16	55	44	30	48	42	46	54	68	80	85	82	71
17	55	47	32	49	39	51	56	70	82	86	81	70
18	57	44	36	46	42	51	56	68	82	81	82	73
19	58	44	32	48	41	51	57	70	82	82	81	68
20	56	42	37	46	42	50	56	70	82	83	82	70
21	56	40	35	40	40	52	58	69	83	83	82	70
22	60	43	33	41	39	52	65	72	82	84	78	68
23	60	44	38	39	40	48	66	70	80	83	79	64
24	58	44	36	38	44	49	65	70	82	82	76	62
25	58	40	37	41	40	51	64	70	82	83	74	60
26	59	40	36	40	44	50	61	70	83	80	74	64
27	59	43	34	38	40	50	62	70	83	85	77	64
28	55	41	36	40	40	52	62	70	84	88	77	64
29	56	43	40	37	40	52	64	71	84	85	77	82
30	58	40	46	36	--	53	64	72	86	83	78	66
31	56	--	47	38	--	54	--	70	--	84	80	--
Average	59	43	40	43	41	47	56	69	81	84	79	70

SALT RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN SALT RIVER BASIN IN KENTUCKY

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Tem- perature (° F)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- nesium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO ₃		Specific conduct- ance (micro- mhos at 25°C)	pH	Color
															Calcium	Non- carbon- ate			
FLOYDS FORK AT FISHERVILLE																			
June 11, 1952	0.9		3.7	0.03	56	19	5.2	0.8	232	33	5.5	0.1	1.5	246	218	28	425	7.1	6
July 24	0		6.8	.04	43	5.3	1.6	3.5	136	21	2.8	.2	3.4	163	130	18	274	7.0	8
Sept. 26	0		2.1	.02	54	8.5	3.2	4.2	165	39	4.2	.2	2.0	208	171	34	357	7.4	6

GREEN RIVER BASIN

GREEN RIVER AT GREENSBURG, KY.

LOCATION.--At gaging station at bridge on State Highways 61 and 70, 300 feet upstream from Clover Lick Creek, a quarter of a mile south of Greensburg, Green County, and 2.6 miles upstream from Russell Creek.

DRAINAGE AREA.--742 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1952.

EXTREMES, 1951-52.--Water temperatures: Maximum, 89°F July 1, 2, 23, Aug. 4; minimum, freezing point Dec. 18.

EXTREMES, 1949-52.--Water temperatures: Maximum, 89°F July 1, 2, 23, Aug. 4, 1952; minimum, freezing point Dec. 18, 1951.

REMARKS.--Daily water temperatures are averages of twice-daily measurements. Data reported under extremes are the individual maximum and minimum measurements. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Temperature (°F) of water, water year October 1951 to September 1952

Twice-daily measurements at approximately 7 a. m. and 5 p. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	85	58	38	55	44	44	59	68	73	87	83	76
2	85	56	42	54	44	44	57	70	70	87	84	74
3	84	52	42	50	44	46	55	69	72	86	84	74
4	85	43	42	48	48	48	58	72	72	80	84	72
5	84	42	48	44	44	42	51	72	77	80	84	74
6	84	44	54	42	45	44	50	70	79	82	84	80
7	82	44	52	42	44	46	50	71	79	82	84	75
8	82	44	51	42	44	46	50	73	81	80	78	74
9	82	44	49	46	44	46	56	72	80	77	84	74
10	81	44	48	48	44	48	58	66	80	81	84	73
11	81	47	50	48	44	48	56	56	80	80	82	78
12	81	48	50	49	44	50	58	58	80	80	82	76
13	80	54	48	51	44	52	60	60	80	80	80	76
14	56	52	48	52	44	51	55	62	72	83	82	76
15	57	51	43	54	46	50	52	65	80	82	80	76
16	58	51	38	56	43	54	50	70	84	84	81	76
17	58	50	36	54	42	53	54	72	83	84	82	73
18	59	44	34	50	41	52	57	68	83	86	83	77
19	58	44	36	50	42	54	59	70	80	85	81	77
20	59	45	37	47	44	54	63	69	82	86	80	76
21	59	42	38	45	44	54	65	66	80	85	79	74
22	60	43	38	45	43	52	66	67	80	86	79	74
23	59	45	38	43	44	52	67	67	83	86	78	74
24	59	47	40	44	44	52	65	64	84	86	78	75
25	58	48	44	48	44	50	62	66	85	83	76	74
26	60	49	46	48	44	52	62	70	86	84	79	72
27	60	48	48	48	44	54	62	70	85	83	74	74
28	58	44	47	49	47	53	62	71	86	84	76	74
29	58	42	46	46	46	55	64	70	86	84	75	76
30	58	41	49	46	--	56	65	69	86	84	75	74
31	57	--	49	48	--	57	--	72	--	83	75	--
Average	60	47	44	48	44	50	56	68	80	83	80	75

GREEN RIVER BASIN--Continued

GREEN RIVER AT MUMFORDVILLE, KY.

LOCATION.--At gaging station at bridge on U.S. Highway 31-W at Mumfordsville, Hart County.

DRAINAGE AREA.--1790 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1952.

Water temperatures: October 1950 to September 1952.

Water samples: April 1951 to September 1952.

EXTREMES, 1950-52.--Dissolved solids: Maximum, 181 ppm Sept. 11-20; minimum, 89 ppm Mar. 21-31.

Hardness: Maximum, 146 ppm Sept. 11-20; minimum, 67 ppm Mar. 21-31.

Specific conductance: Maximum, 209 microhos Aug. 20; minimum daily, 58.9 microhos Mar. 25.

Water temperature: Maximum, 80°F, 31° minimum, 39°F Dec. 19-20.

Sediment concentrations: Maximum daily, 3.180; minimum daily, 5 ppm Oct. 18, 19, 21.

Sediment loads: Maximum daily, 153,000; minimum daily, 3 tons Oct. 18, 19, 21.

EXTREMES, 1950-52.--Dissolved solids: Maximum, 181 ppm Sept. 11-20, 1952; minimum, 86 ppm Feb. 1-10, 1951.

Hardness: Maximum, 146 ppm Sept. 11-20, 1952; minimum, 67 ppm Mar. 21-31, 1952.

Specific conductance: Maximum daily, 341 microhos Aug. 20, 1952; minimum daily, 58.9 microhos Mar. 25, 1952.

Water temperatures: Maximum, 80°F June 28, 29, 1952; minimum, 34°F Dec. 19, 1950; Feb. 3-5, 9, 1951.

REMARKS.--Records of specific conductance of daily samples for October 1950 to September 1952 available in district office at Columbus, Ohio. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (microhos at 25°C)	pH	Color
														Calcium	Non-magnesium			
Oct. 1-10, 1951.....	483	10	0.20	37	5.8	3.8	1.4	128	13	3.9	0.0	2.0	135	116	6	240	8.1	3
Oct. 11-20.....	247	16	.04	40	8.0	5.6	1.8	157	13	5.1	.0	1.2	164	132	4	279	8.2	3
Oct. 21-31.....	364	13	.05	42	6.8	5.6	1.4	150	16	5.8	.0	.8	139	132	10	280	8.2	3
Nov. 1-10.....	3,334	12	.02	26	7.8	4.6	2.3	110	14	3.5	.2	1.5	130	96	7	219	7.4	8
Nov. 11-20.....	7,568	10	.01	24	6.3	4.0	2.1	98	12	3.2	.2	3.0	114	86	6	190	7.4	8
Nov. 21-30.....	11,770	11	.02	25	5.8	3.3	1.7	96	11	3.0	.2	2.9	113	86	8	185	7.4	6
Dec. 1-10.....	10,100	13	.01	28	4.9	4.0	1.7	96	9.2	2.0	.2	2.9	114	84	6	183	7.4	4
Dec. 11-20.....	13,690	9.0	.05	22	4.9	2.8	1.4	80	8.9	2.5	.2	2.7	98	74	10	137	7.1	6
Dec. 21-31.....	9,933	7.4	.01	22	4.4	1.8	.5	81	8.6	1.8	.1	3.2	91	74	10	163	7.1	8
Jan. 1-10, 1952.....	6,169	8.5	.04	28	4.6	2.6	1.1	96	9.9	2.0	.0	3.4	110	89	10	163	7.3	2
Jan. 11-20.....	3,360	8.9	.02	29	5.1	2.5	.9	101	12	1.9	.0	2.9	115	84	11	182	7.4	2
Jan. 21-31.....	12,990	7.1	.01	22	4.1	3.1	.6	79	9.9	2.1	.0	3.1	95	74	8	151	7.4	2
Feb. 1-10.....	5,403	7.4	.08	26	4.9	2.5	.8	97	9.2	2.2	.1	2.1	105	84	8	181	7.4	3
Feb. 11-20.....	5,564	6.0	.04	26	4.9	2.4	.7	96	10	2.2	.0	2.6	105	86	6	184	7.3	2
Feb. 21-28.....	2,577	6.2	.04	29	4.9	2.6	.9	102	12	3.5	.0	2.9	113	92	9	210	7.5	1
Mar. 1-10.....	3,767	7.9	.04	26	5.6	2.3	.4	96	11	2.2	.0	2.4	108	88	9	182	7.5	1
Mar. 11-20.....	16,400	8.6	.03	24	4.1	2.3	.6	86	9.2	1.8	.0	2.7	91	77	6	183	7.2	3
Mar. 21-31.....	21,200	8.3	.02	21	3.6	2.4	1.0	78	7.7	1.8	.0	2.9	89	67	3	146	7.3	4

Apr. 1-10.....	1,970	10	8.5	.05	30	5.5	3.4	.4	108	14	2.8	.0	2.8	126	98	9	205	7.5	2
Apr. 11-20.....	1,984	13	8.5	.04	30	5.7	2.9	.4	108	14	3.6	.0	1.5	127	98	12	204	7.6	2
Apr. 21-30.....	1,989	13	8.5	.04	31	5.7	2.6	.4	108	16	3.3	.0	1.1	135	100	12	214	7.6	4
May 1-10.....	1,989	13	8.5	.04	33	5.5	2.7	.5	116	14	4.5	.1	1.0	134	106	10	227	7.7	8
May 11-20.....	1,985	14	8.5	.04	28	5.4	2.7	.7	98	14	3.5	.1	2.0	118	93	12	186	7.7	8
May 21-31.....	1,957	14	8.6	.04	29	5.3	3.0	.7	100	13	3.2	.1	1.5	120	94	12	186	7.6	5
June 1-10.....	527	8.9		.02	34	6.3	3.9	.8	125	13	4.5	.1	1.7	138	110	8	241	7.5	5
June 11-20.....	539	7.6		.03	34	5.8	3.7	1.5	117	13	4.6	.1	3.1	137	108	13	232	7.5	5
June 21-30.....	471	9.5		.03	37	5.6	4.8	1.5	126	10	5.3	.1	2.0	146	115	12	250	7.7	5
July 1-10.....	422	15		.03	36	7.0	4.1	1.4	136	11	5.0	.1	3.5	153	120	7	257	7.9	8
July 11-20.....	444	14		.03	38	6.1	5.1	1.5	128	12	4.8	.1	3.0	154	115	12	248	7.6	7
July 21-31.....	183	13		.01	41	7.0	5.1	.9	145	11	6.8	.1	2.6	168	132	12	280	7.5	5
Aug. 1-10.....	183	18		.02	43	7.0	5.7	1.0	164	8.2	5.8	.1	2.0	177	137	2	294	7.7	5
Aug. 11-20.....	280	11		.02	40	6.1	4.9	1.3	142	9.1	8.2	.1	2.6	159	124	9	271	7.6	3
Aug. 21-31.....	211	11		.02	37	5.8	5.4	1.6	131	10	7.5	.1	3.0	153	116	9	253	7.7	7
Sept. 1-10.....	126	10		.02	44	6.6	4.6	1.0	158	8.9	7.2	.1	2.5	166	136	8	268	7.7	5
Sept. 11-20.....	128	11		.01	44	8.7	5.5	1.0	167	11	8.5	.1	2.4	181	146	9	317	7.7	2
Sept. 21-30.....	144	12		.01	44	7.5	5.9	1.4	162	12	8.0	.1	2.0	178	141	8	310	7.9	3
Average.....	3,910	10		0.03	32	5.8	3.8	1.1	116	11	4.1	0.1	2.3	131	104	9	221	--	4

OHIO RIVER BASIN

GREEN RIVER BASIN--Continued

GREEN RIVER AT MUNFORDVILLE, KY.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

/Once-daily measurement at approximately 7 a. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	61	52	46	48	41	45	55	62	68	79	73	70
2	62	49	45	50	45	45	55	63	68	78	73	70
3	--	45	45	50	47	45	56	64	68	77	74	67
4	60	45	48	48	48	46	55	65	70	76	75	60
5	67	43	50	47	48	45	53	65	70	75	75	60
6	67	43	50	45	47	43	50	66	71	76	74	60
7	68	42	52	45	45	--	48	67	73	76	73	61
8	63	42	53	43	45	43	49	67	74	77	73	62
9	58	41	53	44	44	43	52	68	75	75	74	67
10	56	42	51	44	43	45	54	69	74	72	73	68
11	55	43	49	43	45	48	48	65	73	71	74	62
12	--	44	47	43	44	49	49	62	73	72	73	68
13	55	47	46	44	45	49	56	60	74	73	74	69
14	55	49	45	46	45	--	55	58	70	74	74	69
15	55	54	44	49	45	48	53	61	70	75	74	68
16	55	52	41	49	45	47	51	67	72	74	75	65
17	56	50	40	50	43	46	52	65	74	73	75	64
18	57	47	40	50	42	47	52	66	75	75	75	66
19	58	43	39	49	42	48	54	65	75	75	75	65
20	65	40	39	49	44	49	52	65	75	78	75	65
21	57	40	42	48	45	50	59	64	75	78	75	65
22	58	40	42	47	44	54	60	64	73	78	74	64
23	58	44	40	45	44	53	64	65	74	77	72	63
24	58	43	40	45	44	53	63	67	75	76	70	61
25	55	46	41	44	44	52	62	66	77	73	69	61
26	55	46	43	45	44	51	60	66	79	73	70	61
27	56	48	42	48	44	50	60	61	79	74	69	61
28	57	47	41	50	45	49	59	67	80	74	69	62
29	55	45	42	47	45	50	60	67	80	75	69	63
30	55	43	44	47	--	51	61	66	79	75	70	63
31	56	--	43	42	--	53	--	66	--	72	70	--
Average	58	45	45	47	45	48	55	65	74	75	73	64

GREEN RIVER BASIN--Continued

GREEN RIVER AT MUNFORDVILLE, KY.--Continued

Suspended sediment, water year October 1951 to September 1952

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-----	764	40	83	1,710	100	a 1,000	3,500	44	416
2-----	608	33	54	4,310	325	3,780	2,840	31	238
3-----	524	26	37	4,210	198	2,250	2,400	19	123
4-----	446	21	25	2,870	97	752	4,160	800	c 10,000
5-----	392	17	18	1,820	31	152	9,820	608	16,100
6-----	368	15	15	1,400	46	174	9,420	175	4,450
7-----	338	13	12	2,740	70	b 600	8,180	130	2,870
8-----	309	12	10	4,700	230	a 2,900	12,700	400	c 15,000
9-----	298	10	8	5,820	214	3,360	21,900	344	20,300
10-----	287	8	6	3,760	78	792	26,100	162	11,400
11-----	276	7	5	2,130	37	213	26,000	83	5,830
12-----	276	7	5	1,570	22	93	20,200	41	2,240
13-----	276	7	5	1,300	21	74	9,430	46	1,170
14-----	260	6	6	6,050	797	s 15,500	5,010	106	s 1,410
15-----	255	7	5	12,500	482	16,300	12,700	430	s 15,200
16-----	240	6	4	13,400	348	12,600	17,900	219	10,800
17-----	235	6	4	14,700	218	8,650	18,400	172	8,540
18-----	220	5	3	12,500	93	3,140	14,700	58	s 2,400
19-----	220	5	3	7,890	71	1,510	6,610	45	803
20-----	215	8	5	3,650	58	572	5,930	63	s 1,070
21-----	210	5	3	2,810	58	409	13,000	287	10,100
22-----	206	7	4	2,080	61	343	15,700	166	7,040
23-----	215	6	3	1,890	66	337	15,500	154	6,440
24-----	230	6	4	7,880	370	c 13,000	10,900	126	3,710
25-----	265	7	5	16,600	375	16,800	5,540	41	613
26-----	518	12	17	20,600	234	13,000	10,100	387	s 11,100
27-----	560	11	17	23,400	165	10,400	12,000	168	5,440
28-----	560	12	18	22,100	72	4,300	11,000	71	2,110
29-----	464	12	15	14,800	40	1,600	6,940	58	1,090
30-----	398	11	12	5,700	54	831	4,740	26	330
31-----	360	10	10	--	--	--	3,840	20	207
Total--	10,813	--	421	226,660	--	135,432	347,160	--	178,340
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-----	3,250	18	158	6,230	38	639	1,840	60	b 300
2-----	3,190	68	586	4,220	29	330	2,330	90	b 550
3-----	4,690	65	823	3,760	33	335	2,740	43	318
4-----	6,760	90	1,640	5,370	65	942	5,350	194	s 3,070
5-----	9,900	118	3,150	7,880	92	1,960	6,600	178	3,270
6-----	10,500	77	2,180	8,000	65	1,400	5,910	77	1,230
7-----	9,120	60	1,480	6,820	45	804	3,990	30	323
8-----	6,150	29	482	4,850	29	380	3,170	16	124
9-----	4,420	22	263	3,860	23	240	2,710	17	124
10-----	3,710	20	200	3,240	19	166	2,830	490	a 4,600
11-----	3,560	35	338	2,820	18	137	12,100	1,100	s 34,200
12-----	3,300	24	214	2,480	18	121	18,400	358	17,800
13-----	2,900	21	164	2,240	22	133	19,400	258	13,500
14-----	2,630	20	142	2,330	30	189	16,200	95	4,160
15-----	2,450	21	139	3,010	47	382	7,510	58	1,180
16-----	2,300	24	149	3,170	60	514	4,060	43	471
17-----	2,230	21	126	4,400	50	594	3,270	32	283
18-----	2,990	57	460	5,770	82	1,280	2,840	30	230
19-----	4,460	120	1,450	5,310	54	774	2,980	28	225
20-----	6,760	187	3,410	4,110	35	388	3,420	32	295
21-----	8,160	238	5,200	3,770	27	275	3,660	40	395
22-----	10,200	231	6,360	3,470	24	225	10,600	960	s 30,100
23-----	14,000	283	10,700	3,050	26	214	33,200	1,730	s 159,000
24-----	14,100	196	7,460	2,710	24	176	52,000	1,090	153,000
25-----	11,000	92	2,730	2,450	19	126	53,900	728	106,000
26-----	6,320	40	683	2,210	13	78	40,300	348	34,300
27-----	7,620	500	c 13,000	1,990	19	102	21,700	90	5,270
28-----	16,300	518	s 21,600	1,830	14	69	7,820	160	3,380
29-----	20,000	238	12,900	1,710	9	42	3,950	99	1,060
30-----	20,600	173	9,620	--	--	--	3,240	72	630
31-----	14,600	44	1,730	--	--	--	2,790	55	414
Total--	238,190	--	109,535	112,860	--	13,015	361,010	--	573,802

s Computed by subdividing day.

a Computed from water-sediment discharge curve.

c Computed partly from water-sediment discharge curve.

GREEN RIVER BASIN--Continued

GREEN RIVER AT MUNFORDVILLE, KY.--Continued

Suspended sediment, water year October 1951 to September 1952--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-----	2,550	42	289	1,280	9	31	770	20	42
2-----	2,350	37	235	1,110	8	24	668	17	31
3-----	2,110	32	182	1,000	7	19	584	12	19
4-----	1,890	28	143	902	6	15	530	17	24
5-----	1,800	25	122	824	7	16	602	17	28
6-----	1,890	22	112	764	11	23	524	12	17
7-----	2,070	21	117	710	7	13	452	10	12
8-----	1,870	20	101	658	8	14	410	10	11
9-----	1,660	18	81	614	11	18	374	9	9
10-----	1,510	17	69	746	110	s 240	356	9	9
11-----	1,400	14	53	2,390	244	1,570	338	10	9
12-----	1,320	12	43	3,050	279	2,300	320	10	9
13-----	1,420	65	b 250	2,550	188	1,290	857	240	s 1,310
14-----	2,580	94	655	1,570	62	263	3,330	3,180	s 34,800
15-----	2,760	65	484	1,190	39	125	1,130	970	2,980
16-----	2,730	35	258	980	28	74	746	400	606
17-----	2,180	24	141	830	22	49	620	138	231
18-----	1,850	21	105	746	17	34	572	77	119
19-----	1,630	17	75	878	21	50	542	54	79
20-----	1,470	14	56	1,300	28	98	434	37	43
21-----	1,350	8	29	1,890	58	296	458	38	47
22-----	1,250	10	34	2,930	121	957	650	80	b 140
23-----	1,170	12	38	2,730	110	811	674	150	273
24-----	1,130	7	21	1,610	57	248	614	130	216
25-----	1,160	6	19	1,210	41	134	560	89	135
26-----	1,440	7	27	1,000	27	73	458	56	69
27-----	2,210	19	113	860	22	51	392	42	44
28-----	2,320	22	138	758	21	43	338	33	30
29-----	1,840	15	75	692	17	32	298	25	20
30-----	1,500	16	65	632	15	26	265	21	15
31-----	--	--	--	620	15	25	--	--	--
Total--	54,430	--	4,130	39,002	--	8,962	19,366	--	41,557
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-----	245	17	11	146	15	6	130	29	10
2-----	230	18	11	146	13	5	150	26	11
3-----	215	18	10	192	12	6	146	27	11
4-----	215	19	11	174	14	7	130	26	9
5-----	380	25	26	170	14	6	123	24	8
6-----	428	31	36	154	12	5	120	22	7
7-----	410	28	31	158	17	7	120	23	7
8-----	304	18	15	215	16	9	116	22	7
9-----	962	350	a 1,100	197	25	b 14	112	21	6
10-----	836	436	s 1,030	282	109	83	109	20	6
11-----	470	152	193	270	50	b 35	106	19	5
12-----	380	56	57	398	112	120	106	18	5
13-----	332	45	40	380	76	78	102	17	5
14-----	276	34	25	270	62	60	112	26	8
15-----	255	30	21	215	40	23	109	27	8
16-----	374	36	36	192	33	17	109	17	5
17-----	758	220	b 550	184	28	14	106	15	4
18-----	614	374	620	162	22	10	109	15	4
19-----	584	264	416	320	55	b 50	202	29	16
20-----	398	64	69	506	54	74	220	30	18
21-----	292	40	32	282	59	45	206	22	12
22-----	240	56	36	452	83	101	202	22	12
23-----	210	50	28	314	72	61	170	18	8
24-----	192	33	17	220	60	36	154	18	7
25-----	174	29	14	184	48	24	138	14	5
26-----	162	26	11	162	38	17	123	13	4
27-----	154	24	10	150	38	15	120	13	4
28-----	150	21	8	138	38	14	112	13	4
29-----	142	16	6	134	34	12	109	12	4
30-----	148	17	7	138	37	14	106	15	4
31-----	150	16	6	150	41	17	--	--	--
Total--	10,678	--	4,483	7,055	--	985	3,977	--	224
Total discharge for year (cfs-days)									
Total load for year (tons)									
								1,431,201	
								1,070,886	

s Computed by subdividing day.

a Computed from water-sediment discharge curve.

b Computed from partly estimated concentration curve.

GREEN RIVER BASIN--Continued
GREEN RIVER AT MUNFORDVILLE, KY.--Continued

Particle-size analyses of suspended sediment, March to June 1952
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Suspended sediment											Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500	1.000
Mar. 11, 1952	7:00 a. m.	9,960	1,260	579	38	49	64	80	94	98	99				BCW
Mar. 11	7:00 a. m.	9,960	1,280	464	26	33	53	75	93	98	99				BN
Mar. 13	10:30 a. m.	19,400	1,333	517	57	67	83	93	98	100	--				BCW
Mar. 22	3:55 p. m.	12,900	960	836	39	44	57	74	90	96	99				BCW
Mar. 23	9:45 a. m.	31,100	1,660	755	49	56	81	86	92	97	98				BCW
Mar. 23	9:45 a. m.	31,100	1,660	596	37	48	69	87	92	96	97				BN
Mar. 24	10:30 a. m.	51,900	1,040	816	40	56	76	92	96	99	--				BN
June 14	7:00 a. m.	5,010	4,190	1,530	35	51	70	95	--	--	--				BCW
June 14	7:00 a. m.	5,010	4,190	1,720	23	36	54	78	92	93	94	97			BN
June 14	10:15 a. m.	4,860	4,180	3,280	32	48	67	90	90	90	90	90	90	90	BCW
June 14	10:15 a. m.	4,860	4,180	3,250	21	37	57	82	--	--	--	--	--	--	BN

GREEN RIVER BASIN--Continued

BARREN RIVER AT BOWLING GREEN, KY.

LOCATION.--At gaging station at bridge 400 feet downstream from bridge on U. S. Highways 31W and 68 at Bowling Green, Warren County, 800 feet upstream from Louisville & Nashville Railroad bridge, 6 miles downstream from Drakes Creek, and 8.9 miles upstream from Jennings Creek.

DRAINAGE AREA.--1,680 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.

Water temperatures: October 1949 to September 1952.

EXTREMES, 1951-52.--Water temperatures: Maximum, 87°F July 1, 2, 22, 29; minimum, 40°F Dec. 18.

EXTREMES, 1949-50.--Dissolved solids: Maximum, 176 ppm Nov. 11-20; minimum, 90 ppm Jan. 11-20.

Hardness: Maximum, 146 ppm Nov. 21-30; minimum, 67 ppm Jan. 11-20.

Specific conductance: Maximum daily, 301 micromhos Nov. 24; minimum daily, 95.7 micromhos Feb. 1.

Water temperatures (1949-52): Maximum, 87°F July 1, 2, 22, 29, 1952; minimum, freezing point Feb. 2, 3, 1951.

REMARKS.--Prior to Aug. 27 daily water temperatures reported are averages of twice-daily measurements. The data reported under extremes are the individual maximum and minimum measurements. Subsequent daily temperatures are averages computed from a temperature recorder. Records of specific conductance of daily samples from October 1949 to September 1950 available in district office at Columbus, Ohio. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Temperature (°F) of water, water year October 1951 to September 1952

/Twice-daily measurements at approximately 6:30 a. m. and 6:00 p. m. prior to Aug. 27; temperature recorder thereafter/

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	85	54	48	54	48	49	58	84	70	86	82	79
2	84	50	48	54	48	48	56	86	69	86	82	78
3	85	47	48	54	46	49	56	86	72	84	84	76
4	88	47	52	50	50	48	56	89	73	83	83	74
5	89	46	50	48	50	48	54	89	74	82	84	72
6	70	44	54	48	48	48	55	71	75	80	81	72
7	68	44	54	46	48	46	54	72	78	80	80	72
8	64	44	54	47	46	48	54	72	79	80	80	73
9	62	46	51	46	47	48	56	72	80	77	80	74
10	60	44	52	47	49	48	55	70	80	76	80	75
11	59	46	50	46	48	52	56	66	79	76	80	75
12	59	45	50	46	48	51	56	64	80	76	81	75
13	58	46	48	46	49	50	56	62	80	80	80	75
14	59	52	45	50	48	51	55	63	80	80	80	75
15	58	56	48	54	50	50	54	64	80	80	80	74
16	59	56	42	54	48	48	54	67	82	79	82	73
17	59	50	42	54	47	48	56	70	82	80	82	72
18	60	48	40	54	46	50	56	68	82	80	82	71
19	58	47	42	54	46	50	58	68	82	83	82	71
20	59	46	46	54	48	52	60	68	82	84	82	70
21	60	44	46	50	48	56	62	65	82	84	82	69
22	60	46	46	50	48	56	65	66	81	85	82	67
23	58	46	48	46	48	56	64	68	80	84	80	66
24	59	46	46	45	48	56	64	67	80	84	79	65
25	59	44	46	45	48	54	64	70	82	84	78	65
26	59	50	47	50	48	54	62	70	83	84	80	65
27	59	50	46	48	48	54	63	70	84	84	78	65
28	58	48	46	52	49	54	62	70	84	84	77	65
29	56	48	46	48	50	54	64	68	85	85	77	65
30	57	48	48	44	--	56	64	68	85	83	77	66
31	56	--	52	46	--	54	--	69	--	82	77	--
Average	61	48	48	49	48	51	58	68	80	82	80	71

GREEN RIVER BASIN--Continued
POND RIVER AT JEWEL CITY, KY.

LOCATION.--At Jewel City, Hopkins County, 200 feet upstream from Cyprus Creek, and three-quarters of a mile upstream from mouth.
DRAINAGE AREA.--790 square miles, approximately
RECORDS AVAILABLE.--Chemical analyses: April 1950 to August 1952.
REMARKS.--No discharge records available for this station.

Chemical analyses, in parts per million, October 1951 to August 1952

Date of collection	Mean discharge (cfs)	Tem- perature (°F)	Silica (SiO ₂)	Alum- inum (Al)	Iron, total (Fe)	Manga- nese, total (Mn)	Cal- cium (Ca)	Mag- nesium (Mg)	Sod- ium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO ₃ , Calcium, magnesium, sodium	Non- carbon- ate	Total acid- ity as H ₂ SO ₄	Specific conduct- ance (micro- mhos at 25°C)	pH	Color
Oct. 18, 1951...			6.6		0.89	1.1	36	11	11	2.2	41	116	3.4	0.3	1.7	213	134	101		329	7.4	4
Nov. 27, 1951...			5.7		a2.8	b.65	15	5.1	5.6	3.2	8	63	2.2	.2	1.8	117	59	52		169	6.4	10
Dec. 18, 1951...			7.0		a1.5	b.04	24	2.9	2.2	.8	78	9.9	2.0	.2	2.7	93	72	8		147	7.8	7
Jan. 30, 1952...			6.8		.53	.91	30	10	8.0	1.1	18	112	2.5	.4	.5	194	118	101		284	6.4	4
Mar. 4, 1952...			7.6		a6.6	b.95	30	11	9.4	1.6	26	111	4.5	.1	1.9	201	120	99		297	6.9	18
Apr. 3, 1952...			4.1		a3.7	b.14	14	4.9	3.8	1.0	28	34	2.1	.0	1.3	84	56	32		121	6.9	22
May 13, 1952...			12		1.2	4.2	102	64	47	3.3	c4	583	9.5	.6	.8	872	520	514		1,120	5.9	6
June 17, 1952...			4.6		a.54	b.35	32	11	7.3	1.0	80	61	4.5	.1	5.4	173	126	60		280	7.2	6
July 22, 1952...			5.6		.23	.00	35	6.8	4.6	1.5	113	28	5.0	.1	2.0	164	116	23		256	7.2	3
Aug. 26, 1952...			7.3		.33	.00	40	6.3	4.4	1.2	138	17	5.5	.2	1.3	158	127	13		279	7.0	2

a Includes iron in suspended materials.

b Includes manganese in suspended materials.

c Total acidity as H₂SO₄, 14 parts per million.

GREEN RIVER BASIN--Continued

ROUGH RIVER AT DUNDEE, KY.

LOCATION.--At auxiliary gaging station at bridge on State Highway 69 at Dundee, Ohio County, and 7.1 miles downstream from Caney Creek.

DRAINAGE AREA.--775 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1952.

EXTREMES, 1951-52.--Water temperatures: Maximum, 88°F July 1; minimum, freezing point Dec. 19, 22, 24.

EXTREMES, 1949-52.--Water temperatures: Maximum, 88°F Sept. 2, 1951, July 1, 1952; minimum, freezing point on several days in February and December 1951.

REMARKS.--Daily water temperatures reported are averages of twice-daily measurements. The data reported under extremes are the individual maximum and minimum measurements. Discharge records for gaging station near Dundee, for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Temperature (°F) of water, water year October 1951 to September 1952
/Twice-daily measurements at approximately 7 a. m. and 4 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	50	42	50	40	43	52	64	70	85	79	74
2	62	48	44	46	40	42	52	65	69	84	78	72
3	64	42	46	44	44	44	54	66	70	82	80	68
4	66	42	52	43	47	44	54	66	72	82	79	68
5	66	46	50	40	46	43	50	68	73	80	79	67
6	68	42	51	39	46	38	48	68	74	82	78	68
7	66	38	54	38	43	40	48	70	76	82	78	68
8	62	40	52	41	44	40	51	69	77	78	78	68
9	58	40	50	41	42	44	52	70	76	78	79	70
10	57	39	46	38	44	46	54	66	76	78	78	70
11	56	42	38	37	45	49	52	62	76	77	76	68
12	56	43	42	42	43	50	52	58	77	78	76	72
13	56	--	40	44	44	51	56	59	76	78	76	72
14	56	49	41	45	44	48	52	58	75	78	75	74
15	53	52	36	49	44	44	52	62	75	78	76	72
16	56	52	34	48	42	46	52	64	76	78	78	70
17	56	46	34	48	42	44	52	65	76	78	79	70
18	58	40	35	49	40	44	54	63	77	80	78	70
19	56	40	32	50	42	48	56	62	77	81	78	69
20	56	38	36	49	44	50	58	62	78	82	78	67
21	56	39	34	46	44	52	60	62	78	82	78	67
22	59	42	32	46	42	58	62	64	79	84	78	66
23	59	44	36	40	42	52	62	66	80	82	76	64
24	58	44	32	39	42	53	62	66	79	82	74	62
25	56	46	39	40	42	54	60	66	82	78	72	62
26	58	45	40	44	42	54	60	66	83	80	74	62
27	58	44	38	48	42	51	61	67	84	82	72	62
28	58	42	38	47	44	50	60	67	83	82	73	63
29	55	43	40	42	44	52	62	67	84	82	74	64
30	56	44	44	38	--	53	63	67	85	80	72	64
31	53	--	47	40	--	54	--	68	--	80	74	--
Average	59	44	41	44	43	48	55	65	77	80	77	68

TRADEWATER RIVER BASIN

TRADEWATER RIVER AT OLNEY, KY.

LOCATION.--At gaging station at highway bridge at Olney, Hopkins County, 1.1 miles upstream from Cave Creek, 5.1 miles downstream from Flynn Creek, and 9.5 miles northeast of Princeton.

DETAILED MAP.--25 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1949 to August 1950, October 1951 to September 1952.

EXTREMES, 1951-52.--Dissolved solids: 16, 35 ppm Nov. 8-16, minimum, 87 ppm Nov. 24-30.

REMARKS.--Daily water temperatures reported in temperature tables are averages of twice-daily measurements. The data reported under extremes are the individual maximum and minimum measurements. Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1235.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 1-10, 1951	32.2	7.8	0.03	33	15	6.2	2.2	12	141	2.2	0.3	1.5	231	144	84	340	6.9	0
Oct. 11-20	3.15	4.6	0.1	23	7.8	4.9	1.8	42	61	2.5	2.2	1.5	138	90	55	221	6.9	0
Oct. 21 to Nov. 7	9.32	9.8	0.5	22	8.3	5.9	1.4	50	56	2.5	2.2	1.8	141	90	48	221	6.9	2
Nov. 8-16	127	9.9	0.2	47	24	7.8	3.8	8	222	3.5	3	5	357	218	209	484	7.0	1
Nov. 17-23	112	10	0.5	31	16	6.8	2.6	10	145	3.5	2	5	239	144	85	341	7.0	1
Nov. 24-30	2,474	6.8	0.31	11	4.9	2.9	2.7	18	39	2.0	3	3	87	48	38	131	6.7	10
Dec. 1-10	1,700	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec. 11-20	1,226	9.8	0.8	19	9.2	4.5	1.3	13	83	2.0	2	1.0	150	86	75	222	6.4	3
Dec. 21-31	1,472	7.3	0.24	13	5.8	3.4	1.2	14	50	2.2	3	7	96	56	45	147	6.8	6
Jan. 1-10, 1952	2,121	7.9	0.16	13	5.6	3.5	1.1	10	51	2.4	1.1	1.0	102	56	47	144	6.2	7
Jan. 11-20	234	11	0.04	28	13	6.4	1.2	14	121	3.0	2	1.0	203	122	112	289	6.2	1
Jan. 21-31	885	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 1-10	729	22	0.3	18	7.8	5.7	1.1	24	66	2.5	2	1.3	150	78	57	197	6.8	2
Feb. 11-20	202	23	0.4	27	11	6.9	1.1	32	99	2.4	2	8	203	112	86	271	7.1	2
Feb. 21-29	326	24	0.4	22	8.3	5.6	1.2	32	73	2.5	2	5	162	88	63	219	7.2	2
Mar. 1-10	454	21	0.9	22	7.8	5.9	1.1	34	69	4.0	2	6	154	86	59	213	7.2	3
Mar. 11-20	1,888	8.5	0.28	14	6.3	3.4	1.2	14	51	2.2	1	7	101	60	49	145	6.2	18
Mar. 21-31	2,528	7.0	0.20	14	6.1	3.3	0.8	9	53	2.0	1	104	104	60	53	149	6.3	8
Apr. 1-10	288	10	0.2	26	14	4.7	0.9	11	114	2.8	2	7	191	121	113	284	6.6	4
Apr. 11-20	408	9.3	0.3	20	9.0	4.4	1.0	18	75	2.2	2	6	137	86	72	214	6.5	3
Apr. 21-31	147	13	0.12	27	12	5.8	1.3	27	102	3.4	1	6	189	117	95	284	6.9	4
May 1-10	51.7	8.8	0.07	30	12	6.1	1.6	24	112	2.9	1	6	199	125	105	303	6.9	4
May 11-20	53.3	8.4	0.04	37	16	6.5	1.7	22	148	3.1	2	1.0	257	158	140	376	6.9	5
May 21-31	52.3	9.9	0.07	40	17	8.1	1.9	22	167	2.2	2	1.4	282	170	152	410	6.7	2

TRADEWATER RIVER BASIN--Continued

TRADEWATER RIVER AT OLNEY, KY.--Continued

Chemical analyses, in parts per million, water year October 1951 to September 1952.--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)	pH	Color
														Calcium, magnesium	Non-carbonate			
June 1-10, 1952.....	9.65	10	0.04	43	20	8.1	1.7	16	184	3.5	0.2	1.2	311	190	176	441	7.4	4
June 11-20.....	2.06	10	.07	44	20	8.6	1.6	16	185	3.3	.3	.8	309	193	179	441	7.4	4
June 21-31.....	.38	7.6	.07	43	19	8.4	1.8	22	173	3.7	.3	.6	298	187	167	431	7.4	7
July 1-10.....	.01	8.1	.06	43	18	7.5	2.2	33	165	4.0	.4	1.0	287	182	154	420	6.6	5
July 11-20.....	.00	8.2	.03	43	18	7.4	1.9	37	162	4.0	.4	.4	288	182	151	420	6.9	3
July 21-31.....	.00	7.8	.04	43	18	7.5	1.9	48	156	4.2	.4	.4	283	182	142	418	6.7	3
Aug. 1-10.....	.00	8.1	.07	44	18	7.7	2.0	56	151	4.0	.4	.2	280	184	138	419	6.8	4
Aug. 11-20.....	.00	11	.06	43	20	9.2	2.5	58	153	4.0	.4	.6	286	189	142	421	6.8	2
Aug. 21-31.....	.00	14	.07	44	19	9.4	2.7	66	148	4.2	.4	.4	288	188	134	424	6.9	5
Sept. 1-10.....	.03	13	.06	42	19	9.2	2.6	68	143	3.5	.4	.6	276	185	127	412	6.9	4
Sept. 11-20.....	.33	19	.07	42	19	9.6	2.5	74	140	3.8	.4	.6	279	184	122	414	6.9	4
Sept. 21-30.....	.20	12	.07	42	18	8.3	2.3	73	133	3.0	.3	.6	269	177	119	401	6.9	3
Average	468	11	0.08	31	14	6.5	1.8	30	117	3.0	0.3	0.8	216	135	110	314	--	4

TRADEWATER RIVER BASIN--Continued

TRADEWATER RIVER AT OLNEY, KY.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	50	--	53	40	44	56	63	71	84	78	76
2	66	49	--	45	43	44	56	64	72	84	78	74
3	66	45	--	41	46	46	55	66	73	82	79	72
4	66	44	--	41	47	46	54	67	74	82	79	70
5	70	43	--	40	46	43	48	67	74	82	78	70
6	70	43	--	45	44	41	47	--	76	82	77	71
7	66	41	--	37	42	41	47	69	76	82	78	70
8	64	40	--	39	44	42	50	70	78	78	79	70
9	62	38	--	41	42	43	52	71	79	78	79	72
10	60	39	--	39	43	47	60	70	78	77	78	72
11	58	42	43	38	45	48	52	64	80	78	76	72
12	58	44	42	39	42	50	54	62	82	78	77	72
13	58	48	41	41	44	52	55	60	80	78	78	73
14	58	49	40	46	45	50	53	61	82	78	78	74
15	58	49	35	50	44	44	52	65	83	78	78	72
16	60	50	34	49	42	46	51	67	84	79	81	70
17	58	47	34	53	41	46	54	69	82	78	80	70
18	60	43	34	52	40	46	56	66	82	82	78	71
19	58	42	32	51	42	47	58	65	81	82	80	70
20	56	39	34	49	44	50	60	62	81	82	80	66
21	56	40	36	--	44	55	62	61	82	84	80	68
22	58	43	34	--	43	58	62	64	82	84	79	68
23	58	44	34	--	43	56	62	66	82	83	78	66
24	58	46	34	--	43	54	62	68	84	82	76	64
25	56	44	35	--	43	54	58	68	84	80	76	64
26	56	44	40	--	43	53	60	68	84	80	75	64
27	58	44	38	--	44	51	60	68	84	82	76	64
28	56	42	36	--	46	49	61	68	84	82	75	66
29	55	42	40	--	46	52	63	68	85	80	76	68
30	55	42	44	--	--	52	64	68	84	80	74	68
31	54	--	46	--	--	54	--	70	--	80	76	--
Average	60	44	--	--	43	49	56	66	80	81	78	70

PART 3-B. CUMBERLAND AND TENNESSEE RIVER BASINS

CUMBERLAND RIVER BASIN

CUMBERLAND RIVER NEAR HARLAN, KY.

LOCATION.--At gaging station at bridge on U. S. Highway 119, at Loyall, 1.6 miles upstream from Fourmile Branch, 2.0 miles downstream from confluence of poor and Clover Forks, and 2 miles west of Harlan, Harlan County.

DRAINAGE AREA.--374 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1236.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 4, 1951.....	66	1.8	0.04	16	5.8	50	1.6	124	62	8.0	0.2	1.5	213	64	0	348	7.5	6
Nov. 9.....	710	5.5	.07	6.4	3.4	12	2.1	32	27	2.2	.2	2.1	74	30	4	124	7.1	5
Dec. 20.....	2,110	5.5	.13	11	2.9	15	1.7	38	40	1.6	.1	2.5	100	40	8	159	7.4	6
Jan. 22, 1952.....	7,440	4.9	.08	6.4	1.9	5.8	1.4	18	18	2.2	.2	1.5	53	24	9	84.9	6.7	4
Feb. 28.....	385	2.7	.17	12	6.1	35	2.2	86	57	3.1	.1	.9	163	56	0	274	7.8	6
Apr. 2.....	532	4.1	.07	13	7.3	29	2.3	80	56	3.4	.1	2.0	162	62	0	273	7.1	7
May 8.....	325	2.1	.02	15	6.3	37	2.1	95	56	4.0	.1	.8	173	63	0	303	7.0	5
June 11.....	380	3.2	.05	14	6.6	43	2.7	119	54	3.5	.2	2.3	169	62	0	329	7.2	3
July 17.....	80	1.0	.01	17	4.1	112	.6	240	95	10	.1	1.0	363	60	0	593	7.4	7
Aug. 21.....	70	2.7	.06	16	6.6	83	2.7	193	75	10	.2	1.7	286	68	0	498	7.3	4
Sept. 26.....	28	2.9	.04	18	7.5	80	1.4	185	77	8.5	.2	2.1	290	75	0	491	7.1	5

CUMBERLAND RIVER BASIN--Continued

CUMBERLAND RIVER AT BARBOURVILLE, KY.

LOCATION.--At gaging station at bridge on State Highway 11, at Barbourville, Knox County, and 0.2 mile upstream from Richland Creek.

DRAINAGE AREA.--972 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1949 to August 1950.

Water temperatures: October 1949 to September 1952.

EXTREMES, 1951-52.--Water temperatures: Maximum, 91°F June 28; minimum, 34°F Dec. 19.

EXTREMES, 1949-52.--Water temperatures: Maximum, 91°F June 28, 1952; minimum, freezing point Nov. 26, Dec. 18, 1950, Feb. 2, 3, 1951.

REMARKS.--Daily water temperatures reported are averages of twice-daily measurements. The data reported under extremes are the individual maximum and minimum measurements. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1236.

Temperature (°F) of water, water year October 1951 to September 1952
/Twice-daily measurements at approximately 8 a.m. and 6 p.m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	58	45	52	42	47	57	63	70	87	80	79
2	72	50	43	56	45	45	56	64	72	86	79	77
3	74	48	46	52	52	46	56	65	74	86	81	74
4	75	47	48	50	48	48	53	66	74	84	80	74
5	76	47	46	49	46	46	52	66	78	84	80	74
6	75	48	42	44	42	44	48	69	80	84	80	76
7	74	45	44	43	42	44	48	70	81	84	80	74
8	70	44	56	46	42	44	51	72	82	82	80	80
9	64	46	40	45	43	46	54	73	82	80	77	76
10	62	47	46	43	44	46	58	69	81	80	80	76
11	62	44	48	42	46	48	57	64	81	78	81	76
12	61	46	43	44	44	46	63	59	80	79	82	77
13	62	51	44	46	44	48	62	57	82	82	82	77
14	62	55	46	50	47	49	59	58	84	82	82	76
15	62	55	42	52	48	45	54	63	84	83	84	76
16	63	52	38	52	50	44	53	66	85	83	64	76
17	63	50	37	53	46	44	55	69	86	80	82	72
18	64	44	38	52	47	46	58	70	85	84	84	72
19	62	42	36	48	44	47	58	72	86	84	84	72
20	64	40	39	48	46	51	84	68	86	86	86	73
21	62	40	46	46	44	54	64	66	85	86	81	71
22	64	42	44	49	42	54	66	68	82	86	80	70
23	65	46	42	46	44	52	67	69	85	86	79	68
24	64	49	42	42	44	51	67	69	86	84	80	66
25	60	48	44	41	44	49	64	71	86	84	80	73
26	62	50	44	48	44	50	61	70	86	85	80	67
27	64	48	41	52	44	50	58	70	86	86	77	68
28	65	45	41	50	44	50	56	72	88	85	74	70
29	62	46	42	42	48	51	60	70	88	82	78	72
30	63	45	47	38	--	54	60	69	87	80	79	70
31	63	--	51	39	--	55	--	69	--	76	80	--
Average	66	47	44	47	47	48	58	67	82	83	81	73

CUMBERLAND RIVER BASIN--Continued

CUMBERLAND RIVER AT WILLIAMSBURG, KY.

LOCATION.--At gaging station at bridge on U. S. Highway 25W and State Highway 92 at Williamsburg, Whitley County, and 2.1 miles downstream from Clear Fork. DRAINAGE AREA.--1,673 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952.

Water temperatures: October 1951 to September 1952.

EXTREMES, 1951-52.--Dissolved solids: Maximum, 234 ppm Aug. 1-10; minimum, 60 ppm Jan. 21-31.

Hardness: Maximum, 83 ppm Sept. 11-20; minimum, 29 ppm Dec. 11-20.

Specific conductance: Maximum daily, 459 micromhos Aug. 9; minimum daily, 60.3 micromhos Mar. 24, 25.

Water temperatures: Maximum, 91°F on several days in June and July; minimum, 39°F Nov. 21, Dec. 19, Jan. 31.

REMARKS.--Daily water temperatures reported in temperature table are averages of twice-daily measurements. The data reported under extremes are the individual maximum and minimum measurements. Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1236.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on 0.45 micron filter at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium, mg./l.	Non-carbonate, mg./l.			
Oct. 1-10, 1951	149		5.2	0.04	15	7.8	26	2.9	69	62	5.5	0.0	1.0	158	70	13	262	7.9	4
Oct. 11-20	91.5		7.0	.04	16	8.7	36	2.9	93	71	7.1	.0	.2	192	77	0	315	7.9	3
Oct. 21-31	118		10	.10	18	8.5	37	3.3	100	70	7.0	.0	.2	204	80	0	324	7.9	5
Nov. 1-10	2,988		5.5	.01	11	4.9	14	2.3	44	38	4.4	.0	2.1	106	48	12	177	7.6	8
Nov. 11-20	3,784		5.8	.10	8.4	3.9	8.7	1.9	29	27	3.8	.0	2.1	78	37	13	126	7.5	5
Nov. 21-30	4,750		7.2	.01	7.2	3.9	6.1	1.1	23	23	3.0	.1	1.7	71	34	15	115	6.5	5
Dec. 1-10	6,821		7.1	.01	8.0	3.9	7.2	1.1	25	27	2.4	.1	1.5	74	36	16	122	6.6	6
Dec. 11-20	12,860		7.3	.01	6.4	3.2	4.5	1.5	18	23	1.6	.1	1.8	61	29	14	97.9	6.6	8
Dec. 21-31	8,917		7.8	.01	8.0	3.9	7.4	.7	23	30	2.0	.1	1.7	74	36	17	122	6.7	3
Jan. 1-10, 1952	3,395		6.8	.01	9.6	3.9	11	1.1	31	37	2.1	.1	1.6	88	40	15	143	6.9	5
Jan. 11-20	5,877		6.4	.01	7.6	3.6	7.5	1.3	24	28	1.9	.1	1.3	70	34	14	116	6.8	4
Jan. 21-31	12,340		6.3	.01	7.2	2.9	5.7	1.3	21	23	1.5	.1	1.2	60	30	13	97.9	6.7	5
Feb. 1-10	4,908		6.3	.03	8.0	4.4	8.5	1.3	28	31	1.9	.1	1.3	76	38	15	127	6.9	2
Feb. 11-20	2,245		5.1	.08	8.4	3.6	7.6	1.5	28	27	1.6	.0	1.5	72	36	13	120	6.8	7
Feb. 21-29	4,136		7.3	.06	8.8	4.6	17	1.9	34	36	2.0	.1	1.5	83	41	13	148	7.0	2
Mar. 1-10	7,110		6.4	.03	7.6	4.4	6.9	1.8	27	29	1.8	.0	1.2	62	32	13	119	6.8	2
Mar. 11-20	7,530		6.5	.03	6.8	4.6	6.9	1.5	27	26	1.6	.0	1.2	62	32	13	112	6.8	2
Mar. 21-31	13,270		7.6	.02	7.6	4.4	6.6	1.5	27	26	2.1	.0	1.2	65	37	15	106	6.7	4
Apr. 1-10	1,908		8.8	.08	18	2.4	16	1.6	44	48	2.5	.1	.9	119	56	19	193	7.1	3
Apr. 11-20	1,417		7.1	.08	10	5.6	16	1.4	46	42	3.2	.1	.6	109	48	10	185	7.0	3
Apr. 21-30	3,417		5.2	.04	9.2	4.9	15	1.4	43	37	2.5	.2	.6	98	43	9	188	7.0	2
May 1-10	1,889		7.1	.04	8.0	4.9	12	1.3	35	33	2.2	.1	.7	89	40	11	147	7.0	3
May 11-20	2,510		7.0	.04	8.8	4.4	11	2.1	38	31	2.4	.1	.9	85	40	9	149	7.0	3
May 21-31	2,378		8.7	.04	8.4	4.9	12	1.4	38	34	2.5	.1	1.0	90	41	10	151	7.0	3

June 1-10.....	1,083	7.8	.03	10	5.1	14	7	48	33	2.8	.1	1.0	94	46	7	154	7.1	7
June 11-20.....	589	5.6	.03	14	5.8	24	1.2	87	48	3.5	.1	.7	137	59	4	225	7.3	6
June 21-30.....	308	8.9	.02	14	6.8	27	1.9	82	50	3.2	.1	.9	155	63	0	255	7.5	6
July 1-10.....	139	6.9	.02	14	8.0	29	1.1	79	58	5.0	.2	.7	164	69	3	272	7.6	5
July 11-20.....	131	5.0	.02	18	8.7	38	5	103	69	6.0	.2	1.0	204	81	0	342	7.7	5
July 21-31.....	98.3	10	.04	18	8.7	40	2.3	110	65	8.0	.1	.5	210	80	0	343	7.4	5
Aug. 1-10.....	254	10	.02	18	8.7	48	3.1	127	72	9.0	.1	.6	234	80	0	384	7.6	5
Aug. 11-20.....	144	8.2	.02	16	8.7	50	3.1	125	73	7.2	.1	.6	231	77	0	379	7.6	5
Aug. 21-31.....	176	7.0	.06	17	7.8	42	2.9	108	66	8.0	.1	.4	206	74	0	340	7.6	5
Sept. 1-10.....	154	14	.02	18	8.0	40	2.0	102	68	7.0	.2	2.6	213	78	0	349	7.5	3
Sept. 11-20.....	68.0	12	.04	18	9.0	42	2.8	107	74	8.0	.2	2.4	223	83	0	374	7.5	3
Sept. 21-30.....	107	12	.04	16	7.8	45	3.5	113	66	10	.1	.4	220	72	0	370	7.8	4
Average	3,320	7.6	0.04	12	5.7	21	1.8	58	44	4.1	0.1	1.1	126	53	6	209	--	4

CUMBERLAND RIVER BASIN--Continued

CUMBERLAND RIVER AT WILLIAMSBURG, KY.--Continued

Temperature (°F) of water, water year October 1951 to September 1952
 /Twice-daily measurements at approximately 8:30 a. m. and 5:30 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	55	42	50	41	48	56	62	70	88	84	78
2	71	54	43	52	42	47	56	64	71	87	85	80
3	73	51	44	52	44	47	55	66	72	87	85	77
4	73	49	46	52	46	48	56	66	74	87	86	74
5	73	48	46	50	48	47	53	69	74	85	84	74
6	75	44	48	48	48	46	52	70	76	84	82	76
7	72	41	54	44	43	46	52	72	78	84	82	76
8	66	46	54	43	42	44	50	72	80	85	80	78
9	63	46	55	44	42	44	53	73	82	82	82	78
10	61	46	54	43	42	46	54	71	82	81	82	78
11	61	45	51	43	44	48	56	68	83	81	81	78
12	60	45	46	42	44	48	59	65	82	82	82	78
13	60	48	45	44	46	48	60	61	82	84	82	78
14	62	51	44	48	47	49	58	60	82	84	84	78
15	62	52	45	51	48	48	56	62	82	84	84	78
16	64	52	44	50	46	47	56	65	82	84	87	77
17	62	50	40	52	42	46	56	68	83	80	85	76
18	64	48	40	52	45	46	59	70	85	83	86	77
19	62	46	39	50	44	46	57	71	84	84	84	76
20	62	42	40	49	46	50	60	70	85	86	84	75
21	61	40	44	47	47	52	64	66	84	88	82	71
22	62	41	44	46	45	54	65	66	83	88	80	70
23	64	43	45	46	44	54	66	68	85	89	76	70
24	63	45	42	45	44	52	66	68	86	86	76	70
25	60	48	44	42	46	50	65	69	88	86	78	68
26	59	49	43	44	45	51	64	71	88	87	79	68
27	60	48	42	46	42	50	61	72	88	87	78	70
28	61	49	42	50	44	50	60	72	88	87	76	70
29	60	44	42	47	46	49	58	70	89	86	74	71
30	60	44	44	42	--	50	58	69	90	86	76	72
31	60	--	46	40	--	52	--	70	--	86	78	--
Average	64	47	45	47	45	48	58	68	82	85	81	80

CUMBERLAND RIVER BASIN--Continued

ROCKCASTLE RIVER AT BILLOWS, KY.

LOCATION.--At gaging station at bridge on State Highway 80 at Billows, Rockcastle County, 1 mile downstream from Hawk Creek, 1 mile upstream from Pine Creek and 13 miles west of London.

DRAINAGE AREA.--607 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952.

REMARKS.--Records of discharge for water year October 1951 to September 1952.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium, magnesium	Non-carbonate			
Oct. 9, 1951	36		6.6	0.10	16	4.4	3.5	1.9	50	20	2.4	0.2	1.1	82	58	17	139	7.5	7
Nov. 14	4,160		6.5	.02	11	3.4	3.7	1.8	36	15	3.0	.2	1.6	63	42	12	105	7.3	5
Dec. 12	1,780		5.9	.10	13	2.4	2.0	1.1	38	14	1.4	.1	1.7	60	42	11	97.1	7.4	6
Jan. 15, 1952	959		5.5	.16	12	2.9	1.8	1.2	38	14	1.4	.1	1.3	58	42	11	94.2	7.4	8
Feb. 14	880		5.1	.08	13	3.9	2.0	.7	40	14	1.8	.1	1.0	59	48	16	97.1	7.3	7
Apr. 8	628		5.6	.16	15	3.2	1.7	1.0	46	15	1.2	.1	.8	71	50	13	117	7.3	5
May 8	228		4.5	.07	14	3.6	4.2	1.1	48	15	2.5	.1	.4	70	50	10	117	7.0	5
June 6	250		5.5	.05	17	3.9	2.2	1.2	56	14	2.8	.1	1.6	74	58	13	130	7.0	2
July 11	53		4.4	.02	24	2.9	2.7	2.3	71	17	2.5	.0	3.3	104	71	14	164	7.2	6
Aug. 8	92		3.7	.01	24	4.4	2.5	1.1	78	17	3.0	.1	1.4	102	78	14	178	6.7	2
Sept. 19	16		3.9	.02	23	4.9	3.8	1.0	58	37	2.8	.1	.4	109	78	32	189	6.7	2

CUMBERLAND RIVER BASIN--Continued
CUMBERLAND RIVER NEAR BURKESVILLE, KY.

LOCATION.--At Neelys Ferry on State Highway 61, half a mile downstream from Raft Creek, 3½ miles south of Burkesville, Cumberland County, and about 37 miles downstream from gaging station near Rowena.
DRAINAGE AREA.--6,050 square miles.
RECORDS AVAILABLE.--Chemical analyses: January to September 1952.

Water temperatures: January to September 1952.

EXTREMES, 1952.--Dissolved solids: Maximum, 80 ppm Aug. 21-31; minimum, 62 ppm Mar. 21-31.

Hardness: Maximum, 53 ppm Jan. 1-10; minimum, 41 ppm Apr. 1-10.

Specific conductance: Maximum daily, 159 micromhos Jan. 10, 13; minimum daily, 93.6 micromhos Apr. 1.

Water temperatures: Maximum, 70°F Aug. 18.

REMARKS.--Daily water temperatures reported in temperature table are averages of twice-daily measurements. The datum reported under extremes is the individual maximum measurement. Records of specific conductance of daily samples available in district office at Columbus, Ohio. No discharge records available at this station.

Chemical analyses, in parts per million, January to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium, mg./nestum	Non-carbonate			
Jan. 1-10, 1952....			5.6	0.02	14	4.1	4.7	1.4	50	18	2.0	0.0	1.1	78	53	11	128	7.0	3
Jan. 11-20			5.3	.06	13	3.2	3.8	1.3	46	16	2.0	.0	1.0	69	46	8	116	7.1	6
Jan. 21-31			6.6	.02	14	3.2	3.5	.9	46	15	1.5	.0	1.0	68	47	10	111	7.2	4
Feb. 1-10			9.7	.01	10	3.9	3.8	1.0	42	15	.8	.0	1.0	66	42	7	106	7.3	2
Feb. 11-20			6.4	.08	13	3.6	3.2	.5	45	16	1.0	.0	1.0	72	48	10	118	7.3	3
Feb. 21-29			8.8	.01	13	3.2	3.9	1.2	43	15	1.8	.0	1.0	69	45	10	109	7.4	2
Mar. 1-10			7.9	.05	12	3.4	3.6	1.0	43	16	1.9	.0	1.0	68	45	9	109	7.4	2
Mar. 11-20			6.1	.11	10	4.1	2.8	.9	36	15	1.6	.1	1.0	65	43	12	101	7.2	8
Mar. 21-31			6.8	.06	10	4.1	2.9	.8	37	15	1.8	.1	1.0	62	43	12	102	7.0	4
Apr. 1-10			7.0	.09	10	3.9	3.0	1.0	34	18	1.6	.1	1.0	65	41	13	101	7.2	6
Apr. 11-20			6.2	.11	11	3.4	3.0	1.1	36	15	2.0	.1	.9	66	42	12	102	7.3	7
Apr. 21-30			6.1	.03	12	3.9	3.0	.8	39	16	2.6	.2	1.0	67	45	14	108	7.3	4
May 1-10			9.3	.01	14	2.9	3.3	.6	47	15	1.5	.0	1.1	72	48	8	117	7.2	7
May 11-20			8.1	.01	14	3.4	4.4	1.0	49	14	1.6	.1	1.1	73	48	9	118	7.0	5
May 21-31			9.1	.01	13	3.6	4.5	.8	50	14	1.8	.0	1.1	71	47	6	114	7.0	4
June 1-10			12	.01	12	3.2	5.2	.9	43	15	1.8	.1	.9	77	44	8	114	7.0	5
June 11-20			11	.01	12	3.2	4.4	.8	42	15	1.5	.0	.8	70	42	9	108	7.3	4
June 21-30			12	.01	12	3.4	4.5	.9	46	14	1.4	.0	.5	71	44	6	108	7.2	5
July 1-10			10	.10	11	4.4	4.9	.8	44	12	2.0	.2	1.0	69	46	10	108	7.3	4
July 11-20			10	.06	12	3.4	2.9	.9	42	12	1.8	.1	.8	69	44	10	107	7.1	4
July 21-31			10	.04	12	4.4	2.6	.9	42	14	1.8	.1	1.0	70	48	14	110	7.2	2

Aug. 1-10	12	.03	14	3.9	2.9	.9	48	15	1.8	.1	.3	78	50	13	119	7.3	4
Aug. 11-20	14	.04	13	3.6	3.1	1.3	49	13	2.0	.1	.5	77	47	7	120	6.8	3
Aug. 21-31	16	.01	13	3.6	3.3	1.0	50	13	1.8	.1	.4	80	47	6	121	6.8	2
Sept. 1-10	12	.06	13	3.4	2.9	.9	47	13	1.9	.1	.4	73	46	8	116	6.8	2
Sept. 11-20	8.7	.02	13	3.4	2.8	.8	45	14	1.8	.1	.4	70	47	10	117	6.7	1
Sept. 21-30	10	.02	13	3.2	2.6	.8	45	13	1.8	.1	.4	70	45	9	115	6.8	1
Average.....	9.1	0.04	12	3.6	3.5	0.9	44	15	1.8	0.1	0.8	71	45	9	112	--	4

CUMBERLAND AND TENNESSEE RIVER BASINS

CUMBERLAND RIVER BASIN--Continued

CUMBERLAND RIVER NEAR BURKESVILLE, KY.--Continued

Temperature (°F) of water, January to September 1952

Twice-daily measurements at approximately 7 a. m. and 6 p. m. 7

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				--	46	44	47	50	52	55	56	64
2				--	46	44	47	52	52	58	56	64
3				--	46	46	46	52	52	56	58	60
4				47	46	46	47	52	52	59	62	60
5				46	44	44	46	54	52	60	60	60
6				46	44	44	46	52	52	58	58	62
7				46	44	42	46	52	52	58	56	62
8				46	44	42	48	51	53	58	57	64
9				48	44	45	48	52	53	54	58	66
10				44	44	46	49	52	52	54	60	64
11				45	44	46	46	52	53	56	64	60
12				46	42	46	47	52	53	56	68	62
13				48	46	46	50	51	53	58	60	62
14				47	46	44	48	51	53	56	59	62
15				48	45	44	46	52	53	56	60	62
16				46	45	44	48	52	53	56	62	63
17				47	44	44	48	52	54	57	64	60
18				46	45	46	50	54	54	56	66	60
19				46	45	46	50	58	53	58	66	58
20				47	44	46	50	58	53	60	62	58
21				44	44	47	50	58	54	60	60	60
22				46	44	47	50	52	59	58	60	60
23				44	44	48	50	52	56	59	60	61
24				44	44	46	49	52	54	60	61	60
25				46	44	46	49	52	55	58	62	58
26				48	44	46	50	52	54	58	62	60
27				48	43	46	52	52	54	63	59	60
28				44	44	46	50	52	53	59	60	60
29				42	44	47	51	51	56	58	60	64
30				43	--	47	50	52	59	56	61	62
31				44	--	46	--	52	--	56	61	--
Average				46	44	45	48	53	54	58	61	61

CUMBERLAND RIVER BASIN--Continued

CUMBERLAND RIVER AT SMITHLAND, KY.

LOCATION.--At gaging station at bridge on U.S. Highway 60 at Smithland, Livingston County, 1 mile downstream from McCormick Creek, and 2.8 miles upstream from mouth.

DRAINAGE AREA.--18,080 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.

Water temperatures: October 1949 to September 1952.

EXTREMES, 1951-52.--Water temperatures: Maximum, 88°F July 27; minimum, 42°F Dec. 19, 21, 22.

EXTREMES, 1949-50.--Dissolved solids: Maximum, 164 ppm Sept. 11-20; minimum, 77 ppm Feb. 11-20.

Hardness: Maximum, 132 ppm Sept. 11-20; minimum, 53 ppm Feb. 11-20.

Specific conductance: Maximum daily, 276 micromhos Sept. 25; minimum daily, 112 micromhos Feb. 13.

Water temperatures (1949-52): Maximum, 88°F July 27, 1952; minimum, 34°F Feb. 3-5, 7, 1951.

REMARKS.--Daily water temperatures reported are averages of twice-daily measurements. Data reported under extremes are the individual maximum and minimum measurements. Records of specific conductance of daily samples from October 1949 to September 1950 available in district office at Columbus, Ohio. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1236.

Temperature (°F) of water, water year October 1951 to September 1952

[Twice-daily measurements at approximately 6 a. m. and 6 p. m.]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	57	50	49	49	48	54	62	70	73	83	81
2	71	54	49	48	47	47	54	62	68	73	82	80
3	72	50	50	48	47	48	54	62	67	74	83	78
4	72	50	50	48	46	48	53	62	67	74	83	77
5	73	50	51	48	46	46	52	64	67	74	82	78
6	73	48	53	47	46	46	52	64	68	74	82	78
7	70	46	54	46	47	48	52	64	69	75	82	78
8	70	46	53	48	48	48	52	66	69	74	82	78
9	68	47	52	47	47	49	53	66	68	74	82	79
10	67	47	52	46	48	49	51	66	70	76	82	79
11	66	48	52	45	48	50	51	66	70	76	82	79
12	66	48	52	46	46	50	52	64	70	77	82	78
13	66	50	50	48	47	51	52	64	70	78	82	79
14	66	50	48	48	46	50	51	64	71	78	82	79
15	66	50	45	50	46	50	52	64	71	78	83	78
16	67	50	44	49	46	50	52	66	70	79	84	78
17	66	50	45	50	47	49	53	66	68	79	84	76
18	66	50	45	50	48	49	54	66	67	80	83	77
19	64	48	43	51	48	49	54	64	70	81	84	76
20	63	48	44	50	48	50	55	64	73	82	84	76
21	64	48	42	50	48	50	56	66	74	82	84	75
22	64	50	43	50	48	52	56	66	71	84	84	74
23	64	50	45	46	47	52	56	68	72	84	82	74
24	63	48	44	46	47	54	56	68	72	83	81	73
25	61	48	46	46	46	54	56	68	72	82	81	73
26	62	48	46	48	47	54	58	69	72	84	82	72
27	61	48	45	48	48	53	58	69	74	86	82	74
28	60	50	46	36	48	52	60	70	74	86	82	73
29	60	49	48	44	47	52	58	70	74	84	82	74
30	60	50	48	46	--	54	60	70	74	85	80	74
31	58	--	49	48	--	54	--	70	--	84	80	--
Average	66	49	48	47	48	50	54	66	70	79	82	77

TENNESSEE RIVER BASIN

MILLS RIVER NEAR MILLS RIVER, N. C.

LOCATION.--At gaging station at ford, 1.4 miles downstream from confluence of North and South Forks, 2.2 miles upstream from village of Mills River, Henderson County, and 4.2 miles northwest of Horseshoe.

DRAINAGE AREA.--66.7 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952.

Water temperatures: October 1951 to September 1952.

EXTREMES, 1951-52.--Dissolved solids: Maximum, 33 ppm Oct. 1-10; minimum, 14 ppm Mar. 11-20, 21-31.

Hardness: Maximum, 10 ppm Oct. 1-10, 11-20; minimum, 4 ppm Mar. 11-20, 21-31.

Water temperatures: Maximum, 74°F Aug. 17; minimum, freezing point Nov. 20, 21, Dec. 16, 17.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1236. No appreciable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
														Calcium	Non-carbonate				Unfiltered	Filtered
Oct. 1-10, 1951	46.7	8.5	0.03	2.6	0.9	3.4	1.0	16	2.7	3.4	0.0	0.1	33	10	0	44.8	6.7	6	9.2	8.8
Oct. 11-20	40.3	6.1	.02	3.3	.3	1.1	1.1	10	1.8	1.0	.1	.1	24	10	0	24.7	6.6	7	3.1	2.1
Oct. 21-31	152.7	6.7	.02	2.0	.6	1.7	1.7	9	1.8	1.1	.1	.1	23	7	0	35.4	6.9	18	5.2	3.3
Nov. 1-10	152.7	6.9	.03	1.8	.6	2.8	2.1	9	2.3	2.1	.1	.2	23	7	0	19.6	7.1	18	6.0	3.8
Nov. 11-20	83.3	7.3	.02	1.5	.4	2.4	2.4	9	1.5	1.1	.0	.1	20	5	0	25.3	7.2	10	2.8	2.0
Nov. 21-30	73.8	7.3	.02	1.1	.5	2.6	2.6	9	1.4	1.1	.0	.0	17	5	0	16.2	6.9	4	2.2	2.2
Dec. 1-10	190	7.5	.02	1.6	.5	1.9	1.9	8	1.6	1.1	.1	.1	20	6	0	21.7	6.5	9	5.0	2.6
Dec. 11-20	194	6.9	.03	1.6	.2	1.9	1.8	8	1.3	1.0	.0	.1	18	5	0	17.6	6.7	7	3.6	2.5
Dec. 21-31	319	6.2	.01	1.6	.3	1.6	1.6	8	1.2	1.1	.0	.1	17	6	0	18.8	7.0	4	2.8	2.0
Jan. 1-10, 1952	179	6.9	.02	1.6	.3	1.4	.7	8	1.3	1.1	.0	.3	19	5	0	18.2	7.8	4	1.8	1.6
Jan. 11-20	186	6.8	.03	1.0	.2	1.9	1.9	8	1.1	1.0	.1	.2	17	5	0	15.4	6.7	2	2.8	2.3
Jan. 21-31	260	7.2	.03	1.2	.3	2.1	2.1	8	1.1	1.1	.0	.1	18	5	0	15.5	6.6	7	3.5	2.2
Feb. 1-10	347	6.4	.04	2.2	.5	.1	.1	6	1.2	.9	.1	.2	17	8	3	14.7	6.4	5	4.0	1.6
Feb. 11-20	202	6.8	.02	1.6	.5	.9	.9	7	1.9	1.0	.1	.1	16	7	1	17.2	7.3	6	2.0	1.9
Feb. 21-29	161	7.0	.02	1.2	.5	2.1	2.1	8	1.2	1.2	.1	.1	16	5	0	14.5	7.0	4	1.7	1.7
Mar. 1-10	259	7.0	.01	1.2	.4	2.0	2.0	6	1.6	1.2	.1	.2	14	5	0	15.0	6.4	3	3.1	1.6
Mar. 11-20	533	6.6	.01	1.1	.4	1.5	1.5	6	1.4	1.2	.0	.2	14	4	0	15.5	6.3	4	4.1	1.6
Mar. 21-31	630	6.3	.01	1.0	.4	1.6	1.6	6	1.3	.9	.0	.1	14	4	0	13.1	6.6	3	2.8	1.5
Apr. 1-10	295	6.5	.03	1.2	.4	1.5	.3	7	1.1	1.0	.1	.1	16	5	0	17.0	6.4	3	4.4	1.6
Apr. 11-20	257	6.9	.05	1.4	.5	1.4	1.4	7	1.1	1.0	.1	.1	17	6	0	18.4	6.9	6	3.2	2.1
Apr. 21-30	347	6.8	.03	1.2	.4	1.6	1.6	6	1.3	.8	.1	.5	17	6	0	18.4	6.7	20	3.8	1.8
May 1-10	178	6.8	.06	1.4	.5	1.7	1.7	8	1.0	1.0	.0	.2	20	6	0	18.6	6.7	8	2.3	1.6
May 11-20	178	6.9	.14	1.4	.5	1.6	1.6	8	1.1	.9	.0	.2	19	6	0	18.6	6.3	5	2.3	1.6
May 21-31	145	8.0	.05	1.5	.5	1.5	1.5	8	.9	.9	.1	.2	19	6	0	17.8	6.2	5	1.8	1.4

June 1-10	127	7.4	.04	1.8	.4	2.3	9	1.7	1.2	.1	.2	21	6	0	19.8	6.4	5	4.5	2.2
June 11-20	120	8.0	.08	1.5	.5	2.0	8	1.7	1.0	.1	.4	20	6	0	20.5	6.5	7	2.8	2.8
June 21-30	106	8.1	.05	3.2	.2	1.5	10	2.0	1.0	.1	.2	24	9	1	18.7	6.4	6	2.6	2.3
July 1-10	83.0	7.6	.07	1.6	.6	1.6	10	.9	1.0	.1	.3	21	6	0	17.1	6.9	5	3.0	1.8
July 11-20	74.6	7.8	.07	2.0	.5	1.4	9	1.0	.9	.1	.3	21	7	0	18.5	6.8	5	4.0	2.2
July 21-31	65.7	8.6	.07	1.6	.6	2.5	11	1.2	1.0	.0	.2	21	6	0	21.4	6.7	5	4.0	2.2
Aug. 1-10	122	6.8	.09	1.4	.6	1.9	9	1.2	.8	.1	.2	20	6	0	18.5	6.7	7	4.6	3.3
Aug. 11-20	77.8	6.7	.12	1.4	.6	2.3	9	2.4	.8	.1	.1	20	6	0	19.4	6.6	6	---	2.3
Aug. 21-31	77.8	7.5	.12	1.4	.6	2.4	9	1.9	.8	.1	.1	19	5	0	17.0	6.5	6	---	2.3
Sept. 1-10	65.5	7.8	.06	1.2	.4	2.4	9	1.9	.8	.1	.1	19	5	0	16.9	6.3	6	---	1.8
Sept. 11-20	50.8	7.9	.03	1.5	.7	2.5	11	1.3	1.0	.1	.2	22	7	0	22.9	6.5	8	3.9	2.9
Sept. 21-30	59.1	8.7	.04	1.8	.8	1.8	10	1.4	1.0	.2	.1	22	8	0	20.7	6.8	7	2.8	2.7
Average	180	7.3	0.04	1.5	0.4	1.9	8	1.4	1.0	0.1	0.2	19	6	0	19.2	--	6	3.5	2.3

TENNESSEE RIVER BASIN--Continued

MILLS RIVER NEAR MILLS RIVER, N. C.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	57	57	36	44	36	44	50	55	59	68	66	65
2	58	52	36	44	40	40	49	54	59	64	67	65
3	58	45	40	46	45	42	47	54	62	62	66	61
4	58	40	48	45	46	45	44	54	61	65	67	57
5	58	40	44	44	45	46	47	54	62	66	66	57
6	60	42	42	42	39	40	44	58	63	65	65	57
7	60	44	50	36	39	38	44	58	63	65	65	57
8	56	41	54	38	37	37	43	57	65	66	64	62
9	53	38	55	41	40	39	47	57	65	66	65	61
10	50	49	47	44	40	44	48	58	64	63	63	57
11	48	39	43	35	45	47	50	56	64	62	64	58
12	47	40	39	40	40	43	53	50	64	64	66	63
13	46	45	38	41	46	45	55	53	64	65	67	63
14	48	52	38	44	46	45	50	50	65	65	68	63
15	48	53	44	48	46	45	46	54	67	67	68	64
16	50	52	32	46	44	38	45	56	66	66	68	61
17	53	44	32	48	43	39	46	58	66	67	74	65
18	51	39	35	49	38	43	47	58	66	69	67	59
19	51	35	35	43	39	44	49	60	65	68	68	62
20	51	32	33	45	40	44	50	58	66	68	66	63
21	54	32	41	42	40	45	53	57	65	68	67	63
22	55	33	40	42	40	46	53	56	66	69	67	66
23	57	38	37	42	42	51	56	58	67	70	67	57
24	58	46	38	36	40	47	58	60	67	67	63	56
25	51	41	39	38	41	43	56	60	71	68	60	55
26	49	46	43	43	41	45	54	58	68	69	56	54
27	50	43	39	50	38	44	52	57	69	68	68	54
28	55	39	33	48	38	44	52	58	71	67	60	55
29	53	38	37	40	40	43	52	59	69	69	60	58
30	54	35	43	33	--	45	52	58	69	68	63	57
31	52	--	43	33	--	42	--	58	--	68	65	--
Average	53	42	40	42	41	43	50	56	65	66	65	60

TENNESSEE RIVER BASIN--Continued

MUD CREEK AT NAPLES, N. C.

LOCATION.--At gaging station at bridge on old Asheville-Hendersonville highway, 100 feet downstream from Byers Creek, 0.8 mile south of Naples, Henderson County, and 2.2 miles upstream from mouth.
DRAINAGE AREA.--109 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1236.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 25, 1951	91	14	0.03	2.6	0.9	3.1	1.3	17	1.9	2.2	0.0	1.2	38	10	0	40.8	7.2	7
Nov. 15	124	20	.05	3.7	1.3	5.8		25	2.2	2.4	.2	.6	54	15	0	64.5	6.4	5
Jan. 14, 1952	207	12	.03	2.7	.9	3.0	1.3	13	2.8	2.6	.1	1.5	34	10	0	38.6	7.2	8
Feb. 15	200	11	.08	2.5	1.3			12	2.7	2.0	.1	.9	31	12	2	32.2	6.3	6
Mar. 15	346	9.6	.07	2.2	.7	3.1		10	3.0	1.9	.1	1.2	28	8	0	31.1	6.3	10
Apr. 15	229	11	.05	2.4	.5	2.7	.5	11	1.6	1.6	.1	.8	29	8	0	29.4	6.4	2
May 15	168	12	.04	2.2	.7	4.3		15	2.0	2.0	.0	1.0	32	8	0	33.3	6.6	2
June 15	136	13	.04	3.0	.9	3.6		16	1.7	1.9	.1	1.5	37	11	0	37.9	6.2	18
July 15	95	10	.05	2.8	.9	4.1	.8	12	2.6	2.9	.1	3.0	36	11	1	43.1	6.2	4
Aug. 15	89	14	.11	3.0	1.0			14	2.6	2.9	.1	1.8	37	12	0	44.7	6.0	8
Sept. 15	119	14	.10	3.2	1.0	2.2	.7	16	1.9	2.1	.1	1.4	40	12	0	39.4	6.6	6

TENNESSEE RIVER BASIN--Continued
BIG LAUREL CREEK NEAR STACKHOUSE, N. C.

LOCATION --At bridge on U.S. Highway 25 and 70, 0.7 mile downstream from Big Hurricane Creek, 0.1 mile upstream from Little Hurricane Creek, 0.5 mile downstream from gaging station, 3.5 miles north of Stackhouse, Madison County, and 3.5 miles upstream from mouth of river.

RECORDS AVAILABLE--Chemical analyses: October 1951 to September 1952.

Water temperatures: October 1951 to September 1952.

EXTREMES: 1951-52 --Dissolved solids: Maximum 49 ppm Mar. 11-20; minimum, 32 ppm Jan. 21-31, Feb. 1-10.

Hardness: Maximum 21 ppm Aug. 1-10; minimum 10 ppm Mar. 11-20.

Water temperatures: Maximum 88°F July 18; minimum freezing point Nov. 19.

REMARKS--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1236. No appreciable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
														Calcium	Non-carbonate				Unfiltered	Filtered
Oct. 1-10, 1951.....	50.3	12	0.02	4.3	1.4	3.1	1.1	25	2.6	1.4	0.1	0.2	39	16	0	51.8	7.0	7	2.8	2.4
Oct. 11-20.....	46.0	12	.04	4.8	1.3	3.6		26	2.7	1.4	.1	.1	39	16	0	50.2	7.0	6	2.6	2.6
Oct. 21-31.....	46.8	12	.02	4.4	1.5	4.9		25	3.7	2.8	.4	.4	32	17	0	51.4	7.1	16	4.4	3.6
Nov. 1-10.....	180	11	.06	3.9	1.2	4.0		18	3.5	2.0	.3	.9	36	13	0	48.0	7.1	16	4.8	3.0
Nov. 11-20.....	193	11	.03	3.9	1.1	4.1		17	3.6	2.1	.2	.7	36	13	0	44.1	7.0	17	4.8	2.4
Nov. 21-30.....	118	14	.01	3.4	1.3	3.1		17	3.0	2.1	.0	.6	36	14	0	44.0	7.2	7	2.8	2.0
Dec. 1-10.....	134	12	.01	3.6	1.2	2.9		17	3.1	1.5	.0	1.2	36	14	0	46.2	6.7	7	4.8	2.2
Dec. 11-20.....	261	13	.01	3.9	1.2	2.5		17	3.3	1.5	.0	.8	37	15	1	44.5	6.8	7	3.6	2.2
Dec. 21-31.....	508	11	.02	4.0	1.0	2.9	1.2	16	3.8	1.4	.0	1.8	35	14	1	41.5	7.2	4	2.8	1.9
Jan. 1-10, 1952.....	212	10	.04	3.2	1.1	2.9		17	3.4	1.6	.1	1.2	35	12	0	41.1	7.7	9	2.4	1.8
Jan. 11-20.....	266	11	.11	3.2	1.4	3.6		17	3.6	1.8	.1	1.0	37	14	0	42.4	6.7	8	3.5	2.0
Jan. 21-31.....	421	10	.04	2.9	1.0	2.9		13	3.5	1.2	.1	1.8	32	11	1	38.6	6.7	9	4.1	1.9
Feb. 1-10.....	294	9.4	.06	3.6	1.1	1.9		14	3.3	1.0	.1	1.3	32	14	2	38.5	6.8	6	2.8	1.8
Feb. 11-20.....	146	11	.16	3.2	1.2	2.9		16	2.9	1.2	.2	1.1	35	13	0	40.6	7.0	5	2.0	1.3
Feb. 21-29.....	123	13	.07	3.9	1.0	4.0		18	3.7	2.0	.2	.7	37	14	0	39.0	6.7	6	2.3	2.0
Mar. 1-10.....	320	11	.03	3.2	1.1	4.3		16	4.5	1.6	.2	1.4	34	12	0	38.0	6.4	9	3.1	1.5
Mar. 11-20.....	260	12	.03	2.4	1.1	8.0		17	5.6	4.6	.3	1.0	49	10	0	73.4	6.5	9	3.2	1.6
Mar. 21-31.....	363	11	.05	2.8	1.0	4.1		16	3.6	1.5	.1	1.0	33	11	0	40.2	6.7	5	2.0	1.6
Apr. 1-10.....	147	11	.04	3.1	1.2	2.8	.4	16	3.2	1.0	.0	.9	33	13	0	40.7	6.7	8	2.1	1.4
Apr. 11-20.....	112	11	.05	4.2	.9			17	2.8	.9	.1	.7	34	14	0	39.0	7.4	9	3.0	1.8
Apr. 21-30.....	349	10	.07	3.5	1.0	3.0		17	3.0	1.1	.1	.7	35	13	0	45.2	7.0	9	4.9	2.0
May 1-10.....	173	11	.16	3.7	1.0	2.5		17	3.0	.9	.0	.6	37	13	0	39.5	6.8	6	3.0	2.1
May 11-20.....	131	11	.08	3.6	1.2	3.5		20	2.8	1.1	.1	.6	36	14	0	45.1	6.6	4	1.8	1.8
May 21-31.....	129	11	.12	3.6	1.2	2.6		18	2.5	1.1	.1	.6	36	14	0	45.9	6.5	8	2.6	2.5

June 1-10.....	91.1	12	.06	3.8	1.2	3.7	21	2.8	1.2	.1	.7	38	14	0	46.2	6.6	5	4.5	2.1
June 11-20.....	83.5	13	.06	4.8	1.1	3.8	23	2.9	1.4	.1	.8	42	16	0	47.5	6.8	7	3.4	2.5
June 21-30.....	55.5	13	.07	4.0	1.4	3.7	23	2.7	1.1	.1	.3	40	16	0	46.9	6.9	7	2.8	2.7
July 1-10.....	81.0	13	.04	5.0	1.0	3.5	20	2.8	2.0	.1	.9	42	17	0	48.0	6.4	10	5.2	3.0
July 11-20.....	62.9	12	.12	4.2	1.7	3.6	24	2.9	1.4	.1	.5	40	18	0	49.9	7.2	10	4.3	2.8
July 21-31.....	34.1	10	.11	4.3	1.5	3.8	25	2.6	1.0	.1	.3	40	17	0	51.8	7.1	10	4.8	3.0
Aug. 1-10.....	64.4	12	.03	6.2	1.3	1.5	22	2.8	1.6	.1	.8	43	21	3	50.8	6.3	5	8.0	3.4
Aug. 11-20.....	38.6	12	.09	4.6	1.5	3.9	25	2.7	1.4	.1	.7	42	18	0	50.8	6.5	7	4.0	3.1
Aug. 21-31.....	43.5	12	.07	4.6	1.5	3.7	25	2.7	1.4	.1	.3	43	18	0	51.8	6.4	7	7.8	2.6
Sept. 1-10.....	52.5	12	.04	4.2	1.3	4.2	22	3.1	2.2	.1	.8	40	16	0	46.3	6.8	23	4.2	2.5
Sept. 11-20.....	41.0	10	.10	4.6	1.7	2.7	24	2.7	1.1	.1	.2	41	18	0	52.2	6.7	8	3.9	3.3
Sept. 21-30.....	30.8	11	.04	4.6	1.8	3.5	27	2.7	1.4	.1	.1	40	19	0	51.6	6.4	6	--	--
Average.....	153	11	.06	3.8	1.2	3.6	19	3.1	1.5	0.1	0.7	37	14	0	48.1	--	8	3.7	2.2

TENNESSEE RIVER BASIN--Continued

BIG LAUREL CREEK NEAR STACKHOUSE, N. C.--Continued

Temperature (°F) of water, water year October 1951 to September 1952
 (Once-daily temperature measurement at approximately 6 p. m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	78	54	40	50	42	46	58	65	74	82	71	75
2	72	51	41	50	44	42	58	66	70	--	77	74
3	72	45	46	45	48	45	58	68	75	80	81	71
4	71	44	52	46	48	52	50	68	78	82	79	69
5	70	48	48	44	42	46	45	68	74	76	76	70
6	74	46	48	40	42	45	42	68	80	76	74	72
7	68	--	55	34	40	46	52	70	70	76	71	74
8	69	41	58	40	42	44	54	68	70	70	75	72
9	58	43	55	48	42	48	58	70	68	72	78	74
10	57	44	48	38	46	48	60	65	85	74	84	72
11	55	46	42	39	46	48	62	58	72	75	81	70
12	58	45	40	42	46	50	65	56	70	80	82	74
13	56	54	38	46	50	54	64	57	80	84	81	76
14	58	55	39	42	54	50	50	54	80	70	82	75
15	59	50	38	52	50	45	45	66	84	80	81	72
16	60	52	34	52	48	40	54	70	80	81	80	73
17	61	43	34	52	42	46	46	74	80	76	81	73
18	61	36	36	48	41	44	58	74	80	88	82	71
19	80	32	35	46	46	52	65	68	80	79	76	73
20	61	34	35	48	44	55	66	66	82	82	82	71
21	63	35	46	44	46	52	66	64	82	83	78	68
22	65	38	38	46	42	58	68	80	80	84	76	65
23	63	45	39	40	46	54	66	70	82	83	74	68
24	64	45	40	38	46	45	60	68	84	82	78	68
25	80	48	42	42	46	50	64	68	84	82	74	67
26	68	50	42	50	42	54	56	66	84	83	76	68
27	68	42	36	52	45	52	54	68	84	85	74	68
28	59	44	35	46	--	52	58	74	82	85	--	68
29	58	42	38	40	52	52	50	62	86	81	77	70
30	61	41	46	36	--	56	62	68	86	79	72	71
31	55	--	48	40	--	55	--	--	--	80	75	--
Average	63	44	42	44	45	49	57	66	78	79	77	71

TENNESSEE RIVER BASIN--Continued
SOUTH TOE RIVER AT NEWDALE, N. C.

LOCATION.--At gaging station at bridge on U. S. Highway 19 E at Newdale, Yancey County, 1.3 miles upstream from Little Crabtree Creek, 6.1 miles east of Burnsville, and at mile 6.9.

DRAINAGE AREA.--60.8 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1236.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs) ^a	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium-magnesium	Non-carbonate			
Oct. 15, 1951.....	27	8.0	0.2	0.8	0.3	1.8	1.1	7	1.6	0.9	0.0	0.1	17	3	0	17.8	6.2	2
Nov. 15.....	60	6.2	.01	1.8	.8	1.5		8	2.1	1.5	.0	.3	21	8	1	20.7	6.7	8
Dec. 24.....	240	5.8	.03	1.4	.6	1.7		7	1.7	1.4	.0	.3	17	6	0	18.1	6.3	9
Jan. 18, 1952.....	130	6.8	.04	2.2	.4	1.3	.8	8	1.9	1.2	.1	.3	18	7	1	16.0	7.3	2
Feb. 18.....	140	6.2	.03	1.4	.5	1.0		5	1.6	1.0	.1	.4	16	6	1	14.1	6.0	5
Mar. 26.....	450	5.5	.01	1.2	.4	1.7		6	1.6	.9	.1	.3	14	5	0	14.5	6.5	8
Apr. 30.....	270	6.0	.03	1.0	.3	1.8	.5	6	1.9	1.4	.0	.2	18	4	0	13.6	6.4	1
May 19.....	130	6.3	.03	1.8	.7	1.6		9	1.9	.8	.1	.2	19	7	0	16.7	6.3	2
June 30.....	40	7.6	.05	1.8	.6	1.0		6	2.3	1.0	.0	.6	22	7	2	17.3	5.9	3
July 22.....	45	7.0	.05	1.2	.5	1.6	.3	6	1.6	1.1	.0	.2	17	5	0	16.4	6.4	1
Aug. 20.....	32	7.3	.03	1.8	.3	1.4		5	2.7	1.1	.0	.3	19	6	2	24.8	6.2	14
Sept. 27.....	30	6.4	.01	1.2	.5	.6	.3	3	1.5	1.1	.2	.4	16	5	3	17.2	5.9	3

^a Estimated discharge.

TENNESSEE RIVER BASIN--Continued

CANE RIVER NEAR SIOUX, N. C.

LOCATION.--At bridge on county road, 0.4 mile upstream from confluence with North Toe River, 1 mile downstream from gaging station, near Sioux, and 1.5 miles east of Sioux, Yancey County.

DRAINAGE AREA.--157 square miles (above gaging station).

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952.

Water temperatures: October 1951 to September 1952.

EXTREMES, 1951-52.--Dissolved solids: Maximum, 43 ppm July 21-31, Aug. 1-10; minimum, 28 ppm Mar. 11-20, May 1-10.

Hardness: Maximum, 18 ppm Oct. 11-20, July 1-10; Aug. 1-10; minimum, 10 ppm Mar. 11-20.

Water temperatures: Maximum, 79°F June 16, July 12; minimum, freezing point on several days in November, December, and January.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1236. No appreciable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
														Calcium, mg-nestum	Non-carbonate				Unfiltered	Filtered
Oct. 1-10, 1951	50.1	13	0.05	4.3	1.6	4.4	1.3	25	2.4	1.8	0.1	0.3	39	17	0	54.6	6.8	13	2.3	1.8
Oct. 11-20	46.5	12	0.05	4.4	1.6	4.0	1.3	26	2.3	1.5	0.1	0.4	39	18	0	50.2	7.5	6	2.6	2.0
Oct. 21-31	77.5	12	0.05	4.1	1.6	3.9	1.0	23	2.6	2.1	0.1	0.6	40	17	0	49.1	7.1	7	4.0	3.1
Nov. 1-10	208	10	0.04	4.4	1.0	2.0	3.0	16	3.1	1.5	0.1	0.8	39	15	2	43.0	7.1	17	7.0	3.3
Nov. 11-20	154	13	0.03	3.8	1.2	3.4	3.4	19	2.8	1.8	0.1	0.8	38	14	0	44.3	7.4	16	3.8	2.6
Nov. 21-30	106	12	0.02	3.4	1.1	3.4	3.4	18	2.3	1.9	0.0	0.8	33	13	0	40.2	7.2	4	2.4	1.7
Dec. 1-10	242	11	0.02	3.2	1.2	2.6	2.6	16	2.3	1.5	0.0	1.2	32	13	0	39.4	6.8	8	3.6	2.4
Dec. 11-20	276	11	0.03	2.8	1.2	3.4	3.4	12	2.6	1.8	0.1	0.9	36	12	0	44.7	6.7	5	4.2	2.4
Dec. 21-31	516	9.1	0.04	2.6	1.1	2.4	2.4	10	2.6	1.5	0.1	1.6	30	11	1	41.5	6.8	8	4.0	2.2
Jan. 1-10, 1952	250	10	0.05	2.8	1.0	2.2	1.2	14	2.3	1.4	0.1	1.5	31	11	0	42.6	7.5	4	2.9	1.9
Jan. 11-20	287	9.5	0.07	2.6	1.1	2.4	2.4	13	2.6	1.4	0.1	0.8	30	11	0	35.7	6.9	7	3.1	2.3
Jan. 21-31	437	9.8	0.08	3.7	0.9	2.4	2.4	14	2.9	1.5	0.1	1.8	33	13	2	36.3	6.7	9	4.3	1.9
Feb. 1-10	615	10	0.04	3.2	1.0	2.5	2.5	13	3.0	1.2	0.1	2.2	32	12	1	35.4	6.9	5	3.0	2.3
Feb. 11-20	238	10	0.04	3.4	1.3	1.2	1.2	13	2.4	1.2	0.1	1.6	31	14	3	33.5	7.3	4	1.8	1.3
Feb. 21-29	173	11	0.09	3.6	0.9	3.1	3.1	12	3.3	2.0	0.1	1.3	32	13	0	36.4	6.9	3	2.7	1.3
Mar. 1-10	377	10	0.05	3.6	0.9	3.2	3.2	14	3.0	2.5	0.1	1.5	32	13	1	35.4	7.1	6	6.2	1.6
Mar. 11-20	437	8.6	0.03	2.5	0.9	2.4	2.4	11	2.5	1.5	0.1	1.3	28	10	1	31.8	6.3	4	4.3	2.0
Mar. 21-31	579	9.5	0.02	3.0	0.9	2.5	2.5	12	2.6	1.9	0.1	1.4	31	11	1	36.9	6.5	6	4.5	1.8
Apr. 1-10	242	10	0.03	2.8	1.0	2.6	2.6	15	2.3	1.5	0.1	0.9	31	11	0	34.5	6.7	3	3.8	2.3
Apr. 11-20	185	9.4	0.03	3.5	0.9	1.8	1.8	14	2.4	1.0	0.1	0.9	31	12	1	33.8	7.0	2	2.7	1.8
Apr. 21-30	366	9.5	0.08	3.2	1.1	2.7	2.7	15	2.2	1.9	0.1	1.9	32	12	0	39.3	6.9	9	3.6	2.2
May 1-10	238	9.2	0.05	2.8	1.1	3.0	3.0	17	1.8	1.0	0.0	1.0	28	12	0	34.8	6.7	3	2.2	2.2
May 11-20	176	10	0.07	3.4	1.2	2.7	2.7	17	2.3	1.5	0.1	0.7	36	13	0	38.5	6.4	3	2.6	2.4
May 21-31	136	11	0.14	4.5	0.9	2.6	2.6	19	2.4	1.2	0.1	0.7	40	15	0	43.9	6.6	3	2.3	2.1

June 1-10.....	111	.06	4.2	1.2	4.2	2.7	1.6	.1	1.5	40	15	0	46.3	6.7	3	2.3	1.8	
June 11-20.....	109	.13	3.9	1.5	3.6	2.2	1.2	.1	1.6	40	16	0	47.7	6.6	20	4.2	2.2	
June 21-30.....	72.6	.08	3.8	1.5	4.7	2.5	1.4	.1	.8	39	16	0	48.6	6.7	6	2.8	2.6	
July 1-10.....	68.6	.04	4.4	1.6	3.2	2.5	1.8	.1	.6	39	18	0	50.9	6.6	4	3.1	2.4	
July 11-20.....	70.0	.17	3.9	1.5	3.9	2.3	2.1	.1	1.7	42	16	0	51.1	7.1	15	4.0	2.7	
July 21-30.....	44.9	.13	4.1	1.6	4.8	2.7	1.9	.1	1.2	43	17	0	54.0	7.2	8	3.6	2.2	
Aug. 1-10.....	56.5	.13	4.8	1.5	3.2	2.4	2.6	.1	.8	43	18	0	51.2	6.6	6	--	1.9	
Aug. 11-20.....	43.4	.12	4.0	1.5	3.5	2.4	1.8	.1	.5	39	16	0	49.3	6.6	6	--	1.8	
Aug. 21-31.....	66.2	.11	3.6	1.4	4.3	2.4	1.9	.1	.7	38	15	0	49.4	6.6	5	--	2.0	
Sept. 1-10.....	80.6	.06	3.4	1.2	2.9	1.9	2.0	1.0	.5	35	13	0	42.2	6.5	7	--	2.7	
Sept. 11-20.....	128	.08	3.4	1.2	3.0	1.7	2.6	1.8	.1	34	13	0	38.5	6.5	8	5.0	4.9	
Sept. 21-30.....	53.5	.10	3.6	1.4	2.8	2.1	1.9	2.5	.1	34	15	0	44.4	6.6	3	3.3	2.5	
Average.....	205	.11	0.06	3.5	1.2	18	2.3	1.5	0.1	0.9	35	13	0	42.9	--	6	3.5	2.2

TENNESSEE RIVER BASIN--Continued

CANE RIVER NEAR SIOUX, N. C.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	59	37	43	40	46	50	55	69	76	74	70
2	65	54	35	46	40	40	44	57	65	70	71	69
3	66	45	44	48	45	41	49	59	66	71	73	67
4	65	44	45	45	45	45	50	60	69	72	74	62
5	64	41	44	43	44	43	50	58	71	74	75	64
6	68	45	45	42	38	41	42	60	72	75	74	65
7	68	44	47	32	39	41	41	62	72	72	73	65
8	61	41	52	36	46	41	44	60	77	73	70	68
9	55	37	52	46	41	46	45	61	74	72	72	69
10	52	40	48	42	43	41	49	63	75	69	72	66
11	51	34	53	36	45	48	51	61	70	69	73	64
12	50	41	40	40	40	42	55	54	70	79	73	67
13	50	40	38	43	45	44	56	53	70	73	74	68
14	51	42	37	43	47	45	50	50	74	73	75	68
15	53	48	32	47	46	45	49	56	74	74	74	69
16	57	49	32	46	46	38	45	59	79	73	76	67
17	54	45	33	48	45	37	45	63	78	74	75	65
18	56	36	35	50	46	43	49	64	75	75	75	67
19	57	34	34	44	37	42	50	67	74	74	76	68
20	57	32	35	44	42	44	52	64	75	75	72	68
21	56	32	38	42	41	47	56	62	75	75	75	66
22	57	33	49	43	39	54	56	61	75	76	73	65
23	60	37	36	40	42	52	59	63	76	75	73	60
24	60	40	35	32	43	48	62	67	77	74	68	59
25	55	42	39	39	42	41	63	66	77	75	68	61
26	51	40	41	43	43	42	61	64	78	75	68	60
27	59	43	38	47	40	44	55	61	78	75	66	56
28	55	39	33	48	41	45	52	65	78	74	67	60
29	57	36	36	40	45	43	53	66	78	75	62	62
30	56	35	49	32	--	45	51	62	78	75	67	64
31	54	--	42	34	--	51	--	64	--	75	70	--
Average	57	41	40	42	42	44	51	60	74	73	71	65

SOUTH FORK HOLSTON RIVER AT VESTAL, VA.

LOCATION.--At gaging station at bridge on U. S. Highway 58 at Vestal, Washington County, 0.7 mile downstream from Laurel Creek, 3.2 miles northwest of Damascus, and 4.9 miles upstream from Middle Fork Holston River.

DRAINAGE AREA.--301 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950, October 1951 to September 1952.

Water temperatures: October 1949 to September 1950.

EXTREMES, 1949-50.--Dissolved solids: Maximum, 91 ppm Aug. 21-31; minimum, 40 ppm Feb. 1-10.

Water temperatures: Maximum, 74 ppm Aug. 11-20; minimum, 29 ppm Feb. 1-10, May 11-20.

Hardness: Maximum, 74 ppm Aug. 11-20; minimum, 29 ppm Feb. 1-10, May 11-20.

Water temperatures: Maximum, 75°F June 26; minimum, 33°F Feb. 20.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1236.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 19, 1951.....	84	8.0	0.04	23	8.7	6.1	1.6	106	13	3.5	0.0	0.9	116	83	6	194	7.9	6
Nov. 2,	203	7.8	.04	26	9.5	1.1	2.3	120	7.9	1.8	.1	1.9	117	104	6	196	8.3	8
Dec. 4,	200	5.7	.06	15	5.7	2.2	1.2	68	6.4	1.8	.1	.8	72	61	5	125	7.5	7
Jan. 9, 1952.....	404	7.6	.04	10	3.8	1.1	.9	45	5.2	1.6	.1	1.5	52	41	3	85.3	7.8	7
Feb. 22,	449	6.0	.04	11	3.9	2.5		50	4.9	1.0	.0	1.8	58	44	3	92.3	7.2	5
Mar. 17,	462	6.0	.01	12	4.7	1.3	1.1	53	3.7	1.3	.1	1.3	58	49	6	93.5	7.6	2
Apr. 1,	444	6.5	.01	14	4.5	1.5		57	3.7	1.3	.1	1.6	63	53	7	103	7.6	3
May 23,	512	6.0	.10	6.7	3.0	6.6	1.2	36	3.0	.7	--	.8	--	29	0	63.3	7.0	5
June 16,	188	4.3	.02	9.6	8.2	1.7		69	3.0	.7	--	1.0	--	58	1	116	7.5	5
July 14,	113	7.7	.01	18	6.6	1.2		83	4.0	1.3	--	.8	--	72	4	143	7.7	2
Aug. 4,	108	5.6	.10	15	6.4	1.5		73	4.0	1.4	--	1.4	--	64	4	129	7.7	1
Sept. 4,	101	6.3	.02	19	6.6	2.1		85	6.0	1.8	--	.9	--	75	5	148	7.5	5

TENNESSEE RIVER BASIN

301

Feb. 11-12, 21, 24-25, 1952	422	5.8	.00	473	22	290	2.4	73	29	1,320	.0	2.0	2,190	1,270	1,210	4,080	7.4	0
Feb. 14, 16-18, 22-23, 26	473	6.2	.00	189	11	134	1.5	85	19	481	.0	2.5	886	517	447	1,700	7.5	0
Mar. 1-3, 7-9, 16-18, Mar. 4, 6, 11-13, 24- 25	435	6.9	.00	215	3.8	186	1.6	79	18	614	.0	2.5	1,070	552	487	2,100	7.5	0
Mar. 5	2,103	7.5	.00	91	9.2	50	.6	75	18	202	.0	2.0	417	265	203	865	7.7	0
Mar. 14-15, 20-23, 26- 28, 30	1,560	7.2	--	44	7.3	28	.9	81	16	90	--	2.0	235	140	74	428	7.9	--
Mar. 29, 31, Apr. 1-2, 5-6	1,096	7.2	.03	130	12	109	1.5	75	21	381	.0	2.0	701	374	312	1,380	7.7	0
Apr. 3-4, 7, 9-11, 14, Apr. 8, 12-13, 15-20, Apr. 21-25	443	6.0	.45	162	6.0	130	1.8	92	27	451	.0	4.0	833	429	353	1,620	7.8	2
Apr. 26	265	4.0	.35	236	45	237	2.1	82	37	848	.0	2.5	1,450	779	707	2,760	7.6	2
Apr. 27, May 3	288	4.4	.24	307	51	356	2.5	76	39	1,145	.0	3.0	1,940	976	913	3,680	7.5	2
May 4-10	596	--	.37	185	22	147	3.4	72	24	1,300	.0	3.0	2,180	1,090	1,030	3,990	7.4	2
May 11-13, 16-17, 22, May 14-15	724	5.8	.35	78	9.8	68	1.4	77	5.8	212	.0	2.5	422	235	172	830	7.6	2
May 18-21, 23	1,560	7.3	.18	116	13	74	1.4	61	14	310	.0	2.0	568	343	283	1,680	7.8	2
May 24-31, June 1-2	592	7.5	.20	152	20	125	1.6	56	21	490	.0	2.5	1,080	462	416	3,190	7.6	2
June 3-10	373	4.8	.23	294	33	298	2.2	71	34	980	.0	2.0	1,580	969	911	3,150	7.8	2
June 11-20	338	5.4	.23	160	12	163	1.6	61	15	530	.0	2.5	923	448	339	1,640	7.4	2
June 21-30	468	5.4	.00	82	3.3	66	1.4	72	14	195	--	1.5	404	216	158	792	7.5	3
July 1-10	345	5.5	.00	280	15	217	2.1	63	28	808	.0	2.2	1,390	760	709	2,590	6.8	2
July 11-20	338	5.9	.00	303	16	262	2.3	63	35	937	.0	2.2	1,620	922	771	3,030	6.9	1
July 21-31	178	4.2	.00	495	26	580	2.1	55	55	1,660	.0	3.0	2,840	1,320	1,270	5,090	7.0	1
Aug. 1-10	159	2.9	.00	618	29	695	3.6	48	60	2,070	.0	1.5	3,490	1,661	1,622	6,230	7.3	2
Aug. 11-20	112	3.8	.00	789	50	835	4.7	42	77	2,570	.0	3.0	4,330	2,120	2,090	7,550	7.0	3
Aug. 21-31	58.4	3.9	.00	870	73	1,010	5.6	42	91	3,050	.0	3.0	5,130	2,470	2,440	8,840	6.9	4
Sept. 1-10	87.0	2.5	.00	824	97	960	5.2	44	75	2,980	.0	3.0	4,970	2,460	2,420	8,680	7.2	1
Sept. 11-20	54.7	2.8	.00	862	67	965	5.4	44	77	3,030	.0	3.0	5,020	2,430	2,390	8,680	7.0	3
Sept. 21-30	66.8	2.7	.00	901	37	945	5.8	45	79	3,110	.0	2.0	4,880	2,400	2,360	8,460	6.7	3
Oct. 1-10	65.2	5.2	.02	996	123	1,140	9.5	41	94	3,710	.1	7.5	6,100	2,990	2,960	10,500	7.0	2
Oct. 11-20	57.1	6.8	.03	1,070	229	1,320	9.5	44	109	4,420	.2	6.3	7,190	3,610	3,580	12,400	6.8	2

TENNESSEE RIVER BASIN--Continued

NORTH FORK HOLSTON RIVER AT HOLSTON, VA.--Continued

Chemical analyses, in parts per million, water year October 1951 to September 1952--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Sept. 1-10, 1952	51.7	5.6	0.02	1,160	269	1,470	11	42	124	4,960	0.2	9.8	8,030	4,000	3,970	13,600	7.1	2
Sept. 11-21	51.5	4.0	.02	1,070	389	1,530	11	42	123	5,200	--	10	8,360	4,270	4,230	14,300	6.9	2
Sept. 22-24, 26-30	57.0	4.5	.01	1,220	51	1,000	8.0	37	90	3,740	.0	2.8	6,130	3,250	3,220	10,600	6.7	2
Average	446	5.6	0.05	555	60	514	3.9	62	49	1,880	--	3.8	3,300	1,620	1,570	5,560	--	2

TENNESSEE RIVER BASIN--Continued

NORTH FORK HOLSTON RIVER AT HOLSTON, VA.--Continued

Temperature (°F) of water, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	56	44	52	45	49	60	61	78	86	81	80
2	--	56	42	54	46	44	58	65	80	79	82	78
3	75	48	46	56	49	48	57	69	81	80	80	75
4	74	46	48	--	50	50	58	69	79	81	78	74
5	70	42	48	48	47	47	52	70	81	75	79	75
6	72	48	50	42	45	47	45	75	82	82	75	76
7	74	42	52	42	47	45	50	75	77	80	74	76
8	69	40	52	44	45	45	53	73	82	80	82	74
9	64	40	--	46	45	50	59	74	82	76	84	76
10	58	42	48	38	49	--	61	55	79	80	80	75
11	58	44	46	44	48	48	62	59	79	80	78	79
12	55	48	44	45	48	46	61	58	76	74	80	80
13	55	48	44	46	50	52	65	59	79	82	80	76
14	54	50	46	50	56	50	58	65	82	81	82	78
15	58	46	--	51	50	46	52	62	79	82	79	75
16	57	52	34	48	51	42	62	--	87	80	84	75
17	59	46	34	48	45	47	59	--	79	81	82	73
18	58	40	38	49	46	45	57	--	85	84	83	70
19	57	38	42	45	47	--	59	--	85	84	84	72
20	64	36	40	46	49	55	65	--	--	85	78	74
21	58	44	42	47	48	52	68	--	83	86	79	70
22	--	42	38	48	48	55	69	--	83	86	78	68
23	62	44	35	44	48	58	72	--	80	85	74	69
24	66	46	44	42	47	52	68	--	88	87	80	67
25	60	46	46	45	48	50	64	--	86	85	77	--
26	62	46	42	48	45	52	62	--	83	85	78	71
27	58	45	42	51	46	50	58	--	85	83	77	70
28	58	42	37	49	49	50	59	--	87	85	72	73
29	62	40	38	42	50	54	60	--	80	85	75	73
30	58	44	44	40	--	57	59	--	84	85	76	74
31	58	--	52	39	--	59	--	75	--	74	78	--
Average	62	45	43	46	48	50	60	--	82	82	79	74

TENNESSEE RIVER BASIN--Continued

CLINCH RIVER AT SPEERS FERRY, VA.

LOCATION.--At gaging station at bridge on U.S. Highway 58, 0.5 mile downstream from Copper Creek, 0.8 mile northwest of Speers Ferry, Scott County, and 1.8 miles downstream from Clinchport.

DRAINAGE AREA.--1,126 square miles.

RECORDS AVAILABLE.--Chemical analyses: April 1930 to March 1931, October 1949 to September 1950, October 1951 to September 1952.

Water temperatures: October 1949 to September 1950.

EXTREMES, 1930-31, 1949-50.--Dissolved solids: Maximum, 175 ppm Nov. 11-20, 1930; minimum, 101 ppm May 11-20, 1930, Mar. 21-31, 1931.

Hardness: Maximum, 156 ppm Nov. 11-20, 1930; minimum, 85 ppm May 11-20, 1930.

Water temperatures (1949-50): Maximum, 84°F Sept. 2, 1950; minimum, 37°F Dec. 6, 1949.

REMARKS.--Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1236.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 11, 1951	174	4.0	0.04	36	14	4.1	4.1	166	15	2.9	0.0	0.7	162	147	11	286	7.9	5
Nov. 15	1,060	8.4	0.06	36	8.1	3.2	3.2	134	14	2.4	0	2.9	145	123	13	239	7.9	10
Dec. 11	2,380	7.5	0.02	28	5.3	2.3	1.3	100	13	1.9	0	2.9	111	92	10	188	8.0	9
Jan. 12, 1952	4,090	6.6	0.12	27	4.8	2.1	1.2	93	12	2.0	0	2.7	108	87	11	178	8.1	11
Feb. 27	1,090	4.9	0.00	28	10	1.3	0.8	123	8.6	1.8	0	3.1	147	112	11	228	8.2	2
Mar. 20	3,540	7.3	0.00	23	7.9	0.8	0.8	94	10	1.7	0	2.9	115	90	13	186	7.9	2
Apr. 18	755	2.4	0.08	26	8.5	--	--	a128	14	1.4	--	--	--	100	0	209	8.4	2
May 21	1,460	5.6	0.10	27	8.2	4.5	4.5	112	15	1.2	--	2.1	--	101	9	206	7.8	5
June 23	456	4.2	0.01	27	12	3.3	3.3	131	12	2.0	--	1.4	--	117	9	231	7.9	5
July 17	272	5.0	0.10	30	13	4.9	4.9	148	14	2.0	--	0.9	--	128	7	254	8.0	4
Aug. 8	275	3.2	0.10	27	14	4.9	4.9	147	11	2.1	--	1.8	--	125	4	249	8.2	1
Sept. 8	152	3.7	0.10	32	15	6.5	6.5	163	17	2.6	--	1.0	--	142	8	271	7.8	5

a Includes equivalent of 7 parts per million of carbonate (CO₃).

TENNESSEE RIVER BASIN--Continued
TENNESSEE RIVER NEAR PADUCAH, KY.

LOCATION --At auxiliary gage at bridge on U.S. Highway 60, one mile upstream from Clarks River, 3 miles southeast of Paducah, McCracken County, 5.3 miles upstream from mouth, and 16.3 miles downstream from base gage at Gilbertsville.

DRAINAGE AREA --40 320 square miles

RECORDS AVAILABLE --Chemical analyses: October 1949 to September 1950, October 1951 to September 1952.

REMARKS --Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1236.

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium, mg./centum	Non-carbonate			
Oct. 3, 1951	36,900		2.8	0.03	21	4.4	4.2	1.5	74	11	7.0	0.2	1.0	92	70	10	171	7.8	2
Nov. 9	57,000		3.5	.03	22	4.4	5.5	2.0	76	13	9.0	.2	1.0	99	74	11	172	7.7	1
Dec. 11	190,000		3.2	.05	19	4.9	5.6	1.4	60	14	12	.1	1.5	99	68	18	168	7.6	5
Jan. 16, 1952	96,400		5.9	.04	18	2.9	3.8	.9	52	8.9	8.0	.1	2.3	84	57	14	136	7.0	6
Mar. 14	254,000		5.9	.06	17	3.9	3.9	1.9	62	8.4	4.2	.1	2.4	77	58	8	119	7.1	10
Apr. 17	35,300		5.3	.07	15	2.9	3.3	1.1	54	5.1	3.8	.1	2.2	69	50	5	106	7.4	15
May 20	37,900		3.5	.07	11	5.3	3.8	.8	53	7.7	3.2	.1	1.0	67	50	6	110	7.0	9
June 26	40,700		1.8	.01	17	2.7	2.5	.8	56	7.6	3.2	.0	1.0	69	53	8	121	7.0	1
July 31	31,400		1.7	.02	19	3.2	4.2	1.0	70	9.2	4.2	.1	.3	79	60	3	140	7.2	1
Sept. 3	35,800		4.8	.04	19	3.2	4.2	1.3	66	9.7	5.2	.2	.2	71	61	6	149	6.7	2

OHIO RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN OHIO RIVER BASIN IN PENNSYLVANIA

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃) (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO ₃	Total acidity as H ₂ SO ₄	Specific conductance (micro-mhos at 25° C)	pH	Color	
KISKIMINETAS RIVER AT LEECHBURG																					
Aug. 4, 1952								119	0	578	14		0.5		364	364	183	1,380	2.6	6
SEWICKLEY CREEK AT AMBRIDGE																					
Apr. 21, 1952	...		8.6		0.02		19	6.6	12		32	49	15	0.1	3.1	136	75	43	233	6.8	5
CHARTIERS CREEK AT CARNEGIE																					
Apr. 21, 1952	...		7.9		0.02		80	30	91		38	423	33	0.1	2.4	752	323	292	1,030	6.5	5
TURTLE CREEK AT TRAFFORD																					
Apr. 21, 1952	...		10	13	1.3	2	56	13	53	0	339	22	0.1	1.2	565	269	269	120	861	3.3	8
PETERS CREEK AT WILSON																					
Apr. 21, 1952	...		9.6		0.05		106	38	72		30	479	34	0.1	7.6	807	421	396	1,060	6.6	8

PART 4. ST. LAWRENCE RIVER BASIN
STREAMS TRIBUTARY TO LAKE MICHIGAN
BLACK RIVER NEAR GARNET, MICH.

LOCATION.--Temperature recorder at gaging station on right bank, 10 feet upstream from county bridge, 15 feet downstream from unnamed tributary entering from right, 3/4 miles upstream from Lake Michigan, and 4 miles southwest of Garnet.
DRAINAGE AREA.--28 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1951 to September 1952.
EXTREMES, 1951-52.--Water temperatures: Maximum, 68° F July 21, 22, minimum 32° F Nov. 18-21.
REMARKS.--River does not freeze over.

Temperature (°F) of water, water year October 1951 to September 1952

/Recorder with temperature attachment, continuous ethyl alcohol actuated thermograph/

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

PINE RIVER NEAR HOXEYVILLE, MICH.

--Temperature recorder at gaging station on right bank 500 feet upstream from State Highway 37 bridge, 4 1/2 miles northwest of Honey-ville, 6 1/2 miles northwest of DUBLIN, 7 miles east of Wellston, and 9 miles upstream from mouth.
 DRAINAGE AREA.--251 square miles.
 RECORDS AVAILABLE.--Water temperatures: July to September 1952.
 EXTREMES. July to September 1952.--Water temperatures: Maximum, 66°F July 21-24.

Temperature ($^{\circ}\text{F}$) of water, period July to September 1952[illegible]

STREAMS TRIBUTARY TO LAKE HURON

PIGEON RIVER NEAR VANDERBILT, MICH.

LOCATION.--Temperature recorder at gaging station on right bank at Pigeon River Fisheries Experiment Station, 10 miles east of Vanderbilt, and 10 1/2 miles southeast of Wolverine.

DRAINAGE AREA.--63 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1952.

EXTREMES, 1951-52.--Water temperatures: Maximum, 78°F July 6, 7, ; minimum, 33°F Mar. 18, 25, Apr. 6.

EXTREMES, 1950-51.--Water temperatures: Maximum, 78°F July 6, 7, 1952; minimum, freezing point on many days during period November 1950 to March 1951.

REMARKS.--Stream frozen Nov. 20, 21, 23-27, Dec. 14-29, Jan. 22-26, Feb. 10, 15-23, Mar. 5-8. Temperatures given for these periods are for the underflow.

Temperature (°F) of water, water year October 1951 to September 1952

/Recorder with temperature attachment, continuous ethyl alcohol actuated thermometer/

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

STREAMS TRIBUTARY TO LAKE HURON--Continued

AU SABLE RIVER AT MIO, MICH.

LOCATION.--Temperature recorder at gaging station on right bank 150 feet upstream from State Highway 33 bridge at Mio, 10 miles downstream from Big Creek, and about 80 miles upstream from mouth.

DRAINAGE AREA = 1,100 square miles.

DRAINAGE AREA.--1,100 square miles.
RECORDS AVAILABLE.--Water temperatures: July to September 1952.

RECORDS AVAILABLE. --Water temperatures: July to September 1952. EXTREMES. July to September 1952. --Water temperatures: Maximum. 74°F July 27. 28.

Temperature ($^{\circ}\text{F}$) of water, period July to September 1952

temperature (2) or water) period easy to September 1967
Recorder with temperature attachment. continuous ethyl alcohol actuated thermograph/

ST LAWRENCE RIVER BASIN

STREAMS TRIBUTARY TO LAKE HURON--Continued

SAU GRES RIVER NEAR NATIONAL CITY, MICH.

LOCATION.--Temperature recorder at gaging station on left bank, 1½ miles upstream from Elm Creek, 4 miles southwest of National City, 12½ miles southwest of Tawas City, and 15½ miles upstream from mouth.

DRAINAGE AREA.---169 square miles.

RECORDS AVAILABLE. --Water temperatures: October 1951 to September 1952.

EXTREMES, 1951-52.---Water temperatures: Maximum, 83°F June 25; minimum, freezing point on many days during November, December, January, February, and March.

REMARKS.--Stream frozen Nov. 7-11, Nov. 19 to Dec. 2, Dec. 13 to Mar. 28. Temperatures given for these periods are for the underflow.

Temperature ($^{\circ}\text{F}$) of water, water year October 1951 to September 1952

temperature (°F) of water, water year October 1951 to September 1952

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

STREAMS TRIBUTARY TO LAKE HURON--Continued
EAST BRANCH AU GRES RIVER AT MC IVOR, MICH.

LOCATION.--Temperature recorder at gaging station on right bank at Mc Ivor, 1.1 miles east of National City, and 9 miles southwest of Tawas City.
DRAINAGE AREA.--84 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1951 to September 1952.
EXTREMES, 1951-52.--Water temperatures: Maximum, 75°F June 25; minimum, 33°F on many days during November, January, February, March, and April.
REMARKS.--Stream frozen Dec. 13 to Mar. 9. Temperatures given for this period are for the underflow.

Temperature (°F) of water, water year October 1951 to September 1952
/Recorder with temperature attachment, continuous ethyl alcohol actuated thermograph/

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

STREAMS TRIBUTARY TO LAKE HURON--Continued

HOUGHTON CREEK NEAR LUPTON, MICH.

LOCATION --Temperature recorder at gaging station on right bank half a mile upstream from mouth, 3 miles downstream from Wilkins Creek, and 3 miles southeast of Lupton.

DRAINAGE AREA --27 square miles.

RECORDS AVAILABLE --Water temperatures: July 1950 to September 1952.

EXTREMES, 1951-52. --Water temperatures: Maximum, 69° F June 25; minimum, freezing point on many days during November, December, January, and February.

EXTREMES, 1950-52. --Water temperatures: Maximum, 69° F June 25, 1952; minimum, freezing point on many days during winter months.

REMARKS --Stream frozen Dec. 17-30, Jan. 28-31. Temperatures given for these periods are for the underflow.

Temperature (°F) of water, water year October 1951 to September 1952

/Recorder with temperature attachment, continuous ethyl alcohol actuated thermograph/

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

STREAMS TRIBUTARY TO LAKE HURON--Continued

RIFLE RIVER AT "THE RANCH" NEAR LUPTON, MICH.

LOCATION.--Temperature recorder at gaging station on left bank, a quarter of a mile downstream from Houghton Creek, and 3 miles southwest of Lupton.

DRAINAGE AREA.--54 square miles.

RECORDS AVAILABLE.--Water temperatures: July 1950 to September 1952.

EXTREMES, 1951-52.--Water temperatures: Maximum, 72°F June 25, 26, minimum, freezing point on many days during December, January, and February.

EXTREMES, 1950-52.--Water temperatures: Maximum, 72°F June 25, 26, 1952; minimum, freezing point on many days during winter months.

REMARKS.--Stream frozen Dec. 16-29, Jan. 29-31. Temperatures given for these periods are for the underflow.

Temperature (°F) of water, water year October 1951 to September 1952

/Recorder with temperature attachment; continuous ethyl alcohol actuated thermometer/

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

STREAMS TRIBUTARY TO LAKE HURON--Continued

PRIOR CREEK NEAR SELKIRK, MICH.

LOCATION.--Temperature recorder at gaging station on right bank a quarter of a mile upstream from mouth, half a mile downstream from Amound Creek, and 1½ miles north of Selkirk.

DRAINAGE AREA.--19 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1952.

EXTREMES, 1951-52.--Water temperatures: Maximum, 71° F June 26, July 13, 14; minimum, freezing point on many days during December, February, and March.

EXTREMES, 1950-52.--Water temperatures: Maximum, 71° F June 26, July 13, 14, 1952; minimum, freezing point on many days during winter months.

REMARKS.--Stream frozen Nov. 19-21, 23-29, Dec. 14 to Feb. 27, Mar. 1-16. Temperatures given for these periods are for the underflow.

Temperature (°F) of water, water year October 1951 to September 1952

/Recorder with temperature attachment, continuous ethyl alcohol actuated thermograph/7

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1	53	47	41	39	35	34	33	33	--	--	33	32	38	37	60	54	57	52	68	61	69	55	63	63
2	56	53	39	37	35	35	33	33	--	--	32	32	38	37	58	54	59	53	66	64	69	55	63	60
3	59	56	37	34	38	35	33	33	--	--	32	32	37	37	56	50	62	56	67	66	60	57	60	58
4	59	57	34	34	37	36	33	33	--	--	32	32	38	37	55	52	60	56	68	64	61	60	60	58
5	59	57	33	33	36	34	33	33	--	--	32	32	37	36	60	52	58	55	67	62	61	59	61	58
6	57	51	33	33	35	34	33	33	--	--	33	32	37	35	60	55	64	56	67	63	61	58	61	59
7	51	47	33	33	37	35	33	33	--	--	33	32	41	35	56	50	64	60	68	64	61	59	59	57
8	47	45	33	33	37	37	33	33	--	--	32	32	44	36	57	51	66	61	69	64	63	60	56	54
9	48	46	33	33	37	36	33	33	--	--	33	32	42	38	55	50	66	63	65	62	63	62	59	56
10	47	42	34	33	38	33	33	33	--	--	33	32	42	37	54	52	64	60	66	63	62	61	62	59
11	47	42	35	34	33	33	33	33	--	--	34	33	42	35	52	50	62	57	67	64	62	60	61	63
12	48	45	35	35	32	33	33	33	--	--	33	35	42	39	50	49	61	58	70	66	61	59	64	61
13	48	43	39	35	32	32	33	33	--	--	33	35	40	38	55	48	62	59	71	67	62	59	63	61
14	50	46	41	39	32	32	33	33	--	--	33	34	39	38	55	52	65	60	71	69	64	61	63	63
15	54	49	38	36	32	32	33	33	--	--	33	33	39	38	57	52	65	63	69	67	66	64	64	62
16	53	48	38	36	32	32	33	33	--	--	33	33	53	43	55	50	66	62	67	63	66	66	62	58
17	53	51	36	35	32	32	33	33	--	--	33	34	54	48	56	51	65	64	68	66	66	62	59	56
18	51	50	35	34	32	32	33	33	--	--	34	34	57	49	55	51	65	60	67	65	63	62	58	58
19	50	48	33	33	32	32	33	33	--	--	33	34	58	52	57	51	63	60	69	65	63	60	58	50
20	46	43	33	33	32	32	33	33	--	--	33	33	60	53	56	53	60	54	68	67	61	61	56	55
21	48	46	33	33	32	32	33	33	--	--	33	33	60	53	59	53	55	55	68	67	63	61	56	54
22	51	48	33	33	32	32	33	33	--	--	34	34	60	57	58	53	61	59	66	65	62	59	55	53
23	51	47	33	33	32	32	33	33	--	--	34	34	57	50	58	55	61	59	66	65	57	54	54	54
24	47	44	33	33	32	32	33	33	--	--	34	34	54	47	58	54	68	62	66	62	58	54	54	52
25	46	43	33	33	32	32	33	33	--	--	34	34	56	47	58	54	70	66	64	61	61	57	57	54
26	47	44	33	33	32	32	33	33	--	--	35	35	57	48	60	55	71	69	67	64	63	60	57	56
27	47	44	33	33	32	32	--	--	--	--	37	35	59	51	61	55	69	64	67	63	64	61	56	52
28	44	42	33	33	32	32	--	--	--	--	37	35	61	54	61	59	65	63	66	64	65	62	57	54
29	44	40	33	33	32	32	--	--	--	--	37	36	62	54	59	54	66	63	64	60	65	64	58	57
30	44	42	34	33	32	32	--	--	--	--	36	34	62	55	52	57	63	61	58	64	64	54	58	55
31	44	41	--	--	35	32	--	--	--	--	34	34	--	--	54	53	--	--	60	55	64	64	--	--
Average	50	47	35	34	33	33	a33	a33	a33	a33	34	33	49	44	57	52	64	60	67	64	62	60	59	57

a Includes estimated temperatures, 33° F, on missing days.

STREAMS TRIBUTARY TO LAKE HURON--Continued
RIFLE RIVER AT SELKIRK, MICH.

LOCATION.--Temperature recorder at gaging station on left upstream bank of bigway bridge at Selkirk and 1½ miles downstream from Prior Creek.
DRAINAGE AREA.--110 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1952.
EXTREMES, 1951-52.--Water temperatures: Maximum, 76° F June 25, 26; minimum, freezing point on many days during November, December, January and February.
EXTREMES, 1950-52.--Water temperatures: 76° F June 25, 26, 1952; minimum, freezing point on many days during winter months.
REMARKS.--Stream frozen Dec. 13 to Jan. 5, Jan. 11, 12, 21-26, 30, 31, Feb. 9, 10, 13-19, Mar. 6-8.

Temperature (°F) of water, water year October 1951 to September 1952
/Recorder with temperature attachment, continuous ethyl alcohol actuated thermograph/

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

STREAMS TRIBUTARY TO LAKE HURON--Continued
WEST BRANCH RIFLE RIVER NEAR SELKIRK, MICH.

LOCATION.--Temperature recorder at gaging station on left bank half a mile downstream from Campbell Creek, 3½ miles upstream from mouth, 4 miles southwest of Selkirk, and 6½ miles southeast of West Branch.

DRAINAGE AREA.--32 square miles.

RECORDS AVAILABLE.--Water temperatures: May to September 1952.

EXTREMES, May to September 1952.--Water temperatures: Maximum, 77°F July 13.

Temperature (°F) of water, period May to September 1952

/Recorder with temperature attachment, continuous ethyl alcohol actuated thermograph/

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1															62	54	62	54	74	65	67	61	68	66
2															61	52	64	55	73	68	69	65	66	64
3															59	50	66	60	74	71	69	64	64	61
4															59	53	65	59	73	67	68	63	64	58
5															64	53	64	59	74	66	67	64	65	60
6															62	57	70	61	75	67	68	62	65	62
7															58	51	70	62	75	68	68	62	62	60
8															59	51	72	64	75	66	71	64	62	57
9															58	51	71	65	70	64	71	67	66	59
10															57	54	69	63	70	64	69	66	68	62
11															55	52	66	60	71	65	68	64	70	65
12															52	50	66	60	75	67	65	61	70	65
13															57	47	66	62	77	70	66	60	71	66
14															56	51	72	64	75	71	70	62	71	68
15															59	52	71	66	72	69	71	66	70	65
16															60	50	73	65	72	66	71	68	65	60
17															58	52	73	68	73	68	70	65	62	57
18															60	54	72	63	73	68	69	63	62	60
19															60	52	74	69	69	63	61	58	51	56
20															59	55	--	--	73	70	68	64	59	57
21															62	55	--	--	73	70	68	64	58	55
22															62	55	--	--	73	69	68	61	57	53
23															62	58	--	--	72	69	64	59	55	52
24															58	57	--	--	71	66	66	60	55	51
25															61	56	--	--	71	64	68	62	59	54
26															64	56	--	--	74	68	71	66	59	55
27															65	58	75	69	75	69	71	65	56	52
28															65	60	71	67	74	70	72	66	58	53
29															62	57	75	66	71	65	72	68	58	56
30															58	54	73	67	69	63	71	67	58	55
31															58	56	--	--	67	61	71	68	--	--
Average															60	54	--	--	73	67	69	64	63	59

LAKE ERIE

MISCELLANEOUS ANALYSES OF WATER, LAKE ERIE

Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium (Cr) hexavalent	Copper (Cu)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Oxygen consumed	
																Total	Non-carbonate			Unfiltered	Filtered

LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE, TOLEDO, OHIO

Oct. 1, 1951.....		0.8	0.08	0.00	0.0	37	8.3	11	2.0	120	25	22	0.2	1.8	177	126	28	306	7.4	5	4.6	4.4
Nov. 1.....		1.3	.01	.00	0	31	8.7	11	1.7	107	17	21	0	1.0	164	114	25	274	7.9	3	3.8	3.6
Dec. 1.....		4.7	.05	.00	0	34	7.8	12	.9	112	16	25	.0	.8	163	116	25	278	7.7	1	5.9	2.9
Jan. 1, 1952.....		2.2	.02	.00	0	35	8.7	9.8	.6	112	19	22	.1	1.5	172	124	31	287	7.9	4	2.4	2.4
Feb. 1.....		5.1	.06	.00	0	41	9.2	5.0	2.2	112	38	7.0	.2	8.7	180	140	48	288	7.2	16	9.2	5.5

LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE, PORT CLINTON, OHIO

Oct. 1, 1951.....		1.1	0.08	0.00	0.0	36	7.8	10	1.3	118	21	22	0.2	0.6	172	122	25	286	7.8	7	3.8	3.1
Nov. 1.....		1.2	.04	.00	0	34	8.7	10	1.3	114	19	24	.2	.7	160	122	27	282	7.8	3	1.7	2.0
Dec. 1.....		2.5	.02	.00	0	39	10	11	1.3	124	32	19	.2	2.2	190	141	37	324	7.8	2	2.2	3.0
Jan. 2, 1952.....		3.9	.08	.00	0	38	9.2	9.9	1.5	109	35	14	.2	10	173	132	43	297	7.7	30	9.0	5.0
Feb. 1.....		5.0	.02	.00	0	38	8.7	6.3	1.5	104	36	11	.2	7.8	174	132	45	284	7.1	5	7.2	4.7

LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE, SANDUSKY, OHIO

Oct. 1, 1951.....		2.4	0.01	0.00	0.0	42	8.7	9.4	1.6	121	35	18	0.2	0.4	190	142	41	326	7.9	2	3.3	2.9
Nov. 1.....		1.2	.02	.00	0	34	9.7	10	1.7	114	25	20	.1	.1	170	126	31	294	7.8	3	4.5	4.1
Dec. 1.....		1.1	.04	.00	0	34	8.7	10	1.3	110	24	19	.2	.9	197	120	30	278	7.9	1	2.1	2.1
Jan. 1, 1952.....		1.1	.03	.00	0	34	9.2	9.5	1.5	110	22	21	.1	.8	162	124	33	280	7.4	4	3.0	2.5
Feb. 1.....		2.5	.06	.00	0	37	8.3	9.6	1.9	109	31	16	.1	3.6	168	126	37	289	7.7	5	4.4	4.0

LAKE ERIE (SANDUSKY BAY) AT PUBLIC WATER-SUPPLY INTAKE, CEDAR POINT, OHIO

Oct. 1, 1951.....		2.3	0.02	0.00	0.0	44	9.2	9.2	1.8	125	39	19	0.2	0.3	197	147	45	386	8.0	2	3.4	2.9
Nov. 1.....		1.2	.01	.00	0	37	10	10	1.8	116	31	21	.2	1.0	160	134	38	315	7.9	3	5.0	4.8
Dec. 1.....		1.9	.02	.00	0	40	9.5	11	2.6	116	36	20	.2	1.4	186	139	40	323	7.9	3	3.9	3.9
Jan. 1, 1952.....		1.2	.02	.00	0	40	9.7	11	1.9	118	35	20	.3	1.4	183	135	43	349	7.2	3	5.3	2.9
Feb. 1.....		4.5	.04	.00	0	46	11	7.4	1.9	110	56	16	.2	6.8	215	162	70	341	7.4	8	5.3	5.2

LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE AT HURON, OHIO

Oct. 1, 1951.....		0.8	0.05	0.00	0.0	38	8.3	9.3	1.2	114	24	20	1.1	0.2	173	126	36	296	7.3	3	2.8	2.6
Nov. 1.....		2.3	.02	.00	0	34	9.2	11	1.9	114	23	20	.0	.2	162	124	29	292	7.9	3	3.9	3.6
Dec. 1.....		3.3	.01	.00	0	34	9.7	11	2.2	110	26	20	.2	1.0	164	126	35	289	7.5	3	3.2	2.7
Jan. 1, 1952.....		1.7	.02	.00	0	35	8.3	9.0	1.2	108	24	20	.3	1.7	181	122	33	264	7.2	4	2.5	2.4
Feb. 1.....		2.7	.02	.00	0	36	8.3	7.4	1.9	102	30	16	.2	3.4	166	124	40	283	7.4	3	2.4	3.1

LAKE ERIE--Continued

MISCELLANEOUS ANALYSES OF WATER, LAKE ERIE--Continued

Chemical analyses, in parts per million, water year October 1951 to September 1952--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium hexavalent	Copper (Cu)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
															Total	Non-carbonate				Unfiltered	Filtered

LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE, VERMILION, OHIO

Oct. 2, 1951.....	2.8	0.07	0.00	0.0	0.0	36	8.0	9.6	1.2	116	25	21	0.1	0.6	128	32	265	7.8	5	2.2	2.0
Nov. 1.....	1.4	.02	.00	.0	.0	36	8.5	9.1	1.0	114	21	20	.1	1.9	126	31	260	7.9	8	3.5	2.9
Dec. 1.....	1.8	.03	.00	.0	.0	32	8.7	11	1.0	107	21	18	.2	3.6	152	28	290	7.8	5	8.1	2.8
Jan. 1, 1952.....	1.9	.02	.00	.0	.0	30	8.6	7.4	1.7	104	31	15	.2	3.0	153	38	270	7.6	4	4.1	3.1
Feb. 1.....	2.6	.07	.00	.0	.0	36	8.5	11	1.08	108	31	17	.2	2.9	167	36	286	7.9	10	4.8	3.8

LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE, LORAIN, OHIO

Oct. 1, 1951.....	1.6	0.06	0.00	0.0	0.0	38	7.8	9.5	1.3	118	24	20	0.2	0.6	173	30	300	8.1	2	3.2	2.4
Nov. 1.....	1.7	.01	.00	.0	.0	36	8.7	10	2.5	114	24	21	.0	.8	168	32	303	7.9	3	5.1	4.6
Dec. 1.....	2.0	.04	.00	.0	.0	32	9.5	8.3	1.3	106	19	18	.1	.9	148	32	257	7.9	2	---	1.7
Jan. 1, 1952.....	1.4	.03	.00	.0	.0	34	7.5	8.8	1.7	99	24	18	.2	1.4	157	35	271	7.7	4	3.0	2.7
Feb. 5.....	2.7	.08	.00	.0	.0	34	9.0	11	1.05	105	30	18	.2	3.1	165	36	284	7.6	10	5.2	4.0

LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE, ELYRIA, OHIO

Oct. 1, 1951.....	0.6	0.02	0.00	0.0	0.0	36	9.2	9.8	1.3	116	24	20	0.2	0.4	170	33	278	7.7	5	2.5	2.1
Nov. 1.....	1.7	.02	.00	.0	.0	36	8.5	11	1.5	111	23	20	.1	.8	168	30	283	7.9	5	3.7	2.5
Dec. 1.....	.7	.02	.00	.0	.0	32	9.0	11	1.5	111	22	19	.1	.5	157	32	279	7.9	3	3.3	3.0
Jan. 1, 1952.....	1.6	.02	.00	.0	.0	32	9.5	8.4	1.6	102	23	18	.2	1.0	161	35	271	7.2	3	2.8	2.4
Feb. 1.....	2.2	.11	.00	.0	.0	34	7.8	11	1.02	102	30	16	.2	2.7	166	33	277	7.6	10	5.2	3.7

LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE, AVON LAKE, OHIO

Oct. 1, 1951.....	0.9	0.06	0.00	0.0	0.0	38	7.3	9.2	1.3	a118	24	21	0.2	0.3	168	28	298	8.1	2	2.9	2.4
Nov. 1.....	1.1	.01	.00	.0	.0	38	9.7	11	1.0	120	28	22	.2	1.1	178	36	313	7.7	3	3.8	2.5
Dec. 1.....	6.7	.06	.00	.0	.0	33	8.7	9.4	1.4	110	20	18	.2	.9	159	28	275	7.9	2	1.6	2.1
Jan. 1, 1952.....	1.5	.03	.00	.0	.0	33	8.3	8.6	1.6	101	23	18	.2	1.5	154	34	270	7.7	3	2.8	2.6
Feb. 4.....	2.0	.07	.00	.0	.0	36	8.0	11	1.08	108	33	16	.1	2.7	168	36	285	7.3	5	4.4	3.8

LAKE ERIE AT DIAMOND ALKALI COMPANY INTAKE, PAINESVILLE, OHIO

Oct. 1, 1951.....	1.0	0.04	0.00	0.0	0.0	45	8.7	16	1.8	116	30	43	0.2	1.3	216	53	385	7.7	2	2.6	2.3
Nov. 1.....	1.3	.02	.00	.0	.0	46	9.7	17	2.2	116	25	50	.0	.4	216	154	402	7.8	3	3.8	3.8
Dec. 1.....	.9	.03	.00	.0	.0	36	7.8	10	.7	109	24	22	.2	1.0	162	33	285	7.9	2	2.2	2.0
Jan. 2, 1952.....	3.1	.02	.00	.0	.0	42	7.3	15	1.7	90	27	50	.0	.8	210	134	347	7.2	2	3.3	3.5
Feb. 1.....	2.1	.02	.03	.0	.0	46	9.7	125	1.6	82	27	80	.1	.5	262	154	442	6.8	7	4.0	4.8

a Includes equivalent of 5 parts per million of carbonate (CO₃).

LAKE ERIE AT INDUSTRIAL RAYON CORPORATION INTAKE, PAINESVILLE, OHIO

Oct. 1, 1951.....	1.1	0.02	0.00	0.0	39	9.2	15	1.9	112	36	31	0.0	1.4	196	136	43	352	7.8	3	2.9	2.9
Nov. 1.....	1.0	.01	.00	.0	40	10	13	1.9	114	26	35	.0	1.0	189	141	48	348	7.9	3	3.4	3.3
Dec. 1.....	1.7	.01	.00	.0	36	8.5	12	2.1	108	30	23	.1	1.0	172	124	36	307	7.6	4	3.3	2.8
Jan. 1, 1952.....	1.7	.02	.00	.0	42	8.7	17	1.2	94	32	44	.2	2.0	203	140	64	365	7.8	3	3.1	2.6
Feb. 1.....	2.6	.05	.00	.0	42	7.8	18	2.2	88	25	59	.1	.9	216	138	65	364	7.3	6	4.1	3.9

LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE, PAINESVILLE, OHIO

Oct. 1, 1951.....	4.8	0.06	0.00	0.0	39	9.0	13	1.5	114	30	28	0.1	1.0	193	135	41	320	7.8	3	2.1	2.1
Nov. 1.....	.5	.02	.00	.0	51	9.2	21	1.5	116	26	66	.2	1.0	259	165	70	434	7.9	1	1.4	1.9
Dec. 1.....	1.5	.04	.00	.0	36	9.2	13	1.2	110	27	26	.2	1.0	173	128	38	306	7.9	0	1.4	1.6
Jan. 2, 1952.....	2.4	.02	.00	.0	31	7.8	7.8	1.2	90	28	18	.0	.8	150	110	36	252	7.5	4	3.3	3.9
Feb. 1.....	1.7	.09	.01	.0	39	5.8	19	1.2	82	26	48	.1	1.2	190	122	54	343	7.7	5	5.0	4.1

LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE, FAIRPORT, OHIO

Oct. 1, 1951.....	1.1	0.01	0.00	0.0	41	8.0	12	1.9	114	27	30	0.2	1.0	187	135	42	334	7.7	2	2.9	2.4
Nov. 1.....	1.1	.03	.00	.0	48	7.0	23	1.4	115	27	53	.1	.9	222	150	54	392	7.9	3	3.4	2.7
Dec. 1.....	1.3	.03	.00	.0	36	10	12	1.4	110	28	22	.2	2.0	181	130	41	310	7.8	3	2.8	2.3
Jan. 2, 1952.....	3.2	.02	.00	.0	30	8.7	8.1	1.6	100	22	20	.0	1.0	151	110	29	255	7.6	4	3.4	2.7
Feb. 1.....	2.8	.06	.00	.0	38	6.8	13	1.4	94	23	39	.1	.8	187	122	46	313	7.5	2	3.2	4.9

LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE, ASHTABULA, OHIO

Nov. 1, 1951.....	0.7	0.02	0.00	0.0	37	9.2	11	1.7	112	24	24	0.0	0.6	171	130	38	312	8.0	2	3.3	3.3
Feb. 16, 1952.....	1.3	.04	.00	.0	34	7.5	12	1.7	104	27	19	.1	1.3	165	117	30	280	7.9	5	4.0	3.3

LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE AT CONNEAUT, OHIO

Oct. 1, 1951.....	0.9	0.01	0.00	0.0	44	6.8	14	1.3	113	28	34	0.2	1.0	196	138	45	353	7.8	2	2.5	2.5
Nov. 1.....	.8	.02	.00	.0	37	8.0	9.6	1.3	117	25	21	.2	.6	170	125	29	292	7.4	4	2.9	2.7
* Dec. 3.....	.8	.02	.00	.0	46	4.9	12	1.5	112	28	28	.2	1.0	183	136	43	316	7.9	2	1.8	2.1
Jan. 2, 1952.....	1.2	.03	.00	.0	35	7.8	13	1.5	106	24	24	.1	.8	163	120	33	292	7.9	5	4.4	2.9
Feb. 1.....	1.6	.03	.00	.0	34	7.3	13	1.3	103	26	22	.1	1.0	163	116	30	279	7.9	5	4.4	3.0

STREAMS TRIBUTARY TO LAKE ERIE

TENMILE CREEK AT TOLEDO, OHIO

LOCATION.--At bridge on Lagrange Street in Toledo, Lucas County, 6½ miles upstream from the Ottawa River.
 DRAINAGE AREA.--179 square miles.
 RECORDS AVAILABLE.--Chemical analyses: March 1951 to February 1952.
 REMARKS.--No discharge records available for this station.

Chemical analyses, in parts per million, October 1951 to February 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium hexavalent (Cr)	Copper (Cu)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
																Calcium-mg./l.	Non-carbonate-mg./l.				Unfiltered	Filtered
Oct. 12, 1951	4.7	0.02	0.02	0.0	63	16	29	153	105	28	0.3	14	17	350	224	98	554	7.8	12	6.9	4.9
Nov. 9	8.0	.04	.12	.0	80	15	12	188	87	14	.3	17	14	338	263	99	531	7.9	20	7.5	5.1
Dec. 7	9.5	.03	.10	.0	81	15	6.1	203	79	12	.2	14	14	322	264	97	496	8.2	20	9.4	5.0
Jan. 14, 1952	8.0	.06	.00	.0	82	22	15	214	100	27	2.0	8.2	11	400	295	110	604	8.0	5	5.3	4.6
Feb. 9	7.6	.03	.00	.0	73	13	11	192	79	19	1.5	11	11	336	243	86	509	8.0	6	9.3	3.2

Dissolved oxygen, cyanide, and phenols, October 1951 to February 1952

Date of collection	Time	Mean discharge (cfs)	Temperature		Dissolved oxygen	Cyanide (CN)	Phenols as C ₆ H ₅ OH
			°F	°C	Parts per million	Parts per million	Parts per million
Oct. 12, 1951	6:15 p. m.	.....	57	13.9	1.2	12	0.000
Oct. 26	6:00 p. m.	.....	54	12.2	7.4	69	.014
Nov. 9	6:30 p. m.	.....	40	4.4	10.8	83	.004
Nov. 24	11:00 a. m.	.....	41	5.0	9.6	75	.005
Dec. 7	6:30 p. m.	.....	48	8.9	9.4	81	.000
Jan. 14, 1952	10:00 a. m.	.....	38	3.3	11.8	88	.000
Feb. 9	10:30 a. m.	.....	34	1.1	12.3	87	.002

STREAMS TRIBUTARY TO LAKE ERIE--Continued

MAUMEE RIVER AT WATERVILLE, OHIO

LOCATION.--At gaging station at bridge on State Highway 64 at Waterville, Lucas County, 3 miles downstream from Tontogany Creek.

DRAINAGE AREA.--6,314 square miles.

RECORDS AVAILABLE.--Chemical analyses: March 1950 to February 1952.

Water temperatures: March 1950 to September 1952.

Sediment records: April 1950 to September 1952.

EXTREMES, 1951-52.--Water temperatures: Maximum, 90°F July 22; minimum, freezing point many days during December to February.

Sediment concentrations: Maximum daily, 1,160 ppm Mar. 12; minimum daily, 2 ppm Oct. 4, 5, Sept. 29.

Sediment loads: Maximum daily, 134,000 tons Mar. 12; minimum daily, 1 ton Oct. 4, 5.

EXTREMES, 1950-52.--Dissolved solids: Maximum, 380 ppm Oct. 21-31, 1951; minimum, 164 ppm Feb. 21-28, 1951.

Hardness: Maximum, 290 ppm Dec. 21-31, 1950; minimum, 128 ppm Feb. 21-28, 1951, Jan. 21-31, 1952.

Specific conductance: Maximum daily, 641 micromhos Nov. 9, 1950; minimum daily, 213 micromhos Jan. 30, 1952.

Water temperatures: Maximum, 90°F July 22, 1952; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 1,160 ppm Mar. 12, 1952; minimum daily, 2 ppm Oct. 4, 5, 1951, Sept. 29, 1952.

Sediment loads: Maximum daily, 134,000 tons Mar. 12, 1952; minimum daily, 1 ton Oct. 4, 5, 1951.

REMARKS.--Flow affected by ice Dec. 16 to Jan. 2. Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1237.

Chemical analyses, in parts per million, October 1951 to February 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium (Cr) hexavalent	Copper per cent (Cu)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
																Calcium	Non-carbonate				Unfiltered	Filtered
Oct. 1-10, 1951.	287	2.5	0.02	0.00	0.0	62	23	18		224	73	20	0.3	0.8	333	247	66	528	7.8	25	8.6	7.0
Oct. 11-20	379	5.4	.02	.00	0	64	25	30	4.8	260	81	21	.3	.8	369	261	49	571	7.9	25	8.6	7.7
Oct. 21-31	1,240	9.0	.02	.00	0	64	25	30		233	85	22	.3	2.1	380	262	72	537	7.7	25	8.6	6.6
Nov. 1-10	1,150	7.7	.02	.00	0	70	23	24		244	82	18	.3	5.6	370	270	69	574	7.7	25	9.4	8.1
Nov. 11-20	6,030	9.7	.02	.00	0	87	18	6.3		172	80	15	.2	11	334	242	100	510	7.6	25	8.2	7.3
Nov. 21-30	2,430	14	.02	.00	0	87	17	5.7		183	68	11	.1	11	325	236	83	478	7.6	25	8.5	6.9
Dec. 1-10	8,120	9.3	.02	.00	0	65	16	10		186	68	12	.1	12	299	227	76	464	7.6	25	8.2	7.4
Dec. 11-20	3,650	9.6	.02	.00	0	66	16	8.1		171	77	11	.1	15	306	232	90	481	7.6	25	10	7.8
Dec. 21-31	7,110	9.0	.02	.00	0	70	17	12		192	81	12	.1	14	324	248	87	505	7.6	20	9.6	7.4
Jan. 1-10, 1952.	23,600	7.4	.02	.00	0	46	10	5.7	2.9	122	44	7.5	.1	14	217	158	56	326	7.5	20	7.7	6.1
Jan. 11-20	19,500	14	.07	.00	0	58	13	7.8	2.7	164	57	8.5	.1	14	263	197	64	399	7.4	27	5.4	5.1
Jan. 21-31	32,500	9.3	.02	.00	0	37	8.7	4.8		105	36	5.0	.1	9.6	169	128	42	272	7.5	20	7.3	6.3
Feb. 1-10	21,400	7.9	.08	.00	0	43	8.7	4.5	2.3	124	40	5.8	.1	12	196	143	42	297	7.5	27	5.7	5.4
Feb. 11-20	9,350	7.5	.06	.00	0	52	12	6.2	1.4	147	51	7.5	.0	12	236	181	59	361	7.5	17	5.0	4.1
Feb. 21-28	2,500	2.5	.02	.00	0	74	18	9.1	2.1	216	76	10	.1	8.4	323	259	82	497	7.5	12	5.4	4.5

ST. LAWRENCE RIVER BASIN

STREAMS TRIBUTARY TO LAKE ERIE--Continued

MAUMEE RIVER AT WATERVILLE, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, October 1951 to February 1952

Date of collection	Time	Mean discharge (cfs)	Temperature		Dissolved oxygen		Cyanide (CN)	Phenols as C_6H_5OH
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Oct. 12, 1951....	4:30 p. m.		63	17.2	11.4	118	0.0	0.000
Nov. 9.....	4:45 p. m.		39	3.9	13.3	101	.0	.019
Dec. 7.....	4:30 p. m.		47	8.3	9.7	82	.0	.000
Jan. 14, 1952....	8:30 a. m.		35	1.7	13.6	97	.0	.003
Feb. 8.....	6:15 p. m.		36	2.2	12.6	92	.0	.000

STREAMS TRIBUTARY TO LAKE ERIE--Continued
 MAUMEE RIVER AT WATERVILLE, OHIO--Continued
 Temperature, (°F) of water, water year October 1951 to September 1952
 Continuous ethyl-alcohol actuated thermograph

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

STREAMS TRIBUTARY TO LAKE ERIE--Continued

MAUMEE RIVER AT WATERVILLE, OHIO--Continued

Suspended sediment, water year October 1951 to September 1952

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-----	274	4	3	956	29	75	1,480	35	140
2-----	274	5	4	905	30	73	1,340	29	105
3-----	274	5	4	1,030	23	64	1,460	30	118
4-----	234	2	1	939	9	23	4,110	41	s 534
5-----	250	2	1	470	12	15	14,800	260	10,400
6-----	242	5	3	837	13	29	15,800	640	27,300
7-----	441	12	s 20	1,480	12	48	12,700	410	14,100
8-----	364	13	13	1,650	12	53	10,100	334	9,110
9-----	210	6	3	1,400	13	49	9,620	264	6,860
10-----	311	5	4	1,870	12	61	9,640	205	5,450
11-----	384	7	7	2,110	12	68	8,950	151	3,850
12-----	342	9	8	2,630	12	85	7,480	115	2,320
13-----	322	10	9	4,000	18	194	5,870	108	1,850
14-----	364	9	9	9,390	58	1,470	3,690	104	1,040
15-----	353	6	6	12,000	110	3,560	2,630	96	682
16-----	322	6	5	9,620	305	7,920	1,800	98	478
17-----	311	6	5	7,060	211	4,020	1,600	81	350
18-----	300	6	5	5,480	163	2,410	1,700	53	243
19-----	364	8	8	4,220	157	1,790	1,400	42	159
20-----	228	8	5	3,780	137	1,400	1,600	34	147
21-----	274	7	5	3,250	117	1,030	2,100	31	178
22-----	290	10	8	2,130	86	495	3,500	40	378
23-----	311	18	15	1,870	72	364	5,500	37	549
24-----	1,280	90	a 310	2,420	62	405	6,500	30	528
25-----	1,170	42	133	2,600	66	463	5,900	30	b 480
26-----	1,850	40	200	3,140	58	492	5,200	32	449
27-----	2,010	35	190	2,680	37	268	7,000	31	586
28-----	2,030	35	192	2,450	33	218	9,500	37	949
29-----	1,560	25	105	1,990	47	253	9,200	48	1,190
30-----	1,480	27	108	1,740	45	211	8,800	68	1,620
31-----	1,400	29	110	--	--	--	15,000	311	12,600
Total--	19,817	--	1,499	96,097	--	27,606	195,970	--	104,337
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-----	28,000	1,000	s 80,800	18,600	168	8,440	2,380	12	77
2-----	50,000	850	115,000	14,800	146	5,830	1,940	10	52
3-----	46,800	419	52,900	13,700	157	5,810	2,280	6	37
4-----	33,200	204	18,300	22,800	193	s 12,700	2,710	14	102
5-----	23,400	129	8,150	32,500	300	26,300	3,170	18	154
6-----	17,000	90	4,130	32,500	262	23,000	4,820	19	252
7-----	12,700	65	2,230	26,200	189	13,400	5,480	20	296
8-----	9,840	50	1,330	19,200	141	7,310	4,560	36	443
9-----	8,100	40	875	17,000	119	5,460	3,660	45	445
10-----	6,860	36	667	16,400	93	4,120	3,460	33	308
11-----	5,670	31	475	21,600	115	6,710	17,300	141	s 9,860
12-----	4,120	28	311	18,600	145	7,280	42,700	1,160	134,000
13-----	4,390	22	261	14,800	130	5,190	50,400	964	131,000
14-----	5,100	23	317	11,200	110	3,330	49,500	699	93,400
15-----	11,500	54	1,680	7,060	94	1,790	37,100	485	48,600
16-----	17,500	228	s 11,400	5,290	62	886	25,500	392	27,000
17-----	26,900	342	24,800	4,560	60	739	19,200	305	15,800
18-----	38,700	720	75,200	3,810	53	545	15,300	250	10,300
19-----	37,900	660	67,500	3,660	46	455	17,000	294	13,500
20-----	43,500	518	60,800	2,920	42	331	21,600	622	36,300
21-----	39,500	448	47,800	2,810	38	288	20,400	551	30,300
22-----	31,100	336	28,200	2,480	33	221	16,400	426	18,900
23-----	24,100	230	15,000	2,450	25	165	18,000	360	17,500
24-----	18,600	205	10,300	2,840	22	169	19,200	522	27,100
25-----	14,300	160	6,160	2,760	17	127	18,000	369	17,900
26-----	17,500	153	s 7,670	2,790	13	98	14,300	276	10,700
27-----	44,300	590	a 73,000	2,380	16	103	11,000	220	6,530
28-----	53,100	630	a 90,000	2,060	14	78	8,740	175	4,130
29-----	51,300	480	66,500	1,960	12	64	7,060	110	2,100
30-----	39,500	322	34,300	--	--	--	5,290	103	1,470
31-----	24,100	209	13,800	--	--	--	4,560	99	1,220
Total--	788,560	--	919,676	329,730	--	140,939	473,110	--	659,776

s Computed by subdividing day.

a Computed from partly estimated concentration graph.

b Computed from estimated concentration graph.

STREAMS TRIBUTARY TO LAKE ERIE--Continued

MAUMEE RIVER AT WATERVILLE, OHIO--Continued

Suspended sediment, water year October 1951 to September 1952--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-----	4,030	84	914	4,390	102	1,210	5,870	75	1,150
2-----	3,570	77	742	3,400	75	688	3,690	58	578
3-----	3,310	67	589	2,550	60	413	2,950	47	374
4-----	2,790	56	422	2,300	57	354	2,280	40	246
5-----	7,470	55	s 1,180	1,830	49	242	1,900	36	185
6-----	16,400	155	s 7,080	1,830	45	222	1,830	28	138
7-----	21,000	330	a 19,000	1,230	38	126	1,360	19	70
8-----	17,000	194	8,900	1,940	36	189	1,280	24	83
9-----	13,700	155	5,730	1,670	31	140	1,650	22	98
10-----	11,200	110	3,330	2,660	31	223	1,080	20	58
11-----	9,170	87	2,150	2,380	21	135	547	17	25
12-----	7,480	79	1,600	3,570	26	251	742	17	34
13-----	8,950	67	1,620	2,420	31	202	727	18	35
14-----	15,300	150	a 6,600	1,650	41	183	1,080	9	26
15-----	23,400	370	a 23,000	1,540	42	175	1,080	12	35
16-----	22,800	271	16,700	1,170	31	98	1,920	18	93
17-----	18,000	249	12,100	1,520	28	115	2,660	21	151
18-----	14,800	190	7,590	1,460	23	91	2,420	20	131
19-----	12,200	149	4,910	2,520	39	265	1,380	31	116
20-----	10,300	124	3,450	3,930	46	488	696	16	30
21-----	7,680	99	2,050	3,600	47	457	650	12	21
22-----	5,480	81	1,200	2,630	34	241	665	12	b 22
23-----	3,870	67	700	4,160	33	371	650	15	26
24-----	9,390	79	s 2,140	7,360	53	s 1,310	680	23	42
25-----	22,800	356	s 22,900	28,600	402	s 36,700	520	20	28
26-----	24,800	414	27,700	39,500	762	81,300	508	19	26
27-----	18,000	271	13,200	31,100	442	37,100	342	13	12
28-----	12,200	208	6,850	21,600	312	18,200	432	12	14
29-----	9,620	166	4,310	14,300	236	9,110	665	12	22
30-----	6,660	130	2,340	10,300	147	4,090	363	12	12
31-----	--	--	--	7,270	94	1,840	--	--	--
Total-	363,370	--	211,007	216,380	--	196,529	42,417	--	3,881
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-----	374	14	14	445	18	22	226	19	12
2-----	445	17	20	364	15	15	266	23	17
3-----	482	22	29	274	17	13	364	24	24
4-----	458	25	31	341	16	15	258	14	10
5-----	322	29	25	254	15	10	218	15	9
6-----	332	30	27	204	15	8	210	16	9
7-----	432	28	33	204	16	9	204	16	9
8-----	445	24	29	234	18	11	226	19	12
9-----	384	20	21	258	18	13	218	12	7
10-----	332	18	16	300	14	11	204	10	6
11-----	311	17	14	218	14	8	186	5	3
12-----	290	12	9	266	15	11	1,650	40	a 210
13-----	274	11	8	395	19	20	1,420	34	s 137
14-----	258	14	10	374	17	17	470	12	15
15-----	290	18	14	384	18	19	250	7	5
16-----	273	15	11	720	34	66	206	7	4
17-----	549	31	46	374	26	26	242	6	4
18-----	374	30	30	322	18	16	353	6	6
19-----	508	24	33	408	20	22	374	8	8
20-----	520	25	35	395	19	20	266	4	3
21-----	549	25	37	332	16	14	266	4	3
22-----	607	30	49	234	20	13	311	5	4
23-----	913	48	118	250	16	11	495	10	13
24-----	2,390	66	a 420	311	15	13	458	10	12
25-----	2,980	49	394	300	20	16	495	10	13
26-----	2,150	40	232	266	12	9	445	8	10
27-----	1,250	30	b 100	218	13	8	408	8	9
28-----	939	25	63	204	13	7	364	5	b 5
29-----	686	26	49	204	16	b 9	290	2	2
30-----	607	18	30	198	19	10	234	4	3
31-----	607	22	36	210	14	8	--	--	--
Total-	21,341	--	1,983	9,461	--	470	11,577	--	584
Total discharge for year (cfs-days).....								2,567,850	
Total load for year (tons).....								2,268,287	

s Computed by subdividing day.

a Computed from partly estimated concentration graph.

b Computed from estimated concentration graph.

STREAMS TRIBUTARY TO LAKE ERIE--Continued

MAUMEE RIVER AT WATERVILLE, OHIO--Continued

Particle-size analyses of suspended sediment, October to May 1952

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500		1.000
Mar. 13, 1952	4:30 p. m.	52, 200	892	1, 590	55	68	87	95	98	99	--	--	--	--	BN
Mar. 13	4:30 p. m.	52, 200	892	1, 700	82	87	93	96	98	99	--	--	--	--	BWCM
Apr. 25	5:50 p. m.	25, 500	463	370	50	60	79	84	92	94	96	99	--	--	BWCM
Apr. 26	11:40 a. m.	25, 500	442	366	55	60	78	85	97	98	99	99	--	--	BWCM
May 25	7:30 p. m.	38, 700	662	1, 250	63	73	85	91	97	100	--	--	--	--	BWCM
May 26	11:45 a. m.	40, 300	708	1, 450	78	86	92	96	100	--	--	--	--	--	BWCM

STREAMS TRIBUTARY TO LAKE ERIE--Continued

SWAN CREEK AT TOLEDO, OHIO

LOCATION.--At bridge on Erie Street in Toledo, Lucas County, 1 mile upstream from mouth, and 4 miles downstream from the discontinued gaging station at Detroit Avenue Bridge.

DRAINAGE AREA.--188 square miles (at mouth).

RECORDS AVAILABLE.--Chemical analyses: March 1951 to February 1952.

REMARKS.--No discharge records available for this station.

Chemical analyses, in parts per million, October 1951 to February 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium hexavalent	Copper (Cu)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
																Calcium	Non-carbonate				Unfiltered	Filtered
Oct. 12, 1951....		3.1	0.01	0.00	0.0	61	20	21	3.9	170	102	24	0.4	7.2	336	236	95	535	7.6	17	6.1	5.3
Nov. 9.....		8.1	.03	.00	.0	68	17	11	11	176	87	14	.2	9.7	315	238	95	495	7.9	15	6.1	4.8
Dec. 7.....		11	.02	.00	.0	76	14	5.3	2.1	192	77	10	.2	13	311	248	90	473	8.2	20	8.6	4.8
Jan. 14, 1952....		7.1	.11	.00	.0	76	16	7.5	1.4	205	84	14	.1	7.5	344	257	88	518	8.0	7	7.3	4.4
Feb. 9.....		9.4	.03	.00	.0	65	15	7.7	.8	180	65	12	.2	7.3	292	222	76	460	7.9	2	4.7	3.4

Dissolved oxygen, cyanide, and phenols, October 1951 to February 1952

Date of collection	Time	Mean discharge (cfs)	Temperature		Dissolved oxygen	Cyanide (CN)	Phenols as C ₆ H ₅ OH
			°F	°C	Parts per million	Parts per million	Parts per million
Oct. 12, 1951....	5:45 p.m.		61	16.1	4.6	47	0.0
Oct. 26.....	5:30 p.m.		54	12.2	7.4	69	.0
Nov. 9.....	5:45 p.m.		38	3.3	11.1	83	.011
Nov. 24.....	11:30 a.m.		40	4.4	12.3	95	.003
Dec. 7.....	47 p.m.		47	8.3	9.7	82	.000
Jan. 14, 1952....	9:30 a.m.		37	2.8	12.7	94	.000
Feb. 9.....	9:30 a.m.		35	1.7	12.2	88	.000

STREAMS TRIBUTARY TO LAKE ERIE--Continued

MAUMEE RIVER AT TOLEDO, OHIO

LOCATION.--At Toledo Terminal Railroad Bridge in Toledo, Lucas County, 1 mile upstream from mouth, 3½ miles downstream from Swan Creek, and about 20 miles downstream from gaging station at Waterville.

DRAINAGE AREA.--6,596 square miles (at mouth).

RECORDS AVAILABLE.--Chemical analyses: March 1950 to February 1952.

Water temperatures: March 1950 to February 1952.

EXTREMES, 1950-52.--Dissolved solids: Maximum, 372 ppm Nov. 1-10, 1951; minimum, 169 ppm Feb. 21-28, 1951.

Hardness: Maximum, 258 ppm Dec. 21-31, 1951; minimum, 130 ppm Feb. 21-28, 1951.

Specific conductance: Maximum daily, 597 micromhos Nov. 10, 1950; minimum daily, 215 micromhos Jan. 30, 1952.

Water temperatures: Maximum, 82°F July 31, 1951; minimum, freezing point Nov. 25, 26, Dec. 9, 10, 16, 1950.

REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Discharge records for gaging station at Waterville for water year October 1951 to September 1952 given in Water-Supply Paper 1237. Some inflow between gaging station and sampling point.

Chemical analyses, in parts per million, October 1951 to February 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium hexavalent (Cr)	Copper (Cu)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
																Calcium	Non-carbonate				Unfiltered	Filtered
Oct. 1-10, 1951.	287	2.7	0.02	0.00	0.0	52	14	23	3.8	162	49	40	0.2	0.2	299	186	55	458	7.6	10	7.2	7.1
Oct. 11-20	329	4.4	.02	.00	.0	47	15	21	5.6	165	58	28	.2	.2	274	180	44	440	7.9	7	6.4	5.9
Oct. 21-31	1,240	5.2	.01	.00	.0	55	17	21	5.4	182	72	25	.2	.4	304	207	58	477	7.8	15	6.2	6.2
Nov. 1-10	1,150	9.2	.02	.00	.0	62	21	28	5.4	202	83	40	.4	.3	372	241	76	568	7.4	11	7.0	6.6
Nov. 11-20	6,030	10	.02	.00	.0	58	19	21	5.2	193	88	20	.3	.5	341	223	65	523	7.5	25	7.0	6.9
Nov. 21-30	2,430	16	.03	.00	.0	53	16	23	4.7	198	75	13	.4	.4	305	198	36	448	7.7	30	7.2	7.0
Dec. 1-10	8,120	9.9	.04	.00	.0	65	15	8.5	3.6	178	74	11	.1	.13	296	226	78	475	7.9	25	9.0	6.8
Dec. 11-20	3,650	9.8	.06	.00	.0	65	15	9.5	3.2	166	75	13	.1	.14	304	224	88	479	7.8	25	7.6	6.4
Dec. 21-31	7,110	16	.05	.00	.0	72	19	11	2.8	200	87	13	.1	.18	345	258	94	531	7.8	20	7.4	5.8
Jan. 1-10, 1952.	23,500	10	.09	.00	.0	47	10	6.4	3.0	122	46	7.0	.1	.15	216	160	58	343	7.9	25	8.2	6.2
Jan. 11-20	19,500	8.9	.10	.00	.0	57	13	6.2	2.0	152	59	8.0	.1	.14	254	194	71	401	7.9	25	9.0	5.8
Jan. 21-31	32,500	12	.06	.00	.0	39	9.0	6.2	2.0	114	37	5.5	.1	.10	183	134	41	285	7.9	30	10	6.0
Feb. 1-10	21,400	11	.09	.00	.0	42	9.5	5.9	1.9	115	43	6.0	.1	.12	194	143	100	310	8.0	30	9.0	6.0
Feb. 11-20	9,350	8.2	.06	.00	.0	50	12	6.1	3.1	142	52	8.0	.1	.11	229	175	58	368	7.9	25	7.6	5.4
Feb. 21-28	2,500	12	.19	.00	.0	64	16	9.3	2.5	188	67	10	.1	.10	291	225	71	460	8.0	20	8.0	5.6

STREAMS TRIBUTARY TO LAKE ERIE--Continued

MAUMEE RIVER AT TOLEDO, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, October 1951 to February 1952

Date of collection	Time	Mean discharge (cfs)	Temperature		Dissolved oxygen		Cyanide (CN)	Phenols as C ₆ H ₅ OH
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Oct. 27, 1951	8:30 a.m.		54	12.2	2.7	25	0.0	0.043
Nov. 24	10:15 a.m.		41	5.0	10.0	78	.8	.226
Dec. 28	10:00 a.m.		32	0	11.9	81	.0	.180
Feb. 1, 1952	2:15 p.m.		36	2.2	12.6	92	.1	.078
Feb. 23	12:45 p.m.		39	3.9	11.8	90	.2	.173

Temperature (°F) of water October 1951 to February 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	63	54	43	34	36							
2	65	52	44	34	35							
3	67	50	45	35	36							
4	67	44	46	35	37							
5	69	39	44	35	37							
6	66	37	45	35	38							
7	66	43	47	35	36							
8	63	44	46	35	37							
9	59	41	45	36	35							
10	59	44	44	36	35							
11	62	46	41	36	36							
12	62	43	39	36	36							
13	62	44	39	36	36							
14	60	46	39	36	34							
15	62	47	34	38	33							
16	63	46	34	41	34							
17	63	44	34	41	34							
18	63	42	37	41	34							
19	63	41	36	41	36							
20	60	41	37	40	36							
21	60	39	39	38	34							
22	64	41	35	37	35							
23	60	41	35	34	38							
24	64	41	36	33	36							
25	58	40	36	34	36							
26	62	39	36	35	36							
27	60	40	37	35	38							
28	57	40	35	35	39							
29	57	42	34	35	39							
30	52	43	35	34	--							
31	54	--	34	35	--							
Average	62	43	39	36	36							

STREAMS TRIBUTARY TO LAKE ERIE--Continued

PORTAGE RIVER AT WOODVILLE, OHIO

LOCATION.--At gaging station at bridge on U.S. Highway 20 in Woodville, Sandusky County.
DRAINAGE AREA.--433 square miles.

RECORDS AVAILABLE.--Sediment records: October 1950 to September 1952.

EXTREMES, 1951-52.--Sediment concentrations: Maximum daily, 1,210 ppm Mar. 12; minimum daily, 1 ppm on several days in May.

Sediment loads: Maximum daily, 27,900 tons Mar. 12; minimum daily, less than 0.05 ton Nov. 3-5.

EXTREMES, 1950-52.--Sediment concentrations: Maximum daily, 1,210 ppm Mar. 12, 1952; minimum daily 1 ppm Oct. 25, 29, 30, Dec. 27, 29, 1950, May 9-16, 1952.

Sediment loads: Maximum daily, 27,900 tons Mar. 12, 1952; minimum daily, less than 0.05 ton Nov. 3-5, 1951.

REMARKS.--Flow affected by ice Dec. 14-18, 22-25, 31, Feb. 16, 17. Relative proportions of organic sediments were much greater during the low flow period in October. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1237

Suspended sediment water year October 1951 to September 1952

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-----	5.5	10	0.1	4.3	7	0.1	48	8	1.0
2-----	4.8	11	.1	3.9	6	.1	43	7	.8
3-----	4.6	12	.1	3.9	2	(t)	38	9	.9
4-----	4.3	12	.1	3.6	2	(t)	43	16	1.9
5-----	3.9	17	.2	3.1	2	(t)	565	380	b 680
6-----	3.3	16	.1	3.9	46	.5	430	132	153
7-----	8.1	10	a. 2	11	59	1.8	350	118	s 157
8-----	12	6	.2	52	62	8.7	920	550	b1,400
9-----	17	8	.4	59	39	6.2	868	240	b 700
10-----	9.3	11	.3	39	12	1.3	1,260	260	b 940
11-----	6.2	13	.2	25	8	.5	638	105	181
12-----	5.5	12	.2	19	7	.4	381	57	59
13-----	4.6	48	.6	22	9	.5	133	37	18
14-----	4.3	64	.7	753	525	s1,570	90	29	7.0
15-----	3.9	63	.7	906	368	s974	70	22	4.2
16-----	3.3	67	.6	353	149	142	65	19	3.3
17-----	3.6	71	.7	174	60	28	60	18	2.9
18-----	3.6	68	.7	114	31	9.5	55	17	2.5
19-----	3.3	72	.6	60	19	3.1	55	15	2.2
20-----	3.3	67	.6	47	10	1.3	60	8	1.3
21-----	4.3	71	.8	49	12	1.6	148	--	e 20
22-----	4.9	54	.7	44	9	1.1	450	--	e 60
23-----	7.9	73	1.6	43	4	.5	550	--	e 60
24-----	18	71	3.5	75	8	1.6	480	--	e 40
25-----	40	70	7.6	103	16	4.4	450	--	e 20
26-----	25	71	4.8	76	17	3.5	660	22	39
27-----	12	20	.6	83	13	2.9	1,160	38	119
28-----	8.8	5	.1	76	11	2.3	795	30	64
29-----	6.5	5	.1	76	10	2.1	615	21	35
30-----	6.2	5	.1	59	8	1.3	1,210	55	s 232
31-----	5.2	5	.1	--	--	--	3,200	390	c 3,800
Total--	253.3	--	27.4	3,340.7	--	2,769.4	15,940	--	8,805.0

e Estimated.

s Computed by subdividing day.

t Less than 0.05 ton.

a Computed from estimated concentration graph.

b Computed partly from water-sediment discharge curve.

c Computed from partly estimated concentration graph.

STREAMS TRIBUTARY TO LAKE ERIE--Continued

PORTAGE RIVER AT WOODVILLE, OHIO--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

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-----	6,410	405	7,010	545	52	77	104	3	0.8
2-----	5,890	213	s 3,520	1,210	188	s 639	88	2	.5
3-----	2,260	135	824	1,400	168	635	99	3	.8
4-----	1,260	84	286	3,240	408	s 3,830	106	3	.9
5-----	905	54	132	3,510	244	s 2,510	170	5	2.3
6-----	725	38	74	1,640	98	434	156	10	4.2
7-----	575	30	47	988	68	181	112	9	2.7
8-----	450	25	30	850	52	119	99	6	1.6
9-----	437	18	21	1,340	106	s 410	95	4	a 1.0
10-----	455	18	22	1,490	101	406	115	5	1.6
11-----	310	16	13	2,080	240	b 1,300	3,140	895	s 10,700
12-----	261	15	11	1,210	98	320	8,740	1,210	27,900
13-----	232	15	9.4	750	57	115	5,660	537	s 8,780
14-----	653	45	s 101	464	40	50	2,290	310	1,920
15-----	1,580	252	s 1,230	331	37	33	1,460	180	710
16-----	1,400	292	1,100	250	28	19	932	90	a 240
17-----	2,200	996	s 7,690	210	20	a 10	595	66	106
18-----	5,650	1,060	16,200	168	15	6.8	446	30	60
19-----	4,300	430	s 5,520	147	11	4.4	1,950	375	s 2,460
20-----	3,510	512	s 5,080	132	12	4.3	2,080	330	s 1,990
21-----	2,640	347	s 2,790	168	11	5.0	1,120	158	478
22-----	1,180	121	386	147	10	4.0	750	95	192
23-----	1,260	179	626	117	8	2.5	1,710	308	s 1,540
24-----	692	100	a 180	113	8	2.4	1,400	201	s 800
25-----	424	58	66	110	7	2.1	725	90	176
26-----	2,230	352	s 2,580	99	7	1.9	515	48	67
27-----	6,800	590	10,800	94	7	1.8	410	37	41
28-----	7,340	394	s 8,070	102	4	1.1	318	37	32
29-----	2,400	202	s 1,380	106	4	1.1	254	29	20
30-----	1,020	130	a 350	--	--	--	209	17	9.6
31-----	560	73	110	--	--	--	185	18	9.0
Total--	66,009	--	76,258.4	23,011	--	11,125.4	36,033	--	58,247.0
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-----	190	18	9.2	121	8	2.6	102	18	5.0
2-----	198	17	9.1	110	5	1.5	80	16	3.5
3-----	160	14	6.0	99	5	1.3	64	32	5.5
4-----	136	10	3.7	85	7	1.6	55	30	4.5
5-----	944	130	b 520	79	6	1.3	52	28	3.9
6-----	2,150	180	c 1,100	78	6	1.3	42	28	3.2
7-----	2,370	180	c 1,200	69	6	1.1	36	28	2.7
8-----	1,370	98	363	63	2	.3	32	28	2.4
9-----	825	67	149	63	1	.2	30	32	2.6
10-----	570	39	60	87	1	.2	27	35	2.6
11-----	428	32	37	110	1	.3	26	22	1.5
12-----	340	24	22	78	1	.2	25	17	1.1
13-----	843	80	s 320	62	1	.2	18	23	1.1
14-----	2,690	407	2,960	52	1	.1	18	20	1.0
15-----	2,370	207	1,320	48	1	.1	16	18	.8
16-----	1,580	143	610	47	1	.1	15	20	.8
17-----	878	82	194	48	4	.5	13	21	.7
18-----	575	50	a 80	55	3	.4	12	18	.6
19-----	384	31	32	52	4	.6	11	15	.4
20-----	275	21	16	48	2	.3	11	20	.6
21-----	209	17	9.6	52	3	.4	10	20	a .5
22-----	175	13	6.1	56	3	.5	9.8	20	.5
23-----	334	22	s 23	56	3	.5	9.8	12	.3
24-----	1,410	164	s 666	789	182	s 716	9.2	10	.2
25-----	1,180	126	s 422	2,860	376	2,810	8.5	12	.3
26-----	615	52	86	2,770	361	2,700	8.5	14	.3
27-----	362	26	25	1,640	180	s 858	7.9	15	a .3
28-----	254	21	14	775	89	186	6.5	16	.3
29-----	193	16	8.3	379	56	57	5.7	32	.5
30-----	147	13	5.2	212	38	22	5.3	20	.3
31-----	--	--	--	140	27	10	--	--	--
Total--	24,155	--	10,276.2	11,183	--	7,374.6	766.2	--	48.0

s Computed by subdividing day.

a Computed from estimated concentration graph.

b Computed partly from water-sediment discharge curve.

c Computed from partly estimated concentration graph.

STREAMS TRIBUTARY TO LAKE ERIE--Continued

PORTAGE RIVER AT WOODVILLE, OHIO--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

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-----	4.9	17	0.2	6.9	19	0.4	7.6	25	0.5
2-----	12	15	.5	5.7	28	.4	15	26	1.1
3-----	44	26	3.1	5.3	22	.3	13	24	.8
4-----	26	22	1.5	5.3	24	.3	19	19	1.0
5-----	17	20	a.9	5.7	25	.4	11	19	.6
6-----	14	15	.6	5.7	29	.4	6.9	23	.4
7-----	8.5	13	.3	5.3	32	.5	5.7	25	.4
8-----	6.1	12	.2	4.9	34	.4	5.3	20	a.3
9-----	4.9	12	.2	4.9	37	.5	4.9	16	.2
10-----	4.1	8	.1	5.3	40	.6	4.1	16	.2
11-----	4.1	7	.1	5.7	40	.6	2.9	18	.1
12-----	4.9	11	.1	8.5	33	.8	3.3	16	.1
13-----	4.1	12	.1	11	31	.9	4.5	17	.2
14-----	3.7	8	.1	19	30	a1.5	4.5	20	a.2
15-----	3.7	8	.1	14	30	1.1	5.3	24	.3
16-----	3.7	12	.1	13	21	.7	5.3	22	.3
17-----	4.1	24	.3	10	24	.6	4.5	17	.2
18-----	6.1	24	.4	8.5	29	.7	6.6	20	.4
19-----	13	23	.8	7.3	24	.5	16	20	a.9
20-----	13	21	.7	5.3	28	.4	46	18	2.2
21-----	21	20	1.1	3.7	22	.2	26	17	1.2
22-----	14	20	a.8	3.3	31	.3	16	18	.8
23-----	273	171	s 238	4.1	35	.4	12	22	.7
24-----	276	224	s 182	6.5	38	.7	8.5	14	.3
25-----	106	82	23	5.7	28	.4	7.9	20	.4
26-----	53	57	8.2	4.5	26	.3	7.3	15	a.3
27-----	31	54	4.5	3.3	28	.2	6.1	11	.2
28-----	20	50	2.7	2.5	27	.2	5.3	16	.2
29-----	14	39	1.5	2.3	26	.2	4.9	24	.3
30-----	10	27	.7	2.7	24	.2	4.1	19	.2
31-----	8.5	16	.4	4.1	24	.3	--	--	--
Total-	1,028.4	--	473.3	200.0	--	15.4	289.5	--	15.0
Total discharge for year (cfs-days)									182,209.1
Total load for year (tons)									17,435.1

s Computed by subdividing day.

a Computed from estimated concentration graph.

STREAMS TRIBUTARY TO LAKE ERIE--Continued
PORTAGE RIVER AT WOODVILLE, OHIO--Continued

Particle-size analyses of suspended sediment, March 1952

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Suspended sediment										Methods of analysis			
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Mar. 12, 1952.....	7:30 a. m.	8,600	1,400	577	58	63	77	83	85	89	92	94		98		BNM
Mar. 12.....	7:30 a. m.	8,600	1,400	652	87	88	94	96	96	98	99	--	--	--	--	BCWM
Mar. 19.....	11:25 a. m.	2,080	394	797	81	89	94	98	99	--	--	--	--	--	--	BCWM
Mar. 19.....	4:45 p. m.	2,770	657	452	47	65	76	85	90	95	96	98	98	99	99	BNM
Mar. 19.....	4:45 p. m.	2,770	657	627	62	86	91	91	96	98	99	--	--	--	--	BCWM

STREAMS TRIBUTARY TO LAKE ERIE--Continued

PORTAGE RIVER AT ELMORE, OHIO

LOCATION.--At bridge at State Highway 120 in Elmore, Ottawa County, 4 miles downstream from gaging station at Woodville, and 6 miles upstream from Sugar Creek. DRAINAGE AREA.--433 square miles (above gaging station). RECORDS AVAILABLE.--Chemical analyses: November 1947 to February 1952. Water temperatures: March 1950 to February 1952. EXTREMES, 1950-52.--Dissolved solids: Maximum, 957 ppm Nov. 1-10, 1951; minimum, 249 ppm Feb. 1-10, 1952. Hardness: Maximum, 410 ppm Nov. 1-10, 1951; minimum, 168 ppm Jan. 21-31, 1952. Specific conductance: Maximum daily, 2,440 micromhos Sept. 19, 20, 1951; minimum, freezing point on several days during winter months. Water temperatures: Maximum, 410 ppm Nov. 1-10, 1951; minimum, 249 micromhos Jan. 26, 1952. REMARKS.--Records of specific conductance of daily samples from March 1950 to February 1952 available in district office at Columbus, Ohio. Discharge records for gaging station at Woodville for water year October 1951 to September 1952 given in Water-Supply Paper 1237. No appreciable inflow between gaging station and sampling point except during periods of heavy local runoff.

Chemical analyses, in parts per million, October 1951 to February 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium hexavalent	Copper (Cu)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
																Calcium	Non-carbonate				Unfiltered	Filtered
Oct. 1-10, 1951.....	7.3	4.0	0.04	0.00	0.0	89	37	140	19	204	197	238	0.4	3.2	888	377	207	1,390	7.6	20	6.8	6.8
Oct. 11-20, 1951.....	4.2	4.1	0.04	0.00	0.0	94	37	143	18	a212	199	242	3	3.0	906	390	213	1,430	8.0	18	6.9	6.4
Oct. 21-31, 1951.....	13	16	0.03	0.00	0.0	97	36	142	16	199	205	245	4	3.7	927	391	227	1,450	7.8	20	6.9	6.8
Nov. 1-10, 1951.....	18	17	0.02	0.00	0.0	103	37	154	5.3	188	218	268	3	7.2	957	410	255	1,490	7.8	15	6.6	6.6
Nov. 11-20, 1951.....	247	14	0.01	0.00	0.0	85	21	50	5.3	180	140	73	1	23	513	300	151	804	7.4	22	--	7.0
Nov. 21-30, 1951.....	68	13	0.02	0.00	0.0	98	25	50	5.4	204	177	65	1	19	563	350	180	869	7.4	17	--	6.4
Dec. 1-10, 1951.....	456	7.3	0.01	0.00	0.0	84	21	32	4.3	189	124	48	1	20	445	296	141	700	7.6	17	--	5.8
Dec. 11-20, 1951.....	166	9.8	0.02	0.00	0.0	94	23	24	3.7	222	131	36	1	23	470	330	147	722	7.7	15	--	5.8
Dec. 21-31, 1951.....	883	8.1	0.02	0.00	0.0	70	16	14	2.5	170	87	21	1	20	334	242	101	528	8.0	15	--	5.4
Jan. 1-10, 1952.....	1,937	11	0.02	0.00	0.0	69	16	13	3.0	169	80	19	1	18	318	236	99	509	7.5	18	--	6.6
Jan. 11-20, 1952.....	2,010	7.4	0.02	0.00	0.0	62	15	12	2.7	154	73	18	1	16	300	214	90	474	7.4	27	--	6.0
Jan. 21-31, 1952.....	2,413	18	0.09	0.00	0.0	50	11	13	3.1	136	54	13	1	13	250	168	59	384	7.8	30	7.0	5.4
Feb. 1-10, 1952.....	1,621	11	0.02	0.00	0.0	51	12	10	2.4	137	54	11	1	16	249	178	64	388	7.5	20	--	5.4
Feb. 11-20, 1952.....	974	8.1	0.01	0.00	0.0	75	19	25	3.1	184	96	38	1	16	380	268	106	622	7.5	10	--	5.4
Feb. 21-29, 1952.....	117	7.2	0.02	0.00	0.0	86	21	31	3.7	238	120	38	1	15	444	302	108	701	7.6	10	--	5.0

a Includes equivalent of 8 parts per million of carbonate (CO₃).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

PORTAGE RIVER AT ELMORE, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, October 1951 to February 1952

Date of collection	Time	Mean discharge (cfs)	Temperature		Dissolved oxygen		Cyanide (CN)	Phenols as C ₆ H ₅ OH
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Oct. 13, 1951	10:15 a. m.		55	12.8	9.8	92	0.0	0.000
Nov. 10.	9:45 a. m.		37	2.8	10.9	80	.0	.019
Dec. 8.	9:30 a. m.		47	8.3	8.0	68	.0	.003
Feb. 9, 1952.	12:30 p. m.		35	1.7	12.0	86	.0	.006

Temperature (°F) of water, October 1951 to February 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	71	50	47	43	42							
2	70	45	45	41	43							
3	74	34	50	39	42							
4	75	35	49	35	41							
5	67	35	45	41	38							
6	65	35	50	39	35							
7	57	37	52	43	--							
8	55	38	49	45	--							
9	49	45	42	39	34							
10	47	41	44	39	39							
11	57	40	41	36	40							
12	58	53	38	39	36							
13	64	51	35	38	37							
14	63	52	38	42	35							
15	60	50	38	47	35							
16	67	47	34	45	38							
17	65	40	35	48	40							
18	66	38	34	45	38							
19	64	32	35	43	38							
20	59	35	38	40	34							
21	67	46	40	37	35							
22	65	48	34	37	--							
23	59	45	37	36	40							
24	52	49	40	34	42							
25	--	45	38	40	42							
26	--	43	35	39	40							
27	52	40	34	38	42							
28	50	43	38	36	40							
29	--	42	40	36	40							
30	50	45	38	34	--							
31	49	--	36	--	--							
Average	61	43	41	40	39							

STREAMS TRIBUTARY TO LAKE ERIE--Continued

SANDUSKY RIVER NEAR FREMONT, OHIO

LOCATION.--At gaging station at highway bridge, 2½ miles downstream from Wolf Creek, 2.3 miles upstream from Ballville power dam, and 3½ miles southwest of Fremont, Sandusky County.

DRAINAGE AREA.--1,248 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1950 to February 1952.

Sediment records: October 1950 to September 1952.

EXTREMES, 1951-52.--Sediment concentrations: Maximum daily, 747 ppm Mar. 12; minimum daily, 3 ppm Nov. 12, Mar. 3.

EXTREMES, 1950-52.--Dissolved solids: Maximum, 646 ppm Nov. 1-10, 1951; minimum, 195 ppm Jan. 21-31, 1952.

Hardness: Maximum, 450 ppm Nov. 1-10, 1951; minimum, 141 ppm Jan. 21-31, 1952.

Specific conductance: Maximum daily, 992 microhmhos Nov. 4, 1951; minimum daily, 184 microhmhos Jan. 27, 1952.

Water temperatures: Maximum, 88°F July 26, Aug. 29, 1951; minimum, 41°F Feb. 4-6, 1951.

Sediment concentrations: Maximum, 747 ppm Mar. 12, 1952; minimum daily, 1 ppm Feb. 4-6, 1951.

Sediment loads: Maximum daily, 31,900 tons Mar. 12, 1952; minimum daily, less than 0.50 ton Oct. 3, 5, 12, 1951, Aug. 5-7, 9, Sept. 28-30, 1952.

REMARKS.--Flow affected by ice Dec. 14 to Jan. 1. Records of specific conductance of daily samples available in district office at Columbus, Ohio. Samples were collected at bridge on U.S. Highway 20 in Fremont, March to September 1950 and at the Fremont Filtration Plant, in Fremont, October 1947 to September 1948. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1237.

Chemical analyses, in parts per million, October 1951 to February 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium (Cr) hexa-valent	Copper per cent (Cu)	Calcium (Ca)	Mag-nesium (Mg)	Sodium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evap-oration at 180°C)	Hardness as CaCO ₃		Specific conduct-ance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
																Calcium	Non-carbon-ates				Unfil-tered	Fil-tered
Oct. 1-10, 1951...	27	2.1	0.02	0.00	0.0	88	44	34	34	222	231	34	0.8	1.5	586	402	219	838	8.2	10	4.7	4.5
Oct. 11-20	28	4.9	0.05	0.00	0.0	102	44	31	4.1	250	243	30	.8	2.0	629	436	231	894	8.1	10	4.7	4.6
Oct. 21-31	45	7.8	0.02	0.00	0.0	98	47	28	4.1	274	229	30	.8	1.0	614	436	213	856	8.1	5	4.3	4.0
Nov. 1-10	69	9.0	0.05	0.00	0.0	107	44	28	5.0	256	253	29	.7	2.5	646	450	238	870	8.1	5	4.3	4.2
Nov. 11-20	244	17	0.02	0.00	0.0	97	36	21	5.1	234	211	22	.5	6.4	564	390	198	772	8.0	10	5.5	4.6
Nov. 21-30	154	9.6	0.02	0.00	0.0	88	30	19	4.6	194	184	21	.4	13	464	342	184	681	8.1	10	5.7	5.5
Dec. 1-10	1,080	10	0.05	0.00	0.0	88	26	16	5.7	188	173	18	.4	13	461	328	174	665	7.5	7	4.6	3.0
Dec. 11-20	850	10	0.05	0.00	0.0	66	19	7.6	3.8	129	118	12	.2	23	341	245	136	499	7.6	10	4.3	3.8
Dec. 21-31	3,660	8.5	0.06	0.00	0.0	57	17	7.4	2.8	114	92	15	.1	20	286	210	119	437	7.8	7	4.5	3.8
Jan. 1-10, 1952...	4,130	11	0.03	0.00	0.0	57	14	6.0	2.9	115	89	8.5	.1	18	279	199	106	410	7.6	12	6.8	4.3
Jan. 11-20	4,610	17	0.03	0.00	0.0	57	14	8.4	2.3	123	86	9.5	.1	13	281	202	95	418	7.8	17	5.5	4.2
Jan. 21-31	7,390	10	0.07	0.00	0.0	40	10	5.2	1.8	89	57	5.5	.2	13	185	141	68	302	7.5	27	6.4	4.3
Feb. 1-10	4,410	18	0.02	0.00	0.0	46	12	5.6	3.4	112	65	7.8	.1	13	229	164	72	346	7.4	25	7.8	6.4
Feb. 11-20	1,030	22	0.03	0.00	0.0	65	18	10	1.6	170	98	9.0	.2	12	337	239	97	498	7.6	7	5.9	5.4
Feb. 21-29	585	16	0.03	0.00	0.0	77	23	10	2.0	198	125	11	.2	9.0	391	285	124	584	7.7	8	6.2	5.6

a Includes equivalent of 6 parts per million of carbonate (CO₃).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

SANDUSKY RIVER NEAR FREMONT, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, October 1951 to February 1952

Date of collection	Time	Mean discharge (cfs)	Temperature		Dissolved oxygen		Cyanide (CN)	Phenols as C_6H_5OH
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Oct. 27, 1951	10:00 a. m.		52	11.1	8.6	78	0.0	0.026
Nov. 24	8:15 a. m.		34	1.1	11.5	81	.0	.011
Jan. 14, 1952	3:00 p. m.		39	3.9	12.9	96	.0	.016
Feb. 9	2:30 p. m.		36	2.2	12.5	91	.0	.002

Temperature (°F) of water October 1951 to February 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	49	42	32	38							
2	76	45	43	33	38							
3	79	37	46	35	36							
4	76	40	47	35	39							
5	--	35	44	41	39							
6	67	34	45	35	37							
7	63	38	48	35	36							
8	56	38	46	36	39							
9	--	40	46	35	36							
10	53	--	43	35	38							
11	56	43	40	35	38							
12	58	43	36	36	38							
13	57	44	34	36	37							
14	60	41	32	37	35							
15	64	44	32	39	35							
16	65	41	32	--	35							
17	65	40	32	41	38							
18	65	38	32	41	37							
19	56	38	32	40	35							
20	56	38	32	35	36							
21	62	32	--	40	36							
22	66	40	33	40	--							
23	63	40	34	36	--							
24	55	38	32	40	36							
25	56	37	33	38	37							
26	56	37	34	38	36							
27	52	35	32	36	36							
28	50	47	35	38	36							
29	52	38	32	34	39							
30	54	40	32	38	--							
31	50	--	32	34	--							
Average	61	40	37	37	37							

STREAMS TRIBUTARY TO LAKE ERIE--Continued

SANDUSKY RIVER NEAR FREMONT, OHIO--Continued

Suspended sediment, water year October 1951 to September 1952

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-----	26	13	1	46	15	2	131	6	2
2-----	24	8	1	43	12	1	112	6	2
3-----	24	7	(t)	46	5	1	103	8	2
4-----	21	10	1	46	8	1	112	11	3
5-----	19	8	(t)	46	7	1	250	21	14
6-----	21	13	1	49	6	1	528	47	67
7-----	26	15	1	80	13	3	862	108	s 304
8-----	34	11	1	112	8	2	2,180	320	a 1,900
9-----	43	10	1	112	7	2	2,920	345	2,720
10-----	32	12	1	108	7	2	3,750	447	4,530
11-----	30	9	1	131	7	2	3,270	345	3,050
12-----	28	5	(t)	112	3	1	1,900	226	1,160
13-----	28	7	1	99	6	2	992	141	378
14-----	28	7	1	306	72	s 76	450	94	114
15-----	28	8	1	710	100	a 190	350	64	60
16-----	30	10	1	386	56	58	330	45	40
17-----	28	13	1	242	40	26	310	34	28
18-----	26	21	1	185	37	18	300	30	24
19-----	26	23	2	149	42	17	290	28	22
20-----	24	20	1	117	44	14	310	88	74
21-----	26	17	1	95	41	11	450	107	130
22-----	24	16	1	91	39	10	1,500	45	182
23-----	26	12	1	103	35	10	2,500	38	256
24-----	32	14	1	121	31	10	2,700	42	306
25-----	52	23	3	149	23	9	2,000	32	173
26-----	49	24	3	191	18	9	3,500	38	359
27-----	49	18	2	242	15	10	5,100	70	964
28-----	61	23	4	219	11	6	4,900	73	966
29-----	72	19	4	180	9	4	3,100	56	469
30-----	58	13	2	144	6	2	5,000	168	2,270
31-----	49	14	2	--	--	--	9,500	430	a 11,000
Total-	1,044	--	43	4,660	--	501	58,700	--	31,569
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-----	11,400	480	14,800	1,800	81	394	409	8	9
2-----	10,200	265	7,300	2,310	66	412	401	4	4
3-----	6,880	165	3,060	3,880	107	1,120	386	3	3
4-----	3,880	116	1,220	8,260	220	a 5,100	417	5	6
5-----	2,290	78	482	8,540	187	4,310	829	31	69
6-----	1,780	48	231	6,200	136	2,280	934	26	66
7-----	1,460	34	134	3,880	113	1,180	744	38	76
8-----	1,170	29	92	2,550	81	558	547	39	58
9-----	1,060	23	66	3,270	89	786	475	28	36
10-----	1,190	18	58	3,390	72	659	475	24	31
11-----	1,050	16	45	2,770	60	449	9,170	734	s 25,100
12-----	842	14	32	1,800	52	253	15,800	747	31,900
13-----	698	13	24	1,270	42	144	11,100	569	17,100
14-----	675	13	24	949	36	92	9,940	350	9,390
15-----	1,050	24	68	816	19	42	5,280	203	2,890
16-----	2,240	72	435	665	20	36	2,790	146	1,100
17-----	5,670	590	a 11,400	594	19	30	1,840	104	517
18-----	12,000	725	23,500	538	12	17	1,360	72	264
19-----	10,800	535	15,600	467	11	14	2,740	149	s 1,310
20-----	11,100	363	10,900	475	10	13	3,880	180	1,890
21-----	7,420	259	5,190	584	9	14	3,270	158	1,390
22-----	4,000	185	2,000	829	6	13	2,520	135	919
23-----	3,160	157	1,340	842	6	14	4,120	167	s 1,930
24-----	2,220	109	653	665	17	31	5,150	380	a 5,300
25-----	1,520	75	308	565	17	26	4,120	376	4,180
26-----	5,270	196	s 4,020	492	17	23	2,700	243	1,770
27-----	17,700	540	25,800	450	16	19	1,500	141	571
28-----	14,800	325	13,000	426	15	17	1,080	88	256
29-----	13,900	328	12,300	409	11	12	868	63	148
30-----	8,540	238	5,490	--	--	--	756	49	100
31-----	2,810	140	1,060	--	--	--	655	44	78
Total-	168,775	--	160,232	59,686	--	18,058	96,256	--	108,461

s Computed by subdividing day.

t Less than 0.5 ton.

a Computed from water-sediment discharge curve.

STREAMS TRIBUTARY TO LAKE ERIE--Continued

SANDUSKY RIVER NEAR FREMONT, OHIO--Continued

Suspended sediment, water year October 1951 to September 1952--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-----	624	36	61	584	30	4'	225	45	27
2-----	624	37	62	492	27	3b	185	35	17
3-----	614	30	50	426	26	30	165	27	12
4-----	584	22	35	371	14	14	154	23	10
5-----	801	34	74	349	17	16	131	22	8
6-----	1,860	58	291	320	13	11	126	19	6
7-----	3,270	100	863	300	11	9	117	13	4
8-----	3,270	106	936	294	17	13	108	10	3
9-----	2,460	63	556	260	16	14	108	7	2
10-----	1,660	80	269	300	15	12	99	10	3
11-----	1,220	45	148	280	11	8	99	13	3
12-----	992	35	94	254	8	5	91	9	2
13-----	1,500	43	s 188	230	7	4	87	7	2
14-----	5,670	360	a 5,800	207	10	6	87	9	2
15-----	7,980	352	7,580	201	8	4	84	10	2
16-----	5,670	216	3,310	185	7	3	80	15	3
17-----	4,630	156	1,950	180	8	4	80	19	4
18-----	2,590	116	811	175	10	5	72	15	3
19-----	1,570	82	348	170	12	6	68	15	3
20-----	1,140	60	185	191	12	6	68	18	3
21-----	868	43	101	201	13	7	68	19	3
22-----	710	38	73	207	13	7	68	16	3
23-----	655	33	58	207	12	7	68	22	4
24-----	2,730	106	s 1,000	435	22	s 29	72	27	5
25-----	4,890	201	2,650	1,660	64	287	68	35	6
26-----	4,120	194	2,160	2,610	237	1,720	61	32	5
27-----	2,790	130	979	2,040	288	1,590	58	24	4
28-----	1,460	72	284	868	164	s 404	58	21	3
29-----	978	54	143	510	95	131	202	87	s 52
30-----	732	41	81	384	77	76	175	102	48
31-----	--	--	--	280	57	43	--	--	--
Total-	66,682	--	31,160	15,171	--	4,554	3,132	--	252
	July			August			September		
1-----	121	65	21	21	14	1	28	13	1
2-----	99	58	16	19	12	1	40	16	2
3-----	87	55	13	17	12	1	72	25	5
4-----	99	63	17	17	11	1	68	21	4
5-----	99	57	15	17	9	(t)	58	11	2
6-----	76	52	11	15	6	(t)	58	12	2
7-----	68	53	10	14	12	(t)	49	12	2
8-----	64	52	9	14	15	1	40	12	1
9-----	68	49	9	14	11	(t)	34	12	1
10-----	61	55	9	14	15	1	30	12	1
11-----	55	43	6	15	15	1	28	13	1
12-----	46	32	4	23	20	1	24	10	1
13-----	40	30	3	26	14	1	23	13	1
14-----	40	30	3	26	14	1	21	13	1
15-----	40	30	3	26	14	1	21	15	1
16-----	37	30	3	26	15	1	24	15	1
17-----	40	30	3	28	17	1	24	15	1
18-----	40	30	3	28	15	1	24	12	1
19-----	49	46	6	28	14	1	42	23	3
20-----	55	37	5	24	15	1	72	25	5
21-----	49	32	4	26	15	1	80	18	4
22-----	49	36	5	28	15	1	72	16	3
23-----	43	30	3	28	17	1	68	18	3
24-----	46	30	4	28	16	1	61	13	2
25-----	40	29	3	28	15	1	58	10	2
26-----	37	26	3	26	11	1	46	8	1
27-----	37	24	2	24	11	1	37	6	1
28-----	34	23	2	23	9	1	32	5	(t)
29-----	30	26	2	24	15	1	30	5	(t)
30-----	26	18	1	24	19	1	26	4	(t)
31-----	23	16	1	24	13	1	--	--	--
Total-	1,698	--	199	695	--	28	1,290	--	54
Total discharge for year (cfs-days)									480,789
Total load for year (tons)									355,111

s Computed by subdividing day.

t Less than 0.5 ton.

a Computed from water-sediment discharge curve.

STREAMS TRIBUTARY TO LAKE ERIE--Continued
SANDUSKY RIVER NEAR FREMONT, OHIO--Continued

Particle-size analyses of suspended sediment, January to May 1952
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Suspended sediment										Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Jan. 18, 1952	7:20 a. m.	12,600	630	518	49	65	83	91	95	97	99				BN
Jan. 18	8:20 a. m.	12,600	630	488	66	76	92	95	96	98	99				BWCM
Jan. 27	8:20 a. m.	13,100	649	1,090	51	62	75	84	91	96	98				BWCM
Jan. 28	5:00 p. m.	13,900	304	480	60	71	85	89	94	97	98				BWCM
May 26	2:40 p. m.	2,920	276	389	61	68	85	91	98	100	--				BWCM

STREAMS TRIBUTARY TO LAKE ERIE--Continued

HURON RIVER AT MILAN, OHIO

LOCATION.--At gaging station at bridge on U.S. Highway 250, a quarter of a mile northwest of Milan, Erie County, and 2 miles downstream from confluence of East Branch and West Branch.

DRAINAGE AREA.--363 square miles.

RECORDS AVAILABLE.--Chemical analyses: March 1950 to February 1952.

Water temperatures: March to August 1950.

REMARKS.--Records of specific conductance of daily samples from March to August 1950 available in district office at Columbus, Ohio. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1237.

Chemical analyses, in parts per million, October 1951 to February 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium hexavalent (Cr)	Copper (Cu)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
																Calcium	Non-carbonate				Unfiltered	Filtered
Oct. 25, 1951	45	11	0.01	0.00	0.0	106	38	34	8.2	320	200	27	0.3	0.1	601	422	158	888	7.6	20	6.0	5.9
Nov. 23	59	7.8	.02	.00	.0	98	29	24	4.6	190	218	27	.2	7.2	536	383	208	765	8.0	6	5.0	4.4
Dec. 27	1,670	6.1	.15	.00	.0	39	10	5.7	2.3	58	85	7.0	.2	14	210	139	91	319	7.6	18	6.7	5.6
Feb. 1, 1952	930	7.5	.04	.00	.0	66	16	9.0	2.6	124	124	10	.2	12	326	230	129	485	7.8	15	6.7	4.7
Feb. 22	245	5.0	.03	.00	.0	61	16	10	2.4	135	116	9.5	.2	5.1	310	216	107	453	7.9	8	4.6	3.3

Dissolved oxygen, cyanide, and phenols, October 1951 to February 1952

Date of collection	Time	Mean discharge (cfs)	Temperature		Dissolved oxygen	Cyanide (CN)	Phenols as C ₆ H ₅ OH
			°F	°C	Parts per million	Percent saturation	Parts per million
Oct. 27, 1951	11:15 a. m.		51	10.6	5.2	46	0.0
Nov. 23	11:00 a. m.		44	6.7	10.4	85	.0
Dec. 27	3:15 p. m.		32	0	13.4	92	.003
Feb. 1, 1952	5:15 p. m.		38	3.3	12.5	94	.000

STREAMS TRIBUTARY TO LAKE ERIE--Continued

VERMILION RIVER NEAR VERMILION, OHIO

LOCATION.--At gaging station at bridge on North Ridge Road, 3½ miles southeast of Vermilion, Erie County, and 4½ miles upstream from mouth.

DRAINAGE AREA.--260 square miles.

RECORDS AVAILABLE.--Chemical analyses: March 1950 to February 1952.

Water temperatures: March to August 1950.

REMARKS.--Records of specific conductance of daily samples from March to August 1950 available in district office at Columbus, Ohio. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1237.

Chemical analyses, in parts per million, October 1951 to February 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium (Cr) hexavalent	Copper (Cu)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃ Calcium magnesium	Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed		
																				Unfiltered	Filtered	
Oct. 27, 1951 ...	14	5.6	0.08	0.00	0.0	72	26	15	24	210	136	16	0.4	0.8	404	286	114	608	8.1	8	5.1	4.1
Nov. 23	312	8.2	.03	.00	.0	73	18	4.3		131	150	17	.2	9.2	377	257	149	556	7.8	12	6.8	4.9
Dec. 27	1,400	6.3	.20	.00	.0	36	9.7	5.4		72	71	9.0	.4	4.2	205	130	71	294	7.5	22	6.1	4.8
Feb. 1, 1952 ...	332	4.7	.02	.00	.0	38	10	7.9		88	73	7.0	.1	4.7	203	137	64	299	7.8	17	6.4	6.1
Feb. 22	276	7.1	.08	.00	.0	49	13	10		115	84	13	.2	3.6	250	176	81	396	8.0	10	4.7	3.6

a Includes equivalent of 6 parts per million of carbonate (CO₃).

Dissolved oxygen, cyanide, and phenols, October 1951 to February 1952

Date of collection	Time	Mean discharge (cfs)	Temperature		Dissolved oxygen	Cyanide		Phenols as C ₆ H ₅ OH
			°F	°C		Parts per million	Parts per million	
Oct. 27, 1951	12:05 p.m.		51	10.6	9.1	0.0	0.0	0.014
Nov. 23	10:15 a.m.		42	5.6	11.2	.0	.0	.004
Dec. 27	2:00 p.m.		32	0	13.4	92	.0	.005
Feb. 1, 1952	6:00 p.m.		36	2.2	11.6	84	.0	.002
Feb. 22	6:15 p.m.		32	0	13.7	94	.0	.003

STREAMS TRIBUTARY TO LAKE ERIE--Continued

BLACK RIVER NEAR ELYRIA, OHIO

LOCATION.--At bridge on State Highway 254, 4½ miles upstream from French Creek, and 6½ miles downstream from gaging station at Elyria, Lorain County.
DRAINAGE AREA.--392 square miles (above gaging station).

RECORDS AVAILABLE.--Chemical analyses: March 1950 to February 1952.

Water temperatures: March 1950 to February 1952.

EXTREMES, 1950-52.--Dissolved solids: Maximum, 582 ppm Oct. 21-31, 1951; minimum, 193 ppm Jan. 21-31, 1952.

Hardness: Maximum, 330 ppm Dec. 21-31, 1950; minimum, 123 ppm Jan. 21-31, 1952.

Specific conductance: Maximum daily, 1,030 micromhos Oct. 30, 31, 1951; minimum daily, 169 micromhos Jan. 27, 1952.

Water temperatures: Maximum, 86° F June 26, 1950; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Discharge records for gaging station at Elyria, for water year October 1951 to September 1952 given in Water-Supply Paper 1237. No appreciable inflow between gaging station and sampling point except during periods of heavy local runoff.

Chemical analyses, in parts per million, October 1951 to February 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium (Cr) hexavalent	Copper (Cu)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
																Calcium	Non-magnesium				Unfiltered	Filtered
Oct. 1-10, 1951 ..	9.4	14	0.06	0.60	0.1	54	19	88	8.6	190	155	63	0.5	5.9	514	214	57	840	7.6	50	7.4	7.3
Oct. 11-20 ..	9.1	15	.05	.10	.2	52	17	101	11	192	167	62	.6	6.8	524	198	42	855	7.8	35	8.8	8.0
Oct. 21-31 ..	15	15	.05	.10	.4	56	17	113	5.4	198	207	60	1.0	6.8	582	208	47	920	7.9	50	6.9	6.0
Nov. 1-10 ..	154	8.2	.05	.20	.3	58	18	84	11	154	168	66	1.0	9.2	498	220	92	800	7.8	60	7.8	6.2
Nov. 11-20 ..	135	10	.02	.10	.1	70	25	52	4.5	120	164	86	.2	13	503	276	179	794	8.0	20	8.6	7.1
Nov. 21-30 ..	354	11	.12	.20	.1	58	19	32	4.5	94	140	50	.3	13	386	224	146	599	7.7	25	8.1	6.5
Dec. 1-10 ..	916	12	.14	.00	.1	57	16	24	5.3	108	127	32	.1	3.4	344	210	122	530	7.2	25	10	6.8
Dec. 11-20 ..	234	13	.50	.02	.1	62	17	24	4.6	105	136	31	.1	8.5	370	227	139	541	7.2	23	8.0	7.8
Dec. 21-31 ..	1,040	9.8	.07	.00	.1	38	8.0	12	3.9	59	80	19	.1	1.4	222	127	79	334	6.9	30	7.0	7.8
Jan. 1-10, 1952 ..	1,200	8.9	.06	.00	.1	49	12	15	2.9	88	94	20	.1	5.1	272	171	100	417	7.1	23	6.4	5.4
Jan. 11-20 ..	1,890	8.5	.12	.01	.1	43	13	15	3.8	84	96	20	.1	5.2	256	165	97	391	7.1	23	6.6	5.4
Jan. 21-31 ..	2,250	7.3	.14	.10	.1	36	8.0	10	3.1	67	68	12	.1	4.9	193	123	68	304	7.1	20	7.4	5.0
Feb. 1-10 ..	1,970	7.9	.06	.10	.1	37	9.2	11	3.4	69	73	14	.1	5.2	198	130	74	324	7.2	20	7.2	5.0
Feb. 11-20 ..	194	17	.03	.01	.1	56	15	23	4.2	126	113	23	.1	6.4	327	203	98	508	7.3	20	5.8	5.2
Feb. 21-29 ..	202	8.7	.09	.32	.1	56	16	24	4.3	114	121	27	.1	4.9	358	207	112	512	7.2	20	6.0	6.2

STREAMS TRIBUTARY TO LAKE ERIE--Continued

BLACK RIVER NEAR ELYRIA, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, October 1951 to February 1952

Date of collection	Time	Mean discharge (cfs)	Temperature		Dissolved oxygen		Cyanide (CN)	Phenols as C ₆ H ₅ OH
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Oct. 5, 1951	7:15 p. m.		73	22.8	6.0	69	0.5	0.000
Oct. 27	12:30 p. m.		54	12.2	6.5	80	1.5	--
Nov. 23	9:15 a. m.		41	5.0	11.1	87	.1	.005
Dec. 27	12:45 p. m.		--	--	--	--	--	.005
Feb. 2, 1952	8:45 a. m.		35	1.7	13.6	97	.0	.008

Temperature (°F) of water, October 1951 to February 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	63	46	40	34	35							
2	71	44	41	35	36							
3	72	42	43	32	36							
4	73	39	45	33	38							
5	--	36	45	35	42							
6	56	35	44	34	39							
7	57	36	48	34	36							
8	54	36	--	34	35							
9	55	38	42	34	35							
10	51	40	40	34	36							
11	57	41	37	33	36							
12	58	42	35	34	35							
13	64	45	33	34	35							
14	64	47	32	37	34							
15	63	47	32	36	33							
16	63	45	32	39	36							
17	64	42	32	42	35							
18	62	35	32	37	35							
19	64	37	32	38	36							
20	64	37	33	37	35							
21	63	--	33	37	35							
22	63	39	32	35	33							
23	62	38	32	33	33							
24	58	38	34	33	35							
25	59	36	33	33	35							
26	56	35	33	35	37							
27	55	34	32	35	36							
28	53	35	32	36	37							
29	52	36	32	33	38							
30	52	38	33	32	--							
31	51	--	33	34	--							
Average	60	39	36	35	36							

STREAMS TRIBUTARY TO LAKE ERIE--Continued

ROCKY RIVER AT CLEVELAND, OHIO

LOCATION.--At bridge on Puritas Spring Road in Cleveland, Cuyahoga County, 3½ miles downstream from gaging station near Berea, and 8 miles upstream from mouth. DRAINAGE AREA.--269 square miles (above gaging station).

RECORDS AVAILABLE.--Chemical analyses: March 1950 to February 1952.

Water temperatures: March to August 1950.

REMARKS.--Records of specific conductance of daily samples from March to August 1950 available in district office at Columbus, Ohio. Discharge records for gaging station near Berea for water year October 1951 to September 1952 given in Water-Supply Paper 1237. No appreciable inflow between gaging station and sampling point except during periods of heavy local runoff.

Chemical analyses, in parts per million, October 1951 to February 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium hexavalent (Cr)	Copper (Cu)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
																Calcium, mg.	Non-carbonate				Unfiltered	Filtered
Oct. 5, 1951.....	5.5	4.8	0.01	0.00	0.0	59	19	45	7.6	126	151	41	0.3	3.6	401	224	122	624	7.9	12	6.2	4.5
Nov. 17.....	195	7.2	.01	.00	0.0	67	18	25	5.2	127	144	33	0.1	5.0	380	242	137	577	7.9	7	7.4	3.9
Dec. 19.....	70	7.5	.04	.00	0.0	64	12	23	3.2	118	128	24	0.2	4.5	353	207	112	542	7.7	0	3.8	3.4
Jan. 19, 1952....	1,010	4.1	.03	.00	0.0	32	4.9	7.3	2.2	54	61	7.5	0.1	4.2	159	101	56	242	7.6	10	7.6	4.8
Feb. 2.....	1,870	4.7	.04	.00	0.0	33	8.7	10	2.4	64	67	13	0.1	3.6	186	118	66	292	7.6	7	6.6	4.2

Dissolved oxygen, cyanide, and phenols, October 1951 to February 1952

Date of collection	Time	Mean discharge (cfs)	Temperature		Dissolved oxygen	Cyanide (CN)	Phenols as C ₆ H ₅ OH
			°F	°C	Parts per million	Parts per million	Parts per million
Oct. 5, 1951.....	6:15 p.m.		75	23.9	9.0	0.0	0.003
Nov. 17.....	2:45 p.m.		41	5.0	11.5	90	0.005
Dec. 19.....	2:30 p.m.		32	0	12.3	84	0.000
Jan. 19, 1952.....	12:30 p.m.		37	2.8	13.4	99	0.000
Feb. 2.....	10:00 a.m.		34	1.1	13.4	94	0.000

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CUYAHOGA RIVER AT BRECKSVILLE, OHIO

LOCATION.--At bridge on Station Road at Brecksville, Cuyahoga County, 2½ miles downstream from Mason Creek, 3¼ miles upstream from Brandywine Creek, and 8 miles upstream from gaging station at Independence.

DRAINAGE AREA.--584 square miles.

RECORDS AVAILABLE.--Chemical analyses: March 1950 to February 1952.

Water temperatures: March to October 1950.

REMARKS.--Records of specific conductance of daily samples from March to October 1950 available in district office at Columbus, Ohio. Discharge records for gaging station at Independence, for water year October 1951 to September 1952 given in Water-Supply Paper 1237. Some inflow between sampling point and gaging station.

Chemical analyses, in parts per million, October 1951 to February 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium (Cr) hexavalent	Copper (Cu)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)		Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
																	Calcium, mg./l.	Non-carbonate, mg./l.				Unfiltered	Filtered
Oct. 19, 1951...	111	8.9	0.06	0.00	0.0	80	20	77	7.4	174	162	101	0.9	1.0	575	139	280	933	7.3	40	17	17	17
Nov. 17, 1951...	720	6.3	0.09	0.00	0.0	58	14	35	3.3	134	103	36	.4	11	345	204	92	549	7.5	20	8.7	6.6	6.6
Dec. 19, 1951...	500	8.3	0.14	0.00	0.0	51	11	38	3.3	97	114	41	.5	9.6	332	175	93	540	7.6	12	7.0	4.9	4.9
Jan. 5, 1952...	2,950	5.5	0.12	0.00	0.0	26	6.7	10	2.1	48	51	17	.2	4.9	165	94	53	252	7.2	10	6.9	5.2	5.2
Feb. 2, 1952...	3,890	4.4	0.02	0.00	0.0	33	6.1	12	2.0	60	59	17	.2	4.4	179	107	58	284	7.6	8	11	9.2	9.2

Dissolved oxygen, cyanide, and phenols, October 1951 to February 1952

Date of collection	Time	Mean discharge (cfs)	Temperature		Dissolved oxygen	Cyanide (CN)	Phenols as C ₆ H ₅ OH Parts per million
			°F	°C	Parts per million	Parts per million	Parts per million
Oct. 5, 1951.....	5:00 p.m.		75	23.9	1.0	12	0.0
Oct. 19, 1951.....	4:45 p.m.		59	15.0	1.0	9	0.023
Nov. 17, 1951.....	4:00 p.m.		48	8.9	6.6	57	0.016
Dec. 19, 1951.....	12:45 p.m.		33	.6	9.8	68	.1
Jan. 5, 1952.....	4:45 p.m.		38	1.7	12.6	90	.007
Feb. 2, 1952.....	11:15 a.m.		38	3.3	12.1	91	.024

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CUYAHOGA RIVER AT INDEPENDENCE, OHIO

LOCATION.--At gaging station at highway bridge on Rockside Road, 1 mile northeast of Independence, Cuyahoga County, and 3 miles downstream from Tinkers Creek.

DRAINAGE AREA.--709 square miles.

RECORDS AVAILABLE.--Sediment records: October 1950 to September 1952.

EXTREMES, 1951-52.--Sediment concentrations: Maximum daily, 1,000 ppm Jan. 17; minimum daily, 3 ppm Aug. 19.

Sediment loads: Maximum daily, 26,000 tons Jan. 27; minimum daily, 1 ton on several days in October, August, and September.

EXTREMES, 1950-52.--Sediment concentrations: Maximum daily, 1,070 ppm Feb. 21, 1951; minimum daily, 2 ppm Aug. 25-30, 1951.

Sediment loads: Maximum daily, 26,000 tons Jan. 27, 1952; minimum daily, 1 ton Aug. 25-30, Sept. 3-10, Oct. 1-4, 1951, Aug. 19, 20, 25-27, Sept. 1, 9-11, 13, 18, 1952.

REMARKS.--Flow affected by ice Dec. 18-20. Records of discharge for water year October 1951 to September 1952 given in Water-Supply Paper 1237.

Suspended sediment, water year October 1951 to September 1952

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-----	111	5	1	119	10	3	960	49	127
2-----	128	4	1	128	7	2	820	42	93
3-----	128	4	1	167	7	3	700	28	53
4-----	124	4	1	144	8	3	720	42	82
5-----	119	5	2	111	7	2	840	59	134
6-----	135	5	2	126	5	2	800	43	93
7-----	150	11	4	1,380	450	b2,000	1,340	133	s587
8-----	209	20	a11	780	153	s357	1,520	109	447
9-----	180	5	2	433	36	42	4,100	476	s6,040
10-----	137	5	2	437	24	28	2,680	198	1,430
11-----	150	5	2	447	18	22	2,050	115	637
12-----	147	5	2	383	16	17	1,600	83	359
13-----	137	6	2	386	23	24	1,380	63	235
14-----	126	7	2	582	73	115	1,080	54	157
15-----	108	7	2	422	34	39	880	43	102
16-----	122	6	2	544	47	s90	680	36	66
17-----	126	10	3	720	45	87	563	27	41
18-----	113	10	3	700	40	76	550	37	55
19-----	111	10	3	641	34	59	500	35	47
20-----	106	11	3	641	30	52	600	29	47
21-----	104	10	3	582	27	42	1,750	165	s1,090
22-----	90	8	2	1,120	150	b950	2,200	184	s1,200
23-----	108	7	2	5,620	720	b11,000	1,580	87	282
24-----	119	6	2	3,350	348	3,150	1,290	46	180
25-----	135	11	4	2,900	180	1,410	1,340	61	s277
26-----	117	11	3	2,680	200	a1,400	2,950	250	b2,000
27-----	115	10	3	1,900	115	590	2,100	115	652
28-----	157	12	5	1,560	92	388	1,700	65	298
29-----	128	15	5	1,290	73	254	1,520	41	168
30-----	128	14	5	1,120	58	175	4,070	39	s5,100
31-----	122	12	4	--	--	--	5,360	450	s6,840
Total-	3,970	--	89	31,413	--	22,382	50,223	--	28,899

s Computed by subdividing day.

a Computed from water-sediment discharge curve.

b Computed from partly-estimated concentration graph.

ST. LAWRENCE RIVER BASIN

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CUYAHOGA RIVER AT INDEPENDENCE, OHIO--Continued

Suspended Sediment, water year October 1951 to September 1952--Continued

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-----	6,830	342	6,310	2,460	256	1,700	660	39	69
2-----	4,760	249	3,200	3,890	410	a 4,300	660	44	78
3-----	3,950	246	2,620	3,120	225	1,900	602	42	68
4-----	3,470	220	2,060	5,620	490	b 7,200	920	120	a 340
5-----	2,950	208	1,660	4,480	204	2,470	1,240	190	a 640
6-----	2,400	156	1,010	3,410	192	1,770	1,080	76	222
7-----	1,850	138	689	3,000	156	1,260	980	53	137
8-----	1,470	119	472	2,620	163	1,150	880	43	102
9-----	1,240	81	271	2,680	151	1,090	840	34	77
10-----	1,120	62	187	2,250	147	893	880	44	s 120
11-----	940	54	137	2,000	121	653	6,540	975	s 17,800
12-----	860	40	93	1,600	113	488	4,270	340	3,920
13-----	800	37	80	1,420	98	376	3,170	218	1,870
14-----	940	63	160	1,240	81	271	3,000	180	1,460
15-----	1,520	170	b 760	1,080	69	201	2,510	154	1,040
16-----	1,560	121	s 516	980	81	214	2,050	110	609
17-----	4,470	1,000	b 14,000	940	66	168	1,700	92	422
18-----	8,100	860	b 20,000	860	51	118	1,580	95	400
19-----	5,060	308	4,210	800	49	106	3,410	351	s 3,540
20-----	5,220	292	4,120	1,000	120	b 400	3,060	200	1,650
21-----	4,200	256	2,900	1,340	195	706	2,300	112	696
22-----	3,590	270	b 2,600	1,040	99	278	1,900	87	446
23-----	3,590	263	2,550	960	69	179	3,000	280	b 2,400
24-----	2,510	195	1,320	920	51	127	2,200	107	636
25-----	1,850	180	899	860	38	88	1,750	79	373
26-----	4,750	604	s 9,530	780	54	114	1,520	68	279
27-----	10,500	923	b 26,000	740	52	104	1,340	68	246
28-----	7,800	312	6,570	700	44	83	1,160	60	188
29-----	5,620	277	4,200	680	42	77	1,000	63	170
30-----	4,270	259	2,990	--	--	--	900	53	129
31-----	2,950	269	2,140	--	--	--	800	35	76
Total-	111,140	--	124,254	53,470	--	28,484	57,862	--	40,203
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-----	780	37	78	602	20	33	602	24	39
2-----	780	33	69	544	20	29	481	18	23
3-----	740	29	56	477	19	24	408	15	17
4-----	660	27	48	386	13	14	348	15	14
5-----	880	100	e 240	401	11	12	310	13	11
6-----	980	84	222	525	20	28	275	12	9
7-----	1,160	80	251	408	17	19	253	11	8
8-----	1,700	180	b 890	304	10	8	211	11	6
9-----	1,560	130	b 580	310	11	9	241	18	12
10-----	1,240	76	254	411	20	22	223	12	7
11-----	1,160	48	150	372	10	10	195	10	5
12-----	1,000	41	111	310	7	6	167	8	4
13-----	2,310	310	s 2,430	294	8	6	154	7	3
14-----	3,230	346	s 3,220	294	10	8	209	20	11
15-----	3,710	260	a 2,700	372	12	12	232	14	9
16-----	3,350	168	1,520	337	11	10	170	5	2
17-----	2,680	116	839	351	10	9	176	5	2
18-----	2,200	92	546	358	6	6	154	6	2
19-----	1,850	76	380	337	7	6	130	5	2
20-----	1,520	62	254	411	10	11	133	5	2
21-----	1,200	44	143	481	18	23	128	5	2
22-----	1,000	32	86	477	21	27	150	10	4
23-----	1,080	65	b 200	429	10	12	251	55	a 45
24-----	1,290	90	b 310	705	70	b 180	173	10	5
25-----	1,160	37	116	1,560	240	b 1,200	154	8	3
26-----	1,040	28	79	1,850	310	b 1,600	137	8	3
27-----	940	25	63	1,250	94	317	184	5	2
28-----	860	23	53	1,120	55	166	170	6	3
29-----	760	23	47	1,000	47	127	137	14	5
30-----	680	21	39	860	42	98	518	140	b 230
31-----	--	--	--	720	34	66	--	--	--
Total-	43,500	--	15,976	18,296	--	4,098	7,074	--	490

e Estimated.

s Computed by subdividing day.

a Computed from water-sediment discharge curve.

b Computed from partly-estimated concentration graph.

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CUYAHOGA RIVER AT INDEPENDENCE, OHIO--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

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-----	334	32	s 32	150	8	3	111	5	1
2-----	189	12	6	137	7	3	144	5	2
3-----	312	250	b 540	122	7	2	209	18	a 10
4-----	665	650	b 1,900	115	6	2	157	5	2
5-----	220	26	15	207	25	a 20	140	4	2
6-----	176	20	10	150	7	3	135	5	2
7-----	133	16	6	135	7	3	150	7	3
8-----	143	11	4	126	6	2	99	6	2
9-----	303	25	20	128	5	2	108	5	1
10-----	247	9	6	274	45	a 45	102	5	1
11-----	176	8	4	178	8	4	99	5	1
12-----	157	12	5	206	6	3	99	6	2
13-----	143	10	4	184	5	2	94	5	1
14-----	115	8	2	147	5	2	96	6	2
15-----	133	7	3	150	7	3	122	15	a 8
16-----	173	6	3	178	11	5	160	15	6
17-----	161	5	2	165	13	6	116	7	2
18-----	147	5	2	115	5	2	104	5	1
19-----	336	32	s 37	111	3	1	310	48	s 57
20-----	268	9	7	106	4	1	192	12	6
21-----	773	910	b 2,300	133	5	2	126	14	5
22-----	458	82	s 108	195	77	4	96	9	2
23-----	354	23	22	144	6	2	104	8	2
24-----	300	14	11	124	5	2	113	7	2
25-----	247	11	7	102	5	1	102	7	2
26-----	193	9	5	104	5	1	124	9	3
27-----	250	9	6	102	5	1	178	12	6
28-----	211	9	5	119	5	2	179	50	a 25
29-----	209	9	5	117	6	2	90	7	2
30-----	165	8	4	110	6	2	102	11	3
31-----	162	8	3	102	7	2	--	--	--
Total-	7,853	--	5,084	4,436	--	135	3,961	--	164
Total discharge for year (cfs-days)									393,198
Total load for year (tons)									270,258

s Computed by subdividing day.

a Computed from water-sediment discharge curve.

b Computed from partly-estimated concentration graph.

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CUYAHOGA RIVER AT INDEPENDENCE, OHIO--Continued

Particle-size analyses of suspended sediment, March 1952

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Suspended sediment											Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500	1.000
Mar. 19, 1952.....	11:55 a. m.	3,890	526	426	24	27	38	51	61	68	77	87		95	BN
Mar. 19.....	2:25 p. m.	4,130	522	402	26	33	41	47	59	66	74	83		92	BN

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CUYAHOGA RIVER AT CLEVELAND, OHIO

LOCATION.--At bridge on Center Street in Cleveland, Cuyahoga County, three-quarters of a mile upstream from mouth, and 3½ miles downstream from Kingsbury Run.
DRAINAGE AREA.--813 square miles (at mouth).
RECORDS AVAILABLE.--Chemical analyses: March 1950 to February 1952.
Water temperatures: March 1950 to February 1952.
EXTREMES, 1950-52.--Dissolved solids: Maximum, 640 ppm Nov. 1-10, 1950; minimum, 209 ppm Jan. 21-31, 1952.
Hardness: Maximum, 298 ppm Oct. 21-31, Nov. 1-10, 1950; minimum, 122 ppm Jan. 21-31, 1952.
Specific conductance: Maximum daily, 1,240 micromhos Nov. 5, 1950; minimum daily, 256 micromhos Jan. 27, 1952.
Water temperatures: Maximum, 92°F Aug. 9, 1951; minimum, 39°F Dec. 9, 1950, Feb. 14, 1951, Jan. 29, 1952.
REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. No discharge records available for this station.

Chemical analyses, in parts per million, October 1951 to February 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium (Cr) hexavalent	Copper (Cu)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
																Calcium	Non-carbonate				Unfiltered	Filtered
Oct. 1-10, 1951	9.1	13	0.01	0.00	0.0	72	15	55	10	140	180	55	1.6	0.2	474	240	127	769	7.4	15	6.4	6.2
Oct. 11-20	13	13	0.01	0.00	0.0	75	16	60	9.7	155	188	64	1.7	2	502	252	126	814	7.3	15	7.2	6.8
Oct. 21-31	5.7	5.7	0.01	0.00	0.0	82	17	65	12	145	218	70	1.6	2	546	276	156	879	7.2	15	7.8	7.3
Nov. 1-10	7.6	7.6	0.01	0.00	0.0	82	18	65	14	140	221	76	1.6	2	582	279	164	919	7.4	15	7.8	6.8
Nov. 11-20	4.9	4.9	0.02	0.00	0.0	78	18	54	11	126	211	65	1.5	1	526	270	165	827	7.2	12	7.6	7.2
Nov. 21-30	2.5	2.5	0.01	0.00	0.0	54	13	33	7.9	95	141	37	.9	.3	332	188	110	541	7.3	15	6.5	4.5
Dec. 1-10	5.3	5.3	0.02	0.00	0.0	57	13	31	7.6	92	153	32	1.0	.4	350	196	120	564	7.3	18	6.8	5.9
Dec. 11-20	3.2	3.2	0.02	0.00	0.0	57	13	39	9.2	86	162	40	1.0	.4	369	195	125	588	7.3	15	6.8	6.3
Dec. 21-31	6.7	6.7	0.02	0.00	0.0	50	11	32	9.4	82	124	42	.7	2.3	312	171	103	509	7.1	16	6.2	5.3
Jan. 1-10, 1952	7.4	7.4	0.11	0.00	0.0	43	9.7	23	23	71	97	25	.7	2.4	249	148	89	401	7.2	16	7.6	6.8
Jan. 11-20	8.0	8.0	0.36	0.00	0.0	50	12	37	37	81	131	34	.8	.9	317	176	108	503	7.3	23	7.1	7.1
Jan. 21-31	6.8	6.8	0.05	0.00	0.0	37	7.3	20	20	58	80	22	.5	2.5	209	122	75	344	7.3	16	6.4	6.4
Feb. 1-10	7.9	7.9	0.12	0.00	0.0	40	8.6	18	3.7	64	89	25	.4	.6	231	135	83	389	6.7	8	6.9	6.1
Feb. 11-20	8.6	8.6	0.23	0.00	0.1	54	12	30	5.1	92	127	35	1.0	.1	335	184	109	559	6.8	8	6.8	5.8
Feb. 21-29	8.8	8.8	0.04	0.00	0.0	61	12	40	5.6	101	159	42	1.0	.1	387	200	119	651	6.8	7	8.0	7.6

STREAMS TRIBUTARY TO LAKE ERIE--Continued
 CUYAHOGA RIVER AT CLEVELAND, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, October 1951 to February 1952

Date of collection	Time	Mean discharge (cfs)	Temperature		Dissolved oxygen		Cyanide (CN)	Phenols as C ₆ H ₅ OH
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Oct. 6, 1951.....	7:15 a. m.		79	26.1	0.0	0	0.1	0.078
Oct. 19	6:00 p. m.		72	22.2	5.7	65	.1	.094
Nov. 3	1:45 p. m.		34	1.1	.0	0	.1	.049
Nov. 17	1:15 p. m.		63	17.2	.0	0	.4	.295
Dec. 1	11:00 a. m.		52	11.1	5.3	48	.6	.601
Dec. 19	3:15 p. m.		34	1.1	6.1	43	.5	.489
Jan. 5, 1952	3:15 p. m.		40	4.4	10.6	81	.2	.179
Jan. 19	11:45 a. m.		42	5.6	10.3	82	.1	.138
Feb. 2	12:15 p. m.		41	5.0	10.5	82	.1	.138
Feb. 16	2:15 p. m.		46	7.8	6.2	52	.2	.474

Temperature (°F) of water, October 1951 to February 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	71	55	40	45							
2	74	71	50	44	42							
3	75	70	55	42	45							
4	78	68	57	42	44							
5	76	66	59	41	45							
6	78	66	55	42	44							
7	77	63	60	43	44							
8	77	50	57	45	44							
9	73	59	50	44	45							
10	71	58	47	48	45							
11	72	62	47	49	--							
12	71	62	47	50	45							
13	70	64	42	50	46							
14	71	52	42	51	46							
15	69	62	45	51	47							
16	73	67	45	52	48							
17	73	62	42	52	50							
18	76	58	45	49	48							
19	75	55	47	45	48							
20	73	54	40	44	51							
21	70	54	51	44	48							
22	73	55	40	44	48							
23	73	45	42	42	50							
24	73	45	44	43	50							
25	73	45	44	44	52							
26	70	45	40	42	53							
27	71	45	40	43	53							
28	73	47	42	41	55							
29	72	--	45	39	51							
30	72	49	43	40	--							
31	71	--	41	40	--							
Average	73	58	47	45	48							

STREAMS TRIBUTARY TO LAKE ERIE--Continued

DOAN BROOK AT CLEVELAND, OHIO

LOCATION.--At bridge on Liberty Row Road, in Rockefeller Park, near intersection of Liberty Row Road and East Boulevard in Cleveland, Cuyahoga County, and 1½ miles upstream from mouth.
 DRAINAGE AREA.--9.6 square miles (at mouth).
 RECORDS AVAILABLE.--Chemical analyses: March 1951 to February 1952.
 REMARKS.--No discharge records available for this station.

Chemical analyses, in parts per million, October 1951 to February 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium (Cr) hexavalent	Copper per (Cu)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
																Calcium	Non-carbonate				Unfiltered	Filtered
Oct. 6, 1951		2.0	0.02	0.00	0.0	40	9.7	12	1.5	113	34	25	0.2	1.7	186	140	47	332	7.8	4	2.3	2.1
Nov. 17		5.1	.02	.00	.0	44	9.0	39	2.8	90	58	62	.2	12	284	147	73	494	7.1	8	6.1	4.1
Dec. 19		2.9	.03	.00	.0	46	10	25	2.6	110	57	36	.2	9.6	282	159	66	435	7.5	0	5.0	3.0
Jan. 19, 1952 ...		2.3	.01	.00	.0	49	11	17	2.9	108	68	36	.1	4.8	258	188	79	424	7.8	7	5.2	5.1
Feb. 16		6.3	.08	.00	.0	51	21	31	3.3	118	93	36	.2	5.9	339	214	117	567	7.3	4	5.2	2.4

Dissolved oxygen, cyanide, and phenols, October 1951 to February 1952

Date of collection	Time	Mean discharge (cfs)	Temperature		Dissolved oxygen		Cyanide (CN)		Phenols as C ₆ H ₅ OH	
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million	Parts per million	Parts per million
Oct. 6, 1951	6:45 a.m.		65	18.3	6.8	72	0.0	0.000		
Nov. 17	12:30 p.m.		44	5.0	10.7	82	.0	.005		
Dec. 19	3:45 p.m.		33	6	11.7	91	.0	.009		
Jan. 19, 1952 ...	11:15 a.m.		38	3.3	12.4	93	.0	.000		
Feb. 16	1:45 p.m.		37	2.8	12.6	93	.0	.011		

STREAMS TRIBUTARY TO LAKE ERIE--Continued

EUCALD CREEK AT CLEVELAND, OHIO

LOCATION.--At bridge on State Highway 283 in Cleveland, Cuyahoga County, near junction of State Highways 283 and 2, and about a quarter of a mile upstream from mouth.
 DRAINAGE AREA.--23.1 square miles (at mouth).
 RECORDS AVAILABLE.--Chemical analyses: March 1951 to February 1952.
 REMARKS.--No discharge records available for this station.

Chemical analyses, in parts per million, October 1951 to February 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium (Cr) hexavalent	Copper (Cu)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)	pH	Color	Oxygen consumed	
																Calcium	Non-carbonate				Unfiltered	Filtered
Oct. 6, 1951	2.2	0.06	0.00	0.0	39	8.3	12		104	33	26	0.4	1.5	183	132	46	324	7.9	5	4.3	2.8
Nov. 17	9.5	.03	.00	.0	50	13	43	5.0	59	89	104	.3	.8	374	180	131	605	7.6	7	5.3	3.7
Dec. 19	9.2	.04	.00	.0	43	13	31	3.7	88	84	38	.8	12	290	160	89	480	7.0	0	5.8	3.7
Jan. 19, 1952	4.7	.11	.00	.0	33	11	13	2.6	56	69	29	0.1	5.7	203	127	82	332	7.6	5	4.7	2.5
Feb. 16	9.5	.03	.00	.0	50	16	23	5.0	71	105	39	.1	.27	321	190	132	524	7.6	3	5.9	2.5

Dissolved oxygen, cyanide, and phenols, October 1951 to February 1952

Date of collection	Time	Mean discharge (cfs)	Temperature		Dissolved oxygen		Cyanide (CN)	Phenols as C ₆ H ₅ OH
			°F	°C	Parts per million	Percent saturation		
Oct. 6, 1951	8:15 a.m.	.....	63	17.2	8.5	88	0.0	0.000
Nov. 17	11:45 a.m.	.....	40	4.4	11.1	86	.0	.008
Jan. 19, 1952	10:45 a.m.	.....	37	2.8	12.8	94	.0	.000
Feb. 16	1:15 p.m.	.....	40	4.4	11.1	86	.0	.008

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CHAGRIN RIVER NEAR WILLOUGHBY, OHIO

LOCATION.--At bridge on State Highway 283, three-quarters of a mile upstream from mouth, and 4½ miles downstream from gaging station at Willoughby, Lake County.

DRAINAGE AREA.--267 square miles (at mouth).

RECORDS AVAILABLE.--Chemical analyses: March 1950 to February 1952.

Water temperatures:--March to August 1950.

REMARKS.--Records of specific conductance of daily samples from March to August 1950 available in district office at Columbus, Ohio. Discharge records for gaging station at Willoughby, for water year October 1951 to September 1952 given in Water-Supply Paper 1237. No appreciable inflow between gaging station and sampling point.

Chemical analyses, in parts per million, October 1951 to February 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium hexavalent (Cr)	Copper per cent (Cu)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
																Calcium, mg./l.	Non-carbonate, mg./l.				Unfiltered	Filtered
Oct. 6, 1951.....	30	4.0	0.01	0.00	0.0	57	18	11	2.8	182	87	12	0.1	9.4	277	215	67	450	8.1	6	2.8	2.7
Nov. 3.....	78	3.1	.01	.00	.0	57	14	8.4	3.3	179	64	9.0	.1	1.2	253	199	53	405	8.0	5	3.4	2.3
Dec. 1.....	295	6.4	.02	.00	.0	39	10	8.3	2.2	92	64	12	.1	3.3	192	139	63	311	7.7	8	4.2	4.1
Jan. 5, 1952.....	508	5.5	.03	.00	.0	30	7.5	6.9	2.0	70	49	11	.1	2.0	158	106	48	256	7.8	6	4.0	3.4
Feb. 2.....	1,920	4.6	.02	.00	.0	24	5.3	4.7	1.7	56	31	9.0	.1	1.0	123	82	36	195	7.6	7	6.4	5.9

Dissolved oxygen, cyanide, and phenols, October 1951 to February 1952

Date of collection	Time	Mean discharge (cfs)	Temperature		Dissolved oxygen	Cyanide (CN)	Phenols as C ₆ H ₅ OH
			°F	°C	Parts per million	Parts per million	Parts per million
Oct. 6, 1951.....	9:00 a. m.		67	19.4	3.1	0.0	0.000
Nov. 3.....	12:05 a. m.		94	34	13.5	.0	.006
Dec. 1.....	10:00 a. m.		38	3	14.2	.0	.008
Jan. 5, 1952.....	2:15 p. m.		38	3	13.3	.0	.005
Feb. 2.....	1:15 p. m.		36	2.2	13.3	.0	.000

STREAMS TRIBUTARY TO LAKE ERIE--Continued
GRAND RIVER AT PAINESVILLE, OHIO

LOCATION.--At bridge on State Highway 535 in Painesville, Lake County, 2½ miles upstream from mouth, 8 miles downstream from Kellogg Creek, and about 12 miles downstream from gaging station near Madison.

DRAINAGE AREA.--712 square miles (at mouth).

RECORDS AVAILABLE.--Chemical analyses: March 1950 to February 1952.

Water temperatures: March 1950 to February 1952.

EXTREMES, 1950-52.--Dissolved solids: Maximum, 18,900 ppm Aug. 9, 1950; minimum, 430 ppm Dec. 1-10, 1950.

Hardness: Maximum, 9,280 ppm Aug. 9, 1950; minimum, 190 ppm Jan. 21-31, 1952.

Specific conductance: Maximum daily, 26,800 micromhos Aug. 9, 1950; minimum daily, 309 micromhos Dec. 8, 1950.

Water temperatures: Maximum, 88°F July 28, Aug. 15, 1951; minimum, freezing point on several days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Discharge records for gaging station near Madison, for water year October 1951 to September 1952 given in Water-Supply Paper 1237. There is some inflow between gaging station and sampling station.

Chemical analyses, in parts per million, October 1951 to February 1952.

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium hexavalent (Cr)	Copper (Cu)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
																Calcium	Non-carbonate				Unfiltered	Filtered
Oct. 1-10, 1951	8.8	6.8	0.02	0.00	0.0	1,300	24	1,152	62	90	4,050	0.1	0.3	0.3	6,980	3,360	3,301	10,800	7.3	5	6.6	7.3
Oct. 11-20	11	13	0.02	0.10	0.0	1,280	29	1,250	92	99	4,150	0.0	0.3	0.3	7,180	3,320	3,237	10,900	7.4	5	7.8	7.9
Oct. 21-31	12	4.4	0.02	0.04	0.0	1,450	41	1,255	74	99	4,500	0.0	0.2	0.2	7,860	3,790	3,721	11,900	7.2	3	7.9	8.1
Nov. 1-10	159	5.8	0.05	0.15	0.0	1,140	36	1,059	66	100	3,650	0.0	0.4	0.4	6,150	3,010	2,948	9,820	7.1	3	8.0	7.3
Nov. 11-20	228	7.1	0.02	0.02	0.0	604	23	576	58	86	1,925	0.1	1.0	1.0	3,470	1,605	1,554	5,740	7.2	7	6.6	6.5
Nov. 21-30	1,600	7.2	0.02	0.02	0.0	228	12	221	52	64	700	0.1	1.5	1.5	1,320	620	576	2,240	7.4	10	8.6	5.5
Dec. 1-10	1,270	6.8	0.08	0.03	0.0	354	9.7	329	70	76	1,010	0.2	2.4	2.4	1,960	850	791	3,190	7.4	18	6.2	6.0
Dec. 11-20	862	6.9	0.06	0.01	0.0	372	13	393	21	72	1,200	0.1	1.0	1.0	2,200	985	964	3,650	7.1	15	8.4	7.5
Dec. 21-31	2,470	3.8	0.05	0.12	0.0	134	11	115	54	53	375	0.2	2.2	2.2	874	380	335	1,350	7.4	16	6.5	5.8
Jan. 1-10, 1952	3,260	5.4	0.20	0.03	0.0	165	11	142	33	46	490	0.2	0.8	0.8	936	460	432	1,630	7.6	16	6.2	6.1
Jan. 11-20	2,920	3.9	0.06	0.04	0.0	248	9.7	241	34	66	770	0.2	0.9	0.9	1,530	660	631	2,450	7.4	17	7.3	7.2
Jan. 21-31	4,480	5.4	0.03	0.03	0.0	68	4.9	69	32	35	195	0.2	0.8	0.8	436	190	164	747	7.6	15	7.2	6.2
Feb. 1-10	2,670	3.9	0.05	0.02	0.0	98	6.3	85	22	37	282	0.2	0.8	0.8	568	272	232	993	7.1	15	6.6	6.2
Feb. 11-20	703	6.6	0.04	0.01	0.0	320	24	280	8	49	1,050	0.0	1.0	1.0	1,960	900	891	3,220	5.7	2	5.4	6.1
Feb. 21-29	451	6.2	0.12	0.00	0.1	346	17	368	14	4	1,120	0.0	1.0	1.0	2,230	940	935	3,660	5.3	2	5.7	5.1

STREAMS TRIBUTARY TO LAKE ERIE--Continued

GRAND RIVER AT PAINESVILLE, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, October 1951 to February 1952

Date of collection	Time	Mean discharge (cfs)	Temperature		Dissolved oxygen		Cyanide (CN)	Phenols as C ₆ H ₅ OH
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Oct. 6, 1951	9:45 a.m.		76	24.4	5.2	62	0.0	0.015
Oct. 20	8:00 a.m.		66	18.9	.0	0	.0	.025
Nov. 17	10:15 a.m.		50	10.0	10.8	95	.0	.039
January 5, 1952 ..	1:45 p.m.		33	.6	13.9	97	.0	.005
Feb. 2	3:15 p.m.		37	2.8	12.6	93	.0	.000

Temperature (°F) of water, October 1951 to February 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	64	42	37	36							
2	77	61	42	34	--							
3	80	55	44	33	36							
4	80	53	47	33	39							
5	80	49	44	33	37							
6	78	55	44	35	40							
7	76	53	47	37	35							
8	65	40	47	37	35							
9	68	41	46	38	35							
10	71	44	42	40	35							
11	72	47	38	37	38							
12	71	47	37	40	36							
13	74	52	34	39	37							
14	71	52	33	40	33							
15	72	55	34	44	34							
16	70	54	35	37	37							
17	72	52	35	38	38							
18	73	44	37	39	35							
19	72	40	36	40	38							
20	70	42	37	40	39							
21	60	40	38	36	38							
22	70	44	33	37	36							
23	75	43	33	34	37							
24	74	41	35	32	36							
25	66	38	33	34	38							
26	67	36	35	35	37							
27	71	37	33	35	38							
28	68	37	32	34	41							
29	67	40	35	33	40							
30	65	42	34	33	--							
31	66	--	34	35	--							
Average	71	47	38	36	37							

STREAMS TRIBUTARY TO LAKE ERIE--Continued
MISCELLANEOUS ANALYSES OF STREAMS TRIBUTARY TO LAKE ERIE IN OHIO
Chemical analyses, in parts per million, water year October 1951 to September 1952

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chromium (Cr) hexavalent	Copper (Cu)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
																Calcium, magnesium	Non-carbonate				Unfiltered	Filtered
ASHTABULA RIVER AT ASHTABULA																						
Oct. 8, 1951	1.5	7.0	0.06	0.00	0.0	72	22	28	3.4	130	184	30	0.4	0.5	425	272	114	627	7.6	300	58	13
Jan. 17, 1952	395	4.7	.02	.00	.0	29	4.5	3.8	1.2	452	49	6.0	.2	2.8	137	90	49	212	8.8	10	8.1	7.2
Mar. 18	57	5.0	.12	.00	.0	32	5.8	11	2.0	44	58	16	.4	12	166	104	68	275	6.8	45	16	10
CONNEAUT CREEK AT AMBOY																						
Oct. 9, 1951	12	2.5	0.06	0.00	0.0	46	13	16	6.2	120	77	24	0.2	1.5	257	170	70	413	7.7	5	4.2	2.8
Jan. 18, 1952	1,820	3.7	.07	.00	.0	16	3.4	2.8	2.2	25	34	5.0	.2	1.7	84	53	33	132	7.3	4	9.9	5.4
Jan. 27	3,880	3.2	.03	.00	.0	8.8	2.7	2.4	2.3	16	22	1.8	.1	1.2	58	33	20	86.5	6.5	9	3.8	3.2
Mar. 18	146	4.8	.10	.00	.0	20	5.1	3.0	1.7	39	39	4.0	.0	1.0	102	70	39	171	7.3	6	3.3	2.4

a Includes equivalent of 6 parts per million of carbonate (CO₃).

INDEX

A		Page		Page	
Abbottsville Creek near Thomasville, N. C.	175	Central College, Ohio, Big Walnut Creek at	244-249		
Adamsville, Ohio, Raccoon Creek at. . .	233-235	Century, Fla., Escambia River near . . .	197-198		
Albemarle, N. C., Big Bear Creek near.	171	Chagrin River near Willoughby, Ohio . . .	357		
Allegheny River at Kittanning, Pa.	206-208	Charleroi, Pa., Monongahela River at. .	211-213		
at Sharpsburg, Pa.	209-210	Chartiers Creek at Carnegie, Pa.	306		
Aluminum	8	Chemical quality	3		
Ambridge, Pa., Ohio River at	214-218	Chloride	10-11		
Angelica Creek at Reading, Pa.	78	Chowan River basin	140-141		
Antietam Creek at Lorane, Pa.	78	Clarion River near Piney, Pa.	203-205		
Appomattox River near Petersburg, Va. .	139	Clarion River basin.	203-205		
Ashtabula River at Ashtabula, Ohio	360	Clark Creek at Lincolnton, N. C.	181		
Au Gres River near National City, Mich.	312	Cleveland, Ohio, Cuyahoga River at	353-354		
Au Sable River at Mio, Mich.	311	Cleveland, Ohio, Doan Brook at.	355		
B		Cleveland, Ohio, Euclid Creek at.	356		
Barbourville, Ky., Cumberland River at	279	Cleveland, Ohio, Rocky River at	347		
Barren River at Bowling Green, Ky.	272	Clewiston, Fla., Lake Okechobee north of	187		
Beaver River at New Brighton, Pa.	219-221	Clinch River at Speers Ferry, Va.	304		
Beaver River basin	219-229	Coddle Creek near Concord, N. C.	175		
Berne, Pa., Schuylkill River at.	52-57	Collection and examination of samples . .	3-5		
Beulahville, Va., Mattaponi River near .	127	Color	12		
Big Bear Creek near Albemarle, N. C. . .	171	Composition of surface waters	7-15		
Big Branch near Millbrook, N. C.	161	Coneross Creek at Richland, S. C.	186		
Big Generostee Creek near Starr, S. C. .	186	Conewango Creek at Russell, Pa.	200-202		
Big Laurel Creek near Stackhouse, N. C.	292-294	Conewango Creek basin	200-202		
Big Mound Canal at West Palm Beach Canal near Canal Point, Fla.	192	Congaree Creek near Cayce, S. C.	183		
Billows, Ky., Rockcastle River at	283	Congaree River at Columbia, S. C.	183		
Big Raft Swamp near Lumberton, N. C. .	174	Conneaut Creek at Amboy, Ohio	360		
Big Sandy River basin	236-238	Cooperation	16-18		
Big Walnut Creek at Central College, Ohio	244-249	Core Creek near Fort Barnwell, N. C. .	161		
Black River near Elyria, Ohio	345-346	Corrosiveness	14		
near Garnet, Mich.	307	Crabtree Creek near Swanton, Md.	103		
Blackwater River near Franklin, Va. . .	140	Cross Canal at Bend near Belle Glade, Fla.	193		
Bolles Canal at Hillsboro Canal, near Belle Glade, Fla.	193	Crowders Creek near Gastonia, N. C. . .	181		
Boron	11	Cub Creek at Phenix, Va.	144		
Boston, Ky., Rolling Fork near	262-263	Culpeper, Va., Rapidan River near . . .	119-123		
Boswells Tavern, Va., Hudson Creek near	124-125	Cumberland River at Barbourville, Ky. .	279		
Bowling Green, Ky., Barren River at .	272	at Burkesville, Ky.	284-286		
Brandywine Creek at Wilmington, Del. .	71-74	at Smithland, Ky.	287		
Brecksville, Ohio, Cuyahoga River at .	348	at Williamsburg, Ky.	280-282		
Bristol, Pa.-Burlington, N. J. Bridge, Delaware River at	40	near Harlan, Ky.	278		
Broad River near Carlisle, S. C.	182	Cumberland River basin	278-287		
near Gaffney, S. C.	182	Cumberland and Tennessee River basins	278-306		
Buchanan, Va., James River at	128-131	Cuyahoga River at Brecksville, Ohio . .	348		
Buffalo Creek near Blacksburg, S. C. .	182	at Cleveland, Ohio	353-354		
near Waco, N. C.	181	at Independence, Ohio	349-352		
Buggs Island, Va., Roanoke River at . .	152	Cynthiana, Ky., South Fork Licking River at	252		
Bullock Creek near Sharon, S. C.	182	D			
Burkesville, Ky., Cumberland River at .	284-286	Dan River at South Boston, Va.	149-151		
C		Danville, Pa., Susquehanna River at . .	87-90		
Calcium	9	Davidson Creek near Cornelius, N. C. . .	180		
Cane Creek near West Union, S. C.	186	Dayton, Ohio, Miami River at	253-256		
Cane River near Sioux, N. C.	296-298	Deep River near Sanford, N. C.	185		
Cape Fear River basin	162-165	Deer Creek at Harmarville, Pa.	102		
Carbonate and bicarbonate	10	Delaware, Ohio, Olentangy River at . . .	243		
Cartledges Creek near Rockingham, N. C.	173	Delaware River at Bristol, Pa. - Bur- lington, N. J. Bridge	40		
Catasauqua, Pa., Lehigh River at	27-29	at Dingmans Ferry, Pa.	24-26		
		at Eddystone, Pa.	69		
		at League Island, Philadelphia, Pa. . .	43		
		at Lehigh Avenue, Philadelphia, Pa. . .	41		
		at Marcus Hook, Pa.	70		
		at Philadelphia, Pa.-Camden, N. J. Bridge	42		
		at Torresdale Intake, Philadelphia, Pa.	41		

	Page		Page
Delaware River at Trenton, N. J.	33-39	Hazel River at Rixeyville, Va.	108-112
at Wharton Street, Philadelphia, Pa.	43	Hillsboro Canal at Belle Glade, Fla. ...	193
Delaware River basin	24-79	at Shawano, Fla.	190
Dike C Borrow Pit at North New River		near Deerfield Beach, Fla.	193
Canal at Broward-Palm Beach		Holloway Lateral at North New River	
County line, Fla.	194	Canal near Fort Lauderdale,	
Dike E Borrow Pit at North New River		Fla.	194
Canal near Fort Lauderdale,		Holston, Va., North Fork Holston River	
Fla.	194	at	300-303
Dingmans Ferry, Pa., Delaware River at	24-26	Hood Creek near Leland, N. C.	165
Dissolved Solids	12	Horse Creek near Wake Forest, N. C. ...	161
Division of work	19	Houghton Creek near Lupton, Mich.	314
Doan Brook at Cleveland, Ohio	355	Hoxeyville, Mich., Pine River near ...	309
Drowning Creek near Jackson Springs, N.		Hudson Creek near Boswells Tavern, Va. ...	124-125
C.	174	Hudson River basin	21-23
Dundee, Ky., Rough River at	274	Huron River at Milan, Ohio	343
Durham Creek at Edward, N. C.	154	Hydrogen-ion concentration	12-13
Dutchmans Creek near Stanley, N. C. ...	180		
		I	
E		Independence, Ohio, Cuyahoga River at.	349-352
Eagle Creek at Glencoe, Ky.	261	Indian Creek near Laboratory, N. C. ...	177
East Branch Au Gres River at Mc Ivor,		Indian Run at Hillsboro Canal near Deer-	
Mich.	313	field Beach, Fla.	193
East Branch Pine River near Tustin,		Introduction	1-3
Mich.	308	Iron	9
Edisto River near Branchville, S. C. ...	184	Iva, S. C., Savannah River near	185
Edisto River basin	184		
Eddystone, Pa., Delaware River at	69	J	
Effingham, S. C., Lynches River at	172	Jacob Fork near Startown, N. C.	180
Elk Creek at Elkville, N. C.	173	James River at Buchanan, Va.	128-131
Elmore, Ohio, Portage River at	336-337	at Scottsville, Va.	132-137
Elyria, Ohio, Black River near	345-346	near Richmond, Va.	138
Enoree River near Enoree, S. C.	183	James River basin	128-139
Escambia River near Century, Fla.	197-198	Jewel City, Ky., Pond River at	273
Escambia River basin	197-198	Johns River at Collettsville, N. C.	180
Euclid Creek at Cleveland, Ohio	356	Juniata River at Newport, Pa.	94-99
Evington, Va., Otter River near	143		
Expression of results	6-7	K	
F		Kanawha River basin	230-232
Falling Creek at Falling Creek, N. C. ...	161	Kentucky River at Lock 4 at Frankfort,	
near Rockingham, N. C.	173	Ky.	258-260
Falls, Pa., Susquehanna River at	84-86	Kentucky River basin	257-261
Farmers, Ky., Licking River at	251	Kings Creek at Kings Creek, S. C.	182
Fingerville, S. C., North Pacolet River		Kiskiminetas River at Leechburg, Pa. ...	306
at	178	Kitanning, Pa., Allegheny River at	206-208
First Broad River near Casar, N. C.	181		
Floyds Fork at Fisherville, Ky.	264	L	
Fluoride	11	Laboratory, N. C., Indian Creek near ..	177
Fort Lauderdale, Fla., North New River		Lafayette, Va., Roanoke River at	142
Canal near	191	Lake Erie at Public Water-Supply Intake,	
Frankfort, Ky., Kentucky River at	258-260	Ashtabula, Ohio	321
Franklin, Va., Blackwater River near	140	at Public Water-Supply Intake, Avon	
Frederick, Md., Linganore Creek near ..	106	Lake, Ohio	320
Fremont, Ohio, Sandusky River near	338-342	at Public Water-Supply Intake, Cedar	
		Point, Ohio	319
G		at Public Water-Supply Intake, Con-	
Galax, Va., New River at	230	neaut, Ohio	321
Garnet, Mich., Black River near	307	at Public Water-Supply Intake,	
Gibsonville, N. C., Reedy Fork near	162-164	Elyria, Ohio	320
Glencoe, Ky., Eagle Creek at	261	at Public Water-Supply Intake, Fair-	
Glenlyn, Va., New River at	231	port, Ohio	321
Grand River at Painesville, Ohio	358-359	at Public Water-Supply Intake, Hu-	
Grants Creek at Salisburg, N. C.	175	ron, Ohio	319
Graterford, Pa., Perkiomen Creek at ...	58-61	at Public Water-Supply Intake,	
Green River at Greensburg, Ky.	265	Lorain, Ohio	320
at Munfordville, Ky.	266-271	at Diamond Alkali Company Intake,	
Green River basin	265-274	Painesville, Ohio	320
Greensburg, Ky., Green River at	265	at Industrial Rayon Corporation In-	
Grindle Creek at Pactolus	154	take, Painesville, Ohio	321
		at Public Water-Supply Intake,	
H		Painesville, Ohio	321
Hancock, Md., Potomac River at	104	at Public Water-Supply Intake, Port	
Hanover, Va., Pamunkey River near	126	Clinton, Ohio	319
Hardness	13	at Public Water-Supply Intake, San-	
Harlan, Ky., Cumberland River near	278	dusky, Ohio	319
Harrisburg, Pa., Susquehanna River at ..	100-101	at Public Water-Supply Intake, To-	
Hazard, Ky., North Fork Kentucky River		ledo, Ohio	319
at	257	at Public Water-Supply Intake, Ver-	
		million, Ohio	320
		Lake Erie	319-321

	Page		Page
Lake Okeechobee at Hurricane Gate		Monongahela River at Charleroi, Pa.	211-213
Structure 4, near Belle Glade, Fla.	192	Monongahela River basin	211-218
5 miles north of Clewiston, Fla. ..	187	Mud Creek at Naples, N. C.	291
Lake Okeechobee and the Everglades ..	187-196	Muddy Creek near Clemmons, N. C. ...	174
Landingville, Pa., Schuylkill River at ..	44-47	Munfordville, Ky., Green River at	266-271
Lateral from North at West Palm Beach Canal, Loxahatchee, Fla.	192		
League Island, Philadelphia, Pa., Delaware River at	43	N	
Leavittsburg, Ohio, Mahoning River at ..	222-223	Nahunta Swamp near Snow Hill, N. C.	161
Lehigh Ave., Philadelphia, Pa., Delaware River at	41	Naples, N. C., Mud Creek at	291
Lehigh River at Catasaqua, Pa.	27-29	National City, Mich., Au Gres River near	312
at Walnutport, Pa.	30-32	New River at Galax, Va.	230
Levisa Fork at Paintsville, Ky.	236-238	at Glenlyn, Va.	231
Lewisburg, Pa., West Branch Susquehanna River at	91-93	Neuse River basin	155-161
Licking River at Farmers, Ky.	251	New Brighton, Pa., Beaver River at	219-221
near Salyersville, Ky.	250	Newdale, N. C., South Toe River at	295
Licking River basin	250-252	Newport, Pa., Juniata River at	94-99
Linganore Creek near Frederick, Md. .	106	Niles, Ohio, Mahoning River at	224
Literature cited	19-20	Nitrate	11
Little River near Sparta, N. C.	232	North Atlantic slope basins, New York to York River	21-127
near Star, N. C.	173	North Fork Holston River at Holston, Va.	300-303
Little Schuylkill River above Tamaqua, Pa.	77	North Fork Kentucky River at Hazard, Ky.	257
at Port Clinton, Pa.	77	North Fork New River at Creston, N. C.	232
at South Tamaqua, Pa.	48-51	North Fork Shenandoah River near Strasburg, Va.	105
below Tamaqua, Pa.	77	North Meherrin River near Lunenburg, Va.	141
Livingston Creek near Acme, N. C.	165	North New River Canal at Holloway Lateral, near Fort Lauderdale, Fla.	191
Lockwoods Folly River basin	166	North New River Canal at bend 4 miles south of Okeelanta, Fla.	194
Long Creek near Gastonia, N. C.	181	North New River Canal lateral from west, 10.0 miles south of Okeelanta, Fla.	194
Lowellville, Ohio, Mahoning River at ..	226-229	North New River Canal at South Bay, Fla.	194
Lower Barton Creek near Bayleaf, N. C.	161	North Pacolet River at Fingerville, S. C.	178
Lower Creek at Lenoir, N. C.	180	North Tyger River near Moore, S. C.	182
Loxahatchee, Fla., West Palm Beach Canal at	188-189		
Loyalsock Creek at Loyalsock, Pa.	102	O	
Lumber River near Pembroke, N. C.	174	Ohio River at Ambridge, Pa.	214-218
Lunenburg, Va., North Meherrin River near	141	Ohio River basin except Cumberland and Tennessee River basins	200-277
Lupton, Mich., Houghton Creek near ..	314	Olentangy River at Delaware, Ohio	243
Lupton, Mich., Rifle River near	315	Olney, Ky., Tradewater River at	275-277
Lycoming Creek near Trout Run, Pa.	102	Otter River near Evington, Va.	143
Lyle Creek at Catawba, N. C.	180	Oxygen consumed	12
Lynches River at Effingham, S. C.	172		
near Bishopville, S. C.	176		
		P	
M		Paducah, Ky., Tennessee River near ...	305
Mc Ivor, Mich., East Branch Au Gres River at	313	Painesville, Ohio, Grand River at	358-359
Magnesium	9	Paintsville, Ky., Levisa Fork at	236-238
Mahoning River at Leavittsburg, Ohio. .	222-223	Pamlico River basin	154
at Lowellville, Ohio	226-229	Pamunkey River near Hanover, Va.	126
at Niles, Ohio	224	Panther Creek at Tamaqua, Pa.	77
at Youngstown, Ohio	225	Pearl River near Bogalusa, La.	199
Manatawny Creek at Pottstown, Pa.	78	Pearl River basin	199
Manganese	9	Pee Dee River at Pee Dee, S. C.	176
Marcus Hook, Pa., Delaware River at ..	70	near Society Hill, S. C.	176
Mattaponi River near Beulahville, Va.	127	Pee Dee River basin	167-178
Maumee River at Toledo, Ohio	330-331	Pennsuo Lateral at Pennsuo, Fla.	195
at Waterville, Ohio	323-328	Percent sodium	14
Miami Canal at Junction with South New River Canal, Fla.	195	Perkiomen Creek at Graterford, Pa. ...	58-61
at Lake Harbor, Fla.	195	at Oaks, Pa.	78
at Water Plant, Hialeah, Fla.	195	Petersburg, Va., Appomattox River near ..	139
Miami River at Dayton, Ohio	253-256	Peters Creek at Wilson, Pa.	306
Miami River basin	253-256	Phenix, Va., Cub Creek at	144
Middle Fork Reddies River at Wilbar, N. C.	173	Philadelphia, Pa., Schuylkill River at Belmont Filter Plant	66-88
Milan, Ohio, Huron River at	343	Philadelphia, Pa., Schuylkill River at Manayunk	62-65
Mills River near Mills River, N. C.	286-290	Philadelphia, Pa.-Camden, N. J. Bridge, Delaware River at ...	42
Mills River N. C., Mills River near ...	288-290	Pigeon River near Vanderbilt, Mich. ...	310
Mine Creek near Millbrook, N. C.	161	Pinch Gut Creek near Bolivia, N. C. ...	166
Mineral constituents in solution	8-12	Pine Creek at Etna, Pa.	102
Mio, Mich., Au Sable River at	311	Pine River near Hoxeyville, Mich.	309
Mitchell River near Mountain Park, N. C.	174	Pineville, S. C., Santee River near	179
Mohawk River at Vischer Ferry Dam, N. Y.	21-23		

	Page
Piney, Pa., Clarion River near	203-205
Pond River at Jewel City, Ky.	273
Portage River at Elmore, Ohio	336-337
at Woodville, Ohio	332-335
Potomac River at Hancock, Md.	104
Potomac River basin	103-107
Prior Creek near Selkirk, Mich.	316
Properties and characteristics of water ..	12-14
Prospect, Ohio, Scioto River near	239-242
Publications	15-16

R

Raccoon Creek at Adamsville, Ohio	233-235
Raccoon Creek basin	233-235
Randolph, Va., Roanoke River at	145-147
Rangeline Canal at Hillsboro Canal near Deerfield Beach, Fla.	193
at West Palm Beach Canal near West Palm Beach, Fla.	192
Rapidan River near Culpeper, Va.	119-123
Rappahannock River at Remington, Va. .	113-118
Rappahannock River basin	108-123
Ready Branch near Williamston, N. C. .	153
Reedy Fork near Gibsonville, N. C.	162-164
Remington, Va., Rappahannock River at	113-118
Richmond, Va., James River near ..	138
Rifle River at Selkirk, Mich.	317
at "The Ranch" near Lupton, Mich. .	315
Rixeyville, Va., Hazel River at	108-112
Roanoke Creek at Saxe, Va.	148
Roanoke River at Buggs Island, Va.	152
at Lafayette, Va.	142
at Randolph, Va.	145-147
near Scotland Neck, N. C.	153
Roanoke River basin	142-153
Roaring River near Roaring River, N.C.	173
Rockcastle River at Billows, Ky.	283
Rockfish Creek near Raeford, N. C.	165
Rocky River near Calhoun Falls, S. C. .	186
at Cleveland, Ohio	347
Rolling Fork near Boston, Ky.	262-263
Rough River at Dundee, Ky.	274
Russell, Pa., Conewango Creek at	200-202

S

St. Lawrence River basin	307-360
Salt River basin	262-264
Salysersville, Ky., Licking River near .	250
Sandusky River near Fremont, Ohio	338-342
Santee River near Pineville, S. C.	179
Santee River basin	177-183
Savannah River at Augusta, Ga.	186
near Iva, S. C.	185
Savannah River basin	185-186
Saxe, Va., Roanoke Creek at	148
Schuylkill River above Phoenixville, Pa.	76
at Berne, Pa.	52-57, 75
at Conshohocken, Pa.	76
at Green Lane Bridge, Pa.	79
at Hamburg, Pa.	75
at Landingville, Pa.	44-47, 75
at Leesport, Pa.	75
at Monocacy, Pa.	76
at Mount Carbon, Pa.	75
at Belmont Filter Plant, Philadelphia, Pa.	66-68
at Girard Ave., Philadelphia, Pa.	76
at Manayunk, Philadelphia, Pa.	62-65
at Passayunk Ave., Philadelphia, Pa.	77
at Port Clinton, Pa.	75
at Port Kennedy, Pa.	76
at Pottsville, Pa.	75
at Sanatoga, Pa.	76
below Phoenixville, Pa.	76
below Reading, Pa.	78
Scioto River near Prospect, Ohio	239-242
Scioto River basin	239-249
Scottsville, Va., James River at	132-137
Second Broad River at Bostic, N. C.	181
Second Creek near Barber, N. C.	174

	Page
Sediment	14-15
Selkirk, Mich., Prior Creek near	316
Selkirk, Mich., Rifle River at	317
Selkirk, Mich., West Branch Rifle River near	318
Sewickley Creek at Ambridge, Pa.	306
Sharpsburg, Pa., Allegheny River at ..	209-210
Shawano, Fla., Hillsboro Canal at	190
Shoeheel Creek near Laurinburg, N. C. .	174
Silica	8
Silver Creek near Glen Alpine, N. C. .	180
Sioux, N. C., Cane River near	296-298
Smithland, Ky., Cumberland River at ..	287
Snake Creek Canal at South New River Canal, near Davie, Fla.	195
Sodium and potassium	10
South Atlantic slope and Eastern Gulf of Mexico basins, Ogeechee River to Peal River.	187-199
South Atlantic slope basins, James River to Savannah River.	128-186
South Boston, Va., Dan River at	149-151
South Fork Holston River at Vestal, Va.	299
South Fork Jones Creek near Morven, N. C.	173
South Fork Licking River at Cynthiana, Ky.	252
South Fork Shenandoah River near Luray, Va.	107
South New River Canal at Davie, Fla.	195
South Tamaqua, Pa., Little Schuylkill River at	48-51
South Toe River at Newdale, N. C.	295
Specific conductance	13
Speers Ferry, Va., Clinch River at	304
Stackhouse, N. C., Big Laurel Creek near	292-294
Stewart Creek near Mount Airy, N. C. ...	174
Stony Creek at Goldsboro, N. C.	161
Strasburg, Va., North Fork Shenandoah River near	105
Stream flow	19
Streams tributary to Lake Erie	322-360
Streams tributary to Lake Huron	310-318
Streams tributary to Lake Michigan	307-309
Sulfate	10
Suspended sediment	4-5
Susquehanna River at Danville, Pa.	87-90
at Falls, Pa.	84-86
at Harrisburg, Pa.	100-101
at Towanda, Pa.	80-83, 102
Susquehanna River basin	80-102
Swan Creek at Toledo, Ohio	329
Swanton, Md., Crabtree Creek near	103
Swift Creek near Red Oak, N. C.	154
Swift Creek near Vanceboro, N. C.	155-157

T

Tamiami Canal near Coral Gables (Foot- Bridge), Fla.	196
at Bridge 45, 27 miles west of Miami, Fla.	196
at Bridge 115, 46 miles west of Miami, Fla.	196
at Bridge 96, Monroe, Fla.	196
Temperature	5
Tennile Creek at Toledo, Ohio	322
Tennessee River near Paducah, Ky.	305
Tennessee River basin	288-306
Toledo, Ohio, Maumee River at	330-331
Toledo, Ohio, Swan Creek at	329
Toledo, Ohio, Tennile Creek at	322
Torresdale Intake, Philadelphia, Pa., Delaware River at	41
Total acidity	13
Towanda, Pa., Susquehanna River at	80-83
Tradewater River at Olney, Ky.	275-277
Tradewater River basin	275-277
Trent River near Trenton, N. C.	158-160
Trenton, N. C., Trent River near	158-160
Trenton, N. J., Delaware River at	33-39
Turnbull Creek near Elizabethtown, N. C.	165
Turtle Creek at Trafford, Pa.	306

	Page		Page
Tustin, Mich., East Branch Pine River near	308	West Branch Schuylkill River at Cressona, Pa.	77
Tyger River near Delta, S. C.	183	West Branch Susquehanna River at Lewisburg, Pa.	91-93
V		West Palm Beach Canal at Canal Point, Fla.	192
Vanceboro, N. C., Swift Creek near	155-157	at Loxahatchee, Fla.	188-189
Vanderbilt, Mich., Pigeon River near	310	at West Palm Beach, Fla.	192
Vermilion, Ohio, Vermilion River near ...	344	Wharton St., Philadelphia, Pa., Delaware River at	43
Vermilion River near Vermilion, Ohio	344	Willoughby, Ohio, Chagrin River near ...	357
Vestal, Va., South Fork Holston River at ..	299	Williamsburg, Ky., Cumberland River at ..	280-282
Vischer Ferry Dam, N. Y., Mohawk River at	21-23	Wilmington, Del., Brandywine Creek at ...	71-74
W		Wissahickon Creek at Philadelphia, Pa. ...	79
Walnutport, Pa., Lehigh River at	30-32	Woodville, Ohio, Portage River at	332-335
Wateree River near Camden, S. C.	182	Wyomissing Creek at West Reading, Pa.	78
Waterville, Ohio, Maumee River at	323-328	Y	
West Branch Rifle River near Selkirk, Mich.	318	Yadkin College, N. C., Yadkin River at ..	167-170
		Yadkin River at Yadkin College, N. C. ...	167-170
		York River basin	124-127
		Youngstown, Ohio, Mahoning River at	225

