# Quality of Surface Waters of the United States 1951

## 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*

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## PREFACE

This report was prepared by the Geological Survey in cooperation with the States of Delaware, Florida, Georgia, Kentucky, 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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# QUALITY OF SURFACE WATERS OF THE UNITED STATES, 1951

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## 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, 1950, to September 30, 1951. 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, total 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.

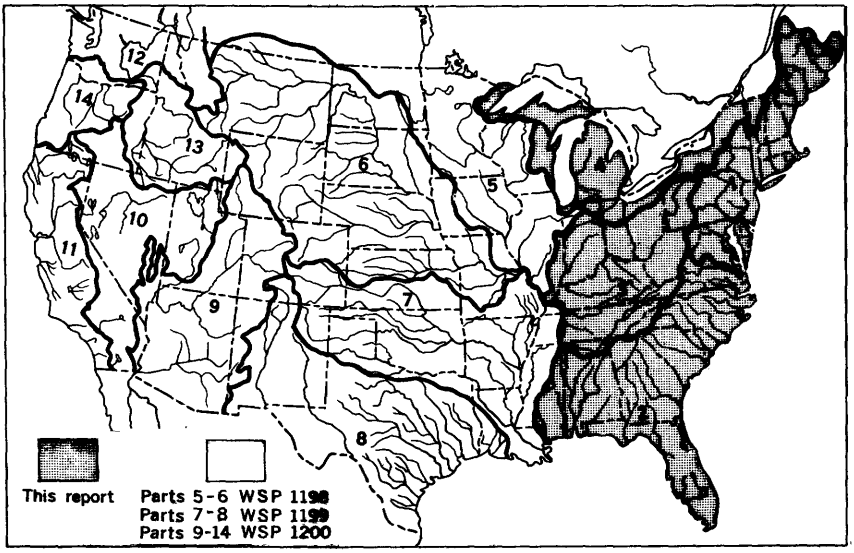


Figure 1. Map of the United States showing basins covered by the four water-supply papers on quality of surface waters in 1951. The shaded portion represents the section of the country covered by this volume; the unshaded portion represents the section of the country covered by other water-supply papers.

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, 1951, 124 regular sampling stations on 80 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 70 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 page 19.

Quantities of suspended sediment are reported for 25 stations during the year ended September 30, 1951. The sediment samples were collected from one to five times daily at most sta-

tions, 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 16 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 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 10,000 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 was often different from the concentration in the original suspension. The weight of sediment used is indicated in the tables of analyses.

## 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 thermograph observations consist of maximum and minimum temperatures for each day, the average of the maximum daily temperatures, and the average of the 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 total 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 (micromhos at 25°C). The discharge of the streams is reported in second-feet (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. Daily sediment loads are expressed in tons per day, and except for subdivided days are usually obtained by multiplying mean daily sediment concentration in parts per million by the mean daily discharge, and the conversion factor 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 Untied 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. 13 ). 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 (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, and 1949, for many of the stations listed in this report are given in Water-Supply Papers 942, 950, 970, 1022, 1030, 1050, 1102, 1132, 1162, and 1186.

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.
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.

By reorganization in 1949, the activities of the Ohio Water Resources Board were assumed by the Ohio Department of Natural Resources.

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 Custon House, Philadelphia 6, Pa. |
| Florida | Florida Geological Survey, Herman Gunter, director. Central and Southern Florida Flood Control District, Cities of Miami and Miami Beach, Fla. | South Atlantic slope and Eastern Gulf of Mexico. | P. O. Box 607, Ocala, Fla. |
| Georgia | Georgia Department of Mines, Mining, and Geology, Garland Peyton, director. | South Atlantic slope and Eastern Gulf of Mexico, Ohio River. | 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. |
| 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.

| 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. | 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. | North Atlantic slope, South Atlantic slope. | P. O. Box 3427, University Station, Charlottesville, Va. |

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, S. K. Love succeeded by Eugene Brown; in North Carolina and South Carolina, F. H. Pauszek succeeded by G. A. Billingsley; in Virginia, J. G. Connor succeeded by M. E. Schroeder; in Ohio, W. L. Lamar; and in Delaware and Pennsylvania, W. F. White succeeded by N. H. Beamer. Any additional analytical data on file can be obtained by writing the responbible 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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PART 1-B. NORTH ATLANTIC SLOPE BASINS, NEW YORK TO YORK RIVER

DELAWARE RIVER BASIN

DELAWARE RIVER AT NARROWSBURG, N. Y.

LOCATION.--At bridge on U. S. highway 106 at Narrowsburg, Sullivan County, about 9 miles upstream from gaging station above Lackawaxen River near Barryville, Pa.
DRAINAGE AREA.--2,023 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1951.
Water temperatures: October 1948 to September 1951.
REMARKS.--Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Extremes omitted because of periodic pollution which makes it misleading to report extremes or averages. River frozen over from Dec. 21-27, Dec. 29 to Jan. 17 and for several other days during late January and February. Records of discharge for water year October 1950 to September 1951 based on records for Delaware River above Lackawaxen River near Barryville, Pa., which are given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 1-10, 1950..... | 664 | | | | | -- | | 23 | 10 | 2.0 | | 0.2 | | 23 | 4 | 67.8 | 7.1 | 1 |
| Oct. 11-20 ..... | 801 | | | | | -- | | 23 | 10 | 2.0 | | .2 | | 24 | 5 | 68.9 | 7.0 | 1 |
| Oct. 21-31 ..... | 595 | | | | | 4.3 | | 24 | 10 | 2.0 | | .5 | | 24 | 4 | 68.6 | 7.0 | 3 |
| Nov. 1-10 ..... | 1,652 | | | | | 3.4 | | 20 | 11 | 2.0 | | .8 | | 24 | 8 | 65.5 | 6.7 | 3 |
| Nov. 11-20 ..... | 1,337 | | | | | 3.5 | | 19 | 10 | 2.0 | | .9 | | 22 | 6 | 60.8 | 6.7 | 3 |
| Nov. 21-30..... | 13,120 | | | | | 2.2 | | 10 | 10 | 1.0 | | 2.1 | | 17 | 9 | 53.0 | 6.2 | 7 |
| Dec. 1-10 ..... | 1,635 | | | | | -- | | 13 | 9.8 | 2.2 | | .5 | | 15 | 4 | 48.7 | 6.3 | 18 |
| Dec. 11-20..... | 5,142 | | | | | -- | | 11 | 11 | 2.8 | | .5 | | 19 | 10 | 57.7 | 6.6 | 6 |
| Dec. 21-28, 30, 31 ... | 2,031 | | | | | -- | | -- | -- | -- | | -- | | -- | -- | -- | -- | -- |
| Dec. 29..... | 1,682 | | | | | -- | | 15 | 12 | 4.0 | | .2 | | 24 | 12 | 73.9 | 6.4 | 5 |
| Jan. 1-10, 1951..... | 5,269 | | | | | -- | | -- | -- | -- | | -- | | -- | -- | -- | -- | -- |
| Jan. 11-17, 19, 20.... | 3,888 | | | | | -- | | -- | -- | -- | | -- | | -- | -- | -- | -- | -- |
| Jan. 18 ..... | 3,901 | | | | | -- | | 13 | 9.8 | 2.8 | | .3 | | 17 | 6 | 52.0 | 6.8 | 7 |
| Jan. 21-23, 27, 30, 31 | 5,309 | | | | | -- | | -- | -- | -- | | -- | | -- | -- | -- | -- | -- |
| Jan. 24-26, 28..... | 10,556 | | | | | -- | | 11 | 9.8 | 2.1 | | .3 | | 16 | 7 | 47.3 | 6.2 | 17 |
| Feb. 1, 4-10 .....i... | 6,872 | | | | | -- | | -- | -- | -- | | -- | | -- | -- | -- | -- | -- |
| Feb. 2-3..... | 13,207 | | | | | -- | | 9 | 9.2 | 1.9 | | .2 | | 15 | 8 | 45.4 | 6.8 | 17 |
| Feb. 11, 13-17, 19, 20 | 6,186 | | | | | -- | | -- | -- | -- | | -- | | -- | -- | -- | -- | -- |
| Feb. 12, 18 ..... | 4,986 | | | | | -- | | 12 | 9.8 | 5.0 | | 2.2 | | 16 | 6 | 52.8 | 6.7 | 5 |
| Feb. 21-28..... | 9,039 | | | | | -- | | 10 | 10 | 3.0 | | 1.4 | | 14 | 6 | 45.8 | 6.6 | 4 |

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT NARROWSBURG, N. Y.--Continued

Chemical analyses, in parts per million, water year October 1950 to September 1951--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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Mar. 1-10, 1951 | 4,500 | | | | | -- | | 16 | 10 | 4.0 | | 1.2 | | 16 | 3 | 51.2 | 6.8 | 2 |
| Mar. 11-20 | 5,309 | | | | | 2.0 | | 10 | 8 | 2.0 | | 1.3 | | 16 | 8 | 49.3 | 6.6 | 10 |
| Mar. 21-28, 30, 31 | 13,724 | | | | | 2.2 | | 9 | 8 | 2.0 | | 1.5 | | 15 | 8 | 46.3 | 6.5 | 10 |
| Mar. 29 | 7,294 | | | | | 96 | | a 86 | 30 | 92 | | .8 | | 24 | 0 | 917 | 8.5 | 20 |
| Apr. 1-10 | 12,652 | | | | | 3.2 | | 9 | 9 | 2.0 | | 1.7 | | 14 | 7 | 45.8 | 6.5 | 5 |
| Apr. 11-20 | 8,068 | | | | | 2.7 | | 10 | 8.5 | 2.0 | | 1.2 | | 15 | 7 | 47.3 | 6.6 | 10 |
| Apr. 21-30 | 4,184 | | | | | 2.5 | | 14 | 7.5 | 2.0 | | .5 | | 17 | 6 | 51.0 | 6.8 | 10 |
| May 1-10 | 3,266 | | | | | 2.9 | | 15 | 9.5 | 1.0 | | .8 | | 18 | 6 | 55.0 | 6.7 | 7 |
| May 11-20 | 1,528 | | | | | 3.0 | | 18 | 9.5 | 1.0 | | .7 | | 20 | 5 | 59.7 | 6.7 | 8 |
| May 21-31 | 1,388 | | | | | 2.6 | | 18 | 9.0 | 2.0 | | 1.0 | | 22 | 7 | 65.3 | 6.7 | 7 |
| June 1-10 | 1,145 | | | | | 1.4 | | 18 | 7.0 | 1.0 | | .8 | | 21 | 6 | 61.0 | 6.9 | 5 |
| June 11-20 | 1,093 | | | | | 2.6 | | 21 | 9.0 | 1.0 | | .8 | | 23 | 6 | 63.1 | 6.8 | 5 |
| June 21-30 | 1,179 | | | | | 2.6 | | 21 | 7.0 | 1.0 | | .8 | | 24 | 4 | 64.1 | 7.1 | 5 |
| July 1-10 | 1,701 | | | | | 3.1 | | 20 | 9.0 | 1.0 | | .7 | | 21 | 5 | 61.1 | 7.1 | 5 |
| July 11-20 | 1,346 | | | | | 2.8 | | 23 | 8.5 | 2.0 | 1.2 | .7 | | 25 | 6 | 62.7 | 7.1 | 7 |
| July 21-31 | 2,623 | | | | | 2.0 | | 19 | 8.0 | 2.0 | | .9 | | 23 | 7 | 58.5 | 6.9 | 10 |
| Aug. 1-10 | 1,412 | | | | | 1.7 | | 22 | 9.0 | 2.0 | | .7 | | 27 | 9 | 62.5 | 7.1 | 8 |
| Aug. 11-20 | 1,423 | | | | | 3.0 | | 22 | 9.0 | 2.5 | | .7 | | 25 | 7 | 63.5 | 7.0 | 10 |
| Aug. 21-31 | 938 | | | | | 3.4 | | 22 | 9.0 | 4.0 | | .3 | | 26 | 8 | 67.8 | 7.1 | 6 |
| Sept. 1-10 | 856 | | | | | -- | | 24 | 9.0 | 3.0 | | .3 | | 24 | 4 | 69.0 | 7.1 | 5 |
| Sept. 11-20 | 1,151 | | | | | -- | | 23 | 6.0 | 3.0 | | .3 | | 25 | 6 | 66.7 | 6.7 | 10 |
| Sept. 21-30 | 748 | | | | | -- | | 22 | 11 | 3.0 | | .6 | | 26 | 8 | 66.4 | 6.7 | 12 |
| Average | 4,129 | | | | | 2.7 | | 17 | 9.2 | 2.2 | | 0.8 | | 20 | 7 | 58.4 | 6.8 | 8 |

a Includes equivalent of 13 parts per million of carbonate ($CO_3$).

## DELAWARE RIVER BASIN--Continued

### DELAWARE RIVER AT NARROWSBURG, N. Y.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

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

## DELAWARE RIVER BASIN--Continued

### DELAWARE RIVER AT DINGMANS FERRY, PA.

LOCATION.--Sample taken from privately owned toll bridge connecting Dingmans Ferry, Pa., with Layton, N. J., approximately 7 miles downstream from nearest gaging station located at Montague, N. J., which is near Milford, Pa.
DRAINAGE AREA.--3,480 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
Water temperatures: October 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 46 ppm Oct. 11-20; minimum, 31 ppm Mar. 21-31, Apr. 1-10.
Hardness: Maximum, 34 ppm Oct. 24; minimum, 15 ppm Apr. 1-10.
Specific conductance: Maximum daily, 101 micromhos Oct. 24; minimum daily 38.5 micromhos Apr. 1.
Water temperatures: Maximum, 82°F July 27; 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 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 1-10, 1950 | | 61 | 1.8 | 0.00 | 7.4 | 1.5 | 1.8 | 0.8 | 20 | 11 | 2.2 | 0.1 | 0.6 | 38 | 25 | 8 | 63.4 | 6.8 | 1 |
| Oct. 11-20 | | 56 | 5.6 | .01 | 7.4 | 1.6 | 2.7 | .9 | 22 | 10 | 2.5 | .1 | .7 | 46 | 25 | 7 | 68.9 | 6.9 | 2 |
| Oct. 21-23, 25-31 | | 53 | 3.3 | .07 | 7.5 | 1.7 | 3.5 | 1.5 | 23 | 10 | 2.8 | .1 | .6 | 44 | 26 | 7 | 68.3 | 7.1 | 1 |
| Oct. 24 | | 54 | 4.3 | -- | 10 | 2.2 | 7.9 | | a44 | 10 | 3.0 | -- | .5 | -- | 34 | 0 | 101 | 8.8 | 2 |
| Nov. 1-10 | | 52 | 3.3 | .02 | 7.4 | 1.6 | 3.2 | 1.2 | 21 | 10 | 2.8 | .1 | .8 | 42 | 25 | 8 | 66.5 | 6.9 | 2 |
| Nov. 11-20 | | 42 | 3.4 | .08 | 6.8 | 1.6 | 2.8 | 1.1 | 17 | 10 | 3.0 | .1 | .9 | 39 | 24 | 10 | 63.7 | 6.9 | 2 |
| Nov. 21-27, 29, 30 | | 38 | 7.0 | .04 | 6.6 | 1.6 | 3.2 | 1.1 | 16 | 9.5 | 3.9 | .1 | 1.3 | 45 | 23 | 10 | 62.5 | 6.8 | 2 |
| Nov. 28 | | 40 | 4.0 | -- | 8.0 | 1.7 | 9.1 | | b38 | 11 | 2.0 | -- | 1.5 | -- | 27 | 0 | 88.9 | 8.4 | * 3 |
| Dec. 1-10 | | 37 | 3.7 | .08 | 4.8 | 1.3 | 1.9 | .9 | 9 | 10 | 1.9 | .1 | 1.6 | 35 | 17 | 10 | 48.5 | 6.5 | 2 |
| Dec. 11-20 | | 34 | 4.0 | .07 | 5.2 | 1.5 | 1.7 | .8 | 10 | 10 | 2.5 | .1 | 1.3 | 35 | 19 | 11 | 50.4 | 6.7 | 2 |
| Dec. 21-31 | | -- | 5.4 | .07 | 5.7 | 1.4 | 2.5 | .7 | 16 | 9.5 | 2.2 | .1 | 1.4 | 38 | 20 | 7 | 57.1 | 6.9 | 2 |
| Jan. 1-10, 1951 | | 33 | 4.2 | .02 | 5.7 | 1.3 | 2.1 | .6 | 13 | 10 | 2.0 | .1 | 1.6 | 38 | 20 | 9 | 55.6 | 6.5 | 3 |
| Jan. 11-20 | | 33 | 5.5 | .03 | 5.6 | 1.3 | 1.9 | .6 | 12 | 10 | 2.0 | .1 | 1.4 | 39 | 19 | 9 | 54.0 | 6.6 | 5 |
| Jan. 21-31 | | 33 | 3.5 | .03 | 4.8 | 1.1 | 1.8 | .6 | 9 | 10 | 2.0 | .1 | 1.0 | 35 | 16 | 9 | 49.7 | 6.5 | 5 |
| Feb. 1-10 | | 32 | 4.0 | .02 | 4.8 | 1.3 | 1.8 | .6 | 10 | 10 | 2.0 | .1 | 1.4 | 37 | 17 | 9 | 50.5 | 6.7 | 5 |
| Feb. 11-20 | | 34 | 4.2 | .02 | 4.6 | 1.2 | 1.4 | .6 | 9 | 9.5 | 2.0 | .1 | .8 | 35 | 16 | 9 | 46.5 | 6.6 | 5 |
| Feb. 21-28 | | 28 | 3.2 | .03 | 4.7 | 1.1 | 1.4 | .6 | 9 | 9.5 | 1.6 | .1 | 1.3 | 33 | 16 | 8 | 44.4 | 6.6 | 10 |
| Mar. 1-10 | | 33 | 3.5 | .04 | 4.8 | 1.0 | 2.0 | .6 | 11 | 8.5 | 2.4 | .2 | .8 | 34 | 16 | 7 | 48.2 | 6.8 | 5 |
| Mar. 11-20 | | 38 | 2.8 | .02 | 4.8 | 1.3 | 1.4 | .6 | 11 | 9.0 | 2.4 | .2 | .8 | 32 | 17 | 8 | 48.6 | 6.8 | 5 |
| Mar. 21-31 | | 38 | 3.7 | .03 | 4.8 | 1.1 | 2.0 | .6 | 10 | 10 | 2.2 | .2 | .7 | 31 | 16 | 8 | 45.7 | 6.8 | 5 |
| Apr. 1-10 | | 45 | 3.3 | .02 | 4.4 | 1.0 | 1.0 | .3 | 7 | 8.5 | 1.8 | .4 | 1.3 | 31 | 15 | 9 | 44.7 | 6.6 | 15 |
| Apr. 11-20 | | 46 | 4.2 | .02 | 5.0 | 1.1 | 1.3 | .3 | 10 | 8.0 | 1.8 | .4 | 1.0 | 34 | 17 | 9 | 46.9 | 6.5 | 10 |
| Apr. 21-30 | | 44 | 3.8 | .02 | 5.0 | 1.0 | 1.5 | .3 | 10 | 8.5 | 1.9 | .4 | .7 | 34 | 17 | 8 | 48.0 | 6.6 | 15 |
| May 1-10 | | 57 | 2.1 | .02 | 5.6 | 1.1 | 1.4 | .5 | 13 | 9.0 | 2.0 | .4 | .5 | 35 | 18 | 8 | 52.3 | 6.7 | 10 |
| May 11-20 | | 64 | 3.0 | .00 | 6.8 | 2.1 | 1.5 | 1.0 | 19 | 11 | 1.1 | .4 | .8 | 40 | 26 | 10 | 60.8 | 6.9 | 5 |
| May 21-31 | | 66 | 3.7 | .02 | 6.6 | 1.1 | 1.7 | .9 | 15 | 9.0 | 2.0 | .1 | 1.1 | 35 | 21 | 9 | 57.0 | 6.9 | 10 |

a Includes equivalent of 5 parts per million of carbonate ($CO_3$).
b Includes equivalent of 2 parts per million of carbonate ($CO_3$).

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| June 1-10 | | 66 | 4.4 | .03 | 6.2 | 1.8 | 1.6 | .8 | 16 | 9.8 | 1.8 | .1 | .9 | 41 | 23 | 10 | 55.5 | 6.9 | 10 |
| June 11-20 | | 68 | 3.1 | .02 | 6.2 | 1.4 | 1.6 | .9 | 15 | 9.0 | 1.8 | .1 | .8 | 39 | 21 | 9 | 54.3 | 6.9 | 10 |
| June 21-30 | | 71 | 3.7 | .01 | 6.4 | 1.1 | 1.9 | .7 | 15 | 9.2 | 1.5 | .1 | .8 | 38 | 20 | 8 | 54.6 | 6.9 | 9 |
| July 1-10 | | 73 | 3.7 | .07 | 6.6 | 1.6 | 1.8 | .8 | 16 | 9.2 | 2.8 | .1 | 1.0 | 42 | 23 | 10 | 59.6 | 6.9 | 15 |
| July 11-20 | | 76 | 2.9 | .03 | 6.6 | 1.6 | 1.7 | .8 | 18 | 8.8 | 2.1 | .1 | .7 | 40 | 23 | 7 | 58.4 | 7.0 | 10 |
| July 21-31 | | 76 | 4.2 | .03 | 6.6 | 1.4 | 1.6 | .9 | 17 | 8.8 | 1.8 | .1 | 1.0 | 40 | 22 | 8 | 56.7 | 7.0 | 10 |
| Aug. 1-10 | | 74 | 2.7 | .00 | 7.0 | 1.3 | 2.0 | .8 | 19 | 9.5 | 2.1 | .1 | 1.1 | 40 | 23 | 7 | 59.6 | 7.2 | 5 |
| Aug. 11-20 | | 76 | 3.3 | .00 | 7.0 | 1.1 | 2.2 | .7 | 19 | 9.8 | 2.2 | .2 | .7 | 40 | 22 | 6 | 57.3 | 7.0 | 5 |
| Aug. 21-31 | | 73 | 2.1 | .00 | 6.8 | 1.5 | 1.8 | .8 | 19 | 10 | 2.1 | .1 | .6 | 38 | 23 | 8 | 59.2 | 7.0 | 8 |
| Sept. 1-10 | | 67 | 2.1 | .05 | 7.4 | 1.6 | 2.2 | .7 | 20 | 9.8 | 2.5 | .1 | .7 | 40 | 25 | 9 | 61.7 | 7.0 | 8 |
| Sept. 11-20 | | 70 | 3.0 | .00 | 8.4 | .7 | 1.8 | .8 | 19 | 10 | 2.1 | .1 | .6 | 38 | 24 | 8 | 59.7 | 6.8 | 9 |
| Sept. 21-30 | | 67 | 2.3 | .00 | 7.6 | 1.0 | 1.9 | .7 | 20 | 9.5 | 2.5 | .1 | .5 | 40 | 23 | 7 | 60.2 | 7.2 | 6 |
| Average | | 53 | 3.6 | 0.03 | 6.3 | 1.4 | 1.9 | 0.8 | 16 | 9.6 | 2.2 | 0.2 | 0.9 | 38 | 21 | 8 | 57.6 | 6.9 | 6 |

## DELAWARE RIVER AT EASTON, PA.

LOCATION.--At raw-water intake, Easton Filter Plant, Easton, Northampton County.
DRAINAGE AREA.--4,717 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1951.
EXTREMES, 1950-51.--Hardness: Maximum, 61 ppm Aug. 11-20; minimum, 26 ppm Feb. 21-28, Apr. 1-10.
Specific conductance: Maximum daily, 144 micromhos Sept. 5; minimum daily, 50.5 micromhos Dec. 5.
EXTREMES, 1947-51.--Hardness: Maximum, 61 ppm Aug. 11-20, 1951; minimum, 22 ppm Apr. 1-10, 1950.
Specific conductance: Maximum daily, 144 micromhos Sept. 5, 1951; minimum daily, 50.5 micromhos Dec. 5, 1950.
REMARKS.--Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year from October 1950 to September 1951 based on records for Delaware River at Belvidere, N. J., which are given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 1-10, 1950 | 1,827 | 3.0 | 0.04 | 12 | 3.6 | 2.9 | | 41 | 13 | 2.5 | 0.0 | 0.3 | 63 | 45 | 11 | 106 | 7.4 | 3 |
| Oct. 11-20 | 2,214 | -- | -- | -- | -- | -- | | 37 | 12 | 3.0 | -- | .3 | -- | 40 | 10 | 103 | 7.3 | 4 |
| Oct. 21-31 | 1,824 | -- | -- | -- | -- | -- | | 41 | 12 | 3.2 | -- | .2 | -- | 40 | 6 | 110 | 7.4 | 3 |
| Nov. 1-10 | 3,162 | -- | -- | -- | -- | -- | | 38 | 13 | 3.1 | -- | .3 | -- | 41 | 10 | 106 | 7.4 | 6 |
| Nov. 11-20 | 2,872 | -- | -- | -- | -- | -- | | 32 | 12 | 3.1 | -- | .5 | -- | 35 | 9 | 93.1 | 7.5 | 5 |
| Nov. 21-30 | 25,080 | -- | -- | -- | -- | -- | | 20 | 11 | 2.4 | -- | 1.2 | -- | 28 | 12 | 76.7 | 7.2 | 21 |
| Dec. 1-10 | 34,632 | 4.2 | .02 | 7.6 | 1.9 | .3 | | 14 | 11 | 1.9 | .2 | 1.7 | 48 | 27 | 15 | 65.4 | 7.4 | 11 |
| Dec. 11-20 | 15,018 | -- | -- | -- | -- | -- | | 21 | 13 | 3.2 | -- | 1.6 | -- | 30 | 13 | 79.8 | 7.3 | 9 |
| Dec. 21-31 | 6,257 | -- | -- | -- | -- | -- | | 30 | 14 | 2.1 | -- | 1.7 | -- | 36 | 11 | 91.9 | 7.3 | 10 |
| Jan. 1-10, 1951 | 10,711 | -- | -- | -- | -- | -- | | 27 | 14 | 2.5 | -- | .9 | -- | 33 | 11 | 83.9 | 7.2 | 6 |
| Jan. 11-20 | 10,312 | -- | -- | -- | -- | -- | | 25 | 15 | 2.4 | -- | .7 | -- | 33 | 12 | 84.6 | 7.2 | 9 |
| Jan. 21-31 | 17,935 | -- | -- | -- | -- | -- | | 19 | 13 | 2.1 | -- | .4 | -- | 27 | 11 | 70.0 | 7.0 | 11 |
| Feb. 1-10 | 19,106 | -- | -- | -- | -- | 3.1 | | 19 | 13 | 2.2 | -- | 2.0 | -- | 27 | 11 | 74.0 | 7.5 | 7 |
| Feb. 11-20 | 16,442 | -- | -- | -- | -- | 2.3 | | 21 | 12 | 2.2 | -- | 1.6 | -- | 29 | 12 | 76.3 | 7.5 | 7 |
| Feb. 21-28 | 23,100 | -- | -- | -- | -- | 2.4 | | 18 | 12 | 2.0 | -- | 1.5 | -- | 26 | 11 | 71.0 | 7.4 | 8 |
| Mar. 1-10 | 13,125 | -- | -- | -- | -- | 2.5 | | 22 | 13 | 2.1 | -- | 1.2 | -- | 30 | 12 | 79.1 | 7.5 | 7 |
| Mar. 11-20 | 13,642 | -- | -- | -- | -- | 2.3 | | 21 | 12 | 3.0 | -- | 1.3 | -- | 30 | 13 | 76.9 | 7.3 | 7 |
| Mar. 21-31 | 26,482 | -- | -- | -- | -- | 2.6 | | 18 | 12 | 3.9 | -- | 1.1 | -- | 28 | 13 | 73.9 | 7.6 | 4 |
| Apr. 1-10 | 34,424 | -- | -- | -- | -- | 2.5 | | 18 | 11 | 3.1 | -- | 1.2 | -- | 26 | 11 | 70.0 | 7.6 | 5 |
| Apr. 11-20 | 19,240 | -- | -- | -- | -- | 2.8 | | 22 | 11 | 2.9 | -- | .6 | -- | 28 | 10 | 72.7 | 7.4 | 6 |
| Apr. 21-30 | 10,976 | -- | -- | -- | -- | 4.5 | | 28 | 12 | 2.5 | -- | .9 | -- | 30 | 7 | 79.4 | 7.4 | 4 |
| May 1-10 | 6,601 | -- | -- | -- | -- | 3.6 | | 30 | 12 | 3.6 | -- | .7 | -- | 35 | 10 | 89.1 | 7.4 | 4 |
| May 11-20 | 4,884 | -- | -- | -- | -- | 2.9 | | 32 | 12 | 5.0 | -- | .7 | -- | 40 | 14 | 94.7 | 7.4 | 5 |
| May 21-31 | 5,369 | -- | -- | -- | -- | 3.1 | | 39 | 14 | 2.4 | -- | 1.0 | -- | 44 | 12 | 106 | 7.2 | 8 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| June 1-10 | 5,324 | -- | -- | -- | -- | 4.1 | 34 | 13 | 2.0 | -- | 1.0 | -- | 36 | 8 | 94.3 | 7.1 | 9 |
| June 11-20 | 4,902 | -- | -- | -- | -- | 4.4 | 38 | 14 | 2.2 | -- | .9 | -- | 40 | 9 | 99.7 | 7.2 | 7 |
| June 21-30 | 4,810 | -- | -- | -- | -- | 2.7 | 32 | 14 | 2.4 | -- | .9 | -- | 39 | 13 | 99.0 | 7.1 | 7 |
| July 1-10 | 5,174 | -- | -- | -- | -- | 3.0 | 32 | 13 | 2.1 | -- | 1.0 | -- | 37 | 11 | 93.1 | 7.3 | 11 |
| July 11-20 | 3,928 | -- | -- | -- | -- | 2.0 | 32 | 13 | 2.1 | -- | .8 | -- | 39 | 13 | 95.5 | 7.2 | 8 |
| July 21-31 | 6,165 | -- | -- | -- | -- | 2.5 | 34 | 15 | 2.0 | -- | 1.4 | -- | 42 | 14 | 105 | 7.2 | 11 |
| Aug. 1-10 | 4,099 | -- | -- | -- | -- | 3.5 | 45 | 18 | 1.8 | -- | 1.9 | -- | 52 | 15 | 125 | 7.6 | 5 |
| Aug. 11-20 | 4,520 | 5.0 | .03 | 16 | 5.2 | 1.2 | 47 | 18 | 3.0 | .1 | 2.8 | 82 | 61 | 23 | 132 | 7.6 | 5 |
| Aug. 21-31 | 3,068 | -- | -- | -- | -- | 2.8 | 45 | 18 | 3.0 | -- | 1.5 | -- | 55 | 18 | 129 | 7.7 | 4 |
| Sept. 1-10 | 2,387 | -- | -- | -- | -- | 3.7 | 47 | 17 | 3.4 | -- | 1.4 | -- | 54 | 16 | 129 | 7.7 | 9 |
| Sept. 11-20 | 3,223 | -- | -- | -- | -- | 3.7 | 42 | 16 | 2.9 | -- | 1.1 | -- | 48 | 14 | 114 | 7.8 | 4 |
| Sept. 21-30 | 2,089 | -- | -- | -- | -- | 3.7 | 44 | 17 | 3.2 | -- | 1.1 | -- | 51 | 15 | 122 | 7.7 | 7 |
| **Average** | 10,290 | -- | -- | -- | -- | 2.9 | 31 | 13 | 2.7 | -- | 1.1 | -- | 37 | 12 | 93.6 | 7.4 | 7 |

DELAWARE RIVER BASIN--Continued

## LEHIGH RIVER AT CATASAUQUA, PA.

LOCATION.--At Race Street Bridge at Catasauqua, 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 1951.
Water temperatures: October 1944 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 131 ppm Oct. 1-10; minimum, 51 ppm Mar. 21-31.
Hardness: Maximum, 74 ppm Oct. 1-10; minimum, 28 ppm Apr. 1-10.
Specific conductance: Maximum daily, 252 micromhos Oct. 9; minimum daily, 62.2 micromhos Apr. 1.
Water temperatures: Maximum 76°F July 17, 28; minimum, freezing point on many days during winter months.
EXTREMES, 1944-51.--Dissolved solids (1944-47) (1949-51): Maximum, 169 ppm Oct. 1-10, 1944; minimum, 45 ppm Apr. 1-10, 1950.
Hardness (1944-47) (1949-51): Maximum, 106 ppm Oct. 1-10, 1944; minimum, 24 ppm Apr. 1-10, 1950.
Specific conductance: Maximum, 254 micromhos Oct. 1-10, 1944; minimum daily, 62.2 micromhos Apr. 1, 1951.
Water temperatures: Maximum, 77°F July 2, 1945; 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 discharge for water year October 1950 to September 1951 based on records for Lehigh River at Bethlehem, which are given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 1-10, 1950 | 524 | 5.8 | 0.03 | 19 | 6.4 | 9.4 | | 27 | 60 | 4.0 | 0.1 | 4.5 | 131 | 74 | 52 | 209 | 6.9 | 2 |
| Oct. 11-20 | 693 | 11 | .04 | 14 | 5.6 | 7.6 | | 21 | 47 | 4.1 | .1 | 3.0 | 111 | 58 | 41 | 170 | 7.0 | 2 |
| Oct. 21-31 | 583 | 7.8 | .06 | 17 | 7.3 | 6.3 | | 22 | 57 | 3.9 | .1 | 3.8 | 124 | 72 | 54 | 194 | 6.9 | 2 |
| Nov. 1-5 | 1,060 | 4.8 | .04 | 16 | 6.7 | 7.6 | | 18 | 58 | 4.2 | .0 | 3.6 | 121 | 67 | 53 | 191 | 6.9 | 2 |
| Nov. 6-10 | 1,835 | 4.6 | .05 | 9.7 | 4.1 | 4.5 | | 11 | 34 | 3.1 | .1 | 2.3 | 76 | 41 | 32 | 117 | 6.7 | 4 |
| Nov. 11-20 | 1,094 | 5.3 | .12 | 12 | 5.2 | 8.1 | | 16 | 47 | 3.2 | .0 | 3.1 | 95 | 51 | 38 | 149 | 6.7 | 4 |
| Nov. 21-30 | 6,324 | 4.6 | .13 | 11 | 3.8 | 6.0 | | 15 | 36 | 2.9 | .0 | 2.9 | 76 | 43 | 31 | 117 | 6.5 | 5 |
| Dec. 1-10 | 9,134 | 4.3 | .14 | 8.4 | 3.2 | 4.1 | | 8 | 30 | 2.5 | .0 | 2.1 | 62 | 34 | 28 | 94.4 | 6.1 | 7 |
| Dec. 11-20 | 3,526 | 4.4 | .15 | 9.4 | 3.7 | 3.7 | | 8 | 34 | 2.2 | .0 | 2.2 | 63 | 39 | 32 | 104 | 6.2 | 4 |
| Dec. 21-31 | 1,813 | 4.8 | .20 | 10 | 4.3 | 6.2 | | 10 | 41 | 2.5 | .0 | 2.1 | 80 | 43 | 34 | 125 | 6.1 | 3 |
| Jan. 1-10, 1951 | 2,230 | 5.1 | .04 | 9.1 | 3.5 | 3.7 | | 7 | 32 | 3.0 | .0 | 2.3 | 70 | 37 | 29 | 105 | 6.7 | 5 |
| Jan. 11-20 | 2,526 | 4.6 | .04 | 9.6 | 3.3 | 3.2 | | 9 | 29 | 3.2 | .0 | 2.9 | 70 | 38 | 30 | 106 | 6.7 | 5 |
| Jan. 21-31 | 5,011 | 4.2 | .07 | 7.5 | 2.7 | 2.6 | | 6 | 24 | 2.5 | .1 | 2.2 | 57 | 30 | 25 | 85.4 | 6.6 | 7 |
| Feb. 1-10 | 5,282 | 4.6 | .06 | 8.0 | 2.6 | 1.4 | | 7 | 22 | 2.2 | .1 | 2.0 | 57 | 31 | 25 | 85.0 | 6.3 | 2 |
| Feb. 11-20 | 4,065 | 4.4 | .04 | 8.1 | 2.6 | 1.2 | | 8 | 22 | 2.0 | .0 | 1.4 | 57 | 31 | 24 | 83.0 | 6.5 | 3 |
| Feb. 21-28 | 4,613 | 4.4 | .04 | 8.2 | 2.5 | 1.1 | | 7 | 22 | 2.1 | .1 | 1.7 | 58 | 31 | 25 | 84.0 | 6.6 | 2 |
| Mar. 1-10 | 3,119 | 5.8 | .04 | 8.8 | 3.2 | 2.0 | | 8 | 27 | 2.0 | .0 | 2.6 | 60 | 35 | 29 | 93.9 | 6.6 | 4 |
| Mar. 11-20 | 3,283 | 6.0 | .04 | 9.0 | 3.1 | 1.8 | | 10 | 25 | 2.0 | .1 | 2.4 | 58 | 35 | 27 | 90.8 | 6.7 | 4 |
| Mar. 21-31 | 4,568 | 5.4 | .07 | 7.7 | 2.8 | 1.6 | | 8 | 22 | 2.0 | .0 | 2.3 | 51 | 31 | 24 | 81.0 | 6.6 | 3 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apr. 1-10 | 4,492 | 5.4 | .07 | 6.6 | 2.8 | 2.6 | | 9 | 21 | 1.9 | .1 | 1.7 | 53 | 28 | 21 | 79.7 | 6.8 | 5 |
| Apr. 11-20 | 4,222 | 4.4 | .07 | 7.8 | 2.4 | 3.4 | 1.2 | 11 | 24 | 2.2 | .0 | 2.3 | 56 | 29 | 20 | 87.5 | 6.8 | 6 |
| Apr. 21-30 | 2,630 | 4.2 | .03 | 9.0 | 3.3 | 4.2 | 1.2 | 12 | 31 | 2.1 | .0 | 2.1 | 65 | 36 | 26 | 102 | 7.0 | 2 |
| May 1-10 | 1,799 | 4.4 | .02 | 10 | 4.1 | 4.2 | | 14 | 33 | 2.2 | .0 | 2.5 | 69 | 42 | 30 | 115 | 7.0 | 3 |
| May 11-20 | 1,425 | 4.9 | .02 | 12 | 4.8 | 4.7 | | 15 | 39 | 2.8 | .0 | 3.7 | 81 | 50 | 37 | 132 | 7.1 | 4 |
| May 21-31 | 1,505 | 10 | .03 | 11 | 4.4 | 3.8 | | 12 | 37 | 2.6 | .1 | 2.0 | 82 | 46 | 36 | 128 | 7.2 | 6 |
| June 1-10 | 1,329 | 11 | .03 | 10 | 3.7 | 4.3 | | 12 | 32 | 3.2 | .1 | 2.1 | 74 | 40 | 30 | 117 | 7.3 | 5 |
| June 11-20 | 1,353 | 5.2 | .03 | 10 | 3.7 | 5.5 | | 14 | 32 | 3.2 | .1 | 3.2 | 73 | 40 | 29 | 113 | 7.4 | 3 |
| June 21-30 | 1,310 | 6.4 | .04 | 13 | 4.5 | 7.3 | | 18 | 41 | 4.2 | .1 | 4.0 | 91 | 51 | 36 | 142 | 7.3 | 5 |
| July 1-10 | 1,413 | 5.8 | .05 | 11 | 4.2 | 4.5 | | 16 | 34 | 3.0 | .1 | 1.9 | 79 | 45 | 32 | 118 | 7.2 | 3 |
| July 11-20 | 998 | 5.1 | .05 | 14 | 5.7 | 5.7 | | 20 | 44 | 4.0 | .1 | 3.4 | 98 | 58 | 42 | 152 | 7.3 | 3 |
| July 21-31 | 2,655 | 7.3 | .10 | 15 | 5.2 | 4.6 | | 20 | 42 | 4.0 | .1 | 3.6 | 98 | 59 | 42 | 148 | 7.5 | 4 |
| Aug. 1-10 | 1,352 | 7.1 | .07 | 14 | 6.5 | 5.2 | | 17 | 46 | 5.5 | .1 | 3.8 | 103 | 62 | 48 | 158 | 7.1 | 4 |
| Aug. 11-20 | 1,756 | 5.8 | .06 | 13 | 5.7 | 4.5 | | 19 | 41 | 4.0 | .1 | 1.9 | 90 | 56 | 40 | 144 | 7.2 | 4 |
| Aug. 21-31 | 991 | 6.1 | .04 | 16 | 5.8 | 5.2 | | 22 | 46 | 4.5 | .1 | 3.0 | 104 | 64 | 46 | 167 | 7.4 | 5 |
| Sept. 1-10 | 819 | 6.4 | .09 | 16 | 6.6 | 6.1 | | 21 | 51 | 5.0 | .1 | 3.5 | 110 | 67 | 50 | 176 | 7.4 | 5 |
| Sept. 11-20 | 784 | 8.0 | .04 | 16 | 6.0 | 7.2 | | 23 | 49 | 4.5 | .1 | 5.1 | 109 | 65 | 46 | 166 | 7.4 | 3 |
| Sept. 21-30 | 597 | 6.3 | .01 | 18 | 6.9 | 6.8 | | 23 | 56 | 5.0 | .1 | 4.4 | 115 | 73 | 54 | 195 | 7.4 | 4 |
| Average | 2,516 | 5.8 | 0.08 | 11 | 4.4 | 4.7 | | 14 | 37 | 3.2 | 0.1 | 2.8 | 82 | 47 | 35 | 128 | 6.9 | 4 |

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT CATASAUQUA, PA.--Continued

Temperature (F°) of water, water year October 1950 to September 1951

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

## LEHIGH RIVER AT WALNUTPORT, PA.

LOCATION.--At highway bridge, 0.3 mile downstream from gaging station, Northampton County, and 0.1 mile upstream from Trout Creek.
DRAINAGE AREA.--889 square miles.
RECORDS AVAILABLE.--Chemical analyses: February 1950 to September 1951.
Sediment records: May 1948 to September 1951.
EXTREMES, 1950-51.--Sediment concentrations: Maximum daily, 1,540 ppm Nov. 26; minimum daily, 1 ppm on several days.
Sediment loads: Maximum daily, 131,000 tons Dec. 4; minimum daily, 1.0 ton Oct. 2.
EXTREMES, 1948-51.--Sediment concentrations: Maximum daily, 2,350 ppm Dec. 30, 1948; minimum daily, 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 discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| Oct. 26, 1950 | 454 | 52 | 5.4 | | 0.04 | 0.37 | 10 | 5.0 | 11 | | 4 | 63 | 2.0 | 0.0 | 2.5 | 102 | 46 | 42 | | 177 | 5.1 | 3 |
| Nov. 8 | 1,140 | 48 | 4.6 | | .01 | .22 | 7.6 | 3.2 | 6.8 | | 6 | 38 | 3.0 | .0 | 1.7 | 69 | 32 | 27 | | 115 | 6.2 | 3 |
| Nov. 22 | 1,090 | 38 | 4.6 | | .02 | .22 | 7.2 | 2.8 | 5.6 | | 6 | 35 | 2.5 | .0 | .7 | 64 | 29 | 25 | | 108 | 5.5 | 2 |
| Jan. 9, 1951 | 1,950 | 33 | 4.6 | | .02 | .16 | 5.8 | 2.6 | 2.9 | | 4 | 25 | 2.0 | .0 | .5 | 46 | 25 | 22 | | 76.4 | 6.0 | 3 |
| Feb. 15 | 3,980 | 35 | 3.9 | | .00 | .22 | 5.0 | 2.1 | 3.6 | | 4 | 21 | 1.5 | .0 | .5 | 41 | 21 | 18 | | 66.7 | 5.9 | 3 |
| Mar. 19 | 2,760 | 46 | 3.7 | | .01 | .19 | 5.8 | 2.4 | 3.7 | | 7 | 23 | 1.5 | .0 | .8 | 46 | 24 | 19 | | 74.3 | 6.1 | 3 |
| May 29 | 1,380 | 72 | 4.8 | 0.0 | .03 | .19 | 7.0 | 2.2 | 6.6 | | 6 | 34 | 2.0 | .0 | .8 | 66 | 26 | 22 | 12 | 98.0 | 5.8 | 5 |
| Aug. 1 | 1,650 | 75 | 6.7 | | .01 | .16 | 8.0 | 3.6 | 4.8 | | 6 | 36 | 2.5 | .0 | 1.7 | 77 | 35 | 30 | | 108 | 6.1 | 3 |
| Aug. 22 | 850 | -- | 6.0 | | .01 | .37 | 7.5 | 3.6 | 5.8 | | 7 | 39 | 2.0 | .0 | 1.4 | 72 | 34 | 28 | | 122 | 7.0 | 4 |
| Sept. 12 | 454 | 71 | 5.4 | | .01 | .50 | 10 | 4.2 | 7.4 | 1.7 | 9 | 43 | 2.5 | .0 | 1.4 | 81 | 42 | 35 | | 128 | 6.5 | 7 |

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT WALNUTPORT, PA.--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 | 378 | 4 | 4 | 378 | 4 | 4 | 3,260 | 60 | 529 |
| 2 | 357 | 1 | 1 | 370 | 3 | 3 | 2,850 | 30 | 231 |
| 3 | 344 | 2 | 2 | 400 | 2 | 2 | 2,670 | 30 | 216 |
| 4 | 338 | 9 | 8 | 625 | 33 | s98 | 19,800 | 1,290 | s131,000 |
| 5 | 318 | 2 | 2 | 2,280 | 172 | 1,060 | 22,700 | 1,120 | s75,600 |
| 6 | 318 | 5 | 4 | 1,850 | 50 | 250 | 10,600 | 398 | s11,700 |
| 7 | 318 | 3 | 3 | 1,360 | 19 | 70 | 7,120 | 210 | 4,040 |
| 8 | 324 | 4 | 4 | 1,140 | 17 | 52 | 12,100 | 434 | s14,700 |
| 9 | 403 | 4 | 4 | 1,000 | 8 | 22 | 10,400 | 150 | s4,430 |
| 10 | 862 | 15 | 35 | 888 | 5 | 12 | 7,300 | 60 | 1,180 |
| 11 | 691 | 4 | 8 | 810 | 2 | 4 | 6,000 | 20 | 324 |
| 12 | 760 | 7 | 14 | 735 | 1 | 2 | 4,980 | 15 | 202 |
| 13 | 810 | 5 | 11 | 702 | 2 | 4 | 4,220 | 15 | 171 |
| 14 | 713 | 6 | 12 | 647 | 1 | 2 | 3,620 | 8 | 78 |
| 15 | 636 | 5 | 9 | 616 | 2 | 3 | 3,260 | 10 | 88 |
| 16 | 549 | 10 | 15 | 616 | 2 | 3 | 3,040 | 8 | 66 |
| 17 | 496 | 8 | 11 | 625 | 1 | 2 | 2,740 | 4 | 30 |
| 18 | 470 | 6 | 8 | 596 | 2 | 3 | 2,350 | 5 | 32 |
| 19 | 445 | 6 | 7 | 568 | 2 | 3 | 2,200 | 8 | 48 |
| 20 | 430 | 4 | 5 | 596 | 4 | 6 | 1,850 | 6 | 30 |
| 21 | 415 | 8 | 9 | 1,090 | 25 | 73 | 1,700 | 10 | 46 |
| 22 | 400 | 7 | 8 | 1,090 | 10 | 29 | 1,750 | 11 | 52 |
| 23 | 462 | 8 | 10 | 930 | 3 | 8 | 1,820 | 15 | 74 |
| 24 | 496 | 6 | 8 | 835 | 1 | 2 | 1,740 | 16 | 75 |
| 25 | 470 | 8 | 10 | 8,910 | 1,040 | s65,500 | 1,630 | 7 | 31 |
| 26 | 454 | 11 | 13 | 23,900 | 1,540 | s114,000 | 1,350 | 8 | 29 |
| 27 | 422 | 6 | 7 | 10,100 | 400 | 10,900 | 1,200 | 11 | 36 |
| 28 | 415 | 2 | 2 | 6,300 | 170 | 2,890 | 1,150 | 10 | 31 |
| 29 | 408 | 5 | 6 | 4,720 | 120 | 1,530 | 1,490 | 15 | 60 |
| 30 | 400 | 5 | 5 | 3,860 | 60 | 626 | 1,740 | 21 | 99 |
| 31 | 392 | 2 | 2 | -- | -- | -- | 1,520 | 18 | 74 |
| Total | 14,694 | -- | 247 | 78,537 | -- | 197,163 | 150,150 | -- | 245,302 |
| | January | | | February | | | March | | |
| 1 | 1,330 | 16 | 58 | 3,680 | 23 | s237 | 3,040 | 13 | 107 |
| 2 | 1,240 | 11 | 37 | 5,550 | 47 | 705 | 2,830 | 2 | 15 |
| 3 | 1,270 | 17 | 58 | 4,350 | 5 | 59 | 2,690 | 3 | 22 |
| 4 | 2,060 | 37 | s224 | 3,740 | 3 | 30 | 2,900 | 2 | 16 |
| 5 | 3,500 | 45 | 427 | 3,260 | 6 | 53 | 2,920 | 5 | 39 |
| 6 | 2,920 | 14 | 110 | 2,830 | 15 | 115 | 3,040 | 18 | 148 |
| 7 | 2,620 | 12 | 85 | 8,190 | 411 | s15,800 | 3,150 | 8 | 68 |
| 8 | 2,200 | 10 | 59 | 8,580 | 200 | s5,670 | 3,260 | 12 | 106 |
| 9 | 1,950 | 8 | 42 | 5,550 | 30 | 448 | 3,150 | 2 | 17 |
| 10 | 1,850 | 6 | 30 | 4,480 | 10 | 121 | 2,780 | 4 | 30 |
| 11 | 1,880 | 6 | 31 | 3,860 | 14 | 146 | 2,540 | 6 | 41 |
| 12 | 1,740 | 8 | 38 | 3,740 | 24 | 242 | 2,430 | 5 | 33 |
| 13 | 1,580 | 8 | 34 | 4,350 | 62 | 729 | 2,320 | 10 | 63 |
| 14 | 1,470 | 5 | 20 | 4,800 | 31 | 386 | 3,010 | 19 | 154 |
| 15 | 2,900 | 26 | s177 | 3,980 | 19 | 204 | 3,980 | 13 | 140 |
| 16 | 3,260 | 13 | 114 | 3,500 | 12 | 113 | 3,500 | 3 | 28 |
| 17 | 2,690 | 4 | 29 | 3,700 | 23 | 230 | 3,150 | 4 | 34 |
| 18 | 2,540 | 6 | 41 | 4,100 | 17 | 188 | 2,870 | 10 | 77 |
| 19 | 2,430 | 6 | 39 | 3,740 | 8 | 81 | 2,760 | 6 | 45 |
| 20 | 2,800 | 9 | 68 | 4,100 | 12 | 133 | 5,310 | 50 | s764 |
| 21 | 3,150 | 6 | 51 | 4,980 | 31 | s471 | 5,400 | 23 | 335 |
| 22 | 2,920 | 5 | 39 | 6,300 | 42 | 716 | 4,720 | 10 | 127 |
| 23 | 2,620 | 24 | 170 | 5,250 | 14 | 198 | 4,100 | 4 | 44 |
| 24 | 9,150 | 251 | s7,640 | 4,350 | 8 | 94 | 4,100 | 12 | 133 |
| 25 | 9,240 | 84 | s2,190 | 3,860 | 6 | 63 | 3,980 | 11 | 118 |
| 26 | 6,300 | 15 | 255 | 3,620 | 5 | 49 | 3,500 | 8 | 76 |
| 27 | 4,850 | 12 | 157 | 3,500 | 6 | 57 | 3,150 | 6 | 51 |
| 28 | 4,100 | 16 | 177 | 3,260 | 13 | 114 | 2,870 | 10 | 77 |
| 29 | 3,740 | 44 | 446 | -- | -- | -- | 3,140 | 11 | s88 |
| 30 | 3,150 | 9 | 77 | -- | -- | -- | 6,170 | 67 | s1,240 |
| 31 | 2,690 | 15 | 109 | -- | -- | -- | 11,300 | 205 | 6,260 |
| Total | 96,140 | -- | 13,032 | 125,000 | -- | 27,452 | 114,060 | -- | 10,496 |

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT WALNUTPORT, PA.--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 | 8,520 | 45 | 1,030 | 1,820 | 10 | 49 | 1,300 | 5 | 18 |
| 2 | 6,450 | 9 | 157 | 1,690 | 12 | 55 | 1,170 | 12 | 38 |
| 3 | 5,400 | 3 | 44 | 1,560 | 11 | 46 | 1,140 | 13 | 40 |
| 4 | 4,720 | 3 | 38 | 1,470 | 8 | 32 | 1,330 | 18 | 65 |
| 5 | 4,100 | 33 | 33 | 1,400 | 10 | 38 | 1,350 | 7 | 26 |
| 6 | 3,620 | 2 | 20 | 1,350 | 9 | 33 | 1,250 | 4 | 14 |
| 7 | 3,260 | 6 | 53 | 1,280 | 7 | 24 | 1,110 | 6 | 18 |
| 8 | 3,040 | 8 | 66 | 1,240 | 8 | 27 | 948 | 5 | 13 |
| 9 | 2,830 | 2 | 15 | 1,170 | 10 | 32 | 892 | 3 | 7 |
| 10 | 2,740 | 7 | 52 | 1,120 | 8 | 24 | 920 | 5 | 12 |
| 11 | 2,830 | 17 | 130 | 1,160 | 9 | 28 | 1,190 | 8 | 26 |
| 12 | 2,960 | 39 | s 423 | 1,330 | 11 | 39 | 1,120 | 8 | 24 |
| 13 | 7,640 | 125 | 2,580 | 1,200 | 9 | 29 | 1,100 | 7 | 21 |
| 14 | 6,450 | 17 | 297 | 1,080 | 8 | 23 | 1,470 | 16 | 63 |
| 15 | 4,980 | 5 | 67 | 1,020 | 7 | 19 | 1,670 | 16 | 72 |
| 16 | 4,220 | 4 | 46 | 962 | 6 | 16 | 1,470 | 10 | 40 |
| 17 | 3,740 | 18 | 182 | 906 | 7 | 17 | 1,250 | 9 | 30 |
| 18 | 3,260 | 14 | 123 | 878 | 6 | 14 | 1,100 | 7 | 21 |
| 19 | 3,040 | 5 | 41 | 824 | 6 | 13 | 990 | 3 | 8 |
| 20 | 2,690 | 16 | 116 | 811 | 5 | 11 | 906 | 4 | 10 |
| 21 | 2,400 | 12 | 78 | 850 | 6 | 14 | 850 | 3 | 7 |
| 22 | 2,270 | 5 | 31 | 824 | 6 | 13 | 850 | 4 | 9 |
| 23 | 3,260 | 23 | 202 | 962 | 7 | 18 | 1,240 | 13 | 43 |
| 24 | 2,920 | 12 | 94 | 1,250 | 14 | 47 | 1,080 | 9 | 26 |
| 25 | 2,580 | 17 | 119 | 1,250 | 14 | 47 | 1,000 | 6 | 16 |
| 26 | 2,430 | 15 | 99 | 1,040 | 9 | 25 | 892 | 5 | 12 |
| 27 | 2,210 | 10 | 60 | 962 | 8 | 21 | 811 | 2 | 4 |
| 28 | 2,040 | 25 | 138 | 1,040 | 7 | 20 | 785 | 1 | 2 |
| 29 | 1,980 | 16 | 86 | 1,380 | 12 | 45 | 990 | 1 | 3 |
| 30 | 1,980 | 9 | 48 | 1,760 | 18 | 86 | 1,080 | 6 | 17 |
| 31 | -- | -- | -- | 1,580 | 6 | 26 | -- | -- | -- |
| Total | 110,560 | -- | 6,468 | 37,169 | -- | 931 | 33,254 | -- | 705 |

| | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1,600 | 21 | 91 | 1,650 | 14 | 62 | 496 | 11 | 15 |
| 2 | 1,520 | 15 | 62 | 1,500 | 19 | 77 | 606 | 12 | 20 |
| 3 | 1,220 | 10 | 33 | 1,200 | 10 | 32 | 674 | 13 | 24 |
| 4 | 1,060 | 5 | 14 | 1,100 | 10 | 30 | 585 | 8 | 13 |
| 5 | 1,730 | 14 | 65 | 990 | 10 | 27 | 525 | 8 | 11 |
| 6 | 1,520 | 13 | 53 | 892 | 7 | 17 | 594 | 10 | 16 |
| 7 | 1,170 | 13 | 41 | 864 | 7 | 16 | 1,070 | 23 | 66 |
| 8 | 990 | 4 | 11 | 934 | 6 | 15 | 686 | 9 | 17 |
| 9 | 864 | 2 | 5 | 878 | 7 | 17 | 575 | 6 | 9 |
| 10 | 785 | 1 | 2 | 897 | 10 | 24 | 505 | 8 | 11 |
| 11 | 864 | 2 | 5 | 1,100 | 11 | 33 | 480 | 9 | 12 |
| 12 | 934 | 5 | 13 | 920 | 6 | 15 | 454 | 8 | 10 |
| 13 | 892 | 8 | 19 | 1,490 | 17 | 68 | 437 | 6 | 7 |
| 14 | 785 | 4 | 9 | 1,220 | 5 | 16 | 522 | 6 | 9 |
| 15 | 697 | 4 | 8 | 1,180 | 5 | 16 | 1,070 | 17 | 49 |
| 16 | 686 | 3 | 6 | 2,210 | 55 | 329 | 811 | 9 | 20 |
| 17 | 628 | 5 | 9 | 1,880 | 13 | 66 | 651 | 7 | 12 |
| 18 | 605 | 4 | 7 | 1,490 | 10 | 40 | 565 | 7 | 11 |
| 19 | 708 | 8 | 15 | 1,190 | 5 | 16 | 515 | 6 | 8 |
| 20 | 934 | 14 | 35 | 1,020 | 3 | 8 | 480 | 8 | 10 |
| 21 | 746 | 10 | 20 | 934 | 3 | 8 | 454 | 7 | 9 |
| 22 | 737 | 9 | 18 | 850 | 7 | 16 | 437 | 6 | 7 |
| 23 | 1,000 | 17 | 46 | 759 | 14 | 29 | 420 | 7 | 8 |
| 24 | 746 | 8 | 16 | 708 | 14 | 27 | 406 | 6 | 7 |
| 25 | 651 | 10 | 18 | 674 | 15 | 27 | 399 | 6 | 7 |
| 26 | 595 | 9 | 14 | 651 | 14 | 25 | 399 | 6 | 7 |
| 27 | 555 | 10 | 15 | 628 | 14 | 24 | 399 | 5 | 5 |
| 28 | 4,760 | 388 | s 6,810 | 605 | 12 | 20 | 525 | 7 | 10 |
| 29 | 4,490 | 70 | 848 | 565 | 12 | 18 | 420 | 6 | 7 |
| 30 | 2,920 | 22 | 173 | 545 | 11 | 16 | 392 | 7 | 7 |
| 31 | 2,120 | 9 | 52 | 515 | 10 | 14 | -- | -- | -- |
| Total | 39,512 | -- | 8,533 | 32,039 | -- | 1,148 | 16,552 | -- | 424 |

Total discharge for year (cfs-days) ..... 847,667
Total load for year (tons) ..... 511,901

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT WALNUTPORT, PA.--Continued

Particle-size analyses of suspended sediment, December 1950
(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. 4, 1950 | 3:00 p.m. | 39,400 | 320 | | | | 4 | 6 | 13 | 28 | 41 | 60 | | 78 | 95 | DSWC |
| Dec. 5 | 6:00 a.m. | 26,700 | 1,400 | | | | 1 | 2 | 4 | 7 | 11 | 22 | | 47 | 86 | DSWC |
| Dec. 5 | 11:25 a.m. | 21,200 | 762 | | | | 3 | 5 | 8 | 12 | 17 | 24 | | 44 | 77 | DSWC |

## DELAWARE RIVER BASIN--Continued

### DELAWARE RIVER AT TRENTON, N. J.

LOCATION.--At Morrisville Filter Plant at foot of Calhoun Street Bridge, Pennsylvania side. Calhoun Street bridge is 200 feet downstream from gaging station which is half a mile upstream from Assunpink Creek.
DRAINAGE AREA.--6,780 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1951.
Water temperatures: October 1944 to September 1951.
Sediment records: September 1949 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 119 ppm Oct. 11-20; minimum, 53 ppm Apr. 1-10.
Hardness: Maximum, 79 ppm Sept. 1-10; minimum, 33 ppm Apr. 1-10.
Specific conductance: Maximum daily, 215 micromhos Oct. 13; minimum daily, 58.2 micromhos Apr. 1.
Water temperatures: Maximum, 80°F July 16, 17; minimum, 35°F Dec. 29, Feb. 10.
Sediment concentrations: Maximum daily, 1,720 ppm Nov. 26; minimum daily, 1 ppm on several days.
Sediment loads: Maximum daily, 274,000 tons Nov. 26; minimum daily, 7 tons Nov. 1, 3, 4.
EXTREMES, 1944-51.--Dissolved solids (1944-47) (1950-51): Maximum, 119 ppm Oct. 11-20, 1950; minimum, 44 ppm Mar. 21-31, 1945.
Hardness (1944-47) (1949-51): Maximum, 85 ppm Sept. 11-20, 1946; minimum, 25 ppm Apr. 1-10, 1950.
Specific conductance: Maximum, 222 micromhos Sept. 11-20, 1949; minimum daily, 58.2 micromhos Apr. 1, 1951.
Water temperatures: Maximum, 88°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, 274,000 tons Nov. 26, 1950; minimum daily, 7 tons Nov. 1, 3, 4, 1950.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 1-10, 1950 | 2,892 | 4.3 | 0.03 | 18 | 6.1 | 7.6 | | 57 | 26 | 7.2 | 0.1 | 3.0 | 114 | 70 | 23 | 183 | 7.3 | 10 |
| Oct. 11-20 | 3,540 | 5.9 | .02 | 19 | 5.9 | 6.4 | | 54 | 28 | 6.6 | .2 | 2.8 | 119 | 72 | 27 | 184 | 7.3 | 8 |
| Oct. 21-31 | 3,026 | 5.2 | .02 | 18 | 6.5 | 6.8 | | 54 | 27 | 7.9 | .1 | 3.3 | 114 | 72 | 27 | 185 | 7.3 | 10 |
| Nov. 1-10 | 4,705 | 4.4 | .03 | 17 | 6.1 | 6.9 | | 50 | 28 | 6.6 | .1 | 3.4 | 106 | 68 | 27 | 174 | 7.1 | 10 |
| Nov. 11-20 | 4,296 | 3.4 | .03 | 14 | 4.8 | 6.5 | | 42 | 23 | 5.5 | .1 | 3.0 | 92 | 55 | 20 | 143 | 7.2 | 8 |
| Nov. 21-26 | 17,305 | 3.2 | .10 | 16 | 5.3 | 6.4 | | 46 | 26 | 6.0 | .0 | 3.0 | 92 | 62 | 24 | 154 | 7.2 | 4 |
| Nov. 27-30 | 58,450 | 3.6 | .09 | 8.3 | 2.7 | 3.4 | | 19 | 16 | 3.0 | .0 | 3.3 | 64 | 32 | 16 | 79.1 | 7.0 | 20 |
| Dec. 1-10 | 47,420 | 4.0 | .23 | 8.8 | 3.0 | 2.9 | | 18 | 19 | 2.9 | .0 | 2.5 | 59 | 34 | 20 | 88.1 | 7.0 | 16 |
| Dec. 11-20 | 22,190 | 4.2 | .09 | 9.8 | 3.4 | 4.2 | | 25 | 20 | 3.0 | .0 | 2.4 | 62 | 38 | 18 | 98.1 | 7.1 | 7 |
| Dec. 21-31 | 10,118 | 4.7 | .09 | 13 | 4.7 | 4.9 | | 37 | 23 | 4.0 | .0 | 3.3 | 78 | 52 | 22 | 127 | 7.2 | 5 |
| Jan. 1-10, 1951 | 14,117 | 4.4 | .06 | 12 | 3.0 | 4.4 | | 27 | 20 | 4.5 | .0 | 3.2 | 72 | 42 | 20 | 113 | 7.0 | 12 |
| Jan. 11-20 | 15,640 | 4.4 | .10 | 11 | 3.5 | 5.6 | | 26 | 23 | 4.5 | .0 | 3.0 | 70 | 42 | 21 | 111 | 7.0 | 16 |
| Jan. 21-31 | 25,082 | 4.2 | .06 | 8.5 | 2.8 | 5.0 | | 21 | 18 | 3.8 | .1 | 2.4 | 62 | 33 | 16 | 96.1 | 7.1 | 16 |

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

Chemical analyses, in parts per million, water year October 1950 to September 1951--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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Feb. 1-10, 1951 | 28,380 | 5.3 | 0.06 | 11 | 3.2 | | 2.2 | 26 | 16 | 3.2 | 0.2 | 3.0 | 68 | 41 | 19 | 102 | 6.9 | 7 |
| Feb. 11-20 | 23,580 | 4.4 | .10 | 9.5 | 3.2 | | 2.4 | 22 | 15 | 4.8 | .0 | 2.1 | 68 | 37 | 19 | 100 | 6.9 | 4 |
| Feb. 21-26 | 34,650 | 4.5 | .12 | 9.1 | 3.1 | | 1.4 | 18 | 15 | 4.2 | .2 | 2.0 | 62 | 35 | 21 | 89.6 | 6.9 | 5 |
| Feb. 27-28 | 21,950 | -- | -- | 25 | 2.6 | | -- | 15 | 17 | 48 | -- | 1.6 | -- | 73 | 61 | 245 | 6.7 | 3 |
| Mar. 1-10 | 18,190 | 4.1 | .10 | 11 | 3.7 | | 1.9 | 26 | 17 | 4.4 | .1 | 1.7 | 70 | 43 | 21 | 109 | 7.0 | 3 |
| Mar. 11-20 | 19,200 | 9.7 | .07 | 10 | 3.6 | | 2.8 | 26 | 17 | 3.4 | .1 | 2.1 | 63 | 40 | 18 | 101 | 7.2 | 6 |
| Mar. 21-31 | 30,564 | 5.8 | .08 | 9.5 | 3.1 | | 2.6 | 25 | 15 | 2.8 | .1 | 2.1 | 57 | 36 | 16 | 91.3 | 7.2 | 6 |
| Apr. 1-10 | 45,940 | 5.8 | .10 | 8.8 | 2.8 | | 1.0 | 20 | 14 | 2.1 | .1 | 1.9 | 53 | 33 | 17 | 81.4 | 7.2 | 9 |
| Apr. 11-20 | 26,780 | 4.4 | .08 | 9.8 | 3.4 | | 1.6 | 25 | 16 | 2.6 | .1 | 1.1 | 63 | 38 | 18 | 94.4 | 7.1 | 1 |
| Apr. 21-30 | 16,070 | 3.6 | .06 | 11 | 3.9 | | 3.4 | 32 | 18 | 3.2 | .2 | 1.1 | 70 | 44 | 17 | 109 | 7.3 | 1 |
| May 1-10 | 9,991 | 2.4 | .06 | 13 | 4.8 | 3.2 | 1.6 | 40 | 20 | 4.0 | .1 | 2.1 | 75 | 52 | 19 | 127 | 7.8 | 3 |
| May 11-20 | 7,530 | 2.2 | .03 | 14 | 5.0 | 4.2 | 1.5 | 43 | 22 | 4.4 | .1 | 2.5 | 83 | 56 | 20 | 139 | 7.6 | 4 |
| May 21-31 | 8,120 | 3.3 | .06 | 16 | 5.7 | | 3.3 | 45 | 23 | 5.0 | .1 | 2.9 | 92 | 63 | 26 | 153 | 7.5 | 5 |
| June 1-10 | 8,687 | 5.4 | .02 | 13 | 5.2 | | 2.9 | 39 | 19 | 3.5 | .1 | 4.1 | 79 | 54 | 22 | 126 | 7.7 | 10 |
| June 11-20 | 7,678 | 5.5 | .05 | 14 | 5.2 | | 3.7 | 41 | 21 | 4.0 | .1 | 3.8 | 87 | 56 | 23 | 139 | 7.7 | 9 |
| June 21-30 | 7,781 | 4.6 | .03 | 15 | 5.1 | | 5.2 | 46 | 21 | 4.5 | .1 | 4.4 | 87 | 58 | 21 | 147 | 7.4 | 4 |
| July 1-10 | 8,338 | 6.3 | .03 | 14 | 5.4 | | 2.3 | 40 | 20 | 3.8 | .1 | 3.8 | 85 | 57 | 24 | 138 | 7.4 | 4 |
| July 11-20 | 5,853 | 4.3 | .01 | 14 | 5.2 | | 6.3 | 45 | 23 | 5.0 | .1 | 2.5 | 88 | 56 | 20 | 149 | 7.4 | 3 |
| July 21-31 | 10,592 | 5.4 | .07 | 15 | 5.3 | | 5.0 | 45 | 23 | 5.0 | .1 | 2.4 | 90 | 59 | 22 | 149 | 7.4 | 4 |
| Aug. 1-10 | 7,279 | 5.6 | .01 | 17 | 5.8 | | 4.6 | 52 | 21 | 6.0 | .1 | 3.8 | 101 | 66 | 24 | 165 | 7.2 | 18 |
| Aug. 11-20 | 8,186 | 8.7 | .01 | 18 | 6.3 | | 7.4 | 58 | 27 | 6.0 | .1 | 3.2 | 109 | 71 | 23 | 175 | 7.3 | 6 |
| Aug. 21-31 | 5,314 | 6.8 | .01 | 19 | 6.6 | | 5.6 | 58 | 26 | 7.0 | .1 | 2.4 | 108 | 75 | 27 | 179 | 7.4 | 5 |
| Sept. 1-10 | 4,128 | 4.3 | .01 | 20 | 7.0 | | 5.6 | 61 | 28 | 6.5 | .1 | 3.0 | 113 | 79 | 29 | 188 | 7.4 | 6 |
| Sept. 11-20 | 4,895 | 3.0 | .01 | 18 | 6.7 | | 5.2 | 56 | 25 | 6.5 | .1 | 3.0 | 106 | 72 | 27 | 175 | 7.3 | 7 |
| Sept. 21-30 | 3,594 | 3.2 | .01 | 19 | 7.3 | | 6.4 | 61 | 27 | 7.0 | .1 | 3.8 | 113 | 77 | 27 | 185 | 7.4 | 3 |
| Average | 14,730 | 4.7 | 0.06 | 14 | 4.7 | | 4.4 | 38 | 21 | 4.7 | 0.1 | 2.8 | 84 | 54 | 23 | 137 | 7.2 | 7 |

DELAWARE RIVER BASIN--Continued

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

Temperature (°F) of water, water year October 1950 to September 1951

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

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 | 21,700 | 35 | 2,050 |
| 2 | 3,020 | 5 | 41 | 2,550 | 2 | 14 | 18,200 | 25 | 1,230 |
| 3 | 2,840 | 4 | 31 | 2,440 | 1 | 7 | 15,800 | 20 | 853 |
| 4 | 2,600 | 2 | 14 | 2,550 | 1 | 7 | 17,200 | 100 | 4,640 |
| 5 | 2,820 | 4 | 31 | 3,680 | 6 | 60 | 83,000 | 870 | 195,000 |
| 6 | 3,070 | 7 | 58 | 5,280 | 24 | 342 | 94,100 | 300 | 76,200 |
| 7 | 3,040 | 5 | 41 | 7,180 | 43 | 833 | 52,600 | 115 | 16,300 |
| 8 | 2,740 | 4 | 30 | 8,120 | 55 | 1,210 | 51,800 | 100 | 14,000 |
| 9 | 2,790 | 6 | 45 | 6,770 | 24 | 439 | 60,000 | 175 | 28,400 |
| 10 | 2,930 | 4 | 32 | 5,880 | 13 | 206 | 50,000 | 130 | 17,600 |
| 11 | 3,160 | 5 | 43 | 5,360 | 9 | 130 | 37,500 | 70 | 7,090 |
| 12 | 3,980 | 9 | 97 | 4,970 | 6 | 80 | 31,600 | 33 | 2,820 |
| 13 | 3,750 | 9 | 91 | 4,640 | 4 | 50 | 26,600 | 30 | 2,150 |
| 14 | 4,140 | 10 | 112 | 4,360 | 4 | 47 | 22,600 | 17 | 1,040 |
| 15 | 4,010 | 8 | 87 | 4,180 | 4 | 45 | 19,700 | 14 | 745 |
| 16 | 3,650 | 5 | 49 | 4,040 | 3 | 33 | 18,500 | 12 | 599 |
| 17 | 3,430 | 4 | 37 | 3,940 | 3 | 32 | 16,700 | 10 | 451 |
| 18 | 3,100 | 4 | 33 | 3,940 | 2 | 21 | 14,600 | 8 | 315 |
| 19 | 3,190 | 3 | 26 | 3,810 | 3 | 31 | 12,700 | 8 | 274 |
| 20 | 2,990 | 2 | 16 | 3,720 | 4 | 40 | 12,800 | 9 | 311 |
| 21 | 2,840 | 1 | 8 | 3,810 | 7 | 72 | 11,800 | 11 | 350 |
| 22 | 2,520 | 1 | 7 | 4,530 | 8 | 98 | 10,800 | 8 | 233 |
| 23 | 2,760 | 3 | 22 | 5,880 | 12 | 191 | 10,100 | 4 | 109 |
| 24 | 2,960 | 2 | 16 | 7,310 | 18 | 355 | 10,300 | 4 | 111 |
| 25 | 3,070 | 2 | 17 | 15,800 | 250 | s 22,600 | 9,610 | 4 | 104 |
| 26 | 3,520 | 4 | 38 | 65,600 | 1,720 | s 274,000 | 9,130 | 4 | 99 |
| 27 | 3,490 | 1 | 9 | 107,200 | 560 | 162,000 | 8,000 | 3 | 65 |
| 28 | 3,220 | 1 | 9 | 61,100 | 275 | 45,400 | 8,000 | 4 | 86 |
| 29 | 3,100 | 1 | 8 | 35,500 | 110 | 10,500 | 10,000 | 14 | 378 |
| 30 | 2,990 | 2 | 16 | 26,400 | 40 | 2,850 | 13,000 | 12 | 421 |
| 31 | 2,820 | 2 | 15 | -- | -- | -- | 12,300 | 7 | 232 |
| Total | 97,610 | -- | 1,087 | 423,140 | -- | 521,700 | 790,740 | -- | 374,256 |

| Day | January | | | February | | | March | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 9,560 | 8 | 207 | 14,400 | 7 | 272 | 20,100 | 10 | 543 |
| 2 | 8,420 | 9 | 205 | 22,300 | 54 | 3,250 | 18,800 | 3 | 152 |
| 3 | 7,980 | 6 | 129 | 35,000 | 52 | s 4,970 | 17,500 | 3 | 142 |
| 4 | 9,080 | 8 | 196 | 26,700 | 24 | 1,730 | 18,500 | 10 | 500 |
| 5 | 12,600 | 18 | s 845 | 19,900 | 20 | 1,070 | 18,600 | 12 | 603 |
| 6 | 24,300 | 93 | 6,100 | 17,600 | 12 | 570 | 16,700 | 5 | 225 |
| 7 | 20,200 | 50 | 2,730 | 23,600 | 119 | s 11,200 | 17,400 | 4 | 188 |
| 8 | 16,600 | 17 | 771 | 46,300 | 272 | 34,000 | 17,500 | 2 | 94 |
| 9 | 14,200 | 15 | 575 | 40,000 | 60 | 6,480 | 18,700 | 2 | 101 |
| 10 | 12,900 | 6 | 209 | 27,400 | 20 | 1,480 | 19,700 | 8 | 426 |
| 11 | 11,800 | 6 | 191 | 22,100 | 18 | 1,070 | 17,200 | 5 | 232 |
| 12 | 11,500 | 5 | 155 | 18,700 | 22 | 1,110 | 14,800 | 3 | 120 |
| 13 | 11,800 | 4 | 127 | 19,500 | 22 | 1,160 | 14,100 | 2 | 76 |
| 14 | 11,100 | 4 | 120 | 24,800 | 37 | 2,480 | 16,300 | 3 | 132 |
| 15 | 20,200 | 93 | s 5,610 | 28,100 | 46 | 3,490 | 20,400 | 5 | 275 |
| 16 | 18,300 | 87 | 4,300 | 24,700 | 14 | 934 | 23,200 | 6 | 376 |
| 17 | 17,900 | 32 | 1,550 | 20,900 | 3 | 169 | 21,300 | 3 | 173 |
| 18 | 17,200 | 12 | 557 | 24,100 | 28 | 1,820 | 18,600 | 1 | 50 |
| 19 | 15,100 | 9 | 367 | 21,400 | 23 | 1,330 | 16,400 | 2 | 89 |
| 20 | 15,200 | 7 | 287 | 22,100 | 16 | 955 | 21,700 | 51 | s 3,190 |
| 21 | 16,400 | 19 | 841 | 27,900 | 48 | 3,620 | 29,300 | 44 | 3,480 |
| 22 | 17,400 | 18 | 846 | 41,100 | 110 | 12,200 | 28,200 | 13 | 990 |
| 23 | 16,500 | 11 | 490 | 47,200 | 138 | 17,600 | 24,400 | 6 | 395 |
| 24 | 20,900 | 62 | s 4,070 | 35,200 | 57 | 5,420 | 21,300 | 10 | 575 |
| 25 | 42,400 | 288 | 33,000 | 26,600 | 14 | 1,010 | 20,500 | 8 | 443 |
| 26 | 42,400 | 168 | 19,200 | 22,500 | 6 | 364 | 23,200 | 8 | 501 |
| 27 | 30,200 | 60 | 4,890 | 21,400 | 8 | 462 | 21,600 | 11 | 642 |
| 28 | 23,700 | 28 | 1,790 | 20,700 | 9 | 503 | 18,900 | 8 | 408 |
| 29 | 20,600 | 17 | 946 | -- | -- | -- | 18,200 | 4 | 197 |
| 30 | 18,400 | 11 | 546 | -- | -- | -- | 31,300 | 9 | s 978 |
| 31 | 16,200 | 6 | 262 | -- | -- | -- | 89,200 | 308 | s 80,100 |
| Total | 551,240 | -- | 91,912 | 742,200 | -- | 120,719 | 693,600 | -- | 96,396 |

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 | 12,600 | 7 | 238 | 10,800 | 5 | 146 |
| 2 | 70,500 | 110 | 20,900 | 12,000 | 5 | 162 | 9,610 | 2 | 52 |
| 3 | 51,600 | 26 | 3,620 | 11,000 | 8 | 238 | 8,620 | 5 | 116 |
| 4 | 44,600 | 13 | 1,560 | 10,300 | 8 | 222 | 8,320 | 4 | 90 |
| 5 | 37,800 | 16 | 1,630 | 9,770 | 6 | 158 | 9,030 | 36 | 878 |
| 6 | 31,900 | 12 | 1,030 | 9,240 | 6 | 150 | 9,400 | 28 | 711 |
| 7 | 27,300 | 13 | 958 | 8,320 | 5 | 112 | 8,420 | 3 | 68 |
| 8 | 23,900 | 9 | 581 | 7,780 | 4 | 84 | 7,310 | 1 | 20 |
| 9 | 20,900 | 13 | 734 | 8,170 | 6 | 132 | 6,640 | 2 | 36 |
| 10 | 19,700 | 16 | 851 | 7,780 | 8 | 168 | 6,290 | 3 | 51 |
| 11 | 19,800 | 13 | 695 | 7,730 | 7 | 146 | 6,040 | 2 | 33 |
| 12 | 20,500 | 16 | 886 | 8,270 | 12 | 268 | 5,840 | 3 | 47 |
| 13 | 27,800 | 100 | 7,510 | 8,570 | 6 | 139 | 5,960 | 3 | 48 |
| 14 | 39,900 | 100 | 10,800 | 7,640 | 2 | 41 | 7,310 | 10 | 197 |
| 15 | 34,800 | 30 | 2,820 | 7,180 | 2 | 39 | 9,240 | 18 | 449 |
| 16 | 28,200 | 6 | 457 | 7,360 | 2 | 40 | 10,200 | 18 | 496 |
| 17 | 25,200 | 11 | 748 | 7,040 | 2 | 38 | 9,290 | 5 | 125 |
| 18 | 22,500 | 8 | 486 | 6,680 | 4 | 72 | 7,730 | 2 | 42 |
| 19 | 20,200 | 5 | 273 | 6,510 | 4 | 70 | 6,640 | 2 | 36 |
| 20 | 18,500 | 7 | 350 | 6,250 | 7 | 118 | 6,460 | 2 | 35 |
| 21 | 16,700 | 8 | 361 | 5,630 | 7 | 106 | 6,170 | 1 | 17 |
| 22 | 15,300 | 6 | 248 | 5,400 | 4 | 58 | 5,630 | 1 | 15 |
| 23 | 14,800 | 9 | 360 | 5,960 | 4 | 64 | 9,500 | 130 | s3,650 |
| 24 | 16,900 | 12 | 548 | 7,830 | 6 | 127 | 10,400 | 130 | 3,650 |
| 25 | 17,900 | 15 | 725 | 8,870 | 11 | 264 | 8,320 | 35 | 786 |
| 26 | 16,200 | 10 | 437 | 8,370 | 8 | 181 | 7,080 | 20 | 382 |
| 27 | 15,000 | 8 | 324 | 7,220 | 5 | 97 | 7,360 | 22 | 437 |
| 28 | 14,400 | 9 | 350 | 6,210 | 4 | 67 | 6,680 | 28 | 505 |
| 29 | 13,400 | 5 | 181 | 7,260 | 14 | 274 | 7,080 | 33 | 631 |
| 30 | 13,200 | 4 | 143 | 11,600 | 24 | 752 | 7,500 | 26 | 526 |
| 31 | -- | -- | -- | 12,500 | 19 | 641 | -- | -- | -- |
| Total | 860,100 | -- | 166,566 | 257,040 | -- | 5,266 | 234,870 | -- | 14,275 |

| Day | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 8,820 | 14 | 333 | 12,000 | 29 | 940 | 3,940 | 2 | 21 |
| 2 | 8,980 | 33 | 800 | 9,990 | 24 | 647 | 3,810 | 7 | 72 |
| 3 | 9,400 | 34 | 863 | 8,420 | 30 | 682 | 4,080 | 7 | 77 |
| 4 | 8,570 | 34 | 787 | 7,180 | 28 | 543 | 3,850 | 6 | 62 |
| 5 | 8,930 | 43 | 1,040 | 6,640 | 28 | 502 | 3,680 | 6 | 60 |
| 6 | 8,980 | 34 | 824 | 5,920 | 27 | 431 | 3,810 | 5 | 52 |
| 7 | 8,170 | 20 | 441 | 5,360 | 27 | 391 | 4,570 | 3 | 37 |
| 8 | 7,080 | 12 | 230 | 5,090 | 8 | 110 | 5,010 | 6 | 81 |
| 9 | 6,380 | 24 | 413 | 5,240 | 16 | 226 | 4,420 | 4 | 48 |
| 10 | 5,750 | 6 | 93 | 5,120 | 6 | 83 | 3,940 | 3 | 32 |
| 11 | 5,320 | 11 | 158 | 6,290 | 6 | 102 | 3,780 | 5 | 51 |
| 12 | 5,640 | 4 | 63 | 6,860 | 16 | 296 | 3,620 | 7 | 68 |
| 13 | 6,130 | 17 | 281 | 6,000 | 41 | 864 | 4,010 | 10 | 108 |
| 14 | 5,960 | 22 | 354 | 6,730 | 25 | 454 | 3,880 | 9 | 94 |
| 15 | 6,000 | 19 | 308 | 6,210 | 30 | 503 | 4,880 | 10 | 132 |
| 16 | 5,630 | 7 | 106 | 8,300 | 57 | s1,430 | 6,550 | 15 | 265 |
| 17 | 5,120 | 1 | 14 | 10,800 | 124 | 3,620 | 5,400 | 16 | 233 |
| 18 | 5,160 | 2 | 28 | 9,660 | 61 | 1,590 | 5,800 | 15 | 235 |
| 19 | 5,400 | 5 | 73 | 10,100 | 40 | 1,090 | 5,550 | 21 | 315 |
| 20 | 6,730 | 27 | 491 | 8,720 | 22 | 518 | 4,820 | 18 | 234 |
| 21 | 6,640 | 27 | 484 | 7,180 | 10 | 194 | 4,390 | 7 | 83 |
| 22 | 8,120 | 54 | 1,180 | 6,680 | 6 | 108 | 3,910 | 3 | 32 |
| 23 | 8,320 | 31 | 696 | 6,420 | 2 | 35 | 3,460 | 3 | 28 |
| 24 | 7,540 | 22 | 448 | 5,750 | 6 | 93 | 3,280 | 3 | 27 |
| 25 | 6,680 | 12 | 217 | 5,160 | 7 | 97 | 3,160 | 3 | 26 |
| 26 | 6,210 | 14 | 235 | 4,710 | 15 | 191 | 3,100 | 3 | 25 |
| 27 | 5,200 | 15 | 211 | 4,460 | 4 | 48 | 3,310 | 7 | 63 |
| 28 | 9,020 | 33 | s1,890 | 4,390 | 1 | 12 | 3,590 | 4 | 39 |
| 29 | 25,800 | 219 | 15,300 | 4,040 | 2 | 22 | 3,940 | 3 | 32 |
| 30 | 15,000 | 127 | 5,140 | 4,390 | 3 | 36 | 3,750 | 4 | 41 |
| 31 | 14,200 | 67 | 2,570 | 4,320 | 4 | 47 | -- | -- | -- |
| Total | 251,080 | -- | 36,071 | 208,130 | -- | 15,705 | 125,290 | -- | 2,673 |

Total discharge for year (cfs-days) ..... 5,235,040
Total load for year (tons) ..... 1,446,626

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

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

Particle-size analyses of suspended sediment, November 1950 to March 1951
(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. 26, 1950 | 5:00 p.m. | 78,300 | 1,210 | -- | | -- | 12 | 25 | 41 | 67 | 82 | 91 | | 98 | -- | DSWC |
| Oct. 26 | 2:30 p.m. | | | | | | | | | | | | | | | |
| Nov. 22 | 1:00 p.m. | | | | | | | | | | | | | | | |
| Dec. 13 | 1:05 p.m. | Composite | 85 | a 309 | | 18 | 28 | 37 | 53 | 68 | 76 | 83 | | 90 | 94 | BWC |
| Jan. 25, 1951 | 2:30 p.m. | | | | | | | | | | | | | | | |
| Feb. 15 | 3:00 p.m. | | | | | | | | | | | | | | | |
| Mar. 1 | 4:00 p.m. | 19,500 | 462 | 348 | | 22 | 32 | 60 | 73 | 80 | 84 | 87 | | 94 | 98 | BWC |

a Depth integrated samples composited into approximately one gallon aliquot to give higher tube concentration.

## SCHUYLKILL RIVER AT PORT CARBON, PA.

LOCATION.--At Mill Street Bridge, 0.1 mile upstream from Mill Creek.
DRAINAGE AREA.--27.1 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to June 1951.
Sediment records: February 1949 to June 1951.
EXTREMES, 1950-51.--Sediment concentrations: Maximum daily, 3,160 ppm Nov. 25; minimum daily, 6 ppm Oct. 3, 4.
Sediment loads: Maximum daily, 8,580 tons Nov. 25; minimum daily, 0.2 ton Oct. 3, 4.
EXTREMES, 1949-51.--Sediment concentrations: Maximum daily, 3,160 ppm Nov. 25, 1950; minimum daily, 1 ppm Nov. 9, 11, 12, 1950.
Sediment loads: Maximum daily 8,580 tons Nov. 25, 1950; minimum daily, 0.1 ton on many days.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Record of water discharge computed from wire-weight gage readings and high-flow water-stage recorder chart.

Chemical analyses, in parts per million, October 1950 to June 1951

| 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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Non-carbonate | | | | |
| Oct. 20, 1950 .... | 36 | 61 | 14 | 10 | 0.23 | 4.1 | 47 | 28 | 6.0 | | 0 | 295 | 5.5 | 0.0 | 2.9 | 460 | 232 | 232 | 158 | 716 | 3.50 | 1 |
| Nov. 13..... | 42 | 40 | 12 | 8.4 | .14 | 3.7 | 40 | 24 | 5.8 | | 0 | 260 | 4.5 | .0 | 1.8 | 406 | 198 | 198 | 126 | 617 | 3.50 | 2 |
| Jan. 15, 1951 .... | 90 | 36 | 9.0 | 7.3 | .09 | 2.2 | 28 | 15 | 4.6 | | 0 | 173 | 3.5 | .0 | .6 | 274 | 132 | 132 | 94 | 420 | 3.80 | 2 |
| Jan. 29..... | 110 | 41 | 11 | 6.9 | .10 | 2.5 | 32 | 19 | 5.4 | | 0 | 201 | 2.0 | .0 | .4 | 319 | 158 | 158 | 108 | 476 | 3.80 | 3 |
| Feb. 12 ..... | 122 | 40 | 11 | 7.3 | .11 | 2.5 | 32 | 19 | 5.2 | | 0 | 206 | 2.0 | .0 | .4 | 327 | 158 | 158 | 84 | 483 | 3.80 | 2 |
| Mar. 28..... | 71 | 43 | 11 | 4.7 | .04 | 2.7 | 36 | 22 | 5.0 | | 0 | 223 | 5.0 | .0 | .8 | 353 | 180 | 180 | 122 | 518 | 3.60 | 2 |
| Apr. 23 ..... | 106 | 54 | 9.6 | 4.7 | .06 | 1.9 | 28 | 16 | 4.8 | | 0 | 171 | 4.0 | .0 | .6 | 274 | 136 | 136 | 104 | 416 | 3.70 | 3 |
| May 7 ..... | 41 | 54 | 13 | 8.6 | .15 | 3.2 | 40 | 24 | 5.8 | | 0 | 250 | 2.5 | .0 | .7 | 385 | 198 | 198 | 142 | 581 | 3.60 | 2 |
| May 21 ..... | 28 | 54 | 14 | 8.6 | .24 | 3.6 | 43 | 23 | 9.4 | | 0 | 275 | 5.0 | .0 | .6 | 434 | 202 | 202 | 146 | 629 | 3.80 | 2 |
| June 4 ..... | 70 | 53 | 11 | 9.8 | .18 | 2.5 | 25 | 14 | 3.8 | | 0 | 185 | 3.0 | .0 | .6 | 292 | 120 | 120 | 116 | 450 | 3.80 | 3 |

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT PORT CARBON, PA.--Continued

Suspended sediment, October 1950 to June 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 | 18 | 8 | 0.4 | 26 | 28 | 2.0 | 139 | 145 | 55 |
| 2 | 16 | 8 | .4 | 26 | 20 | 1.4 | 122 | 100 | 33 |
| 3 | 14 | 6 | .2 | 28 | 45 | 3.4 | 108 | 75 | 22 |
| 4 | 15 | 6 | .2 | 67 | 600 | 109 | 850 | 2,100 | s 5,780 |
| 5 | 14 | 9 | .4 | 75 | 130 | 26 | 588 | 1,360 | 2,160 |
| 6 | 14 | 10 | .4 | 57 | 48 | 7.4 | 361 | 975 | 950 |
| 7 | 15 | 9 | .4 | 57 | 49 | 7.5 | 285 | 480 | 369 |
| 8 | 14 | 10 | .4 | 62 | 140 | 23 | 425 | 1,010 | 1,160 |
| 9 | 73 | 900 | 177 | 50 | 40 | 5.4 | 316 | 400 | 341 |
| 10 | 92 | 450 | 112 | 49 | 31 | 4.1 | 255 | 175 | 120 |
| 11 | 60 | 50 | 8.1 | 47 | 38 | 4.8 | 216 | 149 | 87 |
| 12 | 60 | 90 | 15 | 44 | 35 | 4.2 | 180 | 107 | 52 |
| 13 | 57 | 46 | 7.1 | 42 | 30 | 3.4 | 153 | 92 | 38 |
| 14 | 51 | 34 | 4.7 | 40 | 43 | 4.6 | 134 | 53 | 19 |
| 15 | 49 | 24 | 3.2 | 39 | 43 | 4.5 | 117 | 48 | 15 |
| 16 | 47 | 22 | 2.8 | 38 | 44 | 4.5 | 108 | 55 | 16 |
| 17 | 47 | 28 | 3.6 | 36 | 38 | 3.7 | 92 | 32 | 7.9 |
| 18 | 44 | 27 | 3.2 | 35 | 32 | 3.0 | 80 | 28 | 6.0 |
| 19 | 41 | 23 | 2.5 | 33 | 38 | 3.4 | 70 | 25 | 4.7 |
| 20 | 36 | 16 | 1.6 | 44 | 180 | 21 | 65 | 31 | 5.5 |
| 21 | 33 | 28 | 2.5 | 65 | 180 | 32 | 60 | 23 | 3.7 |
| 22 | 33 | 30 | 2.7 | 47 | 30 | 3.8 | 59 | 34 | 5.4 |
| 23 | 43 | 62 | 7.2 | 43 | 30 | 3.5 | 58 | 31 | a4.9 |
| 24 | 35 | 27 | 2.5 | 41 | 30 | 3.3 | 57 | 24 | a3.7 |
| 25 | 33 | 27 | 2.4 | 808 | 3,160 | s 8,580 | 53 | 20 | a2.9 |
| 26 | 31 | 30 | 2.5 | 665 | 2,080 | 3,730 | 50 | 26 | a3.5 |
| 27 | 30 | 35 | 2.8 | 348 | 650 | 611 | 45 | 28 | a3.4 |
| 28 | 29 | 35 | 2.8 | 228 | 470 | 289 | 43 | 32 | a3.7 |
| 29 | 28 | 28 | 2.1 | 186 | 300 | 151 | 45 | 52 | a6.3 |
| 30 | 28 | 17 | 1.3 | 163 | 180 | 79 | 41 | 37 | a4.1 |
| 31 | 27 | 24 | 1.8 | -- | -- | -- | 40 | 24 | a2.6 |
| Total | 1,127 | -- | 374.2 | 3,489 | -- | 13,728.9 | 5,215 | -- | 11,284.8 |

| Day | January | | | February | | | March | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 38 | 23 | 2.3 | 112 | 241 | 73 | 87 | 31 | 7.3 |
| 2 | 34 | 37 | 3.4 | 110 | 121 | 36 | 78 | 14 | 2.9 |
| 3 | 41 | 50 | 5.5 | 96 | 57 | 15 | 80 | 42 | 9.1 |
| 4 | 74 | 335 | 67 | 90 | 51 | 12 | 90 | 36 | 8.7 |
| 5 | 82 | 95 | 21 | 90 | 41 | 10 | 85 | 34 | 7.8 |
| 6 | 78 | 62 | 13 | 78 | 85 | 18 | 83 | 35 | 7.9 |
| 7 | 80 | 42 | 9.1 | 285 | 1,460 | s 1,590 | 87 | 36 | 8.5 |
| 8 | 72 | 55 | 11 | 230 | 320 | 199 | 83 | 34 | 7.6 |
| 9 | 64 | 45 | 7.8 | 172 | 180 | 84 | 80 | 27 | 5.8 |
| 10 | 59 | 45 | 7.2 | 148 | 98 | 39 | 76 | 25 | 5.1 |
| 11 | 59 | 47 | 7.5 | 134 | 71 | 26 | 68 | 22 | 4.0 |
| 12 | 57 | 46 | 7.1 | 122 | 78 | 26 | 67 | 17 | 3.1 |
| 13 | 53 | 51 | 7.3 | 112 | 93 | 28 | 70 | 38 | 7.2 |
| 14 | 40 | 93 | 10 | 110 | 87 | 26 | 82 | 95 | 21 |
| 15 | 90 | 192 | 47 | 104 | 48 | 13 | 80 | 41 | 8.9 |
| 16 | 82 | 62 | 14 | 96 | 53 | 14 | 70 | 22 | 4.2 |
| 17 | 75 | 71 | 14 | 104 | 85 | 24 | 67 | 52 | 9.4 |
| 18 | 71 | 63 | 12 | 108 | 50 | 15 | 60 | 29 | 4.7 |
| 19 | 70 | 56 | 11 | 106 | 82 | 23 | 63 | 81 | 14 |
| 20 | 71 | 71 | 14 | 110 | 103 | 31 | 120 | 308 | 100 |
| 21 | 73 | 96 | 19 | 148 | 520 | 208 | 104 | 39 | 11 |
| 22 | 71 | 65 | 12 | 141 | 105 | 40 | 102 | 33 | 9.1 |
| 23 | 83 | 140 | 31 | 127 | 47 | 16 | 92 | 32 | 7.9 |
| 24 | 286 | 1,960 | s 1,580 | 120 | 45 | 15 | 90 | 26 | 6.3 |
| 25 | 209 | 470 | 265 | 106 | 47 | 13 | 88 | 28 | 6.6 |
| 26 | 164 | 320 | 142 | 102 | 17 | 4.7 | 78 | 23 | 4.8 |
| 27 | 144 | 180 | 70 | 96 | 90 | 23 | 75 | 22 | 4.5 |
| 28 | 124 | 140 | 47 | 90 | 52 | 13 | 71 | 30 | 5.8 |
| 29 | 110 | 84 | 25 | -- | -- | -- | 87 | 188 | 44 |
| 30 | 94 | 69 | 18 | -- | -- | -- | 148 | 367 | 147 |
| 31 | 83 | 92 | 21 | -- | -- | -- | 153 | 288 | 119 |
| Total | 2,731 | -- | 2,521.2 | 3,447 | -- | 2,634.7 | 2,664 | -- | 613.2 |

s Computed by subdividing day.
a Computed from estimated concentration graph.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT PORT CARBON, PA.--Continued

Suspended sediment, October 1950 to June 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 | 148 | 92 | 37 | 54 | 18 | 2.6 | 21 | 15 | 0.9 |
| 2 | 136 | 58 | 21 | 51 | 17 | 2.3 | 30 | 51 | 4.1 |
| 3 | 120 | 60 | 19 | 49 | 12 | 1.6 | 74 | 1,830 | s846 |
| 4 | 106 | 38 | 11 | 46 | 17 | 2.1 | 70 | 413 | 78 |
| 5 | 94 | 38 | 9.6 | 44 | 20 | 2.4 | 57 | 59 | 9.1 |
| 6 | 83 | 32 | 7.2 | 42 | 22 | 2.5 | 43 | 15 | 1.7 |
| 7 | 78 | 35 | 7.4 | 41 | 17 | 1.8 | 39 | 12 | 1.3 |
| 8 | 75 | 28 | 5.7 | 39 | 19 | 2.0 | 39 | 12 | 1.3 |
| 9 | 67 | 21 | 3.8 | 31 | 26 | 2.2 | 35 | 19 | 1.8 |
| 10 | 80 | 141 | 31 | 35 | 25 | 2.4 | 49 | 52 | 6.9 |
| 11 | 83 | 46 | 10 | 39 | 64 | 6.8 | 44 | 22 | 2.6 |
| 12 | 100 | 550 | 148 | 41 | 42 | 4.6 | 39 | 14 | 1.5 |
| 13 | 151 | 280 | 114 | 35 | 16 | 1.5 | 62 | 260 | 43 |
| 14 | 136 | 94 | 35 | 33 | 13 | 1.2 | 63 | 75 | 13 |
| 15 | 120 | 73 | 24 | 31 | 15 | 1.2 | 53 | 27 | 3.9 |
| 16 | 108 | 63 | 18 | 30 | 13 | 1.1 | 51 | 22 | 3.0 |
| 17 | 98 | 42 | 11 | 29 | 7 | .5 | 47 | 16 | 2.0 |
| 18 | 90 | 33 | 8.0 | 30 | 10 | .8 | 44 | 11 | 1.3 |
| 19 | 83 | 28 | 6.3 | 28 | 11 | .8 | 42 | 15 | 1.7 |
| 20 | 80 | 23 | 5.0 | 31 | 12 | 1.0 | 41 | 18 | 2.0 |
| 21 | 73 | 19 | 3.8 | 28 | 10 | .8 | 38 | 17 | 1.8 |
| 22 | 73 | 30 | 5.9 | 28 | 12 | .9 | 40 | 32 | 3.5 |
| 23 | 106 | 228 | 65 | 29 | 71 | 5.6 | 46 | 80 | 9.9 |
| 24 | 82 | 25 | 5.5 | 33 | 26 | 2.3 | 43 | 255 | 30 |
| 25 | 76 | 21 | 4.3 | 27 | 12 | .9 | 59 | 308 | 49 |
| 26 | 73 | 19 | 3.8 | 25 | 14 | .9 | 40 | 43 | 4.6 |
| 27 | 70 | 22 | 4.2 | 26 | 10 | .7 | 36 | 26 | 2.5 |
| 28 | 65 | 19 | 3.3 | 26 | 8 | .6 | 34 | 19 | 1.8 |
| 29 | 65 | 20 | 3.5 | 28 | 13 | 1.0 | 36 | 41 | 4.0 |
| 30 | 63 | 15 | 2.5 | 28 | 25 | 1.9 | 49 | 50 | 6.6 |
| 31 | -- | -- | -- | 25 | 9 | .6 | -- | -- | -- |
| Total | 2,782 | -- | 633.8 | 1,062 | -- | 57.6 | 1,384 | -- | 1,138.8 |

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT PORT CARBON, PA.--Continued

Particle-size analyses of suspended sediment, November 1950 to February 1951
(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. 25, 1950 | 11:15 a.m. | 456 | 5,500 | | | | 5 | 10 | 18 | 50 | 63 | 73 | | 84 | 93 | DSWC |
| Nov. 25 | 4:00 p.m. | 1,820 | 2,980 | | | | 8 | 16 | 27 | 67 | 80 | 89 | | 95 | 98 | DSWC |
| Jan. 15, 1951 | 3:15 p.m. | 110 | 134 | | | | 11 | 17 | 31 | 46 | 59 | 67 | | 80 | 88 | DSWC |
| Oct. 20, 1950 | 12:45 p.m. | Composite | 516 | | | | 1 | 3 | 10 | 20 | 30 | 43 | | 65 | 80 | DSWC |
| Nov. 13 | 3:40 p.m. | | | | | | | | | | | | | | | |
| Dec. 4 | 5:05 p.m. | | | | | | | | | | | | | | | |
| Dec. 8 | 9:45 p.m. | | | | | | | | | | | | | | | |
| Dec. 20 | 12:55 p.m. | | | | | | | | | | | | | | | |
| Jan. 29, 1951 | 3:55 p.m. | | | | | | | | | | | | | | | |
| Feb. 12 | 11:15 a.m. | | | | | | | | | | | | | | | |

## SCHUYLKILL RIVER AT LANDINGVILLE, PA.

LOCATION.--At gaging station at highway bridge at Landingville, Schuylkill County, 0.1 mile upstream from Mahannon Creek, and 5 miles downstream from mouth of West Branch Schuylkill River.
DRAINAGE AREA.--133 square miles.
RECORDS AVAILABLE.--Chemical analyses: December 1947 to September 1951.
Sediment records: September 1947 to September 1951.
EXTREMES, 1950-51.--Sediment concentrations: Maximum daily, 1,630 ppm Nov. 25; minimum daily, 30 ppm Sept. 4.
Sediment loads: Maximum daily, 18,500 tons Nov. 25; minimum daily, 9 tons Nov. 2, Sept. 4.
EXTREMES, 1947-51.--Sediment concentrations: Maximum daily, 9,740 ppm Feb. 15, 1948; minimum daily, 30 ppm Sept. 4, 1951.
Sediment loads: Maximum daily, 18,740 tons Dec. 30, 1948; minimum daily, 8 tons Aug. 17, 1949.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| Oct. 16, 1950 ... | 121 | 52 | 12 | 5.5 | 0.08 | 4.7 | 69 | 37 | 17 | | 0 | 364 | 7.0 | 0.0 | 5.9 | 574 | 324 | 324 | 136 | 741 | 4.30 | 2 |
| Nov. 14 ..... | 119 | 38 | 12 | 9.5 | .09 | 4.8 | 64 | 36 | 14 | | 0 | 355 | 6.0 | .0 | 5.9 | 556 | 308 | 308 | 144 | 735 | 4.00 | 2 |
| Dec. 18 ..... | 392 | 35 | 14 | 13 | .22 | 5.1 | 58 | 41 | 9.2 | | 0 | 404 | 8.0 | .0 | 3.6 | 632 | 313 | 313 | 234 | 833 | 3.60 | 2 |
| Dec. 22 ..... | 293 | 34 | 11 | 8.9 | .10 | 4.2 | 51 | 34 | 12 | | 0 | 326 | 5.0 | .0 | 1.5 | 510 | 267 | 267 | 138 | 672 | 4.00 | 2 |
| Feb. 2, 1951 ... | 664 | 34 | 11 | 8.9 | .11 | 4.6 | 55 | 40 | 15 | | 0 | 376 | 5.0 | .0 | 1.1 | 580 | 302 | 302 | 162 | 754 | 4.00 | 3 |
| Mar. 26 ..... | 415 | 42 | 11 | 5.5 | .04 | 4.0 | 49 | 37 | 16 | | 0 | 331 | 5.0 | .0 | 1.3 | 516 | 274 | 274 | 152 | 669 | 4.20 | 2 |
| June 15 ..... | 177 | 69 | 12 | 6.8 | .09 | 4.5 | 56 | 39 | 15 | | 3 | 375 | 8.0 | .0 | .6 | 587 | 300 | 298 | 166 | 740 | 4.60 | 4 |
| June 25 ..... | 121 | 69 | 22 | 29 | .29 | 7.6 | 73 | 63 | 18 | | 0 | 626 | 8.0 | .0 | .5 | 996 | 441 | 441 | 376 | 1,140 | 3.60 | 2 |
| Aug. 13 ..... | 402 | 68 | 12 | 5.2 | .11 | 3.2 | 42 | 27 | 7.2 | | 0 | 251 | 6.0 | .0 | .7 | 415 | 216 | 216 | 86 | 538 | 4.35 | 2 |
| Sept. 10 ..... | 130 | 68 | 19 | 2.0 | .06 | 8.1 | 94 | 67 | 24 | 2.5 | 0 | 644 | 7.5 | .0 | 1.0 | 947 | 510 | 510 | 240 | 1,130 | 3.90 | 3 |

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT LANDINGVILLE, PA.--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 | 80 | 82 | 18 | 84 | 160 | 36 | 530 | 200 | 286 |
| 2 | 60 | 81 | 13 | 70 | 50 | 9 | 472 | 330 | 421 |
| 3 | 53 | 98 | 14 | 87 | 128 | 30 | 454 | 250 | 306 |
| 4 | 56 | 88 | 13 | 216 | 904 | s746 | 4,330 | 1,140 | s16,300 |
| 5 | 49 | 150 | 20 | 225 | 410 | 249 | 2,860 | 912 | s6,450 |
| 6 | 54 | 166 | 24 | 169 | 92 | 42 | 1,580 | 546 | 2,330 |
| 7 | 60 | 165 | 27 | 159 | 110 | 47 | 1,250 | 324 | 1,090 |
| 8 | 63 | 85 | 14 | 155 | 175 | 73 | 2,290 | 440 | s2,800 |
| 9 | 240 | 1,380 | s1,010 | 150 | 130 | 53 | 1,580 | 319 | 1,360 |
| 10 | 260 | 650 | 456 | 146 | 166 | 65 | 1,220 | 186 | 613 |
| 11 | 186 | 150 | 75 | 146 | 132 | 52 | 1,040 | 209 | 587 |
| 12 | 192 | 160 | 83 | 138 | 75 | 28 | 820 | 143 | 317 |
| 13 | 177 | 137 | 65 | 120 | 105 | 34 | 698 | 133 | 251 |
| 14 | 155 | 86 | 36 | 117 | 150 | 48 | 590 | 165 | 263 |
| 15 | 142 | 74 | 28 | 117 | 225 | 71 | 550 | 198 | 294 |
| 16 | 121 | 100 | 33 | 117 | 111 | 35 | 510 | 98 | 135 |
| 17 | 109 | 140 | 41 | 120 | 257 | 83 | 465 | 45 | 56 |
| 18 | 107 | 124 | 36 | 120 | 116 | 38 | 394 | 58 | 62 |
| 19 | 101 | 125 | 34 | 124 | 84 | 28 | 359 | 86 | 83 |
| 20 | 97 | 182 | 48 | 155 | 246 | 103 | 331 | 128 | 114 |
| 21 | 107 | 140 | 40 | 217 | 450 | 264 | 301 | 185 | 150 |
| 22 | 103 | 87 | 24 | 155 | 145 | 61 | 293 | 221 | 175 |
| 23 | 157 | 250 | 106 | 157 | 192 | 81 | 290 | 255 | 200 |
| 24 | 111 | 144 | 43 | 146 | 78 | 31 | 287 | 81 | 63 |
| 25 | 103 | 142 | 39 | 3,760 | 1,630 | s18,500 | 266 | 56 | 40 |
| 26 | 99 | 117 | 31 | 3,420 | 986 | s8,260 | 250 | 78 | 53 |
| 27 | 93 | 228 | 57 | 1,460 | 975 | 3,840 | 150 | 78 | 32 |
| 28 | 99 | 135 | 36 | 1,010 | 720 | 1,960 | 162 | 172 | 75 |
| 29 | 101 | 138 | 38 | 770 | 330 | 686 | 225 | 45 | 27 |
| 30 | 97 | 105 | 28 | 630 | 385 | 655 | 200 | 259 | 140 |
| 31 | 74 | 88 | 18 | -- | -- | -- | 195 | 117 | 62 |
| Total | 3,506 | -- | 2,548 | 14,460 | -- | 36,208 | 24,942 | -- | 35,135 |
| | January | | | February | | | March | | |
| 1 | 188 | 112 | 57 | 645 | 281 | 489 | 402 | 102 | 111 |
| 2 | 168 | 92 | 42 | 668 | 145 | 262 | 374 | 100 | 101 |
| 3 | 202 | 190 | 104 | 508 | 55 | 75 | 371 | 105 | 105 |
| 4 | 385 | 492 | 511 | 455 | 55 | 68 | 490 | 87 | 115 |
| 5 | 416 | 281 | 316 | 402 | 68 | 74 | 448 | 90 | 109 |
| 6 | 392 | 178 | 188 | 368 | 126 | 125 | 452 | 122 | 149 |
| 7 | 392 | 110 | 116 | 1,620 | 828 | s5,490 | 472 | 120 | 153 |
| 8 | 347 | 84 | 79 | 1,040 | 170 | 477 | 455 | 98 | 120 |
| 9 | 299 | 110 | 89 | 735 | 80 | 159 | 424 | 66 | 76 |
| 10 | 269 | 146 | 106 | 600 | 86 | 139 | 396 | 64 | 68 |
| 11 | 260 | 172 | 121 | 560 | 80 | 121 | 374 | 34 | 34 |
| 12 | 245 | 205 | 136 | 542 | 125 | 183 | 338 | 42 | 38 |
| 13 | 220 | 202 | 120 | 560 | 152 | 230 | 332 | 174 | 156 |
| 14 | 239 | 222 | s158 | 542 | 165 | 241 | 374 | 230 | 232 |
| 15 | 508 | 402 | 551 | 472 | 129 | 164 | 385 | 103 | 107 |
| 16 | 406 | 198 | 217 | 438 | 167 | 197 | 347 | 122 | 114 |
| 17 | 360 | 198 | 193 | 490 | 212 | 281 | 329 | 128 | 114 |
| 18 | 347 | 188 | 176 | 490 | 135 | 179 | 317 | 77 | 66 |
| 19 | 360 | 188 | 183 | 455 | 142 | 174 | 308 | 87 | 72 |
| 20 | 385 | 232 | 241 | 452 | 170 | 207 | 622 | 338 | 568 |
| 21 | 413 | 122 | 136 | 766 | 607 | s1,490 | 622 | 174 | 292 |
| 22 | 374 | 88 | 89 | 780 | 260 | 548 | 600 | 129 | 209 |
| 23 | 354 | 188 | 180 | 690 | 192 | 358 | 542 | 120 | 176 |
| 24 | 1,650 | 1,570 | s7,530 | 600 | 134 | 217 | 542 | 110 | 161 |
| 25 | 1,240 | 710 | 2,380 | 542 | 96 | 140 | 490 | 173 | 229 |
| 26 | 915 | 125 | 309 | 490 | 101 | 134 | 434 | 88 | 103 |
| 27 | 735 | 204 | 405 | 455 | 112 | 138 | 402 | 77 | 84 |
| 28 | 645 | 160 | 279 | 416 | 100 | 112 | 396 | 96 | 103 |
| 29 | 580 | 165 | 258 | -- | -- | -- | 472 | 187 | 238 |
| 30 | 508 | 149 | 204 | -- | -- | -- | 755 | 358 | s738 |
| 31 | 448 | 115 | 139 | -- | -- | -- | 895 | 289 | 698 |
| Total | 14,250 | -- | 15,613 | 16,781 | -- | 12,472 | 14,160 | -- | 5,639 |

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT LANDINGVILLE, PA.--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 | 820 | 118 | 261 | 264 | 90 | 64 | 101 | 90 | 25 |
| 2 | 725 | 84 | 164 | 258 | 56 | 39 | 115 | 164 | 51 |
| 3 | 635 | 104 | 178 | 255 | 80 | 55 | 136 | 176 | 65 |
| 4 | 530 | 65 | 93 | 234 | 58 | 37 | 195 | 530 | 279 |
| 5 | 470 | 123 | 156 | 240 | 51 | 33 | 134 | 119 | 43 |
| 6 | 410 | 105 | 116 | 229 | 42 | 26 | 106 | 141 | 40 |
| 7 | 386 | 68 | 71 | 192 | 38 | 20 | 106 | 135 | 39 |
| 8 | 362 | 54 | 53 | 190 | 65 | 33 | 103 | 75 | 21 |
| 9 | 324 | 82 | 72 | 170 | 71 | 33 | 115 | 74 | 23 |
| 10 | 346 | 178 | 166 | 167 | 76 | 34 | 170 | 145 | 66 |
| 11 | 362 | 147 | 144 | 195 | 145 | 76 | 148 | 87 | 35 |
| 12 | 528 | 413 | s1,290 | 204 | 190 | 105 | 106 | 56 | 16 |
| 13 | 870 | 380 | 893 | 190 | 71 | 36 | 212 | 248 | 142 |
| 14 | 725 | 140 | 274 | 151 | 82 | 33 | 240 | 234 | 152 |
| 15 | 612 | 85 | 140 | 146 | 110 | 43 | 192 | 95 | 49 |
| 16 | 530 | 76 | 109 | 141 | 86 | 33 | 190 | 76 | 39 |
| 17 | 462 | 98 | 122 | 144 | 99 | 39 | 173 | 57 | 27 |
| 18 | 410 | 101 | 112 | 144 | 137 | 53 | 146 | 53 | 21 |
| 19 | 379 | 98 | 100 | 146 | 132 | 52 | 148 | 64 | 26 |
| 20 | 352 | 88 | 84 | 148 | 70 | 28 | 141 | 73 | 28 |
| 21 | 330 | 80 | 71 | 126 | 54 | 18 | 144 | 80 | 31 |
| 22 | 330 | 45 | 40 | 113 | 59 | 18 | 151 | 125 | 51 |
| 23 | 486 | 237 | 311 | 120 | 76 | 25 | 220 | 341 | 202 |
| 24 | 359 | 93 | 90 | 146 | 140 | 55 | 176 | 78 | 37 |
| 25 | 340 | 104 | 96 | 115 | 78 | 24 | 173 | 415 | 194 |
| 26 | 333 | 154 | 139 | 122 | 70 | 23 | 126 | 84 | 29 |
| 27 | 309 | 146 | 122 | 136 | 70 | 26 | 122 | 75 | 25 |
| 28 | 309 | 129 | 108 | 113 | 46 | 14 | 117 | 90 | 28 |
| 29 | 318 | 114 | 98 | 120 | 80 | 26 | 148 | 390 | 156 |
| 30 | 294 | 138 | 110 | 134 | 98 | 35 | 184 | 308 | 153 |
| 31 | -- | -- | -- | 104 | 48 | 113 | -- | -- | -- |
| Total | 13,846 | -- | 5,783 | 5,157 | -- | 1,149 | 4,538 | -- | 2,093 |

| Day | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 223 | 550 | 331 | 343 | 150 | 139 | 106 | 62 | 18 |
| 2 | 159 | 84 | 36 | 294 | 79 | 63 | 188 | 380 | 193 |
| 3 | 138 | 75 | 28 | 264 | 60 | 43 | 142 | 80 | 31 |
| 4 | 131 | 92 | 33 | 246 | 86 | 57 | 106 | 30 | 9 |
| 5 | 215 | 429 | 249 | 218 | 52 | 31 | 97 | 51 | 13 |
| 6 | 164 | 96 | 42 | 173 | 42 | 20 | 136 | 675 | 248 |
| 7 | 138 | 76 | 28 | 164 | 78 | 35 | 207 | 1,150 | 643 |
| 8 | 156 | 152 | 64 | 173 | 60 | 28 | 148 | 88 | 35 |
| 9 | 138 | 43 | 16 | 173 | 82 | 38 | 146 | 46 | 18 |
| 10 | 117 | 78 | 25 | 156 | 61 | 26 | 126 | 55 | 19 |
| 11 | 117 | 235 | 74 | 192 | 71 | 37 | 117 | 81 | 26 |
| 12 | 110 | 165 | 49 | 428 | 486 | s1,240 | 112 | 69 | 21 |
| 13 | 110 | 121 | 36 | 395 | 390 | 416 | 113 | 72 | 22 |
| 14 | 110 | 71 | 21 | 274 | 60 | 44 | 206 | 402 | s384 |
| 15 | 106 | 44 | 13 | 245 | 108 | 72 | 224 | 268 | 162 |
| 16 | 90 | 40 | 10 | 430 | 573 | s762 | 170 | 85 | 39 |
| 17 | 85 | 66 | 15 | 388 | 432 | 453 | 136 | 80 | 29 |
| 18 | 84 | 44 | 10 | 303 | 146 | 119 | 124 | 79 | 26 |
| 19 | 106 | 174 | 50 | 269 | 142 | 103 | 121 | 90 | 29 |
| 20 | 162 | 277 | 121 | 232 | 108 | 68 | 115 | 92 | 29 |
| 21 | 146 | 99 | 39 | 214 | 120 | 69 | 90 | 76 | 18 |
| 22 | 108 | 48 | 14 | 186 | 128 | 64 | 113 | 85 | 26 |
| 23 | 198 | 368 | 197 | 172 | 120 | 56 | 115 | 46 | 14 |
| 24 | 156 | 180 | 76 | 170 | 82 | 38 | 100 | 95 | 26 |
| 25 | 117 | 88 | 28 | 161 | 59 | 26 | 100 | 57 | 15 |
| 26 | 95 | 56 | 14 | 140 | 40 | 15 | 95 | 60 | 15 |
| 27 | 103 | 78 | 22 | 117 | 40 | 13 | 119 | 85 | 27 |
| 28 | 760 | 1,410 | s4,040 | 115 | 50 | 16 | 117 | 111 | 35 |
| 29 | 550 | 495 | 735 | 106 | 40 | 11 | 115 | 76 | 24 |
| 30 | 466 | 180 | 227 | 108 | 49 | 14 | 113 | 32 | 10 |
| 31 | 400 | 200 | 216 | 98 | 50 | 13 | -- | -- | -- |
| Total | 5,758 | -- | 6,859 | 6,947 | -- | 4,129 | 3,917 | -- | 2,204 |

Total discharge for year (cfs-days) ..... 128,062
Total load for year (tons) ..... 129,832

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT LANDINGVILLE, PA.--Continued

Particle-size analyses of suspended sediment, October 1950 to January 1951
(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 | |
| Oct. 4, 1950 | 9:40 a.m. | 346 | 2,340 | | | | 4 | 10 | 16 | 94 | 98 | 99 | | 100 | | DSWC |
| Oct. 16 | 10:55 a.m. | 124 | 132 | | | | 11 | 43 | 73 | 95 | 97 | 98 | | 100 | | DSWC |
| Oct. 23 | 10:30 a.m. | | | | | | | | | | | | | | | |
| Oct. 30 | 10:45 a.m. | | | | | | | | | | | | | | | |
| Nov. 8 | 3:55 p.m. | Composite | 193 | | | | 3 | 11 | 16 | 24 | 34 | 65 | | 86 | 94 | DSWC |
| Nov. 20 | 3:15 p.m. | | | | | | | | | | | | | | | |
| Jan. 22, 1951 | 10:30 a.m. | | | | | | | | | | | | | | | |

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT AUBURN, PA.

LOCATION.--At Bridge on State Highway 895, 100 feet downstream from gaging station at Auburn, Schuylkill County, which is 0.4 mile upstream from Pine Creek, and 3 miles downstream from Plum Creek.
DRAINAGE AREA.--160 square miles.
RECORDS AVAILABLE.--Chemical analyses: December 1947 to June 1951.
Sediment records: October 1947 to June 1951.
EXTREMES, 1950-51.--Sediment concentrations: Maximum daily, 800 ppm Mar. 6; minimum daily, 3 ppm on several days.
Sediment loads: Maximum daily, 9,860 tons Dec. 4; minimum daily, 1.9 tons June 20, 22.
EXTREMES, 1947-51.--Sediment concentrations: Maximum daily, 5,700 ppm Nov. 17, 1949; minimum daily, 4 ppm on several days.
Sediment loads: Maximum daily 29,540 tons Dec. 30, 1948; minimum daily, 1.9 tons June 20, 22, 1951.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, October 1950 to June 1951

| Date of collection | 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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| Oct. 23, 1950 ... | 107 | 54 | 9.9 | 3.1 | 0.06 | 3.7 | 52 | 33 | 18 | | 0 | 290 | 6.0 | 0.0 | 6.0 | 422 | 265 | 265 | 80 | 636 | 4.05 | 4 |
| Feb. 5, 1951 ... | 492 | 34 | 11 | 8.4 | .09 | 4.2 | 48 | 36 | 17 | | 0 | 331 | 5.0 | .0 | 1.7 | 480 | 268 | 268 | 152 | 680 | 4.00 | 3 |
| Mar. 27 ..... | 450 | 42 | 9.8 | 5.3 | .04 | 3.2 | 40 | 30 | 12 | | 0 | 262 | 3.0 | .0 | 1.9 | 406 | 223 | 223 | 120 | 555 | 4.10 | 2 |
| June 15 ..... | 190 | 69 | 13 | 2.7 | .26 | 4.5 | 66 | 42 | 19 | | 2 | 392 | 7.0 | .0 | 1.2 | 608 | 337 | 336 | 106 | 786 | 4.9 | 3 |

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT AUBURN, PA.--Continued

Suspended sediment, October 1950 to June 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 | 88 | 114 | 27 | 87 | 15 | 3.5 | 860 | 80 | 186 |
| 2 | 74 | 90 | 18 | 90 | 25 | 6.1 | 750 | 25 | 51 |
| 3 | 68 | 66 | 12 | 90 | 20 | 4.9 | 700 | 20 | 38 |
| 4 | 73 | 73 | 14 | 120 | 30 | 9.7 | 5,380 | 468 | s9,860 |
| 5 | 66 | 64 | 11 | 420 | 90 | 102 | 3,950 | 572 | s7,060 |
| 6 | 71 | 135 | 26 | 296 | 73 | 58 | 2,190 | 190 | 1,120 |
| 7 | 76 | 142 | 29 | 251 | 15 | 10 | 1,700 | 220 | 1,010 |
| 8 | 83 | 122 | 27 | 234 | 22 | 14 | 2,910 | 347 | s2,870 |
| 9 | 278 | 672 | s622 | 213 | 34 | 20 | 1,980 | 208 | 1,110 |
| 10 | 372 | 465 | 467 | 200 | 23 | 12 | 1,510 | 160 | 652 |
| 11 | 267 | 215 | 155 | 197 | 25 | 13 | 1,300 | 55 | 193 |
| 12 | 262 | 185 | 131 | 184 | 50 | 25 | 1,000 | 40 | 108 |
| 13 | 240 | 160 | 104 | 165 | 36 | 16 | 805 | 25 | 54 |
| 14 | 210 | 205 | 116 | 145 | 17 | 6.6 | 675 | 42 | 77 |
| 15 | 187 | 135 | 68 | 145 | 18 | 7.0 | 600 | 58 | 94 |
| 16 | 167 | 100 | 45 | 143 | 22 | 8.5 | 580 | 65 | 102 |
| 17 | 160 | 110 | 48 | 141 | 69 | 26 | 502 | 70 | 95 |
| 18 | 155 | 155 | 65 | 141 | 65 | 25 | 435 | 30 | 35 |
| 19 | 145 | 175 | 69 | 145 | 38 | 15 | 390 | 30 | 32 |
| 20 | 134 | 135 | 49 | 180 | 65 | 32 | 363 | 30 | 29 |
| 21 | 136 | 130 | 48 | 319 | 138 | 119 | 336 | 38 | 35 |
| 22 | 132 | 80 | 29 | 226 | 44 | 27 | 327 | 29 | 26 |
| 23 | 98 | 100 | 26 | 221 | 12 | 7.2 | 321 | 23 | 20 |
| 24 | 74 | 40 | 8.0 | 205 | 16 | 8.9 | 318 | 10 | 8.6 |
| 25 | 77 | 140 | 29 | 4,270 | 492 | s8,260 | 291 | 55 | 43 |
| 26 | 79 | 40 | 8.5 | 4,970 | 455 | s6,860 | 255 | 25 | 17 |
| 27 | 81 | 23 | 5.0 | 2,260 | 170 | 1,040 | 170 | 15 | 6.9 |
| 28 | 83 | 10 | 2.2 | 1,570 | 70 | 297 | 190 | 18 | 9.2 |
| 29 | 85 | 17 | 3.9 | 1,240 | 110 | 368 | 250 | 18 | 12 |
| 30 | 83 | 37 | 8.3 | 1,000 | 150 | 405 | 228 | 22 | 14 |
| 31 | 85 | 24 | 5.5 | -- | -- | -- | 216 | 19 | 11 |
| Total | 4,189 | -- | 2,276.4 | 19,868 | -- | 17,806.4 | 31,482 | -- | 24,978.7 |

| | January | | | February | | | March | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 196 | 9 | 4.8 | 778 | 62 | 130 | 448 | 29 | 35 |
| 2 | 182 | 12 | 5.9 | 888 | 72 | 173 | 434 | 9 | 11 |
| 3 | 204 | 20 | 11 | 650 | 72 | 126 | 420 | 11 | 12 |
| 4 | 482 | 40 | s56 | 560 | 44 | 66 | 549 | 18 | 27 |
| 5 | 600 | 16 | 26 | 485 | 19 | 25 | 532 | 22 | 32 |
| 6 | 520 | 5 | 7.0 | 450 | 7 | 8.5 | 518 | 800 | 1,120 |
| 7 | 485 | 5 | 6.5 | 2,290 | 73 | s644 | 532 | 305 | 438 |
| 8 | 420 | 10 | 11 | 1,700 | 66 | 303 | 504 | 60 | 82 |
| 9 | 360 | 30 | 29 | 1,160 | 69 | 216 | 462 | 22 | 28 |
| 10 | 324 | 12 | 10 | 905 | 19 | 46 | 434 | 18 | 21 |
| 11 | 303 | 12 | 9.8 | 708 | 37 | 71 | 420 | 15 | 17 |
| 12 | 282 | 17 | 13 | 662 | 79 | 141 | 379 | 18 | 18 |
| 13 | 258 | 4 | 2.8 | 662 | 45 | 80 | 354 | 36 | 34 |
| 14 | 258 | 9 | 6.3 | 640 | 10 | 17 | 406 | 34 | 37 |
| 15 | 675 | 29 | 53 | 549 | 9 | 13 | 420 | 24 | 27 |
| 16 | 540 | 29 | 42 | 504 | 11 | 15 | 392 | 19 | 20 |
| 17 | 450 | 20 | 24 | 549 | 55 | 82 | 379 | 22 | 23 |
| 18 | 420 | 72 | 82 | 566 | 20 | 31 | 366 | 21 | 21 |
| 19 | 420 | 38 | 43 | 518 | 66 | 92 | 354 | 23 | 22 |
| 20 | 435 | 18 | 21 | 532 | 62 | 89 | 907 | 43 | s107 |
| 21 | 435 | 22 | 26 | 864 | 46 | s132 | 780 | 14 | 29 |
| 22 | 390 | 26 | 27 | 955 | 40 | 103 | 708 | 10 | 19 |
| 23 | 354 | 56 | 53 | 780 | 62 | 131 | 600 | 19 | 31 |
| 24 | 2,050 | 130 | s779 | 685 | 31 | 57 | 583 | 19 | 30 |
| 25 | 1,570 | 61 | 259 | 600 | 97 | 157 | 532 | 10 | 14 |
| 26 | 1,150 | 28 | 87 | 532 | 39 | 56 | 490 | 16 | 21 |
| 27 | 860 | 30 | 70 | 504 | 67 | 91 | 462 | 16 | 20 |
| 28 | 750 | 48 | 97 | 462 | 67 | 84 | 448 | 20 | 24 |
| 29 | 650 | 20 | 35 | -- | -- | -- | 490 | 20 | 26 |
| 30 | 560 | 10 | 15 | -- | -- | -- | 756 | 19 | s39 |
| 31 | 502 | 9 | 12 | -- | -- | -- | 1,010 | 21 | 57 |
| Total | 17,085 | -- | 1,924.1 | 21,158 | -- | 3,179.5 | 16,069 | -- | 2,442 |

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT AUBURN, PA.--Continued

Suspended sediment, October 1950 to June 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 | 930 | 10 | 25 | 316 | 16 | 14 | 129 | 8 | 2.8 |
| 2 | 805 | 13 | 28 | 302 | 23 | 19 | 138 | 12 | 4.5 |
| 3 | 708 | 13 | 25 | 292 | 47 | 87 | 146 | 7 | 2.8 |
| 4 | 566 | 13 | 20 | 292 | 18 | 14 | 204 | 85 | 47 |
| 5 | 518 | 14 | 20 | 268 | 14 | 10 | 160 | 41 | 18 |
| 6 | 462 | 13 | 16 | 255 | 11 | 7.6 | 144 | 44 | 17 |
| 7 | 434 | 14 | 16 | 242 | 16 | 10 | 134 | 19 | 6.9 |
| 8 | 406 | 3 | 3.3 | 226 | 23 | 14 | 129 | 10 | 3.5 |
| 9 | 366 | 7 | 6.9 | 208 | 16 | 9.0 | 130 | 10 | 3.5 |
| 10 | 379 | 22 | 23 | 197 | 87 | 46 | 170 | 10 | 4.6 |
| 11 | 420 | 26 | 29 | 197 | 20 | 11 | 164 | 9 | 4.0 |
| 12 | 538 | 34 | s 86 | 226 | 20 | 12 | 128 | 7 | 2.4 |
| 13 | 1,190 | 32 | 103 | 193 | 50 | 26 | 190 | 12 | 6.2 |
| 14 | 905 | 9 | 22 | 164 | 20 | 8.9 | 235 | 13 | 8.3 |
| 15 | 708 | 13 | 25 | 162 | 15 | 6.6 | 177 | 6 | 2.9 |
| 16 | 600 | 4 | 6.5 | 156 | 21 | 8.9 | 168 | 7 | 3.2 |
| 17 | 549 | 7 | 10 | 154 | 18 | 7.5 | 160 | 5 | 2.2 |
| 18 | 490 | 5 | 6.6 | 150 | 22 | 8.9 | 144 | 8 | 3.1 |
| 19 | 448 | 10 | 12 | 147 | 12 | 4.8 | 144 | 10 | 3.9 |
| 20 | 420 | 4 | 4.5 | 156 | 16 | 6.8 | 142 | 5 | 1.9 |
| 21 | 366 | 10 | 9.9 | 148 | 12 | 4.8 | 146 | 8 | 3.2 |
| 22 | 341 | 24 | 22 | 140 | 11 | 4.2 | 140 | 5 | 1.9 |
| 23 | 504 | 26 | 35 | 141 | 7 | 2.7 | 190 | 5 | 2.6 |
| 24 | 379 | 8 | 8.2 | 162 | 15 | 6.6 | 182 | 8 | 3.9 |
| 25 | 354 | 6 | 5.7 | 142 | 10 | 3.8 | 173 | 15 | 7.0 |
| 26 | 354 | 16 | 15 | 137 | 10 | 3.7 | 141 | 13 | 4.9 |
| 27 | 328 | 6 | 5.3 | 142 | 7 | 2.7 | 134 | 11 | 4.0 |
| 28 | 328 | 4 | 3.5 | 146 | 57 | 22 | 132 | 13 | 4.6 |
| 29 | 354 | 17 | 16 | 135 | 102 | 37 | 142 | 19 | 7.3 |
| 30 | 366 | 34 | 33 | 156 | 5 | 2.1 | 147 | 10 | 4.0 |
| 31 | -- | -- | -- | 135 | 7 | 2.5 | -- | -- | -- |
| Total | 15,516 | -- | 641.4 | 5,887 | -- | 374.1 | 4,663 | -- | 192.1 |

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT AUBURN, PA.--Continued

Particle-size analyses of suspended sediment, November 1950 to December 1951
(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. 25, 1950 | 2:30 p.m. | 6,170 | 1,880 | | | | 3 | 6 | 9 | 14 | 23 | 45 | | 79 | 97 | DSWC |
| Oct. 23, 1950 | 12:55 p.m. | Composite | 29 | | | | -- | -- | 6 | 11 | 17 | 30 | | 65 | 91 | DSWC |
| Oct. 30 | 12:30 p.m. | | | | | | | | | | | | | | | |
| Nov. 14 | 2:10 p.m. | | | | | | | | | | | | | | | |
| Nov. 20 | 1:45 p.m. | | | | | | | | | | | | | | | |
| Dec. 4, 1950 | 1:15 p.m. | 8,520 | 1,420 | | | | 6 | 10 | 14 | 18 | 20 | 26 | | 58 | 89 | DSWC |
| Dec. 7 | 1:25 p.m. | 1,630 | 1,140 | | | | 6 | 11 | 16 | 20 | 23 | 30 | | 60 | 88 | DSWC |

## LITTLE SCHUYLKILL RIVER AT SOUTH TAMAQUA, PA.

LOCATION.--At State Route 443 Highway Bridge, 3½ miles downstream from Panther Creek.
DRAINAGE AREA.--69.6 square miles.
RECORDS AVAILABLE.--Chemical analyses: April 1950 to September 1951.
Sediment records: April 1950 to September 1951.
EXTREMES, 1950-51.--Sediment concentrations: Maximum daily, 6,400 ppm July 28; minimum daily, 20 ppm Mar. 18.
Sediment loads: Maximum daily, 27,700 tons Nov. 25; minimum daily, 5 tons June 1.
EXTREMES, 1950-51.--Sediment concentrations: Maximum daily, 6,400 ppm July 28, 1951; minimum daily, 20 ppm Mar. 18, 1951
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. Discharge records for gaging station at Tamaqua for water year October 1950 to September 1951 given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| Oct. 19, 1950..... | 95 | 64 | 13 | 18 | 0.17 | 4.3 | 52 | 29 | 9.4 | | 0 | 365 | 7.0 | 0.0 | 3.7 | 551 | 249 | 249 | 230 | 797 | 3.50 | 3 |
| Nov. 15..... | 93 | 48 | 12 | 17 | .18 | 4.8 | 63 | 36 | 12 | | 0 | 412 | 7.0 | .0 | 2.0 | 592 | 305 | 305 | 228 | 846 | 3.60 | 1 |
| Dec. 20..... | 170 | 34 | 15 | 26 | .23 | 5.6 | 68 | 49 | 18 | | 0 | 527 | 24 | .0 | .2 | 758 | 371 | 371 | 336 | 1,000 | 3.50 | 1 |
| Jan. 10, 1951 .... | 168 | 35 | 12 | 19 | .17 | 4.4 | 50 | 35 | 15 | | 0 | 386 | 9.0 | .0 | .2 | 554 | 269 | 269 | 248 | 775 | 3.70 | 1 |
| Mar. 14 ..... | 240 | 39 | 9.0 | 7.9 | .07 | 1.9 | 27 | 20 | 5.1 | | 0 | 213 | 4.5 | .0 | 2.5 | 322 | 150 | 150 | 152 | 484 | 3.60 | 2 |
| Apr. 16..... | 312 | 44 | 9.5 | 7.1 | .10 | 2.2 | 30 | 22 | 5.0 | | 0 | 228 | 5.5 | .0 | 2.3 | 350 | 165 | 165 | 156 | 526 | 3.55 | 2 |
| May 2 ..... | 140 | 59 | 13 | 18 | .25 | 4.0 | 50 | 37 | 6.6 | | 0 | 392 | 9.0 | .0 | 1.8 | 600 | 277 | 277 | 250 | 800 | 3.50 | 2 |
| June 15..... | 122 | 69 | 12 | 12 | .43 | 3.7 | 50 | 30 | 5.7 | | 0 | 335 | 6.0 | .0 | .6 | 518 | 248 | 248 | 180 | 698 | 4.00 | 2 |
| July 25 ..... | 71 | 69 | 18 | 33 | .40 | 6.9 | 83 | 59 | 8.9 | | 0 | 679 | 8.0 | .0 | .5 | 1,010 | 450 | 450 | 424 | 1,190 | 3.45 | 2 |
| Aug. 10..... | 146 | -- | 16 | 32 | .68 | 4.8 | 72 | 50 | 7.2 | | 0 | 547 | 6.5 | .0 | 1.1 | 807 | 385 | 385 | 244 | 1,020 | 3.95 | 7 |
| Sept. 21 ..... | 68 | 72 | 16 | 26 | .24 | 6.7 | 76 | 53 | 12 | 2.0 | 0 | 580 | 4.0 | .0 | 1.2 | 859 | 408 | 408 | 326 | 1,090 | 3.65 | 2 |

DELAWARE RIVER BASIN--Continued

LITTLE SCHUYLKILL RIVER AT SOUTH TAMAQUA, PA.--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 | 42 | 145 | 16 | 72 | 125 | 24 | 265 | 145 | 104 |
| 2 | 44 | 110 | 13 | 72 | 155 | 30 | 245 | 110 | 73 |
| 3 | 49 | 130 | 17 | 82 | 630 | 140 | 237 | 35 | 22 |
| 4 | 46 | 195 | 24 | 165 | 2,050 | 913 | 3,000 | 1,210 | s 13,500 |
| 5 | 44 | 235 | 28 | 165 | 500 | 223 | 1,400 | 235 | 888 |
| 6 | 46 | 270 | 33 | 139 | 230 | 86 | 810 | 120 | 262 |
| 7 | 44 | 1,060 | 126 | 123 | 190 | 63 | 670 | 98 | 177 |
| 8 | 42 | 340 | 39 | 129 | 125 | 43 | 1,210 | 425 | 1,390 |
| 9 | 115 | 1,620 | 502 | 132 | 205 | 73 | 820 | 152 | 336 |
| 10 | 186 | 890 | 448 | 115 | 210 | 65 | 625 | 84 | 142 |
| 11 | 106 | 500 | 143 | 112 | 115 | 35 | 530 | 45 | 64 |
| 12 | 126 | 750 | 255 | 103 | 75 | 21 | 405 | 66 | 72 |
| 13 | 115 | 325 | 101 | 103 | 125 | 35 | 330 | 70 | 62 |
| 14 | 98 | 235 | 62 | 93 | 250 | 63 | 285 | 75 | 58 |
| 15 | 98 | 85 | 22 | 93 | 235 | 59 | 250 | 160 | 108 |
| 16 | 98 | 145 | 38 | 95 | 200 | 51 | 225 | 84 | 51 |
| 17 | 100 | 210 | 57 | 87 | 200 | 47 | 200 | 37 | 20 |
| 18 | 95 | 150 | 38 | 87 | 70 | 16 | 185 | 108 | 54 |
| 19 | 95 | 270 | 69 | 85 | 48 | 11 | 180 | 131 | 64 |
| 20 | 98 | 290 | 77 | 120 | 250 | 81 | 170 | 216 | 99 |
| 21 | 85 | 195 | 45 | 152 | 245 | 100 | 160 | 317 | 137 |
| 22 | 80 | 50 | 11 | 103 | 225 | 63 | 155 | 428 | 179 |
| 23 | 103 | 170 | 47 | 95 | 145 | 37 | 150 | 214 | 87 |
| 24 | 95 | 200 | 51 | 90 | 70 | 17 | 145 | 41 | 16 |
| 25 | 95 | 235 | 60 | 3,140 | 3,080 | 27,700 | 144 | 24 | 9 |
| 26 | 87 | 195 | 46 | 1,900 | 540 | 2,770 | 140 | 87 | 33 |
| 27 | 77 | 205 | 43 | 671 | 120 | 221 | 142 | 135 | 52 |
| 28 | 77 | 170 | 35 | 407 | 90 | 99 | 140 | 228 | 86 |
| 29 | 72 | 70 | 14 | 346 | 120 | 112 | 142 | 365 | 140 |
| 30 | 70 | 40 | 8 | 301 | 80 | 65 | 139 | 91 | 34 |
| 31 | 72 | 95 | 18 | -- | -- | -- | 122 | 37 | 12 |
| Total | 2,600 | -- | 2,486 | 9,377 | -- | 33,263 | 13,621 | -- | 18,331 |

| Day | January | | | February | | | March | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 120 | 40 | 13 | 375 | 287 | 291 | 202 | 78 | 43 |
| 2 | 120 | 180 | 58 | 369 | 206 | 205 | 187 | 46 | 23 |
| 3 | 132 | 420 | 150 | 262 | 102 | 72 | 187 | 46 | 23 |
| 4 | 204 | 805 | 443 | 240 | 36 | 23 | 219 | 36 | 21 |
| 5 | 210 | 206 | 117 | 223 | 125 | 75 | 223 | 184 | 111 |
| 6 | 195 | 62 | 33 | 198 | 146 | 78 | 215 | 108 | 63 |
| 7 | 198 | 38 | 20 | 1,290 | 1,350 | s 8,690 | 236 | 127 | 81 |
| 8 | 193 | 136 | 71 | 617 | 135 | 225 | 232 | 62 | 39 |
| 9 | 180 | 124 | 60 | 441 | 102 | 122 | 232 | 37 | 23 |
| 10 | 168 | 255 | 116 | 350 | 62 | 59 | 219 | 35 | 21 |
| 11 | 162 | 300 | 131 | 322 | 21 | 18 | 206 | 36 | 20 |
| 12 | 155 | 308 | 129 | 357 | 104 | 100 | 198 | 27 | 14 |
| 13 | 144 | 98 | 38 | 420 | 235 | 266 | 187 | 42 | 21 |
| 14 | 148 | 66 | 26 | 375 | 122 | 124 | 240 | 115 | 75 |
| 15 | 280 | 380 | 287 | 306 | 105 | 87 | 244 | 61 | 40 |
| 16 | 210 | 186 | 106 | 280 | 96 | 73 | 202 | 30 | 16 |
| 17 | 191 | 210 | 108 | 317 | 120 | 103 | 187 | 26 | 13 |
| 18 | 189 | 241 | 123 | 322 | 94 | 82 | 176 | 20 | 10 |
| 19 | 191 | 238 | 123 | 301 | 145 | 118 | 184 | 46 | 23 |
| 20 | 195 | 97 | 51 | 306 | 120 | 99 | 407 | 210 | 231 |
| 21 | 210 | 96 | 55 | 483 | 600 | 782 | 338 | 140 | 128 |
| 22 | 200 | 121 | 65 | 476 | 222 | 285 | 350 | 102 | 96 |
| 23 | 198 | 185 | 99 | 394 | 144 | 153 | 312 | 62 | 52 |
| 24 | 920 | 1,280 | s 3,450 | 322 | 88 | 76 | 306 | 115 | 95 |
| 25 | 670 | 100 | 181 | 290 | 45 | 35 | 267 | 30 | 22 |
| 26 | 480 | 190 | 246 | 262 | 74 | 52 | 244 | 31 | 20 |
| 27 | 360 | 40 | 39 | 244 | 99 | 65 | 227 | 42 | 26 |
| 28 | 310 | 22 | 18 | 215 | 112 | 65 | 219 | 30 | 18 |
| 29 | 280 | 68 | 51 | -- | -- | -- | 280 | 200 | 151 |
| 30 | 225 | 108 | 66 | -- | -- | -- | 655 | 426 | 753 |
| 31 | 204 | 108 | 59 | -- | -- | -- | 725 | 176 | 345 |
| Total | 7,642 | -- | 6,532 | 10,357 | -- | 12,423 | 8,306 | -- | 2,617 |

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

LITTLE SCHUYLKILL RIVER AT SOUTH TAMAQUA, PA.--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 | 590 | 89 | 142 | 149 | 120 | 48 | 58 | 31 | 5 |
| 2 | 476 | 46 | 59 | 140 | 112 | 42 | 73 | 580 | 114 |
| 3 | 414 | 370 | 414 | 130 | 125 | 44 | 131 | 711 | s 574 |
| 4 | 327 | 77 | 68 | 125 | 100 | 34 | 120 | 380 | 123 |
| 5 | 280 | 74 | 56 | 118 | 52 | 17 | 115 | 200 | 62 |
| 6 | 249 | 71 | 48 | 110 | 35 | 11 | 100 | 167 | 45 |
| 7 | 215 | 40 | 23 | 112 | 95 | 29 | 94 | 274 | 70 |
| 8 | 206 | 28 | 16 | 110 | 142 | 42 | 84 | 215 | 49 |
| 9 | 194 | 128 | 67 | 108 | 148 | 43 | 77 | 65 | 14 |
| 10 | 211 | 560 | 319 | 103 | 197 | 55 | 96 | 103 | 27 |
| 11 | 202 | 145 | 79 | 100 | 169 | 46 | 96 | 102 | 26 |
| 12 | 329 | 505 | s 904 | 98 | 63 | 17 | 87 | 300 | 70 |
| 13 | 499 | 320 | 431 | 89 | 37 | 9 | 128 | 790 | 273 |
| 14 | 414 | 83 | 93 | 94 | 415 | 105 | 133 | 260 | 93 |
| 15 | 350 | 82 | 77 | 91 | 240 | 59 | 122 | 650 | 214 |
| 16 | 312 | 52 | 44 | 87 | 126 | 30 | 105 | 150 | 43 |
| 17 | 285 | 132 | 102 | 82 | 169 | 38 | 100 | 59 | 16 |
| 18 | 236 | 158 | 101 | 78 | 138 | 29 | 103 | 98 | 27 |
| 19 | 223 | 143 | 86 | 73 | 46 | 9 | 100 | 144 | 39 |
| 20 | 198 | 117 | 63 | 73 | 40 | 8 | 98 | 150 | 40 |
| 21 | 176 | 42 | 20 | 75 | 51 | 10 | 89 | 172 | 41 |
| 22 | 180 | 51 | 25 | 69 | 54 | 10 | 94 | 160 | 40 |
| 23 | 301 | 355 | 289 | 71 | 85 | 16 | 103 | 420 | 117 |
| 24 | 198 | 120 | 64 | 78 | 71 | 15 | 89 | 96 | 23 |
| 25 | 184 | 150 | 75 | 64 | 49 | 9 | 100 | 220 | 59 |
| 26 | 180 | 98 | 48 | 64 | 40 | 7 | 82 | 150 | 33 |
| 27 | 169 | 135 | 62 | 66 | 50 | 9 | 80 | 125 | 27 |
| 28 | 162 | 60 | 26 | 63 | 52 | 9 | 78 | 190 | 40 |
| 29 | 162 | 104 | 45 | 73 | 74 | 15 | 82 | 280 | 62 |
| 30 | 173 | 91 | 42 | 69 | 45 | 8 | 87 | 335 | 79 |
| 31 | -- | -- | -- | 61 | 40 | 7 | -- | -- | -- |
| Total | 8,095 | -- | 3,888 | 2,823 | -- | 830 | 2,904 | -- | 2,445 |

| Day | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 118 | 575 | 183 | 258 | 192 | 134 | 87 | 58 | 14 |
| 2 | 82 | 110 | 24 | 215 | 186 | 108 | 96 | 49 | 13 |
| 3 | 73 | 72 | 14 | 198 | 164 | 88 | 82 | 32 | 7 |
| 4 | 82 | 600 | 133 | 173 | 168 | 79 | 80 | 159 | 34 |
| 5 | 103 | 826 | 230 | 149 | 38 | 15 | 78 | 150 | 32 |
| 6 | 77 | 82 | 17 | 140 | 42 | 16 | 122 | 655 | 216 |
| 7 | 71 | 58 | 11 | 140 | 335 | 127 | 158 | 350 | 147 |
| 8 | 69 | 46 | 9 | 143 | 298 | 115 | 78 | 84 | 18 |
| 9 | 66 | 60 | 11 | 136 | 232 | 85 | 69 | 39 | 7 |
| 10 | 69 | 250 | 46 | 146 | 218 | 86 | 75 | 182 | 37 |
| 11 | 75 | 210 | 43 | 152 | 120 | 49 | 73 | 118 | 23 |
| 12 | 89 | 1,360 | 327 | 271 | 182 | s 277 | 71 | 171 | 33 |
| 13 | 78 | 225 | 48 | 280 | 132 | 100 | 69 | 222 | 41 |
| 14 | 64 | 120 | 21 | 191 | 90 | 46 | 100 | 800 | 216 |
| 15 | 61 | 40 | 7 | 184 | 122 | 60 | 118 | 245 | 78 |
| 16 | 66 | 130 | 23 | 267 | 240 | 173 | 77 | 43 | 9 |
| 17 | 66 | 680 | 121 | 211 | 80 | 46 | 77 | 151 | 31 |
| 18 | 66 | 1,420 | 253 | 173 | 45 | 21 | 80 | 300 | 65 |
| 19 | 84 | 1,500 | 340 | 156 | 38 | 16 | 77 | 384 | 80 |
| 20 | 77 | 410 | 85 | 149 | 78 | 31 | 73 | 220 | 43 |
| 21 | 66 | 222 | 40 | 143 | 198 | 76 | 68 | 152 | 28 |
| 22 | 118 | 644 | s 494 | 130 | 1,200 | 421 | 64 | 66 | 11 |
| 23 | 128 | 432 | 149 | 125 | 215 | 73 | 64 | 92 | 16 |
| 24 | 80 | 438 | 94 | 118 | 160 | 51 | 69 | 330 | 62 |
| 25 | 71 | 275 | 53 | 110 | 30 | 9 | 71 | 190 | 36 |
| 26 | 71 | 162 | 31 | 103 | 20 | 6 | 69 | 178 | 33 |
| 27 | 68 | 262 | 48 | 105 | 135 | 38 | 75 | 220 | 45 |
| 28 | 2,230 | 4,370 | s 19,600 | 100 | 158 | 42 | 73 | 146 | 29 |
| 29 | 834 | 202 | 455 | 98 | 165 | 44 | 57 | 62 | 10 |
| 30 | 476 | 95 | 122 | 96 | 182 | 47 | 58 | 42 | 7 |
| 31 | 333 | 248 | 223 | 89 | 120 | 29 | -- | -- | -- |
| Total | 6,011 | -- | 23,255 | 4,949 | -- | 2,508 | 2,406 | -- | 1,421 |

Total discharge for year (cfs-days) ..... 79,091
Total load for year (tons) ..... 110,599

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

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

Particle-size analyses of suspended sediment, November 1950 to January 1951
(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. 15, 1950 | 7:10 a.m. | 82 | 240 | | | | 12 | 37 | 64 | 78 | 84 | 97 | | -- | -- | DSWC |
| Nov. 25 | 4:00 p.m. | 7,220 | 2,480 | | | | 10 | 21 | 33 | 50 | 64 | 77 | | 90 | 96 | DSWC |
| Dec. 4 | 3:10 p.m. | 4,110 | 3,910 | | | | 4 | 6 | 9 | 13 | 15 | 21 | | 37 | 59 | DSWC |
| Dec. 4 | 4:00 p.m. | 3,910 | 1,670 | | | | 11 | 17 | 24 | 32 | 38 | 48 | | 69 | 89 | DSWC |
| Jan. 10, 1951 | 12:55 p.m. | 165 | 545 | | | | 2 | 11 | 39 | 87 | 94 | 99 | | -- | -- | DSWC |

## LITTLE SCHUYLKILL RIVER AT DREHERSVILLE, PA.

LOCATION.--At Highway Bridge at Drehersville, Schuylkill County, 700 feet downstream from gaging station, which is 2½ miles downstream from Indian Run, and 5½ miles upstream from mouth.
DRAINAGE AREA.--122 square miles.
RECORDS AVAILABLE.--Chemical analyses: December 1947 to June 1951.
Sediment records: October 1947 to June 1951.
EXTREMES, 1950-51.--Sediment concentrations: Maximum daily, 1,180 ppm Nov. 25; minimum daily, 1 ppm on several days.
Sediment loads: Maximum daily, 22,400 tons Nov. 25; minimum daily, 0.2 ton on several days.
EXTREMES, 1947-51.--Sediment concentrations: Maximum daily, 7,650 ppm Nov. 4, 1947; minimum daily, 1 ppm on several days.
Sediment loads: Maximum daily, 23,130 tons Nov. 8, 1947; minimum daily, 0.2 ton 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 1950 to September 1951 given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, October 1950 to June 1951

| Date of collection | 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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| Oct. 27, 1950... | 115 | 48 | 12 | 14 | 0.22 | 3.9 | 49 | 29 | 11 | | 0 | 330 | 7.0 | 0.0 | 7.0 | 479 | 242 | 242 | 210 | 739 | 3.50 | 2 |
| Jan. 23, 1951... | 314 | -- | 8.7 | 7.6 | .09 | 1.9 | 26 | 17 | 8.6 | | 0 | 174 | 6.0 | .0 | 3.4 | 257 | 135 | 135 | 98 | 410 | 4.05 | 2 |
| Jan. 30 ..... | 445 | 37 | 8.7 | 7.6 | .06 | 1.8 | 24 | 16 | 8.6 | | 0 | 167 | 6.0 | .0 | 2.7 | 244 | 126 | 126 | 90 | 392 | 4.00 | 3 |
| Feb. 5 ..... | 385 | 36 | 8.5 | 8.7 | .09 | 1.9 | 26 | 18 | 8.3 | | 0 | 184 | 5.0 | .0 | 2.7 | 272 | 139 | 139 | 110 | 419 | 3.95 | 3 |
| Mar. 6 ..... | 430 | 44 | 8.5 | 9.5 | .06 | 2.0 | 24 | 16 | 5.3 | | 0 | 168 | 5.5 | .0 | 3.1 | 258 | 126 | 126 | 104 | 386 | 4.10 | 2 |
| Mar. 21 ..... | 620 | 40 | 7.7 | 4.6 | .03 | .87 | 17 | 12 | 4.1 | | 0 | 110 | 4.0 | .0 | 3.2 | 179 | 92 | 92 | 86 | 282 | 4.05 | 3 |
| May 2 ..... | 231 | 62 | 10 | 10 | .10 | 2.4 | 37 | 24 | 5.6 | | 0 | 250 | 3.5 | .0 | 3.0 | 390 | 191 | 191 | 172 | 541 | 3.80 | 2 |
| June 15 ..... | 191 | 68 | 11 | 11 | 1.2 | 2.7 | 38 | 22 | 3.9 | | 0 | 266 | 6.0 | .0 | 3.1 | 416 | 185 | 185 | 168 | 629 | 3.75 | 3 |

DELAWARE RIVER BASIN--Continued

LITTLE SCHUYLKILL RIVER AT DREHERSVILLE, PA.--Continued

Suspended sediment, October 1950 to June 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 | 68 | 2 | 0.4 | 99 | 5 | 1.4 | 468 | 50 | 63 |
| 2 | 62 | 1 | .2 | 99 | 3 | 0.8 | 410 | 48 | 53 |
| 3 | 66 | 1 | .2 | 115 | 2 | .6 | 376 | 26 | 26 |
| 4 | 66 | 1 | .2 | 221 | 123 | s119 | 5,450 | 470 | s9,280 |
| 5 | 64 | 4 | .7 | 324 | 85 | 74 | 3,360 | 292 | s2,680 |
| 6 | 64 | 2 | .4 | 240 | 11 | 7.1 | 1,520 | 110 | 451 |
| 7 | 70 | 6 | 1.1 | 232 | 10 | 6.3 | 1,090 | 60 | 177 |
| 8 | 64 | 5 | .9 | 216 | 11 | 6.4 | 2,390 | 184 | s1,290 |
| 9 | 118 | 19 | 6.0 | 213 | 8 | 4.6 | 1,470 | 64 | 284 |
| 10 | 288 | 118 | 92 | 200 | 7 | 3.8 | 1,040 | 35 | 98 |
| 11 | 171 | 13 | 6.0 | 190 | 8 | 4.1 | 894 | 23 | 56 |
| 12 | 184 | 38 | 19 | 174 | 9 | 4.2 | 703 | 32 | 61 |
| 13 | 181 | 32 | 16 | 162 | 7 | 3.1 | 575 | 30 | 46 |
| 14 | 162 | 18 | 7.9 | 156 | 9 | 3.8 | 474 | 40 | 51 |
| 15 | 153 | 12 | 5.0 | 144 | 9 | 3.5 | 431 | 40 | 46 |
| 16 | 141 | 11 | 4.2 | 144 | 9 | 3.5 | 400 | 48 | 52 |
| 17 | 138 | 10 | 3.7 | 141 | 6 | 2.3 | 343 | 19 | 18 |
| 18 | 132 | 13 | 4.6 | 129 | 10 | 3.5 | 305 | 17 | 14 |
| 19 | 129 | 10 | 3.5 | 126 | 9 | 3.1 | 283 | 28 | 21 |
| 20 | 126 | 19 | 6.5 | 147 | 12 | 4.8 | 262 | 30 | 21 |
| 21 | 121 | 38 | 12 | 236 | 34 | 22 | 240 | 37 | 24 |
| 22 | 109 | 9 | 2.6 | 171 | 12 | 5.5 | 240 | 38 | 25 |
| 23 | 150 | 56 | 23 | 159 | 11 | 4.7 | 222 | 28 | 17 |
| 24 | 135 | 56 | 20 | 147 | 7 | 2.8 | 216 | 13 | 7.6 |
| 25 | 124 | 22 | 7.4 | 4,540 | 1,180 | s22,400 | 206 | 14 | 7.8 |
| 26 | 124 | 28 | 9.4 | 4,540 | 759 | s10,200 | 195 | 17 | 9.0 |
| 27 | 109 | 7 | 2.1 | 1,580 | 270 | 1,150 | 140 | 16 | 6.0 |
| 28 | 112 | 11 | 3.3 | 958 | 85 | 220 | 155 | 18 | 7.5 |
| 29 | 102 | 9 | 2.5 | 687 | 72 | 134 | 216 | 36 | 21 |
| 30 | 99 | 10 | 2.7 | 548 | 49 | 72 | 200 | 34 | 18 |
| 31 | 96 | 11 | 2.9 | -- | -- | -- | 171 | 13 | 6.0 |
| Total | 3,728 | -- | 266.4 | 17,038 | -- | 34,470.9 | 24,445 | -- | 14,906.9 |
| | January | | | February | | | March | | |
| 1 | 159 | 8 | 3.4 | 535 | 65 | 94 | 343 | 26 | 24 |
| 2 | 156 | 22 | 9.3 | 695 | 86 | 161 | 324 | 25 | 22 |
| 3 | 174 | 28 | 13 | 468 | 35 | 44 | 319 | 16 | 14 |
| 4 | 357 | 86 | 83 | 415 | 16 | 18 | 410 | 20 | 22 |
| 5 | 431 | 42 | 49 | 372 | 12 | 12 | 410 | 15 | 17 |
| 6 | 381 | 48 | 49 | 328 | 27 | 24 | 415 | 22 | 25 |
| 7 | 357 | 17 | 16 | 2,560 | 657 | s7,190 | 436 | 20 | 24 |
| 8 | 338 | 25 | 23 | 1,250 | 130 | 439 | 426 | 19 | 22 |
| 9 | 296 | 50 | 40 | 758 | 44 | 90 | 396 | 10 | 11 |
| 10 | 288 | 65 | 50 | 548 | 40 | 59 | 367 | 10 | 9.9 |
| 11 | 240 | 38 | 25 | 468 | 20 | 25 | 343 | 12 | 11 |
| 12 | 226 | 38 | 23 | 462 | 18 | 22 | 324 | 9 | 7.9 |
| 13 | 206 | 32 | 18 | 595 | 55 | 88 | 301 | 8 | 6.5 |
| 14 | 200 | 22 | 12 | 535 | 52 | 75 | 367 | 17 | 17 |
| 15 | 498 | 65 | 87 | 420 | 35 | 40 | 386 | 17 | 18 |
| 16 | 446 | 52 | 63 | 386 | 38 | 40 | 333 | 12 | 11 |
| 17 | 376 | 48 | 49 | 446 | 41 | 49 | 310 | 9 | 7.5 |
| 18 | 348 | 26 | 24 | 492 | 26 | 35 | 292 | 8 | 6.3 |
| 19 | 333 | 27 | 24 | 426 | 19 | 22 | 292 | 11 | 8.7 |
| 20 | 338 | 20 | 18 | 486 | 30 | 39 | 742 | 100 | 200 |
| 21 | 343 | 18 | 17 | 782 | 195 | 412 | 622 | 42 | 70 |
| 22 | 319 | 10 | 8.6 | 878 | 85 | 201 | 575 | 35 | 54 |
| 23 | 301 | 20 | 16 | 718 | 47 | 91 | 486 | 28 | 37 |
| 24 | 1,620 | 630 | s2,990 | 575 | 41 | 64 | 462 | 25 | 31 |
| 25 | 1,250 | 75 | 253 | 504 | 23 | 31 | 400 | 14 | 15 |
| 26 | 886 | 56 | 134 | 452 | 22 | 27 | 357 | 12 | 12 |
| 27 | 672 | 28 | 51 | 415 | 29 | 32 | 324 | 12 | 10 |
| 28 | 555 | 17 | 25 | 362 | 30 | 29 | 314 | 13 | 11 |
| 29 | 510 | 17 | 23 | -- | -- | -- | 372 | 50 | 50 |
| 30 | 431 | 32 | 37 | -- | -- | -- | 766 | 120 | 248 |
| 31 | 362 | 32 | 31 | -- | -- | -- | 926 | 80 | 200 |
| Total | 13,397 | -- | 4,264.3 | 17,331 | -- | 9,453 | 13,140 | -- | 1,222.8 |

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

LITTLE SCHUYLKILL RIVER AT DREHERSVILLE, PA.--Continued

Suspended sediment, October 1950 to June 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 | 822 | 34 | 75 | 240 | 4 | 2.6 | 84 | 1 | 0.2 |
| 2 | 695 | 25 | 47 | 226 | 8 | 4.9 | 109 | 6 | 1.8 |
| 3 | 615 | 30 | 50 | 213 | 7 | 4.0 | 129 | 8 | 2.8 |
| 4 | 498 | 29 | 39 | 206 | 6 | 3.3 | 213 | 44 | 25 |
| 5 | 431 | 40 | 46 | 197 | 6 | 3.2 | 187 | 7 | 3.5 |
| 6 | 386 | 22 | 23 | 184 | 7 | 3.5 | 156 | 2 | .8 |
| 7 | 343 | 10 | 9.3 | 178 | 8 | 3.8 | 141 | 2 | .8 |
| 8 | 319 | 10 | 8.6 | 174 | 10 | 4.7 | 129 | 1 | .4 |
| 9 | 301 | 9 | 7.3 | 168 | 14 | 6.3 | 124 | 2 | .7 |
| 10 | 338 | 25 | 23 | 159 | 10 | 4.3 | 147 | 2 | .8 |
| 11 | 357 | 19 | 18 | 162 | 12 | 5.2 | 162 | 3 | 1.3 |
| 12 | 480 | 71 | s 223 | 171 | 13 | 6.0 | 135 | 1 | 0.4 |
| 13 | 1,040 | 142 | 399 | 141 | 8 | 3.1 | 181 | 13 | 6.3 |
| 14 | 798 | 25 | 54 | 138 | 10 | 3.7 | 210 | 12 | 6.8 |
| 15 | 615 | 20 | 33 | 138 | 7 | 2.6 | 194 | 4 | 2.1 |
| 16 | 510 | 12 | 17 | 129 | 3 | 1.1 | 171 | 6 | 2.8 |
| 17 | 457 | 13 | 16 | 126 | 12 | 4.1 | 162 | 9 | 3.9 |
| 18 | 386 | 18 | 19 | 121 | 9 | 2.9 | 156 | 10 | 4.2 |
| 19 | 348 | 18 | 17 | 112 | 6 | 1.8 | 153 | 4 | 1.6 |
| 20 | 314 | 22 | 19 | 112 | 12 | 3.6 | 144 | 2 | 0.8 |
| 21 | 279 | 13 | 9.8 | 112 | 8 | 2.4 | 138 | 2 | .8 |
| 22 | 270 | 9 | 6.6 | 104 | 6 | 1.7 | 138 | 4 | 1.5 |
| 23 | 462 | 40 | 50 | 109 | 1 | 0.3 | 197 | 52 | 28 |
| 24 | 328 | 13 | 12 | 135 | 3 | 1.1 | 174 | 44 | 21 |
| 25 | 305 | 15 | 12 | 106 | 1 | 0.3 | 232 | 55 | 35 |
| 26 | 301 | 14 | 11 | 96 | 1 | 0.3 | 168 | 5 | 2.3 |
| 27 | 283 | 9 | 6.9 | 99 | 1 | .3 | 156 | 5 | 2.1 |
| 28 | 270 | 12 | 8.7 | 94 | 1 | .3 | 144 | 4 | 1.6 |
| 29 | 262 | 13 | 9.2 | 106 | 1 | .3 | 194 | 75 | 39 |
| 30 | 279 | 8 | 6.0 | 109 | 1 | .3 | 200 | 39 | 21 |
| 31 | -- | -- | -- | 94 | 1 | .2 | -- | -- | -- |
| Total | 13,092 | -- | 1,275.4 | 4,459 | -- | 82.2 | 4,828 | -- | 219.3 |

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

LITTLE SCHUYLKILL RIVER AT DREHERSVILLE, PA.--Continued

Particle-size analyses of suspended sediment, November to December 1950
(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. 25, 1950 ..... | 5:00 p.m. | 9,700 | 1,960 | | | | 15 | 27 | 42 | 63 | 77 | 88 | | 97 | 99 | DSWC |
| Nov. 25 ..... | 5:10 p.m. | 9,700 | 2,100 | | | | 18 | 30 | 45 | 63 | 81 | 92 | | 98 | 99 | DSWC |
| Dec. 4 ..... | 2:45 p.m. | a10,300 | 1,020 | | | | 16 | 30 | 42 | 58 | 68 | 80 | | 92 | 97 | DSWC |

a Peak discharge of record.

## SCHUYLKILL RIVER AT BERNE, PA.

LOCATION.--At gaging station at highway bridge at Berne, Berks County, 0.5 mile upstream from Mill Creek, and 6.5 miles downstream from Little Schuylkill River.
DRAINAGE AREA.--355 square miles.
RECORDS AVAILABLE.--Chemical analyses: December 1947 to September 1951.
Water temperatures: February 1948 to September 1951.
Sediment records: October 1947 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 712 ppm Sept. 21-30; minimum 245 ppm Jan. 21-31.
Hardness: Maximum, 363 ppm Sept. 21-30; minimum, 123 ppm Dec. 1-10.
Specific conductance: Maximum daily, 968 micromhos Sept. 26; minimum daily, 189 micromhos Dec. 4.
Water temperatures: Maximum, 84°F Aug. 15; minimum, freezing point on several days during winter months.
Sediment concentrations: Maximum daily, 1,250 ppm Nov. 25; minimum daily, 1 ppm on many days.
Sediment loads: Maximum daily, 46,000 tons Nov. 25; minimum daily, 1 ton on many days.
EXTREMES, 1947-51.--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 (1949-51): Maximum daily, 968 micromhos Sept. 26, 1950; minimum daily, 189 micromhos Dec. 4, 1950.
Water temperatures (1948-51): Maximum, 84°F Aug. 15, 1951; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 8,030 ppm Nov. 4, 1947; minimum daily, 1 ppm on many days.
Sediment loads: Maximum daily, 90,180 tons Nov. 12, 1947; minimum daily, 0.3 ton Sept. 2, 1949.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, October 1950 to September 1951

| 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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| Oct. 1-10, 1950 .. | 259 | | 13 | 11 | 0.19 | 4.5 | 66 | 38 | 18 | -- | 0 | 391 | 5.0 | 0.0 | 9.3 | 587 | 321 | 321 | 182 | 831 | 3.65 | 2 |
| Oct. 11-20 ..... | 436 | | 10 | 4.4 | .08 | 2.4 | 36 | 20 | 11 | -- | 0 | 206 | 4.0 | .0 | 6.8 | 318 | 172 | 172 | 74 | 488 | 3.70 | 3 |
| Oct. 21-31 ..... | 267 | | 11 | 7.6 | .13 | 2.9 | 42 | 24 | 13 | -- | 0 | 253 | 5.0 | .0 | 8.0 | 388 | 204 | 204 | 104 | 592 | 3.50 | 3 |
| Nov. 1-10 ..... | 568 | | 10 | 4.7 | .15 | 2.0 | 34 | 20 | 12 | -- | 0 | 199 | 3.5 | .0 | 8.3 | 306 | 167 | 167 | 80 | 499 | 3.70 | 2 |
| Nov. 11-20 ..... | 417 | | 10 | 4.9 | .11 | 2.6 | 34 | 21 | 12 | -- | 0 | 207 | 5.0 | .0 | 7.0 | 320 | 171 | 171 | 84 | 496 | 3.80 | 4 |
| Nov. 21-30 ..... | 3,440 | | 9.3 | 5.0 | .09 | 2.0 | 26 | 17 | 11 | -- | 0 | 165 | 3.5 | .0 | 5.4 | 259 | 135 | 135 | 64 | 397 | 4.15 | 4 |
| Dec. 1-10 ..... | 4,840 | | 9.5 | 4.7 | .06 | 2.0 | 23 | 16 | 9.9 | -- | 0 | 162 | 2.5 | .0 | 3.5 | 248 | 123 | 123 | 90 | 370 | 4.35 | 3 |
| Dec. 11-20..... | 1,420 | | 11 | 10 | .09 | 2.8 | 35 | 25 | 11 | -- | 0 | 251 | 3.0 | .0 | 2.5 | 386 | 190 | 190 | 144 | 526 | 4.30 | 2 |
| Dec. 21-31 ..... | 574 | | 13 | 10 | .10 | 3.9 | 48 | 34 | 12 | -- | 0 | 334 | 6.0 | .0 | 2.0 | 506 | 260 | 260 | 186 | 667 | 4.30 | 2 |
| Jan. 1-10, 1951 .. | 836 | | 10 | 8.1 | .10 | 2.8 | 35 | 25 | 12 | -- | 0 | 238 | 4.0 | .0 | 2.9 | 366 | 190 | 190 | 126 | 508 | 4.40 | 3 |
| Jan. 11-20 ..... | 1,040 | | 9.6 | 6.3 | .12 | 2.1 | 28 | 18 | 6.2 | -- | 0 | 182 | 4.5 | .0 | 4.7 | 269 | 144 | 144 | 104 | 413 | 4.00 | 2 |
| Jan. 21-31 ..... | 1,810 | | 7.9 | 6.6 | .06 | 2.0 | 25 | 17 | 6.9 | -- | 0 | 165 | 5.0 | .0 | 4.1 | 245 | 132 | 132 | 88 | 381 | 4.00 | 2 |
| Feb. 1-10 ..... | 2,080 | | 8.9 | 6.8 | .11 | 2.1 | 26 | 18 | 7.4 | -- | 0 | 174 | 4.5 | .0 | 3.1 | 263 | 139 | 139 | 98 | 398 | 4.05 | 3 |
| Feb. 11-20 ..... | 1,240 | | 9.0 | 8.1 | .09 | 2.5 | 30 | 21 | 7.8 | -- | 0 | 202 | 4.0 | .0 | 2.2 | 306 | 161 | 161 | 116 | 450 | 4.10 | 2 |
| Feb. 21-28 ..... | 1,610 | | 8.7 | 6.6 | .07 | 2.1 | 26 | 18 | 7.5 | -- | 0 | 173 | 5.0 | .0 | 2.3 | 260 | 139 | 139 | 112 | 389 | 4.20 | 2 |
| Mar. 1-10 ..... | 1,100 | | 9.6 | 7.3 | .08 | 2.5 | 30 | 21 | 9.8 | -- | 0 | 205 | 4.5 | .0 | 2.7 | 312 | 161 | 161 | 118 | 453 | 4.30 | 2 |
| Mar. 11-20 ..... | 993 | | 9.4 | 6.8 | .13 | 2.7 | 32 | 22 | 8.9 | -- | 0 | 216 | 4.5 | .0 | 2.4 | 320 | 170 | 170 | 126 | 479 | 4.15 | 3 |
| Mar. 21-31 ..... | 1,340 | | 7.7 | 5.5 | .11 | 2.2 | 28 | 18 | 8.0 | -- | 0 | 170 | 5.0 | .0 | 2.7 | 264 | 144 | 144 | 112 | 416 | 4.15 | 2 |

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BERNE, PA.--Continued

Chemical analyses, in parts per million, October 1950 to September 1951--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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| Apr. 1-10, 1951 . | 1,240 | | 8.3 | 6.5 | 0.10 | 2.1 | 27 | 19 | 5.4 | -- | 0 | 186 | 3.5 | 0.0 | 2.5 | 275 | 145 | 145 | 108 | 415 | 4.15 | 2 |
| Apr. 11-20..... | 1,440 | | 10 | 4.2 | .06 | 1.9 | 25 | 18 | 6.6 | -- | 0 | 172 | 4.0 | .0 | 3.4 | 263 | 136 | 136 | 100 | 397 | 4.10 | 2 |
| Apr. 21-30 ..... | 942 | | 10 | 5.2 | .09 | 2.4 | 28 | 21 | 7.4 | -- | 0 | 200 | 5.0 | .0 | 2.1 | 306 | 156 | 156 | 118 | 446 | 4.10 | 3 |
| May 1-10 ..... | 655 | | 11 | 5.2 | .06 | 3.2 | 34 | 25 | 8.7 | -- | 0 | 238 | 4.0 | .0 | 3.0 | 378 | 188 | 188 | 128 | 522 | 4.10 | 2 |
| May 11-20 ..... | 429 | | 12 | 7.1 | .07 | 4.2 | 46 | 33 | 12 | -- | 0 | 322 | 6.0 | .0 | 2.1 | 496 | 250 | 250 | 184 | 660 | 4.10 | 2 |
| May 21-31 ..... | 331 | | 12 | 10 | .10 | 4.5 | 52 | 37 | 15 | -- | 0 | 365 | 7.0 | .0 | 2.2 | 559 | 282 | 282 | 177 | 741 | 4.15 | 2 |
| June 1-10..... | 343 | | 12 | 7.6 | .10 | 4.4 | 54 | 36 | 15 | -- | 0 | 359 | 8.0 | .0 | 2.2 | 558 | 283 | 283 | 180 | 731 | 4.00 | 3 |
| June 11-20..... | 421 | | 11 | 6.0 | .09 | 3.7 | 45 | 31 | 13 | -- | 0 | 302 | 5.0 | .0 | 1.3 | 474 | 240 | 240 | 144 | 637 | 4.10 | 2 |
| June 21-30 ..... | 405 | | 11 | 6.0 | .15 | 3.5 | 42 | 29 | 12 | -- | 0 | 286 | 7.0 | .0 | 1.9 | 443 | 224 | 224 | 156 | 606 | 4.00 | 3 |
| July 1-10 ..... | 439 | | 11 | 6.6 | .08 | 3.2 | 43 | 28 | 12 | -- | 0 | 286 | 5.5 | .0 | 2.1 | 452 | 222 | 222 | 118 | 574 | 4.20 | 2 |
| July 11-20 ..... | 327 | | 12 | 12 | .18 | 3.9 | 51 | 35 | 12 | -- | 0 | 356 | 6.5 | .0 | 3.7 | 514 | 271 | 271 | 168 | 694 | 3.95 | 2 |
| July 21-31 ..... | 649 | | 13 | 11 | .17 | 4.2 | 51 | 36 | 13 | -- | 0 | 355 | 5.0 | .0 | 3.6 | 520 | 275 | 275 | 168 | 696 | 4.05 | 4 |
| Aug. 1-10 ..... | 489 | | 15 | 10 | .18 | 4.0 | 50 | 33 | 12 | -- | 0 | 335 | 4.5 | .0 | 1.6 | 522 | 260 | 260 | 138 | 697 | 4.35 | 4 |
| Aug. 11-20..... | 657 | | 10 | 12 | .05 | 3.8 | 42 | 29 | 8.5 | 2.1 | 0 | 294 | 4.0 | .0 | 2.8 | 440 | 224 | 224 | 134 | 611 | 3.90 | 2 |
| Aug. 21-31 ..... | 316 | | 13 | 12 | .06 | 4.6 | 49 | 36 | 14 | 2.2 | 0 | 354 | 4.0 | .0 | 2.3 | 538 | 270 | 270 | 182 | 721 | 3.85 | 2 |
| Sept. 1-10 ..... | 281 | | 13 | 15 | .05 | 5.1 | 58 | 41 | 14 | 2.3 | 0 | 411 | 5.5 | .0 | 2.3 | 610 | 313 | 313 | 194 | 803 | 3.95 | 4 |
| Sept. 11-20 ..... | 281 | | 14 | 15 | .06 | 5.3 | 60 | 41 | 18 | 2.5 | 0 | 418 | 6.0 | .0 | 2.5 | 632 | 318 | 318 | 167 | 821 | 3.95 | 3 |
| Sept. 21-30 ..... | 235 | | 15 | 17 | .13 | 5.8 | 68 | 47 | 19 | 2.6 | 0 | 479 | 6.5 | .0 | 4.0 | 712 | 363 | 363 | 220 | 910 | 3.80 | 2 |
| Average ..... | 949 | | 11 | 8.1 | 0.10 | 3.2 | 40 | 27 | 11 | -- | 0 | 267 | 4.9 | 0.0 | 3.5 | 406 | 210 | 210 | 133 | 568 | 4.05 | 3 |

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BERNE, PA.--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 | 186 | 1 | 1 | 236 | 8 | 5 | 1,360 | 40 | 147 |
| 2 | 186 | 1 | 1 | 236 | 6 | 4 | 1,270 | 20 | 69 |
| 3 | 176 | 2 | 1 | 264 | 11 | 8 | 1,190 | 19 | 61 |
| 4 | 170 | 2 | 1 | 458 | 28 | s 60 | 12,500 | 750 | s 35,600 |
| 5 | 160 | 34 | 15 | 1,230 | 78 | 259 | 10,600 | 498 | s 16,000 |
| 6 | 165 | 224 | 100 | 878 | 16 | 38 | 4,630 | 140 | 1,750 |
| 7 | 165 | 45 | 20 | 695 | 20 | 38 | 3,120 | 90 | 759 |
| 8 | 170 | 37 | 17 | 611 | 13 | 21 | 6,310 | 262 | s 4,600 |
| 9 | 340 | 255 | 234 | 564 | 12 | 18 | 4,270 | 70 | 807 |
| 10 | 870 | 180 | 423 | 512 | 12 | 17 | 3,160 | 35 | 300 |
| 11 | 584 | 85 | 134 | 480 | 4 | 5 | 2,640 | 26 | 185 |
| 12 | 564 | 65 | 99 | 448 | 4 | 5 | 2,160 | 22 | 128 |
| 13 | 570 | 164 | 252 | 424 | 4 | 5 | 1,730 | 18 | 84 |
| 14 | 499 | 117 | 158 | 388 | 13 | 14 | 1,420 | 17 | 65 |
| 15 | 466 | 22 | 28 | 376 | 26 | 26 | 1,300 | 18 | 63 |
| 16 | 394 | 340 | 362 | 466 | 29 | 36 | 1,210 | 13 | 42 |
| 17 | 352 | 107 | 102 | 454 | 37 | 45 | 1,060 | 22 | 63 |
| 18 | 322 | 18 | 16 | 376 | 40 | 41 | 950 | 13 | 33 |
| 19 | 310 | 19 | 16 | 364 | 36 | 35 | 902 | 12 | 29 |
| 20 | 298 | 36 | 29 | 394 | 42 | 45 | 828 | 23 | 51 |
| 21 | 286 | 85 | 66 | 709 | 52 | 100 | 720 | 15 | 29 |
| 22 | 292 | 50 | 39 | 597 | 38 | 61 | 690 | 22 | 41 |
| 23 | 328 | 248 | 220 | 499 | 64 | 86 | 672 | 6 | 11 |
| 24 | 274 | 15 | 11 | 473 | 71 | 91 | 648 | 10 | 17 |
| 25 | 264 | 38 | 27 | 9,010 | 1,250 | s 46,000 | 640 | 11 | 19 |
| 26 | 252 | 12 | 8 | 13,200 | 604 | s 24,100 | 550 | 32 | 48 |
| 27 | 247 | 10 | 7 | 4,120 | 225 | 2,500 | 380 | 38 | 39 |
| 28 | 258 | 10 | 7 | 2,400 | 100 | 648 | 410 | 84 | 93 |
| 29 | 269 | 3 | 2 | 1,870 | 62 | 313 | 520 | 56 | 79 |
| 30 | 236 | 2 | 1 | 1,550 | 40 | 167 | 580 | 52 | 82 |
| 31 | 236 | 14 | 9 | -- | -- | -- | 510 | 21 | 29 |
| Total | 9,889 | -- | 2,406 | 44,282 | -- | 74,791 | 68,930 | -- | 61,323 |

| Day | January | | | February | | | March | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 470 | 10 | 13 | 1,660 | 44 | s 240 | 960 | 21 | 55 |
| 2 | 440 | 9 | 11 | 2,240 | 71 | 429 | 960 | 12 | 31 |
| 3 | 450 | 22 | 27 | 1,420 | 33 | 127 | 922 | 11 | 27 |
| 4 | 848 | 140 | s 450 | 1,200 | 33 | 107 | 1,170 | 9 | 28 |
| 5 | 1,300 | 91 | 319 | 1,200 | 18 | 58 | 1,250 | 8 | 27 |
| 6 | 1,150 | 34 | 106 | 1,070 | 15 | 43 | 1,230 | 18 | 60 |
| 7 | 1,080 | 19 | 55 | 5,110 | 725 | s 13,200 | 1,230 | 23 | 76 |
| 8 | 1,000 | 11 | 30 | 3,250 | 165 | 1,450 | 1,200 | 8 | 26 |
| 9 | 837 | 12 | 27 | 2,080 | 32 | 180 | 1,080 | 11 | 32 |
| 10 | 783 | 14 | 30 | 1,540 | 25 | 104 | 980 | 8 | 21 |
| 11 | 714 | 8 | 15 | 1,300 | 18 | 63 | 960 | 7 | 18 |
| 12 | 688 | 7 | 13 | 1,220 | 25 | 82 | 912 | 17 | 42 |
| 13 | 656 | 8 | 14 | 1,420 | 18 | 69 | 810 | 21 | 46 |
| 14 | 608 | 79 | 130 | 1,420 | 13 | 50 | 846 | 24 | 55 |
| 15 | 1,610 | 222 | s 994 | 1,130 | 15 | 46 | 1,010 | 16 | 44 |
| 16 | 1,540 | 63 | 262 | 1,030 | 30 | 83 | 893 | 19 | 46 |
| 17 | 1,250 | 24 | 81 | 1,200 | 54 | 175 | 864 | 30 | 70 |
| 18 | 1,150 | 19 | 59 | 1,300 | 55 | 193 | 810 | 18 | 39 |
| 19 | 1,090 | 14 | 41 | 1,160 | 13 | 41 | 774 | 38 | 79 |
| 20 | 1,080 | 11 | 32 | 1,240 | 13 | 43 | 2,050 | 126 | s 702 |
| 21 | 1,080 | 16 | 47 | 2,000 | 84 | s 560 | 1,930 | 58 | 302 |
| 22 | 1,010 | 10 | 27 | 2,400 | 78 | 505 | 1,660 | 31 | 139 |
| 23 | 940 | 11 | 28 | 1,930 | 33 | 172 | 1,360 | 32 | 117 |
| 24 | 3,830 | 245 | s 3,160 | 1,660 | 36 | 161 | 1,300 | 24 | 84 |
| 25 | 3,440 | 113 | 1,050 | 1,420 | 49 | 188 | 1,150 | 9 | 28 |
| 26 | 2,480 | 31 | 208 | 1,250 | 53 | 179 | 1,030 | 10 | 28 |
| 27 | 1,860 | 18 | 90 | 1,170 | 28 | 89 | 960 | 30 | 78 |
| 28 | 1,540 | 10 | 42 | 1,040 | 17 | 48 | 874 | 41 | 97 |
| 29 | 1,420 | 5 | 19 | -- | -- | -- | 893 | 39 | 94 |
| 30 | 1,200 | 8 | 26 | -- | -- | -- | 1,540 | 40 | 166 |
| 31 | 1,060 | 7 | 20 | -- | -- | -- | 2,080 | 38 | 213 |
| Total | 38,604 | -- | 7,426 | 46,060 | -- | 18,685 | 35,688 | -- | 2,870 |

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BERNE, PA.--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 | 2,000 | 21 | 113 | 970 | 17 | 45 | 264 | 2 | 1 |
| 2 | 1,730 | 23 | 107 | 828 | 118 | 264 | 280 | 2 | 2 |
| 3 | 1,600 | 24 | 104 | 748 | 488 | 986 | 352 | 410 | 390 |
| 4 | 1,300 | 27 | 95 | 714 | 260 | 540 | 480 | 170 | 220 |
| 5 | 1,160 | 25 | 78 | 648 | 80 | 140 | 412 | 4 | 5 |
| 6 | 1,060 | 22 | 63 | 616 | 112 | 186 | 358 | 3 | 3 |
| 7 | 1,000 | 13 | 35 | 585 | 185 | 292 | 328 | 2 | 2 |
| 8 | 922 | 18 | 45 | 406 | 272 | 297 | 304 | 1 | 1 |
| 9 | 846 | 29 | 66 | 525 | 18 | 26 | 304 | 2 | 2 |
| 10 | 801 | 33 | 71 | 512 | 15 | 21 | 346 | 2 | 2 |
| 11 | 1,000 | 23 | 62 | 512 | 6 | 8 | 424 | 5 | 6 |
| 12 | 978 | 45 | s158 | 555 | 12 | 18 | 334 | 1 | 1 |
| 13 | 2,890 | 178 | 1,390 | 486 | 8 | 11 | 418 | 8 | 9 |
| 14 | 2,160 | 20 | 117 | 442 | 8 | 10 | 578 | 20 | 31 |
| 15 | 1,730 | 10 | 47 | 418 | 4 | 5 | 473 | 4 | 5 |
| 16 | 1,420 | 7 | 27 | 394 | 6 | 6 | 436 | 9 | 11 |
| 17 | 1,240 | 23 | 77 | 382 | 8 | 8 | 418 | 2 | 2 |
| 18 | 1,090 | 26 | 76 | 370 | 2 | 2 | 394 | 1 | 1 |
| 19 | 1,010 | 19 | 52 | 364 | 5 | 5 | 370 | 1 | 1 |
| 20 | 931 | 16 | 40 | 364 | 9 | 9 | 364 | 1 | 1 |
| 21 | 792 | 30 | 64 | 364 | 3 | 3 | 352 | 2 | 2 |
| 22 | 765 | 13 | 27 | 334 | 7 | 6 | 340 | 4 | 4 |
| 23 | 1,210 | 38 | 124 | 334 | 6 | 5 | 480 | 59 | 76 |
| 24 | 1,060 | 7 | 20 | 388 | 8 | 8 | 424 | 11 | 13 |
| 25 | 960 | 4 | 10 | 340 | 2 | 2 | 499 | 27 | 36 |
| 26 | 922 | 4 | 10 | 304 | 1 | 1 | 382 | 3 | 3 |
| 27 | 874 | 5 | 12 | 310 | 2 | 2 | 352 | 2 | 2 |
| 28 | 810 | 18 | 39 | 316 | 1 | 1 | 340 | 1 | 1 |
| 29 | 884 | 20 | 48 | 304 | 1 | 1 | 430 | 24 | 28 |
| 30 | 1,140 | 56 | 172 | 340 | 2 | 2 | 448 | 29 | 35 |
| 31 | -- | -- | -- | 304 | 3 | 3 | -- | -- | -- |
| Total | 36,285 | -- | 3,349 | 14,477 | -- | 2,913 | 11,684 | -- | 896 |

| Day | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 624 | 30 | 50 | 714 | 8 | 15 | 198 | 1 | 1 |
| 2 | 499 | 1 | 1 | 616 | 4 | 7 | 269 | 2 | 2 |
| 3 | 418 | 1 | 1 | 548 | 3 | 4 | 328 | 4 | 4 |
| 4 | 400 | 2 | 2 | 518 | 3 | 4 | 242 | 4 | 3 |
| 5 | 570 | 16 | 25 | 466 | 2 | 3 | 214 | 3 | 2 |
| 6 | 436 | 2 | 2 | 424 | 1 | 1 | 230 | 3 | 2 |
| 7 | 382 | 2 | 2 | 394 | 1 | 1 | 480 | 8 | 10 |
| 8 | 364 | 1 | 1 | 418 | 1 | 1 | 322 | 3 | 3 |
| 9 | 358 | 2 | 2 | 394 | 2 | 2 | 269 | 2 | 2 |
| 10 | 340 | 1 | 1 | 394 | 1 | 1 | 258 | 2 | 1 |
| 11 | 328 | 4 | 4 | 454 | 2 | 3 | 242 | 2 | 1 |
| 12 | 328 | 6 | 5 | 473 | 320 | 408 | 230 | 2 | 1 |
| 13 | 418 | 12 | 14 | 1,150 | 66 | 205 | 225 | 4 | 2 |
| 14 | 328 | 6 | 5 | 656 | 1 | 2 | 258 | 11 | 8 |
| 15 | 310 | 4 | 3 | 562 | 1 | 2 | 499 | 9 | 12 |
| 16 | 298 | 4 | 3 | 688 | 9 | 17 | 334 | 1 | 1 |
| 17 | 274 | 4 | 3 | 884 | 6 | 14 | 280 | 2 | 2 |
| 18 | 258 | 6 | 4 | 632 | 1 | 2 | 258 | 2 | 1 |
| 19 | 334 | 49 | 44 | 562 | 1 | 2 | 252 | 2 | 1 |
| 20 | 394 | 10 | 11 | 506 | 1 | 1 | 236 | 1 | 1 |
| 21 | 340 | 8 | 7 | 460 | 1 | 1 | 225 | 1 | 1 |
| 22 | 286 | 8 | 6 | 430 | 1 | 1 | 220 | 1 | 1 |
| 23 | 436 | 18 | 21 | 376 | 1 | 1 | 230 | 1 | 1 |
| 24 | 358 | 6 | 6 | 358 | 1 | 1 | 225 | 2 | 1 |
| 25 | 286 | 9 | 7 | 346 | 2 | 2 | 220 | 2 | 1 |
| 26 | 242 | 8 | 5 | 310 | 1 | 1 | 225 | 1 | 1 |
| 27 | 220 | 3 | 2 | 280 | 1 | 1 | 214 | 3 | 2 |
| 28 | 1,580 | 811 | s5,420 | 252 | 1 | 1 | 328 | 3 | 3 |
| 29 | 1,480 | 48 | 192 | 236 | 1 | 1 | 236 | 2 | 1 |
| 30 | 1,060 | 12 | 34 | 220 | 1 | 1 | 225 | 1 | 1 |
| 31 | 846 | 10 | 23 | 208 | 1 | 1 | -- | -- | -- |
| Total | 14,795 | -- | 5,906 | 14,929 | -- | 707 | 7,972 | -- | 73 |

Total discharge for year (cfs-days) ..... 343,595
Total load for year (tons) ..... 181,345

s Computed by subdividing day.

SCHUYLKILL RIVER AT BERNE, PA.--Continued

Particle-size analyses of suspended sediment, November 1950 to February 1951
(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. 25, 1950 | 7:00 p.m. | 21,500 | 1,140 | | | | 13 | 27 | 48 | 86 | 92 | 96 | | 99 | -- | DSWC |
| Nov. 26 | 11:45 a.m. | 11,300 | 953 | | | | 5 | 32 | 38 | 41 | 53 | 70 | | 89 | 98 | DSWC |
| Nov. 26 | 4:00 p.m. | 8,680 | 693 | | | | 10 | 16 | 26 | 41 | 49 | 86 | | 87 | 96 | DSWC |
| Oct. 20, 1950 | 11:00 a.m. | | | | | | | | | | | | | | | |
| Nov. 21 | 3:20 p.m. | | | | | | | | | | | | | | | |
| Jan. 19, 1951 | 11:15 a.m. | Composite | 82 | | | | 7 | 15 | 24 | 32 | 52 | 70 | | 95 | -- | DSWC |
| Feb. 2 | 2:00 p.m. | | | | | | | | | | | | | | | |

DELAWARE RIVER BASIN--Continued

## SCHUYLKILL RIVER AT POTTSTOWN, PA.

**LOCATION.**--At gaging station at Hanover Street Bridge in Pottstown, Montgomery County, 70 feet from West bank of river, and 0.3 mile downstream from Manatawny Creek.
**DRAINAGE AREA.**--1,147 square miles.
**RECORDS AVAILABLE.**--Chemical analyses: October 1944 to September 1951.
Water temperatures: October 1944 to September 1951.
Sediment records: March 1948 to September 1951.
**EXTREMES, 1950-51.**--Dissolved solids: Maximum, 386 ppm Sept. 21-28; minimum, 156 ppm Feb. 1-10.
Hardness: Maximum, 237 ppm Sept. 21-28; minimum, 103 ppm Feb. 1-10, Apr. 11-20.
Specific conductance: Maximum daily, 573 micromhos, Sept. 18, 28; minimum daily, 150 micromhos Feb. 8.
Water temperatures: Maximum, 90°F Aug. 16; minimum, 33°F on many days during winter months.
Sediment concentrations: Maximum daily, 1,680 ppm Nov. 25; minimum daily, 1 ppm Oct. 3, 5.
Sediment loads: Maximum daily, 158,000 tons Nov. 26; minimum daily, 1 ton Oct. 3, 5.
**EXTREMES, 1944-51.**--Dissolved solids: Maximum, 393 ppm Oct. 11-20, 1944; minimum, 119 ppm Mar. 1-10, 1945.
Hardness: Maximum, 258 ppm Oct. 11-20, 1944; minimum, 79 ppm Mar. 1-10, 1945.
Specific conductance: Maximum daily, 573 micromhos Sept. 18, 28, 1951; minimum daily 150 micromhos Feb. 8.
Water temperatures: Maximum 90°F Aug. 16, 1951; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 1,680 ppm Nov. 25, 1950; minimum daily, 1 ppm Oct. 3, 5, 1950.
Sediment loads: Maximum daily, 158,000 tons Nov. 26, 1950; minimum daily, 1 ton Oct. 3, 5, 1950.
**REMARKS.**--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 1-10, 1950 | 608 | 7.4 | 0.09 | 40 | 17 | 11 | | 41 | 132 | 11 | 0.1 | 7.9 | 263 | 170 | 136 | 400 | 6.8 | 4 |
| Oct. 11-20 | 1,039 | 7.4 | .10 | 37 | 15 | 8.9 | | 32 | 125 | 8.6 | .1 | 5.9 | 242 | 154 | 128 | 367 | 6.7 | 2 |
| Oct. 21-31 | 901 | 7.4 | .05 | 35 | 16 | 7.8 | | 37 | 115 | 10 | .1 | 7.2 | 238 | 153 | 123 | 372 | 6.8 | 4 |
| Nov. 4-10 | 1,803 | 6.5 | .05 | 25 | 12 | 3.9 | | 17 | 90 | 4.8 | .0 | 7.2 | 172 | 112 | 97 | 264 | 6.6 | 4 |
| Nov. 11-20 | 988 | 7.2 | .07 | 32 | 14 | 6.4 | | 31 | 104 | 7.9 | .1 | 7.8 | 211 | 137 | 112 | 338 | 6.7 | 4 |
| Nov. 21-30 | 9,230 | 8.2 | .05 | 27 | 13 | 2.9 | | 17 | 96 | 5.0 | .1 | 7.2 | 185 | 121 | 107 | 285 | 6.5 | 4 |
| Dec. 1-10 | 8,267 | 6.2 | .06 | 25 | 12 | 4.8 | | 8 | 99 | 4.8 | .0 | 7.2 | 183 | 112 | 105 | 270 | 6.4 | 4 |
| Dec. 11-20 | 3,453 | 6.5 | .06 | 32 | 16 | 5.6 | | 17 | 123 | 5.8 | .1 | 7.8 | 230 | 146 | 132 | 336 | 6.5 | 3 |
| Dec. 21-31 | 1,500 | 7.0 | .04 | 39 | 19 | 7.7 | | 22 | 149 | 8.0 | .1 | 9.1 | 275 | 175 | 157 | 397 | 6.5 | 5 |
| Jan. 1-10, 1951 | 1,839 | 6.8 | .05 | 32 | 15 | 5.4 | | 23 | 112 | 7.8 | .0 | 8.4 | 221 | 142 | 123 | 333 | 6.8 | 7 |
| Jan. 11-20 | 3,079 | 6.9 | .07 | 26 | 12 | 3.0 | | 25 | 82 | 6.0 | .0 | 7.9 | 175 | 114 | 94 | 267 | 6.9 | 7 |
| Jan. 21-31 | 3,636 | 6.2 | .40 | 25 | 11 | 4.4 | | 20 | 84 | 5.5 | .0 | 7.0 | 169 | 108 | 91 | 260 | 6.9 | 5 |
| Feb. 1-10 | 5,730 | 3.4 | .06 | 23 | 11 | 3.7 | | 23 | 76 | 5.0 | .1 | 6.8 | 156 | 103 | 84 | 243 | 6.7 | 3 |
| Feb. 11-20 | 3,818 | 3.2 | .06 | 26 | 12 | 6.8 | | 24 | 93 | 4.8 | .1 | 6.9 | 172 | 114 | 95 | 271 | 6.7 | 3 |
| Feb. 21-28 | 4,719 | 2.8 | .06 | 24 | 11 | 5.7 | | 28 | 79 | 4.8 | .1 | 6.7 | 159 | 105 | 82 | 253 | 6.9 | 4 |
| Mar. 1-10 | 3,174 | 3.8 | .08 | 28 | 13 | 5.1 | | 30 | 93 | 5.0 | .1 | 7.0 | 185 | 123 | 99 | 289 | 6.9 | 3 |
| Mar. 11-20 | 2,688 | 4.0 | .06 | 29 | 14 | 5.6 | | 32 | 99 | 5.2 | .1 | 6.6 | 197 | 130 | 104 | 303 | 6.9 | 4 |
| Mar. 21-31 | 3,391 | 3.9 | .07 | 26 | 12 | 4.5 | | 28 | 86 | 4.5 | .1 | 6.2 | 167 | 114 | 91 | 268 | 6.9 | 4 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apr. 1-10 | 2,885 | 4.3 | .07 | 26 | 13 | 5.2 | 22 | 97 | 4.2 | .1 | 5.5 | 178 | 118 | 100 | 280 | 6.9 | 4 |
| Apr. 11-20 | 3,619 | 7.3 | .10 | 23 | 11 | 4.8 | 27 | 77 | 4.1 | .2 | 5.6 | 163 | 103 | 81 | 248 | 7.0 | 3 |
| Apr. 21-30 | 2,373 | 7.3 | .14 | 26 | 14 | 6.1 | 28 | 101 | 5.0 | .2 | 6.2 | 208 | 127 | 104 | 208 | 7.0 | 3 |
| May 1-10 | 1,656 | 7.8 | .12 | 33 | 15 | 6.5 | 34 | 112 | 5.8 | .2 | 6.1 | 222 | 144 | 116 | 324 | 7.1 | 2 |
| May 11-20 | 1,142 | 6.2 | .33 | 37 | 18 | 7.1 | 42 | 127 | 7.0 | .2 | 5.8 | 274 | 166 | 132 | 383 | 7.2 | 4 |
| May 21-31 | 965 | 11 | .18 | 39 | 20 | 8.6 | 56 | 131 | 7.2 | .1 | 7.0 | 278 | 180 | 134 | 410 | 6.7 | 6 |
| June 1-10 | 971 | 11 | .10 | 40 | 20 | 10 | 50 | 141 | 7.8 | .1 | 7.0 | 284 | 182 | 141 | 419 | 6.8 | 5 |
| June 11-20 | 1,159 | 10 | .07 | 28 | 19 | 6.9 | 45 | 131 | 6.8 | .1 | 6.0 | 268 | 173 | 136 | 395 | 6.8 | 5 |
| June 21-30 | 1,243 | 10 | .10 | 34 | 18 | 3.6 | 44 | 113 | 6.5 | .1 | 4.5 | 235 | 159 | 123 | 352 | 6.8 | 4 |
| July 1-10 | 1,234 | 10 | .11 | 34 | 17 | 6.4 | 43 | 121 | 5.2 | .1 | 5.2 | 246 | 155 | 120 | 367 | 6.8 | 3 |
| July 11-20 | 1,178 | 10 | .09 | 33 | 17 | 8.3 | 40 | 120 | 6.2 | .1 | 4.5 | 248 | 152 | 119 | 366 | 6.6 | 3 |
| July 21, 23-26, 28-31 | 1,646 | 10 | .06 | 28 | 19 | 9.9 | 32 | 147 | 7.5 | .1 | 5.5 | 280 | 173 | 147 | 404 | 6.8 | 4 |
| Aug. 1-10 | 979 | 10 | .09 | 35 | 20 | 9.8 | 14 | 160 | 6.5 | .1 | 4.2 | 282 | 170 | 158 | 408 | 6.4 | 5 |
| Aug. 11-17, 19-20 | 1,351 | 10 | .05 | 35 | 20 | 8.3 | 14 | 156 | 6.8 | .1 | 5.0 | 273 | 170 | 158 | 393 | 6.5 | 4 |
| Aug. 21-22, 27-29 | 805 | 10 | .08 | 40 | 21 | 9.7 | 18 | 170 | 6.8 | .1 | 3.5 | 302 | 186 | 171 | 435 | 6.5 | 4 |
| Sept. 3, 5-10 | 984 | 10 | .04 | 44 | 20 | 13 | 35 | 170 | 8.0 | .1 | 5.0 | 323 | 192 | 163 | 449 | 6.7 | 5 |
| Sept. 11-15, 17-18, 20 | 713 | 10 | .05 | 49 | 25 | 15 | 28 | 205 | 11 | .1 | 6.8 | 382 | 225 | 202 | 520 | 6.7 | 4 |
| Sept. 21-28 | 539 | 11 | .02 | 52 | 26 | 17 | 30 | 216 | 13 | .1 | 7.5 | 386 | 237 | 212 | 549 | 6.8 | 4 |
| Average | 2,362 | 7.6 | 0.09 | 33 | 16 | 7.3 | 29 | 120 | 6.7 | 0.1 | 6.4 | 234 | 148 | 124 | 345 | 6.8 | 4 |

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT POTTSTOWN, PA.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

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

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT POTTSTOWN, PA.--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 | 557 | 2 | 3 | 705 | 20 | 38 | 3,770 | 130 | 1,320 |
| 2 | 539 | 2 | 3 | 686 | 29 | 54 | 3,110 | 170 | 1,430 |
| 3 | 533 | 1 | 1 | 719 | 33 | 64 | 2,830 | 175 | 1,340 |
| 4 | 509 | 2 | 3 | 775 | 28 | 59 | 9,320 | 849 | s 34,900 |
| 5 | 515 | 1 | 1 | 2,590 | 193 | s 1,540 | 25,700 | 784 | s 62,900 |
| 6 | 479 | 3 | 4 | 2,720 | 100 | 734 | 11,300 | 500 | 15,300 |
| 7 | 491 | 4 | 5 | 1,970 | 45 | 239 | 7,600 | 375 | 7,700 |
| 8 | 503 | 4 | 5 | 1,700 | 45 | 207 | 12,400 | 606 | s 20,600 |
| 9 | 584 | 8 | 13 | 1,520 | 42 | 172 | 9,510 | 500 | 12,800 |
| 10 | 1,370 | 74 | s 293 | 1,350 | 40 | 146 | 7,130 | 390 | 7,510 |
| 11 | 1,540 | 28 | 116 | 1,190 | 24 | 77 | 6,050 | 272 | 4,440 |
| 12 | 1,480 | 24 | 96 | 1,110 | 14 | 42 | 5,200 | 214 | 3,000 |
| 13 | 1,270 | 6 | 21 | 1,030 | 11 | 31 | 4,070 | 223 | 2,450 |
| 14 | 1,110 | 4 | 12 | 995 | 12 | 32 | 3,400 | 182 | 1,670 |
| 15 | 995 | 2 | 5 | 920 | 5 | 12 | 3,110 | 168 | 1,410 |
| 16 | 920 | 3 | 8 | 1,000 | 22 | 59 | 3,200 | 155 | 1,340 |
| 17 | 831 | 6 | 13 | 1,070 | 36 | 104 | 2,800 | 81 | 612 |
| 18 | 782 | 6 | 13 | 920 | 11 | 27 | 2,500 | 67 | 452 |
| 19 | 747 | 6 | 12 | 824 | 11 | 24 | 2,200 | 106 | 630 |
| 20 | 719 | 10 | 19 | 817 | 14 | 31 | 2,000 | 50 | 270 |
| 21 | 698 | 13 | 24 | 1,150 | 39 | 121 | 1,900 | 40 | 205 |
| 22 | 679 | 11 | 20 | 1,530 | 76 | 314 | 1,900 | 40 | 205 |
| 23 | 1,230 | 52 | 173 | 1,200 | 123 | 399 | 1,650 | 40 | 178 |
| 24 | 1,150 | 30 | 93 | 1,490 | 80 | 322 | 1,650 | 38 | 169 |
| 25 | 875 | 18 | 43 | 14,700 | 1,680 | s 89,300 | 1,600 | 42 | 181 |
| 26 | 789 | 20 | 43 | 36,500 | 1,590 | s 158,000 | 1,400 | 39 | 147 |
| 27 | 733 | 24 | 48 | 16,100 | 770 | 33,500 | 1,000 | 70 | 189 |
| 28 | 692 | 21 | 39 | 8,690 | 410 | 9,620 | 1,050 | 95 | 269 |
| 29 | 712 | 18 | 35 | 6,230 | 250 | 4,210 | 1,300 | 182 | 639 |
| 30 | 733 | 23 | 46 | 4,710 | 160 | 2,030 | 1,610 | 51 | 222 |
| 31 | 719 | 19 | 37 | -- | -- | -- | 1,440 | 34 | 132 |
| Total | 25,484 | -- | 1,247 | 116,911 | -- | 301,508 | 143,700 | -- | 184,610 |
| | January | | | February | | | March | | |
| 1 | 1,290 | 23 | 80 | 3,100 | 239 | s 2,230 | 2,830 | 123 | 940 |
| 2 | 1,210 | 24 | 78 | 6,400 | 575 | 9,940 | 2,830 | 125 | 955 |
| 3 | 1,250 | 32 | 108 | 5,000 | 170 | 2,300 | 2,620 | 130 | 920 |
| 4 | 1,610 | 69 | 300 | 3,700 | 71 | 709 | 3,620 | 266 | 2,600 |
| 5 | 2,620 | 165 | 1,170 | 3,600 | 81 | 787 | 3,920 | 197 | 2,080 |
| 6 | 2,420 | 75 | 490 | 3,300 | 76 | 677 | 3,540 | 127 | 1,210 |
| 7 | 2,300 | 47 | 292 | 6,000 | 807 | s 24,000 | 3,400 | 124 | 1,140 |
| 8 | 2,230 | 44 | 265 | 16,000 | 706 | 30,500 | 3,320 | 149 | 1,340 |
| 9 | 1,790 | 33 | 160 | 5,800 | 228 | 3,570 | 2,970 | 150 | 1,200 |
| 10 | 1,670 | 29 | 131 | 4,400 | 127 | 1,510 | 2,690 | 135 | 981 |
| 11 | 1,610 | 32 | 139 | 3,600 | 113 | 1,100 | 2,490 | 104 | 699 |
| 12 | 1,560 | 41 | 173 | 3,400 | 137 | 1,260 | 2,420 | 113 | 738 |
| 13 | 1,500 | 39 | 158 | 4,000 | 425 | 4,590 | 2,300 | 108 | 671 |
| 14 | 1,440 | 63 | 245 | 4,500 | 253 | 3,070 | 2,620 | 458 | 3,240 |
| 15 | 6,600 | 726 | s 14,600 | 3,600 | 260 | 2,530 | 2,900 | 155 | 1,210 |
| 16 | 6,000 | 432 | 7,000 | 3,180 | 322 | 2,760 | 2,620 | 190 | 1,340 |
| 17 | 3,770 | 208 | 2,120 | 3,340 | 210 | 1,890 | 2,360 | 130 | 828 |
| 18 | 3,110 | 148 | 1,240 | 4,870 | 673 | 8,850 | 2,230 | 44 | 265 |
| 19 | 2,700 | 180 | 1,310 | 3,770 | 218 | 2,220 | 2,160 | 72 | 420 |
| 20 | 2,500 | 208 | 1,400 | 3,920 | 228 | 2,410 | 4,780 | 562 | s 8,300 |
| 21 | 2,500 | 63 | 425 | 5,610 | 532 | s 8,980 | 5,200 | 386 | 5,420 |
| 22 | 2,400 | 44 | 285 | 7,510 | 652 | 13,200 | 4,390 | 255 | 3,020 |
| 23 | 2,100 | 58 | 329 | 5,710 | 515 | 7,940 | 3,770 | 200 | 2,040 |
| 24 | 4,000 | 452 | s 6,910 | 4,710 | 270 | 3,430 | 3,400 | 125 | 1,150 |
| 25 | 7,200 | 530 | 10,300 | 4,070 | 228 | 2,510 | 3,040 | 92 | 755 |
| 26 | 5,000 | 284 | 3,830 | 3,700 | 203 | 2,030 | 2,620 | 64 | 453 |
| 27 | 4,000 | 137 | 1,480 | 3,400 | 126 | 1,160 | 2,420 | 48 | 314 |
| 28 | 3,500 | 106 | 1,000 | 3,040 | 92 | 755 | 2,300 | 30 | 186 |
| 29 | 3,400 | 193 | 1,770 | -- | -- | -- | 2,690 | 85 | 617 |
| 30 | 3,200 | 144 | 1,240 | -- | -- | -- | 3,400 | 182 | 1,670 |
| 31 | 2,700 | 135 | 984 | -- | -- | -- | 4,070 | 144 | 1,580 |
| Total | 89,180 | -- | 60,012 | 133,230 | -- | 146,908 | 95,920 | -- | 48,282 |

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT POTTSTOWN, PA.--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 | 3,920 | 122 | 1,290 | 2,420 | 70 | 457 | 788 | 18 | 38 |
| 2 | 3,620 | 110 | 1,080 | 2,160 | 44 | 256 | 751 | 15 | 31 |
| 3 | 3,700 | 136 | 1,360 | 1,910 | 60 | 309 | 870 | 48 | 113 |
| 4 | 3,250 | 72 | 632 | 1,730 | 28 | 131 | 1,730 | 290 | 1,350 |
| 5 | 2,760 | 79 | 589 | 1,670 | 30 | 135 | 1,270 | 70 | 240 |
| 6 | 2,560 | 112 | 774 | 1,560 | 24 | 101 | 1,020 | 42 | 116 |
| 7 | 2,420 | 82 | 536 | 1,440 | 18 | 70 | 856 | 34 | 79 |
| 8 | 2,300 | 78 | 484 | 1,340 | 13 | 47 | 802 | 32 | 69 |
| 9 | 2,160 | 33 | 193 | 1,130 | 16 | 49 | 772 | 29 | 60 |
| 10 | 2,160 | 44 | 256 | 1,220 | 22 | 72 | 848 | 36 | 82 |
| 11 | 2,560 | 102 | 705 | 1,260 | 30 | 102 | 1,230 | 52 | 173 |
| 12 | 3,060 | 225 | s 3,350 | 1,610 | 42 | 183 | 1,110 | 63 | 189 |
| 13 | 7,130 | 745 | s 14,600 | 1,390 | 27 | 101 | 971 | 52 | 136 |
| 14 | 5,710 | 218 | 3,360 | 1,180 | 17 | 54 | 1,720 | 86 | 399 |
| 15 | 4,550 | 132 | 1,620 | 1,070 | 13 | 38 | 1,500 | 61 | 247 |
| 16 | 3,770 | 130 | 1,320 | 1,020 | 10 | 28 | 1,220 | 35 | 115 |
| 17 | 3,400 | 83 | 762 | 988 | 14 | 37 | 1,070 | 24 | 69 |
| 18 | 2,900 | 70 | 548 | 988 | 15 | 40 | 1,020 | 24 | 66 |
| 19 | 2,690 | 62 | 450 | 962 | 13 | 34 | 865 | 29 | 68 |
| 20 | 2,420 | 82 | 536 | 954 | 12 | 31 | 888 | 27 | 65 |
| 21 | 2,230 | 137 | 825 | 980 | 11 | 29 | 737 | 21 | 42 |
| 22 | 2,100 | 50 | 284 | 946 | 12 | 31 | 795 | 30 | 64 |
| 23 | 2,840 | 72 | 552 | 946 | 19 | 49 | 1,100 | 43 | 128 |
| 24 | 2,970 | 48 | 385 | 1,340 | 41 | 148 | 1,610 | 96 | 417 |
| 25 | 2,420 | 65 | 425 | 1,100 | 40 | 119 | 1,790 | 143 | 691 |
| 26 | 2,300 | 68 | 422 | 888 | 18 | 43 | 1,340 | 72 | 261 |
| 27 | 2,160 | 84 | 490 | 848 | 16 | 37 | 1,040 | 32 | 90 |
| 28 | 1,970 | 70 | 372 | 864 | 22 | 51 | 928 | 27 | 88 |
| 29 | 1,910 | 40 | 206 | 864 | 29 | 88 | 1,240 | 64 | 214 |
| 30 | 2,830 | 63 | 481 | 954 | 34 | 87 | 1,850 | 148 | 739 |
| 31 | -- | -- | -- | 880 | 22 | 52 | -- | -- | -- |
| Total | 90,770 | -- | 38,887 | 38,612 | -- | 2,989 | 33,731 | -- | 6,419 |

| 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 | 100 | 421 | 1,560 | 48 | 202 | 549 | 3 | 4 |
| 2 | 1,560 | 74 | 312 | 1,270 | 43 | 147 | 1,030 | 80 | s 456 |
| 3 | 1,190 | 37 | 119 | 1,090 | 33 | 97 | 1,920 | 390 | 2,020 |
| 4 | 1,020 | 18 | 50 | 988 | 31 | 83 | 1,060 | 115 | 329 |
| 5 | 1,720 | 112 | 520 | 912 | 26 | 64 | 772 | 27 | 56 |
| 6 | 1,560 | 49 | 206 | 825 | 25 | 56 | 737 | 25 | 50 |
| 7 | 1,110 | 14 | 42 | 772 | 25 | 52 | 920 | 30 | 75 |
| 8 | 954 | 4 | 10 | 765 | 14 | 29 | 1,080 | 45 | 131 |
| 9 | 872 | 7 | 16 | 802 | 18 | 39 | 765 | 19 | 39 |
| 10 | 795 | 8 | 17 | 802 | 20 | 43 | 894 | 15 | 28 |
| 11 | 772 | 11 | 23 | 1,100 | 23 | 68 | 648 | 10 | 17 |
| 12 | 827 | 50 | 112 | 946 | 25 | 64 | 628 | 10 | 17 |
| 13 | 2,260 | 590 | 3,600 | 2,110 | 132 | s 918 | 603 | 11 | 18 |
| 14 | 1,100 | 95 | 282 | 1,740 | 50 | 235 | 616 | 19 | 32 |
| 15 | 848 | 42 | 96 | 1,240 | 15 | 50 | 1,090 | 65 | 191 |
| 16 | 751 | 24 | 49 | 1,100 | 18 | 53 | 1,110 | 56 | 168 |
| 17 | 766 | 40 | 83 | 1,560 | 30 | 126 | 802 | 35 | 76 |
| 18 | 864 | 47 | 110 | 1,390 | 24 | 90 | 701 | 18 | 34 |
| 19 | 1,160 | 79 | 247 | 1,110 | 12 | 36 | 654 | 19 | 33 |
| 20 | 2,430 | 524 | s 3,900 | 1,250 | 16 | 54 | 616 | 15 | 25 |
| 21 | 1,170 | 95 | 300 | 1,110 | 19 | 57 | 591 | 16 | 26 |
| 22 | 920 | 46 | 114 | 948 | 10 | 26 | 560 | 12 | 18 |
| 23 | 872 | 42 | 99 | 856 | 12 | 28 | 525 | 15 | 21 |
| 24 | 1,110 | 53 | 159 | 765 | 6 | 12 | 543 | 28 | 41 |
| 25 | 904 | 28 | 68 | 744 | 5 | 10 | 531 | 10 | 14 |
| 26 | 772 | 11 | 23 | 730 | 5 | 10 | 531 | 12 | 17 |
| 27 | 687 | 5 | 9 | 681 | 2 | 4 | 520 | 10 | 14 |
| 28 | 864 | 30 | s 103 | 654 | 7 | 12 | 514 | 18 | 25 |
| 29 | 4,530 | 440 | s 5,610 | 635 | 8 | 14 | 609 | 29 | 48 |
| 30 | 2,620 | 55 | 389 | 609 | 4 | 7 | 514 | 15 | 21 |
| 31 | 1,970 | 48 | 255 | 585 | 4 | 6 | -- | -- | -- |
| Total | 40,538 | -- | 17,344 | 31,647 | -- | 2,692 | 22,433 | -- | 4,044 |

Total discharge for year (cfs-days) ..... 862,156
Total load for year (tons) ..... 819,783

s Computed by subdividing day.

SCHUYLKILL RIVER AT POTTSTOWN, PA.--Continued

Particle-size analyses of suspended sediment, November 1950 to January 1951
(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. 25, 1950 | 8:00 p. m. | 30,170 | 2,170 | | | | 5 | 15 | 28 | 68 | 88 | 97 | | 98 | 100 | DSWC |
| Nov. 26 | 2:40 p. m. | 40,100 | 1,140 | | | | 21 | 36 | 51 | 69 | 78 | 86 | | 94 | 98 | DSWC |
| Nov. 28 | 5:00 p. m. | 36,770 | 965 | | | | 20 | 34 | 51 | 65 | 74 | 82 | | 91 | 98 | DSWC |
| Jan. 25, 1951 | 10:50 a. m. | 2,900 | 318 | | | | 18 | 32 | 50 | 63 | 75 | 88 | | 97 | 100 | DSWC |

DELAWARE RIVER BASIN--Continued

## PERKIOMEN CREEK AT GRATERFORD, PA.

LOCATION.--At Highway Bridge, at Graterford, Montgomery County, 1,650 feet downstream from gaging station, which is half a mile upstream from Landis Brook, and 2½ miles north of Collegeville.
DRAINAGE AREA.--279 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1951
Sediment records: April 1948 to September 1951.
EXTREMES, 1950-51.--Sediment concentrations: Maximum daily, 551 ppm Jan. 24; minimum daily, 1 ppm on many days.
Sediment loads: Maximum daily, 18,900 tons Nov. 25; minimum daily, 0.1 ton Oct. 3, Nov. 19.
EXTREMES, 1948-51.--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 ton Sept. 24, 1950.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| Oct. 26, 1950 .. | 93 | 55 | 12 | | 0.02 | | 23 | 8.4 | 8.8 | | 80 | 34 | 9.5 | 0.0 | 2.4 | 140 | 92 | 26 | | 228 | 7.7 | 15 |
| Nov. 21..... | 70 | 44 | 10 | | .02 | | 24 | 9.3 | 9.9 | | 94 | 32 | 9.0 | .0 | 2.0 | 140 | 98 | 21 | | 239 | 7.5 | 5 |
| Jan. 11, 1951 .. | 160 | 32 | 13 | | .03 | | 20 | 8.5 | 9.1 | | 56 | 42 | 10 | .0 | 7.8 | 133 | 85 | 39 | | 219 | 7.8 | 5 |
| Feb. 15..... | 444 | 42 | 10 | | .06 | | 12 | 5.3 | 5.3 | | 29 | 27 | 6.0 | .0 | 5.6 | 86 | 52 | 29 | | 135 | 7.1 | 10 |
| Mar. 29 ..... | 702 | 45 | 12 | | .04 | | 15 | 6.0 | 6.3 | | 47 | 31 | 5.0 | .0 | 5.1 | 106 | 62 | 24 | | 165 | 7.2 | 5 |
| Apr. 26..... | 257 | 46 | 9.0 | | .04 | | 16 | 6.0 | 5.4 | | 49 | 33 | 5.0 | .0 | 1.9 | 108 | 65 | 24 | | 171 | 7.5 | 7 |
| June 14 ..... | 556 | 68 | 15 | | .13 | | 18 | 7.3 | 5.9 | | 68 | 24 | 4.5 | .0 | 2.8 | 119 | 75 | 19 | | 179 | 7.5 | 15 |
| Aug. 15 ..... | 72 | 78 | 11 | | .01 | | 24 | 4.7 | 6.4 | | 74 | 26 | 6.0 | .0 | 1.8 | 129 | 79 | 19 | | 211 | 7.9 | 7 |
| Sept. 6 ..... | 46 | 74 | 11 | | .04 | | 22 | 8.3 | 12 | 2.8 | 90 | 26 | 6.0 | .0 | .5 | 140 | 89 | 15 | | 217 | 8.2 | 5 |

DELAWARE RIVER BASIN--Continued

PERKIOMEN CREEK AT GRATERFORD, PA.--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 | 41 | 3 | 0.3 | 61 | 2 | 0.3 | 400 | 1 | 1.1 |
| 2 | 43 | 3 | .4 | 58 | 2 | .3 | 370 | 1 | 1 |
| 3 | 39 | 1 | .1 | 60 | 12 | 1.9 | 350 | 1 | 0.9 |
| 4 | 36 | 8 | .8 | 67 | 11 | 2 | 4,070 | 184 | s3,670 |
| 5 | 36 | 8 | .8 | 221 | 38 | 23 | 1,800 | 63 | 306 |
| 6 | 33 | 9 | .8 | 130 | 27 | 9.5 | 690 | 5 | 9.3 |
| 7 | 30 | 9 | .7 | 91 | 16 | 3.9 | 490 | 4 | 5.3 |
| 8 | 32 | 11 | .9 | 76 | 11 | 2.3 | 4,010 | 140 | s2,050 |
| 9 | 45 | 12 | 1.5 | 70 | 8 | 1.5 | 935 | 12 | 30 |
| 10 | 173 | 10 | 4.7 | 63 | 4 | .7 | 588 | 2 | 3.2 |
| 11 | 101 | 9 | 2.5 | 61 | 4 | .6 | 616 | 1 | 1.7 |
| 12 | 79 | 12 | 2.6 | 57 | 4 | .6 | 521 | 1 | 1.4 |
| 13 | 98 | 13 | 3.4 | 56 | 3 | .5 | 361 | 1 | 1 |
| 14 | 75 | 10 | 2 | 54 | 2 | .3 | 295 | 2 | 1.6 |
| 15 | 59 | 9 | 1.4 | 52 | 2 | .3 | 275 | 2 | 1.5 |
| 16 | 53 | 7 | 1 | 52 | 2 | .3 | 475 | 2 | 2.6 |
| 17 | 52 | 6 | .8 | 52 | 2 | .3 | 335 | 3 | 2.7 |
| 18 | 48 | 7 | .9 | 52 | 3 | .4 | 230 | 6 | 3.7 |
| 19 | 48 | 10 | 1.3 | 52 | 1 | .1 | 200 | 2 | 1.1 |
| 20 | 45 | 8 | 1 | 54 | 2 | .3 | 180 | 1 | .5 |
| 21 | 44 | 10 | 1.2 | 70 | 4 | .8 | 170 | 1 | .5 |
| 22 | 44 | 10 | 1.2 | 106 | 2 | .6 | 160 | 1 | .4 |
| 23 | 216 | 19 | 11 | 75 | 1 | .2 | 163 | 1 | .4 |
| 24 | 239 | 8 | 5.2 | 63 | 1 | .2 | 159 | 3 | 1.3 |
| 25 | 120 | 6 | 1.9 | 10,900 | 299 | 18,900 | 150 | 2 | .8 |
| 26 | 93 | 6 | 2 | 4,600 | 180 | 4,620 | 125 | 2 | a.7 |
| 27 | 76 | 4 | .8 | 1,050 | 22 | 62 | 100 | 3 | a.8 |
| 28 | 67 | 3 | .5 | 690 | 8 | 15 | 110 | 2 | a.6 |
| 29 | 65 | 3 | .5 | 550 | 3 | 4.5 | 180 | 1 | a.5 |
| 30 | 68 | 3 | .5 | 460 | 1 | 1.2 | 324 | 2 | a1.8 |
| 31 | 65 | 3 | .5 | -- | -- | -- | 319 | 2 | a1.7 |
| Total- | 2,263 | -- | 53.2 | 20,003 | -- | 23,653.6 | 19,151 | -- | 6,104.1 |
| | January | | | February | | | March | | |
| 1 | 214 | 8 | a4.6 | 1,000 | 51 | 161 | 400 | 3 | 3.2 |
| 2 | 159 | 12 | a5.2 | 2,180 | 66 | 389 | 502 | 1 | 1.4 |
| 3 | 149 | 15 | 6 | 586 | 28 | 44 | 428 | 3 | 3.5 |
| 4 | 275 | 13 | 9.7 | 470 | 13 | 16 | 1,460 | 12 | s51 |
| 5 | 360 | 17 | 17 | 390 | 9 | 9.5 | 946 | 16 | 41 |
| 6 | 220 | 20 | 12 | 370 | 13 | 13 | 567 | 5 | 7.7 |
| 7 | 205 | 17 | 9.4 | 4,600 | 83 | s1,520 | 483 | 2 | 2.6 |
| 8 | 340 | 20 | 18 | 1,660 | 23 | 103 | 428 | 3 | 3.5 |
| 9 | 200 | 20 | 11 | 560 | 51 | 77 | 356 | 2 | 1.9 |
| 10 | 155 | 21 | 8.8 | 420 | 57 | 65 | 290 | 2 | 1.6 |
| 11 | 160 | 6 | 2.6 | 380 | 32 | 33 | 257 | 3 | 2.1 |
| 12 | 145 | 5 | 1.9 | 350 | 14 | 13 | 262 | 2 | 1.4 |
| 13 | 135 | 7 | 2.5 | 661 | 33 | 98 | 252 | 7 | 4.8 |
| 14 | 170 | 10 | 4.6 | 817 | 78 | 172 | 653 | 11 | s29 |
| 15 | 5,580 | 137 | s1,890 | 444 | 21 | 25 | 718 | 15 | 29 |
| 16 | 883 | 75 | 179 | 335 | 10 | 9 | 458 | 2 | 2.5 |
| 17 | 438 | 7 | 8.3 | 802 | 42 | s198 | 356 | 2 | 1.9 |
| 18 | 361 | 3 | 2.9 | 1,090 | 102 | 300 | 295 | 2 | 1.6 |
| 19 | 319 | 2 | 1.7 | 677 | 55 | 100 | 266 | 2 | 1.4 |
| 20 | 319 | 1 | 0.9 | 1,120 | 200 | 605 | 2,970 | 104 | s1,060 |
| 21 | 361 | 2 | 1.9 | 3,470 | 540 | s6,020 | 889 | 54 | 130 |
| 22 | 270 | 2 | 1.5 | 2,000 | 140 | 756 | 637 | 11 | 19 |
| 23 | 205 | 8 | 4.4 | 948 | 31 | 79 | 508 | 6 | 8.2 |
| 24 | 3,520 | 551 | s7,240 | 623 | 6 | 10 | 471 | 9 | 11 |
| 25 | 1,190 | 170 | 546 | 508 | 12 | 16 | 428 | 10 | 12 |
| 26 | 614 | 11 | 18 | 489 | 16 | 21 | 324 | 5 | 4.4 |
| 27 | 388 | 43 | 45 | 508 | 9 | 12 | 285 | 3 | 2.3 |
| 28 | 356 | 10 | 9.6 | 446 | 4 | 4.8 | 270 | 3 | 2.2 |
| 29 | 423 | 8 | 9.1 | -- | -- | -- | 702 | 16 | s64 |
| 30 | 404 | 14 | 15 | -- | -- | -- | 2,580 | 164 | s1,650 |
| 31 | 245 | 31 | 21 | -- | -- | -- | 3,360 | 146 | 1,320 |
| Total- | 18,763 | -- | 10,107.6 | 27,904 | -- | 10,869.3 | 22,801 | -- | 4,474.2 |

s Computed by subdividing day.
a Computed from estimated concentrated graph.

DELAWARE RIVER BASIN--Continued

PERKIOMEN CREEK AT GRATERFORD, PA.--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 | 918 | 28 | 69 | 304 | 22 | 18 | 139 | 10 | 3.8 |
| 2 | 658 | 4 | 7.1 | 234 | 8 | 5 | 126 | 3 | 1 |
| 3 | 1,630 | 20 | s90 | 210 | 7 | 4 | 178 | 5 | 2.4 |
| 4 | 817 | 7 | 15 | 193 | 5 | 2.6 | 490 | 100 | s184 |
| 5 | 581 | 2 | 3.1 | 178 | 7 | 3.4 | 234 | 89 | 56 |
| 6 | 471 | 2 | 2.5 | 174 | 8 | 3.8 | 156 | 48 | 20 |
| 7 | 411 | 2 | 2.2 | 163 | 6 | 2.6 | 123 | 21 | 7 |
| 8 | 361 | 1 | 1 | 156 | 8 | 3.4 | 101 | 5 | 1.4 |
| 9 | 324 | 17 | 15 | 149 | 6 | 2.4 | 93 | 11 | 2.8 |
| 10 | 314 | 6 | 5.1 | 136 | 7 | 2.6 | 109 | 15 | 4.4 |
| 11 | 400 | 2 | 2.2 | 148 | 6 | 2.4 | 205 | 17 | 9.4 |
| 12 | 520 | 3 | s14 | 247 | 7 | 4.7 | 133 | 10 | 3.6 |
| 13 | 2,830 | 116 | 886 | 185 | 6 | 3 | 118 | 4 | 1.3 |
| 14 | 766 | 76 | 157 | 139 | 9 | 3.4 | 556 | 40 | 60 |
| 15 | 534 | 9 | 13 | 123 | 7 | 2.3 | 341 | 33 | 31 |
| 16 | 446 | 3 | 3.6 | 115 | 7 | 2.2 | 189 | 12 | 6.1 |
| 17 | 452 | 2 | 2.4 | 104 | 5 | 1.4 | 139 | 14 | 5.3 |
| 18 | 372 | 2 | 2 | 104 | 5 | 1.4 | 112 | 11 | 3.3 |
| 19 | 329 | 1 | 0.9 | 101 | 4 | 1.1 | 98 | 10 | 2.6 |
| 20 | 300 | 2 | 1.6 | 106 | 5 | 1.4 | 84 | 12 | 2.7 |
| 21 | 262 | 1 | .7 | 115 | 5 | 1.6 | 78 | 12 | 2.5 |
| 22 | 248 | 1 | .7 | 109 | 6 | 1.8 | 75 | 9 | 1.8 |
| 23 | 446 | 5 | 6 | 105 | 8 | 2.3 | 133 | 18 | 6.5 |
| 24 | 340 | 4 | 3.7 | 358 | 16 | 15 | 166 | 29 | 13 |
| 25 | 275 | 3 | 2.2 | 226 | 9 | 5.5 | 144 | 19 | 7.4 |
| 26 | 257 | 7 | 4.9 | 136 | 7 | 2.6 | 91 | 16 | 3.9 |
| 27 | 210 | 9 | 5.1 | 117 | 14 | 4.4 | 82 | 14 | 3.1 |
| 28 | 193 | 7 | 3.6 | 130 | 9 | 3.2 | 81 | 16 | 3.5 |
| 29 | 205 | 4 | 2.2 | 457 | 33 | s60 | 122 | 26 | 8.6 |
| 30 | 622 | 59 | s102 | 532 | 29 | 42 | 280 | 94 | 71 |
| 31 | -- | -- | -- | 217 | 16 | 9.4 | -- | -- | -- |
| Total | 16,492 | -- | 1,423.8 | 5,771 | -- | 218.9 | 4,976 | -- | 529.4 |

| Day | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 178 | 93 | 45 | 91 | 6 | 1.5 | 31 | 7 | 0.6 |
| 2 | 146 | 44 | 17 | 75 | 9 | 1.8 | 40 | 11 | 1.2 |
| 3 | 104 | 31 | 8.7 | 64 | 10 | 1.7 | 123 | 20 | 6.6 |
| 4 | 86 | 29 | 6.7 | 61 | 9 | 1.5 | 67 | 11 | 2 |
| 5 | 435 | 106 | s162 | 59 | 10 | 1.6 | 51 | 9 | 1.2 |
| 6 | 223 | 71 | 43 | 53 | 9 | 1.3 | 46 | 9 | 1.1 |
| 7 | 120 | 40 | 13 | 50 | 6 | 0.8 | 50 | 10 | 1.4 |
| 8 | 93 | 31 | 7.8 | 58 | 9 | 1.4 | 50 | 11 | 1.5 |
| 9 | 75 | 30 | 6.1 | 58 | 4 | .6 | 39 | 12 | 1.3 |
| 10 | 68 | 11 | 2 | 59 | 10 | 1.6 | 36 | 15 | 1.5 |
| 11 | 61 | 7 | 1.2 | 179 | 19 | 9.2 | 33 | 16 | 1.4 |
| 12 | 59 | 2 | 0.3 | 121 | 10 | 3.3 | 36 | 13 | 1.3 |
| 13 | 133 | 27 | 9.7 | 131 | 15 | 5.3 | 32 | 12 | 1 |
| 14 | 88 | 22 | 5.2 | 88 | 12 | 2.9 | 34 | 10 | .9 |
| 15 | 70 | 16 | 3 | 72 | 18 | 3.5 | 215 | 15 | 8.7 |
| 16 | 63 | 10 | 1.7 | 66 | 17 | 3 | 132 | 14 | 5 |
| 17 | 139 | 33 | 12 | 66 | 12 | 2.1 | 65 | 13 | 2.3 |
| 18 | 219 | 98 | 58 | 57 | 17 | 2.6 | 52 | 10 | 1.4 |
| 19 | 360 | 83 | s130 | 51 | 22 | 3 | 44 | 11 | 1.3 |
| 20 | 587 | 175 | s312 | 63 | 10 | 1.7 | 43 | 12 | 1.4 |
| 21 | 166 | 85 | 38 | 61 | 5 | .8 | 39 | 5 | .5 |
| 22 | 112 | 27 | 8.2 | 56 | 5 | .8 | 34 | 4 | .4 |
| 23 | 104 | 17 | 4.8 | 47 | 6 | .8 | 34 | 5 | .5 |
| 24 | 96 | 19 | 4.9 | 41 | 4 | .4 | 38 | 6 | .6 |
| 25 | 80 | 25 | 5.4 | 39 | 9 | .9 | 35 | 5 | .5 |
| 26 | 71 | 8 | 1.5 | 36 | 10 | 1 | 35 | 7 | .6 |
| 27 | 61 | 1 | .2 | 41 | 8 | .9 | 36 | 6 | .6 |
| 28 | 409 | 74 | s218 | 37 | 6 | .6 | 31 | 6 | .5 |
| 29 | 348 | 115 | 108 | 38 | 8 | .8 | 30 | 3 | .2 |
| 30 | 149 | 122 | 49 | 33 | 5 | .4 | 29 | 6 | .5 |
| 31 | 117 | 36 | 11 | 37 | 7 | .7 | -- | -- | -- |
| Total | 5,000 | -- | 1,293.4 | 1,986 | -- | 58.5 | 1,560 | -- | 48 |

Total discharge for year (cfs-days) ..... 146,670
Total load for year (tons) ..... 58,834

s Computed by subdividing day.

PERKIOMEN CREEK AT GRATERFORD, PA.--Continued

Particle-size analyses of suspended sediment, February 1951
(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 | |
| Feb. 1, 1951 ..... | 4:30 p.m. | 1,300 | 60 | a 4,940 | | 8 | 16 | 30 | 52 | 78 | 90 | 97 | | 99 | 100 | BWC |

a Depth integrated samples composited into approximately one gallon aliquot to give higher tube concentration.

DELAWARE RIVER BASIN--Continued

## SCHUYLKILL RIVER AT BELMONT FILTERS, PHILADELPHIA, PA.

LOCATION.--At Belmont Filters, Philadelphia, Philadelphia County, 1.6 miles upstream from gaging station at Fairmount Dam in Philadelphia.
DRAINAGE AREA.--1,890 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1951.
Water temperatures: October 1945 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 331 ppm Sept. 21-30; minimum, 142 ppm Feb. 1-10.
Hardness: Maximum, 203 ppm Sept. 21-30; minimum, 94 ppm Feb. 1-10, Feb. 21-28.
Specific conductance: Maximum daily, 517 micromhos Sept. 15, 30; minimum daily, 159 micromhos Feb. 9.
Water temperatures: Maximum, 86°F July 17; minimum, 34°F Jan. 3, Feb. 6, 10, 11, 13.
EXTREMES, 1944-51.--Dissolved solids: Maximum, 358 ppm Oct. 11-20, 1947; minimum, 94 ppm Feb. 1-10, Feb. 21-28, 1951.
Hardness: Maximum, 210 ppm Aug. 21-31, 1950; minimum, 80 ppm Feb. 11-20, 1951.
Specific conductance: Maximum daily, 517 micromhos Sept. 15, 30, 1951; minimum daily, 159 micromhos Feb. 9, 1951.
Water temperatures: Maximum, 86°F July 17, 1951; minimum, freezing point on many days during winter months.
REMARKS.--Samples collected at raw-water intake on west side of river at Belmont Filters 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 1950 to September 1951 based on records for Schuylkill River at Philadelphia which are given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 1-10, 1950 | 370 | 13 | 0.02 | 43 | 18 | 16 | | 80 | 113 | 19 | 0.2 | 7.1 | 292 | 181 | 116 | 457 | 7.2 | 8 |
| Oct. 11-20 | 994 | 8.4 | .06 | 39 | 17 | 15 | | 61 | 119 | 14 | .1 | 7.6 | 268 | 167 | 117 | 408 | 7.0 | 5 |
| Oct. 21-31 | 875 | 7.3 | .06 | 34 | 14 | 13 | | 60 | 93 | 13 | .1 | 6.8 | 222 | 142 | 93 | 355 | 7.0 | 8 |
| Nov. 1-10 | 1,505 | 7.4 | .06 | 34 | 15 | 12 | | 61 | 94 | 13 | .1 | 7.1 | 229 | 147 | 97 | 358 | 7.0 | 5 |
| Nov. 11-20 | 897 | 8.1 | .05 | 32 | 13 | 7.1 | | 57 | 76 | 12 | .1 | 7.2 | 203 | 133 | 87 | 330 | 7.0 | 5 |
| Nov. 21-25 | 6,818 | 7.8 | .06 | 35 | 15 | 8.4 | | 55 | 94 | 13 | .1 | 7.2 | 234 | 149 | 104 | 371 | 7.2 | 5 |
| Nov. 26-30 | 21,074 | 7.7 | .06 | 17 | 7.6 | 6.9 | | 21 | 58 | 5.1 | .1 | 4.6 | 130 | 74 | 56 | 203 | 6.9 | 5 |
| Dec. 1-10 | 12,050 | 7.5 | .02 | 26 | 10 | 1.8 | | 20 | 79 | 5.4 | .1 | 4.2 | 153 | 106 | 90 | 243 | 6.7 | 4 |
| Dec. 11-20 | 4,591 | 8.2 | .02 | 27 | 12 | 3.7 | | 25 | 67 | 6.5 | .1 | 5.2 | 182 | 117 | 96 | 285 | 6.8 | 3 |
| Dec. 21-31 | 1,861 | 9.4 | .05 | 34 | 16 | 9.5 | | 36 | 116 | 9.2 | .1 | 9.7 | 244 | 151 | 121 | 359 | 6.8 | 5 |
| Jan. 1-10, 1951 | 2,485 | 8.5 | .06 | 32 | 15 | 5.7 | | 37 | 100 | 9.2 | .1 | 7.9 | 222 | 142 | 111 | 332 | 6.9 | 5 |
| Jan. 11-20 | 4,779 | 7.3 | .08 | 24 | 11 | 6.3 | | 36 | 68 | 8.0 | .1 | 8.7 | 167 | 105 | 76 | 257 | 6.9 | 6 |
| Jan. 21-31 | 5,436 | 5.0 | .05 | 22 | 9.7 | 7.9 | | 30 | 70 | 6.5 | .1 | 6.4 | 151 | 95 | 70 | 241 | 6.8 | 4 |
| Feb. 1-10 | 8,415 | 4.6 | .07 | 22 | 9.6 | 4.6 | | 26 | 66 | 6.0 | .1 | 7.0 | 142 | 94 | 73 | 230 | 6.8 | 3 |
| Feb. 11-20 | 5,109 | 5.5 | .06 | 24 | 11 | 4.4 | | 31 | 72 | 6.0 | .2 | 6.7 | 155 | 105 | 80 | 250 | 6.9 | 3 |
| Feb. 21-28 | 7,221 | 11 | .09 | 22 | 9.5 | 4.1 | | 33 | 60 | 5.4 | .1 | 6.9 | 144 | 94 | 67 | 224 | 7.2 | 3 |
| Mar. 1-10 | 4,389 | 12 | .06 | 25 | 12 | 4.6 | | 39 | 72 | 6.4 | .1 | 6.9 | 169 | 112 | 80 | 258 | 7.4 | 2 |
| Mar. 11-20 | 3,750 | 12 | .06 | 26 | 12 | 6.8 | | 43 | 75 | 7.2 | .0 | 6.9 | 178 | 114 | 79 | 275 | 7.5 | 1 |
| Mar. 21-31 | 5,253 | 11 | .07 | 23 | 10 | 5.6 | | 38 | 63 | 6.0 | .0 | 6.7 | 150 | 98 | 67 | 240 | 7.3 | 3 |
| Apr. 1-10 | 4,425 | 8.7 | .05 | 23 | 11 | 5.2 | | 33 | 71 | 6.4 | .1 | 4.6 | 170 | 103 | 76 | 257 | 7.0 | 2 |
| Apr. 11-20 | 5,172 | 8.6 | .08 | 24 | 10 | 6.0 | | 37 | 68 | 6.1 | .2 | 4.8 | 162 | 101 | 71 | 250 | 7.1 | 3 |
| Apr. 21-30 | 2,940 | 7.7 | .05 | 27 | 12 | 6.6 | | 42 | 79 | 7.6 | .1 | 4.3 | 188 | 117 | 82 | 281 | 7.3 | 3 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| May 1-10 | 2,023 | 6.5 | .08 | 28 | 13 | 7.4 | 48 | 82 | 7.9 | .2 | 3:8 | 200 | 123 | 84 | 304 | 7.3 | 3 |
| May 11-20 | 1,361 | 6.6 | .04 | 33 | 15 | 11 | 60 | 95 | 9.8 | .2 | 6.6 | 216 | 144 | 95 | 344 | 7.2 | 3 |
| May 21-31 | 1,290 | 7.2 | .04 | 34 | 17 | 8.3 | 65 | 95 | 10 | .2 | 7.4 | 226 | 155 | 102 | 358 | 7.4 | 5 |
| June 1-10 | 1,138 | 8.9 | .03 | 34 | 16 | 9.5 | 64 | 95 | 9.5 | .2 | 7.4 | 226 | 151 | 98 | 355 | 7.4 | 4 |
| June 11-20 | 1,425 | 12 | .03 | 34 | 16 | 8.9 | 62 | 96 | 10 | .1 | 6.1 | 238 | 151 | 100 | 375 | 7.7 | 4 |
| June 21-30 | 1,385 | 9.8 | .02 | 35 | 17 | 6.7 | 62 | 98 | 10 | .1 | 5.7 | 237 | 157 | 106 | 376 | 7.4 | 4 |
| July 1-10 | 1,504 | 11 | .02 | 29 | 13 | 6.5 | 56 | 75 | 7.5 | .1 | 6.3 | 195 | 126 | 80 | 315 | 7.4 | 3 |
| July 11-20 | 1,253 | 8.2 | .07 | 32 | 15 | 8.3 | 60 | 88 | 9.8 | .1 | 6.0 | 218 | 142 | 92 | 354 | 7.5 | 5 |
| July 21-31 | 1,480 | 10 | .03 | 32 | 16 | 7.6 | 59 | 99 | 4.5 | .1 | 5.2 | 228 | 146 | 97 | 366 | 7.3 | 5 |
| Aug. 1-10 | 921 | 7.8 | .01 | 34 | 19 | 13 | 30 | 137 | 14 | .1 | 5.1 | 266 | 163 | 138 | 388 | 7.5 | 4 |
| Aug. 11-20 | 1,312 | 8.1 | .03 | 37 | 20 | 20 | 38 | 157 | 14 | .1 | 4.2 | 280 | 175 | 143 | 438 | 7.4 | 4 |
| Aug. 21-31 | 633 | 5.6 | .04 | 36 | 19 | 15 | 42 | 137 | 14 | .1 | 4.2 | 279 | 168 | 134 | 427 | 7.2 | 5 |
| Sept. 1-10 | 771 | 6.6 | .01 | 39 | 19 | 16 | 50 | 139 | 14 | .1 | 4.8 | 282 | 175 | 134 | 446 | 7.6 | 4 |
| Sept. 11-20 | 650 | 5.8 | .03 | 42 | 20 | 18 | 52 | 148 | 18 | .1 | 6.0 | 310 | 187 | 144 | 475 | 7.8 | 4 |
| Sept. 21-30 | 362 | 6.6 | .01 | 45 | 22 | 19 | 57 | 163 | 17 | .1 | 5.2 | 331 | 203 | 156 | 510 | 7.8 | 5 |
| Average | 3,434 | 8.3 | 0.05 | 31 | 14 | 9.1 | 46 | 95 | 9.8 | 0.1 | 6.2 | 213 | 135 | 98 | 332 | 7.2 | 4 |

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BELMONT FILTERS, PHILADELPHIA, PA--Continued

Temperature (°F) of water, water year October 1950 to September 1951

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

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 1951.
EXTREMES, 1950-51.--Sediment concentrations: Maximum daily, 4,010 ppm Nov. 25; minimum daily, 1 ppm on several days.
Sediment loads: Maximum daily, 537,000 tons Nov. 26; minimum daily, 2 tons on several days.
EXTREMES, 1947-51.--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 1950 to September 1951 based on records for Schuylkill River at Philadelphia (Fairmount Dam), which are given in Water-Supply Paper 1202 and includes water diverted by the City of Philadelphia for municipal water supply.

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 | 668 | 11 | 20 | 837 | 15 | 34 | 4,940 | 65 | 867 |
| 2 | 670 | 10 | 18 | 822 | 14 | 31 | 4,220 | 40 | 456 |
| 3 | 654 | 13 | 23 | 791 | 18 | 38 | 3,650 | 25 | 247 |
| 4 | 640 | 18 | 31 | 1,010 | 18 | 49 | 9,270 | 982 | s 56,400 |
| 5 | 611 | 16 | 26 | 2,290 | 52 | 322 | 33,800 | 3,540 | s 320,000 |
| 6 | 598 | 14 | 23 | 3,710 | 38 | 381 | 15,500 | 1,280 | 53,600 |
| 7 | 573 | 12 | 19 | 2,730 | 20 | 147 | 9,680 | 400 | a 10,450 |
| 8 | 585 | 9 | 14 | 2,180 | 13 | 76 | 18,760 | 3,440 | s 191,000 |
| 9 | 638 | 15 | 26 | 1,850 | 17 | 85 | 13,900 | 910 | 34,150 |
| 10 | 928 | 20 | 50 | 1,700 | 7 | 32 | 9,670 | 218 | 5,690 |
| 11 | 2,120 | 24 | 137 | 1,470 | 9 | 36 | 8,110 | 132 | a 2,890 |
| 12 | 1,910 | 23 | 119 | 1,320 | 13 | 46 | 7,440 | 124 | 2,490 |
| 13 | 1,480 | 20 | 80 | 1,230 | 18 | 60 | 6,070 | 90 | a 1,480 |
| 14 | 1,430 | 15 | 58 | 1,170 | 18 | 57 | 5,040 | 48 | 653 |
| 15 | 1,220 | 13 | 43 | 1,180 | 21 | 67 | 4,330 | 24 | a 281 |
| 16 | 1,050 | 11 | 31 | 1,220 | 19 | 63 | 4,380 | 50 | 591 |
| 17 | 991 | 14 | 38 | 1,100 | 13 | 39 | 4,260 | 34 | 391 |
| 18 | 923 | 13 | 32 | 1,180 | 13 | 41 | 3,520 | 20 | 190 |
| 19 | 863 | 10 | 23 | 1,020 | 10 | 28 | 3,110 | 19 | 160 |
| 20 | 844 | 10 | 23 | 972 | 14 | 37 | 2,630 | 16 | a 114 |
| 21 | 800 | 12 | 26 | 995 | 28 | 75 | 2,580 | 8 | 56 |
| 22 | 794 | 14 | 30 | 1,580 | 28 | 119 | 2,470 | 8 | 53 |
| 23 | 1,720 | 24 | 112 | 1,830 | 27 | 133 | 2,340 | 10 | 63 |
| 24 | 2,280 | 27 | 166 | 1,230 | 16 | 53 | 2,340 | 9 | a 57 |
| 25 | 1,500 | 17 | 69 | 29,830 | 4,010 | s 483,000 | 2,320 | 9 | a 56 |
| 26 | 1,120 | 20 | 60 | 59,840 | 3,180 | s 537,000 | 2,140 | 10 | a 58 |
| 27 | 986 | 19 | 50 | 23,270 | 1,120 | 70,400 | 1,490 | 9 | a 36 |
| 28 | 904 | 14 | 34 | 10,290 | 560 | 15,600 | 1,390 | 4 | 15 |
| 29 | 860 | 15 | 35 | 7,500 | 230 | 4,660 | 1,680 | 4 | a 18 |
| 30 | 872 | 17 | 40 | 5,860 | 98 | 1,550 | 2,480 | 8 | 53 |
| 31 | 868 | 17 | 40 | -- | -- | -- | 2,620 | 6 | 42 |
| Total | 32,100 | -- | 1,496 | 172,007 | -- | 1,114,259 | 193,320 | -- | 682,607 |

s Computed by subdividing day.
a Computed from estimated concentration graph.

DELAWARE RIVER BASIN--Continued

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

Suspended sediment, water year October 1950 to September 1951--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 | 2,240 | -- | | 4,300 | 49 | 569 | 4,110 | 17 | 189 |
| 2 | 1,880 | -- | | 11,500 | 792 | s 25,800 | 4,170 | 28 | 315 |
| 3 | 1,810 | -- | | 7,560 | 275 | 5,610 | 4,030 | 25 | 272 |
| 4 | 2,050 | -- | | 5,150 | 76 | 1,060 | 5,280 | 15 | 214 |
| 5 | 3,430 | -- | | 4,710 | 47 | 598 | 6,450 | 48 | 836 |
| 6 | 3,950 | -- | | 4,220 | 40 | 456 | 5,240 | 40 | 566 |
| 7 | 3,460 | -- | | 10,400 | -- | e 30,000 | 4,820 | 42 | 546 |
| 8 | 3,640 | -- | | 24,900 | -- | e 100,000 | 4,680 | 40 | 505 |
| 9 | 2,980 | -- | e 41,350 | 8,440 | 350 | 7,980 | 4,350 | 14 | 164 |
| 10 | 2,490 | -- | | 6,030 | 373 | 6,070 | 3,860 | 16 | 167 |
| 11 | 2,390 | -- | | 4,900 | 140 | 1,850 | 3,480 | 11 | 103 |
| 12 | 2,310 | -- | | 4,510 | 66 | 804 | 3,300 | 9 | 80 |
| 13 | 2,120 | -- | | 4,950 | 49 | 655 | 3,180 | 13 | 112 |
| 14 | 2,120 | -- | | 6,460 | 104 | 1,810 | 3,700 | 22 | 220 |
| 15 | 13,800 | -- | | 5,370 | 76 | 1,100 | 4,730 | 14 | 179 |
| 16 | 9,660 | -- | | 4,260 | 91 | 1,050 | 4,120 | 8 | 89 |
| 17 | 5,970 | -- | | 4,310 | 133 | 1,550 | 3,530 | 56 | 534 |
| 18 | 4,660 | 50 | 629 | 7,420 | 230 | 4,610 | 3,180 | 115 | 987 |
| 19 | 4,040 | 30 | 327 | 5,850 | 148 | 2,340 | 3,120 | 137 | 1,150 |
| 20 | 3,720 | 19 | 191 | 6,190 | 138 | 2,310 | 8,240 | 299 | s 4,830 |
| 21 | 3,510 | 19 | 180 | 10,200 | 661 | s 21,100 | 8,050 | 213 | 4,630 |
| 22 | 3,470 | 15 | 140 | 13,700 | 875 | 32,400 | 6,440 | 280 | 4,870 |
| 23 | 2,970 | 18 | 144 | 8,880 | 480 | 11,500 | 5,580 | 72 | 1,080 |
| 24 | 8,180 | 468 | s 17,400 | 6,940 | 155 | 2,910 | 4,920 | 37 | 491 |
| 25 | 12,090 | 790 | s 27,500 | 5,860 | 104 | 1,650 | 4,510 | 78 | 950 |
| 26 | 8,000 | 275 | 5,940 | 5,240 | 58 | 821 | 3,950 | 93 | 992 |
| 27 | 6,140 | 105 | 1,740 | 4,950 | 72 | 962 | 3,510 | 98 | 929 |
| 28 | 5,170 | 62 | 865 | 4,510 | 37 | 451 | 3,260 | 52 | 458 |
| 29 | 4,900 | 64 | 847 | -- | -- | -- | 3,360 | 145 | 1,320 |
| 30 | 4,820 | 42 | 546 | -- | -- | -- | 6,600 | 442 | s 7,840 |
| 31 | 3,900 | 44 | 463 | -- | -- | -- | 10,900 | 481 | s 14,800 |
| Total | 141,870 | -- | 98,262 | 201,710 | -- | 268,016 | 148,650 | -- | 50,418 |

| Day | April | | | May | | | June | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6,440 | 400 | 6,960 | 3,660 | 27 | 267 | 1,280 | 9 | 31 |
| 2 | 5,560 | 51 | 766 | 2,960 | 3 | 24 | 1,130 | 11 | 33 |
| 3 | 6,970 | 174 | s 3,420 | 2,620 | 5 | 35 | 1,150 | 17 | 53 |
| 4 | 5,900 | 80 | 1,270 | 2,370 | 8 | 51 | 2,170 | 26 | 152 |
| 5 | 4,660 | 40 | 503 | 2,260 | 15 | 92 | 2,320 | 32 | 200 |
| 6 | 4,100 | 12 | 133 | 2,150 | 19 | 110 | 1,650 | 18 | 80 |
| 7 | 3,750 | 31 | 314 | 2,020 | 10 | 55 | 1,360 | 14 | 51 |
| 8 | 3,460 | 15 | 140 | 1,920 | 7 | 36 | 1,150 | 8 | 25 |
| 9 | 3,270 | 10 | 88 | 1,760 | 22 | 104 | 1,090 | 15 | 44 |
| 10 | 3,110 | 25 | 210 | 1,570 | 22 | 93 | 1,180 | 12 | 38 |
| 11 | 3,470 | 36 | 337 | 1,880 | 32 | 163 | 1,500 | 20 | 81 |
| 12 | 3,510 | 25 | 237 | 2,440 | 20 | 132 | 1,690 | 25 | 114 |
| 13 | 10,100 | 600 | s 18,000 | 2,220 | 3 | 18 | 1,420 | 9 | 35 |
| 14 | 8,540 | 180 | 4,150 | 1,750 | 6 | 28 | 2,510 | 2 | 14 |
| 15 | 6,700 | 85 | 1,540 | 1,570 | 15 | 64 | 2,750 | 8 | 59 |
| 16 | 5,470 | 35 | 517 | 1,450 | 20 | 78 | 2,010 | 18 | 98 |
| 17 | 4,970 | 27 | 362 | 1,390 | 20 | 75 | 1,600 | 19 | 82 |
| 18 | 4,390 | 31 | 367 | 1,310 | 11 | 39 | 1,390 | 8 | 30 |
| 19 | 3,910 | 35 | 369 | 1,320 | 9 | 32 | 1,310 | 7 | 25 |
| 20 | 3,690 | 29 | 289 | 1,350 | 28 | 102 | 1,140 | 2 | 6 |
| 21 | 3,350 | 11 | 99 | 1,310 | 16 | 57 | 1,140 | 9 | 28 |
| 22 | 3,000 | 25 | 202 | 1,340 | 30 | 109 | 1,020 | 15 | 41 |
| 23 | 3,400 | 20 | 184 | 1,480 | 29 | 116 | 1,220 | 6 | 20 |
| 24 | 4,310 | 31 | 361 | 2,240 | 21 | 127 | 1,740 | 10 | 47 |
| 25 | 3,510 | 30 | 284 | 2,140 | 18 | 104 | 2,010 | 19 | 103 |
| 26 | 3,180 | 17 | 146 | 1,520 | 20 | 82 | 2,000 | 31 | 167 |
| 27 | 2,980 | 9 | 72 | 1,270 | 28 | 96 | 1,720 | 21 | 97 |
| 28 | 2,750 | 9 | 67 | 1,230 | 8 | 27 | 1,390 | 16 | 60 |
| 29 | 2,650 | 9 | 64 | 1,390 | 15 | 56 | 1,510 | 30 | 122 |
| 30 | 3,280 | 21 | 186 | 2,050 | 19 | 105 | 3,340 | 42 | 379 |
| 31 | -- | -- | -- | 1,560 | 10 | 42 | -- | -- | -- |
| Total | 134,380 | -- | 41,637 | 57,500 | -- | 2,519 | 48,890 | -- | 2,315 |

e Estimated.
s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

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

Suspended sediment, water year October 1950 to September 1951--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 | 2,890 | 19 | 148 | 1,940 | 10 | 52 | 705 | 3 | 6 |
| 2 | 2,190 | 29 | 171 | 1,620 | 8 | 35 | 661 | 1 | 2 |
| 3 | 1,860 | 30 | 151 | 1,410 | 25 | 95 | 1,600 | 8 | 35 |
| 4 | 1,530 | 28 | 116 | 1,250 | 32 | 108 | 1,780 | 18 | 86 |
| 5 | 1,870 | 30 | 151 | 1,150 | 20 | 62 | 1,100 | 45 | 134 |
| 6 | 2,490 | 31 | 208 | 1,070 | 3 | 9 | 903 | 5 | 12 |
| 7 | 1,730 | 35 | 164 | 999 | 2 | 5 | 922 | 8 | 20 |
| 8 | 1,350 | 20 | 73 | 950 | 12 | 31 | 1,120 | 9 | 27 |
| 9 | 1,170 | 12 | 38 | 983 | 35 | 93 | 1,120 | 3 | 9 |
| 10 | 1,080 | 8 | 23 | 1,020 | 12 | 33 | 864 | 4 | 9 |
| 11 | 989 | 5 | 13 | 1,480 | 26 | 104 | 788 | 3 | 6 |
| 12 | 961 | 7 | 18 | 1,680 | 25 | 113 | 760 | 2 | 4 |
| 13 | 1,730 | 20 | 93 | 1,600 | 25 | 108 | 767 | 6 | 12 |
| 14 | 2,240 | 19 | 115 | 2,640 | 55 | 392 | 755 | 6 | 12 |
| 15 | 1,220 | 5 | 16 | 1,670 | 23 | 104 | 1,140 | 7 | 22 |
| 16 | 1,020 | 9 | 25 | 1,390 | 21 | 79 | 1,870 | 8 | 36 |
| 17 | 941 | 9 | 23 | 1,360 | 6 | 22 | 1,190 | 2 | 6 |
| 18 | 1,490 | 20 | 80 | 1,780 | 7 | 34 | 949 | 2 | 5 |
| 19 | 1,790 | 10 | 48 | 1,420 | 13 | 50 | 848 | 1 | 2 |
| 20 | 3,430 | 10 | 93 | 1,350 | 48 | 175 | 794 | 3 | 6 |
| 21 | 2,170 | 5 | 29 | 1,520 | 12 | 49 | 744 | 5 | 10 |
| 22 | 1,390 | 7 | 26 | 1,250 | 2 | 7 | 703 | 6 | 11 |
| 23 | 1,190 | 22 | 71 | 1,080 | 9 | 26 | 713 | 1 | 2 |
| 24 | 1,230 | 18 | 60 | 993 | 10 | 27 | 631 | 1 | 2 |
| 25 | 1,300 | 30 | 105 | 926 | 12 | 30 | 678 | 5 | 9 |
| 26 | 1,110 | 8 | 24 | 894 | 3 | 7 | 659 | 4 | 7 |
| 27 | 971 | 2 | 5 | 846 | 1 | 2 | 653 | 5 | 9 |
| 28 | 860 | 2 | 5 | 816 | 2 | 4 | 649 | 5 | 9 |
| 29 | 3,580 | 160 | 1,550 | 785 | 10 | 21 | 607 | 4 | 7 |
| 30 | 3,530 | 50 | 477 | 773 | 39 | 81 | 694 | 6 | 11 |
| 31 | 2,520 | 19 | 129 | 724 | 10 | 20 | -- | -- | -- |
| Total | 53,822 | -- | 4,248 | 39,369 | -- | 1,978 | 27,167 | -- | 528 |

Total discharge for year (cfs-days) ..... 1,250,785
Total load for year (tons) ..... 2,268,283

DELAWARE RIVER BASIN--Continued

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

Particle-size analyses of suspended sediment, November 1950 to January 1951
(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) a | 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. 25, 1950 | 9:00 p.m. | 83,600 | 5,290 | | | | 9 | 17 | 25 | 38 | 47 | 61 | | 86 | 99 | DSWC |
| Nov. 25 | 9:15 p.m. | 85,200 | 5,460 | | | | 8 | 16 | 24 | 36 | 43 | 59 | | 89 | 99 | DSWC |
| Nov. 26 | 7:05 a.m. | 70,200 | 2,080 | | | | 2 | 6 | 10 | 60 | 69 | 78 | | 95 | 99 | DSWC |
| Nov. 26 | 4:45 p.m. | 47,700 | 2,890 | | | | 9 | 16 | 30 | 48 | 56 | 68 | | 87 | 98 | DSWC |
| Dec. 5 | 2:40 p.m. | 37,600 | 1,870 | | | | 10 | 19 | 29 | 39 | 48 | 62 | | 83 | 97 | DSWC |
| Jan. 25, 1951 | 12:50 p.m. | 19,900 | 228 | | | | 14 | 25 | 38 | 53 | 62 | 74 | | 82 | 93 | DSWC |

a Includes diversion for City of Philadelphia water supply.

DELAWARE RIVER BASIN--Continued

BRANDYWINE CREEK AT WILMINGTON, DEL.

LOCATION.--At Henry Clay Bridge, in 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.--Chemical analyses: October 1947 to September 1951
Sediment records: December 1946 to September 1951.
EXTREMES, 1950-51.--Sediment concentrations: Maximum daily, 938 ppm Nov. 25; minimum daily, 1 ppm on several days.
Sediment loads: Maximum daily, 17,300 tons Nov. 25; minimum daily, 1 ton on several days.
EXTREMES, 1946-51.--Sediment concentrations: Maximum daily, 1,220 ppm Nov. 4, 1947; minimum daily, 1 ppm on many 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 discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1202.

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 | 220 | 20 | 12 | 265 | 11 | 8 | 472 | 18 | 23 |
| 2 | 215 | 15 | 9 | 259 | 11 | 8 | 435 | 21 | 25 |
| 3 | 205 | 15 | 8 | 253 | 12 | 8 | 428 | 22 | 25 |
| 4 | 200 | 12 | 7 | 332 | 40 | s64 | 1,120 | 88 | s451 |
| 5 | 195 | 10 | 5 | 514 | 134 | s235 | 1,330 | 132 | 474 |
| 6 | 190 | 15 | 8 | 295 | 22 | 18 | 614 | 24 | 40 |
| 7 | 195 | 15 | 8 | 265 | 14 | 10 | 534 | 18 | 26 |
| 8 | 200 | 13 | 7 | 259 | 7 | 5 | 2,260 | 253 | s1,890 |
| 9 | 241 | 13 | 9 | 253 | 6 | 4 | 990 | 50 | 134 |
| 10 | 472 | 22 | 28 | 247 | 4 | 3 | 710 | 20 | 38 |
| 11 | 330 | 7 | 6 | 241 | 2 | 1 | 726 | 8 | 16 |
| 12 | 259 | 12 | 8 | 235 | 2 | 1 | 686 | 6 | 11 |
| 13 | 253 | 13 | 9 | 235 | 2 | 1 | 590 | 8 | 13 |
| 14 | 225 | 15 | 9 | 235 | 3 | 2 | 550 | 4 | 6 |
| 15 | 215 | 11 | 6 | 230 | 8 | 5 | 542 | 7 | 10 |
| 16 | 210 | 11 | 6 | 235 | 4 | 3 | 638 | 12 | 21 |
| 17 | 205 | 9 | 5 | 247 | 1 | 1 | 566 | 9 | 14 |
| 18 | 205 | 13 | 7 | 241 | 5 | 3 | 502 | 11 | 15 |
| 19 | 205 | 8 | 4 | 230 | 8 | 5 | 465 | 10 | 13 |
| 20 | 200 | 6 | 3 | 235 | 13 | 8 | 442 | 12 | 14 |
| 21 | 190 | 6 | 3 | 358 | 15 | 14 | 428 | 10 | 12 |
| 22 | 195 | 4 | 2 | 323 | 15 | 13 | 428 | 11 | 13 |
| 23 | 1,090 | 162 | s693 | 265 | 12 | 9 | 442 | 10 | 12 |
| 24 | 662 | 64 | 114 | 247 | 5 | 3 | 450 | 6 | 7 |
| 25 | 407 | 16 | 18 | 4,280 | 938 | s17,300 | 450 | 6 | 7 |
| 26 | 337 | 7 | 6 | 5,590 | 251 | s5,080 | 407 | 6 | 7 |
| 27 | 302 | 5 | 4 | 1,010 | 38 | 104 | 330 | 8 | 7 |
| 28 | 283 | 6 | 5 | 694 | 10 | 19 | 360 | 24 | 23 |
| 29 | 277 | 6 | 5 | 582 | 8 | 13 | 450 | 8 | 10 |
| 30 | 283 | 5 | 4 | 518 | 8 | 11 | 526 | 10 | 14 |
| 31 | 271 | 6 | 4 | -- | -- | -- | 495 | 6 | 8 |
| Total | 8,937 | -- | 1,022 | 19,173 | -- | 22,959 | 19,366 | -- | 3,379 |

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

BRANDYWINE CREEK AT WILMINGTON, DELAWARE--Continued

Suspended sediment, water year October 1950 to September 1951--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 | 442 | 11 | 13 | 814 | 15 | 33 | 622 | 14 | 24 |
| 2 | 400 | 10 | 11 | 1,630 | 126 | s552 | 662 | 14 | 25 |
| 3 | 407 | 12 | 13 | 700 | 25 | 47 | 606 | 14 | 23 |
| 4 | 480 | 10 | 13 | 560 | 18 | 27 | 822 | 20 | 44 |
| 5 | 550 | 11 | 16 | 566 | 7 | 11 | 726 | 24 | 47 |
| 6 | 450 | 9 | 11 | 534 | 5 | 7 | 606 | 20 | 33 |
| 7 | 450 | 10 | 12 | 1,910 | 563 | s6,400 | 590 | 15 | 24 |
| 8 | 510 | 11 | 15 | 2,820 | 662 | s7,800 | 566 | 18 | 28 |
| 9 | 372 | 9 | 9 | 862 | 105 | 244 | 534 | 21 | 30 |
| 10 | 379 | 8 | 8 | 686 | 26 | 48 | 502 | 16 | 22 |
| 11 | 386 | 8 | 8 | 638 | 8 | 14 | 495 | 16 | 21 |
| 12 | 372 | 12 | 12 | 646 | 12 | 21 | 502 | 13 | 18 |
| 13 | 351 | 8 | 8 | 766 | 15 | 31 | 502 | 10 | 14 |
| 14 | 358 | 30 | 29 | 878 | 14 | 33 | 670 | 14 | 25 |
| 15 | 3,000 | 508 | s4,920 | 670 | 10 | 18 | 678 | 16 | 29 |
| 16 | 974 | 112 | 294 | 590 | 6 | 10 | 574 | 11 | 17 |
| 17 | 566 | 29 | 44 | 838 | 114 | 258 | 526 | 10 | 14 |
| 18 | 502 | 10 | 14 | 1,150 | 270 | 838 | 495 | 10 | 13 |
| 19 | 480 | 6 | 8 | 718 | 43 | 83 | 570 | 38 | 59 |
| 20 | 480 | 5 | 7 | 782 | 24 | 51 | 2,050 | 285 | s1,600 |
| 21 | 480 | 8 | 10 | 1,850 | 247 | s2,050 | 990 | 52 | 139 |
| 22 | 435 | 10 | 12 | 1,630 | 530 | 2,330 | 774 | 14 | 29 |
| 23 | 393 | 16 | 17 | 966 | 60 | 157 | 678 | 9 | 16 |
| 24 | 1,110 | 76 | s313 | 790 | 37 | 79 | 654 | 7 | 12 |
| 25 | 1,030 | 88 | 245 | 718 | 35 | 68 | 606 | 10 | 16 |
| 26 | 598 | 32 | 52 | 686 | 29 | 54 | 566 | 11 | 17 |
| 27 | 502 | 18 | 24 | 670 | 29 | 52 | 534 | 14 | 20 |
| 28 | 502 | 14 | 19 | 630 | 23 | 39 | 526 | 16 | 23 |
| 29 | 550 | 12 | 18 | -- | -- | -- | 622 | 21 | 35 |
| 30 | 614 | 15 | 25 | -- | -- | -- | 990 | 49 | 131 |
| 31 | 488 | 17 | 22 | -- | -- | -- | 1,030 | 115 | 319 |
| Total | 18,611 | — | 6,222 | 26,698 | -- | 21,355 | 21,268 | -- | 2,867 |
| | April | | | May | | | June | | |
| 1 | 694 | 13 | 24 | 480 | 13 | 17 | 283 | 3 | 2 |
| 2 | 646 | 6 | 10 | 450 | 10 | 12 | 283 | 1 | 1 |
| 3 | 1,150 | 28 | 87 | 421 | 12 | 14 | 289 | 2 | 2 |
| 4 | 862 | 13 | 30 | 435 | 12 | 14 | 372 | 4 | 4 |
| 5 | 702 | 3 | 6 | 428 | 12 | 14 | 534 | 8 | 12 |
| 6 | 638 | 1 | 2 | 414 | 8 | 9 | 379 | 10 | 10 |
| 7 | 606 | 3 | 5 | 407 | 8 | 9 | 302 | 7 | 6 |
| 8 | 580 | 2 | 3 | 393 | 9 | 10 | 277 | 12 | 9 |
| 9 | 560 | 10 | 15 | 379 | 7 | 7 | 300 | 11 | 9 |
| 10 | 580 | 12 | 19 | 365 | 5 | 5 | 470 | 8 | 10 |
| 11 | 620 | 8 | 13 | 421 | 3 | 3 | 540 | 6 | 9 |
| 12 | 660 | 10 | 18 | 694 | 21 | 39 | 358 | 2 | 2 |
| 13 | 2,200 | 730 | 4,340 | 472 | 14 | 18 | 330 | 5 | 5 |
| 14 | 960 | 150 | 389 | 386 | 9 | 9 | 1,000 | 88 | s275 |
| 15 | 740 | 46 | 92 | 365 | 8 | 8 | 510 | 55 | 76 |
| 16 | 660 | 11 | 20 | 344 | 6 | 6 | 372 | 16 | 16 |
| 17 | 680 | 6 | 11 | 323 | 6 | 5 | 309 | 14 | 12 |
| 18 | 620 | 4 | 7 | 316 | 12 | 10 | 277 | 15 | 11 |
| 19 | 640 | 6 | 10 | 316 | 10 | 9 | 259 | 12 | 8 |
| 20 | 600 | 5 | 8 | 330 | 13 | 12 | 247 | 14 | 9 |
| 21 | 560 | 18 | 27 | 344 | 9 | 8 | 235 | 12 | 8 |
| 22 | 540 | 26 | 38 | 316 | 5 | 4 | 230 | 5 | 3 |
| 23 | 740 | 22 | 44 | 372 | 6 | 6 | 330 | 6 | 5 |
| 24 | 620 | 24 | 40 | 870 | 36 | 85 | 309 | 7 | 6 |
| 25 | 540 | 21 | 31 | 472 | 17 | 22 | 265 | 5 | 4 |
| 26 | 520 | 14 | 20 | 351 | 12 | 11 | 241 | 4 | 3 |
| 27 | 500 | 22 | 30 | 337 | 10 | 9 | 215 | 6 | 4 |
| 28 | 490 | 22 | 29 | 330 | 15 | 13 | 302 | 13 | 11 |
| 29 | 500 | 21 | 28 | 379 | 12 | 12 | 498 | 78 | s224 |
| 30 | 500 | 21 | 28 | 407 | 19 | 21 | 766 | 260 | s571 |
| 31 | -- | -- | -- | 316 | 14 | 12 | -- | -- | -- |
| Total | 20,908 | -- | 5,424 | 12,633 | -- | 433 | 11,082 | -- | 1,327 |

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

BRANDYWINE CREEK AT WILMINGTON, DELAWARE--Continued

Suspeuded sediment, water year October 1950 to September 1951--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------ | 379 | 87 | 89 | 190 | 25 | 13 | 121 | 28 | 9 |
| 2------ | 323 | 37 | 32 | 176 | 25 | 12 | 128 | 25 | 9 |
| 3------ | 247 | 35 | 23 | 162 | 30 | 13 | 171 | 30 | 14 |
| 4------ | 309 | 32 | 27 | 171 | 27 | 12 | 162 | 27 | 12 |
| 5------ | 566 | 60 | 92 | 153 | 20 | 8 | 136 | 23 | 9 |
| 6------ | 309 | 35 | 29 | 153 | 35 | 14 | 136 | 18 | 7 |
| 7------ | 230 | 42 | 26 | 166 | 33 | 15 | 157 | 17 | 7 |
| 8------ | 205 | 50 | 28 | 176 | 26 | 12 | 153 | 25 | 10 |
| 9------ | 195 | 26 | 14 | 185 | 25 | 13 | 124 | 18 | 6 |
| 10------ | 190 | 23 | 12 | 171 | 24 | 11 | 121 | 16 | 5 |
| 11------ | 180 | 25 | 12 | 190 | 20 | 10 | 117 | 15 | 5 |
| 12------ | 180 | 20 | 10 | 185 | 20 | 10 | 121 | 30 | 10 |
| 13------ | 210 | 20 | 11 | 235 | 26 | 16 | 117 | 35 | 11 |
| 14------ | 200 | 20 | 11 | 195 | 27 | 14 | 114 | 37 | 11 |
| 15------ | 176 | 20 | 10 | 225 | 45 | 27 | 309 | 22 | 18 |
| 16------ | 176 | 20 | 10 | 171 | 27 | 21 | 254 | 26 | 18 |
| 17------ | 265 | 29 | 21 | 153 | 38 | 16 | 166 | 21 | 9 |
| 18------ | 495 | 55 | 73 | 132 | 26 | 9 | 140 | 20 | 8 |
| 19------ | 289 | 40 | 31 | 128 | 37 | 13 | 132 | 20 | 7 |
| 20------ | 407 | 43 | 47 | 932 | 211 | s 692 | 128 | 16 | 6 |
| 21------ | 247 | 33 | 22 | 382 | 157 | 162 | 128 | 13 | 5 |
| 22------ | 210 | 28 | 16 | 220 | 63 | 38 | 116 | 16 | 5 |
| 23------ | 200 | 21 | 11 | 171 | 44 | 20 | 124 | 17 | 6 |
| 24------ | 195 | 17 | 9 | 157 | 45 | 19 | 126 | 19 | 7 |
| 25------ | 190 | 24 | 12 | 153 | 45 | 19 | 118 | 20 | 6 |
| 26------ | 176 | 20 | 10 | 153 | 54 | 22 | 117 | 20 | 6 |
| 27------ | 186 | 18 | 9 | 144 | 45 | 17 | 115 | 17 | 5 |
| 28------ | 171 | 21 | 10 | 140 | 64 | 24 | 117 | 15 | 5 |
| 29------ | 304 | 29 | s 26 | 140 | 50 | 19 | 110 | 16 | 5 |
| 30------ | 247 | 35 | 23 | 132 | 53 | 19 | 104 | 13 | 4 |
| 31------ | 205 | 20 | 11 | 128 | 45 | 16 | -- | -- | -- |
| Total- | 7,842 | -- | 767 | 6,169 | -- | 1,317 | 4,182 | -- | 245 |

Total discharge for year (cfs-days) ..... 176,869
Total load for year (tons) ..... 67,317

s Computed by subdividing day.

BRANDYWINE CREEK AT WILMINGTON, DELAWARE--Continued

Particle-size analyses of suspended sediment, November 1950
(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. 26, 1950 | 1:50 a. m. | 3,980 | 660 | 623 | | 20 | 37 | 53 | 70 | 81 | 89 | 97 | | 99 | 100 | BWC |
| Nov. 26 | 2:10 a. m. | 11,040 | 600 | 482 | | 21 | 38 | 52 | 68 | 90 | 97 | 99 | | 100 | | BWC |

## MISCELLANEOUS ANALYSES OF STREAMS IN DELAWARE RIVER BASIN IN PENNSYLVANIA

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| **BUSHKILL CREEK AT SHOEMAKERS** | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 17, 1950 | 40.5 | -- | 3.9 | | 0.02 | | 3.6 | 1.4 | 0.9 | 0.6 | 10 | 6.5 | 1.5 | 0.3 | 0.3 | 31 | 15 | 7 | | 37.8 | 7.0 | 12 |
| Dec. 1 | 474 | 35 | 3.9 | | .02 | | 3.2 | 1.2 | 1.0 | .6 | 5 | 8.6 | 1.8 | .2 | .5 | 34 | 13 | 9 | | 34.5 | 6.1 | 28 |
| Dec. 30 | 189 | 31 | 4.4 | | .01 | | 3.0 | 1.1 | 1.0 | .6 | 5 | 8.3 | 1.5 | .2 | .2 | 30 | 12 | 8 | | 33.0 | 6.4 | 14 |
| Feb. 1, 1951 | 411 | 32 | 2.8 | | .08 | | 2.8 | 1.0 | 3.1 | 1.9 | 5 | 12 | 1.5 | .0 | 2.5 | 31 | 15 | 10 | | 30.9 | 7.1 | 10 |
| Mar. 6 | 371 | 34 | 5.1 | | .01 | | 2.6 | 1.0 | 1.6 | .5 | 5 | 8.6 | 1.0 | .1 | .1 | 25 | 11 | 6 | | 31.8 | 6.6 | 4 |
| Apr. 12 | 382 | 46 | 3.4 | | .01 | | 2.6 | 1.1 | .6 | 1.0 | 5 | 7.2 | .9 | .1 | .4 | 23 | 11 | 7 | | 30.5 | 6.5 | 12 |
| May 17 | 103 | 60 | 3.0 | | .01 | | 2.8 | 1.2 | 1.1 | 1.0 | 7 | 7.5 | 1.0 | .1 | .4 | 24 | 12 | 6 | | 33.0 | 7.0 | 17 |
| June 19 | 148 | 66 | 4.4 | | .01 | | 2.9 | .9 | 2.1 | .6 | 8 | 6.7 | 1.1 | .0 | .7 | 28 | 11 | 4 | | 31.2 | 6.8 | 26 |
| July 31 | 104 | 74 | 4.2 | | .02 | | 3.4 | 1.7 | 1.8 | | 8 | 6.9 | 2.4 | .1 | 2.5 | 33 | 16 | 9 | | 39.7 | 6.9 | 30 |
| **SCHUYLKILL RIVER AT POTTSVILLE** | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 10, 1950 | 121 | 58 | 12 | | -- | | | | | | 0 | 253 | 4.0 | 0.0 | 0.8 | | 248 | 248 | 152 | 544 | 3.70 | 5 |
| Oct. 17 | 54 | 47 | 16 | 17 | 0.78 | 6.2 | 55 | 40 | 9.3 | | 0 | 424 | 6.0 | .0 | 1.0 | 624 | 302 | 302 | 294 | 836 | 3.50 | 5 |
| Oct. 24 | 50 | 51 | 17 | | .84 | | | | | | 0 | 461 | 3.5 | .0 | .5 | | 340 | 340 | 302 | 903 | 3.70 | 2 |
| **SCHUYLKILL RIVER AT MOUNT CARBON** | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 10, 1950 | 138 | 58 | 12 | | -- | | | | | | 0 | 270 | 3.5 | 0.0 | 1.2 | | 256 | 256 | 140 | 550 | 4.35 | 5 |
| Oct. 17 | 61 | 50 | 15 | 8.9 | 0.17 | 6.0 | 68 | 43 | 19 | | 0 | 429 | 8.0 | .0 | 1.1 | 650 | 346 | 346 | 206 | 824 | 4.20 | 5 |
| Oct. 24 | 57 | 52 | 15 | | .12 | | | | | | 4 | 439 | 5.0 | .0 | .5 | | 365 | 362 | 224 | 851 | 4.6 | 3 |
| **SCHUYLKILL RIVER AT PORT CLINTON** | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 10, 1950 | 523 | 59 | 7.3 | | -- | | | | | | 4 | 121 | 6.0 | 0.0 | 2.0 | | 114 | 111 | 32 | 297 | 5.0 | 3 |
| Oct. 17 | 182 | -- | 8.8 | 2.6 | 0.08 | 2.2 | 35 | 19 | 11 | | 2 | 187 | 7.0 | .0 | 1.9 | 296 | 165 | 164 | 102 | 424 | 4.8 | 2 |
| Oct. 24 | 123 | 53 | 7.8 | | .01 | | | | | | 7 | 155 | 4.0 | .0 | 1.5 | | 150 | 144 | 46 | 365 | 5.1 | 2 |
| **SCHUYLKILL RIVER AT HAMBURG** | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 10, 1950 | 988 | 60 | 8.1 | | -- | | | | | | 0 | 182 | 5.0 | 0.0 | 1.9 | | 148 | 148 | 84 | 412 | 4.45 | 3 |
| Oct. 17 | 341 | 55 | 9.9 | 7.1 | 0.36 | 2.8 | 38 | 22 | 9.7 | | 0 | 231 | 5.5 | .0 | 4.1 | 342 | 185 | 185 | 132 | 509 | 4.10 | 15 |
| Oct. 24 | 271 | 54 | 9.6 | | .12 | | | | | | 0 | 226 | 3.5 | .0 | 2.4 | | 180 | 180 | 130 | 499 | 4.40 | 2 |

DELAWARE RIVER BASIN--Continued

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

Chemical analyses, in parts per million, water year October 1950 to September 1951--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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| **SCHUYLKILL RIVER AT BERNE** | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 10, 1950 | 1,020 | 61 | 8.1 | | -- | 2.9 | 39 | 22 | 10 | | 0 | 186 | 3.0 | 0.0 | 0.5 | 348 | 154 | 154 | 82 | 414 | 4.30 | 3 |
| Oct. 17 | 352 | 55 | 10 | 5.5 | 0.25 | | | | | | 0 | 229 | 4.0 | .0 | .8 | | 188 | 188 | 97 | 499 | 4.20 | 15 |
| Oct. 24 | 280 | 54 | 9.8 | | .05 | | | | | | 0 | 228 | 4.0 | .0 | .7 | | 188 | 188 | 116 | 499 | 4.20 | 2 |
| **SCHUYLKILL RIVER AT LEESPORT** | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 10, 1950 | 1,200 | 60 | 8.7 | | -- | 2.6 | 37 | 22 | 9.3 | | 0 | 222 | 4.0 | 0.0 | 0.6 | 323 | 185 | 185 | 106 | 478 | 4.35 | 2 |
| Oct. 17 | 374 | 56 | 10 | 5.6 | 0.21 | | | | | | 0 | 217 | 4.5 | .0 | 1.0 | | 183 | 183 | 85 | 457 | 4.40 | 5 |
| Oct. 24 | 348 | 54 | 10 | | .05 | | | | | | 0 | 233 | 4.0 | .0 | 1.0 | | 192 | 192 | 103 | 501 | 4.5 | 1 |
| **SCHUYLKILL RIVER AT MONOCACY** | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 11, 1950 | 1,350 | 61 | 8.8 | | 0.20 | 1.4 | 37 | 16 | 16 | | 30 | 191 | 9.0 | 0.0 | 3.4 | 255 | 204 | 179 | | 475 | 6.8 | 4 |
| Oct. 18 | 610 | 59 | 8.4 | | | | | | | | 42 | 130 | 11 | .0 | 4.5 | | 158 | 124 | | 385 | 7.1 | 8 |
| Oct. 25 | 650 | 58 | 8.4 | | | | | | | | 38 | 141 | 14 | .0 | 5.2 | | 156 | 125 | | 399 | 7.1 | 8 |
| **SCHUYLKILL RIVER AT SANATOGA** | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 11, 1950 | 1,680 | 61 | 9.4 | | 0.05 | 0.2 | 36 | 14 | 15 | | 44 | 196 | 7.0 | 0.0 | 6.0 | 242 | 223 | 187 | | 498 | 7.1 | 8 |
| Oct. 18 | 798 | 58 | 8.8 | | | | | | | | 48 | 117 | 10 | .0 | 5.0 | | 147 | 108 | | 369 | 7.3 | 7 |
| Oct. 25 | 913 | 57 | 8.7 | | | | | | | | 41 | 123 | 10 | .0 | 6.2 | | 156 | 122 | | 365 | 6.9 | 7 |
| **SCHUYLKILL RIVER ABOVE PHOENIXVILLE** | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 11, 1950 | 1,700 | 62 | 9.5 | | 0.04 | 0.1 | 34 | 14 | 11 | | 66 | 146 | 9.5 | 0.0 | 6.7 | 228 | 186 | 132 | | 441 | 7.1 | 7 |
| Oct. 18 | 819 | 59 | 7.9 | | | | | | | | 45 | 114 | 8.0 | .0 | 5.6 | | 142 | 106 | | 342 | 7.2 | 5 |
| Oct. 25 | 936 | 58 | 8.8 | | | | | | | | 43 | 99 | 9.5 | .0 | 6.7 | | 132 | 97 | | 320 | 7.2 | 8 |
| **SCHUYLKILL RIVER BELOW PHOENIXVILLE** | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 11, 1950 | 1,790 | 63 | 8.9 | | 0.05 | 0.2 | 34 | 13 | 11 | | 64 | 133 | 9.5 | 0.0 | 7.1 | 231 | 174 | 122 | | 417 | 7.3 | 10 |
| Oct. 18 | 872 | 57 | 8.7 | | | | | | | | 45 | 110 | 9.0 | .0 | 5.6 | | 138 | 101 | | 339 | 7.3 | 4 |
| Oct. 25 | 997 | 57 | 9.5 | | | | | | | | 42 | 70 | 9.5 | .0 | 5.3 | | 104 | 70 | | 260 | 7.0 | 9 |

SCHUYLKILL RIVER AT PORT KENNEDY

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 11, 1950 .... | 1,950 | -- | 6.8 | | 0.04 | 0.02 | 32 | 13 | 11 | | 78 | 123 | 13 | 0.0 | 5.8 | | 171 | 107 | | 428 | 7.5 | 10 |
| Oct. 18..... | 932 | 57 | 8.4 | | | | | | | | 50 | 100 | 8.5 | .0 | 5.3 | 213 | 133 | 92 | | 328 | 7.4 | 5 |
| Oct. 25..... | 1,180 | 57 | 8.5 | | | | | | | | 48 | 90 | 10 | .0 | 6.3 | | 130 | 91 | | 315 | 7.1 | 8 |

SCHUYLKILL RIVER AT CONSHOHOCKEN

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 11, 1950 .... | 2,080 | 64 | 5.6 | | 0.07 | 0.2 | 34 | 14 | 14 | | 81 | 126 | 15 | 0.0 | 5.9 | | 178 | 112 | | 436 | 7.5 | 7 |
| Oct. 18..... | 993 | 64 | 8.5 | | | | | | | | 58 | 102 | 12 | .0 | 4.8 | 227 | 142 | 95 | | 354 | 7.4 | 6 |
| Oct. 25..... | 1,260 | 61 | 8.1 | | | | | | | | 58 | 85 | 14 | .0 | 4.9 | | 132 | 84 | | 329 | 7.0 | 10 |

SCHUYLKILL RIVER AT GIRARD AVENUE IN PHILADELPHIA

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 11, 1950 .... | 1,830 | 68 | 3.7 | | 0.08 | 0.2 | 35 | 13 | 16 | | 84 | 127 | 17 | 0.0 | 5.5 | | 185 | 116 | | 462 | 7.4 | 10 |
| Oct. 18..... | 635 | 63 | 8.7 | | | | | | | | 66 | 97 | 15 | .0 | 4.8 | 241 | 141 | 87 | | 362 | 7.4 | 10 |
| Oct. 25..... | 1,220 | 61 | 7.4 | | | | | | | | 54 | 85 | 14 | .0 | 6.2 | | 130 | 86 | | 323 | 7.1 | 9 |

SCHUYLKILL RIVER AT PASSYUNK AVENUE IN PHILADELPHIA

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 25, 1950 .... | | | 7.3 | | | | | | | | 80 | 95 | 20 | 0.0 | 0.6 | | 142 | 76 | | 396 | 6.8 | 5 |

WEST BRANCH SCHUYLKILL RIVER AT CRESSONA

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 10, 1950 .... | 41 | 58 | 9.9 | 5.1 | 0.21 | 4.5 | 70 | 42 | 14 | | 0 | 338 | 4.0 | 0.0 | 0.9 | 599 | 316 | 316 | 124 | 699 | 4.05 | 3 |
| Oct. 17..... | 16 | 47 | 10 | | | | | | | | 0 | 397 | 6.0 | .0 | 1.1 | | 347 | 347 | 193 | 796 | 3.95 | 5 |
| Oct. 24..... | 20 | 51 | 10 | | | | | | | | 0 | 347 | 4.0 | .0 | .8 | | 310 | 310 | 148 | 714 | 4.20 | 2 |

LITTLE SCHUYLKILL RIVER ABOVE TAMAQUA

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 10, 1950 .... | 145 | 57 | 5.6 | 1.5 | -- | 0.50 | 8.1 | 3.9 | 4.4 | | 6 | 25 | 3.0 | 0.0 | 1.9 | 87 | 30 | 25 | 14 | 83.3 | 5.9 | 7 |
| Oct. 17..... | 53 | 48 | 7.6 | | 0.20 | | | | | | 2 | 47 | 4.0 | .0 | 3.2 | | 36 | 35 | 38 | 131 | 4.6 | 1 |
| Oct. 24..... | 42 | 50 | 7.6 | | .02 | | | | | | 4 | 54 | 2.5 | .0 | 2.1 | | 40 | 37 | 53 | 149 | 4.6 | 2 |

DELAWARE RIVER BASIN--Continued

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

Chemical analyses, in parts per million, water year October 1950 to September 1951--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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| **LITTLE SCHUYLKILL RIVER AT TAMAQUA** | | | | | | | | | | | | | | | | | | | | | | |
| Dec. 19, 1950 | 86 | 34 | 8.5 | 3.8 | 0.04 | 0.59 | 7.5 | 3.4 | 2.8 | | 0 | 56 | 2.5 | 0.0 | 2.9 | 94 | 33 | 33 | 40 | 168 | 4.15 | 3 |
| Mar. 12, 1951 | 61 | 42 | 6.5 | .25 | .09 | .31 | 6.4 | 2.4 | 2.0 | .3 | 0 | 31 | 2.0 | .0 | 2.9 | 54 | 26 | 26 | 26 | 92.9 | 4.40 | 4 |
| June 19 | 45 | 68 | 7.0 | 2.9 | .03 | .40 | 8.4 | 3.4 | 1.7 | 1.6 | 0 | 52 | 1.5 | .0 | 1.7 | 93 | 35 | 35 | 40 | 155 | 4.40 | 2 |
| Sept. 11 | 28 | 62 | 8.7 | 2.7 | .03 | .62 | 9.0 | 4.1 | 2.5 | -- | 0 | 58 | 2.0 | .0 | 2.6 | 99 | 39 | 39 | -- | 172 | 4.25 | 3 |
| **PANTHER CREEK AT TAMAQUA** | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 10, 1950 | 50 | -- | 22 | -- | -- | -- | -- | -- | -- | -- | 0 | 941 | 8.0 | 0.0 | 1.9 | -- | 720 | 720 | 586 | 1,570 | 3.50 | 8 |
| Oct. 17 | 34 | 56 | 19 | 48 | 1.8 | 11 | 149 | 88 | 25 | -- | 0 | 1,030 | 8.0 | .0 | 1.4 | 1,520 | 734 | 734 | 698 | 1,630 | 3.50 | 10 |
| Oct. 24 | 40 | 54 | 24 | -- | 4.3 | -- | -- | -- | -- | -- | 0 | 1,220 | 6.5 | .0 | 1.0 | -- | 900 | 900 | 810 | 1,950 | 3.35 | 4 |
| Dec. 19 | 64 | 47 | 24 | 50 | 1.0 | 14 | 190 | 131 | 45 | | 0 | 1,360 | 15 | .0 | 1.2 | 2,020 | 1,010 | 1,010 | 784 | 2,190 | 3.40 | 3 |
| Mar. 12, 1951 | 39 | 52 | 27 | 52 | .63 | 13 | 144 | 105 | 19 | 0.8 | 0 | 1,120 | 14 | .0 | 1.2 | 1,770 | 791 | 791 | 364 | 1,870 | 2.40 | 4 |
| June 19 | 42 | 74 | 20 | 43 | 2.8 | 8.7 | 121 | 76 | 10 | 1.4 | 0 | 850 | 12 | .0 | .6 | 1,350 | 614 | 614 | 482 | 1,490 | 3.30 | 4 |
| Sept. 11 | 38 | 63 | 19 | 41 | 1.0 | 9.5 | 132 | 90 | 12 | -- | 0 | 947 | 7.0 | .0 | .7 | 1,360 | 699 | 699 | -- | 1,570 | 3.35 | 3 |
| **LITTLE SCHUYLKILL RIVER BELOW TAMAQUA** | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 10, 1950 | 195 | 59 | 12 | | -- | | | | | | 1 | 320 | 6.0 | 0.0 | 2.0 | | 268 | 267 | 254 | 672 | 4.8 | 10 |
| Oct. 17 | 113 | 53 | 15 | 28 | 6.4 | 7.1 | 71 | 47 | 22 | | 0 | 556 | 7.0 | .0 | 2.0 | 840 | 370 | 370 | 384 | 989 | 3.90 | 3 |
| Oct. 24 | 88 | 52 | 15 | | 1.1 | | | | | | 0 | 526 | 5.0 | .0 | .9 | | 370 | 370 | 382 | 1,000 | 3.70 | 3 |
| **LITTLE SCHUYLKILL RIVER AT PORT CLINTON** | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 10, 1950 | 363 | 60 | 8.7 | | -- | | | | | | 0 | 233 | 5.0 | 0.0 | 2.5 | | 188 | 188 | 116 | 522 | 4.00 | 3 |
| Oct. 17 | 161 | 52 | 11 | 13 | 0.44 | 3.1 | 38 | 23 | 8.6 | | 0 | 276 | 5.0 | .0 | 4.5 | 407 | 189 | 189 | 190 | 591 | 3.80 | 10 |
| Oct. 24 | 154 | 52 | 11 | | .33 | | | | | | 0 | 288 | 4.5 | .0 | 4.1 | | 220 | 220 | 215 | 626 | 4.00 | 2 |
| **WYOMISSING CREEK AT WEST READING** | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 10, 1950 | 9 | -- | 13 | | | | | | | | 169 | 37 | 46 | 0.0 | 1.0 | | 136 | 0 | | 483 | 7.4 | 140 |
| Oct. 17 | 7 | 68 | 11 | | 0.28 | 0.4 | 56 | 18 | 131 | | 214 | 57 | 193 | .0 | 1.0 | 636 | 214 | 38 | | 1,060 | 7.4 | 120 |
| Oct. 24 | 8 | 62 | 13 | | | | | | | | 210 | 31 | 271 | .0 | .5 | | 264 | 92 | | 1,280 | 7.2 | 60 |

### ANGELICA CREEK AT READING

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 10, 1950 .... | 4 | 64 | 14 | | 0.32 | 0.3 | 24 | 9.7 | 8.9 | | 90 | 17 | 7.0 | 0.0 | 0.2 | | 81 | 7 | | 196 | 7.0 | 15 |
| Oct. 17..... | 3 | 60 | 14 | | | | | | | | 94 | 19 | 11 | .0 | .6 | 156 | 100 | 23 | | 227 | 6.8 | 60 |
| Oct. 24..... | 5 | 59 | 13 | | | | | | | | 91 | 16 | 8.5 | .0 | .3 | | 88 | 12 | | 213 | 6.8 | 25 |

### SCHUYLKILL RIVER BELOW READING

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 10, 1950 .... | 1,840 | 65 | 9.0 | | 0.19 | 1.3 | 38 | 17 | 16 | | 25 | 218 | 6.0 | 0.0 | 3.5 | | 231 | 210 | | 517 | 6.7 | 5 |
| Oct. 17..... | 770 | 59 | 8.1 | | | | | | | | 45 | 149 | 12 | .0 | 4.2 | 286 | 165 | 128 | | 393 | 6.7 | 30 |
| Oct. 24..... | 955 | 59 | 8.1 | | | | | | | | 51 | 144 | 11 | .0 | .2 | | 176 | 134 | | 427 | 6.8 | 25 |

### ANTIETAM CREEK AT LORANE

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 11, 1950 .... | 4 | 55 | 17 | | 0.12 | 0.2 | 32 | 16 | 20 | | 119 | 22 | 18 | 0.0 | 4.5 | | 118 | 20 | | 294 | 7.7 | 10 |
| Oct. 18..... | 3 | 48 | 14 | | | | | | | | 152 | 27 | 19 | .0 | 6.0 | 212 | 146 | 21 | | 357 | 7.8 | 10 |
| Oct. 25..... | 8 | 54 | 17 | | | | | | | | 124 | 26 | 17 | .0 | 5.3 | | 132 | 30 | | 317 | 7.1 | 5 |

### MANATAWNY CREEK AT POTTSTOWN

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 11, 1950 .... | 50 | 57 | 14 | | 0.04 | 0.0 | 31 | 11 | 7.1 | | 90 | 20 | 5.0 | 0.0 | 2.8 | | 90 | 16 | | 210 | 7.6 | 20 |
| Oct. 18..... | 45 | -- | 10 | | | | | | | | 127 | 19 | 4.5 | .0 | 4.1 | 148 | 123 | 19 | | 255 | 7.8 | 7 |
| Oct. 25..... | 74 | 55 | 14 | | | | | | | | 88 | 23 | 8.0 | .0 | 2.8 | | 93 | 21 | | 215 | 7.5 | 15 |

### PERKIOMEN CREEK AT OAKS

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 11, 1950 .... | 142 | 62 | 6.0 | | 0.03 | 0.2 | 24 | 8.7 | 15 | | 104 | 31 | 9.5 | 0.0 | 0.5 | | 100 | 15 | | 251 | 7.8 | 9 |
| Oct. 18..... | 50 | 57 | 8.4 | | | | | | | | 90 | 34 | 11 | .0 | .6 | 146 | 96 | 22 | | 245 | 8.2 | 10 |
| Oct. 25..... | 170 | 56 | 9.5 | | | | | | | | 88 | 32 | 12 | .1 | 1.6 | | 96 | 24 | | 245 | 7.4 | 12 |

### WISSAHICKON CREEK AT PHILADELPHIA

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 11, 1950 .... | 28 | 60 | 9.0 | | 0.06 | 0.2 | 34 | 19 | 18 | | 159 | 36 | 13 | 0 0 | 8.3 | | 158 | 28 | | 369 | 7.9 | 6 |
| Oct. 18..... | 21 | 56 | 10 | | | | | | | | 158 | 40 | 16 | .0 | 7.2 | 230 | 163 | 34 | | 382 | 7.8 | 6 |
| Oct. 25..... | 38 | -- | 8.8 | | | | | | | | 74 | 36 | 12 | .0 | 5.8 | | 96 | 35 | | 248 | 7.2 | 26 |

DELAWARE RIVER BASIN--Continued

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

Chemical analyses, in parts per million, water year October 1950 to September 1951--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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| **MILL CREEK AT MILL CREEK** | | | | | | | | | | | | | | | | | | | | | | |
| Dec. 19, 1950 | 6.8 | 47 | 27 | | 4.0 | 19 | 190 | 109 | 31 | | 0 | 1,250 | 13 | 0.0 | 1.7 | 1,860 | 922 | 922 | 723 | 2,220 | 3.20 | 3 |
| Mar. 12, 1951 | 8.9 | 55 | 28 | | 2.4 | 19 | 170 | 94 | 7.6 | 2.1 | 0 | 1,040 | 18 | .0 | 1.5 | 1,680 | 811 | 811 | 494 | 1,980 | 3.20 | 2 |
| June 19 | .45 | 66 | 17 | | .68 | 7.4 | 123 | 62 | 8.1 | 2.6 | 0 | 682 | 2.5 | .0 | 1.0 | 1,070 | 562 | 562 | 238 | 1,360 | 3.25 | 2 |
| Sept. 11 | .37 | 67 | 26 | | 2.6 | 9.9 | 123 | 68 | 11 | -- | 0 | 729 | 5.0 | .0 | 1.2 | 1,120 | 586 | 586 | -- | 1,470 | 3.10 | 2 |
| **WEST BRANCH SCHUYLKILL RIVER AT POTTSVILLE** | | | | | | | | | | | | | | | | | | | | | | |
| Dec. 19, 1950 | 68 | 38 | 14 | 22 | 0.65 | 6.6 | 80 | 61 | 12 | | 0 | 600 | 3.0 | 0.0 | 1.1 | 884 | 450 | 450 | 335 | 1,260 | 3.50 | 2 |
| Mar. 12 | 50 | 55 | 11 | 10 | .29 | 9.7 | 131 | 107 | 57 | 2.3 | 0 | 931 | 7.0 | .0 | 1.2 | 1,430 | 767 | 767 | 390 | 1,660 | 3.70 | 2 |
| June 19 | 35 | 62 | 12 | 9.8 | .27 | 7.7 | 135 | 108 | 46 | 4.6 | 0 | 902 | 4.0 | .0 | .5 | 1,420 | 781 | 781 | 224 | 1,620 | 3.65 | 2 |
| Sept. 11 | 29 | 69 | 14 | 9.9 | .24 | 12 | 198 | 168 | 80 | -- | 0 | 1,380 | 6.0 | .0 | .5 | 2,020 | 1,180 | 1,180 | -- | 2,190 | 3.80 | 5 |
| **WEST WEST BRANCH OF SCHUYLKILL RIVER AT POTTSVILLE** | | | | | | | | | | | | | | | | | | | | | | |
| Dec. 19, 1950 | 37 | 35 | 11 | 3.1 | 0.09 | 3.3 | 58 | 38 | 7.1 | | 0 | 325 | 1.5 | 0.0 | 0.7 | 494 | 301 | 301 | 66 | 654 | 4.45 | 4 |
| Mar. 12, 1951 | 31 | 49 | 26 | .50 | .18 | 2.3 | 40 | 26 | 8.2 | 3.5 | 6 | 217 | 2.5 | .0 | 1.0 | 342 | 207 | 202 | 54 | 465 | 5.0 | 3 |
| June 19 | 9.0 | 62 | 12 | 2.9 | .06 | 3.5 | 86 | 51 | 15 | 2.7 | 0 | 445 | 2.0 | .0 | 1.8 | 697 | 424 | 424 | 78 | 876 | 4.40 | 3 |
| Sept. 11 | 9.8 | 66 | 12 | 2.6 | .08 | 4.5 | 103 | 59 | 19 | -- | 0 | 528 | 2.0 | .0 | .7 | 767 | 500 | 500 | -- | 978 | 4.40 | 2 |
| **MAIDEN CREEK AT VIRGINVILLE** | | | | | | | | | | | | | | | | | | | | | | |
| Nov. 2, 1950 | 64 | 57 | 6.6 | | 0.04 | 0.00 | 14 | 3.5 | 3.2 | | 42 | 15 | 2.5 | 0.0 | 3.6 | 69 | 49 | 15 | | 115 | 7.5 | 4 |
| Feb. 19, 1951 | 162 | 38 | 6.8 | | .11 | .00 | 9.4 | 2.1 | 3.2 | 4.2 | 13 | 19 | 2.5 | .0 | 5.9 | 54 | 32 | 21 | | 84.0 | 7.1 | 5 |
| May 22 | 44 | 77 | 6.0 | | .01 | .00 | 11 | 3.1 | 3.0 | 1.0 | 34 | 15 | 1.5 | .0 | 3.0 | 55 | 40 | 12 | | 88.9 | 7.7 | 5 |
| Aug. 23 | 60 | 73 | 5.6 | | .11 | .00 | 16 | 4.3 | 3.0 | -- | 42 | 23 | 2.5 | .0 | 5.1 | 81 | 58 | 23 | | 120 | 7.1 | 3 |
| **SACONY CREEK AT VIRGINVILLE** | | | | | | | | | | | | | | | | | | | | | | |
| Nov. 2, 1950 | 11 | 57 | 5.5 | | 0.63 | 0.09 | 27 | 5.7 | 7.3 | | 90 | 20 | 5.5 | 0.0 | 5.4 | 122 | 91 | 17 | | 215 | 7.7 | 6 |
| Feb. 19, 1951 | 95 | 40 | 8.8 | | .04 | .00 | 27 | 5.5 | 4.4 | 3.3 | 68 | 23 | 2.5 | .0 | 10 | 115 | 90 | 34 | | 195 | 7.7 | 5 |
| May 22 | 35 | 73 | 7.9 | | .02 | .00 | 34 | 7.1 | 2.1 | 6.4 | a110 | 22 | 4.0 | .0 | 6.3 | 149 | 114 | 24 | | 231 | 8.8 | 5 |
| Aug. 23 | 38 | 68 | 6.6 | | .12 | .00 | 34 | 7.2 | 3.1 | -- | 103 | 22 | 5.5 | .0 | 7.3 | 156 | 114 | 30 | | 241 | 7.6 | 3 |

a Includes equivalent of 10 parts per million as carbonate ($CO_3$).

## TULPEHOCKEN CREEK AT BERNVILLE

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nov. 2, 1950 | 50 | 57 | 4.6 | | 0.02 | 0.00 | 50 | 14 | 4.6 | | 184 | 26 | 4.5 | 0.0 | 10 | 203 | 182 | 32 | | 360 | 8.2 | 2 |
| Feb. 20, 1951 | 173 | 43 | 7.3 | | .17 | .00 | 51 | 11 | .4 | 1.9 | 158 | 29 | 3.5 | .0 | 11 | 210 | 172 | 43 | | 340 | 7.9 | 20 |
| May 25 | 86 | 54 | 8.2 | | .02 | .00 | 53 | 14 | 4.2 | | b190 | 28 | 4.5 | .0 | 9.0 | 231 | 190 | 34 | | 376 | 8.0 | 5 |
| Aug. 27 | 17 | 70 | 5.6 | | .05 | -- | 54 | 16 | 3.1 | | 196 | 28 | 5.5 | .0 | 12 | 226 | 201 | 40 | | 390 | 7.9 | 10 |

## NORTHKILL CREEK AT BERNVILLE

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nov. 2, 1950 | 28 | 58 | 7.3 | | 0.03 | 0.10 | 11 | 3.3 | 6.4 | | 47 | 10 | 3.0 | 0.0 | 2.1 | 66 | 41 | 2 | | 102 | 7.3 | 9 |
| Feb. 20, 1951 | 76 | 41 | 7.7 | | .05 | .00 | 8.8 | 2.4 | 3.3 | 5.6 | 21 | 14 | 2.5 | .0 | 5.5 | 52 | 32 | 15 | | 82.3 | 7.2 | 6 |
| May 25 | 16 | 54 | 6.3 | | .02 | .00 | 13 | 3.6 | 1.3 | 5.4 | 51 | 13 | 2.0 | .0 | 2.5 | 70 | 47 | 5 | | 109 | 7.0 | 8 |
| Aug. 27 | 6.7 | 69 | 5.4 | | .01 | -- | 14 | 4.0 | 3.5 | | 53 | 9.4 | 2.0 | .0 | 3.7 | 69 | 51 | 8 | | 122 | 7.5 | 8 |

## TULPEHOCKEN CREEK NEAR READING

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 10, 1950 | 253 | 61 | 8.3 | | 0.03 | 0.00 | 39 | 10 | 6.2 | | 135 | 25 | 5.5 | 0.0 | 9.3 | 178 | 138 | 28 | | 293 | 7.4 | 7 |
| Nov. 21 | -- | 44 | 7.6 | | .03 | .00 | 39 | 9.6 | 5.2 | | 133 | 23 | 5.0 | .0 | 10 | 166 | 137 | 28 | | 286 | 7.4 | 4 |
| Jan. 11, 1951 | 316 | 34 | 8.9 | | .03 | .00 | 40 | 9.4 | 6.5 | | 132 | 25 | 5.0 | .0 | 14 | 176 | 138 | 30 | | 285 | 7.8 | 4 |
| Jan. 25 | 805 | 34 | 9.4 | | .14 | .00 | 29 | 6.6 | 1.9 | | 83 | 21 | 4.0 | .0 | 10 | 132 | 100 | 32 | | 212 | 7.7 | 10 |
| Feb. 20 | 680 | 42 | 7.7 | | .06 | .00 | 34 | 6.8 | 3.0 | 4.5 | 94 | 23 | 3.5 | .0 | 11 | 143 | 113 | 36 | | 239 | 7.9 | 5 |
| Mar. 14 | 488 | 43 | 9.8 | | .13 | .00 | 40 | 11 | 4.8 | -- | 136 | 25 | 5.5 | .0 | 14 | 174 | 145 | 34 | | 300 | 7.1 | 5 |
| Apr. 12 | 326 | 53 | 7.7 | | .02 | .00 | 38 | 8.7 | 5.9 | 4.3 | 126 | 22 | 3.5 | .0 | 10 | 162 | 131 | 27 | | 272 | 7.5 | 4 |
| May 10 | 219 | 65 | 7.0 | | .01 | .00 | 43 | 12 | 4.7 | 4.2 | 156 | 22 | 4.5 | .0 | 9.3 | 189 | 157 | 29 | | 315 | 7.6 | 5 |
| June 26 | 154 | 70 | 10 | | .01 | .00 | 42 | 11 | 6.1 | -- | 160 | 21 | 5.0 | .0 | 11 | 205 | 150 | 19 | | 316 | 7.4 | 5 |
| July 26 | 121 | 71 | 7.6 | | .01 | .00 | 46 | 9.2 | 5.8 | -- | 155 | 25 | 5.0 | .0 | 11 | 195 | 153 | 26 | | 333 | 8.0 | 4 |
| Sept. 28 | 113 | 59 | 6.0 | | .01 | .00 | 47 | 13 | 4.7 | | 168 | 27 | 5.0 | .0 | 10 | 197 | 171 | 33 | | 339 | 7.8 | 5 |

## MAIDEN CREEK NEAR READING

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 17, 1950 | -- | 57 | 3.8 | | 0.03 | 0.20 | 28 | 8.3 | 4.5 | -- | 107 | 17 | 3.5 | 0.0 | 3.8 | 128 | 104 | 15 | | 221 | 7.7 | 6 |
| Nov. 21 | -- | 45 | 9.5 | | .03 | .00 | 25 | 9.4 | 4.3 | | 103 | 15 | 3.0 | .0 | 7.7 | 124 | 101 | 17 | | 211 | 8.0 | 5 |
| Jan. 11, 1951 | -- | 36 | 8.8 | | .05 | .00 | 24 | 6.8 | 2.1 | | 72 | 19 | 4.0 | .0 | 10 | 115 | 88 | 29 | | 185 | 7.8 | 5 |
| Jan. 25 | -- | 38 | 8.4 | | .04 | .00 | 19 | 5.1 | 1.5 | | 49 | 19 | 3.0 | .0 | 9.1 | 95 | 68 | 28 | | 150 | 7.6 | 4 |
| Feb. 20 | -- | 39 | 7.9 | | .09 | .00 | 19 | 5.1 | 3.5 | 4.1 | 56 | 18 | 2.0 | .0 | 7.4 | 95 | 68 | 22 | | 155 | 7.6 | 5 |

*b* Includes equivalent of 5 parts per million as carbonate ($CO_3$).

DELAWARE RIVER BASIN--Continued

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

Chemical analyses, in parts per million, water year October 1950 to September 1951--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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| **MAIDEN CREEK NEAR READING--Continued** | | | | | | | | | | | | | | | | | | | | | | |
| Mar. 14, 1951.... | -- | 45 | 8.7 | | 0.10 | 0.00 | 23 | 6.9 | 2.6 | 2.0 | 76 | 18 | 4.0 | 0.0 | 11 | 112 | 86 | 23 | | 184 | 7.5 | 5 |
| Apr. 12 ..... | 305 | 51 | 8.7 | | .01 | .00 | 21 | 6.4 | 3.7 | 2.3 | 74 | 18 | 2.5 | .0 | 7.1 | 106 | 79 | 18 | | 177 | 7.1 | 4 |
| May 10 ..... | -- | 69 | 8.3 | | .02 | .00 | 25 | 7.9 | 3.3 | 1.4 | 89 | 19 | 2.5 | .0 | 6.8 | 119 | 95 | 22 | | 192 | 7.5 | 5 |
| June 26..... | 220 | 70 | 10 | | .04 | .00 | 30 | 12 | 3.6 | -- | 138 | 11 | 4.0 | .0 | 8.0 | 154 | 124 | 11 | | 251 | 7.2 | 10 |
| July 26 ..... | -- | 73 | 7.4 | | .01 | .00 | 25 | 8.7 | 3.2 | -- | 104 | 16 | 3.0 | .0 | 4.1 | 128 | 98 | 13 | | 209 | 7.1 | 5 |
| Sept. 28 ..... | 62 | 63 | 4.4 | | .01 | .00 | 31 | 9.2 | 2.0 | | 115 | 18 | 2.0 | .0 | 4.7 | 133 | 115 | 21 | | 236 | 7.6 | 5 |
| **PICKERING CREEK AT PHOENIXVILLE** | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 10, 1950 .... | 28 | 64 | 17 | | 0.01 | 0.00 | 14 | 4.4 | 5.2 | | 52 | 15 | 3.0 | 0.0 | 2.4 | 94 | 53 | 10 | | 133 | 7.2 | 5 |
| Feb. 19, 1951.... | 48 | 39 | 15 | | .18 | .00 | 11 | 3.8 | 5.1 | 3.2 | 30 | 19 | 3.0 | .0 | 5.3 | 79 | 43 | 18 | | 116 | 7.3 | 10 |
| Apr. 12..... | 48 | 52 | 15 | | .02 | .00 | 13 | 4.3 | 5.4 | 3.8 | 38 | 20 | 3.0 | .0 | 4.3 | 85 | 50 | 19 | | 126 | 6.6 | 5 |
| Aug. 15..... | 19 | 85 | 13 | | .02 | .00 | 14 | 4.4 | 5.9 | 2.6 | 57 | 17 | 3.0 | .0 | 2.2 | 95 | 53 | 6 | | 138 | 7.4 | 6 |
| **PERKIOMEN CREEK AT PERKIOMEN HEIGHTS** | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 10, 1950 .... | 34 | 64 | 17 | | 0.03 | 0.00 | 18 | 6.4 | 7.9 | | 59 | 28 | 5.5 | 0.0 | 3.9 | 121 | 71 | 23 | | 181 | 7.0 | 20 |
| Jan. 18, 1951 .... | 66 | 39 | 15 | | .04 | .00 | 17 | 5.7 | 3.6 | | 44 | 26 | 3.5 | .0 | 7.1 | 104 | 66 | 30 | | 158 | 7.7 | 3 |
| Apr. 12 ..... | 82 | 52 | 14 | | .01 | .00 | 16 | 5.6 | 6.2 | 2.7 | 56 | 23 | 3.0 | .0 | 4.9 | 97 | 63 | 17 | | 155 | 7.3 | 4 |
| Aug. 1 ..... | 37 | 81 | 13 | | .05 | .00 | 21 | 6.8 | 5.9 | 2.1 | 83 | 21 | 1.5 | .0 | 3.8 | 125 | 80 | 12 | | 189 | 7.6 | 7 |

### NORTHWEST BRANCH PERKIOMEN CREEK AT PERKIOMEN HEIGHTS

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 10, 1950 .... | 28 | 63 | 18 | | 0.03 | 0.00 | 15 | 5.4 | 5.8 | | 53 | 19 | 5.0 | 0.0 | 2.4 | 101 | 60 | 16 | 144 | 7.2 | 10 |
| Jan. 18, 1951 .... | 32 | 39 | 14 | | .04 | .00 | 13 | 5.1 | 3.4 | | 36 | 20 | 4.0 | .0 | 6.0 | 90 | 53 | 24 | 132 | 7.5 | 4 |
| Apr. 12..... | 43 | 53 | 13 | | .01 | .00 | 12 | 4.8 | 5.1 | 3.4 | 42 | 16 | 2.5 | .0 | 3.9 | 81 | 50 | 15 | 125 | 7.1 | 5 |
| Aug. 1 ..... | 11 | 80 | 7.3 | | .07 | .00 | 16 | 5.6 | 5.2 | 1.5 | 70 | 14 | 2.0 | .0 | 1.1 | 99 | 63 | 6 | 152 | 7.7 | 8 |

### UNAMI CREEK AT SUMNEYTOWN

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 9, 1950 ..... | 2.6 | 62 | 18 | | 0.02 | 0.00 | 25 | 9.4 | 6.2 | | 86 | 33 | 6.0 | 0.0 | 1.5 | 151 | 101 | 31 | 224 | 7.5 | 10 |
| Jan. 18, 1951 .... | 45 | 36 | 12 | | .04 | .00 | 12 | 4.5 | 4.1 | | 24 | 27 | 5.0 | .0 | 3.3 | 91 | 48 | 29 | 117 | 7.2 | 20 |
| Apr. 10..... | 45 | 55 | 16 | | .11 | .00 | 16 | 6.6 | 4.1 | 0.3 | 49 | 28 | 4.5 | .0 | 3.2 | 108 | 67 | 27 | 160 | 7.5 | 8 |
| Aug. 1 ..... | 13 | 78 | 12 | | .06 | .00 | 15 | 4.8 | 4.4 | 1.0 | 41 | 26 | 2.5 | .0 | 3.1 | 110 | 57 | 24 | 142 | 7.2 | 40 |

### WEST SWAMP CREEK AT ZIEGLERSVILLE

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 9, 1950 ..... | 5.8 | 61 | 3.8 | | 0.01 | 0.00 | 30 | 9.7 | 16 | | 97 | 48 | 12 | 0.0 | 4.1 | 179 | 115 | 35 | 297 | 7.2 | 7 |
| Jan. 18, 1951 .... | 68 | 36 | 15 | | .05 | .00 | 18 | 6.4 | 7.4 | | 39 | 38 | 6.5 | .0 | 8.2 | 121 | 71 | 39 | 187 | 7.3 | 6 |
| Apr. 10..... | 56 | 55 | 12 | | .02 | .00 | 18 | 6.5 | 6.8 | 1.4 | 51 | 34 | 4.5 | .0 | 4.7 | 115 | 72 | 30 | 183 | 6.9 | 5 |
| Aug. 1..... | 6.5 | 81 | 8.3 | | .03 | .00 | 22 | 6.9 | 6.3 | -- | 74 | 29 | 7.0 | .0 | 2.3 | 140 | 83 | 23 | 215 | 7.3 | 8 |

### NORTHEAST BRANCH PERKIOMEN CREEK AT SCHWENKSVILLE

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 9, 1950 ..... | 2.8 | 62 | 2.0 | | 0.02 | 0.00 | 32 | 13 | 22 | | 115 | 58 | 18 | 0.0 | 0.6 | 211 | 133 | 39 | 349 | 7.3 | 10 |
| Jan. 18, 1951 .... | 67 | 37 | 10 | | .05 | .00 | 16 | 7.3 | 8.1 | | 31 | 41 | 8.0 | .0 | 10 | 116 | 70 | 44 | 187 | 7.3 | 4 |
| Apr. 10..... | 40 | 56 | 6.6 | | .01 | .00 | 17 | 8.1 | 8.6 | 1.8 | 44 | 42 | 7.5 | .0 | 6.8 | 126 | 76 | 40 | 205 | 7.0 | 5 |
| Aug. 1..... | 6.6 | 80 | 2.4 | | .02 | .00 | 28 | 11 | 10 | 6.4 | 112 | 37 | 12 | .0 | .3 | 182 | 115 | 23 | 299 | 7.6 | 8 |

### SKIPPACK CREEK AT COLLEGEVILLE

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 9, 1950 ..... | 2.7 | 62 | 2.6 | | 0.02 | 0.00 | 28 | 9.7 | 20 | | 105 | 34 | 22 | 0.1 | 1.0 | 175 | 110 | 24 | 307 | 7.2 | 7 |
| Jan. 18, 1951 .... | 78 | 38 | 12 | | .04 | .00 | 18 | 7.0 | 11 | | 30 | 44 | 11 | .0 | 14 | 140 | 74 | 49 | 214 | 7.5 | 5 |
| Apr. 10..... | 45 | 55 | 8.1 | | .01 | .00 | 17 | 6.8 | 8.7 | 3.4 | 39 | 41 | 9.0 | .0 | 10 | 129 | 70 | 39 | 206 | 6.9 | 5 |
| Aug. 1..... | 1.9 | 79 | 5.5 | | .03 | .00 | 28 | 9.6 | 16 | 3.7 | 117 | 27 | 18 | .0 | .7 | 177 | 109 | 14 | 300 | 7.6 | 6 |

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

Chemical analyses, in parts per million, water year October 1950 to September 1951--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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| **WISSAHICKON CREEK AT RIDGE AVENUE PHILADELPHIA** | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 18, 1950 | -- | 56 | 10 | | 0.06 | 0.00 | 34 | 19 | 18 | -- | 158 | 40 | 16 | 0.0 | 7.2 | 230 | 163 | 34 | | 382 | 7.8 | 6 |
| Jan. 18, 1951 | 121 | 37 | 12 | | .01 | .00 | 23 | 12 | 8.6 | | 74 | 40 | 11 | .0 | 9.6 | 159 | 107 | 46 | | 263 | 7.6 | 5 |
| Apr. 10 | 92 | 54 | 10 | | .01 | .00 | 23 | 12 | 9.8 | 2.7 | 82 | 41 | 10 | .0 | 9.6 | 165 | 107 | 40 | | 266 | 7.4 | 4 |
| July 11 | 22 | 71 | 6.3 | | .03 | .00 | 30 | 18 | 12 | 4.0 | 145 | 36 | 14 | .0 | 7.1 | 211 | 149 | 30 | | 349 | 7.6 | 5 |
| **MONOCACY CREEK AT MONOCACY** | | | | | | | | | | | | | | | | | | | | | | |
| Nov. 3, 1950 | 11 | 51 | 7.8 | | 0.03 | 0.00 | 52 | 12 | 7.0 | | 185 | 30 | 4.5 | 0.0 | 6.3 | 209 | 179 | 28 | | 358 | 7.8 | 5 |
| Feb. 19, 1951 | 33 | 39 | 11 | | .12 | .00 | 34 | 7.0 | 5.4 | 3.5 | 100 | 28 | 4.0 | .0 | 8.6 | 148 | 114 | 32 | | 246 | 7.8 | 8 |
| Apr. 10 | 22 | 54 | 11 | | .15 | .00 | 42 | 10 | 4.9 | 5.3 | 145 | 28 | 4.5 | .0 | 9.9 | 191 | 146 | 27 | | 305 | 7.8 | 5 |
| May 22 | 15 | 67 | 12 | | .02 | .00 | 48 | 11 | 3.6 | 5.8 | 169 | 32 | 4.0 | .0 | 7.8 | 214 | 165 | 26 | | 334 | 7.8 | 4 |
| Aug. 23 | 1.4 | 71 | 8.5 | | .04 | .00 | 46 | 9.7 | 4.6 | -- | 167 | 23 | 5.0 | .0 | 5.1 | 213 | 155 | 18 | | 332 | 8.1 | 8 |
| **LITTLE MANATAWNY CREEK AT PLEASANTVILLE** | | | | | | | | | | | | | | | | | | | | | | |
| Nov. 3, 1950 | 26 | 55 | 16 | | 0.03 | 0.00 | 18 | 7.3 | 6.9 | | 84 | 14 | 3.0 | 0.0 | 2.7 | 107 | 75 | 6 | | 173 | 7.5 | 7 |
| Feb. 19, 1951 | 86 | 39 | 13 | | .03 | .00 | 15 | 5.1 | 5.1 | 2.6 | 51 | 16 | 2.0 | .0 | 5.8 | 85 | 58 | 17 | | 137 | 7.6 | 5 |
| May 22 | 33 | 70 | 17 | | .01 | .00 | 15 | 6.1 | 3.9 | 3.7 | 71 | 11 | 3.5 | .0 | 3.9 | 93 | 63 | 4 | | 139 | 7.6 | 8 |
| Aug. 23 | 22 | -- | 15 | | .10 | .00 | 18 | 8.3 | 3.8 | -- | 83 | 9.6 | 3.0 | .0 | 3.4 | 108 | 79 | 11 | | 171 | 7.4 | 5 |
| **MANATAWNY CREEK NEAR POTTSTOWN** | | | | | | | | | | | | | | | | | | | | | | |
| Nov. 3, 1950 | 50 | 57 | 12 | | 0.02 | 0.00 | 29 | 10 | 5.9 | | 119 | 18 | 5.0 | 0.0 | 3.6 | 144 | 113 | 16 | | 247 | 7.9 | 5 |
| Feb. 19, 1951 | 137 | 39 | 13 | | .10 | .00 | 19 | 6.2 | 3.9 | | 61 | 20 | 4.0 | .0 | 6.2 | 105 | 73 | 23 | | 165 | 7.7 | 10 |
| May 22 | 73 | 69 | 14 | | .03 | .00 | 22 | 7.8 | 5.6 | 4.7 | 94 | 15 | 2.0 | .0 | 4.9 | 130 | 87 | 10 | | 194 | 7.4 | 4 |
| Aug. 23 | 41 | 71 | 9.9 | | .07 | .00 | 26 | 9.9 | 4.1 | -- | 105 | 15 | 4.5 | .0 | 2.7 | 130 | 106 | 20 | | 213 | 7.7 | 3 |
| **FRENCH CREEK ABOVE SOUTH BRANCH AT COVENTRYVILLE** | | | | | | | | | | | | | | | | | | | | | | |
| Nov. 3, 1950 | 20 | 57 | 16 | | 0.06 | 0.00 | 11 | 3.9 | 6.0 | | 48 | 10 | 3.5 | 0.0 | 2.3 | 76 | 44 | 4 | | 112 | 7.3 | 6 |
| Feb. 19, 1951 | 78 | 38 | 14 | | .07 | .00 | 8.2 | 2.8 | 4.3 | 3.4 | 23 | 14 | 2.0 | .0 | 3.1 | 58 | 32 | 13 | | 83.3 | 7.4 | 6 |
| May 22 | 27 | 64 | 18 | | .02 | .00 | 9.5 | 3.3 | 5.3 | 3.4 | 42 | 10 | 2.5 | .0 | 3.6 | 72 | 37 | 3 | | 96.6 | 7.2 | 5 |
| Aug. 23 | 20 | 65 | 17 | | .11 | .00 | 10- | 4.3 | 4.2 | -- | 41 | 9.7 | 3.0 | .0 | 2.5 | 75 | 43 | 9 | | 103 | 7.2 | 4 |

## FRENCH CREEK NEAR PHOENIXVILLE

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 10, 1950 .... | 98 | 62 | 17 | | 0.02 | 0.00 | 12 | 3.5 | 6.0 | | 44 | 13 | 4.0 | 0.0 | 2.8 | 85 | 44 | 8 | | 119 | 7.4 | 10 |
| Nov. 21..... | | 44 | 14 | | .04 | .00 | 13 | 4.3 | 4.9 | | 48 | 11 | 5.5 | .0 | 2.9 | 79 | 50 | 11 | | 123 | 7.7 | 5 |
| Jan. 11, 1951 .... | | 38 | 18 | | .05 | .00 | 11 | 3.3 | 7.4 | | 36 | 14 | 6.0 | .0 | 5.7 | 85 | 41 | 12 | | 111 | 7.5 | 5 |
| Jan. 25..... | | 38 | 11 | | .04 | .00 | 9.2 | 3.6 | 4.2 | | 22 | 18 | 4.5 | .0 | 4.7 | 69 | 38 | 20 | | 100 | 6.9 | 25 |
| Feb. 19..... | | 39 | 14 | | .06 | .00 | 9.8 | 3.1 | 4.6 | 1.2 | 23 | 15 | 4.0 | .0 | 4.6 | 68 | 37 | 18 | | 98 [7] | 7.2 | 8 |
| Mar. 14..... | | 41 | 14 | | .09 | .00 | 10 | 3.6 | 4.4 | 2.5 | 33 | 16 | 4.5 | .0 | 5.9 | 82 | 40 | 13 | | 107 | 7.2 | 5 |
| Apr. 12..... | | 50 | 14 | | .01 | .00 | 9.0 | 3.4 | 5.1 | 3.3 | 32 | 12 | 3.5 | .0 | 3.0 | 67 | 36 | 10 | | 100 | 7.2 | 5 |
| May 24..... | | 68 | 15 | | .01 | .00 | 9.1 | 3.7 | 3.2 | 5.9 | 37 | 13 | 3.0 | .0 | 3.7 | 74 | 38 | 8 | | 101 | 6.6 | 8 |
| June 21..... | | 74 | 17 | | .02 | .00 | 12 | 3.5 | 5.6 | -- | 48 | 12 | 4.0 | .0 | 3.9 | 80 | 44 | 5 | | 113 | 6.9 | 5 |
| July 26..... | | 75 | 10 | | .08 | .00 | 13 | 3.8 | 5.5 | 1.2 | 49 | 9.8 | 3.5 | .0 | 3.1 | 84 | 48 | 8 | | 121 | 7.3 | 7 |
| Sept. 28..... | | 66 | 15 | | .01 | -- | 14 | 4.1 | 5.5 | | 53 | 11 | 5.5 | .0 | 1.3 | 84 | 52 | 8 | | 133 | 7.6 | 7 |

## SUSQUEHANNA RIVER BASIN

### SUSQUEHANNA RIVER AT TOWANDA, PA.

LOCATION.--At Bridge Street Bridge at Towanda, Bradford County, 1¾ miles upstream from Towanda Creek.
DRAINAGE AREA.--7,797 square miles.
RECORDS AVAILABLE.--Sediment records: January to September 1951.
EXTREMES, 1950-51.--Sediment concentrations: Maximum daily, 1,670 ppm Mar. 31; minimum daily, 2 ppm on several days.
Sediment loads: Maximum daily, 417,000 tons Mar. 31; minimum daily, 7 tons on several days.
REMARKS.--Records of specific conductance and pH of daily samplee available in district office at Philadelphia, Pa. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1202.

Suspended sediment, January to September 1951

| 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 | 7,550 | -- | e 10,000 | 9,420 | 31 | 788 | 18,800 | 27 | 1,370 |
| 2 | 7,200 | -- | | 30,800 | 125 | a10,400 | 16,300 | 14 | a616 |
| 3 | 7,020 | -- | | 34,400 | 80 | a7,430 | 14,800 | 17 | a679 |
| 4 | 24,100 | -- | | 26,000 | 45 | a3,160 | 13,900 | 37 | a1,390 |
| 5 | 51,800 | 360 | 50,300 | 17,800 | 35 | a1,680 | 15,600 | 73 | 3,070 |
| 6 | 37,600 | 87 | 8,830 | 15,300 | 30 | 1,240 | 18,800 | 98 | 4,970 |
| 7 | 26,600 | 35 | 2,510 | 18,700 | 55 | a2,780 | 27,200 | 244 | 17,900 |
| 8 | 19,800 | 28 | 1,500 | 25,400 | 105 | a7,200 | 30,800 | 107 | 8,900 |
| 9 | 15,800 | 25 | 1,070 | 20,800 | 90 | a5,050 | 26,000 | 40 | 2,810 |
| 10 | 13,400 | 25 | 904 | 14,400 | 70 | a2,720 | 20,300 | 14 | a767 |
| 11 | 13,000 | 14 | 491 | 11,600 | 60 | a1,880 | 16,000 | 3 | a130 |
| 12 | 13,000 | 11 | 386 | 11,400 | 51 | 1,570 | 13,400 | 3 | a109 |
| 13 | 12,100 | 15 | 490 | 19,000 | 60 | 3,080 | 13,900 | 17 | 638 |
| 14 | 10,600 | 14 | 401 | 39,000 | 212 | 22,300 | 17,600 | 58 | 2,760 |
| 15 | 10,200 | 15 | 413 | 26,600 | 50 | 3,590 | 25,400 | 51 | 3,500 |
| 16 | 13,000 | 20 | 702 | 19,800 | 30 | a1,600 | 23,600 | 26 | 1,660 |
| 17 | 13,900 | 21 | 788 | 16,300 | 24 | 1,060 | 19,800 | 23 | 1,230 |
| 18 | 13,000 | 19 | 667 | 14,800 | 18 | 719 | 16,800 | 16 | a726 |
| 19 | 13,000 | 16 | 562 | 14,800 | 22 | 879 | 17,000 | 22 | 1,010 |
| 20 | 20,300 | 50 | a2,740 | 26,100 | 112 | 7,890 | 25,700 | 99 | 6,870 |
| 21 | 24,200 | 65 | a4,250 | 38,200 | 140 | 14,400 | 30,200 | 61 | 4,970 |
| 22 | 27,200 | 85 | a6,240 | 57,600 | 325 | 50,500 | 24,200 | 23 | 1,500 |
| 23 | 20,300 | 45 | 2,470 | 44,800 | 136 | 16,500 | 19,800 | 10 | 535 |
| 24 | 22,200 | 50 | 3,000 | 30,200 | 75 | a6,120 | 19,800 | 14 | 748 |
| 25 | 33,800 | 117 | a10,700 | 21,800 | 55 | a3,240 | 29,000 | 36 | 2,820 |
| 26 | 27,800 | 50 | 3,750 | 19,300 | 48 | 2,500 | 29,000 | 45 | 3,520 |
| 27 | 20,300 | 31 | 1,700 | 19,300 | 32 | 1,670 | 21,800 | 25 | 1,470 |
| 28 | 15,300 | 19 | 785 | 21,300 | 25 | 1,440 | 18,800 | 15 | 761 |
| 29 | 13,000 | 14 | a491 | -- | -- | -- | 19,800 | 15 | 802 |
| 30 | 11,000 | 12 | a356 | -- | -- | -- | 33,600 | 100 | 9,070 |
| 31 | 9,200 | 13 | a323 | -- | -- | -- | 92,400 | 1,670 | 417,000 |
| Total | 592,370 | -- | 116,819 | 664,920 | -- | 183,386 | 730,100 | -- | 504,301 |

e Estimated.
a Computed from estimated concentration graph.

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT TOWANDA, PA.--Continued

Suspended sediment, January 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 | 90,700 | 470 | 115,000 | 10,600 | 10 | 286 | 4,150 | 11 | 123 |
| 2 | 60,700 | 150 | 24,600 | 9,350 | 6 | 151 | 3,510 | 16 | 152 |
| 3 | 51,600 | 103 | 14,300 | 8,350 | 7 | 158 | 3,110 | 12 | 101 |
| 4 | 39,700 | 65 | 6,970 | 7,550 | 6 | 122 | 2,860 | 8 | 62 |
| 5 | 31,400 | 50 | 4,240 | 7,200 | 6 | 117 | 2,680 | 12 | 87 |
| 6 | 26,600 | 30 | 2,150 | 6,680 | 12 | 216 | 2,540 | 8 | 55 |
| 7 | 22,400 | 22 | 1,330 | 6,150 | 8 | 133 | 2,340 | 8 | 51 |
| 8 | 19,800 | 22 | a1,180 | 5,800 | 4 | 63 | 2,250 | 11 | 67 |
| 9 | 18,300 | 22 | 1,090 | 5,500 | 2 | 30 | 2,090 | 10 | 56 |
| 10 | 16,800 | 25 | 1,130 | 5,200 | 4 | 56 | 2,070 | 6 | 34 |
| 11 | 16,300 | 25 | 1,100 | 5,050 | 3 | 41 | 2,830 | 10 | 76 |
| 12 | 16,300 | 40 | 1,760 | 5,800 | 3 | 47 | 6,680 | 48 | 866 |
| 13 | 34,000 | 360 | 33,000 | 7,550 | 18 | 367 | 5,050 | 22 | 300 |
| 14 | 36,900 | 210 | 20,900 | 8,150 | 11 | 242 | 7,970 | 58 | 1,250 |
| 15 | 30,200 | 40 | 3,260 | 6,850 | 6 | 111 | 10,200 | 64 | 1,760 |
| 16 | 24,200 | 40 | 2,610 | 5,980 | 7 | 113 | 7,950 | 28 | 601 |
| 17 | 19,800 | 27 | 1,440 | 5,200 | 5 | 70 | 5,980 | 15 | a242 |
| 18 | 17,800 | 19 | 913 | 4,900 | 5 | 66 | 5,050 | 10 | a136 |
| 19 | 15,800 | 13 | 555 | 4,600 | 8 | 99 | 4,150 | 10 | a112 |
| 20 | 13,900 | 15 | 563 | 4,450 | 5 | 60 | 3,490 | 9 | 85 |
| 21 | 12,600 | 16 | 544 | 4,150 | 2 | 22 | 2,960 | 2 | 16 |
| 22 | 11,200 | 14 | 423 | 4,000 | 2 | 22 | 2,640 | 6 | 43 |
| 23 | 11,000 | 23 | 683 | 3,860 | 4 | 42 | 2,680 | 15 | 109 |
| 24 | 14,800 | 27 | 1,080 | 3,710 | 7 | 70 | 3,510 | 10 | 95 |
| 25 | 13,400 | 15 | 543 | 3,650 | 8 | 79 | 3,860 | 4 | 42 |
| 26 | 12,600 | 10 | 340 | 3,430 | 5 | 46 | 4,300 | 8 | 93 |
| 27 | 12,600 | 12 | 408 | 3,300 | 6 | 53 | 5,500 | 6 | 89 |
| 28 | 11,600 | 13 | 407 | 3,080 | 5 | 42 | 4,600 | 3 | 37 |
| 29 | 10,800 | 14 | 408 | 3,160 | 5 | 43 | 3,860 | 14 | 146 |
| 30 | 11,000 | 9 | 267 | 3,650 | 8 | 79 | 3,710 | 14 | 140 |
| 31 | -- | -- | -- | 4,450 | 12 | 144 | -- | -- | -- |
| Total | 724,800 | -- | 243,194 | 171,350 | -- | 3,190 | 124,570 | -- | 7,026 |

| Day | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6,030 | 36 | 586 | 4,450 | 15 | 180 | 1,330 | 4 | a14 |
| 2 | 13,000 | 74 | 2,600 | 3,570 | 10 | 96 | 1,280 | 4 | a14 |
| 3 | 11,600 | 24 | 752 | 3,080 | 6 | a50 | 1,280 | 4 | a14 |
| 4 | 8,550 | 20 | 462 | 2,780 | 4 | a30 | 1,320 | 4 | a14 |
| 5 | 7,380 | 23 | 458 | 2,660 | 4 | 29 | 1,560 | 6 | a25 |
| 6 | 8,550 | 38 | 877 | 2,500 | 6 | 40 | 2,360 | 10 | a64 |
| 7 | 7,750 | 36 | 753 | 2,360 | 5 | 32 | 2,170 | 10 | a59 |
| 8 | 7,950 | 19 | 408 | 2,190 | 5 | 30 | 2,050 | 10 | a55 |
| 9 | 6,680 | 11 | a198 | 2,070 | 5 | a28 | 2,210 | 10 | a60 |
| 10 | 5,200 | 6 | a84 | 1,930 | 5 | a26 | 2,300 | 10 | a62 |
| 11 | 4,300 | 3 | a35 | 1,830 | 5 | a25 | 2,250 | 10 | a61 |
| 12 | 5,470 | 8 | a118 | 1,830 | 5 | a25 | 2,000 | 10 | a54 |
| 13 | 13,900 | 468 | 35,100 | 1,830 | 8 | a40 | 1,770 | 8 | a38 |
| 14 | 10,800 | 130 | 3,790 | 1,760 | 10 | 48 | 1,630 | 6 | a26 |
| 15 | 8,750 | 40 | 945 | 1,720 | 10 | 46 | 1,560 | 6 | a25 |
| 16 | 6,500 | 20 | 351 | 2,030 | 11 | 60 | 1,580 | 6 | a26 |
| 17 | 5,050 | 15 | 205 | 3,300 | 10 | 89 | 1,670 | 6 | a27 |
| 18 | 4,600 | 10 | 124 | 3,710 | 10 | 100 | 1,950 | 6 | a32 |
| 19 | 5,350 | 20 | 289 | 3,650 | 10 | a99 | 1,890 | 6 | a31 |
| 20 | 6,850 | 20 | 370 | 3,630 | 10 | a98 | 1,650 | 5 | 22 |
| 21 | 11,600 | 50 | 1,570 | 2,760 | 10 | a75 | 1,510 | 3 | 12 |
| 22 | 9,750 | 27 | 711 | 2,340 | 10 | a63 | 1,430 | 4 | 15 |
| 23 | 7,200 | 25 | 486 | 2,190 | 10 | a59 | 1,380 | 3 | 11 |
| 24 | 5,800 | 18 | 282 | 2,030 | 10 | a55 | 1,300 | 2 | 7 |
| 25 | 5,200 | 12 | 168 | 1,930 | 6 | a31 | 1,270 | 2 | 7 |
| 26 | 4,750 | 11 | 141 | 1,890 | 6 | a31 | 1,240 | 3 | 10 |
| 27 | 4,150 | 13 | 146 | 1,720 | 6 | a28 | 1,270 | 2 | a7 |
| 28 | 3,860 | 19 | 198 | 1,580 | 6 | a26 | 1,350 | 2 | 7 |
| 29 | 4,150 | 32 | 359 | 1,530 | 4 | a17 | 1,330 | 2 | 7 |
| 30 | 5,980 | 40 | 646 | 1,490 | 4 | a16 | 1,360 | 2 | 7 |
| 31 | 5,350 | 9 | 130 | 1,430 | 4 | a15 | -- | -- | -- |
| Total | 222,050 | -- | 53,342 | 73,770 | -- | 1,587 | 49,250 | -- | 813 |

a Computed from estimated concentration graph.

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT TOWANDA, PA.--Continued

Particle-size analyses of suspended sediment, March 1951
(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. 31, 1951..... | 4:00 p. m. | 92,400 | 2,820 | a 5,330 | | 13 | 23 | 29 | 46 | 72 | 94 | 99 | | 100 | | BWC |

a Depth-integrated samples composited into approximately one gallon aliquots to give higher tube concentrations.

## 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 1951.
Water temperatures: October 1944 to September 1951.
EXTREMES, 1950-51.--Hardness: Maximum, 104 ppm Sept. 21-30; minimum, 41 ppm Dec. 1-10.
Specific conductance: Maximum daily, 268 micromhos Sept. 30; minimum daily, 80.0 micromhos Dec. 6.
Water temperatures: Maximum, 83°F July 30, 31; minimum, freezing point on several days in December.
EXTREMES, 1944-51.--Dissolved solids (1944-47): Maximum, 143 ppm Sept. 21-30, 1947; minimum, 58 ppm May 21-31, 1946.
Hardness: Maximum, 105 ppm Sept. 11-20, 1946; minimum, 36 ppm May 21-31, 1946.
Specific conductance: Maximum, 282 micromhos Oct. 21-31, 1947; minimum daily, 80.0 micromhos Dec. 6, 1950.
Water temperatures (1944-49) (1950-51): Maximum, 83°F Aug. 27, 1948, July 30, 31, 1951; 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 discharge for water year October 1950 to September 1951 based on records for Susquehanna River at Wilkes-Barre, which are given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 1-10, 1950 | 2,878 | 4.1 | 0.02 | 29 | 4.9 | -- | | 91 | 17 | 8.0 | | 0.8 | 119 | 92 | 18 | 213 | 7.0 | 5 |
| Oct. 11-20 | 10,788 | -- | -- | -- | -- | -- | | 65 | 17 | 5.2 | | 1.7 | -- | 74 | 21 | 159 | 6.8 | 5 |
| Oct. 21-31 | 4,025 | -- | -- | -- | -- | -- | | 82 | 18 | 6.9 | | .9 | -- | 92 | 25 | 199 | 7.4 | 8 |
| Nov. 1-10 | 9,027 | -- | -- | -- | -- | -- | | 73 | 18 | 7.0 | | 1.4 | -- | 74 | 14 | 184 | 7.3 | 11 |
| Nov. 11-20 | 7,140 | -- | -- | -- | -- | -- | | 68 | 17 | 5.0 | | 1.5 | -- | 69 | 13 | 166 | 7.3 | 8 |
| Nov. 21-30 | 37,036 | -- | -- | -- | -- | -- | | 42 | 14 | 3.5 | | 2.2 | -- | 46 | 12 | 119 | 7.0 | 13 |
| Dec. 1-10 | 55,841 | 3.7 | .42 | 12 | 2.7 | 2.3 | | 31 | 14 | 2.9 | 0.1 | 2.1 | 67 | 41 | 16 | 99.1 | 7.1 | 11 |
| Dec. 11-20 | 22,078 | -- | -- | -- | -- | -- | | 44 | 17 | 3.2 | | 2.6 | -- | 51 | 15 | 131 | 7.3 | 10 |
| Dec. 21-31 | 9,419 | -- | -- | -- | -- | -- | | 62 | 19 | 4.4 | | 3.4 | -- | 68 | 17 | 170 | 7.3 | 9 |
| Jan. 1-10, 1951 | 24,030 | -- | -- | -- | -- | -- | | 44 | 15 | 3.6 | | 3.0 | -- | 49 | 13 | 134 | 7.0 | 7 |
| Jan. 11-20 | 14,542 | -- | -- | -- | -- | -- | | 49 | 16 | 3.8 | | 2.2 | -- | 54 | 14 | 139 | 7.3 | 3 |
| Jan. 21-31 | 25,857 | -- | -- | -- | -- | -- | | 34 | 12 | 3.1 | | 1.8 | -- | 43 | 15 | 110 | 7.2 | 6 |
| Feb. 1-10 | 25,793 | -- | -- | -- | -- | -- | | 37 | 13 | 3.4 | | 2.0 | -- | 43 | 13 | 112 | 7.2 | 9 |
| Feb. 11-20 | 22,154 | -- | -- | -- | -- | -- | | 39 | 13 | 3.8 | | 1.8 | -- | 47 | 15 | 120 | 7.3 | 7 |
| Feb. 21-28 | 37,323 | -- | -- | -- | -- | -- | | 34 | 14 | 3.0 | | 2.2 | -- | 43 | 15 | 106 | 7.1 | 4 |
| Mar. 1-10 | 23,712 | -- | -- | -- | -- | -- | | 41 | 15 | 3.5 | | 2.0 | -- | 48 | 14 | 124 | 7.3 | 6 |
| Mar. 11-20 | 22,515 | -- | -- | -- | -- | -- | | 41 | 15 | 4.8 | | 1.8 | -- | 48 | 14 | 124 | 7.3 | 7 |
| Mar. 21-31 | 32,421 | -- | -- | -- | -- | -- | | 36 | 13 | 2.8 | | 1.8 | -- | 43 | 14 | 105 | 7.2 | 6 |

SUSQUEHANNA RIVER AT FALLS, PA.--Continued

Chemical analyses, in parts per million, water year October 1950 to September 1951--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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Apr. 1-10, 1951 | 47,614 | -- | -- | -- | -- | -- | | 36 | 13 | 2.5 | | 1.9 | -- | 43 | 14 | 104 | 7.2 | 2 |
| Apr. 11-20 | 28,282 | -- | -- | -- | -- | 5.5 | | 43 | 14 | 7.5 | | 1.8 | -- | 50 | 15 | 125 | 7.8 | 8 |
| Apr. 21-30 | 15,324 | -- | -- | -- | -- | 4.9 | | 55 | 14 | 7.0 | | 1.4 | -- | 60 | 15 | 144 | 8.1 | 7 |
| May 1-10 | 9,327 | -- | -- | -- | -- | 4.5 | | 66 | 15 | 5.8 | | 1.1 | -- | 69 | 15 | 162 | 7.7 | 4 |
| May 11-20 | 6,831 | -- | -- | -- | -- | 3.8 | | 75 | 15 | 5.2 | | 1.2 | -- | 77 | 16 | 179 | 7.7 | 3 |
| May 21-31 | 4,259 | -- | -- | -- | -- | 5.7 | | 86 | 16 | 6.6 | | 1.2 | -- | 85 | 15 | 200 | 7.8 | 3 |
| June 1-10 | 3,677 | -- | -- | -- | -- | 7.0 | | 90 | 18 | 6.0 | | 1.4 | -- | 87 | 13 | 205 | 8.1 | 5 |
| June 11-20 | 6,949 | -- | -- | -- | -- | 3.8 | | 74 | 19 | 6.1 | | 1.4 | -- | 82 | 21 | 183 | 7.9 | 5 |
| June 21-30 | 4,734 | -- | -- | -- | -- | 4.8 | | 80 | 17 | 5.9 | | 1.2 | -- | 82 | 16 | 192 | 8.0 | 5 |
| July 1-10 | 8,861 | -- | -- | -- | -- | 4.7 | | 65 | 15 | 4.8 | | 2.1 | -- | 67 | 14 | 159 | 7.8 | 5 |
| July 11-20 | 7,358 | -- | -- | -- | -- | 3.5 | | 65 | 14 | 4.0 | | 1.4 | -- | 67 | 14 | 157 | 7.5 | 8 |
| July 21-31 | 6,586 | -- | -- | -- | -- | 5.7 | | 74 | 14 | 4.2 | | 1.5 | -- | 70 | 9 | 166 | 7.7 | 5 |
| Aug. 1-10 | 3,486 | -- | -- | -- | -- | 4.5 | | 77 | 15 | 5.9 | | .9 | -- | 78 | 15 | 184 | 7.9 | 5 |
| Aug. 11-20 | 2,789 | -- | -- | -- | -- | 5.1 | | 90 | 18 | 5.4 | | 1.1 | -- | 90 | 16 | 210 | 7.8 | 8 |
| Aug. 21-23, 25-31 | 2,423 | -- | -- | -- | -- | 7.9 | | 86 | 18 | 7.8 | | 1.3 | -- | 84 | 14 | 202 | 7.7 | 5 |
| Sept. 1-10 | 1,881 | -- | -- | -- | -- | 6.9 | | 94 | 19 | 9.8 | | 1.6 | -- | 97 | 20 | 225 | 7.7 | 5 |
| Sept. 11-20 | 2,155 | -- | -- | -- | -- | 5.6 | | 94 | 19 | 8.6 | | 1.5 | -- | 98 | 21 | 231 | 8.0 | 4 |
| Sept. 21-30 | 1,547 | -- | -- | -- | -- | 8.6 | | 103 | 21 | 11 | | 1.0 | -- | 104 | 19 | 246 | 8.1 | 3 |
| Average | 15,133 | -- | -- | -- | -- | -- | | 63 | 16 | 5.3 | | 1.7 | -- | 87 | 16 | 161 | 7.5 | 6 |

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT FALLS, PA.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

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

SUSQUEHANNA RIVER BASIN--Continued

LACKAWANNA RIVER AT OLD FORGE, PA.

LOCATION.--At bridge 600 feet upstream from gaging station which is 150 feet upstream from Delaware, Lackawanna & Western Railroad bridge in Old Forge, Lackawanna County, and 0.5 mile upstream from Ascension Brook.
DRAINAGE AREA.--332 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1951.
EXTREMES, 1950-51.--Hardness: Maximum, 620 ppm Sept. 1-10; minimum, 4 ppm Apr. 5.
Specific conductance: Maximum daily, 1,530 micromhos May 22; minimum daily, 57.4 micromhos Apr. 5.
Water temperatures: Maximum, 78°F July 31; minimum, 33°F Feb. 3, 8.
EXTREMES, 1948-51.--Dissolved solids (1948-49): Maximum, 1,280 ppm Oct. 21-31, 1948; minimum, 123 ppm Jan. 5-10, 1949.
Hardness: Maximum, 984 ppm Oct. 21-31, 1948; minimum, 4 ppm Apr. 5, 1951.
Specific conductance: Maximum daily, 1,530 micromhos May 22, 1951; minimum daily, 57.4 micromhos Apr. 5, 1951.
Water temperatures: Maximum, 80°F June 26, 1950; minimum, freezing point Feb. 26, 1950.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| Oct. 1-10, 1950 .. | 130 | 59 | 15 | 9.7 | 1.1 | 0.30 | 109 | 77 | 24 | | 0 | 684 | 6.2 | 0.4 | 0.6 | 1,020 | 589 | 589 | 142 | 1,330 | 3.35 | 4 |
| Oct. 11-20 ..... | 143 | 57 | | | | | | | -- | | -- | 638 | 7.0 | | .6 | | 545 | 545 | 130 | 1,240 | 3.50 | 4 |
| Oct. 21-31 ..... | 148 | 56 | | | | | | | -- | | -- | 635 | 5.1 | | .4 | | 535 | 535 | 142 | 1,240 | 3.40 | 4 |
| Nov. 1, 2, 4 ... | 164 | 64 | | | | | | | -- | | -- | 590 | 12 | | .8 | | 510 | 510 | 156 | 1,180 | 3.55 | 25 |
| Nov. 3, 5 ..... | 346 | 56 | | | | | | | -- | | 66 | 242 | 11 | | .7 | | 310 | 256 | -- | 693 | 6.8 | 5 |
| Nov. 6-10 ..... | 300 | 51 | | | | | | | -- | | -- | 373 | 8 | | .8 | | 340 | 340 | -- | 811 | 3.60 | 5 |
| Nov. 11-19 ..... | 183 | 47 | | | | | | | -- | | -- | 512 | 12 | | .7 | | 460 | 460 | 120 | 1,080 | 3.50 | 8 |
| Nov. 20 ..... | 200 | 48 | | | | | | | -- | | 38 | 309 | 8 | | .9 | | 348 | 317 | -- | 757 | 6.4 | 5 |
| Nov. 21-24 ..... | 273 | 42 | | | | | | | -- | | -- | 378 | 9 | | .9 | | 330 | 330 | 100 | 814 | 3.60 | 6 |
| Nov. 25-27 ..... | 3,737 | 41 | | | | | | | -- | | -- | 85 | 4 | | .5 | | 68 | 68 | 21 | 231 | 4.10 | 8 |
| Nov. 28-30 ..... | 1,201 | 41 | | | | | | | -- | | -- | 206 | 4 | | .8 | | 190 | 190 | 51 | 486 | 3.80 | 10 |
| Dec. 1-3, 9, 10 .. | 1,309 | 40 | | | | | | | -- | | -- | 267 | 5 | | .9 | | 235 | 235 | 68 | 623 | 3.65 | 10 |
| Dec. 4-8 ..... | 3,702 | 40 | | | | | | | -- | | -- | 61 | 4 | | .9 | | 60 | 60 | 13 | 172 | 4.5 | 8 |
| Dec. 11-13, 15-20 | 811 | 39 | | | | | | | -- | | -- | 305 | 6 | | .9 | | 260 | 260 | 74 | 714 | 3.50 | 5 |
| Dec. 14..... | 828 | 40 | | | | | | | -- | | -- | 124 | 4 | | .7 | | 110 | 110 | 24 | 295 | 4.5 | 5 |
| Dec. 21-31 ..... | 388 | 41 | | | | | | | -- | | -- | 501 | 8 | | .9 | | 450 | 450 | 116 | 1,100 | 3.35 | 5 |
| Jan. 1-3, 1951 ... | 321 | 43 | | | | | | | -- | | -- | 505 | 7 | | 1.0 | | 435 | 435 | 122 | 1,100 | 3.35 | 8 |
| Jan. 4-10 ..... | 942 | 35 | | | | | | | -- | | -- | 207 | 5 | | .7 | | 190 | 190 | 46 | 501 | 3.80 | 5 |
| Jan. 11-19..... | 607 | 40 | | | | | | | 10 | | -- | 315 | 8 | | 1.3 | | 268 | 268 | 74 | 711 | 3.60 | 8 |
| Jan. 20..... | 860 | 43 | | | | | | | 20 | | -- | 174 | 5 | | 3.6 | | 148 | 148 | 46 | 424 | 3.90 | 8 |
| Jan. 21, 23, 27-31 | 772 | 36 | | | | | | | 18 | | -- | 212 | 7 | | 2.1 | | 194 | 194 | 61 | 548 | 3.65 | 5 |
| Jan. 22, 24-26 ... | 1,420 | 36 | | | | | | | 11 | | -- | 92 | 5 | | 3.0 | | 82 | 82 | 20 | 242 | 4.25 | 5 |
| Feb. 1, 3-6, 9, 10 | 1,028 | 36 | | | | | | | 19 | | -- | 175 | 7 | | 1.2 | | 152 | 152 | 42 | 432 | 3.90 | 8 |
| Feb. 2, 8..... | 1,900 | 34 | | | | | | | 7.9 | | -- | 65 | 6 | | 1.4 | | 60 | 60 | 14 | 183 | 4.35 | 10 |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Feb. 7 | 1,860 | 35 | | | | | | | 5.2 | 6 | 28 | 3 | | 1.1 | | 28 | 28 | -- | 98.2 | 5.6 | 8 |
| Feb. 11, 12, 15-19 | 891 | 39 | | | | | | | 18 | -- | 209 | 7 | | 1.0 | | 188 | 188 | 52 | 540 | 3.70 | 8 |
| Feb. 13, 14, 20 | 1,177 | 40 | | | | | | | 27 | -- | 163 | 7 | | 1.0 | | 122 | 122 | 30 | 342 | 4.20 | 10 |
| Feb. 21-23 | 2,030 | 37 | | | | | | | 12 | -- | 92 | 6 | | 2.3 | | 80 | 80 | 20 | 246 | 4.25 | 8 |
| Feb. 24-28 | 1,025 | 40 | | | | | | | 21 | -- | 210 | 8 | | 1.0 | | 184 | 184 | 49 | 508 | 3.80 | 5 |
| Mar. 1-10 | 793 | 41 | | | | | | | 31 | -- | 268 | 9 | | 1.0 | | 224 | 224 | 59 | 631 | 3.65 | 5 |
| Mar. 11-20 | 894 | 43 | | | | | | | 21 | -- | 231 | 7 | | 1.0 | | 206 | 206 | 47 | 537 | 3.80 | 8 |
| Mar. 21-29 | 1,185 | 43 | | | | | | | 13 | -- | 168 | 2.4 | | 2.3 | | 152 | 152 | 42 | 428 | 4.05 | 2 |
| Mar. 30, 31 | 2,910 | 46 | | | | | | | 7.8 | -- | 67 | 2.2 | | 2.5 | | 58 | 58 | 22 | 198 | 4.40 | 2 |
| Apr. 1-4 | 1,733 | 44 | | | | | | | 9.9 | -- | 122 | 1.6 | | 2.7 | | 110 | 110 | 28 | 319 | 4.10 | 2 |
| Apr. 5 | 1,130 | 42 | | | | | | | -- | 1 | 10 | -- | | -- | | 4 | 3 | -- | 57.4 | 5.9 | 13 |
| Apr. 6-10 | 832 | 49 | | | | | | | 21 | -- | 244 | 1.8 | | .7 | | 212 | 212 | 58 | 601 | 3.60 | 3 |
| Apr. 11, 12 | 1,160 | 48 | | | | | | | 15 | -- | 174 | 3.5 | | .9 | | 154 | 154 | 40 | 438 | 3.80 | 3 |
| Apr. 13-16 | 2,053 | 45 | | | | | | | 9.9 | -- | 95 | 1.4 | | .9 | | 80 | 80 | 26 | 262 | 4.20 | 2 |
| Apr. 17-20 | 934 | 48 | | | | | | | 19 | -- | 236 | 1.6 | | .5 | | 206 | 206 | 40 | 575 | 3.70 | 1 |
| Apr. 21-30 | 667 | 54 | | | | | | | 27 | -- | 293 | 2.1 | | .6 | | 250 | 250 | 46 | 699 | 3.60 | 1 |
| May 1-10 | 408 | 57 | | | | | | | 33 | -- | 454 | 6.6 | | .3 | | 410 | 410 | 96 | 1,000 | 3.50 | 5 |
| May 11-20 | 320 | 60 | | | | | | | 47 | -- | 598 | 5.2 | | .6 | | 528 | 528 | 124 | 1,260 | 3.40 | 5 |
| May 21-27, 29 | 273 | 61 | | | | | | | 55 | -- | 639 | 6.6 | | .1 | | 554 | 554 | 148 | 1,380 | 3.25 | 3 |
| May 28 | 253 | 59 | | | | | | | 30 | 6 | 461 | 10 | | .4 | | 434 | 429 | -- | 933 | 5.60 | 8 |
| May 30, 31 | 465 | 65 | | | | | | | 28 | -- | 323 | 4.2 | | .3 | | 282 | 282 | 64 | 712 | 3.80 | 5 |
| June 1-10 | 349 | 66 | | | | | | | 39 | -- | 435 | 4.2 | | .4 | | 374 | 374 | 90 | 951 | 3.50 | 4 |
| June 11-12, 15-20 | 471 | 62 | | | | | | | 35 | -- | 340 | 3.2 | | .5 | | 282 | 282 | 68 | 790 | 3.60 | 3 |
| June 13-14 | 489 | 57 | | | | | | | 22 | 12 | 221 | 6.1 | | .2 | | 202 | 192 | -- | 509 | 6.1 | 5 |
| June 21-30 | 383 | 67 | | | | | | | 39 | -- | 489 | 1.8 | | .1 | | 426 | 426 | 102 | 1,050 | 3.40 | 3 |
| July 1-6 | 597 | 65 | | | | | | | 19 | -- | 272 | 2.9 | | .1 | | 246 | 246 | 52 | 618 | 3.70 | 5 |
| July 7-10 | 352 | 66 | | | | | | | 43 | -- | 462 | 3.9 | | .2 | | 394 | 394 | 96 | 973 | 3.50 | 5 |
| July 11-20 | 288 | 67 | | | | | | | 54 | -- | 551 | 9 | | .3 | | 470 | 470 | 104 | 1,160 | 3.45 | 4 |
| July 21-31 | 247 | 71 | | | | | | | 59 | -- | 590 | 9 | | .6 | | 500 | 500 | 134 | 1,220 | 3.50 | 3 |
| Aug. 1-10 | 193 | 66 | | | | | | | 57 | -- | 691 | 10 | | .6 | | 610 | 610 | 130 | 1,340 | 3.50 | 3 |
| Aug. 11-20 | 200 | 69 | | | | | | | 55 | -- | 660 | 9 | | .4 | | 580 | 580 | 110 | 1,290 | 3.60 | 4 |
| Aug. 21-31 | 1,519 | 65 | | | | | | | 57 | -- | 694 | 11 | | .4 | | 615 | 615 | 132 | 1,340 | 3.70 | 3 |
| Sept. 1-10 | 145 | 64 | | | | | | | 58 | -- | 699 | 13 | | .3 | | 620 | 620 | 144 | 1,360 | 3.55 | 2 |
| Sept. 11-20 | 156 | 64 | | | | | | | 53 | -- | 642 | 11 | | .7 | | 570 | 570 | 118 | 1,260 | 3.65 | 4 |
| Sept. 21-30 | 138 | 63 | | | | | | | 53 | -- | 666 | 12 | | .2 | | 595 | 595 | 126 | 1,350 | 3.50 | 5 |
| Average | 633 | 50 | | | | | | | 29 | -- | 342 | 7.6 | | 1.1 | | 302 | 300 | 77 | 744 | 3.97 | 6 |

SUSQUEHANNA RIVER BASIN--Continued

LACKAWANNA RIVER AT OLD FORGE, PA.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

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

## 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.--11,220 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: September 1906 to September 1907, October 1945 to September 1951.
Water temperatures: October 1945 to September 1951.
EXTREMES, 1950-51.--Hardness: Maximum, 178 ppm Sept. 1-10; minimum, 48 ppm Dec. 1-10, Feb. 1-10.
Specific conductance: Maximum daily, 447 micromhos Sept. 8; minimum daily, 93.6 micromhos Dec. 6.
Water temperatures: Maximum, 85°F Aug. 11, 15; minimum, freezing point on several days in January, February, and March.
EXTREMES, 1945-51.--Dissolved solids (1945-47): Maximum, 334 ppm Sept. 11-20, 1946; minimum, 68 ppm May 21-31, 1946.
Hardness (1945-47) (1949-51): Maximum, 223 ppm Sept. 11-20, 1946; minimum, 42 ppm Apr. 1-10, 1950.
Specific conductance: Maximum, 522 micromhos Oct. 1-10, 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, 1945-51. 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). During part of 1950-51 cross-sectional studies were made monthly. Records of specific conductance of daily samples from October 1945 to September 1951 available in district office at Philadelphia, Pa. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 1-10, 1950 | 3,207 | 2.8 | 0.05 | 37 | 12 | 8.9 | | 60 | 95 | 7.8 | 0.2 | 1.7 | 209 | 142 | 92 | 326 | 7.3 | 3 |
| Oct. 11-20 | 11,389 | -- | -- | -- | -- | 8.5 | | 52 | 50 | 7.4 | -- | 1.8 | -- | 88 | 45 | 217 | 7.2 | 7 |
| Oct. 21-31 | 4,459 | -- | -- | -- | -- | 9.5 | | 59 | 67 | 6.5 | -- | 1.7 | -- | 108 | 60 | 262 | 7.2 | 4 |
| Nov. 1-10 | 9,652 | -- | -- | -- | -- | 9.1 | | 55 | 63 | 7.0 | -- | 1.5 | -- | 102 | 57 | 253 | 7.2 | 5 |
| Nov. 11-20 | 8,047 | -- | -- | -- | -- | 7.4 | | 50 | 44 | 5.6 | -- | 1.8 | -- | 80 | 39 | 197 | 7.4 | 5 |
| Nov. 21-30 | 45,679 | -- | -- | -- | -- | 6.1 | | 34 | 28 | 3.8 | -- | 2.3 | -- | 51 | 23 | 129 | 6.9 | 9 |
| Dec. 1-10 | 67,570 | 4.5 | 38 | 13 | 3.8 | 3.5 | | 25 | 27 | 3.5 | .2 | 1.9 | 78 | 48 | 28 | 117 | 7.0 | 9 |
| Dec. 11-20 | 29,160 | -- | -- | -- | -- | -- | | 30 | 39 | 3.0 | -- | 2.0 | -- | 64 | 39 | 158 | 7.0 | 3 |
| Dec. 21-31 | 11,632 | -- | -- | -- | -- | -- | | 41 | 60 | 4.4 | -- | 3.8 | -- | 96 | 62 | 231 | 7.0 | 2 |
| Jan. 1-10, 1951 | 28,450 | -- | -- | -- | -- | -- | | 35 | 47 | 3.6 | -- | 2.7 | -- | 72 | 43 | 179 | 7.0 | 12 |
| Jan. 11-20 | 19,070 | -- | -- | -- | -- | 5.9 | | 35 | 42 | 4.9 | -- | 3.2 | -- | 69 | 40 | 175 | 7.0 | 3 |
| Jan. 21-31 | 33,664 | -- | -- | -- | -- | 4.1 | | 28 | 32 | 3.2 | -- | 2.7 | -- | 54 | 31 | 141 | 7.1 | 3 |
| Feb. 1-10 | 34,570 | -- | -- | -- | -- | 3.4 | | 24 | 28 | 3.1 | -- | 2.9 | -- | 48 | 28 | 125 | 6.9 | 2 |
| Feb. 11-20 | 27,740 | -- | -- | -- | -- | 4.1 | | 28 | 35 | 3.2 | -- | 2.6 | -- | 57 | 34 | 148 | 6.9 | 3 |
| Feb. 21-28 | 45,362 | -- | -- | -- | -- | 2.9 | | 25 | 28 | 3.1 | -- | 3.0 | -- | 50 | 30 | 124 | 6.9 | 4 |
| Mar. 1-10 | 29,170 | -- | -- | -- | -- | -- | | 32 | 34 | 3.0 | -- | 2.4 | -- | 57 | 31 | 150 | 6.9 | 4 |
| Mar. 11-20 | 27,510 | -- | -- | -- | -- | -- | | 32 | 33 | 3.0 | -- | 2.1 | -- | 59 | 33 | 148 | 7.1 | 3 |
| Mar. 21-31 | 37,900 | -- | -- | -- | -- | -- | | 30 | 26 | 3.1 | -- | 1.8 | -- | 53 | 28 | 128 | 7.1 | 3 |
| Apr. 1-10 | 56,840 | -- | -- | -- | -- | -- | | 29 | 26 | 2.1 | -- | 1.9 | -- | 49 | 25 | 122 | 7.1 | 4 |
| Apr. 11-20 | 33,640 | -- | -- | -- | -- | -- | | 34 | 31 | 2.5 | -- | 1.9 | -- | 58 | 30 | 143 | 7.2 | 4 |
| Apr. 21-30 | 18,330 | -- | -- | -- | -- | 3.1 | | 42 | 40 | 3.5 | -- | 2.1 | -- | 76 | 42 | 186 | 7.7 | 3 |

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT DANVILLE, PA.--Continued

Chemical analyses in parts per million, water year October 1950 to September 1951--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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| May 1-10, 1951 | 11,132 | -- | -- | -- | -- | 4.3 | | 46 | 53 | 4.4 | -- | 1.7 | -- | 91 | 53 | 217 | 7.9 | 0 |
| May 11-20 | 7,873 | -- | -- | -- | -- | 4.6 | | 54 | 62 | 4.9 | -- | 1.6 | -- | 107 | 63 | 250 | 7.7 | 2 |
| May 21-31 | 5,189 | -- | -- | -- | -- | 6.6 | | 49 | 82 | 5.5 | -- | 1.4 | -- | 120 | 80 | 286 | 7.4 | 3 |
| June 1-10 | 4,632 | -- | -- | -- | -- | 3.1 | | 50 | 82 | 6.5 | -- | 1.7 | -- | 130 | 89 | 301 | 7.4 | 3 |
| June 11-13, 15-20 | 8,612 | -- | -- | -- | -- | 6.8 | | 48 | 65 | 6.0 | -- | 1.7 | -- | 102 | 63 | 256 | 7.4 | 3 |
| June 14 | 10,200 | -- | -- | -- | -- | 6.8 | | 23 | 35 | 5.0 | -- | 3.0 | -- | 50 | 31 | 144 | 7.3 | 8 |
| June 21-30 | 5,992 | -- | -- | -- | -- | 5.5 | | 39 | 81 | 6.0 | -- | 1.4 | -- | 114 | 82 | 272 | 7.3 | 7 |
| July 1-10 | 10,529 | -- | -- | -- | -- | 4.4 | | 46 | 59 | 5.0 | -- | 1.8 | -- | 98 | 60 | 236 | 7.1 | 4 |
| July 11-20 | 8,444 | -- | -- | -- | -- | 5.1 | | 44 | 60 | 4.4 | -- | 1.6 | -- | 95 | 59 | 232 | 7.1 | 6 |
| July 21-31 | 7,226 | -- | -- | -- | -- | 5.2 | | 50 | 65 | 4.4 | -- | 1.9 | -- | 105 | 64 | 247 | 7.2 | 6 |
| Aug. 1-10 | 4,236 | -- | -- | -- | -- | 8.8 | | 47 | 94 | 5.6 | -- | 1.2 | -- | 126 | 88 | 304 | 7.8 | 6 |
| Aug. 11-20 | 3,419 | -- | -- | -- | -- | 8.9 | | 34 | 125 | 7.0 | -- | 1.8 | -- | 150 | 122 | 352 | 7.2 | 5 |
| Aug. 21-31 | 3,028 | -- | -- | -- | -- | 7.5 | | 40 | 112 | 8.1 | -- | 1.8 | -- | 146 | 113 | 343 | 7.3 | 5 |
| Sept. 1-10 | 2,227 | -- | -- | -- | -- | 6.2 | | 29 | 150 | 7.0 | -- | 2.1 | -- | 178 | 154 | 414 | 7.2 | 5 |
| Sept. 11-20 | 2,475 | -- | -- | -- | -- | 14 | | 48 | 132 | 9.0 | -- | 2.0 | -- | 160 | 121 | 380 | 7.4 | 5 |
| Sept. 21-30 | 1,926 | 3.8 | 0.02 | 42 | 17 | 8.9 | | 44 | 134 | 9.8 | 0.1 | 2.3 | 272 | 175 | 139 | 409 | 7.7 | 3 |
| Average | 18,390 | -- | -- | -- | -- | 6.3 | | 40 | 61 | 5.0 | -- | 2.1 | -- | 93 | 60 | 224 | 7.2 | 5 |

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT DANVILLE, PA.--Continued

Chemical analyses of cross-section samples, water year October 1950 to September 1951

| Date | Discharge (cfs) | Sampling point | | | Temperature (°F) | Parts per million | | | | | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Channel | Station | Time | | Bicarbonate ($HCO_3$) | Sulfate ($SO_4$) | Chloride (Cl) | Nitrate ($NO_3$) | Hardness as $CaCO_3$ | | | |
| Oct. 15, 1950 | | | 1180 | 10:00 a. m. | 61 | 38 | 111 | -- | -- | -- | 325 | 6.5 | |
| | | | 880 | 10:00 a. m. | 60 | 44 | 111 | -- | -- | -- | 329 | 6.8 | |
| | | | 650 | 10:00 a. m. | 60 | 50 | 100 | -- | -- | -- | 319 | 6.6 | |
| | | | 465 | 10:00 a. m. | 59 | 59 | 88 | -- | -- | -- | 307 | 6.8 | |
| | | | 120 | 10:00 a. m. | 60 | 76 | 69 | -- | -- | -- | 268 | 6.8 | |
| Nov. 15 | | | 1180 | 5:00 p. m. | 50 | 33 | 74 | -- | -- | -- | 233 | 6.5 | |
| | | | 880 | 5:00 p. m. | 50 | 45 | 63 | -- | -- | -- | 221 | 6.7 | |
| | | | 650 | 5:00 p. m. | 51 | 52 | 54 | -- | -- | -- | 218 | 6.7 | |
| | | | 465 | 5:00 p. m. | 50 | 51 | 54 | -- | -- | -- | 210 | 6.8 | |
| | | | 120 | 5:00 p. m. | 50 | 47 | 47 | -- | -- | -- | 198 | 6.7 | |
| Dec. 16 | | | 1180 | 2:00 p. m. | 43 | 27 | 53 | 2 | -- | -- | 180 | 6.6 | |
| | | | 880 | 2:00 p. m. | 42 | 29 | 56 | 3 | -- | -- | 180 | 6.6 | |
| | | | 650 | 2:00 p. m. | 43 | 32 | 47 | 2 | -- | -- | 173 | 6.8 | |
| | | | 465 | 2:00 p. m. | 44 | 36 | 43 | 3 | -- | -- | 170 | 6.7 | |
| | | | 120 | 2:00 p. m. | 44 | 32 | 41 | 3 | -- | -- | 157 | 6.6 | |
| Jan. 14, 1951 | | | 1180 | 4:00 p. m. | -- | 22 | 58 | 3 | -- | -- | 183 | 6.8 | |
| | | | 880 | 4:00 p. m. | -- | 33 | 51 | 4 | -- | -- | 186 | 6.9 | |
| | | | 650 | 4:00 p. m. | -- | 36 | 47 | 3 | -- | -- | 180 | 7.1 | |
| | | | 465 | 4:00 p. m. | -- | 38 | 46 | 3 | -- | -- | 176 | 6.9 | |
| | | | 120 | 4:00 p. m. | -- | 35 | 39 | 4 | -- | -- | 163 | 6.8 | |
| Feb. 18 | | | 1180 | 2:00 p. m. | 36 | 13 | 47 | -- | -- | -- | 164 | 6.2 | |
| | | | 880 | 2:00 p. m. | 35 | 21 | 39 | -- | -- | -- | 164 | 6.5 | |
| | | | 650 | 2:00 p. m. | 36 | 26 | 38 | -- | -- | -- | 162 | 6.5 | |
| | | | 465 | 2:00 p. m. | 36 | 28 | 32 | -- | -- | -- | 155 | 6.5 | |
| | | | 120 | 2:00 p. m. | 35 | 26 | 27 | -- | -- | -- | 135 | 6.6 | |
| Mar. 17 | | | 1180 | 3:00 p. m. | 33 | 26 | 30 | -- | -- | -- | 142 | 6.6 | |
| | | | 880 | 3:00 p. m. | 33 | 29 | 27 | -- | -- | -- | 138 | 6.7 | |
| | | | 650 | 3:00 p. m. | 33 | 32 | 25 | -- | -- | -- | 136 | 6.8 | |
| | | | 465 | 3:00 p. m. | 32 | 32 | 25 | -- | -- | -- | 134 | 6.8 | |
| | | | 120 | 3:00 p. m. | 34 | 30 | 20 | -- | -- | -- | 122 | 7.1 | |
| Apr. 23 | | | 1180 | 5:00 p. m. | 46 | 21 | 52 | 4 | -- | -- | 187 | 6.5 | |
| | | | 880 | 5:00 p. m. | 44 | 32 | 50 | 4 | -- | -- | 197 | 6.8 | |
| | | | 650 | 5:00 p. m. | 45 | 38 | 40 | 4 | -- | -- | 195 | 6.8 | |
| | | | 465 | 5:00 p. m. | 45 | 40 | 38 | 3 | -- | -- | 190 | 6.8 | |
| | | | 120 | 5:00 p. m. | 44 | 27 | 30 | 3 | -- | -- | 135 | 6.6 | |
| May 7 | | | 1180 | 3:00 p. m. | 71 | 41 | 75 | 5 | -- | -- | 252 | 6.6 | |
| | | | 880 | 3:00 p. m. | 70 | 53 | 72 | 5 | -- | -- | 259 | 6.8 | |
| | | | 650 | 3:00 p. m. | 70 | 57 | 67 | 6 | -- | -- | 257 | 6.9 | |
| | | | 465 | 3:00 p. m. | 70 | 60 | 65 | 6 | -- | -- | 257 | 7.0 | |
| | | | 120 | 3:00 p. m. | 70 | 56 | 57 | 6 | -- | -- | 232 | 7.0 | |
| June 16 | | | 1180 | 6:30 p. m. | 70 | 42 | 73 | 7 | 2.5 | 108 | 266 | 5.6 | |
| | | | 880 | 6:30 p. m. | 70 | 42 | 63 | 7 | 2.4 | 108 | 266 | 5.8 | |
| | | | 650 | 6:30 p. m. | 70 | 47 | 66 | 7 | 2.1 | 106 | 258 | 5.9 | |
| | | | 465 | 6:30 p. m. | 70 | 48 | 60 | 8 | 1.8 | 106 | 256 | 5.9 | |
| | | | 120 | 6:30 p. m. | 70 | 34 | 46 | 6 | 2.4 | 74 | 191 | 5.7 | |
| July 15 | | | 1180 | 2:45 p. m. | 82 | 38 | 54 | 4 | .3 | 90 | 216 | 5.8 | |
| | | | 880 | 2:45 p. m. | 82 | 54 | 46 | 6 | .4 | 94 | 216 | 5.9 | |
| | | | 650 | 2:45 p. m. | 82 | 56 | 44 | 2 | .4 | 92 | 216 | 6.1 | |
| | | | 465 | 2:45 p. m. | 82 | 54 | 46 | 6 | 1.0 | 90 | 209 | 6.2 | |
| | | | 120 | 2:45 p. m. | 82 | 52 | 43 | 4 | 1.8 | 86 | 202 | 6.4 | |
| Aug. 15 | | | 1180 | 2:30 p. m. | 85 | 16 | 129 | 7 | .8 | 132 | 325 | 5.5 | |
| | | | 880 | 2:30 p. m. | 85 | 12 | 132 | 8 | 1.2 | 144 | 346 | 5.5 | |
| | | | 650 | 2:30 p. m. | 85 | 12 | 133 | 8 | 1.3 | 144 | 350 | 5.6 | |
| | | | 465 | 2:30 p. m. | 85 | 26 | 128 | 8 | .8 | 148 | 359 | 5.9 | |
| | | | 120 | 2:30 p. m. | 85 | 34 | 95 | 8 | 1.4 | 126 | 304 | 6.5 | |
| Sept. 15 | | | 1180 | 4:00 p. m. | 75 | 18 | 119 | 9 | 2.3 | 136 | 334 | 5.5 | |
| | | | 880 | 4:00 p. m. | 75 | 26 | 128 | 9 | 1.6 | 154 | 363 | 5.8 | |
| | | | 560 | 4:00 p. m. | 75 | 38 | 121 | 8 | 1.4 | 152 | 364 | 6.0 | |
| | | | 465 | 4:00 p. m. | 75 | 46 | 106 | 9 | 1.9 | 154 | 364 | 6.2 | |
| | | | 120 | 4:00 p. m. | 75 | 52 | 90 | 9 | 2.0 | 134 | 331 | 6.2 | |

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT DANVILLE, PA.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 59 | 60 | 38 | 33 | -- | 36 | -- | -- | -- | -- | 83 | 79 |
| 2 | 56 | 62 | -- | 35 | 32 | 34 | 34 | -- | 78 | 77 | 81 | 74 |
| 3 | 58 | -- | 39 | 36 | 32 | 33 | 35 | 46 | 77 | 78 | 78 | 74 |
| 4 | 55 | 58 | -- | 40 | 32 | 37 | 35 | 48 | 79 | 75 | 78 | 77 |
| 5 | 57 | 57 | 39 | 36 | -- | 35 | 36 | -- | -- | 71 | 76 | 77 |
| 6 | -- | 59 | 38 | 37 | 32 | 34 | 36 | 47 | 77 | 73 | 76 | 71 |
| 7 | 59 | 60 | -- | 35 | -- | -- | -- | 46 | -- | 78 | 71 | 70 |
| 8 | 61 | -- | 40 | 34 | 31 | 38 | 35 | 49 | -- | 77 | 78 | 71 |
| 9 | -- | 60 | 36 | -- | -- | 35 | 36 | 65 | 76 | 79 | 60 | 73 |
| 10 | 58 | 50 | 38 | 34 | 31 | 33 | -- | 51 | 73 | 81 | 83 | 75 |
| 11 | 60 | 48 | 46 | 34 | 32 | -- | 40 | -- | 72 | 81 | 85 | 77 |
| 12 | -- | 50 | 45 | 36 | 32 | 32 | 40 | 51 | 73 | 80 | 79 | 79 |
| 13 | 56 | 52 | 46 | -- | 33 | 33 | 41 | 53 | 71 | 78 | 81 | 78 |
| 14 | 53 | 51 | 44 | 35 | 32 | 35 | 39 | 58 | 72 | 80 | 83 | 75 |
| 15 | 53 | 50 | -- | 34 | 34 | 33 | -- | 60 | 74 | -- | 85 | 76 |
| 16 | 54 | -- | 43 | 34 | 33 | 34 | 40 | 64 | 70 | 83 | 83 | 76 |
| 17 | -- | 49 | 41 | 37 | 35 | 32 | 41 | 70 | 73 | 81 | 83 | 74 |
| 18 | 61 | 49 | 40 | 37 | -- | 35 | -- | 72 | 74 | 79 | 80 | 73 |
| 19 | 60 | 38 | 38 | 38 | 34 | 33 | 41 | 71 | 75 | 78 | 78 | 73 |
| 20 | 59 | 46 | 34 | 38 | 38 | 34 | 42 | -- | -- | 77 | 79 | 74 |
| 21 | 58 | 45 | 34 | 37 | 35 | 35 | -- | 73 | 76 | 78 | 79 | 75 |
| 22 | 59 | 45 | -- | 36 | 35 | -- | 45 | 74 | -- | 78 | 74 | 74 |
| 23 | 58 | 46 | 33 | -- | 36 | 34 | 45 | 73 | 80 | 79 | 75 | 72 |
| 24 | -- | 47 | 33 | 34 | 35 | 33 | 45 | 72 | 79 | 80 | 75 | 69 |
| 25 | 56 | -- | -- | 33 | 37 | 32 | 48 | 74 | 80 | 82 | 76 | 68 |
| 26 | 52 | 42 | -- | 34 | 38 | -- | 45 | 75 | 78 | 84 | 76 | 68 |
| 27 | 55 | 40 | -- | 33 | 36 | -- | 47 | 78 | 80 | 83 | 79 | 67 |
| 28 | 57 | 40 | -- | -- | 34 | 31 | 46 | 73 | 82 | 80 | 80 | 61 |
| 29 | 58 | 39 | -- | 35 | -- | 34 | 45 | 71 | 80 | 76 | 82 | 58 |
| 30 | 56 | 39 | -- | 32 | -- | 33 | 47 | 73 | 79 | 83 | 81 | 60 |
| 31 | 58 | -- | -- | -- | -- | -- | -- | 69 | -- | 80 | 83 | -- |
| Average | 57 | 49 | 39 | 34 | 34 | 34 | 41 | 64 | 76 | 79 | 79 | 72 |

## WEST BRANCH SUSQUEHANNA RIVER AT LOCK HAVEN, PA.

LOCATION.--In north channel at bridge on northeast side of Great Island, 2 miles downstream from Lock Haven, Clinton County, and 30.1 miles downstream from gaging station at Renova.
DRAINAGE AREA.--3,337 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1951.
Water temperatures: October 1945 to September 1951.
EXTREMES, 1950-51.--Hardness: Maximum, 206 ppm Sept. 11-20, minimum, 30 ppm Nov. 21-30, Mar. 1-10.
Specific conductance: Maximum daily, 785 micromhos Sept. 18; minimum daily, 79.1 micromhos Apr. 2.
Water temperatures: Maximum, 80°F July 18, 29, 30, 31, Aug. 1; minimum, freezing point on several days during winter months.
EXTREMES, 1945-51.--Dissolved solids (1945-47): Maximum, 262 ppm Sept. 21-30, 1946; minimum, 51 ppm Mar. 1-10, 1946.
Hardness (1945-47) (1949-51): Maximum, 206 ppm Sept. 11-20, 1951; minimum, 28 ppm Apr. 1-10, 1950.
Specific conductance: Maximum daily, 785 micromhos Sept. 18, 1951; minimum daily, 79.1 micromhos Apr. 2, 1951.
Water temperatures: Maximum, 83°F July 5, 1949; 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 water year October 1950 to September 1951 based on records for West Branch Susquehanna River at Renovo, which are given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| Oct. 1-9, 1950 .. | 1,735 | | | | | | | | | -- | 0 | 117 | 5 | | 1.6 | | 95 | 95 | 43 | 351 | 3.70 | 1 |
| Oct. 10-20..... | 12,773 | | | | | | | | | -- | -- | 44 | 1 | | 1.6 | | 37 | 37 | 14 | 137 | 4.20 | 1 |
| Oct. 21-31 ..... | 3,304 | | | | | | | | | -- | -- | 67 | 1 | | 1.0 | | 54 | 54 | 23 | 208 | 3.90 | 1 |
| Nov. 1-4 ..... | 4,250 | | | | | | | | | -- | -- | 79 | 2 | | .9 | | 62 | 62 | 26 | 236 | 3.85 | 1 |
| Nov. 5-10 ..... | 24,038 | | | | | | | | | -- | -- | 37 | 1 | | 1.8 | | 32 | 32 | 12 | 115 | 4.25 | 1 |
| Nov. 11-20..... | 7,172 | | | | | | | | | -- | -- | 51 | 1 | | .9 | | 45 | 45 | 19 | 160 | 3.95 | 1 |
| Nov. 21-30 ..... | 33,058 | | | | | | | | | 6.6 | 0 | 47 | 1 | | 1.4 | | 30 | 30 | 19 | 154 | 3.85 | 0 |
| Dec. 1-10 ..... | 23,192 | | | | | | | | | 4.6 | 0 | 44 | 1 | | 1.3 | | 31 | 31 | 19 | 151 | 3.85 | 0 |
| Dec. 11-20 ..... | 7,548 | | | | | | | | | -- | 0 | 69 | 2.5 | | 1.2 | | 52 | 52 | 32 | 215 | 3.85 | 5 |
| Dec. 21-31 ..... | 3,826 | | | | | | | | | -- | 0 | 91 | 2.8 | | .6 | | 67 | 67 | 32 | 279 | 3.70 | 4 |
| Jan. 1-4, 1951.. | 5,850 | | | | | | | | | -- | 0 | 84 | 2.9 | | .4 | | 64 | 64 | 30 | 254 | 3.80 | 3 |
| Jan. 5-10 ..... | 16,783 | | | | | | | | | -- | 0 | 43 | 1.9 | | .4 | | 35 | 35 | 14 | 133 | 4.20 | 4 |
| Jan. 11-20 ..... | 11,250 | | | | | | | | | -- | 0 | 58 | 2.5 | | .4 | | 45 | 45 | 22 | 171 | 4.00 | 5 |
| Jan. 21-31..... | 14,794 | | | | | | | | | 5.4 | 0 | 44 | 3 | | .9 | | 38 | 38 | 25 | 133 | 4.40 | 5 |
| Feb. 1-10 ..... | 9,900 | | | | | | | | | 5.1 | 0 | 50 | 3 | | .9 | | 43 | 43 | 23 | 153 | 4.20 | 3 |
| Feb. 11-20 ..... | 12,954 | | | | | | | | | 5.2 | 0 | 49 | 4 | | .8 | | 43 | 43 | 25 | 152 | 4.15 | 4 |
| Feh. 21-28 ..... | 21,023 | | | | | | | | | 4.9 | 0 | 37 | 3 | | 1.0 | | 32 | 32 | 21 | 116 | 4.35 | 2 |
| Mar. 1-10 ..... | 19,856 | | | | | | | | | -- | 0 | 32 | 2 | | .5 | | 30 | 30 | 12 | 101 | 4.5 | 4 |
| Mar. 11-20 ..... | 8,391 | | | | | | | | | -- | 0 | 48 | 2 | | .6 | | 37 | 37 | 15 | 138 | 4.20 | 6 |
| Mar. 21-31 ..... | 13,873 | | | | | | | | | -- | 0 | 42 | 2 | | .7 | | 36 | 36 | 15 | 128 | 4.30 | 6 |

SUSQUEHANNA RIVER BASIN--Continued

WEST BRANCH SUSQUEHANNA RIVER AT LOCK HAVEN, PA.--Continued

Chemical analyses, in parts per million, water year October 1950 to September 1951--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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| Apr. 1-10, 1951 | 17,330 | | | | | | | | | 4.0 | 0 | 37 | 2 | | 0.5 | | 31 | 31 | 14 | 116 | 4.30 | 3 |
| Apr. 11-20 | 11,280 | | | | | | | | | 5.5 | 0 | 45 | 2 | | .3 | | 36 | 36 | 15 | 132 | 4.25 | 2 |
| Apr. 21-30 | 9,120 | | | | | | | | | 5.2 | 0 | 44 | 1 | | .3 | | 34 | 34 | 13 | 131 | 4.30 | 3 |
| May 1-10 | 8,218 | | | | | | | | | 4.6 | 0 | 53 | 2 | | .2 | | 45 | 45 | 18 | 163 | 4.15 | 2 |
| May 11-20 | 4,897 | | | | | | | | | 7.4 | 0 | 69 | 3 | | .2 | | 55 | 55 | 21 | 208 | 4.00 | 7 |
| May 21-31 | 4,526 | | | | | | | | | 5.2 | 0 | 65 | 1 | | .4 | | 53 | 53 | 25 | 205 | 3.95 | 6 |
| June 1-10 | 2,505 | | | | | | | | | 6.8 | 0 | 84 | 2 | | .8 | | 69 | 69 | 31 | 266 | 3.85 | 5 |
| June 11-20 | 9,626 | | | | | | | | | 3.3 | 0 | 57 | 2 | | .2 | | 51 | 51 | 17 | 172 | 4.10 | 3 |
| June 21-30 | 3,167 | | | | | | | | | 7.4 | 0 | 77 | 2 | | .3 | | 60 | 60 | 22 | 229 | 3.85 | 5 |
| July 1-10 | 3,590 | | | | | | | | | 8.4 | 0 | 84 | 2 | | .2 | | 66 | 66 | 22 | 240 | 3.90 | 5 |
| July 11-20 | 1,976 | | | | | | | | | 7.5 | 0 | 88 | 2 | | .2 | | 71 | 71 | 23 | 258 | 3.85 | 5 |
| July 21-31 | 1,906 | | | | | | | | | 8.0 | 0 | 122 | 4 | | 1.1 | | 108 | 108 | 35 | 348 | 3.80 | 3 |
| Aug. 1-10 | 790 | | | | | | | | | 9.2 | 0 | 132 | 4 | | 1.4 | | 116 | 116 | 39 | 384 | 3.80 | 3 |
| Aug. 11-20 | 790 | | | | | | | | | 18 | 0 | 205 | 6 | | 1.3 | | 172 | 172 | 56 | 552 | 3.60 | 3 |
| Aug. 21-31 | 394 | | | | | | | | | 20 | 0 | 195 | 7 | | 1.2 | | 160 | 160 | 54 | 525 | 3.70 | 3 |
| Sept. 1-10 | 354 | | | | | | | | | -- | 0 | 242 | 6 | | 1.1 | | 172 | 172 | 65 | 614 | 3.40 | 5 |
| Sept. 11-20 | 417 | | | | | | | | | -- | 0 | 302 | 9 | | 1.1 | | 206 | 206 | 85 | 731 | 3.30 | 5 |
| Sept. 21-30 | 304 | | | | | | | | | -- | 0 | 255 | 7 | | 1.3 | | 135 | 135 | 74 | 659 | 3.25 | 5 |
| Average | 8,643 | | | | | | | | | -- | 0 | 87 | 2.9 | | 0.8 | | 67 | 67 | 28 | 248 | 3.96 | 3 |

SUSQUEHANNA RIVER BASIN--Continued

WEST BRANCH SUSQUEHANNA RIVER AT LOCK HAVEN, PA.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 59 | 50 | -- | 33 | 33 | 39 | 44 | 60 | 67 | 73 | 80 | 75 |
| 2 | 60 | 52 | 50 | 32 | 32 | 38 | 44 | 59 | 71 | 73 | 78 | 68 |
| 3 | 59 | 53 | 50 | 34 | 33 | 39 | 45 | 58 | 71 | 74 | 75 | 68 |
| 4 | 64 | 52 | 49 | 34 | 32 | 39 | 43 | 57 | 72 | 76 | 75 | 67 |
| 5 | 58 | 50 | 46 | 34 | 32 | 40 | 44 | 59 | 70 | 74 | 74 | 67 |
| 6 | 57 | 49 | 38 | 34 | 32 | 40 | 44 | 58 | 69 | 67 | 74 | 68 |
| 7 | 58 | 45 | 40 | 35 | 32 | 40 | 45 | 59 | 69 | 73 | 72 | 69 |
| 8 | 61 | 47 | 40 | 34 | -- | 42 | 46 | 54 | 70 | 75 | 71 | 80 |
| 9 | 60 | 52 | 40 | 33 | -- | 42 | 48 | 58 | 69 | 75 | 72 | 78 |
| 10 | 56 | 49 | 40 | 33 | 32 | 39 | 49 | 59 | 67 | 76 | 74 | 80 |
| 11 | 55 | 45 | 38 | 33 | 33 | 40 | 45 | 57 | 64 | 76 | 74 | 69 |
| 12 | 55 | 43 | 38 | 33 | 33 | 40 | 47 | 57 | 65 | 77 | 74 | 67 |
| 13 | 56 | 41 | 35 | 34 | 34 | 40 | 43 | 56 | 64 | 78 | 74 | 68 |
| 14 | 50 | 40 | 35 | 34 | 34 | 40 | 44 | 56 | 63 | 76 | 75 | 65 |
| 15 | 49 | 41 | 34 | 34 | 34 | 39 | 46 | 58 | 60 | 77 | 75 | 69 |
| 16 | 49 | 42 | 35 | 34 | 35 | 40 | 46 | 55 | 60 | 78 | 76 | 68 |
| 17 | 50 | 42 | 33 | 34 | 37 | 37 | 47 | 62 | 61 | 79 | 76 | 68 |
| 18 | 50 | 41 | 32 | 34 | 35 | 39 | 48 | 66 | 63 | 80 | 74 | 66 |
| 19 | 55 | 42 | 32 | 36 | 36 | 40 | 47 | 65 | 65 | 76 | 75 | 65 |
| 20 | 55 | 44 | 32 | 36 | 37 | 40 | 47 | 66 | 69 | 74 | 73 | 63 |
| 21 | 51 | 42 | 32 | 36 | 37 | 39 | 48 | 65 | 70 | 73 | 73 | 66 |
| 22 | 51 | 40 | 32 | 36 | 38 | 40 | 49 | 67 | 70 | 75 | 75 | 65 |
| 23 | 53 | 40 | 34 | 36 | 39 | 41 | 49 | 70 | 71 | 76 | 74 | 65 |
| 24 | 53 | 40 | 34 | 36 | 38 | 41 | 50 | 68 | 73 | 74 | 73 | 63 |
| 25 | 52 | 35 | 33 | 35 | 40 | 41 | 50 | 69 | 75 | 75 | 72 | 63 |
| 26 | 50 | 41 | 33 | 35 | 40 | 41 | 51 | 67 | 73 | 74 | 63 | 63 |
| 27 | 48 | 35 | 33 | 34 | 39 | 39 | 52 | 66 | 75 | 78 | 65 | 61 |
| 28 | 49 | 33 | 33 | 35 | 39 | 41 | 54 | 64 | 76 | 79 | 70 | 62 |
| 29 | 50 | 33 | 34 | 34 | -- | 43 | 55 | 65 | 78 | 80 | 72 | 61 |
| 30 | 50 | 34 | 32 | 34 | -- | 43 | 56 | 64 | 78 | 80 | 74 | 62 |
| 31 | 53 | -- | 33 | 34 | -- | 44 | -- | 65 | -- | 80 | 75 | -- |
| Average | 54 | 43 | 37 | 34 | 35 | 40 | 48 | 62 | 69 | 76 | 73 | 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 1951.
Water temperatures: October 1944 to September 1951.
EXTREMES, 1950-51.--Hardness: Maximum, 138 ppm Sept. 21-30; minimum, 28 ppm Apr. 1-10.
Specific conductance: Maximum daily, 360 micromhos Sept. 29; minimum daily, 64.4 micromhos Apr. 1.
Water temperatures: Maximum, 81°F July 17; minimum, freezing point on several days during winter months.
EXTREMES, 1944-51.--Dissolved solids (1944-47): Maximum, 219 ppm Oct. 1-10, 1944; minimum, 46 ppm May 1-10, 1945.
Hardness: Maximum, 138 ppm Sept. 21-30, 1951; minimum, 26 ppm May 21-31, 1946.
Specific conductance: Maximum daily, 360 micromhos Sept. 29, 1951; minimum daily, 64.4 micromhos 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. Records of discharge for water year October 1950 to September 1951 based on records for West Branch Susquehanna River at Renovo which are given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 1-10, 1950 | 3,252 | | | | | 6.1 | | 10 | 68 | 6 | | 1.0 | | 75 | 67 | 208 | 6.5 | 1 |
| Oct. 11-20 | 18,809 | | | | | 3.7 | | 2 | 39 | 1 | | .6 | | 36 | 34 | 109 | 5.1 | 1 |
| Oct. 21-31 | 5,384 | | | | | 3.6 | | 3 | 49 | 2 | | .7 | | 49 | 47 | 134 | 5.8 | 1 |
| Nov. 1-5 | 7,614 | | | | | -- | | 3 | 58 | 3 | | .6 | | 60 | 58 | 172 | 5.6 | 1 |
| Nov. 6-10 | 32,440 | | | | | -- | | 3 | 32 | 4 | | 1.0 | | 31 | 29 | 97.3 | 6.0 | 1 |
| Nov. 11-20 | 11,364 | | | | | -- | | 4 | 40 | 3 | | .7 | | 42 | 39 | 119 | 5.8 | 1 |
| Nov. 21-30 | 64,600 | | | | | 3.8 | | 5 | 35 | 2 | | 1.1 | | 36 | 32 | 102 | 6.1 | 1 |
| Dec. 1-10 | 49,230 | | | | | -- | | 4 | 31 | 2 | | 1.3 | | 34 | 31 | 97.3 | 6.0 | 1 |
| Dec. 11-19 | 21,278 | | | | | -- | | 4 | 42 | 3 | | 1.4 | | 44 | 41 | 117 | 6.1 | 1 |
| Dec. 20 | 9,400 | | | | | -- | | 10 | 46 | 3 | | 2.2 | | 54 | 46 | 137 | 6.5 | 1 |
| Dec. 21-31 | 7,252 | | | | | -- | | 11 | 49 | 4 | | 1.8 | | 59 | 50 | 155 | 6.6 | 2 |
| Jan. 1-4, 1951 | 8,130 | | | | | -- | | 11 | 58 | 3 | | 1.3 | | 65 | 56 | 174 | 6.8 | 1 |
| Jan. 5-9 | 30,460 | | | | | -- | | 6 | 35 | 4 | | 1.5 | | 38 | 33 | 109 | 6.5 | 2 |
| Jan. 10 | 17,000 | | | | | -- | | 30 | 46 | 9 | | 1.3 | | 77 | 52 | 219 | 7.2 | 1 |
| Jan. 11-20 | 14,600 | | | | | -- | | 6 | 42 | 1 | | 1.3 | | 45 | 40 | 123 | 6.4 | 1 |
| Jan. 21-29, 31 | 31,080 | | | | | -- | | 6 | 23 | 2.5 | | 1.0 | | 32 | 27 | 95.3 | 6.5 | 1 |
| Jan. 30 | 15,400 | | | | | -- | | 8 | 24 | 40 | | 1.4 | | 86 | 79 | 225 | 6.4 | 1 |
| Feb. 1-10 | 19,730 | | | | | -- | | 8 | 30 | 2.5 | | 1.2 | | 39 | 32 | 103 | 6.4 | 1 |
| Feb. 11-19 | 21,844 | | | | | 4.9 | | 7 | 35 | 3 | | 1.4 | | 37 | 31 | 106 | 6.4 | 1 |
| Feb. 21-28 | 36,837 | | | | | 2.9 | | 5 | 28 | 3 | | 1.0 | | 32 | 25 | 87.2 | 6.2 | 2 |
| Mar. 1-10 | 32,220 | | | | | 3.0 | | 7 | 26 | 2 | | 1.2 | | 30 | 24 | 86.1 | 6.6 | 5 |
| Mar. 11-20 | 18,150 | | | | | 2.5 | | 8 | 28 | 2 | | 1.1 | | 34 | 27 | 94.7 | 6.7 | 5 |
| Mar. 21-31 | 25,300 | | | | | 2.3 | | 10 | 27 | 2 | | 1.0 | | 35 | 27 | 91.3 | 7.0 | 5 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apr. 1-10 | 42,500 | | | | | 4.0 | 7 | 26 | 2 | | 1.4 | | 28 | 22 | 83.5 | 6.8 | 5 |
| Apr. 11-20 | 22,340 | | | | | 2.9 | 8 | 28 | 2 | | 1.1 | | 33 | 26 | 94.7 | 6.7 | 5 |
| Apr. 21-30 | 16,350 | | | | | 3.1 | 7 | 30 | 2 | | 1.1 | | 34 | 28 | 97.1 | 6.3 | 3 |
| May 1-10 | 13,026 | | | | | 5.2 | 5 | 41 | 2 | | 2.2 | | 40 | 36 | 117 | 6.1 | 4 |
| May 11-20 | 7,937 | | | | | 2.9 | 7.0 | 49 | 4 | | 1.0 | | 57 | 51 | 146 | 6.5 | 5 |
| May 21-31 | 6,879 | | | | | 3.8 | 6 | 53 | 4 | | .8 | | 58 | 53 | 150 | 6.3 | 6 |
| June 1-10 | 4,466 | | | | | 3.4 | 10 | 51 | 3 | | 1.1 | | 59 | 51 | 162 | 6.7 | 6 |
| June 11-20 | 18,703 | | | | | 1.5 | 4 | 41 | 2 | | .6 | | 46 | 43 | 122 | 5.7 | 7 |
| June 21-30 | 6,329 | | | | | 3.4 | 9 | 44 | 4 | | .7 | | 52 | 45 | 137 | 6.7 | 6 |
| July 1-10 | 6,885 | | | | | 3.1 | 11 | 53 | 1 | | 1.5 | | 60 | 51 | 159 | 6.9 | 5 |
| July 11-20 | 3,855 | | | | | 3.5 | 13 | 51 | 3 | | 2.0 | | 62 | 51 | 160 | 6.9 | 2 |
| July 21-31 | 2,767 | | | | | 2.2 | 15 | 79 | 5 | | 1.5 | | 98 | 86 | 229 | 6.9 | 5 |
| Aug. 1-10 | 1,684 | | | | | 3.0 | 14 | 80 | 5 | | .8 | | 96 | 85 | 233 | 6.9 | 5 |
| Aug. 11-20 | 1,730 | | | | | -- | 22 | 85 | 28 | | 1.5 | | 96 | 78 | 247 | 6.8 | 2 |
| Aug. 21-31 | 1,045 | | | | | -- | 16 | 109 | 8 | | 1.4 | | 124 | 111 | 314 | 6.5 | 2 |
| Sept. 1-10 | 1,011 | | | | | -- | 28 | 118 | 9 | | 1.5 | | 130 | 107 | 323 | 7.1 | 5 |
| Sept. 11-20 | 9,959 | | | | | -- | 40 | 94 | 10 | | 1.3 | | 122 | 89 | 305 | 7.2 | 8 |
| Sept. 21-30 | 806 | | | | | -- | 31 | 105 | 8.0 | | 1.4 | | 138 | 113 | 352 | 7.2 | 10 |
| Average | 15,938 | | | | | -- | 10 | 49 | 5 | | 1.2 | | 59 | 50 | 156 | 6.5 | 3 |

SUSQUEHANNA RIVER BASIN--Continued

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

Temperature (°F) of water, water year October 1950 to September 1951

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

## JUNIATA RIVER AT HUNTINGDON, PA.
(Formerly published as Frankstown Branch Juniata River at Huntingdon)

LOCATION.--At Fourth Street Bridge at Huntingdon, Huntingdon County.
DRAINAGE AREA.--816 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1951.
Water temperatures: October 1947 to September 1951.
EXTREMES, 1950-51.--Hardness: Maximum, 173 ppm Sept. 21-23, 25-30; minimum, 80 ppm Feb. 21-28.
Specific conductance: Maximum daily, 425 micromhos Sept. 30; minimum daily, 148 micromhos June 14.
Water temperatures: Maximum, 79°F Aug. 16, 17; minimum, freezing point on several days in December.
EXTREMES, 1947-51.--Dissolved solids (1947-50): Maximum, 241 ppm Oct. 21-31, 1947; minimum, 109 ppm May 1-10, 1948.
Hardness: Maximum, 175 ppm Oct. 21-31, 1947; minimum, 77 ppm Mar. 21-31, 1950.
Specific conductance: Maximum daily, 475 micromhos Nov. 4, 1949; minimum daily, 143 micromhos Mar. 29, 1950.
Water temperatures: Maximum, 80°F on several days in June, July, and August 1949; minimum, freezing point on several 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 water year October 1950 to September 1951 given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 1-10, 1950 | 1,181 | 4.0 | 0.04 | 40 | 12 | 13 | | 130 | 39 | 20 | 0.1 | 3.4 | 206 | 149 | 43 | 352 | 7.6 | 9 |
| Oct. 11-20 | 1,374 | -- | -- | -- | -- | -- | | 84 | 36 | 8.8 | | 3.9 | -- | 101 | 32 | 239 | 7.3 | 8 |
| Oct. 21-31 | 714 | -- | -- | -- | -- | -- | | 103 | 34 | 13 | | 3.6 | -- | 122 | 38 | 285 | 7.5 | 9 |
| Nov. 1-10 | 1,642 | -- | -- | -- | -- | -- | | 78 | 29 | 9.2 | | 2.4 | -- | 97 | 33 | 228 | 7.5 | 6 |
| Nov. 11-20 | 962 | -- | -- | -- | -- | -- | | 88 | 31 | 9.8 | | 3.3 | -- | 105 | 33 | 249 | 7.5 | 4 |
| Nov. 21-30 | 5,127 | -- | -- | -- | -- | -- | | 76 | 29 | 6.1 | | 4.3 | -- | 92 | 30 | 215 | 7.4 | 7 |
| Dec. 1-10 | 4,434 | 6.7 | .06 | 26 | 6.7 | 1.6 | | 70 | 27 | 5.0 | | 4.3 | 135 | 92 | 35 | 202 | 8.2 | 4 |
| Dec. 11-20 | 1,907 | -- | -- | -- | -- | -- | | 93 | 28 | 7.1 | | 5.3 | -- | 108 | 32 | 243 | 7.6 | 4 |
| Dec. 21-31 | 1,154 | -- | -- | -- | -- | -- | | 106 | 27 | 8.6 | | 4.6 | -- | 119 | 32 | 276 | 7.5 | 9 |
| Jan. 1-10, 1951 | 2,076 | -- | -- | -- | -- | 5.2 | | 81 | 30 | 7.2 | | 4.4 | -- | 100 | 34 | 236 | 7.3 | 4 |
| Jan. 11-20 | 2,351 | -- | -- | -- | -- | 4.3 | | 70 | 29 | 5.5 | | 3.9 | -- | 89 | 32 | 212 | 7.2 | 4 |
| Jan. 21-31 | 2,492 | -- | -- | -- | -- | 4.8 | | 70 | 27 | 5.8 | | 3.8 | -- | 87 | 30 | 208 | 7.3 | 6 |
| Feb. 1-10 | 1,959 | -- | -- | -- | -- | 4.7 | | 77 | 27 | 6.1 | | 4.3 | -- | 93 | 30 | 217 | 7.4 | 4 |
| Feb. 11-20 | 3,094 | -- | -- | -- | -- | 4.0 | | 68 | 26 | 5.5 | | 3.9 | -- | 85 | 29 | 199 | 7.4 | 4 |
| Feb. 21-28 | 4,000 | -- | -- | -- | -- | -- | | 63 | 25 | 4.5 | | 4.5 | -- | 80 | 28 | 185 | 7.4 | 4 |
| Mar. 1-10 | 2,889 | -- | -- | -- | -- | -- | | 65 | 26 | 4.9 | | 4.7 | -- | 85 | 32 | 194 | 7.4 | 2 |
| Mar. 11-20 | 1,911 | -- | -- | -- | -- | -- | | 82 | 28 | 6.5 | | 5.2 | -- | 100 | 33 | 227 | 7.5 | 2 |
| Mar. 21-31 | 2,594 | -- | -- | -- | -- | -- | | 79 | 26 | 6.8 | | 4.6 | -- | 96 | 31 | 217 | 7.5 | 4 |
| Apr. 1-10 | 2,965 | -- | -- | -- | -- | 4.8 | | 74 | 26 | 6.1 | | 5.0 | -- | 90 | 29 | 202 | 7.6 | 6 |
| Apr. 11-20 | 2,404 | -- | -- | -- | -- | 4.4 | | 76 | 27 | 6.0 | | 4.6 | -- | 93 | 31 | 207 | 7.6 | 4 |
| Apr. 21-30 | 1,848 | -- | -- | -- | -- | 5.6 | | 83 | 26 | 7.0 | | 4.0 | -- | 96 | 28 | 220 | 7.7 | 7 |

JUNIATA RIVER AT HUNTINGDON, PA.--Continued
(Formerly published as Frankstown Branch Juniata River at Huntingdon)

Chemical analyses, in parts per million, water year October 1950 to September 1951--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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| May 1-10, 1951 | 1,587 | -- | -- | -- | -- | 5.3 | | a 83 | 22 | 7.4 | | 2.5 | -- | 92 | 26 | 217 | 8.2 | 3 |
| May 11-20 | 1,119 | -- | -- | -- | -- | 7.7 | | 100 | 25 | 10 | | 3.2 | -- | 108 | 26 | 254 | 7.7 | 3 |
| May 21-31 | 873 | -- | -- | -- | -- | 6.9 | | 106 | 27 | 11 | | 3.2 | -- | 118 | 31 | 273 | 7.5 | 6 |
| June 1-10 | 845 | -- | -- | -- | -- | 5.8 | | 106 | 27 | 12 | | 3.4 | -- | 122 | 35 | 290 | 7.4 | 7 |
| June 11-20 | 4,493 | -- | -- | -- | -- | 2.0 | | 65 | 24 | 4.5 | | 2.1 | -- | 82 | 29 | 191 | 7.4 | 16 |
| June 21-30 | 1,085 | -- | -- | -- | -- | 5.3 | | 100 | 30 | 10 | | 2.7 | -- | 118 | 36 | 274 | 7.5 | 7 |
| July 1-10 | 779 | -- | -- | -- | -- | 5.1 | | 114 | 30 | 10 | | 3.0 | -- | 130 | 37 | 298 | 7.6 | 8 |
| July 11-20 | 649 | -- | -- | -- | -- | 6.3 | | 120 | 32 | 12 | | 3.8 | -- | 138 | 40 | 313 | 7.9 | 5 |
| July 21-28,30, 31 | 829 | -- | -- | -- | -- | 8.4 | | 105 | 33 | 10 | | 3.4 | -- | 124 | 38 | 284 | 8.0 | 5 |
| Aug. 1-10 | 499 | -- | -- | -- | -- | 8.5 | | 133 | 33 | 15 | | 3.7 | -- | 149 | 40 | 337 | 8.2 | 4 |
| Aug. 11-20 | 454 | -- | -- | -- | -- | 9.8 | | 137 | 32 | 18 | | 2.9 | -- | 152 | 40 | 347 | 8.2 | 5 |
| Aug. 21-31 | 339 | -- | -- | -- | -- | 9.7 | | 148 | 32 | 20 | | 2.7 | -- | 164 | 43 | 371 | 7.7 | 5 |
| Sept. 1-10 | 332 | -- | -- | -- | -- | 11 | | 154 | 31 | 18 | | 3.7 | -- | 164 | 38 | 373 | 7.9 | 5 |
| Sept. 11-20 | 300 | -- | -- | -- | -- | 13 | | 160 | 31 | 22 | | 2.7 | -- | 168 | 37 | 385 | 8.0 | 5 |
| Sept. 21-23, 25-30 | 286 | -- | -- | -- | -- | 8.9 | | 160 | 31 | 19 | | 2.7 | -- | 173 | 42 | 405 | 8.0 | 5 |
| Average | 1,747 | -- | -- | -- | -- | -- | | 97 | 29 | 10 | | 3.7 | -- | 113 | 34 | 262 | 7.6 | 6 |

a Includes equivalent of 3 parts per million of carbonate ($CO_3$).

SUSQUEHANNA RIVER BASIN--Continued

JUNIATA RIVER AT HUNTINGDON, PA.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 61 | 52 | 40 | 35 | 39 | -- | 45 | 60 | 70 | 73 | 77 | -- |
| 2 | 60 | 50 | 41 | 40 | 35 | -- | 46 | 63 | 74 | 73 | 77 | 75 |
| 3 | 60 | 49 | 41 | 39 | 33 | 40 | 45 | 60 | 74 | 73 | 75 | 75 |
| 4 | 62 | 47 | 40 | 38 | 34 | 41 | 45 | 56 | 74 | 74 | 75 | 73 |
| 5 | 60 | 46 | 42 | 39 | 36 | 43 | 46 | 58 | 73 | 69 | 74 | 74 |
| 6 | 59 | 50 | 41 | 39 | 34 | 45 | 49 | 55 | 70 | 70 | 70 | 72 |
| 7 | 58 | 51 | 42 | 35 | 36 | 46 | 51 | 58 | 70 | 70 | 70 | 69 |
| 8 | 59 | 52 | 40 | 36 | 35 | 45 | 50 | 59 | 69 | 74 | 74 | 69 |
| 9 | 57 | 54 | 41 | 38 | 34 | 43 | 52 | 59 | 66 | 74 | 73 | 66 |
| 10 | 58 | 50 | 40 | 37 | 35 | 40 | 50 | 60 | 67 | 74 | 76 | 68 |
| 11 | 58 | 53 | 42 | 35 | 36 | 41 | 49 | 69 | -- | 75 | 75 | 68 |
| 12 | 60 | 50 | 41 | 39 | 37 | 45 | 50 | -- | 65 | 73 | 75 | 69 |
| 13 | 59 | 49 | -- | 35 | -- | 42 | 48 | 56 | 64 | 73 | 76 | 72 |
| 14 | 56 | 47 | 41 | 34 | -- | 45 | 49 | 51 | 60 | 74 | 78 | 70 |
| 15 | 55 | 44 | 40 | 37 | 40 | 43 | 49 | 60 | 60 | 76 | 78 | 73 |
| 16 | 51 | 40 | 43 | 41 | 38 | 43 | 49 | 60 | 64 | 76 | 79 | 69 |
| 17 | 52 | 42 | 39 | 37 | 40 | 44 | 48 | 65 | 64 | 78 | 79 | 69 |
| 18 | 57 | 45 | 38 | 35 | 40 | 43 | 50 | 60 | 65 | 77 | 75 | 69 |
| 19 | 59 | 45 | 37 | 44 | 40 | 42 | 48 | 64 | 66 | 77 | 76 | 67 |
| 20 | 56 | 46 | 34 | 35 | 41 | 41 | 49 | 63 | 67 | 72 | 75 | 70 |
| 21 | 58 | 42 | -- | 37 | 42 | 43 | -- | 65 | 70 | 73 | 75 | 72 |
| 22 | 57 | 42 | 33 | 38 | 41 | 42 | -- | -- | -- | 72 | 73 | 72 |
| 23 | 58 | 42 | 38 | 40 | 40 | 42 | 50 | 55 | 70 | 72 | 74 | 69 |
| 24 | 56 | 40 | -- | 37 | 40 | 44 | 53 | -- | 71 | 73 | 73 | -- |
| 25 | 58 | -- | 32 | 35 | 43 | 43 | 55 | 64 | 71 | 76 | 72 | 69 |
| 26 | 57 | 40 | 33 | 34 | 42 | 44 | 56 | 64 | 71 | 76 | -- | 67 |
| 27 | 55 | 39 | 32 | 39 | 47 | 42 | 56 | 65 | 71 | 77 | 73 | 63 |
| 28 | 59 | 41 | 32 | 35 | 45 | 45 | 57 | 64 | 72 | 77 | 74 | 60 |
| 29 | 57 | 39 | 34 | -- | -- | 42 | 60 | 62 | 73 | -- | 75 | 60 |
| 30 | 56 | 38 | 35 | 38 | -- | 44 | 62 | 62 | 72 | 76 | 72 | 59 |
| 31 | 54 | -- | 36 | 39 | -- | -- | -- | 66 | -- | 77 | 74 | -- |
| Average | 58 | 46 | 38 | 37 | 39 | 43 | 51 | 61 | 68 | 74 | 75 | 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 1951.
Water temperatures: October 1944 to September 1951.
Sediment records: January 1951 to September 1951.
EXTREMES, 1950-51.--Hardness: Maximum, 152 ppm Sept. 21-30; minimum, 54 ppm Dec. 1-10, Feb. 21-28.
Specific conductance: Maximum daily, 442 micromhos Sept. 27; minimum daily, 74.5 micromhos Nov. 25.
Water temperatures: Maximum, 89°F Aug. 27; minimum, 33°F on several days in December and January.
Sediment concentrations: Maximum daily, 650 ppm Mar. 31; minimum daily, 1 ppm on several days.
Sediment loads: Maximum daily, 62,700 tons Mar. 31; minimum daily, 3 tons Sept. 23.
EXTREMES, 1944-51.--Dissolved solids ( 1944-47) (1949-51): Maximum, 282 ppm Oct. 1-10, 1944; minimum, 74 ppm Feb. 11-20, 1950.
Hardness: (1944-47) (1949-51): Maximum, 167 ppm Oct. 1-10, 1944; minimum, 14 ppm Feb. 21-28, Apr. 1-10, 1951.
Specific conductance: .Maximum, 444 micromhos Oct. 1-10, 1944; minimum daily, 74.5 micromhos Nov. 25, 1950.
REMARKS.--Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 1-10, 1950 | 1,905 | | -- | -- | -- | -- | -- | | 84 | 60 | 9.1 | -- | 2.8 | -- | 105 | 36 | 307 | 7.8 | 7 |
| Oct. 11-20 | 7,854 | | -- | -- | -- | -- | -- | | 60 | 34 | 4.2 | -- | 3.7 | -- | 76 | 27 | 192 | 7.3 | 7 |
| Oct. 21-31 | 2,206 | | -- | -- | -- | -- | -- | | 80 | 43 | 6.8 | -- | 2.5 | -- | 94 | 28 | 246 | 7.6 | 5 |
| Nov. 1-10 | 6,150 | | -- | -- | -- | -- | 10 | | 60 | 32 | 8.4 | -- | 1.9 | -- | 74 | 25 | 196 | 7.4 | 10 |
| Nov. 11-20 | 3,257 | | -- | -- | -- | -- | 8.5 | | 62 | 32 | 5.9 | -- | 2.6 | -- | 76 | 25 | 198 | 7.6 | 8 |
| Nov. 21-24, 26-30 | 22,875 | | -- | -- | -- | -- | -- | | 50 | 28 | 9.0 | -- | 2.6 | -- | 60 | 19 | 162 | 7.4 | 25 |
| Nov. 25 | 26,500 | | -- | -- | -- | -- | -- | | 15 | 13 | 2.0 | -- | 5.4 | -- | 24 | 12 | 74.5 | 6.7 | 6 |
| Dec. 1-10 | 21,268 | | 5.3 | 0.34 | 15 | 4.0 | 3.1 | | 40 | 19 | 3.4 | 0.2 | 3.4 | 84 | 54 | 21 | 126 | 7.4 | 14 |
| Dec. 11-20 | 8,810 | | -- | -- | -- | -- | -- | | 52 | 25 | 2.8 | -- | 4.6 | -- | 65 | 22 | 162 | 7.4 | 10 |
| Dec. 21-31 | 3,951 | | -- | -- | -- | -- | -- | | 70 | 33 | 4.6 | -- | 5.0 | -- | 90 | 33 | 217 | 7.4 | 12 |
| Jan. 1-10, 1951 | 8,241 | | -- | -- | -- | -- | -- | | 52 | 27 | 3.5 | -- | 4.5 | -- | 66 | 23 | 168 | 7.4 | 12 |
| Jan. 11-20 | 8,458 | | -- | -- | -- | -- | -- | | 49 | 24 | 3.2 | -- | 3.3 | -- | 62 | 22 | 158 | 7.4 | 8 |
| Jan. 21-31 | 10,610 | | -- | -- | -- | -- | -- | | 41 | 20 | 2.9 | -- | 2.9 | -- | 52 | 18 | 136 | 7.4 | 9 |
| Feb. 1-10 | 9,603 | | -- | -- | -- | -- | -- | | 44 | 22 | 2.9 | -- | 2.9 | -- | 58 | 22 | 147 | 7.5 | 6 |
| Feb. 11-20 | 10,624 | | -- | -- | -- | -- | -- | | 44 | 20 | 2.9 | -- | 2.8 | -- | 57 | 21 | 142 | 7.5 | 7 |
| Feb. 21-28 | 15,390 | | -- | -- | -- | -- | 2.8 | | 41 | 20 | 2.6 | -- | 2.6 | -- | 54 | 20 | 136 | 7.4 | 18 |
| Mar. 1-10 | 10,114 | | -- | -- | -- | -- | -- | | 50 | 24 | 3.1 | -- | 4.5 | -- | 64 | 23 | 155 | 7.4 | 3 |
| Mar. 11-20 | 7,330 | | -- | -- | -- | -- | -- | | 52 | 25 | 3.4 | -- | 4.1 | -- | 66 | 23 | 160 | 7.5 | 4 |
| Mar. 21-31 | 10,147 | | -- | -- | -- | -- | -- | | 51 | 25 | 3.9 | -- | 3.9 | -- | 67 | 25 | 163 | 7.5 | 4 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apr. 1-10 | 14,566 | | -- | -- | -- | -- | -- | 47 | 22 | 2.6 | -- | 4.2 | -- | 60 | 18 | 145 | 7.6 | 4 |
| Apr. 11-20 | 10,134 | | -- | -- | -- | -- | -- | 50 | 22 | 3.1 | -- | 3.2 | -- | 63 | 22 | 151 | 7.5 | 3 |
| Apr. 21-30 | 5,861 | | -- | -- | -- | -- | -- | 62 | 26 | 3.6 | -- | 3.4 | -- | 77 | 26 | 178 | 7.6 | 4 |
| May 1-10 | 6,120 | | -- | -- | -- | -- | 4.3 | 56 | 24 | 3.4 | -- | 2.2 | -- | 68 | 22 | 170 | 7.6 | 4 |
| May 11-20 | 3,413 | | -- | -- | -- | -- | 6.5 | 75 | 28 | 4.8 | -- | 2.2 | -- | 85 | 24 | 212 | 8.0 | 3 |
| May 21-31 | 2,449 | | -- | -- | -- | -- | 13 | 88 | 33 | 9.8 | -- | 2.3 | -- | 94 | 22 | 235 | 7.8 | 8 |
| June 1-10 | 1,941 | | -- | -- | -- | -- | 7.5 | 90 | 37 | 6.5 | -- | 1.7 | -- | 105 | 31 | 253 | 7.7 | 4 |
| June 11-20 | 13,166 | | -- | -- | -- | -- | 3.2 | 50 | 23 | 3.0 | -- | 2.3 | -- | 64 | 23 | 153 | 7.7 | 5 |
| June 21-30 | 3,363 | | -- | -- | -- | -- | 6.6 | 71 | 31 | 4.5 | -- | 2.0 | -- | 84 | 26 | 208 | 7.8 | 5 |
| July 1-10 | 2,805 | | -- | -- | -- | -- | 5.9 | 82 | 35 | 4.1 | -- | 1.7 | -- | 98 | 31 | 233 | 7.8 | 5 |
| July 11-19 | 2,340 | | -- | -- | -- | -- | 8.9 | 89 | 41 | 6.0 | -- | 1.4 | -- | 106 | 33 | 257 | 7.9 | 4 |
| July 22-28, 30, 31 | 2,424 | | -- | -- | -- | -- | 8.9 | 86 | 40 | 6.5 | -- | 2.6 | -- | 104 | 34 | 257 | 8.0 | 4 |
| Aug. 1, 2, 4-8 | 1,365 | | -- | -- | -- | -- | 14 | 95 | 54 | 8.1 | -- | 1.8 | -- | 116 | 38 | 300 | 8.1 | 4 |
| Aug. 11-20 | 1,274 | | -- | -- | -- | -- | 18 | 102 | 56 | 9.5 | -- | 2.0 | -- | 118 | 34 | 325 | 8.2 | 5 |
| Aug. 21-31 | 800 | | -- | -- | -- | -- | 22 | 112 | 69 | 12 | -- | 1.1 | -- | 133 | 41 | 363 | 8.1 | 4 |
| Sept. 1-10 | 933 | | -- | -- | -- | -- | 18 | 120 | 60 | 13 | -- | 2.1 | -- | 142 | 44 | 361 | 7.9 | 5 |
| Sept. 11-20 | 787 | | -- | -- | -- | -- | 18 | 116 | 65 | 13 | -- | 1.4 | -- | 144 | 49 | 383 | 8.1 | 6 |
| Sept. 21-30 | 642 | | 2.8 | 03 | 38 | 14 | 21 | 121 | 73 | 15 | .0 | 1.2 | 246 | 152 | 53 | 402 | 8.1 | 5 |
| Average | 6,625 | | -- | -- | -- | -- | -- | 68 | 34 | 5.8 | -- | 2.8 | -- | 83 | 27 | 212 | 7.6 | 7 |

SUSQUEHANNA RIVER BASIN--Continued

JUNIATA RIVER AT NEWPORT, PA.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 67 | 61 | 39 | 34 | 34 | 43 | 49 | 65 | 76 | 74 | 82 | 83 |
| 2 | 68 | 61 | 40 | 34 | 34 | 45 | 48 | 62 | 77 | 77 | 82 | 76 |
| 3 | 69 | 57 | 42 | 36 | 34 | 43 | 48 | 65 | 80 | 79 | -- | 88 |
| 4 | 66 | 57 | 45 | 37 | 34 | 42 | 47 | 62 | 79 | 75 | 80 | 78 |
| 5 | 65 | 54 | 43 | 35 | 35 | 44 | 47 | 60 | 76 | 74 | 79 | 76 |
| 6 | 67 | 52 | 41 | 34 | 35 | 45 | 50 | 60 | 76 | 73 | 80 | 71 |
| 7 | 61 | 51 | 42 | 34 | 35 | 46 | 52 | 60 | 76 | 77 | 81 | 72 |
| 8 | 61 | 51 | 44 | 35 | -- | 46 | 53 | 60 | 73 | 78 | 82 | 72 |
| 9 | 67 | 51 | 42 | 34 | 34 | 44 | 54 | 63 | 69 | 80 | -- | 72 |
| 10 | 60 | 51 | 39 | 33 | 34 | 42 | 54 | 61 | 66 | 83 | -- | 72 |
| 11 | 59 | 49 | 39 | 34 | 34 | 44 | 54 | 60 | 61 | 83 | 83 | 76 |
| 12 | 60 | 46 | 39 | 35 | 36 | 45 | -- | 58 | 66 | 83 | 83 | 78 |
| 13 | 60 | 44 | 39 | 36 | 36 | 43 | 50 | 60 | 66 | 81 | 80 | 78 |
| 14 | 55 | 44 | 39 | 35 | 36 | 44 | 49 | 63 | 66 | 80 | 81 | 75 |
| 15 | 56 | 44 | 39 | 36 | 37 | 44 | 51 | 66 | 63 | 81 | 83 | 78 |
| 16 | 56 | 45 | 38 | 35 | 36 | 43 | 50 | 69 | 66 | 82 | 83 | 76 |
| 17 | 57 | 44 | 36 | 36 | 38 | 43 | 50 | 71 | 66 | 83 | 83 | 75 |
| 18 | 58 | 45 | 35 | 38 | 40 | 43 | 51 | 70 | 68 | 82 | 81 | 75 |
| 19 | 60 | 45 | 34 | 39 | 40 | 44 | 51 | 68 | 71 | 82 | 81 | 74 |
| 20 | 59 | 46 | 33 | 40 | 40 | 42 | 41 | 68 | 72 | -- | 81 | 75 |
| 21 | 59 | 44 | 33 | 41 | 42 | 44 | 55 | 70 | 66 | -- | 80 | 76 |
| 22 | 59 | 43 | 33 | 39 | 42 | 43 | 54 | 73 | 73 | 80 | 78 | 76 |
| 23 | 58 | 42 | 35 | 34 | 42 | 43 | 56 | 68 | 76 | 80 | 77 | 75 |
| 24 | 55 | 44 | 36 | 34 | 43 | 44 | 56 | 69 | 77 | 81 | 77 | 68 |
| 25 | 57 | 47 | 34 | 34 | 44 | 46 | 58 | 70 | 78 | 81 | 77 | 78 |
| 26 | 55 | 45 | 33 | 37 | 45 | 47 | 68 | 70 | 79 | 82 | 79 | 70 |
| 27 | 53 | 39 | 33 | 34 | 46 | 46 | 62 | 70 | 77 | 82 | 89 | 68 |
| 28 | 54 | 39 | 33 | 36 | 47 | 47 | 61 | 68 | 80 | 82 | 79 | 65 |
| 29 | 57 | 39 | 34 | 34 | -- | 46 | 61 | 66 | 80 | -- | 79 | 63 |
| 30 | 57 | 39 | 34 | 34 | -- | 47 | -- | 67 | 77 | 83 | 82 | 65 |
| 31 | 57 | -- | 34 | 34 | -- | 49 | -- | 72 | -- | 82 | 82 | -- |
| Average | 60 | 47 | 38 | 37 | 38 | 44 | 53 | 66 | 73 | 80 | 81 | 74 |

SUSQUEHANNA RIVER BASIN--Continued

JUNIATA RIVER AT NEWPORT, PA.--Continued

Suspended sediment, January to September 1951

| 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 | 4,280 | -- | | 7,160 | 27 | 522 | 8,060 | 24 | 522 |
| 2 | 3,900 | -- | e 200 | 8,680 | 39 | 914 | 8,060 | 15 | 326 |
| 3 | 3,780 | -- | | 10,900 | 24 | 706 | 7,610 | 12 | 247 |
| 4 | 5,160 | 12 | 167 | 8,990 | 21 | 510 | 9,310 | 30 | 754 |
| 5 | 13,000 | 113 | 3,970 | 7,460 | 29 | 584 | 13,800 | 69 | 2,570 |
| 6 | 13,800 | 100 | 3,730 | 6,870 | 20 | 371 | 13,500 | 36 | 1,310 |
| 7 | 12,200 | 33 | 1,090 | 10,800 | 50 | 1,460 | 11,900 | 28 | 900 |
| 8 | 10,300 | 20 | 556 | 15,200 | 71 | 2,910 | 10,900 | 30 | 883 |
| 9 | 8,680 | 12 | 281 | 11,600 | 35 | 1,100 | 9,630 | 22 | 572 |
| 10 | 7,310 | 16 | 316 | 8,370 | 18 | 407 | 8,370 | 18 | 407 |
| 11 | 6,440 | 18 | 313 | 6,720 | 21 | 381 | 7,160 | 16 | 309 |
| 12 | 6,020 | 12 | 195 | 6,300 | 22 | 374 | 6,580 | 12 | 213 |
| 13 | 5,600 | 7 | 106 | 7,020 | 23 | 436 | 6,160 | 15 | 249 |
| 14 | 5,060 | 8 | 109 | 12,100 | 42 | 1,370 | 6,580 | 19 | 338 |
| 15 | 7,160 | 18 | 348 | 16,500 | 133 | 5,920 | 8,990 | 25 | 607 |
| 16 | 11,200 | 58 | 1,750 | 14,200 | 72 | 2,760 | 8,680 | 24 | 562 |
| 17 | 11,600 | 46 | 1,440 | 11,600 | 54 | 1,690 | 8,060 | 18 | 392 |
| 18 | 9,950 | 20 | 537 | 10,300 | 38 | 1,060 | 6,870 | 13 | 241 |
| 19 | 9,950 | 19 | 510 | 10,300 | 34 | 946 | 6,160 | 12 | 200 |
| 20 | 11,600 | 25 | 783 | 11,200 | 38 | 1,150 | 8,060 | 22 | 479 |
| 21 | 13,500 | 42 | 1,530 | 15,000 | 68 | 2,750 | 9,630 | 35 | 910 |
| 22 | 13,200 | 34 | 1,210 | 23,900 | 337 | 21,700 | 10,300 | 32 | 890 |
| 23 | 11,200 | 8 | 242 | 24,300 | 162 | 10,600 | 8,990 | 18 | 437 |
| 24 | 13,200 | 41 | 1,460 | 17,500 | 100 | 4,720 | 8,060 | 20 | 435 |
| 25 | 13,500 | 41 | 1,490 | 13,200 | 54 | 1,920 | 7,310 | 22 | 434 |
| 26 | 11,600 | 13 | 407 | 10,900 | 30 | 883 | 6,870 | 12 | 223 |
| 27 | 9,630 | 10 | 260 | 9,630 | 39 | 1,010 | 6,300 | 8 | 136 |
| 28 | 8,060 | 6 | 131 | 8,680 | 32 | 750 | 5,880 | 8 | 127 |
| 29 | 7,460 | 5 | 101 | -- | -- | -- | 5,600 | 9 | 136 |
| 30 | 7,760 | 16 | 335 | -- | -- | -- | 6,980 | 28 | 528 |
| 31 | 7,610 | 19 | 390 | -- | -- | -- | 35,700 | 650 | 62,700 |
| Total | 283,710 | -- | 23,957 | 325,380 | -- | 69,904 | 286,060 | -- | 79,037 |

| Day | April | | | May | | | June | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 35,800 | 400 | 38,700 | 8,680 | 99 | 2,320 | 1,840 | 3 | 15 |
| 2 | 23,500 | 125 | 7,930 | 8,680 | 65 | 1,520 | 2,000 | 2 | 11 |
| 3 | 19,200 | 74 | 3,840 | 7,610 | 52 | 1,070 | 1,820 | 1 | 5 |
| 4 | 15,200 | 42 | 1,720 | 6,580 | 42 | 746 | 1,950 | 1 | 5 |
| 5 | 12,200 | 32 | 1,050 | 6,020 | 30 | 488 | 1,950 | 1 | 5 |
| 6 | 10,300 | 23 | 640 | 5,600 | 21 | 318 | 2,220 | 2 | 12 |
| 7 | 8,680 | 23 | 539 | 5,060 | 14 | 191 | 1,910 | 2 | 10 |
| 8 | 7,610 | 24 | 493 | 4,670 | 12 | 151 | 1,650 | 1 | 4 |
| 9 | 6,870 | 14 | 260 | 4,280 | 11 | 127 | 1,690 | 1 | 5 |
| 10 | 6,300 | 12 | 204 | 4,020 | 6 | 65 | 2,380 | 3 | 19 |
| 11 | 6,020 | 22 | 358 | 3,900 | 4 | 42 | 7,140 | 168 | 3,240 |
| 12 | 6,070 | 295 | 4,830 | 3,900 | 6 | 63 | 9,310 | 164 | 4,120 |
| 13 | 15,200 | 355 | 14,600 | 4,280 | 11 | 127 | 8,280 | 94 | 2,100 |
| 14 | 16,800 | 150 | 6,800 | 3,900 | 8 | 84 | 24,400 | 320 | 21,100 |
| 15 | 14,500 | 66 | 2,580 | 3,650 | 3 | 30 | 30,800 | 225 | 18,700 |
| 16 | 11,600 | 41 | 1,280 | 3,160 | 5 | 43 | 18,800 | 80 | 4,060 |
| 17 | 9,630 | 34 | 884 | 2,920 | 5 | 39 | 12,200 | 47 | 1,550 |
| 18 | 8,060 | 24 | 522 | 3,040 | 4 | 33 | 8,680 | 40 | 937 |
| 19 | 7,160 | 25 | 483 | 3,040 | 8 | 66 | 6,580 | 40 | 711 |
| 20 | 6,300 | 16 | 272 | 2,340 | 5 | 32 | 5,470 | 34 | 502 |
| 21 | 5,740 | 14 | 217 | 2,240 | 5 | 30 | 4,800 | 25 | 324 |
| 22 | 5,340 | 16 | 231 | 2,500 | 6 | 40 | 4,410 | 29 | 345 |
| 23 | 6,300 | 34 | 578 | 2,590 | 7 | 49 | 4,150 | 19 | 213 |
| 24 | 7,020 | 26 | 493 | 2,800 | 7 | 53 | 3,650 | 11 | 108 |
| 25 | 6,300 | 18 | 306 | 2,680 | 7 | 51 | 2,920 | 6 | 47 |
| 26 | 5,880 | 15 | 238 | 2,660 | 8 | 57 | 2,590 | 4 | 28 |
| 27 | 5,470 | 10 | 148 | 2,340 | 6 | 38 | 2,900 | 3 | 23 |
| 28 | 5,200 | 10 | 140 | 2,240 | 7 | 42 | 2,660 | 5 | 36 |
| 29 | 5,060 | 43 | 587 | 2,150 | 6 | 35 | 2,750 | 3 | 22 |
| 30 | 6,300 | 50 | 851 | 2,360 | 3 | 19 | 2,800 | 7 | 53 |
| 31 | -- | -- | -- | 2,380 | 6 | 39 | -- | -- | -- |
| Total | 305,610 | -- | 91,774 | 122,270 | -- | 8,008 | 184,700 | -- | 58,310 |

e Estimated.

SUSQUEHANNA RIVER BASIN--Continued

JUNIATA RIVER AT NEWPORT, PA.--Continued

Suspended sediment, January to September 1951--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 | 3,650 | 3 | 30 | 2,040 | 8 | 44 | 754 | 2 | 4 |
| 2 | 3,280 | 1 | 9 | 1,710 | 13 | 60 | 821 | 3 | 7 |
| 3 | 3,040 | 3 | 25 | 1,590 | 13 | 56 | 875 | 4 | 10 |
| 4 | 2,780 | 2 | 15 | 1,230 | 9 | 30 | 821 | 4 | 9 |
| 5 | 3,160 | 11 | 94 | 1,140 | 10 | 31 | 767 | 3 | 6 |
| 6 | 3,400 | 14 | 129 | 1,210 | 12 | 39 | 920 | 3 | 8 |
| 7 | 3,280 | 12 | 106 | 1,060 | 12 | 34 | 1,170 | 4 | 13 |
| 8 | 2,040 | 3 | 17 | 1,170 | 13 | 41 | 1,110 | 8 | 24 |
| 9 | 1,710 | 1 | 5 | 980 | 10 | 26 | 1,110 | 4 | 12 |
| 10 | 1,710 | 1 | 5 | 1,160 | 11 | 34 | 980 | 4 | 11 |
| 11 | 1,710 | 1 | 5 | 1,070 | 11 | 32 | 862 | 3 | 7 |
| 12 | 1,950 | 1 | 5 | 1,580 | 13 | 55 | 834 | 3 | 7 |
| 13 | 1,970 | 3 | 16 | 1,910 | 38 | 196 | 794 | 4 | 7 |
| 14 | 3,940 | 11 | 117 | 1,610 | 25 | 109 | 848 | 4 | 9 |
| 15 | 3,280 | 5 | 44 | 1,450 | 13 | 51 | 905 | 4 | 10 |
| 16 | 2,500 | 3 | 20 | 1,170 | 11 | 35 | 794 | 3 | 6 |
| 17 | 1,970 | 3 | 16 | 1,040 | 12 | 34 | 740 | 3 | 6 |
| 18 | 1,930 | 2 | 10 | 1,020 | 11 | 30 | 680 | 3 | 6 |
| 19 | 2,020 | 7 | 38 | 980 | 11 | 29 | 668 | 2 | 4 |
| 20 | 2,130 | 13 | 75 | 905 | 12 | 29 | 740 | 4 | 8 |
| 21 | 2,290 | 10 | 62 | 935 | 6 | 15 | 680 | 8 | 15 |
| 22 | 2,470 | 9 | 60 | 834 | 4 | 9 | 644 | 4 | 7 |
| 23 | 3,040 | 80 | 657 | 905 | 2 | 5 | 610 | 2 | 3 |
| 24 | 2,750 | 58 | 431 | 821 | 4 | 9 | 610 | 3 | 5 |
| 25 | 3,520 | 40 | 380 | 875 | 2 | 5 | 578 | 3 | 5 |
| 26 | 2,430 | 17 | 112 | 740 | 2 | 4 | 588 | 4 | 6 |
| 27 | 2,150 | 12 | 70 | 716 | 4 | 8 | 620 | 5 | 8 |
| 28 | 2,000 | 12 | 65 | 716 | 4 | 8 | 704 | 5 | 10 |
| 29 | 1,860 | 9 | 45 | 716 | 3 | 6 | 668 | 4 | 7 |
| 30 | 2,080 | 13 | 73 | 780 | 4 | 8 | 716 | 5 | 10 |
| 31 | 2,380 | 13 | 84 | 767 | 3 | 6 | -- | -- | -- |
| Total | 78,420 | -- | 2,820 | 34,830 | -- | 1,078 | 23,611 | -- | 250 |

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 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1202.

Chemical analyses of cross-section samples, November 1950 to September 1951

| Date | Discharge (cfs) | Sampling point | | | Temperature (°F) | Parts per million | | | | | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Channel | Station | Time | | Bicarbonate ($HCO_3$) | Sulfate ($SO_4$) | Chloride (Cl) | Nitrate ($NO_3$) | Hardness as $CaCO_3$ | | | |
| Nov. 15, 1950 | 26,000 | East | 120 | 11:00 a.m. | 43 | 34 | 76 | 5 | 1.8 | 95 | 247 | 6.5 | 5 |
| | | | 600 | 11:00 a.m. | 42 | 42 | 50 | 4 | 2.0 | 76 | 198 | 6.7 | 6 |
| | | | 1180 | 11:00 a.m. | 42 | 2 | 41 | 3 | 1.2 | 36 | 115 | 5.3 | 4 |
| | | West | 600 | 11:00 a.m. | 41 | 13 | 41 | 2 | 2.0 | 45 | 129 | 6.3 | 5 |
| | | | 1100 | 11:00 a.m. | 42 | 52 | 33 | 4 | 2.0 | 68 | 170 | 6.9 | 6 |
| | | | 1320 | 11:00 a.m. | 41 | 89 | 21 | 4 | 4.0 | 87 | 204 | 7.0 | 7 |
| Nov. 16 | 24,200 | East | 120 | 10:15 a.m. | 55 | 27 | 68 | 5 | 4.0 | 86 | 221 | 6.2 | 6 |
| | | | 600 | 10:15 a.m. | 56 | 30 | 38 | 4 | 2.5 | 59 | 157 | 6.3 | 7 |
| | | | 1180 | 10:15 a.m. | 56 | 4 | 32 | 2 | 1.3 | 33 | 100 | 5.7 | 6 |
| | | West | 600 | 10:30 a.m. | 55 | 10 | 34 | 4 | 1.1 | 38 | 110 | 6.0 | 7 |
| | | | 1100 | 10:30 a.m. | 56 | 55 | 30 | 3 | 2.8 | 68 | 168 | 6.7 | 10 |
| | | | 1320 | 10:15 a.m. | 54 | 86 | 22 | 5 | 5.2 | 88 | 200 | 6.8 | 10 |
| Dec. 20 | 33,000 | East | 120 | 11:00 a.m. | 34 | 6 | 106 | 5 | 2.8 | 114 | 278 | 5.6 | 2 |
| | | | 600 | 11:00 a.m. | 34 | 29 | 46 | 4 | 3.1 | 72 | 181 | 6.7 | 2 |
| | | | 1180 | 11:00 a.m. | 35 | 12 | 39 | 3 | 3.0 | 54 | 140 | 6.1 | 2 |
| | | West | 600 | 11:00 a.m. | 35 | 15 | 38 | 3 | 2.0 | 52 | 136 | 6.4 | 7 |
| | | | 1100 | 11:00 a.m. | 35 | 62 | 24 | 4 | 4.2 | 75 | 181 | 7.2 | 2 |
| | | | 1320 | 11:00 a.m. | 35 | 119 | 19 | 4 | 5.7 | 120 | 264 | 7.9 | 2 |
| Jan. 15, 1951 | 40,600 | East | 120 | 11:00 a.m. | 38 | 8 | 78 | 5 | 5.4 | 88 | 218 | 6.4 | 4 |
| | | | 600 | 11:00 a.m. | 38 | 30 | 43 | 3 | 2.3 | 68 | 171 | 7.1 | 3 |
| | | | 1180 | 11:00 a.m. | 38 | 13 | 40 | 3 | 1.8 | 50 | 131 | 6.8 | 5 |
| | | West | 600 | 11:00 a.m. | 37 | 90 | 47 | 2 | 2.0 | 50 | 129 | 7.2 | 5 |
| | | | 1100 | 11:00 a.m. | 38 | 79 | 26 | 3 | 3.4 | 68 | 163 | 7.4 | 5 |
| | | | 1320 | 11:00 a.m. | 37 | 107 | 17 | 4 | 5.8 | 115 | 236 | 7.7 | 5 |
| Feb. 15 | 85,900 | East | 120 | 11:00 a.m. | 37 | 3 | 84 | 4 | 1.9 | 90 | 224 | 5.3 | 4 |
| | | | 600 | 11:00 a.m. | 37 | 24 | 45 | 5 | 2.1 | 65 | 164 | 6.9 | 5 |
| | | | 1180 | 11:00 a.m. | 37 | 16 | 37 | 2 | 1.6 | 48 | 127 | 6.6 | 5 |
| | | West | 600 | 11:00 a.m. | 36 | 45 | 22 | 3 | 2.8 | 64 | 148 | 7.2 | 5 |
| | | | 1100 | 11:00 a.m. | 36 | 51 | 21 | 4 | 3.2 | 66 | 156 | 7.2 | 5 |
| | | | 1320 | 11:00 a.m. | 36 | 70 | 17 | 4 | 2.6 | 70 | 174 | 8.1 | 13 |
| Mar. 16 | 59,900 | East | 120 | 11:00 a.m. | 42 | 14 | 79 | 3 | 1.9 | 92 | 222 | 6.6 | 5 |
| | | | 600 | 11:00 a.m. | 42 | 29 | 44 | 1 | .2 | 66 | 164 | 6.9 | 4 |
| | | | 1180 | 11:00 a.m. | 42 | 14 | 33 | 1 | 1.1 | 44 | 110 | 6.8 | 2 |
| | | West | 600 | 11:00 a.m. | 45 | 16 | 29 | 1 | .1 | 40 | 105 | 6.9 | 5 |
| | | | 1100 | 11:00 a.m. | 44 | 58 | 24 | 4 | 2.3 | 64 | 163 | 7.5 | 5 |
| | | | 1320 | 11:00 a.m. | 44 | 103 | 18 | 2 | 4.3 | 104 | 228 | 7.5 | 4 |
| Apr. 17 | | East | 120 | 11:00 a.m. | 47 | 27 | 49 | 3.0 | 2.7 | 68 | 169 | 6.8 | 5 |
| | | | 600 | 11:00 a.m. | 60 | 35 | 29 | 2.0 | 2.5 | 52 | 129 | 6.5 | 7 |
| | | | 1180 | 11:00 a.m. | 47 | 21 | 23 | 2.0 | 1.9 | 43 | 111 | 6.2 | 7 |
| | | West | 600 | 11:00 a.m. | 47 | 12 | 29 | 1.0 | 1.6 | 39 | 102 | 6.1 | 3 |
| | | | 1100 | 11:00 a.m. | 48 | 42 | 19 | 2.0 | 3.0 | 54 | 130 | 6.4 | 5 |
| | | | 1320 | 11:00 a.m. | 49 | 48 | 17 | 2.0 | 3.5 | 58 | 134 | 6.7 | 5 |
| May 17 | | East | 120 | 11:00 a.m. | 68 | 21 | 123 | 6.0 | 1.7 | 144 | 336 | 6.6 | 2 |
| | | | 600 | 11:00 a.m. | 68 | 44 | 76 | 6.0 | 2.3 | 113 | 268 | 6.8 | 3 |
| | | | 1180 | 11:00 a.m. | 68 | 15 | 52 | 5.0 | 1.4 | 62 | 162 | 6.5 | 2 |
| | | West | 600 | 11:00 a.m. | 68 | 19 | 44 | 5.0 | 1.4 | 58 | 153 | 6.4 | 2 |
| | | | 1100 | 11:00 a.m. | 67 | 66 | 30 | 6.0 | 1.7 | 82 | 194 | 7.0 | 3 |
| | | | 1320 | 11:00 a.m. | 67 | 96 | 23 | 5.0 | 1.9 | 99 | 223 | 7.1 | 4 |
| June 15 | | East | 120 | 11:00 a.m. | 65 | 14 | 117 | 8.0 | 3.2 | 136 | 309 | 6.0 | 3 |
| | | | 600 | 11:00 a.m. | 63 | 21 | 34 | 3.0 | 2.6 | 49 | 126 | 6.5 | 2 |
| | | | 1180 | 11:00 a.m. | 59 | 38 | 19 | 2.0 | 1.7 | 50 | 121 | 6.9 | 8 |
| | | West | 600 | 11:00 a.m. | 60 | 42 | 21 | 3.0 | 2.3 | 54 | 127 | 6.8 | 7 |
| | | | 1100 | 11:00 a.m. | 60 | 38 | 20 | 4.0 | 3.4 | 50 | 125 | 6.5 | 11 |

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT HARRISBURG, PA.--Continued

Chemical analyses of cross-section samples, November 1950 to September 1951--Continued

| Date | Discharge (cfs) | Sampling point | | | Temperature (°F) | Parts per million | | | | | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Channel | Station | Time | | Bicarbonate (HC) | Sulfate ($SO_4$) | Chloride (Cl) | Nitrate ($NO_3$) | Hardness as $CaCO_3$ | | | |
| June 15.. 1951 ... | | West | 1320 | 11:00 a. m. | 60 | 41 | 20 | 3.0 | 7.4 | 50 | 122 | 6.6 | 10 |
| Aug. 15 .. | | East | 145 | 11:20 a. m. | 82 | 2 | 211 | 8.0 | .5 | 221 | 484 | 4.9 | 3 |
| | | | 600 | 11:20 a. m. | 83 | 27 | 114 | 8.0 | .9 | 142 | 333 | 7.0 | 4 |
| | | | 1220 | 11:20 a. m. | 83 | 50 | 56 | 7.0 | 1.9 | 93 | 221 | 7.5 | 6 |
| | | West | 600 | 11:20 a. m. | 83 | 70 | 48 | 8.0 | 2.2 | 116 | 234 | 7.2 | 5 |
| | | | 1100 | 11:20 a. m. | 80 | 77 | 36 | 8.0 | 3.6 | 93 | 240 | 7.4 | 6 |
| | | | 1300 | 11:20 a. m. | 80 | 133 | 18 | 4.0 | 6.0 | 132 | 268 | 7.2 | 5 |
| Sept. 24.. | | East | 140 | 1:10 p. m. | 67 | 2 | 232 | 10 | 1.3 | 249 | 587 | 4.9 | 5 |
| | | | 600 | 1:10 p. m. | 67 | 28 | 168 | 9.5 | 1.3 | 186 | 442 | 6.6 | 7 |
| | | | 1220 | 1:10 p. m. | -- | 51 | 112 | 10 | 1.8 | 142 | 347 | 6.8 | 8 |
| | | West | 600 | 1:10 p. m. | -- | 77 | 88 | 12 | 1.2 | 146 | 359 | 7.2 | 6 |
| | | | 1100 | 1:10 p. m. | -- | 102 | 54 | 14 | .8 | 146 | 354 | 7.2 | 5 |
| | | | 1320 | 1:10 p. m. | -- | 114 | 18 | 7.5 | 3.4 | 123 | 249 | 7.3 | 5 |

## MISCELLANEOUS ANALYSES OF STREAMS IN SUSQUEHANNA RIVER BASIN IN PENNSYLVANIA

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| **PINE CREEK NEAR JERSEY SHORE** | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 13, 1950.... | a3,290 | 54 | 4.6 | | 0.04 | | 7.1 | 1.7 | 1.1 | 1.0 | 14 | 13 | 1.5 | 0.2 | 0.7 | 42 | 25 | 13 | | 63.9 | 7.4 | 7 |
| Nov. 15..... | a1,280 | -- | 3.3 | | .07 | | 6.3 | 1.7 | 1.0 | .7 | 12 | 13 | 1.4 | .3 | .5 | 37 | 23 | 13 | | 57.3 | 7.4 | 4 |
| Dec. 13..... | a2,840 | -- | 4.0 | | .02 | | 6.2 | 1.5 | .9 | .9 | 5 | 17 | 1.2 | .2 | .4 | 38 | 22 | 18 | | 56.6 | 6.8 | 2 |
| Mar. 27, 1951... | a2,160 | 40 | 4.9 | | .03 | | 6.3 | 1.6 | 3.3 | .9 | 14 | 14 | 2.9 | .1 | 1.2 | 42 | 22 | 11 | | 62.0 | 6.8 | 6 |
| May 4..... | a1,160 | -- | 3.8 | | .05 | | 6.4 | 1.6 | 1.4 | 1.4 | 15 | 12 | 1.4 | .1 | .5 | 44 | 23 | 10 | | 58.9 | 7.3 | 3 |
| June 5..... | 328 | 74 | 2.2 | | .05 | | 7.9 | 2.0 | 2.6 | 1.5 | 22 | 13 | 2.2 | .1 | .4 | 49 | 28 | 10 | | 73.7 | 7.3 | 4 |
| July 11..... | 745 | 75 | 3.6 | | .08 | | 7.8 | 1.6 | 2.8 | 1.0 | 20 | 14 | 1.8 | .1 | .3 | 46 | 26 | 10 | | 69.7 | 7.0 | 5 |
| Aug. 15..... | 308 | 72 | 1.9 | | .05 | | 10 | 2.8 | 3.7 | | 30 | 13 | 3.8 | .1 | .9 | 52 | 36 | 12 | | 88.0 | 7.1 | 5 |

a Estimated.

## POTOMAC RIVER BASIN

### ANTIETAM CREEK NEAR WAYNESBORO, PA.

LOCATION.--At gaging station at county highway bridge, at Rock Forge, Md., 0.5 mile downstream from Maryland-Pennsylvania State line, 0.9 mile downstream from confluence of West and East Branches of Antietam Creek, and 2.5 miles southwest of Waynesboro, Pa.
DRAINAGE AREA.--93.5 square miles.
RECORDS AVAILABLE.--Chemical analyses: April 1948 to June 1951.
Sediment records: April 1948 to June 1951.
REMARKS.--Records of specific conductance and pH of weekly samples available in field office at Schuylkill Haven, Pa.

Chemical analyses, in parts per million, October 1950 to June 1951

| Date of collection | 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 | Suspended sediment | Hardness as $CaCO_3$ | Specific conductance (micromhos at 25°C) | pH | Color | Biochemical oxygen demand (five days at 20°C) | Dissolved oxygen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 4, 1950.. | 36 | 60 | -- | -- | -- | -- | | -- | 200 | -- | -- | -- | 11 | -- | 9 | 182 | 357 | 7.9 | 5 | 1.2 | 11.4 |
| Oct. 11..... | 66 | 57 | -- | -- | -- | -- | | -- | 136 | -- | -- | -- | 9.0 | -- | 16 | 128 | 269 | 7.5 | 10 | 2.0 | 10.6 |
| Oct. 25..... | 51 | 54 | 7.6 | 0.09 | 38 | 12 | | 6.8 | 157 | 16 | 4.5 | 0.0 | 9.0 | 182 | 6 | 144 | 289 | 8.1 | 2 | 1.6 | 10.8 |
| Nov. 1..... | 44 | 59 | -- | -- | -- | -- | | -- | 168 | -- | -- | -- | 9.5 | -- | 8 | 154 | 307 | 8.0 | 5 | 1.8 | 11.2 |
| Nov. 8..... | 59 | 48 | -- | -- | -- | -- | | -- | 150 | -- | -- | -- | 9.0 | -- | 4 | 137 | 280 | 7.8 | 5 | 2.1 | 10.7 |
| Nov. 15..... | 51 | 42 | 6.8 | .03 | 38 | 12 | | 5.8 | 156 | 14 | 4.5 | .0 | 10 | 173 | 10 | 144 | 293 | 8.1 | 5 | 2.0 | 13.4 |
| Nov. 22..... | 53 | 39 | -- | -- | -- | -- | | -- | 140 | -- | -- | -- | 8.3 | -- | 2 | 131 | 273 | 7.8 | 6 | 4.4 | 13.8 |
| Dec. 6..... | 315 | 42 | -- | -- | -- | -- | | -- | 97 | -- | -- | -- | 7.3 | -- | 30 | 98 | 202 | 7.6 | 8 | 2.0 | 12.2 |
| Dec. 13..... | 225 | 39 | 7.7 | .06 | 30 | 8.9 | | 2.5 | 114 | 13 | 2.5 | .0 | 8.0 | 134 | 11 | 111 | 227 | 7.8 | 5 | 2.4 | 12.6 |
| Jan. 3, 1951.. | 116 | 43 | 8.5 | .03 | 39 | 12 | | 1.9 | 148 | 15 | 3.5 | .0 | 11 | 166 | 12 | 147 | 289 | 7.6 | 4 | 1.7 | 12.4 |
| Jan. 17..... | 148 | 40 | -- | -- | -- | -- | | -- | 122 | -- | -- | -- | 9.3 | -- | 18 | 124 | 248 | 7.7 | 5 | 1.7 | 13.2 |
| Jan. 24..... | 247 | 42 | -- | -- | -- | -- | | -- | 86 | -- | -- | -- | 6.2 | -- | 86 | 86 | 184 | 7.4 | 20 | 3.9 | 12.2 |
| Feb. 14..... | 214 | 44 | 7.0 | .16 | 30 | 9.2 | | 2.1 | 110 | 15 | 4.0 | .0 | 7.4 | 135 | 63 | 113 | 225 | 7.8 | 10 | 3.1 | 13.3 |
| Feb. 28..... | 204 | 46 | -- | -- | -- | -- | | -- | 129 | -- | -- | -- | 9.0 | -- | 45 | 129 | 258 | 7.8 | 7 | 2.4 | 13.2 |
| Mar. 7..... | 169 | 51 | -- | -- | -- | -- | | -- | 137 | -- | -- | -- | 9.9 | -- | 19 | 135 | 278 | 7.5 | 5 | 1.6 | 12.4 |
| Mar. 14..... | 354 | 43 | -- | -- | -- | -- | | -- | 88 | -- | -- | -- | 7.7 | -- | -- | 91 | 203 | 7.3 | 25 | 3.8 | 11.8 |
| Mar. 21..... | 229 | 45 | 8.3 | .08 | 31 | 9.2 | | 4.3 | 120 | 15 | 3.0 | .0 | 7.8 | 135 | 28 | 115 | 238 | 7.8 | 5 | 2.7 | 13.8 |
| Mar. 28..... | 166 | 48 | -- | -- | -- | -- | | -- | 148 | -- | -- | -- | 9.0 | -- | 41 | 130 | 273 | 7.6 | 5 | 2.6 | 13.2 |
| Apr. 4..... | 202 | 48 | -- | -- | -- | -- | | -- | 114 | -- | -- | -- | 8.3 | -- | 22 | 114 | 229 | 7.4 | 5 | 2.0 | 13.2 |
| Apr. 11..... | 166 | 51 | -- | -- | -- | -- | | -- | 126 | -- | -- | -- | 8.6 | -- | 258 | 126 | 254 | 7.3 | 5 | 3.3 | 14.4 |
| Apr. 18..... | 162 | 49 | 5.7 | .05 | 31 | 10 | | 4.0 | 124 | 14 | 3.0 | .0 | 8.5 | 138 | 30 | 118 | 237 | 7.9 | 5 | 1.8 | 14.4 |
| Apr. 25..... | 166 | 57 | -- | -- | -- | -- | | -- | 112 | -- | -- | -- | 7.1 | -- | 20 | 111 | 226 | 7.6 | 8 | 1.4 | 13.7 |
| May 2..... | 176 | 61 | -- | -- | -- | -- | | -- | 114 | -- | -- | -- | 6.6 | -- | 30 | 108 | 221 | 7.5 | 5 | 3.5 | 12.2 |
| May 9..... | 138 | 58 | -- | -- | -- | -- | | -- | 130 | -- | -- | -- | 7.4 | -- | 16 | 126 | 251 | 7.7 | 5 | 1.2 | 11.0 |
| May 16..... | 112 | 63 | 7.2 | .05 | 34 | 11 | | 7.3 | 134 | 24 | 3.0 | .0 | 8.6 | 157 | 20 | 130 | 258 | 7.9 | 5 | 1.1 | 10.5 |
| May 23..... | 101 | 63 | -- | -- | -- | -- | | -- | 149 | -- | -- | -- | 10 | -- | 14 | 140 | 281 | 7.7 | 5 | 1.3 | 9.5 |
| June 6..... | 120 | 61 | -- | -- | -- | -- | | -- | 110 | -- | -- | -- | 7.3 | -- | 60 | 108 | 223 | 7.3 | 5 | 1.3 | 9.1 |
| June 13..... | 442 | 57 | -- | -- | -- | -- | | -- | 70 | -- | -- | -- | 4.4 | -- | 238 | 68 | 151 | 7.2 | 15 | 3.2 | 8.8 |
| June 20..... | 180 | 63 | 8.5 | .04 | 31 | 9.5 | | .6 | 116 | 11 | 3.5 | .0 | 7.7 | 139 | 52 | 116 | 235 | 7.9 | 5 | .9 | 8.9 |
| June 27..... | 122 | 69 | -- | -- | -- | -- | | -- | 148 | -- | -- | -- | 8.2 | -- | 46 | 141 | 285 | 7.6 | 5 | 1.8 | 8.6 |

## SOUTH FORK SHENANDOAH RIVER NEAR LURAY, VA.

LOCATION.--At gaging station at bridge on U. S. Highway 211, 1.2 miles downstream from Big Run, 2.2 miles upstream from Mill Creek, and 4.1 miles west of Luray, Page County.
DRAINAGE AREA.--1,377 square miles.
RECORDS AVAILABLE.--Chemical analyses: April 1929 to March 1930, October 1948 to August 1950, October 1950 to May 1951.
Water temperatures: October 1948 to September 1949.
EXTREMES, 1929-30, 1948-49.--Dissolved solids: Maximum, 170 ppm Sept. 21-30, 1929; minimum, 81 ppm May 1-10, 1929.
Hardness: Maximum, 156 ppm Sept. 21-30, 1929; minimum, 66 ppm May 1-10, 1929.
Specific conductance (1948-49): Maximum daily, 304 micromhos Oct. 2, 1948; minimum daily, 94.3 micromhos June 19, 1949.
Water temperatures (1948-49): Maximum, 82°F Aug. 10, 1949; minimum, 35°F Dec. 27, 1948.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1202.

Chemical analyses, in parts per million, October 1950 to May 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| Oct. 26, 1950..... | 550 | | -- | 0.00 | 35 | 14 | 5.6 | | 162 | 14 | 6.5 | 0.0 | 0.8 | 159 | 145 | 12 | 279 | 8.0 | -- |
| Dec. 20 ..... | 1,360 | | -- | .07 | 31 | 9.1 | 1.6 | | 120 | 13 | 3.5 | .1 | 1.4 | 132 | 115 | 16 | 224 | 7.8 | 7 |
| Jan. 17, 1951 ..... | 1,170 | | 3.2 | .02 | 31 | 11 | 1.8 | | 128 | 12 | 4.9 | .1 | 2.4 | 144 | 123 | 18 | 237 | 8.0 | 0 |
| Feb. 22..... | 3,430 | | 4.9 | .02 | 23 | 6.2 | 2.7 | | 86 | 11 | 2.9 | .0 | 3.4 | 104 | 83 | 12 | 167 | 7.2 | 5 |
| Mar. 20 ..... | 3,360 | | 3.0 | .02 | 29 | 8.4 | 1.7 | | 110 | 13 | 3.0 | .0 | 3.3 | 133 | 107 | 17 | 214 | 7.2 | 4 |
| Apr. 12..... | 4,020 | | 6.7 | .01 | 20 | 5.2 | 2.1 | | 76 | 8.0 | 2.1 | .0 | 2.9 | 89 | 71 | 9 | 149 | 6.7 | 6 |
| May 16 ..... | 1,260 | | 2.6 | .04 | 29 | 8.9 | 3.1 | | 120 | 9.5 | 3.9 | .0 | 2.5 | 132 | 109 | 11 | 225 | 7.0 | 10 |

POTOMAC RIVER BASIN--Continued

MONOCACY RIVER AT BRIDGEPORT, MD.

LOCATION.--At bridge on State Highway 32 at Bridgeport, Carrol County, 60 feet upstream from gaging station, which is 0.9 mile upstream from Cattail Branch, 3.4 miles northwest of Taneytown, and 4.8 miles downstream from confluence of Rock and Marsh Creeks at Maryland-Pennsylvania State line.
DRAINAGE AREA.--173 square miles.
RECORDS AVAILABLE.--Chemical analyses: April 1948 to June 1951.
Sediment records: April 1948 to June 1951.
REMARKS.--Records of specific conductance and pH of weekly samples available in field office at Schuylkill Haven, Pa.

Chemical analyses, in parts per million, October 1950 to June 1951

| Date of collection | 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 | Suspended sediment | Hardness as $CaCO_3$ | Specific conductance (micromhos at 25°C) | pH | Color | Biochemical oxygen demand (five days at 20°C) | Dissolved oxygen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 4, 1950.. | 13 | 64 | -- | -- | -- | -- | -- | | 71 | -- | -- | -- | 4.2 | -- | 8 | 86 | 216 | 7.6 | 10 | 0.8 | 9.2 |
| Oct. 11 ..... | 101 | 60 | -- | -- | -- | -- | -- | | 64 | -- | -- | -- | 3.3 | -- | 22 | 72 | 195 | 7.3 | 30 | 2.4 | 8.2 |
| Oct. 25 ..... | 99 | 55 | 15 | 0.43 | 18 | 5.7 | 6.9 | | 53 | 29 | 5.0 | 0.0 | 3.3 | 123 | 18 | 68 | 170 | 7.2 | 50 | 2.2 | 8.2 |
| Nov. 1..... | 43 | 60 | -- | -- | -- | -- | -- | | 78 | -- | -- | -- | 1.3 | -- | 6 | 84 | 211 | 7.3 | 6 | .8 | 9.6 |
| Nov. 8..... | 53 | 46 | -- | -- | -- | -- | -- | | 75 | -- | -- | -- | 2.4 | -- | 8 | 85 | 217 | 7.4 | 10 | 1.2 | 10.4 |
| Nov. 15..... | 32 | 40 | 6.5 | .02 | 22 | 6.7 | 8.1 | | 76 | 28 | 5.5 | .0 | 1.0 | 121 | 6 | 82 | 204 | 7.3 | 7 | 2.0 | 13.4 |
| Nov. 22..... | 31 | 41 | -- | -- | -- | -- | -- | | 83 | -- | -- | -- | 2.5 | -- | 2 | 83 | 211 | 7.6 | 8 | 3.0 | 13.2 |
| Dec. 6..... | 389 | 39 | -- | -- | -- | -- | -- | | 33 | -- | -- | -- | 7.0 | -- | 10 | 50 | 139 | 7.1 | 20 | 2.8 | 13.0 |
| Dec. 13..... | 245 | 35 | 12 | .17 | 16 | 4.9 | 5.0 | | 39 | 26 | 5.0 | .0 | 6.0 | 97 | 1 | 60 | 147 | 7.5 | 15 | 3.1 | 13.7 |
| Jan. 3, 1951.. | 86 | 34 | 12 | .03 | 18 | 5.9 | 5.1 | | 50 | 26 | 5.0 | .0 | 6.4 | 105 | 1 | 69 | 168 | 7.7 | 5 | 2.2 | 13.5 |
| Jan. 17 ..... | 192 | 35 | -- | -- | -- | -- | -- | | 28 | -- | -- | -- | 5.8 | -- | 8 | 50 | 133 | 6.9 | 25 | 2.2 | 13.6 |
| Jan. 24 ..... | 3,080 | 36 | -- | -- | -- | -- | -- | | 28 | -- | -- | -- | 3.8 | -- | 690 | 42 | 118 | 7.0 | 140 | 7.2 | 12.2 |
| Feb. 14..... | 920 | 34 | 5.5 | .65 | 9.0 | 3.0 | 1.8 | | 24 | 14 | 1.0 | .0 | 3.9 | 69 | 62 | 35 | 87.4 | 7.1 | 25 | 4.4 | 14.0 |
| Feb. 28..... | 195 | 46 | -- | -- | -- | -- | -- | | 35 | -- | -- | -- | 5.0 | -- | 9 | 53 | 140 | 7.5 | 20 | 1.6 | 12.2 |
| Mar. 7..... | 207 | 48 | -- | -- | -- | -- | -- | | 37 | -- | -- | -- | 4.7 | -- | 4 | 53 | 151 | 6.9 | 6 | 2.5 | 12.8 |
| Mar. 14..... | 207 | 42 | -- | -- | -- | -- | -- | | 43 | -- | -- | -- | 4.5 | -- | 1 | 57 | 155 | 7.0 | 9 | 2.8 | 13.6 |
| Mar. 21..... | 384 | 44 | 8.8 | .61 | 13 | 4.0 | 3.6 | | 28 | 25 | 2.5 | .0 | 5.3 | 92 | 18 | 49 | 126 | 7.2 | 30 | 3.1 | 12.7 |
| Mar. 28..... | 118 | 48 | -- | -- | -- | -- | -- | | 41 | -- | -- | -- | 3.4 | -- | 7 | 52 | 143 | 6.9 | 8 | 2.9 | 14.2 |
| Apr. 4..... | 282 | 46 | -- | -- | -- | -- | -- | | 40 | -- | -- | -- | 3.5 | -- | 30 | 55 | 140 | 7.0 | 15 | 2.3 | 12.3 |
| Apr. 11..... | 138 | 56 | -- | -- | -- | -- | -- | | 47 | -- | -- | -- | 1.9 | -- | 2 | 57 | 140 | 7.1 | 10 | 2.2 | 13.8 |
| Apr. 18..... | 129 | 51 | 7.4 | .11 | 13 | 5.1 | 2.1 | | 42 | 20 | 1.0 | .0 | 1.7 | 78 | 4 | 53 | 124 | 7.6 | 10 | 2.2 | 14.5 |
| Apr. 25..... | 167 | 63 | -- | -- | -- | -- | -- | | 39 | -- | -- | -- | 1.5 | -- | 8 | 49 | 124 | 7.1 | 20 | 2.2 | 12.2 |
| May 2..... | 109 | 70 | -- | -- | -- | -- | -- | | 56 | -- | -- | -- | 1.9 | -- | 14 | 57 | 141 | 7.0 | 5 | 3.7 | 12.3 |
| May 9 ..... | 68 | 64 | -- | -- | -- | -- | -- | | 54 | -- | -- | -- | 3.5 | -- | -- | 57 | 144 | 7.0 | 7 | 1.7 | 12.3 |
| May 16..... | 56 | 68 | 8.3 | .02 | 15 | 5.2 | 9.4 | | 56 | 28 | 2.0 | .0 | 1.7 | 92 | 10 | 59 | 144 | 7.5 | 8 | 1.2 | 9.4 |
| May 23 ..... | 43 | 73 | -- | -- | -- | -- | -- | | 64 | -- | -- | -- | 1.7 | -- | 16 | 59 | 149 | 7.0 | 5 | .8 | 7.5 |
| June 6 ..... | 79 | 72 | -- | -- | -- | -- | -- | | 42 | -- | -- | -- | 5.4 | -- | 86 | 53 | 140 | 6.7 | 40 | 2.1 | 5.7 |
| June 13 ..... | 2,930 | 60 | -- | -- | -- | -- | -- | | 38 | -- | -- | -- | 9.0 | -- | 184 | 57 | 148 | 6.7 | 30 | 3.4 | 8.4 |
| June 20 ..... | 109 | 73 | 12 | .03 | 13 | 4.3 | 2.6 | | 40 | 18 | 1.0 | .0 | 3.6 | 128 | 6 | 50 | 128 | 7.6 | 5 | .6 | 8.5 |
| June 27 ..... | 62 | 77 | -- | -- | -- | -- | -- | | 60 | -- | -- | -- | 2.0 | -- | 14 | 55 | 146 | 7.1 | 15 | 1.2 | 6.2 |

## MISCELLANEOUS ANALYSES OF STREAMS IN POTOMAC RIVER BASIN IN VIRGINIA

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| **NORTH FORK SHENANDOAH RIVER NEAR STRASBURG** | | | | | | | | | | | | | | | | | | | |
| Oct. 25, 1950 | 189 | | 6.8 | 0.02 | 48 | 17 | 2.7 | | 210 | 15 | 4.2 | 0.1 | 2.0 | 196 | 190 | 18 | 340 | 8.2 | 4 |
| Jan. 11, 1951 | 424 | | 3.2 | -- | 44 | 12 | 1.0 | | 171 | 14 | 3.1 | .1 | 2.5 | 176 | 159 | 19 | 293 | 7.6 | 2 |
| Feb. 21 | 1,420 | | 5.6 | .04 | 29 | 7.1 | 2.8 | | 102 | 14 | 4.4 | .1 | 3.7 | 132 | 102 | 18 | 208 | 6.8 | 3 |
| Mar. 16 | 1,480 | | 7.3 | .11 | 29 | 6.1 | 4.2 | | 107 | 13 | 2.8 | .0 | 1.6 | 129 | 97 | 10 | 197 | 7.5 | 9 |
| Apr. 18 | 1,100 | | 4.8 | .02 | 34 | 8.2 | 6.4 | | 138 | 12 | 2.6 | .1 | 3.7 | 143 | 119 | 5 | 227 | 7.1 | 3 |
| May 18 | 577 | | 6.6 | .02 | 29 | 8.6 | .6 | | 110 | 11 | 4.0 | .0 | 2.1 | 128 | 108 | 18 | 202 | 7.0 | 6 |

## RAPPAHANNOCK RIVER BASIN

### 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, and 2.5 miles downstream from Hazel River.
DRAINAGE AREA.--616 square miles.
RECORDS AVAILABLE.--Water temperatures: May to September 1951.
Sediment records: April to September 1951.
EXTREMES, 1951.--Water temperatures: Maximum, 78°F Aug. 12.
Sediment concentrations: Maximum daily observed, 1,240 ppm June 10; minimum daily observed, 2 ppm on several days in September.
Sediment loads: Maximum daily observed, 23,400 tons June 10; minimum daily observed, less than 0.50 ton on several days in September.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1202.

Temperature (°F) of water, May to September 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | -- | 65 | 72 | 75 | 70 |
| 2 | | | | | | | | -- | 65 | 69 | 71 | 74 |
| 3 | | | | | | | | -- | 72 | 70 | 72 | 74 |
| 4 | | | | | | | | -- | 70 | 71 | 68 | 69 |
| 5 | | | | | | | | -- | 70 | 73 | 65 | 66 |
| 6 | | | | | | | | -- | 65 | -- | 65 | 69 |
| 7 | | | | | | | | -- | 63 | 66 | 67 | 68 |
| 8 | | | | | | | | -- | 67 | 67 | 69 | 60 |
| 9 | | | | | | | | -- | 66 | 68 | 72 | 59 |
| 10 | | | | | | | | -- | 63 | 70 | 75 | 60 |
| 11 | | | | | | | | -- | 60 | 73 | 75 | 65 |
| 12 | | | | | | | | -- | 62 | 73 | 78 | 66 |
| 13 | | | | | | | | -- | 60 | 75 | 74 | 70 |
| 14 | | | | | | | | -- | 61 | 74 | 73 | 70 |
| 15 | | | | | | | | -- | 62 | 75 | 74 | 69 |
| 16 | | | | | | | | -- | 60 | 74 | 74 | 63 |
| 17 | | | | | | | | 70 | 63 | 75 | 75 | 66 |
| 18 | | | | | | | | 64 | 65 | 76 | 71 | 62 |
| 19 | | | | | | | | 60 | 64 | 72 | 68 | 60 |
| 20 | | | | | | | | 61 | 68 | 68 | 72 | 60 |
| 21 | | | | | | | | 66 | 69 | 65 | 72 | 62 |
| 22 | | | | | | | | 65 | 71 | 72 | 73 | 63 |
| 23 | | | | | | | | 69 | 72 | 76 | 73 | 69 |
| 24 | | | | | | | | 60 | 75 | 74 | 65 | 59 |
| 25 | | | | | | | | 61 | 74 | 73 | 63 | 65 |
| 26 | | | | | | | | 63 | 72 | 73 | 62 | 65 |
| 27 | | | | | | | 63 | 61 | 74 | 73 | 67 | 65 |
| 28 | | | | | | | | 60 | 73 | 75 | 68 | 64 |
| 29 | | | | | | | | 60 | 74 | 74 | 66 | 53 |
| 30 | | | | | | | | 60 | 73 | 72 | 67 | 50 |
| 31 | | | | | | | | 63 | -- | 73 | 67 | -- |
| Average | | | | | | | | -- | 67 | 72 | 70 | 64 |

RAPPAHANNOCK RIVER BASIN--Continued

RAPPAHANNOCK RIVER AT REMINGTON, VA.--Continued

Suspended sediment, April to September 1951

| 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 | -- | -- | -- | 870 | 35 | 82 | 345 | 11 | 10 |
| 2 | -- | -- | -- | 768 | 12 | 25 | 333 | 15 | 13 |
| 3 | -- | -- | -- | 735 | 8 | 16 | 309 | 15 | 13 |
| 4 | -- | -- | -- | 702 | 8 | 15 | 638 | 135 | a 240 |
| 5 | -- | -- | -- | 735 | 6 | 12 | 835 | 221 | a 500 |
| 6 | -- | -- | -- | 905 | 14 | 34 | 605 | 159 | 260 |
| 7 | -- | -- | -- | 768 | 6 | 12 | 442 | 35 | 42 |
| 8 | -- | -- | -- | 670 | 4 | 7 | 442 | 30 | 36 |
| 9 | -- | -- | -- | 638 | 9 | 16 | 735 | 191 | s 684 |
| 10 | -- | -- | -- | 605 | 9 | 15 | 6,980 | 1,240 | 23,400 |
| 11 | -- | -- | -- | 572 | 8 | 12 | 2,270 | 248 | s 1,680 |
| 12 | -- | -- | -- | 870 | 58 | 136 | 1,150 | 73 | 227 |
| 13 | -- | -- | -- | 735 | 71 | 141 | 2,480 | 270 | s 2,550 |
| 14 | -- | -- | -- | 638 | 26 | 45 | 4,500 | 373 | s 5,000 |
| 15 | -- | -- | -- | 572 | 19 | 29 | 2,200 | 130 | 772 |
| 16 | -- | -- | -- | 508 | 17 | 23 | 1,360 | 62 | 228 |
| 17 | -- | -- | -- | 508 | 11 | 15 | 1,150 | 43 | 134 |
| 18 | -- | -- | -- | 475 | 9 | 12 | 1,010 | 31 | 85 |
| 19 | 1,150 | 19 | 59 | 475 | 11 | 14 | 870 | 30 | 70 |
| 20 | 1,080 | 32 | 93 | 508 | 12 | 16 | 768 | 19 | 39 |
| 21 | 1,010 | 50 | 136 | 540 | 15 | 22 | 702 | 18 | 34 |
| 22 | 940 | 22 | 56 | 508 | 10 | 14 | 1,010 | 828 | a 2,300 |
| 23 | 1,220 | 34 | 112 | 508 | 13 | 18 | 835 | 177 | 399 |
| 24 | 1,010 | 27 | 74 | 572 | 17 | 26 | 702 | 40 | 76 |
| 25 | 905 | 13 | 32 | 508 | 10 | 14 | 572 | 22 | 34 |
| 26 | 835 | 11 | 25 | 442 | | | 508 | 16 | 22 |
| 27 | 870 | 12 | 28 | 410 | | | 475 | 20 | 26 |
| 28 | 835 | 15 | 34 | 410 | 7 | 8 | 638 | 56 | 96 |
| 29 | 800 | 39 | 84 | 410 | | | 1,150 | 427 | a 1,300 |
| 30 | 1,010 | 60 | 164 | 410 | | | 1,500 | 415 | a 1,700 |
| 31 | -- | -- | -- | 378 | 6 | 6 | -- | -- | -- |
| Total | 11,665 | -- | 897 | 18,353 | -- | 817 | 37,514 | -- | 41,970 |

| Day | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1,010 | 207 | 565 | 203 | | | 117 | | |
| 2 | 735 | 60 | 119 | 185 | 11 | 6 | 90 | | |
| 3 | 540 | 29 | 42 | 203 | | | 96 | | |
| 4 | 475 | 25 | 32 | 221 | | | 93 | 6 | 1 |
| 5 | 442 | | | 198 | 15 | 8 | 72 | | |
| 6 | 410 | 15 | 15 | 164 | | | 79 | | |
| 7 | 345 | | | 164 | | | 93 | | |
| 8 | 321 | | | 178 | | | 88 | | |
| 9 | 291 | | | 154 | 10 | 4 | 66 | | |
| 10 | 285 | 5 | 4 | 147 | | | 64 | | |
| 11 | 274 | | | 135 | | | 64 | 4 | 1 |
| 12 | 274 | | | 182 | 65 | 32 | 59 | | |
| 13 | 345 | 38 | 35 | 572 | 232 | 358 | 64 | | |
| 14 | 309 | 14 | 12 | 263 | 33 | 23 | 59 | | |
| 15 | 309 | 9 | 8 | 182 | | | 70 | | |
| 16 | 297 | | | 157 | | | 72 | | |
| 17 | 285 | 8 | 6 | 157 | | | 75 | 5 | 1 |
| 18 | 285 | | | 185 | 15 | 6 | 68 | | |
| 19 | 345 | 57 | 53 | 157 | | | 64 | | |
| 20 | 475 | 142 | 182 | 150 | | | 61 | | |
| 21 | 285 | 18 | 14 | 132 | | | 59 | | |
| 22 | 241 | 11 | 7 | 157 | | | 55 | | |
| 23 | 274 | 68 | 50 | 138 | 23 | 8 | 50 | | |
| 24 | 905 | 448 | 1,090 | 114 | | | 46 | | |
| 25 | 540 | 90 | 131 | 96 | | | 43 | 2 | (t) |
| 26 | 410 | 50 | 55 | 96 | | | 46 | | |
| 27 | 309 | 25 | 21 | 96 | | | 50 | | |
| 28 | 252 | 19 | 13 | 123 | 6 | 2 | 46 | | |
| 29 | 263 | 20 | 14 | 138 | | | 46 | | |
| 30 | 274 | 18 | 13 | 132 | | | 43 | | |
| 31 | 230 | 11 | 7 | 114 | | | -- | -- | -- |
| Total | 12,035 | -- | 2,557 | 5,293 | -- | 559 | 1,998 | -- | 24 |

Total discharge for period Apr. 19 to Sept. 30 (cfs-days) ..... 86,858
Total load for period Apr. 19 to Sept. 30 (tons) ..... 46,824

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.

LOCATION.--At bridge on U. S. Highway 522, a quarter of a 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.
Water temperatures: October 1945 to September 1946, May to September 1951.
Sediment records: April to September 1951.
EXTREMES, 1951.--Water temperatures: Maximum, 91°F Aug. 9.
Sediment concentrations: Maximum daily observed, 816 ppm July 24; minimum daily observed, 2 ppm Sept. 27-30.
Sediment loads: Maximum daily observed, 16,500 tons June 10; minimum daily observed, less than 0.50 ton Sept. 27-30.
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 to September 1951): Maximum, 91°F Aug. 9, 1951; minimum, 33°F on several days in December 1945 and January 1946.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1202.

Temperature (°F) of water, May to September 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | -- | -- | 80 | 82 | 81 |
| 2 | | | | | | | | -- | -- | 77 | 80 | 83 |
| 3 | | | | | | | | -- | -- | 75 | 77 | 80 |
| 4 | | | | | | | | -- | -- | 79 | 75 | 79 |
| 5 | | | | | | | | -- | -- | 75 | 76 | 79 |
| 6 | | | | | | | | -- | -- | 78 | 73 | 74 |
| 7 | | | | | | | | -- | -- | 77 | 73 | -- |
| 8 | | | | | | | | -- | -- | 79 | 86 | 70 |
| 9 | | | | | | | | -- | -- | 79 | 91 | 70 |
| 10 | | | | | | | | -- | -- | 81 | 81 | 68 |
| 11 | | | | | | | | -- | -- | 82 | 81 | 70 |
| 12 | | | | | | | | -- | 69 | 82 | 80 | 75 |
| 13 | | | | | | | | -- | 64 | 82 | 79 | 75 |
| 14 | | | | | | | | -- | 65 | -- | 80 | 75 |
| 15 | | | | | | | | -- | 68 | 81 | 80 | 78 |
| 16 | | | | | | | | -- | 65 | 84 | 83 | 72 |
| 17 | | | | | | | | 74 | -- | 82 | 80 | 75 |
| 18 | | | | | | | | 65 | 68 | 80 | 78 | 74 |
| 19 | | | | | | | | 62 | -- | 67 | 80 | 69 |
| 20 | | | | | | | | 65 | 71 | 78 | 81 | 70 |
| 21 | | | | | | | | 71 | 76 | 80 | 81 | 79 |
| 22 | | | | | | | | 72 | 68 | 82 | 81 | 73 |
| 23 | | | | | | | | -- | 77 | 82 | 79 | 71 |
| 24 | | | | | | | | 69 | 81 | 77 | 76 | 70 |
| 25 | | | | | | | | -- | 80 | 78 | 75 | 71 |
| 26 | | | | | | | | -- | 84 | 70 | 75 | 68 |
| 27 | | | | | | | 63 | -- | 79 | 81 | 77 | 70 |
| 28 | | | | | | | | -- | 79 | 81 | 78 | 60 |
| 29 | | | | | | | | -- | 79 | 75 | 78 | 60 |
| 30 | | | | | | | | -- | 79 | 81 | 80 | 65 |
| 31 | | | | | | | | -- | -- | 83 | 79 | -- |
| Average | | | | | | | | -- | -- | 79 | 79 | 73 |

RAPPAHANNOCK RIVER BASIN--Continued

RAPIDAN RIVER NEAR CULPEPER, VA.--Continued

Suspended sediment, April to September 1951

| 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 | -- | -- | -- | 578 | 13 | 20 | 249 | | |
| 2 | -- | -- | -- | 548 | 9 | 13 | 236 | 5 | 3 |
| 3 | -- | -- | -- | 530 | 6 | 9 | 240 | | |
| 4 | -- | -- | -- | 530 | 7 | 10 | 337 | 22 | 20 |
| 5 | -- | -- | -- | 536 | 8 | 12 | 726 | 446 | s 961 |
| 6 | -- | -- | -- | 597 | 7 | 11 | 500 | 215 | 291 |
| 7 | -- | -- | -- | 524 | 6 | 8 | 342 | 72 | 66 |
| 8 | -- | -- | -- | 483 | 5 | 7 | 466 | 60 | 76 |
| 9 | -- | -- | -- | 454 | 4 | 5 | 495 | 144 | 192 |
| 10 | -- | -- | -- | 432 | 3 | 3 | 7,210 | 775 | s 16,500 |
| 11 | -- | -- | -- | 477 | 8 | 10 | 1,920 | 141 | s 818 |
| 12 | -- | -- | -- | 807 | 214 | 467 | 948 | 55 | 141 |
| 13 | -- | -- | -- | 506 | 54 | 74 | 3,590 | 368 | s 6,320 |
| 14 | -- | -- | -- | 443 | 9 | 11 | 4,720 | 262 | s 3,860 |
| 15 | -- | -- | -- | 399 | 5 | 5 | 1,780 | 115 | 553 |
| 16 | -- | -- | -- | 383 | 5 | 5 | 1,260 | 49 | 167 |
| 17 | -- | -- | -- | 368 | | | 1,020 | 27 | a 74 |
| 18 | -- | -- | -- | 352 | | | 872 | 20 | 47 |
| 19 | 940 | 21 | 53 | 352 | 7 | 7 | 752 | 13 | a 26 |
| 20 | 872 | 21 | 49 | 363 | | | 680 | 13 | 24 |
| 21 | 793 | 26 | 56 | 363 | | | 616 | 10 | 17 |
| 22 | 752 | 16 | 32 | 363 | | | 597 | 8 | 13 |
| 23 | 902 | 22 | 54 | 347 | 8 | 8 | 962 | 194 | a 500 |
| 24 | 779 | 23 | 48 | 432 | | | 585 | 75 | 118 |
| 25 | 713 | 13 | 25 | 337 | 23 | 21 | 506 | 16 | 22 |
| 26 | 680 | 10 | a 18 | 308 | 15 | 12 | 448 | 9 | 11 |
| 27 | 668 | 10 | 18 | 294 | | | 443 | 14 | 17 |
| 28 | 616 | 10 | 17 | 298 | 6 | 5 | 443 | 14 | 17 |
| 29 | 610 | 8 | 13 | 308 | | | 443 | 10 | 12 |
| 30 | 648 | 18 | 32 | 294 | | | 585 | 50 | 79 |
| 31 | -- | -- | -- | 276 | 5 | 4 | -- | -- | -- |
| Total | 8,973 | -- | 415 | 13,282 | -- | 786 | 33,971 | -- | 30,971 |

| Day | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 477 | 44 | 57 | 224 | 13 | 8 | 124 | | |
| 2 | 399 | 12 | 13 | 228 | 36 | 22 | 123 | | |
| 3 | 363 | 6 | 6 | 192 | 26 | 13 | 153 | 6 | 2 |
| 4 | 342 | | | 276 | 20 | 15 | 166 | | |
| 5 | 337 | | | 200 | 19 | 10 | 134 | | |
| 6 | 298 | | | 177 | 12 | 6 | 129 | | |
| 7 | 294 | | | 181 | 11 | 5 | 132 | 6 | a 2 |
| 8 | 262 | | | 236 | 15 | 10 | 120 | | |
| 9 | 271 | | | 203 | 22 | 12 | 100 | | |
| 10 | 240 | 5 | 4 | 181 | 14 | 7 | 118 | 5 | 2 |
| 11 | 228 | | | 483 | 212 | a 280 | 126 | | |
| 12 | 232 | | | 249 | 80 | 54 | 103 | | |
| 13 | 245 | | | 648 | 251 | 439 | 102 | | |
| 14 | 276 | | | 342 | 62 | 57 | 94 | | |
| 15 | 318 | | | 245 | 23 | 15 | 91 | 16 | 5 |
| 16 | 368 | | | 211 | 13 | 7 | 98 | | |
| 17 | 280 | 9 | a 7 | 224 | 11 | 7 | 120 | | |
| 18 | 253 | | | 196 | 14 | 7 | 126 | | |
| 19 | 249 | | | 224 | 22 | 13 | 93 | | |
| 20 | 253 | 9 | 6 | 203 | 14 | 8 | 95 | | |
| 21 | 240 | | | 163 | 10 | 4 | 84 | 4 | 1 |
| 22 | 211 | | | 166 | | | 80 | | |
| 23 | 219 | 16 | 9 | 160 | 12 | 5 | 44 | | |
| 24 | 1,300 | 816 | s 3,810 | 150 | | | 84 | | |
| 25 | 500 | 150 | 202 | 134 | | | 88 | 4 | 1 |
| 26 | 448 | 40 | 48 | 123 | | | 52 | | |
| 27 | 332 | 21 | a 19 | 134 | 3 | 1 | 70 | | |
| 28 | 276 | 15 | 11 | 166 | | | 65 | 2 | (t) |
| 29 | 253 | 10 | 7 | 192 | | | 57 | | |
| 30 | 253 | 8 | 5 | 166 | 5 | 2 | 51 | | |
| 31 | 224 | 8 | 5 | 147 | | | -- | -- | -- |
| Total | 10,241 | -- | 4,281 | 6,824 | -- | 1,028 | 3,022 | -- | 61 |

Total discharge for period Apr. 19 to Sept. 30 (cfs-days) ..... 76,313

Total load for period Apr. 19 to Sept. 30 (tons) ..... 37,522

s Computed by subdividing day.

t Less than 0.50 ton.

a Computed from estimated concentration graph.

## YORK RIVER BASIN

### MISCELLANEOUS ANALYSES OF STREAMS IN YORK RIVER BASIN IN VIRGINIA

Periodic determinations of suspended sediment discharge, water year October 1950 to September 1951

| Date | Instantaneous water discharge (second-feet) | Suspended sediment | |
|---|---|---|---|
| | | Mean concentration (ppm) | Instantaneous discharge (lbs. per day) |
| **HUDSON CREEK NEAR BOSWELLS TAVERN** | | | |
| Sept. 14, 1951 | 7.3 | 87 | 3,431 |
| Sept. 17 | .67 | 4 | 14 |
| Sept. 21 | .61 | 2 | 7 |
| Sept. 24 | .67 | 5 | 18 |

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.
Water temperatures: October 1947 to September 1948, May to September 1951.
Sediment records: May to September 1951.
EXTREMES, 1951.--Water temperatures: Maximum observed, 86°F July 25, Aug. 12.
Sediment concentrations: Maximum daily observed, 256 ppm June 9; minimum daily observed, 2 ppm on several days in June and July.
Sediment loads: Maximum daily observed, 17,400 tons June 14; minimum daily observed, 5 tons on several days in July and September.
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 to September 1951): Maximum, 86°F July 25, Aug. 12, 1951: minimum, 34°F Dec. 29, 30, 1947.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Temperature (°F) of water, May to September 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | -- | 75 | -- | 82 | 79 |
| 2 | | | | | | | | -- | 75 | -- | 81 | 80 |
| 3 | | | | | | | | -- | 77 | -- | 81 | 81 |
| 4 | | | | | | | | -- | 78 | -- | 79 | 80 |
| 5 | | | | | | | | -- | 70 | -- | 79 | 76 |
| 6 | | | | | | | | -- | 69 | -- | 76 | 74 |
| 7 | | | | | | | | -- | 70 | -- | 77 | 75 |
| 8 | | | | | | | | 63 | 71 | -- | 81 | 72 |
| 9 | | | | | | | | 60 | 70 | 78 | 82 | 73 |
| 10 | | | | | | | | 69 | 70 | 81 | 84 | 73 |
| 11 | | | | | | | | 68 | 66 | 81 | 85 | 76 |
| 12 | | | | | | | | 59 | 66 | 85 | 86 | 80 |
| 13 | | | | | | | | 64 | 68 | 85 | 84 | 78 |
| 14 | | | | | | | | 68 | 63 | -- | 83 | 75 |
| 15 | | | | | | | | 69 | 66 | -- | 83 | 74 |
| 16 | | | | | | | | 71 | 66 | -- | 82 | 73 |
| 17 | | | | | | | | 72 | 66 | -- | 82 | 73 |
| 18 | | | | | | | | 72 | 68 | -- | 81 | 71 |
| 19 | | | | | | | | 71 | 67 | -- | 80 | 74 |
| 20 | | | | | | | | 72 | 69 | -- | 82 | 73 |
| 21 | | | | | | | | 75 | 71 | 84 | 82 | 74 |
| 22 | | | | | | | | 74 | 77 | -- | 79 | 71 |
| 23 | | | | | | | | 71 | 79 | 85 | 79 | 70 |
| 24 | | | | | | | | 70 | 83 | 80 | 79 | 70 |
| 25 | | | | | | | | 71 | 82 | 86 | 76 | 72 |
| 26 | | | | | | | | 68 | 80 | 82 | 78 | 70 |
| 27 | | | | | | | | 65 | 81 | 82 | 75 | 73 |
| 28 | | | | | | | | 65 | 82 | 78 | 75 | 69 |
| 29 | | | | | | | | 65 | -- | 80 | 79 | 67 |
| 30 | | | | | | | | 65 | -- | 78 | 77 | 61 |
| 31 | | | | | | | | 65 | -- | 81 | 77 | -- |
| Average | | | | | | | | -- | 72 | -- | 80 | 74 |

JAMES RIVER BASIN--Continued

JAMES RIVER AT BUCHANAN, VA.--Continued

Suspended sediment, May to September 1951

| 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 | | | | -- | -- | -- | 1,160 | 3 | 9 |
| 2 | | | | -- | -- | -- | 1,090 | 3 | 9 |
| 3 | | | | -- | -- | -- | 1,030 | 7 | 19 |
| 4 | | | | -- | -- | -- | 1,460 | 24 | a 95 |
| 5 | | | | -- | -- | -- | 2,320 | 77 | a 480 |
| 6 | | | | -- | -- | -- | 3,430 | 114 | 1,060 |
| 7 | | | | -- | -- | -- | 2,060 | 45 | 250 |
| 8 | | | | 2,800 | 8 | 60 | 2,590 | 42 | 294 |
| 9 | | | | 2,590 | 6 | 42 | 3,760 | 256 | 2,600 |
| 10 | | | | 2,320 | 12 | 75 | 8,920 | 221 | 5,320 |
| 11 | | | | 2,450 | 11 | 73 | 7,400 | 82 | 1,640 |
| 12 | | | | 3,190 | 25 | 215 | 4,300 | 35 | 407 |
| 13 | | | | 3,270 | 13 | 115 | 16,500 | 197 | s 12,900 |
| 14 | | | | 2,800 | 15 | 113 | 29,200 | 221 | 17,400 |
| 15 | | | | 2,520 | 17 | 116 | 12,900 | 47 | 1,640 |
| 16 | | | | 2,260 | 10 | 61 | 6,880 | 22 | 408 |
| 17 | | | | 2,120 | 13 | 74 | 4,690 | 16 | 203 |
| 18 | | | | 2,000 | 9 | 49 | 5,000 | 5 | 68 |
| 19 | | | | 1,880 | 8 | 41 | 4,500 | 7 | 85 |
| 20 | | | | 1,760 | 8 | 38 | 3,430 | 6 | 56 |
| 21 | | | | 1,700 | 8 | 37 | 2,960 | 5 | 40 |
| 22 | | | | 1,700 | 13 | 60 | 2,660 | 4 | 29 |
| 23 | | | | 1,700 | 17 | 78 | 2,380 | 5 | 32 |
| 24 | | | | 1,700 | 16 | 73 | 2,060 | 3 | 17 |
| 25 | | | | 1,640 | 19 | 84 | 1,860 | 2 | 10 |
| 26 | | | | 1,480 | 6 | 24 | 1,640 | 2 | 9 |
| 27 | | | | 1,380 | 3 | 11 | 1,540 | 2 | 8 |
| 28 | | | | 1,330 | 3 | 11 | 1,590 | 5 | 21 |
| 29 | | | | 1,280 | 6 | 21 | 1,940 | 8 | a 42 |
| 30 | | | | 1,280 | 5 | 17 | 1,640 | 5 | a 20 |
| 31 | | | | 1,240 | 4 | 13 | -- | -- | -- |
| Total | | | | 48,390 | -- | 1,501 | 142,910 | -- | 45,171 |

| Day | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1,540 | 4 | a 17 | 937 | 14 | 32 | 504 | 4 | 5 |
| 2 | 1,330 | 4 | a 14 | 804 | | | 486 | | |
| 3 | 1,180 | 3 | a 10 | 780 | | | 498 | | |
| 4 | 1,140 | 3 | a 9 | 764 | 11 | 21 | 504 | | |
| 5 | 1,180 | 3 | a 10 | 705 | | | 492 | | |
| 6 | 1,130 | 3 | a 9 | 670 | | | 510 | | |
| 7 | 1,030 | 2 | a 6 | 670 | | | 528 | 8 | 11 |
| 8 | 955 | 2 | a 5 | 670 | | | 534 | | |
| 9 | 892 | 2 | 5 | 670 | 8 | 15 | 528 | | |
| 10 | 856 | 2 | a 5 | 656 | | | 492 | | |
| 11 | 937 | 2 | a 5 | 670 | | | 468 | 7 | 10 |
| 12 | 1,160 | 2 | 6 | 607 | | | 456 | | |
| 13 | 964 | | | 787 | | | 450 | | |
| 14 | 1,240 | 27 | a 90 | 946 | 10 | 20 | 468 | | |
| 15 | 2,840 | 55 | a 420 | 829 | | | 635 | | |
| 16 | 1,640 | 28 | a 120 | 740 | | | 677 | | |
| 17 | 1,430 | 20 | a 77 | 649 | | | 649 | | |
| 18 | 1,180 | 12 | a 38 | 670 | | | 576 | | |
| 19 | 1,000 | 10 | a 27 | 628 | | | 516 | | |
| 20 | 1,000 | 10 | a 27 | 582 | | | 486 | | |
| 21 | 946 | 10 | 23 | 552 | 6 | 9 | 468 | 6 | 7 |
| 22 | 856 | | | 528 | | | 456 | | |
| 23 | 780 | | | 510 | | | 450 | | |
| 24 | 937 | 34 | a 85 | 498 | 5 | 7 | 438 | | |
| 25 | 838 | 80 | 181 | 492 | | | 432 | | |
| 26 | 1,740 | 56 | 263 | 474 | | | 438 | | |
| 27 | 1,330 | 29 | 104 | 474 | | | 450 | | |
| 28 | 1,020 | 14 | 37 | 504 | | | 450 | | |
| 29 | 910 | | | 522 | | | 432 | | |
| 30 | 1,070 | | | 528 | | | 420 | | |
| 31 | 955 | | | 522 | | | -- | -- | -- |
| Total | 36,006 | -- | 1,756 | 20,038 | -- | 492 | 14,891 | -- | 244 |

Total discharge for period May 8 to Sept. 30 (cfs-days) ..... 262,235
Total load for period May 8 to Sept. 30 (tons) ..... 49,164

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.--4,571 square miles.
RECORDS AVAILABLE.--Chemical analyses: April 1930 to March 1931, October 1947 to September 1948.
Water temperatures: May to September 1951.
Sediment records: December 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum 84°F July 19.
Sediment concentrations: Maximum daily observed, 645 ppm Apr. 1; minimum daily observed, 2 ppm July 3, 8, 10.
Sediment loads: Maximum daily observed, 60,000 tons Apr. 1; minimum daily observed, 9 tons July 10.
EXTREMES, 1930-31.--Dissolved solids: Maximum, 235 ppm Sept. 21-30, 1930; minimum, 72 ppm Apr. 11-20, 1930.
Hardness: Maximum, 128 ppm Oct. 1-10, 1930; minimum, 48 ppm Apr. 11-20, 1930.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Temperature (°F) of water, May to September 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | -- | 79 | 80 | 80 | 76 |
| 2 | | | | | | | | -- | 81 | 77 | 79 | 76 |
| 3 | | | | | | | | -- | 68 | 76 | 77 | 78 |
| 4 | | | | | | | | -- | 82 | 77 | 75 | 76 |
| 5 | | | | | | | | -- | 73 | 76 | 72 | 75 |
| 6 | | | | | | | | -- | 73 | 80 | 69 | 75 |
| 7 | | | | | | | | -- | 75 | 72 | 72 | 75 |
| 8 | | | | | | | | -- | 75 | 74 | 72 | 66 |
| 9 | | | | | | | | -- | 74 | 75 | 80 | 72 |
| 10 | | | | | | | | -- | 72 | 74 | 77 | 67 |
| 11 | | | | | | | | -- | 73 | 77 | 79 | 78 |
| 12 | | | | | | | | -- | 71 | 78 | 82 | 81 |
| 13 | | | | | | | | -- | 69 | 79 | 80 | 82 |
| 14 | | | | | | | | -- | 69 | 80 | 79 | 75 |
| 15 | | | | | | | | -- | 76 | 81 | 80 | 72 |
| 16 | | | | | | | | -- | 71 | 75 | 80 | 69 |
| 17 | | | | | | | | -- | 69 | 75 | 80 | 69 |
| 18 | | | | | | | | -- | 64 | 79 | 78 | 76 |
| 19 | | | | | | | | -- | 66 | 84 | 77 | 65 |
| 20 | | | | | | | | -- | 74 | 75 | 77 | 65 |
| 21 | | | | | | | | -- | 70 | 73 | 79 | 76 |
| 22 | | | | | | | | -- | 74 | 79 | 77 | 76 |
| 23 | | | | | | | | 70 | 80 | 80 | 76 | 76 |
| 24 | | | | | | | | 71 | 76 | 75 | 73 | 66 |
| 25 | | | | | | | | 74 | 78 | 80 | 70 | 70 |
| 26 | | | | | | | | 72 | 76 | 76 | 70 | 69 |
| 27 | | | | | | | | 70 | 76 | 77 | 74 | 70 |
| 28 | | | | | | | | 66 | 76 | 80 | 73 | 67 |
| 29 | | | | | | | | 70 | 79 | 80 | 74 | 61 |
| 30 | | | | | | | | 73 | 80 | 77 | 72 | 67 |
| 31 | | | | | | | | 75 | -- | 78 | 74 | -- |
| Aver-age | | | | | | | | -- | 74 | 77 | 76 | 72 |

JAMES RIVER BASIN--Continued

JAMES RIVER AT SCOTTSVILLE, VA.--Continued

Suspended sediment, December 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 | | | | | | | -- | -- | -- |
| 2 | | | | | | | -- | -- | -- |
| 3 | | | | | | | -- | -- | -- |
| 4 | | | | | | | -- | -- | -- |
| 5 | | | | | | | -- | -- | -- |
| 6 | | | | | | | -- | -- | -- |
| 7 | | | | | | | -- | -- | -- |
| 8 | | | | | | | -- | -- | -- |
| 9 | | | | | | | -- | -- | -- |
| 10 | | | | | | | -- | -- | -- |
| 11 | | | | | | | -- | -- | -- |
| 12 | | | | | | | -- | -- | -- |
| 13 | | | | | | | -- | -- | -- |
| 14 | | | | | | | -- | -- | -- |
| 15 | | | | | | | -- | -- | -- |
| 16 | | | | | | | -- | -- | -- |
| 17 | | | | | | | -- | -- | -- |
| 18 | | | | | | | -- | -- | -- |
| 19 | | | | | | | -- | -- | -- |
| 20 | | | | | | | -- | -- | -- |
| 21 | | | | | | | 3,990 | 12 | 129 |
| 22 | | | | | | | 3,990 | 10 | 108 |
| 23 | | | | | | | 3,810 | 4 | 41 |
| 24 | | | | | | | 3,630 | 7 | 69 |
| 25 | | | | | | | 3,540 | 8 | 76 |
| 26 | | | | | | | 3,810 | 5 | 51 |
| 27 | | | | | | | 3,280 | 8 | 71 |
| 28 | | | | | | | 3,200 | 9 | 78 |
| 29 | | | | | | | 3,200 | 8 | 69 |
| 30 | | | | | | | 3,900 | 14 | 148 |
| 31 | | | | | | | 3,120 | 6 | 51 |
| Total- | | | | | | | 39,470 | -- | 891 |

| | January | | | February | | | March | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 3,370 | 9 | 82 | 4,260 | 16 | 184 | 6,220 | 16 | 269 |
| 2 | 3,370 | 6 | 55 | 5,010 | 48 | 649 | 6,010 | 19 | 309 |
| 3 | 2,860 | 11 | 85 | 15,100 | 245 | a 10,000 | 5,410 | 21 | 307 |
| 4 | 3,280 | 19 | 168 | 13,600 | 176 | a 6,500 | 5,010 | 19 | 257 |
| 5 | 2,780 | 14 | 105 | 9,600 | 98 | 2,540 | 4,820 | 15 | 195 |
| 6 | 3,120 | 18 | 152 | 8,170 | 52 | 1,150 | 4,820 | 12 | 156 |
| 7 | 3,120 | 4 | 34 | 9,880 | 50 | 1,330 | 4,820 | 11 | 143 |
| 8 | 3,720 | 9 | 90 | 24,300 | 242 | a 16,000 | 4,630 | 14 | 175 |
| 9 | 3,620 | 11 | 108 | 22,700 | 179 | a 11,000 | 4,720 | 13 | 166 |
| 10 | 3,200 | 8 | 69 | 14,000 | 115 | 4,340 | 5,210 | 8 | 113 |
| 11 | 3,720 | 8 | 80 | 10,400 | 75 | 2,110 | 5,210 | 5 | a 70 |
| 12 | 3,460 | 11 | 103 | 8,870 | 43 | 1,030 | 5,010 | 4 | 54 |
| 13 | 3,370 | 11 | 100 | 8,400 | 40 | a 900 | 5,010 | 14 | a 190 |
| 14 | 3,630 | 10 | 98 | 7,280 | 35 | a 700 | 11,500 | 278 | a 8,600 |
| 15 | 3,540 | 22 | 210 | 7,720 | 30 | 625 | 11,500 | 148 | a 4,600 |
| 16 | 4,080 | 27 | 298 | 7,940 | 19 | 407 | 10,400 | 53 | 1,490 |
| 17 | 3,990 | 15 | 162 | 8,630 | 25 | 582 | 8,630 | 37 | 862 |
| 18 | 5,610 | 19 | 288 | 9,600 | 36 | 933 | 7,720 | 22 | 459 |
| 19 | 4,820 | 18 | 234 | 11,800 | 54 | 1,720 | 7,940 | 31 | 664 |
| 20 | 4,720 | 12 | 153 | 11,500 | 38 | 1,180 | 20,400 | 123 | a 6,800 |
| 21 | 4,440 | 11 | 132 | 10,400 | 26 | 730 | 22,700 | 170 | a 10,000 |
| 22 | 3,900 | 4 | 42 | 11,200 | 44 | 1,330 | 19,200 | 125 | a 6,500 |
| 23 | 3,810 | 5 | 51 | 16,000 | 98 | a 4,200 | 15,000 | 67 | 2,720 |
| 24 | 3,900 | 17 | 178 | 14,000 | 54 | 2,040 | 12,400 | 45 | 1,510 |
| 25 | 3,990 | 15 | 162 | 10,600 | 36 | 1,030 | 10,600 | 32 | 916 |
| 26 | 4,080 | 16 | 176 | 8,870 | 27 | 646 | 10,400 | 21 | 590 |
| 27 | 5,610 | 21 | 318 | 8,170 | 18 | 397 | 9,350 | 13 | 328 |
| 28 | 5,010 | 20 | 270 | 7,060 | 14 | 267 | 8,400 | 10 | 227 |
| 29 | 4,720 | 15 | 191 | -- | -- | -- | 7,940 | 16 | 343 |
| 30 | 4,440 | 10 | 120 | -- | -- | -- | 7,500 | 24 | 486 |
| 31 | 4,540 | 15 | 184 | -- | -- | -- | 16,100 | 212 | a 9,200 |
| Total- | 121,820 | -- | 4,498 | 305,060 | -- | 74,520 | 284,580 | -- | 58,699 |

a Computed from estimated concentration graph.

JAMES RIVER BASIN--Continued

JAMES RIVER AT SCOTTSVILLE, VA.--Continued

Suspended sediment, December 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 | 34,500 | 645 | a60,000 | 6,640 | 20 | 359 | 2,690 | 10 | 73 |
| 2 | 21,100 | 330 | a19,000 | 6,430 | 25 | 434 | 2,690 | 8 | 58 |
| 3 | 23,500 | 246 | a16,000 | 6,010 | 22 | 357 | 2,690 | 4 | 29 |
| 4 | 21,100 | 145 | 8,260 | 7,940 | 19 | 407 | 2,940 | 16 | 128 |
| 5 | 18,500 | 74 | 3,700 | 7,280 | 33 | 649 | 4,080 | 124 | s1,470 |
| 6 | 14,300 | 50 | 1,930 | 6,850 | 44 | 814 | 6,850 | 486 | 8,990 |
| 7 | 11,800 | 37 | 1,180 | 6,850 | 27 | 499 | 7,280 | 105 | 2,060 |
| 8 | 10,400 | 27 | 758 | 6,640 | 22 | 395 | 6,430 | 81 | 1,400 |
| 9 | 12,100 | 32 | 1,050 | 6,430 | 20 | 347 | 5,810 | 186 | 2,920 |
| 10 | 23,900 | 120 | s8,180 | 6,010 | 20 | 325 | 10,100 | 294 | 8,020 |
| 11 | 26,800 | 150 | 10,900 | 5,610 | 22 | 334 | 12,100 | 227 | 7,410 |
| 12 | 20,400 | 92 | 5,070 | 5,410 | 23 | 336 | 11,200 | 120 | 3,630 |
| 13 | 23,900 | 138 | 8,910 | 5,810 | 25 | 392 | 16,500 | 289 | s17,200 |
| 14 | 31,000 | 223 | 18,700 | 6,430 | 21 | 365 | 38,500 | 485 | 50,400 |
| 15 | 21,500 | 107 | 6,210 | 6,220 | 20 | 336 | 38,500 | 347 | s38,600 |
| 16 | 16,000 | 58 | 2,510 | 5,010 | 20 | 271 | 18,900 | 153 | 7,810 |
| 17 | 12,700 | 32 | 1,100 | 4,540 | 18 | 221 | 12,400 | 79 | 2,650 |
| 18 | 10,400 | 27 | 758 | 4,260 | 18 | 207 | 9,600 | 48 | 1,240 |
| 19 | 9,110 | 24 | 591 | 4,350 | 19 | 223 | 8,870 | 43 | 1,030 |
| 20 | 8,440 | 21 | 479 | 4,170 | 18 | 203 | 8,400 | 37 | 839 |
| 21 | 7,940 | 15 | 322 | 3,540 | 14 | 134 | 7,060 | 35 | 668 |
| 22 | 7,060 | 22 | 419 | 3,990 | 14 | 151 | 6,430 | 52 | a900 |
| 23 | 8,170 | 46 | 1,010 | 3,990 | 21 | 226 | 6,010 | 108 | 1,760 |
| 24 | 8,630 | 55 | 1,280 | 3,900 | 15 | 158 | 5,010 | 40 | 541 |
| 25 | 8,400 | 42 | 952 | 3,720 | 13 | 130 | 4,540 | 20 | 245 |
| 26 | 8,630 | 32 | 746 | 3,460 | 15 | 140 | 3,810 | 14 | 144 |
| 27 | 8,170 | 27 | 596 | 3,030 | 9 | 74 | 3,810 | 12 | 123 |
| 28 | 7,500 | 29 | 587 | 3,200 | 9 | 78 | 3,370 | 8 | 73 |
| 29 | 7,060 | 28 | 534 | 3,370 | 11 | 100 | 3,370 | 6 | 55 |
| 30 | 6,640 | 19 | 341 | 2,940 | 9 | 71 | 3,460 | 7 | 65 |
| 31 | -- | -- | -- | 2,690 | 8 | 58 | -- | -- | -- |
| Total- | 449,650 | -- | 182,073 | 156,720 | -- | 8,794 | 273,400 | -- | 160,531 |

| Day | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 3,630 | 7 | 69 | 2,450 | 27 | 179 | 1,060 | 6 | 18 |
| 2 | 3,200 | 3 | 26 | 2,140 | 20 | 116 | 1,030 | | |
| 3 | 2,780 | 2 | 15 | 2,140 | 22 | 127 | 1,190 | | |
| 4 | 2,780 | 5 | 38 | 1,620 | 15 | 66 | 1,310 | 9 | 32 |
| 5 | 2,690 | 4 | 29 | 1,970 | 19 | 101 | 1,440 | | |
| 6 | 2,370 | 3 | 19 | 2,420 | 25 | 163 | 1,190 | 10 | 30 |
| 7 | 2,450 | 3 | a20 | 1,360 | 5 | 18 | 1,060 | | |
| 8 | 2,530 | 2 | 14 | 2,210 | 14 | 84 | 1,220 | | |
| 9 | 2,210 | 5 | 30 | 1,910 | 22 | 113 | 1,140 | | |
| 10 | 1,690 | 2 | 9 | 2,280 | 74 | 456 | 1,010 | | |
| 11 | 2,210 | 3 | 18 | 2,140 | 29 | 168 | 1,040 | 9 | 26 |
| 12 | 1,760 | 8 | 38 | 1,690 | 11 | 50 | 1,190 | | |
| 13 | 1,570 | 10 | 42 | 1,690 | 8 | 37 | 1,050 | | |
| 14 | 2,370 | 24 | 154 | 1,760 | | | 922 | | |
| 15 | 3,200 | 57 | 493 | 1,690 | | | 1,140 | | |
| 16 | 6,640 | 150 | 2,690 | 2,060 | 7 | 31 | 1,190 | 12 | 37 |
| 17 | 4,820 | 168 | 2,190 | 1,980 | | | 1,060 | | |
| 18 | 3,370 | 40 | 364 | 1,590 | | | 1,190 | | |
| 19 | 3,120 | 32 | 270 | 1,370 | | | 1,420 | 12 | 39 |
| 20 | 2,780 | 24 | 180 | 1,240 | | | 1,100 | | |
| 21 | 2,140 | 24 | 139 | 1,580 | 4 | 14 | 1,110 | 10 | 25 |
| 22 | 2,140 | 43 | 248 | 1,290 | | | 860 | | |
| 23 | 1,910 | 37 | 191 | 1,190 | | | 1,080 | | |
| 24 | 2,530 | 62 | a420 | 1,140 | | | 890 | | |
| 25 | 3,820 | 90 | s1,130 | 1,240 | | | 988 | | |
| 26 | 3,990 | 224 | 2,410 | 890 | 4 | 12 | 900 | 6 | 15 |
| 27 | 4,440 | 115 | 1,380 | 1,120 | | | 933 | | |
| 28 | 3,630 | 45 | 442 | 1,230 | | | 977 | | |
| 29 | 2,780 | 32 | 240 | 1,530 | | | 922 | | |
| 30 | 2,690 | 20 | 145 | 1,290 | 9 | 33 | 800 | | |
| 31 | 2,370 | 22 | 142 | 1,290 | | | -- | -- | -- |
| Total- | 90,610 | -- | 13,595 | 51,500 | -- | 2,110 | 32,412 | -- | 836 |

Total discharge for period Dec. 21 to Sept. 30 (cfs-days) ..... 1,805,222
Total load for period Dec. 21 to Sept. 30 (tons) ..... 506,547

s Computed by subdividing day.
a Computed from estimated concentration graph.

JAMES RIVER BASIN--Continued

JAMES RIVER AT RICHMOND, VA.

LOCATION.--At filtration plant of Richmond Waterworks half a mile west of city limits of Richmond, Henrico County, and 2½ miles downstream from gaging station near Richmond.
DRAINAGE AREA.--6,757 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1951.
Water temperatures: October 1947 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 133 ppm Sept. 1-30; minimum, 69 ppm Mar. 1-31, Apr. 1-30.
Hardness: Maximum, 73 ppm Sept. 1-30; minimum, 41 ppm Feb. 1-28, Mar. 1-31.
Specific conductance: Maximum daily 245 micromhos Sept. 30; minimum daily, 72.7 micromhos Apr. 5.
Water temperatures: Minimum, freezing point Feb. 8,9.
EXTREMES, 1947-51.--Dissolved solids: Maximum, 133 ppm Sept. 1-30, 1951; minimum, 58 ppm Apr. 1-10, Dec. 1-10, 1948.
Hardness: Maximum, 76 ppm Sept. 21-30, 1948, Aug. 1-10, 1950; minimum, 35 ppm Apr. 1-10, Dec. 1-10, 1948.
Specific conductance (1948-51): Maximum daily, 245 micromhos Sept. 30, 1951; minimum daily, 47.0 micromhos Aug. 17, 1949.
Water temperatures: Maximum, 89°F Aug. 28, 1948; minimum, freezing point Feb. 8, 9, 1951.
REMARKS.--Records of specific conductance of daily samples available in district office at Charlottesville, Va. Discharge records for gaging station near Richmond for water year October 1950 to September 1951 given in Water-Supply Paper 1203. No appreciable inflow between gaging station and sampling point.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| Oct. 1-31, 1950..... | 2,757 | | 10 | 0.14 | 17 | 3.6 | 8.2 | | 56 | 22 | 4.0 | 0.1 | 0.5 | 94 | 57 | 11 | 142 | 7.5 | 10 |
| Nov. 1-30..... | 2,633 | | 10 | .17 | 20 | 4.3 | 12 | | 66 | 26 | 9.1 | .1 | .3 | 111 | 68 | 14 | 169 | 7.8 | 15 |
| Dec. 1-31..... | 13,684 | | 10 | .36 | 14 | 3.1 | 6.8 | | 46 | 17 | 4.0 | .1 | 1.5 | 81 | 48 | 10 | 120 | 7.3 | 15 |
| Jan. 1-31, 1951 .... | 4,741 | | 10 | .42 | 16 | 3.6 | 7.1 | | 51 | 20 | 4.8 | .1 | .6 | 91 | 55 | 13 | 138 | 7.2 | 12 |
| Feb. 1-28 ..... | 13,169 | | 9.0 | .33 | 12 | 2.8 | 5.4 | | 42 | 13 | 3.2 | .1 | .7 | 70 | 41 | 7 | 102 | 8.1 | 60 |
| Mar. 1-31 ..... | 11,506 | | 10 | 1.2 | 12 | 2.8 | 4.6 | | 42 | 11 | 3.2 | .2 | .8 | 69 | 41 | 7 | 106 | 6.9 | 25 |
| Apr. 1-30..... | 17,838 | | 9.8 | .21 | 12 | 3.0 | 4.9 | | 41 | 10 | 5.8 | .1 | .6 | 69 | 42 | 9 | 101 | 7.1 | 20 |
| May 1-31 ..... | 5,830 | | 8.1 | .04 | 15 | 3.4 | 5.6 | | 51 | 15 | 4.0 | .1 | .5 | 80 | 51 | 10 | 129 | 7.0 | 18 |
| June 1-30 ..... | 11,213 | | 10 | .32 | 14 | 3.2 | 5.8 | | 46 | 16 | 4.0 | .1 | .7 | 82 | 48 | 10 | 122 | 7.6 | 30 |
| July 1-31 ..... | 3,253 | | 9.4 | .05 | 17 | 4.0 | 6.4 | 1.5 | 56 | 22 | 5.8 | .0 | .6 | 98 | 59 | 13 | 156 | 7.5 | 5 |
| Aug. 1-31 ..... | 1,551 | | 7.0 | .01 | 20 | 4.4 | 8.7 | 1.6 | 58 | 28 | 7.8 | .1 | .7 | 115 | 68 | 20 | 179 | 7.1 | 10 |
| Sept. 1-30 ..... | 897 | | 7.5 | .03 | 21 | 5.1 | 12 | 1.8 | 58 | 37 | 10 | .1 | .6 | 133 | 73 | 26 | 202 | 7.2 | 20 |

JAMES RIVER BASIN--Continued

JAMES RIVER AT RICHMOND, VA.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

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

## 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 1951.
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 specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $CaCO_3$: Calcium, magnesium | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 1-10, 1950 | 120 | | 7.9 | 0.02 | 30 | 16 | 2.6 | 1.4 | 150 | 16 | 2.5 | 0.1 | 0.5 | 146 | 141 | 18 | 257 | 8.2 | 5 |
| Oct. 11-20 | 99.5 | | 8.4 | .01 | 33 | 17 | 3.2 | 1.9 | 166 | 18 | 2.8 | .1 | .5 | 163 | 152 | 16 | 284 | 8.3 | 5 |
| Oct. 21-24 | 144 | | 6.0 | .04 | 33 | 17 | 3.0 | 2.8 | 156 | 20 | 3.2 | .1 | .7 | 153 | 152 | 24 | 269 | 8.2 | 10 |
| Nov. 1-12 | 139 | | 8.0 | .02 | 30 | 15 | 1.3 | | 145 | 16 | 2.1 | .1 | .8 | 147 | 137 | 18 | 252 | 8.0 | 3 |
| Nov. 25-30 | 97.0 | | 7.4 | .02 | 33 | 18 | 1.7 | | 164 | 20 | 2.2 | .1 | 1.8 | 167 | 156 | 22 | 279 | 8.2 | 2 |
| Dec. 1-10 | 825 | | 9.6 | .25 | 23 | 11 | 1.2 | | 108 | 12 | 2.0 | .1 | 1.6 | 115 | 103 | 14 | 192 | 7.7 | 18 |
| Dec. 11-20 | 218 | | 8.7 | .04 | 25 | 12 | 1.1 | | 116 | 13 | 2.1 | .1 | 2.8 | 122 | 112 | 17 | 208 | 7.2 | 6 |
| Dec. 21-31 | 138 | | 18 | .04 | 27 | 13 | 3.5 | | 132 | 15 | 2.0 | .1 | 1.9 | 143 | 121 | 13 | 231 | 7.3 | 8 |
| Jan. 1-10, 1951 | 122 | | 13 | .04 | 30 | 14 | 2.2 | .4 | 142 | 16 | 2.0 | .1 | 2.0 | 146 | 132 | 16 | 247 | 7.3 | 11 |
| Jan. 11-20 | 157 | | 8.0 | .04 | 28 | 13 | 3.0 | .8 | 131 | 15 | 2.2 | .1 | 2.2 | 134 | 123 | 16 | 232 | 7.4 | 9 |
| Jan. 21-31 | 136 | | 7.8 | .01 | 29 | 14 | 3.8 | .7 | 138 | 16 | 2.4 | .1 | 1.7 | 142 | 130 | 17 | 252 | 7.9 | 5 |
| Feb. 1-10 | 346 | | 8.2 | .04 | 24 | 12 | -- | | 110 | 13 | 2.6 | .1 | 2.2 | 122 | 109 | 19 | 206 | 7.8 | 5 |
| Feb. 11-19 | 316 | | 7.8 | .01 | 23 | 11 | -- | | 104 | 13 | 2.2 | .1 | 1.9 | 118 | 103 | 17 | 191 | 7.8 | 5 |
| Feb. 20-28 | 392 | | 7.6 | .03 | 23 | 11 | 1.3 | | 108 | 12 | 2.0 | .1 | 1.7 | 118 | 103 | 14 | 193 | 7.7 | 5 |
| Mar. 1-10 | 270 | | 7.9 | .02 | 27 | 13 | .8 | | 127 | 14 | 2.0 | .0 | 1.3 | 132 | 121 | 17 | 231 | 7.9 | 3 |
| Mar. 11-20 | 623 | | 8.6 | .04 | 24 | 11 | .9 | | 109 | 13 | 2.0 | .1 | 1.4 | 121 | 105 | 16 | 204 | 7.8 | 3 |
| Mar. 21-31 | 685 | | 4.4 | .04 | 22 | 10 | 1.2 | | 102 | 10 | 2.0 | .1 | 2.0 | 112 | 96 | 12 | 192 | 7.5 | 15 |
| Apr. 1-10 | 1,027 | | 5.8 | .06 | 23 | 9.9 | 3.7 | | 112 | 9.3 | 2.2 | .0 | 1.8 | 118 | 98 | 6 | 194 | 7.8 | 10 |
| Apr. 11-20 | 923 | | 9.9 | .08 | 25 | 12 | 2.2 | 1.2 | 121 | 13 | 1.8 | .0 | 2.4 | 127 | 112 | 13 | 217 | 7.7 | 5 |
| Apr. 21-30 | 406 | | 8.9 | .04 | 29 | 14 | 2.3 | 1.1 | 144 | 14 | 2.0 | .1 | 1.7 | 139 | 130 | 12 | 242 | 7.8 | 3 |
| May 1-10 | 262 | | 8.8 | .04 | 32 | 15 | 1.2 | | 151 | 16 | 2.0 | .0 | 1.3 | 153 | 142 | 18 | 260 | 7.9 | 3 |
| May 11-20 | 204 | | 11 | .02 | 32 | 16 | 2.0 | | 154 | 16 | 1.8 | .1 | 1.3 | 156 | 146 | 19 | 269 | 7.6 | 3 |
| May 21-31 | 162 | | 8.2 | .02 | 34 | 17 | 2.0 | | 158 | 18 | 2.2 | .1 | 1.1 | 162 | 155 | 25 | 280 | 7.7 | 3 |
| June 1-10 | 170 | | 11 | .04 | 34 | 16 | 4.3 | | 162 | 21 | 2.5 | .1 | 2.1 | 167 | 151 | 18 | 286 | 7.6 | 6 |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| June 11-20 ..... | 354 | 8.4 | .02 | 22 | 9.7 | 1.9 | | 100 | 12 | 2.0 | .1 | 1.8 | 113 | 95 | 13 | 189 | 7.3 | 8 |
| June 21-30 ..... | 212 | 7.6 | .02 | 26 | 12 | 3.2 | | 122 | 16 | 2.2 | .1 | 1.5 | 130 | 114 | 14 | 221 | 7.4 | 10 |
| July 1-10 ..... | 116 | 5.2 | .02 | 32 | 16 | 2.1 | 1.5 | 158 | 19 | 3.8 | .2 | .8 | 167 | 146 | 16 | 279 | 7.7 | 6 |
| July 11-20 ..... | 138 | 7.4 | .02 | 30 | 15 | 2.1 | 1.8 | 142 | 19 | 1.2 | .2 | 1.8 | 161 | 137 | 20 | 260 | 7.5 | 15 |
| July 21-31 ..... | 164 | 6.0 | .04 | 30 | 15 | 2.2 | 1.2 | 144 | 18 | 2.0 | .1 | 2.6 | 150 | 137 | 19 | 265 | 7.4 | 8 |
| Aug. 1-10 ..... | 105 | 6.8 | .02 | 34 | 17 | 2.4 | 1.2 | 160 | 20 | 2.4 | .1 | 2.3 | 164 | 155 | 24 | 293 | 7.5 | 8 |
| Aug. 11-20 ..... | 85.0 | 7.0 | .02 | 37 | 18 | 2.3 | 1.2 | 174 | 22 | 2.6 | .1 | 1.2 | 176 | 166 | 24 | 316 | 7.6 | 8 |
| Aug. 21-31 ..... | 68.6 | 5.8 | .04 | 40 | 21 | 2.5 | 1.1 | 192 | 26 | 2.8 | .1 | 1.3 | 194 | 186 | 29 | 346 | 7.8 | 6 |
| Sept. 1-10 ..... | 66.2 | 6.0 | .02 | 41 | 21 | 2.3 | 1.2 | 195 | 27 | 2.8 | .1 | 1.5 | 198 | 189 | 29 | 352 | 7.7 | 8 |
| Sept. 11-20 ..... | 67.2 | 6.6 | .02 | 41 | 21 | 2.4 | 1.2 | 198 | 27 | 2.9 | .1 | 1.4 | 203 | 189 | 26 | 359 | 7.7 | 6 |
| Sept. 21-30 ..... | 55.2 | 6.0 | .02 | 43 | 23 | 2.5 | 1.1 | 207 | 29 | 3.2 | .1 | 1.1 | 213 | 202 | 32 | 373 | 7.8 | 9 |
| Average ..... | 262 | 6.0 | 0.04 | 30 | 15 | 2.6 | | 143 | 17 | 2.3 | 0.1 | 1.5 | 148 | 136 | 18 | 255 | -- | 7 |

ROANOKE RIVER BASIN--Continued

ROANOKE RIVER AT LAFAYETTE, VA.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

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

## ROANOKE RIVER AT ROANOKE, VA.

LOCATION.--At gaging station at Walnut Street Bridge in Roanoke, Roanoke County, 3.2 (revised) miles upstream from Tinker Creek, and at mile 360.6.
DRAINAGE AREA.--388 square miles.
RECORDS AVAILABLE.--Chemical analyses: April 1929 to March 1930, November 1950 to September 1951.
EXTREMES, 1929-30.--Dissolved solids: Maximum, 212 ppm Aug. 21-31; minimum, 115 ppm Dec. 21-31.
Hardness: Maximum, 184 ppm Aug. 21-31; minimum, 91 ppm June 1-10.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, November 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| Nov. 14, 1950 | 141 | | 1.2 | 0.02 | 38 | 16 | 10 | | 171 | 21 | 12 | 0.1 | 4.6 | 188 | 161 | 20 | 328 | 7.6 | 7 |
| Jan. 9, 1951 | 150 | | 7.8 | .02 | 34 | 15 | 5.5 | | 154 | 18 | 5.8 | .1 | 6.2 | 172 | 147 | 20 | 290 | 7.6 | 5 |
| Feb. 13 | 418 | | 7.0 | .04 | 27 | 11 | 3.2 | | 119 | 13 | 4.0 | .1 | 3.3 | 134 | 113 | 15 | 225 | 7.4 | 3 |
| Mar. 20 | 2,060 | | 7.5 | .06 | 18 | 6.1 | 3.7 | | 73 | 12 | 2.5 | .0 | 2.8 | 94 | 70 | 10 | 152 | 6.7 | 5 |
| Apr. 24 | 697 | | 7.0 | .04 | 28 | 11 | 4.9 | | 124 | 13 | 4.5 | .1 | 5.0 | 151 | 115 | 14 | 240 | 6.6 | 6 |
| May 22 | 240 | | 5.0 | .04 | 37 | 16 | 5.2 | | 168 | 21 | 5.8 | .0 | 2.0 | 186 | 158 | 20 | 305 | 8.0 | 5 |
| June 12 | 310 | | 5.8 | .02 | 29 | 12 | 5.3 | | 134 | 14 | 4.8 | .1 | 2.3 | 155 | 122 | 12 | 242 | 7.7 | 4 |
| July 10 | 132 | | 3.0 | .02 | 36 | 17 | 7.7 | | 172 | 21 | 8.8 | .1 | 1.1 | 201 | 160 | 19 | 333 | 7.2 | 3 |
| Aug. 7 | 150 | | 6.0 | .03 | 37 | 17 | 8.4 | 2.2 | 172 | 22 | 11 | .2 | 6.8 | 198 | 162 | 21 | 341 | 8.1 | 4 |
| Sept. 17 | 95 | | 5.9 | .04 | 41 | 20 | 9.4 | | 192 | 29 | 8.9 | .1 | 5.5 | 224 | 185 | 27 | 370 | 7.3 | 3 |

ROANOKE RIVER BASIN--Continued

BLACKWATER RIVER NEAR UNION HALL, VA.

LOCATION.--At gaging station at highway bridge at Kemps Ford, 3 miles upstream from Gills Creek, and 3 miles north of Union Hall, Franklin County.
DRAINAGE AREA.--208 square miles.
RECORDS AVAILABLE.--Chemical analyses: November 1950 to September 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, November 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| Nov. 16, 1950 | 137 | | 13 | 0.10 | 3.9 | 1.7 | 3.0 | | 22 | 2.8 | 1.5 | 0.0 | 0.2 | 35 | 17 | 0 | 42.7 | 7.1 | 5 |
| Jan. 10, 1951 | 170 | | 14 | .14 | 3.6 | 1.7 | 1.9 | | 19 | 2.5 | 1.6 | .1 | .6 | 41 | 16 | 0 | 41.9 | 6.7 | 20 |
| Feb. 13 | 264 | | 15 | .25 | 3.2 | 1.5 | 2.0 | | 15 | 3.3 | 1.6 | .1 | .4 | 35 | 14 | 2 | 39.6 | 6.4 | 9 |
| Mar. 20 | 710 | | 16 | .65 | 4.0 | 1.5 | 2.1 | | 13 | 5.5 | 2.2 | .0 | 1.6 | 40 | 16 | 6 | 45.3 | 7.5 | 15 |
| Apr. 24 | 340 | | 15 | .32 | 3.4 | 1.4 | 2.3 | | 16 | 2.9 | 1.8 | .0 | .8 | 36 | 14 | 1 | 41.1 | 6.1 | 30 |
| May 22 | 234 | | 13 | .06 | 3.8 | 1.5 | 3.3 | | 20 | 2.8 | 2.2 | .0 | .6 | 41 | 16 | 0 | 42.2 | 6.5 | 8 |
| June 12 | 165 | | 13 | .42 | 4.1 | 2.0 | 1.5 | | 20 | 1.8 | 1.8 | .1 | .8 | 35 | 18 | 2 | 47.0 | 6.5 | 11 |
| July 10 | 146 | | 12 | .12 | 4.9 | 1.6 | 2.2 | | 22 | 2.8 | 1.5 | .1 | .3 | 40 | 19 | 1 | 42.8 | 6.8 | 6 |
| Aug. 7 | 137 | | 14 | .26 | 4.6 | 2.3 | 1.5 | 1.0 | 24 | 2.5 | 2.6 | .1 | .3 | 41 | 21 | 1 | 46.6 | 7.3 | 19 |
| Sept. 18 | 92 | | 13 | .17 | 3.9 | 1.8 | 4.4 | | 26 | 2.5 | 1.5 | .2 | .1 | 44 | 17 | 0 | 46.3 | 7.3 | 9 |

## ROANOKE RIVER NEAR TOSHES, VA.

LOCATION.--At gaging station, 1¾ miles downstream from Witchers Creek, 3 miles upstream from Pigg River, 5 miles northwest of Toshes, Pittsylvania County, and at mile 313.1.
DRAINAGE AREA.--1,020 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| Oct. 18, 1950 | 504 | | 11 | 0.02 | 21 | 10 | 13 | | 98 | 25 | 9.6 | 0.1 | 1.8 | 139 | 94 | 13 | 226 | 7.3 | 5 |
| Nov. 16 | 514 | | 9.8 | .04 | 19 | 7.6 | 23 | | 78 | 47 | 10 | .0 | 1.6 | 156 | 79 | 15 | 251 | 7.5 | 9 |
| Dec. 15 | 1,010 | | 12 | .05 | 16 | 6.9 | 6.6 | | 70 | 15 | 5.4 | .1 | 2.2 | 102 | 68 | 11 | 166 | 7.5 | 5 |
| Jan. 11, 1951 | 680 | | 12 | .02 | 20 | 8.4 | 12 | | 83 | 32 | 5.6 | .1 | 2.5 | 143 | 84 | 16 | 227 | 7.4 | 2 |
| Feb. 15 | 1,000 | | 12 | .36 | 15 | 5.8 | 7.1 | | 64 | 14 | 5.8 | .0 | 2.0 | 99 | 61 | 9 | 153 | 7.1 | 8 |
| Mar. 22 | 2,690 | | 10 | .08 | 14 | 5.4 | 5.6 | | 56 | 16 | 3.6 | .1 | 1.8 | 91 | 57 | 11 | 146 | 6.5 | 6 |
| Apr. 26 | 1,420 | | 8.8 | .06 | 18 | 7.3 | 3.5 | | 76 | 7.6 | 7.5 | .1 | 1.8 | 98 | 75 | 13 | 182 | 6.8 | 10 |
| May 24 | 742 | | 10 | .04 | 18 | 7.5 | 15 | | 79 | 33 | 5.2 | .1 | 2.1 | 138 | 76 | 11 | 222 | 7.2 | 10 |
| June 14 | 3,100 | | 8.1 | .04 | 13 | 5.0 | 4.4 | | 48 | 13 | 4.0 | .1 | 4.8 | 87 | 53 | 14 | 127 | 6.7 | 18 |
| July 12 | 530 | | 5.0 | .04 | 21 | 8.4 | 14 | | 90 | 28 | 9.8 | .1 | .5 | 141 | 87 | 13 | 228 | 7.2 | 5 |
| Aug. 9 | 472 | | 12 | .02 | 22 | 9.4 | 20 | 2.2 | 87 | 50 | 12 | .1 | 1.6 | 174 | 94 | 22 | 277 | 7.8 | 5 |
| Sept. 20 | 290 | | 9.1 | .02 | 22 | 8.8 | 31 | | 96 | 59 | 12 | .2 | 1.8 | 196 | 91 | 12 | 305 | 7.7 | 2 |

ROANOKE RIVER BASIN--Continued

PIGG RIVER NEAR TOSHES, VA.

LOCATION.--At gaging station 0.5 mile downstream from Fryingpan Creek and 1.7 miles northwest of Toshes, Pittsylvania County.
DRAINAGE AREA.--394 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| Oct. 18, 1950 | 225 | | 15 | 0.14 | 5.6 | 3.3 | 4.0 | | 32 | 2.6 | 5.0 | 0.1 | 0.1 | 48 | 28 | 1 | 55.9 | 7.4 | 2 |
| Nov. 16 | 252 | | 15 | .19 | 4.8 | 1.9 | 4.0 | | 29 | 2.4 | 1.5 | .0 | .2 | 45 | 20 | 0 | 53.4 | 7.3 | 10 |
| Dec. 15 | 382 | | 15 | .24 | 4.7 | 2.1 | 2.7 | | 25 | 2.8 | 1.6 | .1 | .5 | 44 | 20 | 0 | 55.4 | 7.1 | 8 |
| Jan. 11, 1951 | 250 | | 16 | .15 | 5.3 | 2.2 | 3.7 | | 27 | 1.9 | 4.2 | .0 | .4 | 46 | 22 | 0 | 52.2 | 7.0 | 7 |
| Feb. 15 | 346 | | 17 | .34 | 4.4 | 2.1 | 2.2 | | 23 | 2.7 | 1.6 | .1 | .4 | 45 | 20 | 1 | 52.0 | 6.6 | 15 |
| Mar. 22 | 545 | | 15 | .39 | 5.2 | 1.7 | 3.2 | | 23 | 4.8 | 2.0 | .0 | .3 | 50 | 20 | 1 | 50.4 | 6.8 | 8 |
| Apr. 26 | 470 | | 13 | .41 | 4.6 | 2.1 | 2.4 | | 24 | 2.6 | 1.8 | .0 | .5 | 49 | 20 | 0 | 49.3 | 6.6 | 23 |
| May 24 | 297 | | 15 | .23 | 5.1 | 2.3 | 2.6 | | 28 | 1.9 | 1.5 | .1 | .5 | 48 | 22 | 0 | 53.7 | 6.6 | 24 |
| June 14 | 1,270 | | 8.5 | .08 | 3.5 | 1.4 | 2.0 | | 14 | 3.8 | 1.2 | .0 | 2.3 | 34 | 14 | 3 | 39.2 | 6.2 | 20 |
| July 12 | 200 | | 12 | .05 | 5.5 | 1.9 | 3.5 | | 30 | 1.9 | 1.5 | .1 | .2 | 46 | 22 | 0 | 54.5 | 7.0 | 6 |
| Aug. 9 | 200 | | 15 | .29 | 5.4 | 2.2 | 3.4 | | 30 | 1.9 | 2.0 | .1 | .4 | 48 | 22 | 0 | 53.9 | 7.5 | 15 |
| Sept. 20 | 130 | | 14 | .10 | 5.4 | 2.0 | 4.6 | | 32 | 2.6 | 1.4 | .2 | .2 | 48 | 22 | 0 | 54.7 | 7.2 | 6 |

## GOOSE CREEK NEAR HUDDLESTON, VA.

LOCATION.--At gaging station a quarter of a mile upstream from Haden Bridge, three-eighths of a mile upstream from Rockcastle Creek, and 4 miles upstream from Huddleston, Bedford County.
DRAINAGE AREA.--187 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| Oct. 16, 1950 | 98 | | -- | 0.13 | 10 | 4.3 | 3.6 | | 47 | 8.8 | 1.9 | 0.0 | 0.2 | 74 | 43 | 4 | 101 | 7.7 | 10 |
| Nov. 13 | 98 | | 13 | .12 | 10 | 4.6 | 5.1 | | 48 | 12 | 1.9 | .1 | .2 | 67 | 44 | 4 | 98.1 | 7.8 | 6 |
| Dec. 14 | 166 | | 20 | .28 | 8.6 | 4.2 | 2.2 | | 37 | 8.9 | 2.1 | .1 | .9 | 66 | 39 | 8 | 86.9 | 7.2 | 8 |
| Jan. 11, 1951 | 100 | | 21 | .19 | 9.6 | 4.7 | .8 | | 40 | 8.6 | 1.9 | .1 | .5 | 68 | 43 | 10 | 91.8 | 7.4 | 7 |
| Feb. 12 | 225 | | 16 | .44 | 7.4 | 3.5 | 3.4 | | 31 | 8.8 | 2.8 | .2 | 1.4 | 64 | 33 | 7 | 63.3 | 6.7 | 15 |
| Mar. 19 | 548 | | 16 | .47 | 7.2 | 2.9 | 4.4 | | 30 | 9.9 | 2.5 | .0 | 1.3 | 66 | 30 | 5 | 76.6 | 6.7 | 8 |
| Apr. 23 | 413 | | 12 | .06 | 7.1 | 2.9 | -- | | 30 | 6.6 | 1.5 | .1 | 1.9 | 57 | 35 | 10 | 74.1 | 6.8 | 20 |
| May 21 | 130 | | 15 | .05 | 9.1 | 3.8 | 3.8 | | 42 | 7.7 | 2.5 | .1 | .5 | 68 | 38 | 4 | 89.6 | 6.5 | 11 |
| June 11 | 187 | | 15 | .22 | 8.1 | 3.2 | 2.7 | | 36 | 6.3 | 1.5 | .0 | 1.4 | 70 | 33 | 4 | 82.6 | 6.9 | 6 |
| July 9 | 98 | | 15 | .08 | 9.6 | 3.8 | 4.5 | | 45 | 9.1 | 1.8 | .1 | .2 | 66 | 40 | 3 | 94.7 | 7.4 | 6 |
| Aug. 6 | 90 | | 17 | .20 | 10 | 4.3 | 2.2 | 1.5 | 49 | 8.4 | 1.9 | .2 | .3 | 72 | 43 | 2 | 100 | 7.7 | 15 |
| Sept. 17 | 65 | | 17 | .07 | 12 | 5.2 | 3.6 | | 56 | 9.7 | 1.9 | .1 | .3 | 82 | 51 | 5 | 116 | 7.7 | 5 |

ROANOKE RIVER BASIN--Continued

ROANOKE RIVER AT ALTAVISTA, VA.

LOCATION.--At gaging station at highway bridge a quarter of a mile south of Altavista, Campbell County, half a mile downstream from Sycamore Creek, 3½ miles upstream from Otter River, and at mile 286.5.
DRAINAGE AREA.--1,802 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
Water temperatures: October 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 150 ppm Sept. 21-30; minimum, 70 ppm Apr. 1-10.
Hardness: Maximum, 70 ppm Sept. 10-20, 21-30; minimum, 44 ppm Dec. 1-10, Apr. 1-10.
Specific conductance: Maximum daily, 288 micromhos Sept. 18; minimum daily, 58.2 micromhos Apr. 3.
Water temperatures: Maximum, 86°F Aug. 10; minimum, freezing point on several days during November to February.
REMARKS.--Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| Oct. 1-10, 1950 .... | 1,289 | | 14 | 0.03 | 14 | 6.1 | 9.2 | 1.5 | 63 | 17 | 6.8 | 0.1 | 0.7 | 99 | 60 | 8 | 155 | 7.9 | 8 |
| Oct. 11-20..... | 1,111 | | 12 | .01 | 16 | 6.6 | 12 | 1.7 | 71 | 24 | 7.8 | .1 | .4 | 110 | 67 | 9 | 175 | 8.0 | 10 |
| Oct. 21-31 ..... | 1,613 | | 13 | .29 | 12 | 5.4 | 8.5 | 1.9 | 54 | 16 | 6.5 | .1 | .1 | 92 | 52 | 8 | 140 | 7.9 | 25 |
| Nov. 1-10 ..... | 1,141 | | 14 | .04 | 13 | 5.9 | 9.9 | | 61 | 17 | 6.9 | .1 | .6 | 98 | 57 | 7 | 156 | 7.8 | 5 |
| Nov. 11-20 ..... | 902 | | 12 | .03 | 13 | 5.2 | 12 | | 60 | 19 | 6.8 | .1 | .8 | 99 | 54 | 5 | 156 | 7.9 | 15 |
| Nov. 21-30 ..... | 1,024 | | 12 | .06 | 12 | 4.9 | 14 | | 58 | 22 | 6.6 | .0 | .8 | 102 | 50 | 3 | 161 | 7.5 | 20 |
| Dec. 1-10 ..... | 5,717 | | 11 | .47 | 11 | 3.9 | 8.1 | | 45 | 15 | 4.9 | .1 | 1.8 | 83 | 44 | 7 | 122 | 7.4 | 100 |
| Dec. 11-20 ..... | 2,276 | | 13 | .06 | 13 | 4.5 | 8.9 | | 55 | 17 | 4.5 | .0 | 1.6 | 92 | 51 | 6 | 142 | 7.9 | 20 |
| Dec. 21-31 ..... | 1,496 | | 14 | .03 | 13 | 5.0 | 9.3 | | 59 | 16 | 4.8 | .0 | 1.8 | 94 | 53 | 5 | 148 | 7.7 | 20 |
| Jan. 1-10, 1951 ... | 1,308 | | 13 | .03 | 14 | 5.4 | 8.3 | 1.2 | 62 | 14 | 5.8 | .1 | 1.8 | 98 | 57 | 6 | 152 | 6.8 | 7 |
| Jan. 11-20..... | 1,319 | | 11 | .04 | 13 | 5.3 | 11 | 1.3 | 60 | 20 | 6.0 | .1 | 1.9 | 101 | 54 | 5 | 158 | 6.8 | 9 |
| Jan. 21-31 ..... | 1,270 | | 12 | .02 | 13 | 5.3 | 11 | 1.0 | 57 | 20 | 7.5 | .1 | 1.4 | 101 | 54 | 8 | 154 | 7.2 | 3 |
| Feb. 1-10..... | 3,334 | | 9.3 | .42 | 11 | 5.2 | 12 | | 52 | 19 | 6.5 | .1 | 3.1 | 99 | 49 | 6 | 144 | 7.3 | 35 |
| Feb. 11-19..... | 2,240 | | 12 | .21 | 12 | 4.7 | 7.3 | | 52 | 12 | 5.8 | .1 | 1.9 | 80 | 49 | 7 | 125 | 7.2 | 15 |
| Feb. 20-28 ..... | 238 | | 12 | .13 | 13 | 4.6 | 7.1 | | 55 | 14 | 4.2 | .1 | 1.2 | 83 | 51 | 6 | 141 | 7.2 | 10 |
| Mar. 1-10..... | 1,670 | | 12 | .07 | 13 | 4.9 | 9.6 | | 59 | 16 | 5.2 | .0 | 1.5 | 90 | 53 | 4 | 153 | 7.1 | 5 |
| Mar. 11-20..... | 4,109 | | 6.9 | .35 | 12 | 4.7 | 6.0 | | 51 | 12 | 4.6 | .1 | 1.6 | 84 | 49 | 8 | 121 | 7.6 | 45 |
| Mar. 21-31 ..... | 3,665 | | 6.9 | .30 | 12 | 4.8 | 5.5 | | 52 | 11 | 4.1 | .1 | 1.9 | 82 | 50 | 7 | 126 | 7.3 | 30 |
| Apr. 1-10 ..... | 6,761 | | 6.9 | .62 | 11 | 4.1 | 4.1 | | 46 | 8.5 | 3.4 | .1 | 1.9 | 70 | 44 | 7 | 107 | 7.4 | 110 |
| Apr. 11-20 ..... | 4,859 | | 12 | .25 | 13 | 4.9 | 4.4 | .9 | 56 | 12 | 3.2 | .1 | 1.0 | 81 | 53 | 7 | 126 | 7.1 | 5 |
| Apr. 21-30 ..... | 2,835 | | 12 | .09 | 14 | 5.6 | 5.8 | 1.3 | 60 | 13 | 4.4 | .1 | .8 | 87 | 58 | 9 | 139 | 7.6 | 5 |
| May 1-10..... | 2,080 | | 10 | .05 | 14 | 5.7 | 6.3 | | 61 | 14 | 4.9 | .0 | .7 | 89 | 58 | 8 | 146 | 7.4 | 3 |
| May 11-20 ..... | 1,718 | | 11 | .08 | 14 | 6.5 | 6.4 | | 61 | 16 | 5.5 | .1 | 1.1 | 94 | 62 | 12 | 150 | 6.9 | 5 |
| May 21-30 ..... | 1,448 | | 13 | .06 | 14 | 6.1 | 12 | 1.5 | 72 | 19 | 6.5 | .1 | 1.2 | 103 | 60 | 1 | 168 | 7.1 | 3 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| May 31-June 10..... | 1,672 | | 13 | .33 | 12 | 5.7 | 8.5 | 1.7 | 56 | 18 | 6.0 | .1 | 1.5 | 93 | 53 | 8 | 144 | 6.9 | 8 |
| June 11-20 ..... | 4,199 | | 15 | .53 | 11 | 4.8 | 5.4 | 1.6 | 47 | 13 | 3.8 | .1 | 2.2 | 82 | 47 | 9 | 117 | 6.9 | 5 |
| June 21-30 ..... | 2,108 | | 15 | .26 | 12 | 5.0 | 6.1 | 1.5 | 51 | 13 | 4.9 | .1 | 1.7 | 85 | 50 | 9 | 127 | 7.0 | 15 |
| July 1-10 ..... | 1,210 | | 12 | .05 | 11 | 5.5 | 8.2 | 1.5 | 51 | 15 | 5.0 | .0 | .8 | 90 | 50 | 8 | 144 | 7.6 | 5 |
| July 11-20 ..... | 1,457 | | 12 | .49 | 14 | 5.4 | 9.8 | 1.9 | 59 | 19 | 7.2 | .0 | 1.7 | 103 | 57 | 9 | 158 | 7.6 | 25 |
| July 21-31 ..... | 1,338 | | 15 | .63 | 12 | 5.1 | 12 | 2.0 | 58 | 20 | 7.5 | .0 | 1.3 | 107 | 51 | 3 | 158 | 7.4 | 30 |
| Aug. 1-10 ..... | 1,042 | | 14 | .24 | 13 | 5.3 | 13 | 1.9 | 59 | 20 | 7.0 | .0 | 1.6 | 105 | 54 | 6 | 161 | 7.4 | 5 |
| Aug. 11-20 ..... | 866 | | 12 | .18 | 14 | 5.9 | 16 | 2.1 | 65 | 25 | 8.0 | .0 | 1.2 | 116 | 59 | 6 | 186 | 7.6 | 10 |
| Aug. 21-31 ..... | 597 | | 9.2 | .03 | 16 | 6.5 | 19 | 2.0 | 74 | 35 | 10 | .1 | .7 | 134 | 67 | 6 | 211 | 7.2 | 5 |
| Sept. 1-10..... | 645 | | 9.9 | .04 | 16 | 6.6 | 18 | 2.1 | 70 | 31 | 11 | .2 | 1.6 | 132 | 67 | 10 | 208 | 7.3 | 5 |
| Sept. 11-20..... | 551 | | 12 | .04 | 17 | 6.6 | 21 | 2.1 | 72 | 34 | 14 | .2 | 1.8 | 144 | 70 | 11 | 229 | 7.3 | 5 |
| Sept. 21-30 ..... | 468 | | 10 | .02 | 17 | 6.6 | 23 | 1.9 | 74 | 39 | 13 | .1 | .5 | 150 | 70 | 9 | 243 | 7.6 | 5 |
| Average ..... | 2,039 | | 12 | 0.18 | 13 | 5.4 | 11 | | 59 | 18 | 6.4 | 0.1 | 1.3 | 99 | 55 | 7 | 154 | -- | 18 |

ROANOKE RIVER BASIN--Continued

ROANOKE RIVER AT ALTAVISTA, VA.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

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

## OTTER RIVER NEAR BEDFORD, VA.

LOCATION.--At gaging station at bridge on U. S. Highway 460, 1 mile downstream from Roaring Run, 5 miles upstream from Elk Creek, 6½ miles northeast of Bedford, Bedford County, and 8 miles upstream from Little Otter River.
DRAINAGE AREA.--116 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $CaCO_3$: Calcium, magnesium | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 16, 1950 | 57 | | 10 | 0.05 | 3.5 | 1.5 | 4.2 | | 20 | 4.7 | 1.6 | 0.1 | 0.2 | 38 | 15 | 0 | 40.1 | 7.6 | 2 |
| Nov. 13 | 47 | | 15 | .08 | 3.8 | 2.5 | -- | | 19 | 1.8 | 2.0 | .1 | .2 | 38 | 20 | 4 | 39.5 | 7.3 | 5 |
| Dec. 14 | 138 | | 16 | .11 | 3.5 | 1.6 | .8 | | 13 | 2.0 | 2.5 | .1 | .7 | 34 | 15 | 5 | 34.7 | 6.7 | 10 |
| Jan. 11, 1951 | 72 | | 12 | .08 | 3.0 | 1.0 | 2.5 | | 14 | 2.4 | 1.5 | .1 | .9 | 32 | 12 | 0 | 33.1 | 6.9 | 6 |
| Feb. 12 | 178 | | 12 | .29 | 2.6 | 1.2 | 1.4 | | 11 | 2.0 | 1.8 | .2 | .4 | 27 | 11 | 2 | 30.9 | 7.2 | 22 |
| Mar. 19 | 322 | | 13 | .34 | 3.1 | .9 | 3.4 | | 13 | 3.7 | 2.4 | .0 | 1.2 | 34 | 11 | 1 | 35.6 | 6.6 | 5 |
| Apr. 23 | 220 | | 11 | .42 | 3.4 | 1.2 | 3.1 | | 13 | 3.1 | 3.0 | .1 | 2.1 | 34 | 13 | 3 | 36.8 | 6.2 | 10 |
| May 21 | 110 | | 12 | .05 | 3.0 | 1.1 | 1.6 | | 14 | 1.8 | 1.2 | .0 | .6 | 28 | 12 | 1 | 33.4 | 6.6 | 5 |
| June 11 | 140 | | 13 | .19 | 4.1 | 1.3 | 2.6 | | 19 | 2.[illegible] | 1.2 | .1 | 1.4 | 36 | 16 | 0 | 43.9 | 6.8 | 6 |
| July 9 | 57 | | 14 | .06 | 3.4 | .8 | 3.7 | | 20 | .9 | 1.5 | .1 | .3 | 37 | 12 | 0 | 36.5 | 7.2 | 5 |
| Aug. 6 | 51 | | 15 | .19 | 4.0 | 1.0 | 2.8 | 1.4 | 21 | 2.1 | 2.2 | .1 | .8 | 42 | 14 | 0 | 42.1 | 7.2 | 15 |
| Sept. 17 | 23 | | 14 | .08 | 3.7 | 1.2 | 4.3 | | 22 | 2.0 | 1.9 | .2 | .3 | 40 | 14 | 0 | 41.7 | 7.4 | 9 |

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.--325 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| Oct. 19, 1950 | 174 | | 16 | 0.15 | 3.5 | 2.2 | 5.9 | | 30 | 2.2 | 2.1 | 0.2 | 0.2 | 46 | 18 | 0 | 51.6 | 6.8 | 3 |
| Nov. 17 | 161 | | 15 | .11 | 4.6 | 1.8 | 4.3 | | 27 | 1.9 | 2.4 | .1 | .6 | 42 | 19 | 0 | 52.8 | 7.0 | 5 |
| Jan. 11, 1951 | 170 | | 14 | .13 | 4.0 | 1.9 | 2.9 | | 20 | 3.0 | 2.4 | .1 | 1.3 | 44 | 18 | 1 | 48.4 | 6.9 | 5 |
| Feb. 15 | 358 | | 15 | .20 | 3.4 | 1.0 | 4.0 | | 18 | 1.7 | 2.5 | .2 | .8 | 36 | 13 | 0 | 41.9 | 6.7 | 25 |
| Mar. 23 | 542 | | 13 | .29 | 3.5 | 1.4 | 2.2 | | 16 | 2.5 | 2.0 | .1 | .7 | 43 | 14 | 1 | 41.9 | 6.2 | 25 |
| Apr. 27 | 500 | | 14 | .09 | 3.4 | 1.5 | 2.9 | | 19 | 2.1 | 1.6 | .1 | .8 | 41 | 15 | 0 | 42.2 | 6.1 | 21 |
| May 24 | 278 | | 14 | .58 | 4.0 | 2.0 | 3.7 | | 23 | 2.3 | 2.5 | .1 | 1.6 | 48 | 18 | 0 | 49.0 | 6.8 | 12 |
| June 15 | 808 | | 14 | .21 | 3.9 | 1.6 | 2.4 | | 17 | 3.3 | 1.8 | .1 | 1.6 | 46 | 16 | 2 | 43.2 | 6.7 | 20 |
| July 13 | 155 | | 13 | .10 | 5.0 | 1.9 | 4.1 | | 26 | 2.2 | 3.8 | .0 | .4 | 51 | 20 | 0 | 59.8 | 7.0 | 8 |
| Aug. 10 | 155 | | 16 | .25 | 5.0 | 1.9 | 4.7 | | 28 | 2.1 | 2.6 | .2 | 1.4 | 50 | 20 | 0 | 57.1 | 7.6 | 10 |
| Sept. 21 | 83 | | 15 | .09 | 5.1 | 2.0 | 4.8 | | 32 | 1.5 | 2.2 | .1 | .4 | 50 | 21 | 0 | 58.0 | 7.3 | 8 |

## 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 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| Oct. 11, 1950 | 108 | | 20 | 0.21 | 2.9 | 2.5 | 5.3 | | 28 | 2.6 | 1.9 | 0.2 | 0.2 | 50 | 18 | 0 | 52.8 | 6.9 | 14 |
| Nov. 6 | 79 | | 21 | .19 | 4.7 | 2.5 | 7.6 | | 32 | 2.5 | 3.1 | .1 | .1 | 56 | 22 | 0 | 63.7 | 6.6 | 5 |
| Dec. 5 | 724 | | 13 | .59 | 3.6 | 2.3 | 1.4 | | 13 | 5.7 | 2.9 | .1 | .6 | 37 | 18 | 8 | 45.9 | 6.8 | 30 |
| Jan. 8, 1951 | 90 | | 20 | .37 | 4.2 | 2.1 | 3.7 | | 24 | 3.8 | 2.2 | .1 | .4 | 54 | 19 | 0 | 54.0 | 6.5 | 25 |
| Feb. 5 | 96 | | 20 | .16 | 4.4 | 2.1 | 4.3 | | 27 | 3.1 | 2.4 | .0 | .2 | 52 | 20 | 0 | 63.4 | 7.1 | 15 |
| Mar. 12 | 78 | | 16 | .16 | 4.4 | 2.0 | 4.1 | | 28 | 1.9 | 2.0 | .1 | .2 | 51 | 19 | 0 | 55.9 | 6.8 | 9 |
| Apr. 2 | 93 | | 18 | .22 | 4.6 | 2.1 | 4.4 | | 27 | 3.0 | 2.8 | .1 | .3 | 54 | 20 | 0 | 56.4 | 7.2 | 10 |
| May 7 | 110 | | 18 | .22 | 4.9 | 2.3 | 3.8 | | 27 | 4.1 | 2.2 | .1 | .4 | 54 | 22 | 0 | 57.4 | 7.3 | 10 |
| June 4 | 61 | | 19 | .04 | 4.7 | 2.1 | 4.0 | | 30 | 1.2 | 1.8 | .0 | .8 | 56 | 20 | 0 | 59.2 | 6.3 | 15 |
| July 16 | 62 | | 20 | .15 | 4.4 | 2.1 | 5.0 | | 28 | 3.2 | 2.5 | .1 | .5 | 56 | 20 | 0 | 57.9 | 7.5 | 27 |
| Aug. 8 | 55 | | 21 | .54 | 4.7 | 2.1 | 4.7 | | 30 | 2.8 | 1.9 | .1 | .3 | 60 | 20 | 0 | 57.9 | 7.5 | 27 |
| Sept. 9 | 44 | | 21 | .48 | 4.8 | 2.0 | 5.8 | | 32 | 2.5 | 2.3 | .2 | .3 | 60 | 20 | 0 | 58.9 | 7.6 | 23 |

ROANOKE RIVER BASIN--Continued

## ROANOKE RIVER AT RANDOLPH, VA.

LOCATION.--At gaging station at bridge on State Highway 746 (formerly 26), 2.8 miles northwest of Randolph, Charlotte County, 3.6 miles upstream from Roanoke Creek, and at mile 227.3.
DRAINAGE AREA.--3,000 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: April 1929 to March 1930, October 1950 to September 1951.
Water temperatures: October 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 113 ppm Sept. 21-30; minimum, 69 ppm Feb. 11-19.
Hardness: Maximum, 55 ppm Sept. 21-30; minimum, 30 ppm Dec. 1-10.
Specific conductance: Maximum daily, 196 micromhos Sept. 22; minimum daily, 55.6 micromhos Apr. 4.
Water temperatures: Maximum, 81°F Aug. 11, 16; minimum, freezing point on several days in December and February.
EXTREMES, 1929-30, 1950-51.--Dissolved solids: Maximum, 113 ppm Sept. 21-30, 1951; minimum, 63 ppm June 11-20, Oct. 1-10, 1929, Mar. 11-20, 1930.
Hardness: Maximum, 55 ppm Sept. 21-30, 1951; minimum, 30 ppm Dec. 1-10, 1950.
REMARKS.--During water year 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 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| Oct. 1-10, 1950 | 2,000 | | 16 | 0.11 | 10 | 4.6 | 6.6 | 1.4 | 49 | 10 | 3.9 | 0.1 | 0.6 | 77 | 44 | 4 | 116 | 7.8 | 10 |
| Oct. 11-20 | 1,702 | | 14 | .07 | 11 | 5.0 | 8.7 | 1.5 | 52 | 15 | 4.6 | .1 | .8 | 83 | 48 | 5 | 128 | 7.8 | 10 |
| Oct. 21-31 | 2,455 | | 14 | .24 | 10 | 4.3 | 7.3 | 1.7 | 49 | 12 | 4.5 | .2 | .3 | 80 | 43 | 2 | 118 | 7.1 | 28 |
| Nov. 1-10 | 1,904 | | 14 | .08 | 11 | 4.6 | 10 | | 54 | 13 | 5.4 | .1 | .2 | 84 | 44 | 0 | 122 | 7.5 | 10 |
| Nov. 11-20 | 1,578 | | 14 | .08 | 11 | 4.4 | 8.4 | | 53 | 13 | 4.6 | .1 | .2 | 82 | 46 | 2 | 124 | 7.3 | 5 |
| Nov. 21-30 | 1,804 | | 13 | .12 | 9.2 | 3.6 | 11 | | 46 | 15 | 5.1 | .0 | .6 | 79 | 38 | 0 | 117 | 7.2 | 25 |
| Dec. 1-10 | 8,526 | | 12 | .65 | 7.2 | 3.0 | 8.8 | | 36 | 12 | 4.1 | .1 | 1.7 | 78 | 30 | 1 | 93.6 | 7.4 | 100 |
| Dec. 11-20 | 3,650 | | 12 | .30 | 9.4 | 3.2 | 7.9 | | 43 | 12 | 3.2 | .0 | 1.8 | 73 | 37 | 1 | 103 | 7.5 | 30 |
| Dec. 21-31 | 2,252 | | 14 | .10 | 10 | 3.8 | 7.8 | | 47 | 12 | 3.8 | .0 | 1.5 | 79 | 41 | 2 | 115 | 7.7 | 25 |
| Jan. 1-10, 1951 | 2,144 | | 14 | .13 | 10 | 4.0 | 7.8 | .8 | 46 | 12 | 4.1 | .1 | .8 | 79 | 41 | 4 | 114 | 7.0 | 13 |
| Jan. 11-20 | 2,198 | | 12 | .11 | 10 | 4.0 | 8.8 | 1.2 | 48 | 16 | 4.4 | .1 | 1.1 | 82 | 41 | 2 | 119 | 6.8 | 16 |
| Jan. 21-31 | 2,028 | | 13 | .06 | 10 | 4.1 | 6.4 | 1.2 | 46 | 14 | 4.5 | .1 | .7 | 79 | 42 | 4 | 119 | 7.5 | 3 |
| Feb. 1-10 | 4,911 | | 13 | .28 | 9.1 | 3.7 | 7.8 | | 40 | 13 | 4.9 | .1 | 1.7 | 82 | 38 | 5 | 108 | 7.1 | 55 |
| Feb. 11-19 | 3,784 | | 13 | .17 | 8.2 | 3.5 | 4.3 | | 36 | 9.8 | 2.1 | .1 | 1.7 | 69 | 35 | 5 | 93.2 | 7.1 | 40 |
| Feb. 20-28 | 3,882 | | 13 | .09 | 10 | 3.6 | 7.8 | | 46 | 12 | 4.0 | .1 | .7 | 75 | 40 | 2 | 120 | 7.3 | 3 |
| Mar. 1-10 | 2,790 | | 14 | .29 | 10 | 3.5 | 7.6 | | 43 | 14 | 3.9 | .0 | .8 | 75 | 39 | 4 | 112 | 7.2 | 10 |
| Mar. 11-20 | 5,156 | | 13 | .46 | 9.2 | 3.9 | 4.0 | | 39 | 8.8 | 3.6 | .1 | 1.5 | 75 | 39 | 7 | 99.1 | 7.0 | 80 |
| Mar. 21-31 | 4,826 | | 16 | .34 | 10 | 4.1 | 3.6 | | 42 | 9.1 | 3.1 | .1 | 1.5 | 71 | 42 | 7 | 104 | 7.0 | 35 |
| Apr. 1-10 | 8,844 | | 14 | .63 | 9.0 | 3.4 | 3.4 | .5 | 36 | 8.6 | 2.2 | .1 | 1.7 | 72 | 36 | 7 | 89.8 | 6.8 | 70 |
| Apr. 11-20 | 6,211 | | 13 | .39 | 10 | 4.0 | 3.6 | .8 | 44 | 9.2 | 2.5 | .0 | 1.3 | 72 | 41 | 5 | 102 | 6.8 | 35 |
| Apr. 21-30 | 4,242 | | 13 | .21 | 11 | 4.3 | 5.0 | .9 | 49 | 10 | 4.0 | .1 | .6 | 74 | 45 | 5 | 112 | 7.5 | 15 |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| May 1-10 | 3,312 | | 12 | .08 | 10 | 4.1 | 5.8 | | 48 | 8.8 | 3.5 | .1 | .8 | 72 | 42 | 2 | 110 | 6.8 | 9 |
| May 11-20 | 2,601 | | 14 | .08 | 10 | 4.2 | 6.8 | | 49 | 10 | 3.8 | .2 | .7 | 75 | 42 | 2 | 117 | 6.9 | 15 |
| May 21-31 | 2,163 | | 13 | .06 | 11 | 4.2 | 7.9 | | 50 | 13 | 4.5 | .2 | .7 | 82 | 45 | 4 | 127 | 6.8 | 8 |
| June 1-10 | 2,737 | | 16 | .22 | 10 | 4.7 | 6.6 | 1.5 | 48 | 13 | 4.4 | .1 | 1.3 | 83 | 44 | 5 | 118 | 7.0 | 8 |
| June 11-20 | 5,262 | | 16 | .60 | 8.5 | 4.1 | 4.5 | 1.5 | 39 | 9.5 | 3.5 | .1 | 2.0 | 76 | 38 | 6 | 95.0 | 6.9 | 10 |
| June 21-30 | 3,052 | | 16 | .56 | 9.5 | 4.0 | 5.0 | 1.5 | 45 | 10 | 3.8 | .1 | 1.6 | 75 | 40 | 3 | 99.7 | 6.9 | 8 |
| July 1-10 | 1,839 | | 16 | .24 | 11 | 4.5 | 5.8 | | 48 | 12 | 4.1 | .1 | .7 | 80 | 46 | 7 | 115 | 7.1 | 5 |
| July 11-20 | 2,316 | | 15 | .72 | 10 | 4.1 | 7.4 | 1.8 | 48 | 12 | 4.8 | .0 | 1.2 | 84 | 42 | 2 | 124 | 7.1 | 35 |
| July 21-31 | 2,035 | | 15 | 1.0 | 9.6 | 3.9 | 6.7 | 1.8 | 43 | 13 | 4.8 | .0 | 1.4 | 88 | 40 | 5 | 116 | 7.1 | 35 |
| Aug. 1-10 | 1,715 | | 16 | .70 | 11 | 4.3 | 8.0 | 1.8 | 50 | 14 | 5.1 | .0 | 1.4 | 92 | 45 | 4 | 128 | 7.5 | 30 |
| Aug. 11-20 | 1,602 | | 15 | .63 | 14 | 4.2 | 9.2 | 1.8 | 58 | 17 | 5.9 | .0 | .5 | 94 | 52 | 5 | 135 | 7.7 | 30 |
| Aug. 21-31 | 1,035 | | 11 | .04 | 12 | 5.0 | 11 | 1.1 | 66 | 22 | 6.4 | .1 | .4 | 98 | 50 | 5 | 162 | 7.2 | 10 |
| Sept. 1-10 | 1,245 | | 12 | .12 | 11 | 5.4 | 12 | 1.2 | 55 | 21 | 7.1 | .1 | .7 | 101 | 50 | 5 | 161 | 7.2 | 19 |
| Sept. 11-20 | 948 | | 12 | .03 | 13 | 5.2 | 11 | 1.8 | 62 | 18 | 7.6 | .0 | .3 | 100 | 54 | 3 | 155 | 7.4 | 5 |
| Sept. 21-30 | 760 | | 12 | .02 | 13 | 5.4 | 15 | 1.7 | 64 | 25 | 8.9 | .1 | .3 | 113 | 55 | 2 | 177 | 7.6 | 5 |
| Average | 3,025 | | 14 | 0.28 | 10 | 4.2 | 7.9 | | 47 | 13 | 4.5 | 0.1 | 1.0 | 81 | 43 | 4 | 119 | -- | 24 |

ROANOKE RIVER BASIN--Continued

ROANOKE RIVER AT RANDOLPH, VA.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

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

## 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 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| Oct. 11, 1950 ..... | 102 | | 20 | 0.15 | 6.5 | 4.3 | 4.9 | | 42 | 2.5 | 5.1 | 0.1 | 0.1 | 66 | 34 | 0 | 80.9 | 7.3 | 5 |
| Nov. 10 ..... | 64 | | 22 | .22 | 6.8 | 3.6 | 5.9 | | 44 | 2.4 | 4.0 | .1 | .1 | 69 | 32 | 0 | 85.2 | 7.6 | 10 |
| Dec. 5 ..... | 830 | | 11 | .21 | 4.5 | 2.7 | 1.8 | | 18 | 5.6 | 3.6 | .1 | .5 | 54 | 22 | 8 | 57.4 | 6.8 | 35 |
| Jan. 11, 1951 ..... | 110 | | 21 | .44 | 5.6 | 2.8 | 5.0 | | 31 | 5.2 | 3.5 | .1 | .3 | 66 | 25 | 0 | 74.4 | 6.9 | 45 |
| Mar. 12 ..... | 79 | | 16 | .07 | 7.0 | 3.2 | 5.0 | | 40 | 2.7 | 3.9 | .1 | .1 | 66 | 31 | 0 | 84.5 | 6.7 | 8 |
| Apr. 2 ..... | 89 | | 18 | .16 | 7.0 | 3.3 | 5.3 | | 42 | 2.7 | 3.5 | .1 | .2 | 64 | 31 | 0 | 82.5 | 7.3 | 8 |
| May 7 ..... | 197 | | 16 | .34 | 7.4 | 3.5 | 3.4 | | 39 | 4.6 | 2.2 | .1 | .3 | 73 | 33 | 1 | 81.3 | 6.3 | 35 |
| June 5 ..... | 41 | | 21 | .06 | 8.7 | 3.8 | 4.6 | | 51 | 1.9 | 2.2 | .1 | .2 | 81 | 37 | 0 | 92.2 | 6.5 | 20 |
| July 16 ..... | 44 | | 20 | .22 | 6.7 | 3.5 | 4.3 | | 38 | 4.4 | 3.0 | .1 | .3 | 66 | 31 | 0 | 77.3 | 7.6 | 23 |
| Aug. 9 ..... | 57 | | 20 | .34 | 6.4 | 2.7 | 6.2 | | 38 | 3.4 | 3.8 | .1 | .2 | 72 | 27 | 0 | 78.2 | 7.1 | 18 |
| Sept. 14 ..... | 19 | | 22 | .08 | 7.5 | 3.2 | 7.4 | | 48 | 3.7 | 3.1 | .1 | .1 | 77 | 32 | 0 | 86.7 | 7.6 | 16 |

ROANOKE RIVER BASIN--Continued

NORTH MAYO RIVER NEAR SPENCER, VA.

LOCATION.--At gaging station 800 feet downstream from highway bridge at Moores Mill, 2 miles downstream from Horse Pasture Creek, and 4 miles southeast of Spencer, Henry County.
DRAINAGE AREA.--108 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| Oct. 12, 1950 | 77 | | 19 | 0.27 | 4.5 | 3.1 | 2.6 | | 30 | 1.9 | 1.9 | 0.1 | 0.1 | 49 | 24 | 0 | 50.3 | 7.2 | 4 |
| Nov. 15 | 79 | | 18 | .24 | 4.6 | 2.1 | 2.9 | | 28 | 1.4 | 1.2 | .1 | .1 | 42 | 20 | 0 | 47.5 | 7.5 | 10 |
| Dec. 12 | 133 | | 12 | .19 | 4.0 | 1.6 | 4.1 | | 24 | 3.3 | 1.1 | .2 | .3 | 35 | 17 | 0 | 44.4 | 6.7 | 10 |
| Jan. 10, 1951 | 70 | | 22 | .22 | 4.7 | 2.7 | 1.3 | | 26 | 1.8 | 1.5 | .1 | .1 | 46 | 23 | 2 | 47.9 | 6.6 | 5 |
| Feb. 14 | 111 | | 18 | .27 | 3.6 | 1.8 | 2.6 | | 22 | 1.9 | 1.2 | .1 | .2 | 44 | 16 | 0 | 50.2 | 7.0 | 15 |
| Mar. 21 | 160 | | 16 | .34 | 4.2 | 1.6 | 2.8 | | 21 | 3.1 | 1.8 | .0 | .3 | 44 | 17 | 0 | 42.7 | 6.7 | 5 |
| Apr. 25 | 154 | | 15 | .25 | 3.4 | 1.6 | 3.0 | | 21 | 1.9 | 1.4 | .1 | .2 | 42 | 15 | 0 | 41.9 | 6.0 | 29 |
| May 23 | 106 | | 16 | .19 | 4.4 | 1.7 | 2.6 | | 24 | 1.8 | 1.0 | .1 | .7 | 48 | 18 | 0 | 47.8 | 6.4 | 20 |
| June 13 | 242 | | 16 | .52 | 4.0 | 1.8 | 2.4 | | 20 | 2.3 | 1.5 | .1 | 1.8 | 40 | 17 | 1 | 44.3 | 6.1 | 25 |
| July 11 | 70 | | 19 | .26 | 4.5 | 2.4 | 2.4 | | 28 | 1.4 | 1.2 | .0 | .4 | 49 | 21 | 0 | 49.4 | 7.5 | 30 |
| Aug. 8 | 72 | | 17 | .52 | 4.1 | 1.9 | 3.7 | | 26 | 1.9 | 1.4 | .2 | .3 | 48 | 18 | 0 | 46.4 | 7.5 | 29 |
| Sept. 19 | 51 | | 18 | .29 | 4.4 | 2.1 | 3.8 | | 28 | 2.0 | 1.5 | .2 | .2 | 47 | 20 | 0 | 50.1 | 7.1 | 19 |

## DAN RIVER NEAR WENTWORTH, N. C.

LOCATION.--At Settles Bridge, 150 feet upstream from gaging station 3½ miles northwest of Wentworth, Rockingham County, and 7½ miles downstream from Mayo River.
DRAINAGE AREA.--1,050 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
Water temperatures: October 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 48 ppm Oct. 11-20; minimum, 36 ppm Apr. 1-10.
Hardness: Maximum, 19 ppm Oct. 11-20, June 1-10; minimum, 12 ppm Apr. 1-10.
Water temperatures: Maximum, 83°F Aug. 1-2; minimum, freezing point Feb. 3-5, 13.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Oct. 1-10, 1950 | 649 | 16 | 0.05 | 4.1 | 1.7 | 3.9 | 1.2 | 25 | 2.8 | 1.9 | 0.0 | 0.3 | 44 | 17 | 0 | 51.0 | 7.1 | 3 | 4.2 | 1.8 |
| Oct. 11-20 | 535 | 19 | .05 | 4.5 | 1.9 | 4.3 | | 29 | 2.1 | 1.5 | .1 | .2 | 48 | 19 | 0 | 57.2 | 7.0 | 3 | 3.1 | 1.8 |
| Oct. 21-31 | 1,087 | 16 | .04 | 4.4 | 1.3 | 3.8 | | 22 | 2.9 | 2.2 | .1 | .3 | 47 | 16 | 0 | 50.4 | 6.7 | 5 | 6.4 | 2.6 |
| Nov. 1-10 | 709 | 16 | .06 | 4.3 | 1.6 | 4.8 | | 27 | 2.3 | 2.1 | .1 | .1 | 44 | 17 | 0 | 52.9 | 6.9 | 4 | 3.1 | 1.9 |
| Nov. 11-20 | 584 | 15 | .01 | 4.2 | 1.7 | 4.7 | | 26 | 2.3 | 2.0 | .4 | .1 | 43 | 18 | 0 | 53.6 | 6.9 | 3 | 2.8 | 1.4 |
| Nov. 21-30 | 645 | 12 | .05 | 3.8 | 1.6 | 4.9 | | 26 | 2.5 | 1.6 | .2 | .1 | 42 | 16 | 0 | 50.8 | 6.9 | 3 | 2.7 | 1.6 |
| Dec. 1-10 | 2,030 | 13 | .05 | 3.7 | 1.3 | 3.4 | | 18 | 3.6 | 2.2 | .1 | .3 | 40 | 15 | 0 | 45.8 | 6.5 | 5 | 10 | 2.9 |
| Dec. 11-20 | 885 | 15 | .05 | 3.6 | 1.3 | 4.5 | | 21 | 2.7 | 2.4 | .1 | .5 | 41 | 14 | 0 | 46.7 | 6.8 | 5 | 3.3 | 1.8 |
| Dec. 21-31 | 765 | 16 | .09 | 3.7 | 1.6 | 3.7 | | 22 | 2.3 | 1.8 | .2 | .5 | 40 | 16 | 0 | 50.3 | 7.1 | 4 | 2.6 | 2.0 |
| Jan. 1-10, 1951 | 694 | 15 | .05 | 4.3 | 1.3 | 3.5 | .8 | 23 | 2.8 | 2.0 | .0 | .3 | 42 | 16 | 0 | 49.6 | 6.9 | 7 | 1.3 | 1.0 |
| Jan. 11-20 | 814 | 16 | .06 | 4.2 | 1.6 | 4.0 | | 22 | 3.6 | 2.2 | .2 | .3 | 42 | 17 | 0 | 48.8 | 6.8 | 3 | 1.6 | 1.2 |
| Jan. 21-31 | 749 | 17 | .03 | 4.4 | 1.5 | 3.6 | | 23 | 3.0 | 1.8 | .1 | .3 | 43 | 17 | 0 | 49.6 | 6.9 | 3 | 1.8 | 1.0 |
| Feb. 1-10 | 2,016 | 14 | .10 | 4.0 | 1.6 | 3.4 | | 20 | 4.1 | 2.1 | .1 | .1 | 42 | 17 | 0 | 46.1 | 6.7 | 4 | 5.6 | 3.6 |
| Feb. 11-19 | 1,063 | 13 | .07 | 3.8 | 1.4 | 3.8 | | 20 | 3.4 | 2.2 | .1 | .4 | 39 | 15 | 0 | 45.1 | 6.8 | 3 | 3.0 | 1.7 |
| Feb. 20-28 | 1,265 | 11 | .03 | 3.4 | 1.5 | 5.9 | | 21 | 6.2 | 2.5 | .0 | .4 | 40 | 14 | 0 | 48.7 | 7.0 | 3 | 3.7 | 3.1 |
| Mar. 1-10 | 971 | 14 | .04 | 3.6 | 1.5 | 4.9 | | 20 | 5.9 | 2.2 | .0 | .2 | 41 | 15 | 0 | 49.1 | 6.9 | 3 | 3.2 | 2.3 |
| Mar. 11-20 | 1,803 | 13 | .08 | 3.5 | 1.4 | 4.9 | | 20 | 3.9 | 2.8 | .1 | .5 | 40 | 14 | 0 | 46.1 | 6.6 | 3 | 4.9 | 2.0 |
| Mar. 21-31 | 1,428 | 16 | .11 | 3.8 | 1.3 | 3.9 | | 20 | 3.1 | 2.2 | .1 | .4 | 41 | 15 | 0 | 47.4 | 6.6 | 3 | 4.7 | 1.8 |
| Apr. 1-10 | 3,278 | 11 | .04 | 3.0 | 1.2 | 2.3 | 1.4 | 14 | 4.4 | 1.9 | .0 | 1.0 | 36 | 12 | 1 | 44.5 | 6.5 | 6 | 8.9 | 2.9 |
| Apr. 11-20 | 1,772 | 13 | .03 | 3.4 | 1.4 | 4.0 | | 20 | 3.3 | 2.1 | .0 | .2 | 39 | 14 | 0 | 44.2 | 6.8 | 5 | 4.6 | 2.2 |
| Apr. 21-30 | 1,539 | 13 | .02 | 3.6 | 1.2 | 4.8 | | 22 | 3.0 | 2.1 | .0 | .3 | 40 | 14 | 0 | 48.8 | 6.8 | 4 | 4.6 | 2.0 |
| May 1-10 | 1,090 | 14 | .04 | 4.2 | 1.2 | 4.6 | | 22 | 3.5 | 2.5 | .0 | .4 | 41 | 15 | 0 | 48.4 | 6.8 | 17 | 2.7 | 2.2 |
| May 11-20 | 1,194 | 10 | .03 | 4.4 | 1.2 | 6.1 | | 21 | 8.0 | 2.5 | .0 | .1 | 41 | 16 | 0 | 48.1 | 6.8 | 4 | 7.4 | 3.1 |
| May 21-31 | 742 | 15 | .03 | 4.1 | 1.2 | 5.2 | | 25 | 2.8 | 2.1 | .0 | .2 | 46 | 15 | 0 | 49.9 | 6.9 | 7 | 4.2 | 2.6 |

ROANOKE RIVER BASIN--Continued

DAN RIVER NEAR WENTWORTH, N. C.--Continued

*Chemical analyses, in parts per million, water year October 1950 to September 1951--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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| June 1-10, 1951 | 772 | 14 | 0.04 | 5.3 | 1.3 | 3.8 | | 22 | 3.1 | 3.6 | 0.1 | 0.3 | 47 | 19 | 0 | 49.3 | 6.7 | 4 | 5.7 | 3.6 |
| June 11-20 | 1,130 | 13 | .07 | 3.5 | 1.3 | 4.1 | | 20 | 3.5 | 1.8 | .1 | .3 | 40 | 14 | 0 | 44.9 | 6.5 | 4 | 7.1 | 2.0 |
| June 21-30 | 858 | 14 | .08 | 3.7 | 1.5 | 4.2 | | 21 | 3.2 | 2.4 | .1 | .5 | 41 | 15 | 0 | 47.4 | 6.6 | 7 | 7.3 | 2.7 |
| July 1-10 | 659 | 17 | .02 | 3.7 | 1.5 | 3.8 | 1.1 | 24 | 2.3 | 1.8 | .0 | .9 | 43 | 15 | 0 | 54.9 | 6.8 | 20 | 6.2 | 1.8 |
| July 11-20 | 633 | 12 | .08 | 4.0 | 1.4 | 5.7 | | 26 | 3.5 | 1.9 | .1 | .3 | 43 | 16 | 0 | 54.7 | 6.8 | 3 | 5.6 | 2.2 |
| July 21-31 | 668 | 14 | .05 | 4.5 | 1.3 | 4.7 | | 20 | 5.5 | 2.9 | .0 | .6 | 46 | 16 | 0 | 52.2 | 6.7 | 5 | 7.6 | 2.6 |
| Aug. 1-10 | 597 | 10 | .04 | 4.0 | 1.3 | 5.0 | | 23 | 3.2 | 2.5 | .0 | .6 | 38 | 15 | 0 | 50.5 | 7.0 | 12 | 8.6 | 2.6 |
| Aug. 11-20 | 800 | 12 | .02 | 4.0 | 1.4 | 5.9 | | 21 | 5.2 | 3.5 | .2 | .5 | 43 | 16 | 0 | 52.9 | 6.6 | 7 | 12 | 3.1 |
| Aug. 21-31 | 489 | 14 | .03 | 4.3 | 1.4 | 5.7 | | 25 | 3.8 | 2.6 | .2 | .2 | 43 | 16 | 0 | 50.8 | 6.8 | 5 | 3.6 | 2.1 |
| Sept. 1-10 | 390 | 14 | .03 | 4.2 | 1.6 | 1.7 | | 16 | 3.5 | 2.5 | .1 | .2 | 42 | 17 | 4 | 53.1 | 6.9 | 17 | 2.9 | 2.1 |
| Sept. 11-20 | 372 | 14 | .05 | 4.5 | 1.7 | 4.6 | | 26 | 3.5 | 2.2 | .0 | .2 | 44 | 18 | 0 | 53.3 | 6.8 | 18 | 2.9 | 2.1 |
| Sept. 21-30 | 326 | 15 | .02 | 4.7 | 1.4 | 4.4 | 1.3 | 27 | 2.6 | 1.5 | .2 | .2 | 44 | 17 | 0 | 51.9 | 7.0 | 18 | 2.6 | 2.2 |
| Average | 996 | 14 | 0.05 | 4.0 | 1.4 | 4.4 | | 22 | 3.5 | 2.2 | 0.1 | 0.3 | 42 | 16 | 0 | 49.7 | -- | 6 | 4.8 | 2.2 |

ROANOKE RIVER BASIN--Continued

DAN RIVER NEAR WENTWORTH, N. C.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

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

ROANOKE RIVER BASIN--Continued

## SMITH RIVER AT BASSETT, VA.

LOCATION.--At gaging station at highway bridge at north edge of North Bassett, 1 mile northwest of Bassett, Henry County, 3.0 miles (revised) downstream from Town Creek, and 5.6 miles upstream from Reed Creek.
DRAINAGE AREA.--253 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| Oct. 12, 1950 | 221 | | 15 | 0.08 | 6.6 | 3.3 | 1.0 | | 32 | 3.5 | 1.4 | 0.1 | 0.1 | 47 | 30 | 4 | 58.2 | 7.3 | 6 |
| Nov. 15 | 206 | | 14 | .09 | 5.2 | 2.5 | 2.5 | | 29 | 2.7 | 1.2 | .1 | .2 | 40 | 23 | 0 | 62.8 | 7.5 | 6 |
| Dec. 13 | 385 | | 18 | .19 | 5.1 | 2.6 | .6 | | 22 | 3.6 | 1.6 | .1 | .5 | 42 | 23 | 5 | 48.0 | 6.8 | 10 |
| Jan. 8, 1951 | 230 | | 14 | .08 | 4.7 | 2.1 | 2.1 | | 24 | 3.0 | 1.5 | .0 | .2 | 43 | 20 | 1 | 51.2 | 6.1 | 2 |
| Feb. 14 | 350 | | 14 | .22 | 4.3 | 1.8 | 2.0 | | 21 | 2.7 | 1.5 | .1 | .3 | 43 | 18 | 1 | 45.2 | 6.9 | 10 |
| Mar. 21 | 421 | | 18 | .45 | 4.5 | 1.8 | 4.7 | | 22 | 7.9 | 1.6 | .0 | .4 | 49 | 19 | 1 | 50.7 | 7.0 | 5 |
| Apr. 25 | 498 | | 13 | .19 | 4.6 | 1.9 | 1.7 | | 21 | 3.2 | 1.5 | .0 | .38 | 44 | 19 | 2 | 48.7 | 6.1 | 20 |
| June 13 | 641 | | 11 | .32 | 5.2 | 2.1 | 2.5 | | 24 | 4.9 | 1.0 | .1 | .8 | 44 | 22 | 2 | 53.5 | 6.2 | 32 |
| July 11 | 206 | | 12 | .09 | 5.4 | 2.1 | 2.6 | | 28 | 2.8 | 1.1 | .1 | .2 | 46 | 22 | 0 | 53.2 | 7.1 | 9 |
| Aug. 8 | 166 | | 13 | .01 | 5.8 | 2.2 | 3.3 | | 30 | 3.1 | 1.5 | .2 | .3 | 47 | 24 | 0 | 57.0 | 7.2 | 5 |
| Sept. 18 | 117 | | 14 | .08 | 5.5 | 2.1 | 2.9 | | 27 | 2.5 | 1.3 | .1 | 2.3 | 54 | 22 | 0 | 56.1 | 7.4 | 8 |

## SMITH RIVER AT MARTINSVILLE, VA.

LOCATION.--At gaging station 800 feet downstream from bridge on U. S. Highway 58 and 220, 2 miles south of Martinsville, Henry County, and 5 miles downstream from Beaver Creek.
DRAINAGE AREA.--374 square miles.
RECORDS AVAILABLE.--Chemical analyses: April 1930 to March 1931, November 1950 to September 1951.
EXTREMES, 1930-31.--Dissolved solids: Maximum, 71 ppm Oct. 11-20; minimum, 42 ppm Apr. 1-10.
Hardness: Maximum, 32 ppm Oct. 11-20; minimum, 19 ppm Mar. 21-31.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, November 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| Nov. 15, 1950 | 282 | | 15 | 0.10 | 5.5 | 2.4 | 4.2 | | 32 | 3.4 | 2.0 | 0.0 | 0.2 | 47 | 24 | 0 | 60.1 | 7.2 | 5 |
| Jan. 10, 1951 | 261 | | 16 | .04 | 5.2 | 2.3 | 3.1 | | 26 | 4.0 | 2.4 | .0 | .3 | 50 | 22 | 1 | 61.4 | 6.5 | 2 |
| Feb. 14 | 427 | | 14 | .19 | 4.4 | 2.4 | 2.3 | | 23 | 3.5 | 2.0 | .1 | .5 | 46 | 21 | 2 | 51.6 | 6.7 | 10 |
| Mar. 21 | 550 | | 15 | .30 | 5.1 | 1.9 | 3.4 | | 23 | 5.4 | 2.2 | .0 | .5 | 52 | 20 | 2 | 57.1 | 6.6 | 5 |
| Apr. 25 | 578 | | 13 | .08 | 4.6 | 2.4 | 2.2 | | 24 | 3.2 | 2.0 | .1 | .2 | 47 | 21 | 2 | 54.0 | 6.1 | 18 |
| May 23 | 446 | | 14 | .05 | 5.5 | 2.1 | 4.2 | | 30 | 3.6 | 1.8 | .0 | .7 | 53 | 22 | 0 | 61.7 | 6.5 | 4 |
| June 13 | 689 | | 16 | .20 | 5.8 | 2.3 | 3.6 | | 28 | 4.4 | 1.8 | .1 | 1.8 | 59 | 24 | 1 | 61.1 | 6.6 | 25 |
| July 11 | 278 | | 12 | .05 | 6.2 | 2.2 | 3.8 | | 32 | 3.3 | 2.0 | .0 | .3 | 52 | 24 | 0 | 65.0 | 6.6 | 4 |
| Aug. 9 | 210 | | 15 | .02 | 6.2 | 2.2 | 3.5 | | 32 | 2.8 | 1.3 | .1 | 1.1 | 58 | 24 | 0 | 65.7 | 7.4 | 32 |
| Sept. 19 | 154 | | 14 | .06 | 6.2 | 2.3 | 4.4 | | 33 | 3.2 | 2.3 | .1 | .8 | 60 | 25 | 0 | 68.3 | 7.2 | 5 |

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 Lawson 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 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 80 ppm Sept. 21-30; minimum, 45 ppm Apr. 11-20.
Hardness: Maximum, 27 ppm Oct. 11-20; minimum, 17 ppm Feb. 11-19.
Specific conductance: Maximum daily, 135 micromhos Sept. 14; minimum daily, 46.5 micromhos Apr. 10.
EXTREMES, 1929-30, 1950-51.--Dissolved solids: Maximum, 80 ppm Sept. 21-30, 1951; minimum, 45 ppm June 21-30, Apr. 11-20, 1951.
Hardness: Maximum, 29 ppm Nov. 21-30, 1929; minimum, 15 ppm July 11-20, 1929.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $CaCO_3$: Calcium, magnesium | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 1-10, 1950 | 1,594 | | 18 | 0.26 | 5.7 | 2.8 | 8.0 | 1.5 | 39 | 4.7 | 4.8 | 0.0 | 0.8 | 66 | 26 | 0 | 83.1 | 7.6 | 18 |
| Oct. 11-20 | 1,376 | | 17 | .23 | 6.1 | 2.8 | 8.9 | 1.5 | 41 | 5.1 | 5.8 | .0 | .7 | 68 | 27 | 0 | 91.0 | 7.6 | 15 |
| Oct. 21-31 | 2,693 | | 16 | .41 | 5.4 | 2.3 | 7.1 | 1.5 | 32 | 4.5 | 5.1 | .2 | .3 | 59 | 23 | 0 | 75.6 | 7.7 | 55 |
| Nov. 1-10 | 1,661 | | 18 | .24 | 6.2 | 2.6 | 9.4 | | 42 | 4.4 | 5.1 | .1 | .2 | 67 | 26 | 0 | 89.0 | 7.6 | 15 |
| Nov. 11-20 | 1,436 | | 18 | .16 | 5.0 | 2.7 | 12 | | 43 | 4.7 | 5.5 | .2 | .2 | 69 | 24 | 0 | 90.8 | 7.5 | 5 |
| Nov. 21-30 | 1,651 | | 18 | .20 | 5.1 | 2.3 | 11 | | 40 | 4.7 | 5.1 | .2 | .5 | 67 | 22 | 0 | 84.1 | 7.0 | 10 |
| Dec. 1-10 | 5,903 | | 15 | .15 | 4.3 | 1.9 | 7.3 | | 26 | 5.5 | 4.1 | .2 | 1.2 | 54 | 19 | 0 | 68.2 | 6.7 | 9 |
| Dec. 11-20 | 2,464 | | 19 | .33 | 3.9 | 2.1 | 8.6 | | 30 | 5.6 | 4.0 | .2 | .5 | 59 | 18 | 0 | 68.9 | 7.0 | 35 |
| Dec. 21-31 | 1,711 | | 19 | .20 | 4.7 | 2.4 | 8.5 | | 35 | 4.3 | 4.0 | .2 | .8 | 61 | 22 | 0 | 73.7 | 7.1 | 8 |
| Jan. 1-10, 1951 | 1,757 | | 20 | .18 | 4.9 | 2.4 | 7.8 | 1.4 | 35 | 4.2 | 4.0 | .2 | .6 | 63 | 22 | 0 | 74.4 | 7.0 | 15 |
| Jan. 11-20 | 1,868 | | 19 | .23 | 4.9 | 2.4 | 6.9 | 1.4 | 34 | 4.7 | 4.5 | .2 | .5 | 62 | 22 | 0 | 79.4 | 7.0 | 20 |
| Jan. 21-30 | 1,709 | | 17 | .14 | 5.4 | 2.1 | 7.7 | 2.4 | 37 | 5.4 | 4.5 | .0 | .4 | 63 | 22 | 0 | 87.7 | 7.1 | 15 |
| Feb. 1-10 | 4,311 | | 24 | .62 | 5.1 | 2.1 | 6.7 | | 28 | 6.4 | 4.0 | .0 | .8 | 64 | 21 | 0 | 78.5 | 7.4 | 55 |
| Feb. 11-19 | 2,644 | | 17 | .46 | 4.6 | 1.4 | 8.1 | | 27 | 6.7 | 3.8 | .0 | .6 | 56 | 17 | 0 | 70.7 | 6.6 | 25 |
| Feb. 20-28 | 3,136 | | 17 | .60 | 5.0 | 2.0 | 7.9 | | 28 | 8.4 | 3.9 | .1 | .6 | 60 | 21 | 0 | 77.4 | 7.0 | 50 |
| Mar. 1-10 | 2,201 | | 11 | .18 | 5.2 | 2.2 | 6.0 | | 30 | 4.0 | 4.0 | .1 | .5 | 48 | 22 | 0 | 76.4 | 6.9 | 10 |
| Mar. 11-20 | 4,835 | | 11 | .72 | 4.7 | 2.1 | 5.8 | | 27 | 4.4 | 3.8 | .1 | .8 | 46 | 20 | 0 | 65.7 | 6.8 | -- |
| Mar. 21-31 | 2,922 | | 11 | .46 | 5.0 | 2.3 | 5.5 | | 29 | 4.2 | 3.6 | .1 | .5 | 47 | 22 | 0 | 69.2 | 7.1 | 45 |
| Apr. 1-10 | 7,996 | | 18 | .65 | 4.6 | 2.2 | 4.0 | 1.2 | 23 | 6.6 | 2.9 | .1 | .5 | 52 | 21 | 2 | 56.6 | 6.7 | 55 |
| Apr. 11-20 | 5,370 | | 13 | .50 | 4.3 | 1.8 | 4.1 | 1.3 | 24 | 4.4 | 3.0 | .1 | .7 | 45 | 18 | 0 | 57.1 | 6.9 | 45 |
| Apr. 21-30 | 3,149 | | 15 | .42 | 4.7 | 1.9 | 5.2 | 1.3 | 26 | 3.7 | 3.8 | .1 | .7 | 50 | 20 | 0 | 63.7 | 6.4 | 35 |
| May 1-10 | 2,435 | | 17 | .23 | 5.4 | 2.3 | 6.4 | | 32 | 5.7 | 2.8 | .1 | .7 | 57 | 23 | 0 | 68.7 | 6.9 | 10 |
| May 11-20 | 2,602 | | 12 | .60 | 5.4 | 2.2 | 6.9 | | 33 | 4.8 | 3.2 | .1 | .8 | 52 | 22 | 0 | 73.8 | 6.6 | 55 |
| May 21-31 | 1,690 | | 16 | .07 | 5.6 | 1.9 | 9.5 | | 38 | 4.1 | 4.5 | .1 | .6 | 61 | 22 | 0 | 83.7 | 7.0 | 7 |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| June 1-10 | 2,253 | | 20 | .52 | 5.1 | 2.1 | 8.9 | | 34 | 5.4 | 4.5 | 1 | 0.7 | 64 | 21 | 0 | 81.5 | 6.8 | 20 |
| June 11-20 | 4,468 | | 13 | .20 | 4.7 | 2.4 | 5.4 | 1.6 | 27 | 6.4 | 2.9 | .1 | 1.7 | 51 | 22 | 0 | 65.7 | 6.6 | 10 |
| June 21-30 | 2,343 | | 16 | .18 | 4.9 | 2.4 | 6.1 | 1.5 | 29 | 6.3 | 3.4 | .1 | 1.4 | 56 | 22 | 0 | 69.6 | 7.2 | 10 |
| July 1-10 | 1,882 | | 17 | .17 | 5.8 | 2.6 | 5.1 | 1.6 | 30 | 8.6 | 2.8 | .1 | 1.3 | 60 | 25 | 1 | 69.7 | 7.0 | 8 |
| July 11-20 | 1,272 | | 18 | .22 | 5.8 | 2.5 | 10 | 1.0 | 45 | 4.2 | 5.1 | .2 | 1.0 | 70 | 25 | 0 | 97.1 | 7.1 | 26 |
| July 21-31 | 1,829 | | 15 | .03 | 5.2 | 2.0 | 6.8 | 1.9 | 34 | 4.9 | 4.2 | .1 | 1.7 | 59 | 21 | 0 | 80.4 | 7.6 | 4 |
| Aug. 1-10 | 1,356 | | 12 | .05 | 5.6 | 2.2 | 8.0 | 1.9 | 38 | 5.3 | 4.5 | .1 | 1.4 | 60 | 23 | 0 | 87.3 | 7.5 | 6 |
| Aug. 11-20 | 1,465 | | 14 | .08 | 5.4 | 2.2 | 7.0 | 1.9 | 36 | 5.0 | 4.0 | .1 | 1.6 | 59 | 22 | 0 | 81.0 | 7.6 | 7 |
| Aug. 21-31 | 858 | | 15 | .23 | 5.8 | 2.4 | 12 | 2.0 | 46 | 5.4 | 5.8 | .1 | 1.6 | 73 | 24 | 0 | 101 | 7.3 | 18 |
| Sept. 1-10 | 760 | | -- | .04 | 6.2 | 2.3 | 13 | 1.9 | 52 | 4.9 | 6.0 | .1 | 1.6 | 70 | 25 | 0 | 109 | 7.4 | 5 |
| Sept. 11-20 | 780 | | 12 | .07 | 6.3 | 2.4 | 15 | 1.5 | 52 | 5.3 | 6.9 | .2 | .8 | 76 | 26 | 0 | 119 | 7.2 | 9 |
| Sept. 21-30 | 733 | | 16 | .04 | 6.2 | 2.3 | 15 | 1.5 | 52 | 5.7 | 6.2 | .2 | .7 | 80 | 25 | 0 | 112 | 7.2 | 8 |
| Average | 2,462 | | 16 | 0.28 | 5.2 | 2.2 | 8.6 | | 35 | 5.2 | 4.3 | 0.1 | 0.8 | 60 | 22 | 0 | 80.0 | -- | 21 |

ROANOKE RIVER BASIN--Continued

GEORGES CREEK NEAR GRETNA, VA.

LOCATION.--At gaging station at bridge on State Highway 40, 2.8 miles (revised) southeast of Gretna, Pittsylvania County, and 5.8 miles upstream from Whitethorn Creek.
DRAINAGE AREA.--9.2 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $CaCO_3$: Calcium, magnesium | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 18, 1950 | 5.7 | | 7.7 | 0.13 | 2.0 | 1.6 | 2.9 | | 14 | 1.9 | 2.5 | 0.1 | 0.8 | 29 | 12 | 0 | 34.7 | 7.4 | 7 |
| Nov. 16 | 4.9 | | 11 | .20 | 2.3 | 1.3 | 3.6 | | 14 | 3.5 | 2.2 | .1 | .7 | 32 | 11 | 0 | 32.4 | 6.9 | 3 |
| Dec. 15 | 8.1 | | 15 | .23 | 2.8 | 1.7 | 1.1 | | 12 | 1.9 | 2.6 | 1 | .7 | 32 | 14 | 4 | 34.9 | 6.6 | 5 |
| Jan. 10, 1951 | 8.1 | | 11 | .08 | 2.3 | 1.4 | 2.1 | | 12 | 1.3 | 2.5 | .1 | 1.4 | 31 | 12 | 2 | 35.7 | 6.2 | 3 |
| Feb. 15 | 7.0 | | 11 | .04 | 2.4 | .9 | 3.4 | | 13 | 1.2 | 2.8 | .1 | 1.2 | 34 | 10 | 0 | 32.8 | 6.3 | 8 |
| Mar. 22 | 11 | | 10 | .11 | 2.4 | 1.1 | 2.3 | | 11 | 1.5 | 3.1 | .0 | .7 | 31 | 10 | 2 | 34.1 | 6.4 | 19 |
| Apr. 26 | 9.1 | | 9.6 | .19 | 2.2 | 1.2 | 2.5 | | 12 | 1.6 | 2.6 | .1 | .6 | 33 | 10 | 1 | 34.1 | 6.2 | 22 |
| May 23 | 7.4 | | 9.6 | .10 | 2.5 | 1.3 | 2.6 | | 12 | 2.1 | 2.7 | .0 | 1.6 | 34 | 12 | 2 | 35.5 | 6.3 | 15 |
| June 14 | 9.1 | | 8.0 | .23 | 3.0 | 1.3 | 2.9 | | 14 | 1.9 | 2.9 | .1 | 1.7 | 37 | 13 | 1 | 36.4 | 6.5 | 5 |
| Aug. 9 | 5.7 | | 12 | .35 | 2.8 | 1.3 | 2.3 | 1.1 | 14 | 2.5 | 2.8 | .1 | 1.2 | 36 | 12 | 1 | 35.5 | 7.1 | 15 |
| Sept. 20 | 2.9 | | 10 | .11 | 2.3 | 1.0 | 5.2 | | 13 | 1.3 | 5.1 | .1 | 2.2 | 33 | 10 | 0 | 36.[illegible] | 7.0 | 10 |

## BANISTER RIVER AT HALIFAX, VA.

LOCATION.--At gaging station at bridge on U. S. Highway 360, 1,700 feet downstream from Terrible Creek, 1 mile northeast of Halifax County, and 10 miles upstream from mouth.
DRAINAGE AREA.--552 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| Oct. 13, 1950 ..... | 242 | | 22 | 0.22 | 5.3 | 3.5 | 3.6 | | 35 | 2.2 | 2.8 | 0.1 | 0.2 | 58 | 28 | 0 | 62.5 | 7.3 | 5 |
| Nov. 8 ..... | 280 | | 20 | .34 | 5.1 | 1.9 | 5.8 | | 33 | 1.7 | 2.8 | .1 | .2 | 56 | 20 | 0 | 63.3 | 7.1 | 21 |
| Jan. 12, 1951 ..... | 329 | | 21 | .24 | 4.9 | 2.2 | 3.8 | | 27 | 2.7 | 2.9 | .1 | .3 | 58 | 21 | 0 | 60.0 | 6.3 | 12 |
| Feb. 9 ..... | 1,020 | | 21 | .82 | 3.9 | 1.6 | 3.5 | | 15 | 6.1 | 3.2 | .1 | .8 | 52 | 16 | 4 | 54.1 | 7.4 | 30 |
| Mar. 15 ..... | 2,320 | | 14 | 1.0 | 3.8 | 1.4 | 3.1 | | 12 | 7.0 | 2.6 | .0 | 1.5 | -- | 15 | 5 | 47.6 | 6.1 | 10 |
| Apr. 4 ..... | 2,320 | | 11 | .19 | 3.5 | 1.4 | 3.0 | | 13 | 5.4 | 2.4 | .1 | 1.3 | 49 | 14 | 4 | 46.1 | 6.8 | 18 |
| May 8 ..... | 300 | | 18 | .16 | 6.0 | 2.4 | 6.0 | | 33 | 4.0 | 4.2 | .0 | .8 | 64 | 25 | 0 | 73.0 | 7.2 | 5 |
| June 6 ..... | 324 | | 18 | .18 | 4.9 | 1.8 | 5.0 | | 30 | 1.8 | 2.2 | .1 | .8 | 62 | 20 | 0 | 61.3 | 6.4 | 10 |
| July 17..... | 182 | | 21 | .22 | 5.2 | 2.9 | 4.0 | | 33 | 2.2 | 2.5 | .1 | .6 | 62 | 25 | 0 | 64.3 | 7.3 | 30 |
| Aug. 9 ..... | 258 | | 16 | .40 | 4.8 | 2.0 | 3.9 | | 26 | 3.0 | 2.5 | .1 | .6 | 55 | 20 | 0 | 54.2 | 6.7 | 8 |
| Sept. 13 ..... | 118 | | 20 | .52 | 5.4 | 1.8 | 5.0 | | 32 | 1.6 | 2.4 | .1 | .3 | 64 | 21 | 0 | 60.1 | 7.4 | 35 |

ROANOKE RIVER BASIN--Continued

## HYCO RIVER NEAR DENNISTON, VA.

LOCATION.--At gaging station at bridge on U. S. Highway 501, 0.8 mile upstream from Mayo Creek, 2 miles east of Denniston, Halifax County, and 8 miles south of South Boston.
DRAINAGE AREA.--219 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| Oct. 11, 1950 | 54 | | 20 | 0.18 | 9.5 | 5.5 | 11 | | 55 | 7.9 | 11 | 0.2 | 0.2 | 94 | 46 | 1 | 134 | 7.4 | 7 |
| Nov. 10 | 57 | | 16 | .17 | 10 | 5.2 | 14 | | 60 | 12 | 9.9 | .2 | .1 | 96 | 46 | 0 | 144 | 7.6 | 5 |
| Dec. 5 | 1,390 | | 16 | .52 | 6.8 | 4.2 | -- | | 21 | 9.3 | 5.2 | .1 | .5 | 70 | 34 | 17 | 73.8 | 6.6 | 90 |
| Jan. 11, 1951 | 140 | | 23 | .62 | 8.8 | 4.3 | 9.0 | | 47 | 8.1 | 8.1 | .2 | .4 | 101 | 40 | 1 | 120 | 7.0 | 55 |
| Feb. 13 | 222 | | 15 | .21 | 9.3 | 4.1 | 10 | | 52 | 8.2 | 7.8 | .1 | .3 | 87 | 40 | 0 | 127 | 7.3 | 18 |
| Mar. 14 | 1,280 | | 13 | .34 | 5.1 | 2.2 | 4.5 | | 19 | 9.3 | 4.1 | .0 | .5 | 66 | 22 | 6 | 67.0 | 6.8 | 8 |
| Apr. 4 | 1,110 | | 13 | .12 | 6.5 | 2.8 | 4.7 | | 29 | 6.8 | 4.5 | .1 | .7 | 66 | 28 | 4 | 81.0 | 7.0 | 23 |
| June 6 | 374 | | 15 | .05 | 5.5 | 2.6 | 5.8 | | 25 | 8.7 | 4.0 | .1 | 2.0 | 63 | 24 | 4 | 74.3 | 6.7 | 25 |
| July 20 | 42 | | 19 | .13 | 10 | 4.5 | 12 | | 59 | 7.4 | 8.5 | .1 | .4 | 96 | 43 | 0 | 133 | 7.5 | 15 |
| Aug. 8 | 57 | | 6.6 | .04 | 13 | 4.0 | 22 | | 98 | 3.2 | 6.0 | .2 | 5.1 | 120 | 49 | 0 | 177 | 7.6 | 5 |
| Sept. 13 | 5.9 | | 14 | .02 | 12 | 5.3 | 35 | | 74 | 16 | 35 | .2 | .3 | 154 | 52 | 0 | 249 | 7.6 | 6 |

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

Chemical analyses, in parts per million, water year October 1950 to September 1951

| Date of collection | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| TAR RIVER NEAR TARBORO | | | | | | | | | | | | | | | | | | |
| Mar. 28, 1951 ..... | | 7.9 | 0.05 | 4.5 | 1.5 | 6.5 | | 21 | 5.7 | 5.8 | 0.0 | 0.2 | 54 | 17 | 0 | 68.5 | 6.9 | 27 |

## NEUSE RIVER BASIN

### LITTLE RIVER NEAR PRINCETON, N. C.

LOCATION.--At highway bridge a quarter of a mile downstream from gaging station, half a mile upstream from Little Creek, and about 3 miles north of Princeton, Johnston County.
DRAINAGE AREA.--229 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 15, 1950 | 40 | 18 | 0.37 | 2.0 | 0.9 | 6.5 | 1.7 | 19 | 2.3 | 4.2 | 0.0 | 0.3 | 50 | 9 | 0 | 51.7 | 6.8 | 16 |
| Nov. 15 | 42 | 18 | .96 | 2.9 | 1.2 | 7.7 | | 23 | 2.8 | 4.8 | .1 | .2 | 54 | 12 | 0 | 60.2 | 6.4 | 18 |
| Dec. 15 | 118 | 14 | .08 | 2.3 | 1.0 | 6.6 | | 13 | 5.6 | 5.2 | .1 | .2 | 48 | 10 | 0 | 53.2 | 6.3 | 22 |
| Jan. 15, 1951 | 112 | 14 | .19 | 2.5 | .8 | 6.1 | 1.4 | 14 | 5.9 | 5.6 | .1 | .3 | 49 | 10 | 0 | 54.5 | 6.7 | 22 |
| Feb. 16 | 104 | 7.5 | .27 | 2.9 | 1.0 | 6.9 | | 17 | 5.1 | 4.8 | .1 | .2 | 44 | 11 | 0 | 53.4 | 6.5 | 9 |
| Mar. 15 | 275 | 8.6 | .16 | 2.4 | 1.3 | 6.9 | | 15 | 5.9 | 5.5 | .0 | .2 | 53 | 11 | 0 | 55.5 | 6.4 | 33 |
| Apr. 21 | 146 | 11 | .15 | 2.9 | 1.0 | 5.2 | 1.6 | 19 | 3.2 | 4.6 | .0 | .5 | 48 | 11 | 0 | 55.3 | 6.7 | 24 |
| May 15 | 44 | 14 | 1.5 | 3.9 | 1.0 | 6.5 | | 22 | 2.6 | 4.8 | .0 | .6 | 56 | 14 | 0 | 54.7 | 6.5 | 64 |
| June 15 | 31 | 9.8 | 1.1 | 5.5 | 2.0 | 4.8 | | 24 | 2.4 | 7.1 | .0 | .2 | 50 | 22 | 2 | 55.9 | 6.5 | 47 |
| July 16 | 24 | 9.7 | .26 | 2.8 | .8 | 6.1 | 1.5 | 18 | 3.3 | 4.5 | .1 | .5 | 49 | 10 | 0 | 54.2 | 7.2 | 50 |
| Aug. 15 | 43 | 13 | .75 | 4.2 | 2.8 | 1.2 | | 19 | 4.1 | 3.4 | .0 | .1 | 51 | 22 | 6 | 48.3 | 6.4 | 55 |
| Sept. 20 | 13 | 11 | .24 | 2.6 | .9 | 6.3 | 1.9 | 22 | 3.7 | 4.5 | .0 | .4 | 47 | 10 | 0 | 52.6 | 6.5 | 50 |

## NEUSE RIVER BASIN--Continued

### SWIFT CREEK NEAR VANCEBORO, N. C.

LOCATION.--At gaging station at bridge on county road 2½ miles upstream from bridge on State Highway 118, 2½ miles downstream from Clayroot Swamp, and 3½ miles northwest of Vanceboro, Craven County.
DRAINAGE AREA.--182 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 15, 1950 | 7 | 8.7 | 0.18 | 21 | 2.2 | 35 | 2.2 | 74 | 11 | 53 | 0.1 | 0.5 | 175 | 61 | 1 | 286 | 6.9 | 20 |
| Nov. 15 | 11 | 11 | .32 | 20 | 2.1 | 22 | | 73 | 9.6 | 25 | .2 | .4 | 134 | 59 | 0 | 222 | 6.7 | 32 |
| Dec. 15 | 35 | 12 | .16 | 14 | 1.7 | 13 | | 39 | 14 | 16 | .1 | 1.0 | 99 | 42 | 10 | 151 | 6.6 | 28 |
| Jan. 15, 1951 | 44 | 7.4 | .10 | 13 | 1.4 | 11 | 1.4 | 36 | 14 | 14 | .1 | .4 | 91 | 38 | 9 | 139 | 6.7 | 23 |
| Feb. 15 | 56 | 9.5 | .15 | 12 | 1.8 | 9.6 | | 29 | 15 | 13 | .1 | .4 | 87 | 37 | 14 | 139 | 6.7 | 18 |
| Mar. 15 | 44 | 13 | .13 | 14 | 2.0 | 13 | | 39 | 16 | 15 | .0 | .8 | 105 | 43 | 11 | 153 | 7.0 | 21 |
| Apr. 16 | 43 | 7.3 | .10 | 13 | 1.8 | 12 | 1.8 | 35 | 14 | 18 | .0 | .9 | 98 | 40 | 11 | 155 | 6.6 | 27 |
| May 15 | 12 | 13 | .28 | 19 | 2.1 | 22 | | 61 | 14 | 28 | .1 | .8 | 142 | 56 | 6 | 224 | 6.6 | 27 |
| June 15 | 2.6 | 8.5 | .23 | 23 | 2.5 | 43 | | 81 | 12 | 58 | .0 | .5 | 195 | 68 | 1 | 343 | 6.7 | 27 |
| July 16 | 53 | 8.3 | .08 | 10 | 1.4 | 24 | 1.9 | 21 | 4.2 | 40 | .1 | 1.0 | 125 | 31 | 14 | 197 | 6.4 | 25 |
| Aug. 15 | 382 | 7.2 | .17 | 5.4 | 1.1 | 3.3 | | 13 | 7.4 | 4.5 | .1 | .2 | 56 | 18 | 7 | 57.8 | 5.9 | 110 |
| Sept. 15 | 7.2 | 9.1 | .07 | 20 | 2.3 | 24 | 2.5 | 69 | 16 | 26 | .1 | .6 | 146 | 59 | 3 | 230 | 7.0 | 38 |

## CAPE FEAR RIVER BASIN

### NORTHEAST CAPE FEAR RIVER NEAR CHINQUAPIN, N. C.

LOCATION.--At bridge on State Highway 41, 540 feet upstream from gaging station, about 0.4 mile downstream from Muddy Creek, and 1½ miles west of Chinquapin, Duplin County.
DRAINAGE AREA.--600 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
Water temperatures: October 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 117 ppm June 11-20; minimum, 56 ppm Feb. 1-10, 11-19.
Hardness: Maximum, 38 ppm June 1-10; minimum, 15 ppm Jan. 1-10, Feb. 11-19, Mar. 21-31, July 11-20.
Water temperatures: Maximum, 87°F July 1; minimum, 34°F Dec. 22.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Oct. 1-10, 1950 | 58.3 | 9.0 | 0.33 | 8.3 | 1.1 | 12 | 1.4 | 24 | 4.1 | 18 | 0.0 | 0.3 | 73 | 25 | 6 | 107 | 6.9 | 45 | 10 | 9.4 |
| Oct. 11-20 | 148 | 8.0 | .24 | 6.7 | 1.2 | 13 | | 22 | 5.4 | 18 | .0 | .3 | 74 | 22 | 4 | 107 | 6.8 | 45 | 10 | 8.9 |
| Oct. 21-31 | 1,462 | 7.9 | .18 | 5.6 | 1.3 | 6.2 | | 10 | 10 | 10 | .0 | .2 | 72 | 19 | 11 | 76.2 | 5.9 | 75 | 20 | 16 |
| Nov. 1-10 | 161 | 13 | .16 | 7.2 | 1.2 | 9.3 | | 19 | 6.1 | 15 | .0 | .2 | 78 | 23 | 7 | 98.3 | 6.5 | 55 | 14 | 11 |
| Nov. 11-20 | 140 | 12 | .33 | 6.3 | 1.2 | 9.9 | | 21 | 4.6 | 14 | .1 | .3 | 71 | 21 | 3 | 95.3 | 6.6 | 55 | 12 | 10 |
| Nov. 21-30 | 220 | 9.3 | .08 | 5.8 | 1.1 | 9.7 | | 18 | 5.1 | 14 | .0 | .2 | 71 | 19 | 4 | 87.3 | 6.2 | 50 | 13 | 11 |
| Dec. 1-10 | 338 | 13 | .08 | 4.9 | 1.1 | 8.5 | | 12 | 6.7 | 13 | .0 | .1 | 68 | 17 | 7 | 79.5 | 6.1 | 50 | 14 | 11 |
| Dec. 11-20 | 407 | 11 | .12 | 4.9 | 1.0 | 8.4 | | 12 | 6.9 | 12 | .2 | .2 | 65 | 16 | 6 | 77.8 | 6.2 | 45 | 15 | 10 |
| Dec. 21-31 | 255 | 9.9 | .14 | 5.2 | .9 | 7.2 | | 13 | 5.6 | 11 | .1 | .2 | 58 | 17 | 6 | 76.0 | 6.4 | 40 | 9.8 | 9.0 |
| Jan. 1-10, 1951 | 625 | 9.4 | .10 | 4.6 | .8 | 7.2 | 1.0 | 10 | 6.8 | 11 | .0 | .1 | 59 | 15 | 7 | 69.7 | 6.1 | 60 | 17 | 10 |
| Jan. 11-20 | 359 | 12 | .10 | 5.0 | 1.1 | 7.9 | | 13 | 5.9 | 12 | .1 | .2 | 63 | 17 | 6 | 72.6 | 6.4 | 45 | 12 | 9.4 |
| Jan. 21-31 | 264 | 13 | .15 | 6.0 | 1.0 | 9.3 | | 16 | 5.7 | 14 | .1 | .2 | 68 | 19 | 6 | 83.0 | 6.5 | 40 | 9.8 | 8.0 |
| Feb. 1-10 | 290 | 7.8 | .14 | 5.2 | 1.0 | 8.2 | | 15 | 5.3 | 12 | .0 | .2 | 56 | 17 | 5 | 74.4 | 6.6 | 32 | 12 | 11 |
| Feb. 11-19 | 335 | 6.7 | .04 | 4.7 | .9 | 8.7 | | 14 | 5.5 | 12 | .0 | .3 | 56 | 15 | 4 | 73.7 | 6.5 | 37 | 11 | 9.6 |
| Feb. 20-28 | 350 | 1.8 | .18 | 5.0 | 1.0 | 11 | | 15 | 7.9 | 14 | .0 | .2 | 61 | 17 | 4 | 79.5 | 6.4 | 45 | 12 | 11 |
| Mar. 1-10 | 241 | 6.6 | .20 | 6.0 | 1.1 | 9.3 | | 20 | 4.5 | 13 | .0 | .2 | 62 | 19 | 3 | 86.1 | 6.0 | 55 | 13 | 8.3 |
| Mar. 11-20 | 329 | 7.2 | .30 | 5.4 | .9 | 8.5 | | 17 | 4.4 | 12 | .0 | .2 | 61 | 17 | 3 | 78.1 | 6.2 | 60 | 13 | 9.7 |
| Mar. 21-31 | 739 | 7.0 | .14 | 4.6 | .8 | 7.2 | | 13 | 5.4 | 10 | .0 | .2 | 57 | 15 | 4 | 68.8 | 5.8 | 60 | 16 | 12 |
| Apr. 1-10 | 552 | 5.3 | .19 | 4.6 | 1.0 | 5.9 | 1.2 | 13 | 4.3 | 9.4 | .1 | .2 | a57 | 16 | 5 | 65.2 | 6.3 | 60 | 15 | 14 |
| Apr. 11-20 | 477 | 6.3 | .16 | 5.0 | 1.1 | 8.0 | | 17 | 4.7 | 11 | .0 | .2 | 64 | 17 | 3 | 68.4 | 6.2 | 65 | 17 | 13 |
| Apr. 21-30 | 449 | 6.8 | .32 | 5.3 | 1.1 | 5.9 | | 15 | 3.8 | 10 | .0 | .2 | 63 | 18 | 5 | 70.9 | 6.2 | 80 | 20 | 13 |
| May 1-10 | 344 | 7.7 | .15 | 5.0 | 1.3 | 6.5 | | 15 | 3.7 | 11 | .0 | .4 | 64 | 18 | 6 | 71.3 | 6.3 | 90 | 19 | 13 |
| May 11-20 | 133 | 9.3 | .33 | 8.2 | 1.1 | 10 | | 24 | 4.7 | 16 | .0 | .4 | 81 | 25 | 5 | 102 | 6.4 | 130 | 18 | 9.4 |
| May 21-31 | 50.0 | 6.0 | .32 | 9.8 | 1.2 | 15 | | 32 | 5.6 | 21 | .0 | .2 | 82 | 29 | 3 | 131 | 6.6 | 70 | 13 | 9.4 |
| June 1-10 | 17.3 | 4.0 | .30 | 13 | 1.3 | 12 | | 47 | 4.6 | 15 | .0 | .6 | 84 | 38 | 0 | 136 | 6.6 | 50 | 18 | 8.0 |
| June 11-20 | 19.9 | 4.9 | .30 | 12 | 1.6 | 26 | | 43 | 5.9 | 37 | .0 | .6 | 117 | 37 | 1 | 210 | 6.9 | 60 | 10 | 8.4 |

a Large proportion of organic matter present; sum of mineral constituents 39 parts per million.

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| June 21-30 | 39.0 | 5.2 | .25 | 8.9 | 1.2 | 26 | | 29 | 7.7 | 37 | .0 | .4 | 110 | 27 | 3 | 193 | 6.6 | 60 | 22 | 15 |
| July 1-10 | 244 | 12 | .17 | 9.6 | 1.8 | 14 | 1.3 | 11 | 22 | 19 | .2 | .5 | 107 | 31 | 22 | 142 | 6.4 | 50 | 21 | 11 |
| July 11-20 | 61.8 | 8.4 | .23 | 4.0 | 1.3 | 24 | | 20 | 15 | 24 | .0 | 2.0 | 100 | 15 | 15 | 152 | 6.5 | 70 | 11 | 10 |
| July 21-31 | 127 | 9.9 | .29 | 6.6 | 1.3 | 18 | | 15 | 13 | 24 | .0 | .2 | 100 | 22 | 10 | 136 | 6.4 | 70 | 36 | 16 |
| Aug. 1-10 | 257 | 10 | .33 | 6.3 | 1.3 | 11 | | 11 | 9.4 | 19 | .0 | .2 | 89 | 21 | 12 | 107 | 6.3 | 60 | 22 | 16 |
| Aug. 11-20 | 169 | 10 | .16 | 6.2 | 3.3 | 9.5 | | 16 | 6.4 | 21 | .0 | .4 | 92 | 29 | 16 | 108 | 6.3 | 90 | 22 | 15 |
| Aug. 21-31 | 146 | | .15 | 6.5 | 1.2 | 13 | | 15 | 8.9 | 20 | .0 | .4 | 87 | 21 | 9 | 113 | 6.4 | 65 | 21 | 13 |
| Sept. 1-10 | 57.5 | | .11 | 7.9 | 1.0 | 18 | | 24 | 6.7 | 25 | .0 | .3 | 89 | 24 | 4 | 137 | 6.7 | 80 | 14 | 14 |
| Sept. 11-20 | 34.5 | 8. | .22 | 9.1 | 1.3 | 19 | | 28 | 8.0 | 27 | .0 | .2 | 100 | 28 | 5 | 146 | 6.7 | 65 | 13 | 10 |
| Sept. 21-30 | 46.3 | 9.2 | .[illegible] | 8.7 | 1.3 | 22 | 1.6 | 27 | 6.5 | 34 | .0 | .2 | 109 | 27 | 5 | 174 | 6.9 | 90 | 11 | 8.0 |
| Average | 279 | 8.5 | .20 | 6.6 | 1.2 | 12 | | 19 | 6.9 | 17 | 0.0 | 0.3 | 77 | 21 | 6 | 104 | -- | 60 | 15 | 11 |

CAPE FEAR RIVER BASIN--Continued

NORTHEAST CAPE FEAR RIVER NEAR CHINQUAPIN, N. C.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 60 | 65 | 43 | 42 | 44 | 56 | 59 | 70 | 70 | 87 | 82 | 75 |
| 2 | 66 | 65 | 47 | 42 | 43 | 64 | 60 | 70 | 72 | 81 | -- | 75 |
| 3 | 66 | 62 | 47 | 44 | 40 | 65 | 58 | 69 | 75 | 79 | 78 | 75 |
| 4 | 65 | 60 | 52 | 48 | 39 | 57 | 59 | 67 | 74 | 78 | 75 | 76 |
| 5 | 66 | 62 | 50 | 46 | 40 | 56 | 60 | 67 | 74 | 79 | 75 | -- |
| 6 | 64 | 60 | 49 | 47 | 40 | 56 | 55 | 64 | 74 | 75 | 76 | 76 |
| 7 | 65 | 58 | 50 | 51 | 40 | 56 | 60 | 64 | 75 | 74 | 76 | 71 |
| 8 | 65 | 58 | 47 | 51 | 41 | 60 | 59 | 65 | 76 | 76 | 78 | 76 |
| 9 | 66 | 62 | 45 | 45 | 41 | 60 | 59 | 74 | 75 | 75 | -- | 68 |
| 10 | 64 | 57 | 45 | 40 | 51 | 56 | 59 | 67 | 76 | 72 | 80 | 70 |
| 11 | 63 | 55 | 43 | 38 | 44 | 50 | 59 | 68 | 76 | 76 | 78 | 86 |
| 12 | 64 | 55 | 43 | 38 | 45 | 48 | 68 | 73 | 76 | 86 | 78 | 82 |
| 13 | 64 | 50 | 41 | 42 | 47 | 48 | 67 | 71 | 84 | 86 | 78 | 78 |
| 14 | 58 | 50 | 41 | 42 | 50 | 47 | 65 | 71 | 74 | 80 | 79 | 78 |
| 15 | 60 | 58 | 39 | 46 | 49 | 48 | 65 | 69 | 80 | 82 | 80 | 74 |
| 16 | 63 | 55 | 41 | 45 | 49 | 48 | 60 | 60 | 78 | 80 | 82 | 72 |
| 17 | 63 | 53 | 41 | 56 | 54 | 47 | 65 | 68 | 74 | 80 | 84 | 72 |
| 18 | 65 | 48 | 40 | 46 | 54 | 53 | 60 | 68 | 74 | 81 | 82 | 70 |
| 19 | 68 | 48 | 39 | 47 | 52 | 60 | 60 | 67 | 77 | 82 | 78 | 68 |
| 20 | 68 | 48 | 36 | 47 | 52 | 54 | 63 | 67 | 78 | 80 | 78 | 66 |
| 21 | 67 | 50 | 35 | 56 | 55 | 55 | 63 | 70 | 78 | 80 | 78 | 72 |
| 22 | 68 | 49 | 34 | 54 | 55 | 51 | 63 | 68 | 79 | 80 | 81 | 72 |
| 23 | 68 | 47 | 38 | 50 | 53 | 50 | 62 | 71 | 85 | 80 | 78 | 73 |
| 24 | 68 | 46 | 42 | 49 | 52 | 56 | 61 | 66 | 79 | 84 | 76 | 74 |
| 25 | 67 | 44 | 40 | 48 | 49 | 55 | 63 | 69 | 86 | 84 | 74 | 74 |
| 26 | 64 | 43 | 41 | 46 | 48 | 50 | 65 | 71 | 79 | 79 | 73 | 72 |
| 27 | 60 | 43 | 41 | 44 | 52 | 50 | 67 | 67 | 79 | 85 | 73 | 70 |
| 28 | 60 | 42 | 41 | 45 | 55 | 52 | 67 | 69 | 79 | 83 | 73 | 68 |
| 29 | 60 | 42 | 41 | 45 | -- | 59 | 68 | 65 | 79 | 82 | 73 | 68 |
| 30 | 60 | 41 | 42 | 44 | -- | 60 | 69 | 67 | 86 | 79 | 73 | 66 |
| 31 | 61 | -- | 40 | 44 | -- | 59 | -- | 68 | -- | 82 | 73 | -- |
| Average | 64 | 53 | 42 | 46 | 47 | 54 | 62 | 68 | 77 | 80 | 77 | 73 |

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

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| **BACK CREEK NEAR HAW RIVER** | | | | | | | | | | | | | | | | | | |
| Oct. 12, 1950 ..... | 8.65 | 21 | 0.13 | 5.8 | 3.2 | 10 | 50 | 3.0 | 4.2 | 0.0 | 0.1 | 72 | 28 | 0 | 96.5 | 7.2 | 8 |
| **CAPE FEAR RIVER NEAR KELLY** | | | | | | | | | | | | | | | | | | |
| Oct. 10, 1950 ..... | -- | 9.4 | 0.15 | 4.0 | 1.4 | 7.2 | 18 | 5.8 | 7.2 | 0.1 | 0.4 | 54 | 16 | 1 | 69.2 | 6.7 | 26 |
| **BLACK RIVER NEAR TOMAHAWK** | | | | | | | | | | | | | | | | | | |
| Aug. 3, 1951 ..... | 466 | 12 | 0.19 | 3.0 | 1.0 | 5.3 | 7 | 8.6 | 5.8 | 0.0 | 0.4 | 63 | 12 | 6 | 54.6 | 5.5 | 80 |
| **SOUTH RIVER NEAR PARKERSBURG** | | | | | | | | | | | | | | | | | | |
| Aug. 3, 1951 ..... | 79.5 | 10 | 0.07 | 1.4 | 0.8 | 5.5 | 5 | 5.9 | 5.9 | 0.0 | 0.3 | 51 | 7 | 3 | 40.9 | 4.8 | 65 |
| **BLACK RIVER NEAR ATKINSON** | | | | | | | | | | | | | | | | | | |
| Oct. 10, 1950 ..... | | 6.5 | 0.27 | 3.2 | 0.9 | 7.4 | 20 | 3.8 | 5.0 | 0.0 | 0.5 | 48 | 12 | 0 | 41.5 | 5.9 | 90 |

## WACCAMAW RIVER BASIN

### WACCAMAW RIVER AT FREELAND, N. C.

LOCATION.--At bridge on State Highway 130, 150 feet upstream from gaging station, 1 mile southwest of Freeland, Brunswick County, and 7 miles downstream from Juniper Creek.
DRAINAGE AREA.--626 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
Water temperatures: October 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 116 ppm Sept. 1-10; minimum, 56 ppm Mar. 11-20.
Hardness: Maximum, 27 ppm Sept. 1-10; minimum, 12 ppm Dec. 11-20, 21-31, Jan. 1-10, Mar. 21-31.
Water temperatures: Maximum, 88°F June 19, July 13, 14; minimum, 38°F Dec. 15, 20, Jan. 8, 21.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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)[a] | Hardness as $CaCO_3$ | | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Oct. 1-10, 1950 | 193 | 8.2 | 0.30 | 4.8 | 1.1 | 2.9 | 0.9 | 10 | 2.3 | 8.1 | 0.0 | 0.4 | 78 | 16 | 8 | 51.6 | 6.0 | 120 | 29 | 29 |
| Oct. 11-20 | 122 | 7.6 | .32 | 4.8 | 1.0 | 3.0 | | 11 | 2.6 | 7.6 | .0 | .3 | 74 | 16 | 7 | 53.3 | 5.9 | 120 | 25 | 24 |
| Oct. 21-31 | 750 | 6.9 | .42 | 4.2 | 1.1 | 2.8 | | 8 | 3.7 | 7.4 | .0 | .2 | 79 | 15 | 8 | 52.8 | 5.4 | 130 | 30 | 30 |
| Nov. 1-10 | 926 | 9.2 | .35 | 4.4 | 1.1 | 4.0 | | 10 | 2.3 | 9.5 | .0 | .2 | 86 | 16 | 7 | 54.5 | 5.7 | 150 | 34 | 32 |
| Nov. 11-20 | 404 | 9.4 | .30 | 4.0 | 1.2 | 2.7 | | 8 | 2.5 | 8.2 | .0 | .2 | 77 | 15 | 8 | 51.6 | 5.7 | 110 | 26 | 24 |
| Nov. 21-30 | 247 | 7.9 | .24 | 4.4 | 1.2 | 2.8 | | 10 | 2.3 | 8.0 | .0 | .2 | 69 | 16 | 8 | 50.1 | 5.8 | 85 | 22 | 22 |
| Dec. 1-10 | 286 | 7.2 | .26 | 3.7 | 1.0 | 3.2 | | 7 | 2.7 | 8.2 | .0 | .1 | 64 | 13 | 8 | 49.0 | 5.8 | 80 | 19 | 19 |
| Dec. 11-20 | 415 | 6.0 | .11 | 3.2 | .9 | 4.3 | | 7 | 3.0 | 8.6 | .0 | .1 | 59 | 12 | 6 | 49.2 | 5.7 | 120 | 20 | 20 |
| Dec. 21-31 | 407 | 7.0 | .07 | 3.3 | .8 | 4.4 | | 7 | 3.0 | 8.6 | .0 | .1 | 58 | 12 | 6 | 49.3 | 5.7 | 110 | 19 | 17 |
| Jan. 1-10, 1951 | 783 | 5.9 | .05 | 3.5 | .8 | 5.0 | 1.1 | 9 | 3.7 | 8.5 | .0 | .1 | 58 | 12 | 5 | 48.1 | 5.7 | 100 | 21 | 16 |
| Jan. 11-20 | 627 | 5.1 | .07 | 3.8 | 1.0 | 4.0 | | 7 | 3.4 | 9.2 | .0 | .2 | 58 | 14 | 8 | 49.1 | 5.7 | 80 | 21 | 16 |
| Jan. 21-31 | 442 | 5.1 | .18 | 3.6 | 1.2 | 4.1 | | 7 | 3.5 | 9.5 | .0 | .2 | 60 | 14 | 8 | 48.6 | 5.9 | 80 | 18 | 18 |
| Feb. 1-10 | 324 | 3.9 | .20 | 4.0 | 1.3 | 3.8 | | 9 | 3.7 | 8.8 | .0 | .1 | 58 | 15 | 8 | 49.5 | 5.9 | 80 | 21 | 18 |
| Feb. 11-19 | 285 | 4.9 | .16 | 3.8 | 1.1 | 6.8 | | 8 | 8.9 | 9.1 | .0 | .2 | 69 | 14 | 7 | 46.2 | 5.9 | 75 | 25 | 17 |
| Feb. 20-28 | 274 | 2.2 | .15 | 3.5 | 1.1 | 5.6 | | 9 | 4.0 | 9.8 | .0 | .1 | 60 | 13 | 6 | 51.2 | 5.8 | 100 | 20 | 19 |
| Mar. 1-10 | 355 | 6.2 | .12 | 4.0 | .9 | 3.5 | | 8 | 3.3 | 7.8 | .0 | .3 | 63 | 14 | 7 | 50.4 | 5.6 | 110 | 22 | 21 |
| Mar. 11-20 | 764 | 4.3 | .09 | 4.3 | .9 | 4.3 | | 9 | 4.1 | 8.4 | .0 | .4 | 56 | 14 | 7 | 49.8 | 5.6 | 120 | 17 | 17 |
| Mar. 21-31 | 949 | 3.8 | .09 | 3.6 | .8 | 4.1 | | 8 | 3.1 | 7.9 | .0 | .3 | 58 | 12 | 6 | 51.2 | 5.6 | 110 | 24 | 19 |
| Apr. 1-10 | 978 | 3.2 | .11 | 3.6 | 1.0 | 4.4 | 1.2 | 10 | 2.5 | 8.1 | .1 | .2 | 62 | 13 | 5 | 52.9 | 5.6 | 130 | 23 | 23 |
| Apr. 11-20 | 1,114 | 3.9 | .10 | 3.4 | 1.1 | 4.7 | | 9 | 2.7 | 9.2 | .0 | .2 | 67 | 13 | 6 | 60.9 | 5.3 | 110 | 28 | 25 |
| Apr. 21-30 | 994 | 4.3 | .18 | 3.8 | 1.1 | 1.6 | | 6 | 2.7 | 6.8 | .0 | .3 | 68 | 14 | 9 | 50.2 | 5.6 | 130 | 25 | 24 |
| May 1-10 | 547 | 5.0 | .33 | 4.6 | 1.1 | 3.9 | | 10 | 2.2 | 9.8 | .0 | .2 | 81 | 16 | 8 | 56.6 | 5.7 | 220 | 32 | 25 |
| May 11-20 | 242 | 6.0 | .25 | 4.9 | 1.1 | 3.2 | | 10 | 2.4 | 9.1 | .0 | .3 | 72 | 17 | 9 | 57.0 | 5.3 | 180 | 34 | 27 |
| May 21-31 | 85.4 | 5.9 | .18 | 5.4 | 1.2 | 3.5 | | 11 | 2.3 | 10 | .0 | .6 | 72 | 18 | 9 | 60.8 | 5.9 | 180 | 28 | 23 |

a Includes a large proportion of organic matter for most of the analyses, except for the periods Aug. 21-31 and Sept. 1-10.

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| June 1-10 | 24.3 | 5.7 | .20 | 6.0 | 1.2 | 4.9 | 16 | 3.2 | 9.5 | .0 | 1.0 | 79 | 20 | 7 | 69.7 | 6.9 | 120 | 32 | 22 |
| June 11-20 | 42.9 | 4.3 | .24 | 7.2 | 1.3 | 3.7 | 16 | 4.6 | 6.8 | .0 | 1.2 | 71 | 23 | 10 | 64.7 | 6.2 | 100 | 23 | 16 |
| June 21-30 | 79.1 | 4.8 | .16 | 5.5 | 1.2 | 5.9 | 10 | 8.9 | 9.5 | .0 | .8 | 73 | 19 | 10 | 72.2 | 5.9 | 110 | 23 | 13 |
| July 1-10 | 66.1 | 8.4 | .16 | 7.4 | 1.4 | 6.6 \| .6 | 14 | 12 | 7.8 | .2 | .8 | 87 | 24 | 13 | 78.3 | 5.9 | 120 | 20 | 19 |
| July 11-20 | 28.0 | 6.4 | .29 | 6.4 | 1.5 | 4.3 | 12 | 9.4 | 8.1 | .0 | .4 | 86 | 22 | 12 | 71.4 | 6.0 | 130 | 20 | 20 |
| July 21-31 | 152 | 6.0 | .20 | 4.5 | 1.1 | 4.2 | 7 | 6.9 | 8.4 | .0 | .2 | 75 | 16 | 10 | 58.8 | 5.7 | 110 | 25 | 18 |
| Aug. 1-10 | 306 | 7.0 | .16 | 5.6 | 1.1 | 4.8 | 9 | 10 | 7.8 | .0 | .2 | 80 | 18 | 11 | 56.9 | 5.4 | 130 | 30 | 22 |
| Aug. 11-20 | 100 | 6.8 | .32 | 7.0 | 1.3 | 3.4 | 11 | 9.1 | 8.2 | .0 | .1 | 84 | 23 | 14 | 70.7 | 5.6 | 120 | 26 | 23 |
| Aug. 21-31 | 54.9 | 5.2 | .15 | 5.6 | 1.2 | 8.7 | 9 | 7.2 | 16 | .0 | .5 | 73 | 19 | 12 | 58.8 | 5.8 | 110 | 23 | 18 |
| Sept. 1-10 | 37.6 | 6.8 | .10 | 8.2 | 1.6 | 20 | 41 | 15 | 15 | .0 | .4 | 116 | 27 | 0 | 155 | 6.6 | 90 | 20 | 17 |
| Sept. 11-20 | 45.6 | 6.6 | .27 | 6.5 | 1.3 | 5.2 | 13 | 8.8 | 9.0 | .0 | .4 | 86 | 22 | 11 | 70.5 | 6.0 | 110 | 23 | 21 |
| Sept. 21-30 | 61.4 | 7.3 | .28 | 4.8 | 1.6 | 4.0 \| 1.0 | 10 | 4.8 | 10 | .1 | .2 | 78 | 19 | 10 | 58.6 | 5.9 | 160 | 16 | 13 |
| Average | 377 | 6.0 | 0.20 | 4.8 | 1.1 | 4.8 | 10 | 4.9 | 9.0 | 0.0 | 0.3 | 72 | 16 | 8 | 59.2 | -- | 120 | 24 | 21 |

a Includes a large proportion of organic matter for most of the analyses, except for the periods Aug. 21-31 and Sept. 1-10.

## WACCAMAW RIVER BASIN--Continued

### WACCAMAW RIVER AT FREELAND, N. C.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

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

## 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 6½ miles downstream from Reedy Creek.
DRAINAGE AREA.--2,280 square miles.
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 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 85 ppm Nov. 1-10; minimum, 34 ppm Apr. 11-20.
Hardness: Maximum, 17 ppm Oct. 1-10, Sept. 11-20; minimum, 11 ppm Apr. 11-20.
Water temperatures: Maximum, 83°F July 14; minimum, freezing point Feb. 4, 5.
Sediment concentrations: Maximum daily, 1,470 ppm June 14; minimum daily, 10 ppm Jan. 10.
Sediment loads: Maximum daily, 51,500 tons Feb. 8; minimum daily, 46 tons Sept. 13.
EXTREMES, 1943-44, 1950-51.--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 (1951): Maximum daily, 1,470 ppm June 14; minimum daily, 10 ppm Jan. 10.
Sediment loads (1951): Maximum daily, 51,500 tons Feb. 8; minimum daily, 46 tons Sept. 13.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Oct. 1-10, 1950 .... | 1,956 | 16 | 0.04 | 4.2 | 1.5 | 5.0 | 1.3 | 24 | 3.2 | 3.0 | 0.0 | 0.5 | 47 | 17 | 0 | 56.7 | 6.9 | 5 | 3.3 | 1.8 |
| Oct. 11-20 ..... | 1,714 | 14 | .04 | 4.0 | 1.3 | 6.0 | | 24 | 3.1 | 3.4 | .1 | .6 | 44 | 15 | 0 | 57.4 | 6.8 | 3 | 3.4 | 1.7 |
| Oct. 21-31 ..... | 2,385 | 15 | .05 | 4.1 | 1.1 | 5.9 | | 22 | 3.7 | 3.4 | .1 | .7 | 46 | 15 | 0 | 55.0 | 6.6 | 7 | 4.6 | 1.9 |
| Nov. 1-10 ..... | 2,093 | 16 | .04 | 3.6 | 1.0 | 15 | | 44 | 3.4 | 3.4 | .1 | 1.2 | 85 | 13 | 0 | 88.1 | 8.4 | 6 | 3.6 | 2.5 |
| Nov. 11-20 ..... | 1,716 | 16 | .03 | 3.7 | 1.2 | 5.5 | | 22 | 2.9 | 3.0 | .2 | .5 | 44 | 14 | 0 | 55.5 | 6.7 | 4 | 2.1 | 1.3 |
| Nov. 21-30 ..... | 1,728 | 15 | .03 | 3.8 | 1.2 | 6.6 | | 24 | 3.0 | 3.5 | .1 | .9 | 46 | 14 | 0 | 61.4 | 6.7 | 4 | 2.2 | 1.4 |
| Dec. 1-10 ..... | 5,791 | 14 | .08 | 2.5 | 1.4 | 5.0 | | 16 | 4.3 | 3.2 | .1 | .6 | 48 | 12 | 0 | 50.8 | 6.3 | 5 | 12 | 1.8 |
| Dec. 11-20 ..... | 2,850 | 18 | .09 | 3.5 | 1.0 | 5.7 | | 19 | 3.6 | 3.2 | .1 | 1.4 | 46 | 13 | 0 | 53.0 | 6.5 | 5 | 3.4 | 2.0 |
| Dec. 21-31 ..... | 2,123 | 14 | .07 | 3.5 | 1.2 | 4.9 | | 20 | 2.8 | 2.5 | .2 | 1.2 | 40 | 14 | 0 | 49.9 | 6.6 | 6 | 2.7 | 1.9 |
| Jan. 1-10, 1951 ... | 1,965 | 14 | .03 | 3.7 | 1.0 | 4.6 | 1.0 | 20 | 3.0 | 2.9 | .0 | 1.0 | 42 | 13 | 0 | 51.5 | 6.7 | 5 | 2.0 | .9 |
| Jan. 11-20 ..... | 2,231 | 15 | .07 | 4.2 | 1.3 | 4.7 | | 20 | 4.6 | 2.8 | .1 | 1.0 | 46 | 16 | 0 | 53.0 | 6.6 | 6 | 3.0 | 1.4 |
| Jan. 21-31 ..... | 2,024 | 14 | .03 | 4.0 | 1.1 | 4.5 | | 19 | 3.1 | 3.0 | .2 | .8 | 39 | 14 | 0 | 50.3 | 6.7 | 5 | 1.6 | 1.5 |
| Feb. 1-10 ..... | 4,821 | 13 | .04 | 4.2 | 1.4 | 6.7 | | 16 | 4.8 | 8.1 | .1 | 1.4 | 51 | 16 | 3 | 70.3 | 6.4 | 6 | 7.0 | 2.3 |
| Feb. 11-19 ..... | 2,800 | 12 | .03 | 4.0 | 1.0 | 5.1 | | 18 | 5.2 | 3.1 | .1 | .6 | 40 | 14 | 0 | 48.6 | 6.7 | 7 | 2.4 | 1.7 |
| Feb. 20-28..... | 2,861 | 6.2 | .09 | 3.5 | 1.3 | 6.0 | | 19 | 6.3 | 2.8 | .1 | 1.0 | 42 | 14 | 0 | 49.7 | 6.7 | 3 | 3.7 | 2.9 |
| Mar. 1-10 ..... | 2,465 | 9.4 | .06 | 3.5 | 1.2 | 6.6 | | 20 | 6.7 | 3.0 | .0 | .5 | 40 | 14 | 0 | 52.7 | 6.7 | 3 | 3.6 | 2.0 |
| Mar. 11-20 ..... | 3,512 | 15 | .08 | 3.7 | 1.3 | 4.4 | | 18 | 4.2 | 3.2 | .0 | .8 | 40 | 15 | 0 | 49.2 | 6.5 | 3 | 4.2 | 1.8 |
| Mar. 21-31 ..... | 3,541 | 12 | .01 | 3.6 | 1.1 | 5.3 | | 21 | 2.9 | 2.9 | .0 | .8 | 40 | 14 | 0 | 52.2 | 6.6 | 7 | 4.3 | 1.7 |
| Apr. 1-10 ..... | 6.595 | 10 | .03 | 3.0 | 1.1 | 2.6 | 1.4 | 15 | 3.9 | 2.1 | .0 | 1.3 | 36 | 12 | 0 | 43.8 | 6.4 | 4 | 9.2 | 2.7 |
| Apr. 11-20 ..... | 4,803 | 9.0 | .03 | 3.0 | .8 | 5.3 | | 16 | 3.3 | 3.4 | .1 | 1.0 | 34 | 11 | 0 | 50.7 | 6.2 | 4 | 4.9 | 1.8 |
| Apr. 21-30 ..... | 3,570 | 12 | .05 | 3.4 | 1.1 | 4.6 | | 19 | 3.3 | 2.6 | .0 | .5 | 39 | 13 | 0 | 47.0 | 6.5 | 4 | 5.1 | 2.1 |

PEE DEE RIVER BASIN--Continued

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

Chemical analyses, in parts per million, water year October 1950 to September 1951--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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| May 1-10, 1951 .... | 2,775 | 13 | 0.10 | 3.8 | 1.1 | 5.8 | | 23 | 2.8 | 3.1 | 0.0 | 0.7 | 42 | 14 | 0 | 56.0 | 6.7 | 4 | 5.2 | 2.8 |
| May 11-20 ..... | 2,482 | 13 | .04 | 3.6 | 1.2 | 5.5 | | 21 | 3.5 | 3.1 | .0 | 1.0 | 42 | 14 | 0 | 50.8 | 6.6 | 4 | 7.6 | 2.7 |
| May 21-31 ..... | 1,920 | 12 | .04 | 3.6 | 1.2 | 6.0 | | 23 | 2.8 | 3.2 | .0 | .8 | 40 | 14 | 0 | 53.3 | 6.7 | 7 | 2.7 | 2.0 |
| June 1-10 ..... | 1,938 | 13 | .03 | 4.0 | 1.2 | 6.1 | | 23 | 3.9 | 3.2 | .1 | .7 | 46 | 15 | 0 | 59.0 | 6.7 | 4 | 5.2 | 2.2 |
| June 11-20 ..... | 3,530 | 11 | .04 | 3.7 | .8 | 3.6 | | 15 | 3.5 | 2.6 | .0 | 1.0 | 39 | 13 | 0 | 43.4 | 6.4 | 7 | 9.7 | 3.5 |
| June 21-30 ..... | 2,190 | 15 | .04 | 4.1 | 1.2 | 5.3 | | 21 | 3.3 | 3.6 | .1 | 1.0 | 46 | 15 | 0 | 51.7 | 6.7 | 3 | 8.0 | 2.2 |
| July 1-10 ..... | 1,747 | 16 | .03 | 3.9 | 1.1 | 4.2 | 1.1 | 22 | 3.0 | 2.8 | .0 | 1.2 | 45 | 14 | 0 | 54.9 | 6.7 | 20 | 5.0 | 1.8 |
| July 11-20 ..... | 1,815 | 13 | .09 | 3.7 | .9 | 5.6 | | 19 | 4.5 | 3.1 | .0 | .6 | 46 | 13 | 0 | 53.5 | 6.7 | 7 | 6.0 | 2.4 |
| July 21-31 ..... | 2,264 | 12 | .10 | 3.8 | 1.0 | 7.0 | | 20 | 5.6 | 3.8 | .0 | 1.5 | 50 | 14 | 0 | 52.9 | 6.6 | 7 | 11 | 2.4 |
| Aug. 1-10 ..... | 1,763 | 13 | .04 | 3.8 | 1.1 | 6.7 | | 20 | 4.8 | 4.5 | .1 | .8 | 46 | 14 | 0 | 55.1 | 6.6 | 12 | 11 | 2.8 |
| Aug. 11-20 ..... | 1,985 | 12 | .03 | 3.6 | 1.0 | 6.6 | | 20 | 4.8 | 3.2 | .2 | 1.2 | 44 | 13 | 0 | 52.8 | 6.4 | 8 | 8.5 | 2.8 |
| Aug. 21-31 ..... | 1,161 | 13 | .02 | 4.3 | 1.4 | 6.2 | | 23 | 4.6 | 3.9 | .1 | .8 | 48 | 16 | 0 | 62.0 | 6.7 | 6 | 3.7 | 2.4 |
| Sept. 1-10 ..... | 1,071 | 11 | .04 | 4.3 | 1.2 | 7.3 | | 25 | 4.4 | 4.0 | .1 | .8 | 46 | 16 | 0 | 64.9 | 6.8 | 6 | 3.5 | 2.1 |
| Sept. 11-20 ..... | 1,112 | 12 | .03 | 4.4 | 1.4 | 6.4 | | 23 | 5.0 | 4.2 | .0 | .9 | 56 | 17 | 0 | 63.2 | 6.7 | 16 | 3.1 | 2.9 |
| Sept. 21-30 ..... | 996 | 12 | .02 | 3.8 | 1.3 | 5.8 | 1.6 | 26 | 4.1 | 4.0 | .0 | .5 | 45 | 15 | 0 | 65.4 | 6.9 | 17 | 3.6 | 1.9 |
| Average ..... | 2,555 | 13 | 0.05 | 3.8 | 1.2 | 5.9 | | 21 | 3.9 | 3.4 | 0.1 | 0.9 | 45 | 14 | 0 | 55.2 | -- | 6 | 5.1 | 2.1 |

PEE DEE RIVER BASIN--Continued

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

Temperature (°F) of water, water year October 1950 to September 1951

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

Suspended sediment, January to September 1951

| 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 | -- | -- | -- | 2,100 | 21 | 119 | 2,350 | 55 | 349 |
| 2 | -- | -- | -- | 2,500 | 60 | 405 | 2,350 | 40 | 254 |
| 3 | 1,970 | 23 | 122 | 3,050 | 107 | 880 | 2,250 | 48 | 292 |
| 4 | 1,970 | 30 | 160 | 2,450 | 84 | 556 | 2,200 | 38 | 226 |
| 5 | 1,970 | 27 | 144 | 2,300 | 83 | 516 | 2,400 | 49 | 318 |
| 6 | 1,970 | 33 | 176 | 2,350 | 34 | 216 | 2,750 | 61 | 453 |
| 7 | 1,970 | 25 | 133 | 5,690 | 213 | s 5,040 | 2,650 | 60 | 429 |
| 8 | 2,060 | 54 | 300 | 16,500 | 1,140 | s 51,500 | 2,650 | 46 | 329 |
| 9 | 1,920 | 18 | 93 | 6,920 | 588 | s 11,500 | 2,650 | 44 | 315 |
| 10 | 1,790 | 10 | 48 | 4,350 | 375 | 4,400 | 2,400 | 37 | 240 |
| 11 | 1,840 | 14 | 70 | 3,450 | 238 | 2,220 | 2,250 | 29 | 176 |
| 12 | 1,920 | 21 | 109 | 3,050 | 126 | 1,040 | 2,150 | 30 | 174 |
| 13 | 1,880 | 16 | 81 | 2,850 | 104 | 799 | 2,950 | 195 | s 1,790 |
| 14 | 1,920 | 21 | 109 | 2,750 | 88 | 653 | 7,140 | 529 | s 10,100 |
| 15 | 2,350 | 28 | 178 | 2,650 | 61 | 437 | 5,080 | 330 | s 4,650 |
| 16 | 2,950 | 66 | 526 | 2,500 | 64 | 432 | 3,550 | 186 | 1,780 |
| 17 | 2,750 | 72 | 535 | 2,550 | 60 | 413 | 3,050 | 119 | 980 |
| 18 | 2,350 | 54 | 343 | 2,750 | 96 | 713 | 2,750 | 53 | 394 |
| 19 | 2,200 | 43 | 255 | 2,650 | 81 | 580 | 2,750 | 84 | 624 |
| 20 | 2,150 | 28 | 163 | 2,500 | 72 | 486 | 3,450 | 64 | 596 |
| 21 | 2,100 | 32 | 181 | 2,850 | 78 | 599 | 3,550 | 125 | 1,200 |
| 22 | 2,020 | 22 | 120 | 3,750 | 186 | 1,880 | 3,150 | 114 | 970 |
| 23 | 1,970 | 14 | 74 | 3,450 | 177 | 1,650 | 2,850 | 71 | 546 |
| 24 | 2,020 | 18 | 98 | 2,950 | 108 | 861 | 2,650 | 68 | 487 |
| 25 | 2,200 | 24 | 143 | 2,750 | 72 | 535 | 2,550 | 68 | 468 |
| 26 | 2,100 | 22 | 125 | 2,550 | 52 | 359 | 2,400 | 56 | 363 |
| 27 | 1,970 | 12 | 64 | 2,500 | 54 | 364 | 2,350 | 62 | 393 |
| 28 | 1,880 | 14 | 71 | 2,450 | 56 | 370 | 2,300 | 38 | 236 |
| 29 | 1,970 | 14 | 74 | -- | -- | -- | 2,450 | 42 | 278 |
| 30 | 1,970 | 18 | 96 | -- | -- | -- | 4,300 | 282 | s 4,120 |
| 31 | 2,060 | 22 | 122 | -- | -- | -- | 10,400 | 676 | s 19,300 |
| Total | a 60,190 | -- | 4,710 | 99,160 | -- | 89,500 | 98,720 | -- | 52,800 |

s Computed by subdividing day.
a Total discharge for month 64,220 cfs-days.

PEE DEE RIVER BASIN--Continued

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

*Suspended sediment, January to September 1951--Continued*

| Day | April | | | May | | | June | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean discharge (cfs) | Suspended sediment | | Mean discharge (second-feet) | 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 | 6,750 | 547 | s 10,300 | 3,150 | 240 | 2,040 | 1,700 | 37 | 170 |
| 2 | 4,650 | 322 | 4,040 | 3,150 | 186 | 1,580 | 1,660 | 30 | 134 |
| 3 | 6,560 | 746 | s 13,800 | 3,050 | 146 | 1,200 | 1,610 | 42 | 183 |
| 4 | 4,970 | 440 | 5,900 | 2,850 | 139 | 1,070 | 1,920 | 557 | 2,890 |
| 5 | 3,950 | 181 | 1,930 | 2,750 | 112 | 832 | 1,700 | 112 | 514 |
| 6 | 3,450 | 141 | 1,310 | 2,750 | 87 | 646 | 1,790 | 86 | 416 |
| 7 | 3,150 | 90 | 765 | 2,650 | 80 | 572 | 1,700 | 91 | 418 |
| 8 | 7,370 | 653 | s 16,200 | 2,550 | 62 | 427 | 2,400 | 206 | 1,340 |
| 9 | 13,700 | 900 | s 33,300 | 2,450 | 72 | 476 | 2,150 | 300 | 1,740 |
| 10 | 11,400 | 633 | s 20,200 | 2,400 | 58 | 376 | 2,750 | 338 | 2,510 |
| 11 | 6,400 | 405 | s 7,030 | 2,400 | 85 | 551 | 3,950 | 656 | 7,000 |
| 12 | 4,970 | 264 | 3,540 | 3,950 | 892 | s 10,700 | 2,300 | 718 | 4,460 |
| 13 | 7,660 | 573 | s 11,900 | 3,150 | 1,100 | s 9,680 | 2,400 | 448 | 2,900 |
| 14 | 5,900 | 466 | 7,420 | 2,450 | 438 | 2,900 | 9,800 | 1,470 | s 39,800 |
| 15 | 4,750 | 272 | 3,490 | 2,300 | 169 | 1,050 | 4,050 | 833 | 9,110 |
| 16 | 4,250 | 192 | 3,300 | 2,200 | 105 | 624 | 2,750 | 376 | 2,790 |
| 17 | 3,950 | 170 | 1,810 | 2,150 | 94 | 546 | 2,350 | 183 | 1,160 |
| 18 | 3,550 | 165 | 1,580 | 2,100 | 76 | 431 | 2,550 | 163 | 1,120 |
| 19 | 3,350 | 141 | 1,280 | 2,060 | 72 | 400 | 2,750 | 220 | 1,630 |
| 20 | 3,250 | 105 | 921 | 2,060 | 61 | 339 | 2,400 | 152 | 985 |
| 21 | 3,150 | 80 | 680 | 2,060 | 56 | 311 | 2,200 | 130 | 772 |
| 22 | 3,150 | 78 | 663 | 2,100 | 56 | 318 | 2,200 | 96 | 570 |
| 23 | 4,450 | 282 | s 3,750 | 2,060 | 52 | 289 | 2,400 | 112 | 726 |
| 24 | 4,650 | 412 | s 5,270 | 1,970 | 84 | 447 | 2,650 | 949 | 6,790 |
| 25 | 3,550 | 176 | 1,690 | 1,920 | 50 | 259 | 2,150 | 382 | 2,220 |
| 26 | 3,250 | 136 | 1,190 | 1,840 | 38 | 189 | 1,920 | 201 | 1,040 |
| 27 | 3,550 | 110 | 1,050 | 1,840 | 49 | 243 | 1,880 | 128 | 650 |
| 28 | 3,450 | 342 | 3,190 | 1,920 | 51 | 264 | 2,650 | 988 | s 7,400 |
| 29 | 3,150 | 189 | 1,610 | 1,880 | 46 | 233 | 2,060 | 1,100 | s 6,580 |
| 30 | 3,350 | 144 | 1,500 | 1,790 | 41 | 198 | 1,790 | 458 | 2,210 |
| 31 | -- | -- | -- | 1,740 | 40 | 188 | -- | -- | -- |
| Total | 149,680 | -- | 170,000 | 73,690 | -- | 39,400 | 76,580 | -- | 110,000 |

| Day | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1,970 | 210 | 1,120 | 1,790 | 380 | 1,840 | 1,110 | 39 | 117 |
| 2 | 1,790 | 402 | 1,940 | 1,520 | 180 | 739 | 1,030 | 28 | 78 |
| 3 | 1,740 | 116 | 545 | 1,390 | 108 | 405 | 1,020 | 36 | 99 |
| 4 | 1,700 | 89 | 409 | 1,390 | 97 | 364 | 985 | 25 | 66 |
| 5 | 2,250 | 582 | 3,540 | 1,310 | 81 | 286 | 955 | 26 | 67 |
| 6 | 2,020 | 226 | 1,230 | 1,230 | 76 | 252 | 1,020 | 24 | 66 |
| 7 | 1,700 | 132 | 606 | 1,810 | 153 | 748 | 1,230 | 37 | 123 |
| 8 | 1,480 | 79 | 316 | 3,750 | 1,180 | 12,000 | 1,270 | 48 | 165 |
| 9 | 1,430 | 73 | 282 | 1,920 | 734 | 3,800 | 1,110 | 24 | 72 |
| 10 | 1,390 | 58 | 218 | 1,520 | 236 | 969 | 978 | 22 | 58 |
| 11 | 1,350 | 29 | 106 | 1,740 | 244 | 1,150 | 955 | 20 | 52 |
| 12 | 1,430 | 33 | 127 | 1,480 | 170 | 679 | 955 | 21 | 54 |
| 13 | 1,390 | 34 | 128 | 1,660 | 250 | 1,120 | 895 | 19 | 46 |
| 14 | 1,350 | 36 | 131 | 1,880 | 237 | 1,200 | 940 | 22 | 56 |
| 15 | 1,430 | 36 | 139 | 2,950 | 742 | 5,910 | 1,190 | 66 | 212 |
| 16 | 2,020 | 900 | 4,910 | 3,150 | 1,140 | 9,700 | 1,700 | 100 | 459 |
| 17 | 2,550 | 213 | 1,470 | 2,300 | 561 | 3,480 | 1,310 | 60 | 212 |
| 18 | 2,550 | 614 | 4,230 | 1,740 | 341 | 1,600 | 1,070 | 50 | 144 |
| 19 | 2,060 | 978 | 5,440 | 1,560 | 230 | 969 | 1,070 | 38 | 110 |
| 20 | 2,020 | 456 | 2,490 | 1,390 | 148 | 555 | 1,030 | 34 | 95 |
| 21 | 2,150 | 727 | 4,220 | 1,230 | 122 | 405 | 985 | 30 | 80 |
| 22 | 1,560 | 771 | 3,250 | 1,190 | 80 | 257 | 970 | 24 | 63 |
| 23 | 1,390 | 258 | 968 | 1,150 | 80 | 248 | 948 | 31 | 79 |
| 24 | 1,660 | 166 | 744 | 1,110 | 51 | 153 | 948 | 20 | 51 |
| 25 | 1,920 | 622 | 3,220 | 1,030 | 46 | 128 | 1,010 | 26 | 71 |
| 26 | 2,300 | 518 | 3,220 | 1,030 | 36 | 100 | 925 | 20 | 50 |
| 27 | 3,250 | 952 | 8,350 | 1,030 | 38 | 106 | 918 | 20 | 50 |
| 28 | 2,020 | 608 | 3,320 | 1,190 | 58 | 186 | 1,010 | 23 | 63 |
| 29 | 2,650 | 406 | 2,910 | 1,390 | 74 | 278 | 1,230 | 42 | 139 |
| 30 | 3,650 | 842 | 8,300 | 1,270 | 58 | 199 | 1,020 | 23 | 63 |
| 31 | 2,350 | 766 | 4,860 | 1,150 | 38 | 118 | -- | -- | -- |
| Total | 60,520 | -- | 72,700 | 50,250 | -- | 49,900 | 31,787 | -- | 2,990 |

Total discharge for period Jan. 3 to Sept. 30, 1951 (cfs-days) ..... 700,577
Total load for period Jan. 3 to Sept. 30, 1951 (tons) ..... 592,000

s Computed by subdividing day.

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

Particle-size analyses of suspended sediment, February to July 1951
(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 | |
| Feb. 8, 1951 | 10:00 a.m. | 18,900 | 1,460 | 1,460 | | -- | 41 | 50 | 66 | 87 | 94 | 99 | | | | BN |
| Feb. 9 | 8:30 a.m. | 7,010 | 814 | 814 | | -- | 30 | 40 | 55 | 78 | 86 | 90 | | 93 | | BN |
| June 14 | 9:00 a.m. | 12,200 | 1,980 | 1,980 | | 28 | 51 | 70 | 82 | 92 | 95 | 97 | | | | BN |
| July 31 | 9:35 a.m. | 2,550 | 743 | 743 | | 47 | 68 | 88 | 97 | -- | -- | -- | | | | BN |
| July 31 | 9:50 a.m. | 2,550 | 828 | 828 | | 55 | 73 | 87 | 97 | -- | -- | -- | | | | BN |

PEE DEE RIVER BASIN--Continued

LITTLE PEE DEE RIVER AT GALIVANTS FERRY, S. C.

LOCATION.--At gaging station at bridge on U. S. Highway 501 at Galivants Ferry, Horry County, 1.0 mile downstream from Lake Swamp, and 3 miles upstream from Back Swamp.
DRAINAGE AREA.--2,790 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | | Unfiltered | Filtered |
| Oct. 16, 1950 | 826 | 7.7 | 0.15 | 2.0 | 0.7 | 4.5 | 0.8 | 7 | 5.2 | 5.0 | 0.0 | 0.3 | 42 | 8 | 2 | 39.4 | 5.6 | 45 | 12 | 11 |
| Nov. 15 | 860 | 10 | .08 | 1.8 | .6 | 6.0 | | 6 | 3.3 | 8.0 | .0 | .3 | 48 | 7 | 2 | 38.1 | 5.8 | 80 | 13 | 11 |
| Dec. 15 | 1,800 | 11 | .14 | 2.2 | .9 | 5.9 | | 6 | 4.9 | 8.5 | .0 | .1 | 57 | 9 | 4 | 50.1 | 5.4 | 85 | 15 | 15 |
| Jan. 15, 1951 | 2,230 | 13 | .09 | 2.0 | .7 | 4.0 | 1.0 | 4 | 3.7 | 7.0 | .1 | .2 | 50 | 8 | 5 | 45.5 | 5.5 | 70 | 6.9 | 5.6 |
| Feb. 15 | 1,440 | 8.2 | .07 | 2.3 | .5 | 4.8 | | 6 | 3.8 | 6.5 | .0 | .2 | 42 | 8 | 3 | 39.9 | 5.7 | 40 | 12 | 11 |
| Mar. 15 | 2,370 | 8.7 | .24 | 3.2 | .7 | 4.5 | | 7 | 3.9 | 7.6 | .0 | .2 | a 54 | 11 | 5 | 44.9 | 5.7 | 80 | 20 | 16 |
| Apr. 16 | 4,890 | 5.6 | .13 | 2.6 | .8 | 4.9 | 1.0 | 6 | 4.5 | 7.5 | .1 | .2 | b 60 | 10 | 5 | 46.7 | 5.5 | 120 | 28 | 23 |
| May 15 | 826 | 6.9 | .22 | 1.8 | .7 | 4.2 | | 7 | 2.3 | 5.5 | .0 | .8 | c 45 | 7 | 2 | 42.4 | 5.4 | 90 | 24 | 11 |
| June 15 | 418 | 4.2 | .13 | 1.8 | .6 | 4.9 | | 8 | 3.2 | 4.9 | .1 | .6 | 32 | 7 | 0 | 36.9 | 6.0 | 47 | 16 | 7.0 |
| July 17 | 588 | 7.5 | .22 | 2.2 | .7 | 4.6 | 1.0 | 7 | 6.3 | 4.1 | .1 | .4 | 46 | 8 | 3 | 42.6 | 6.0 | 70 | 10 | 9.6 |
| Aug. 15 | 826 | 7.9 | .16 | 2.2 | .7 | 4.3 | | 6 | 5.0 | 5.4 | .0 | .2 | d 52 | 8 | 4 | 41.7 | 6.0 | 90 | 19 | 15 |
| Sept. 17 | 299 | 5.7 | .11 | 1.7 | .6 | 4.7 | 1.1 | 9 | 3.2 | 4.9 | .1 | .6 | 33 | 7 | 0 | 35.3 | 5.9 | 45 | 9.0 | 6.4 |

a Large proportion of organic matter present; sum of mineral constituents 32 parts per million.
b Large proportion of organic matter present; sum of mineral constituents 30 parts per million.
c Large proportion of organic matter present; sum of mineral constituents 26 parts per million.
d Large proportion of organic matter present; sum of mineral constituents 29 parts per million.

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

Chemical analyses, in parts per million, water year October 1950 to September 1951

| Date of collection | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| LUMBER RIVER NEAR WAGRAM | | | | | | | | | | | | | | | | | | |
| Feb. 20, 1951 ..... | | 9.0 | 0.06 | 0.9 | 0.5 | 4.3 | 5 | 4.9 | 2.9 | 0.0 | 0.4 | 25 | 4 | 0 | 19.9 | 5.6 | 45 | |

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 1950 to September 1951

| 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 | Noncarbonate | | | |
| **THOMPSON CREEK NEAR CHERAW** | | | | | | | | | | | | | | | | | | |
| Nov. 22, 1950 | a20.9 | 8.3 | 0.15 | 2.2 | 1.1 | 5.6 | 13 | 2.2 | 6.0 | 0.2 | 0.2 | 38 | 10 | 0 | 47.5 | 6.2 | 13 |
| May 8, 1951 | a92.9 | 6.5 | .16 | 3.0 | 1.2 | 5.9 | 15 | 3.3 | 6.4 | .0 | .7 | 43 | 12 | 0 | 49.3 | 6.1 | 40 |
| Sept. 12 | a10.9 | 7.1 | .10 | 2.8 | 1.0 | 2.0 | 6 | 5.0 | 3.5 | .0 | .5 | 40 | 11 | 6 | 40.3 | 6.0 | 39 |
| **CEDAR CREEK AT SOCIETY HILL** | | | | | | | | | | | | | | | | | | |
| Nov. 22, 1950 | a56.9 | 7.5 | 0.03 | 0.7 | 0.8 | 1.8 | 3 | 2.1 | 2.9 | 0.0 | 0.3 | 23 | 5 | 3 | 18.1 | 6.1 | 17 |
| May 11, 1951 | a34.8 | 4.7 | .02 | .9 | .3 | 2.1 | 3 | 1.2 | 2.8 | .1 | .3 | 17 | 4 | 1 | 18.8 | 6.2 | 25 |
| Sept. 12 | a27.5 | 10 | .03 | 1.2 | .6 | 1.6 | 2 | 2.6 | 3.0 | .0 | .3 | 31 | 5 | 4 | 25.0 | 5.5 | 17 |
| **PEE DEE RIVER NEAR SOCIETY HILL** | | | | | | | | | | | | | | | | | | |
| Nov. 21, 1950 | a7,720 | 10 | 0.04 | 4.0 | 2.2 | 10 | 26 | 4.5 | 10 | 0.2 | 0.6 | 56 | 19 | 0 | 63.7 | 6.4 | 3 |
| May 11, 1951 | a6,410 | 11 | .06 | 4.0 | 1.5 | 6.5 | 23 | 4.5 | 3.9 | .2 | .9 | 46 | 16 | 0 | 63.3 | 7.7 | 6 |
| **PEE DEE RIVER AT PEEDEE** | | | | | | | | | | | | | | | | | | |
| Nov. 21, 1950 | 2,880 | 14 | 0.09 | 4.0 | 1.4 | 6.9 | 24 | 4.2 | 4.0 | 0.2 | 0.6 | 51 | 16 | 0 | 63.5 | 6.6 | 6 |
| May 10, 1951 | 7,120 | 9.5 | .04 | 4.7 | 1.7 | 6.3 | 24 | 4.8 | 4.8 | .1 | 1.1 | 48 | 19 | 0 | 70.8 | 6.4 | 8 |
| **LYNCHES RIVER AT EFFINGHAM** | | | | | | | | | | | | | | | | | | |
| Nov. 29, 1950 | 469 | 9.9 | 0.06 | 1.8 | 0.3 | 5.9 | 8 | 4.6 | 4.9 | 0.0 | 0.4 | 33 | 6 | 0 | 38.4 | 5.9 | 26 |
| June 1, 1951 | 198 | 8.7 | .27 | 2.1 | .8 | 4.0 | 11 | 2.6 | 3.6 | .0 | .6 | 29 | 9 | 0 | 38.1 | 7.0 | 5 |

a Instantaneous discharge.

## SOUTH FORK CATAWBA RIVER AT LINCOLNTON, N. C.

LOCATION.--At bridge about 1.1 mile downstream from State Highways 27 and 150 at Lincolnton, Lincoln County, and about 1.5 miles downstream from Clark Creek.
DRAINAGE AREA.--393 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| Date of collection | 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 17, 1950 | 180 | 11 | 0.07 | 3.7 | 1.5 | 6.3 | 1.5 | 24 | 3.0 | 6.2 | 0.0 | 0.4 | 46 | 15 | 0 | 59.2 | 6.9 | 3 |
| Nov. 15 | 210 | 14 | .04 | 3.2 | 1.2 | 7.8 | | 18 | 2.5 | 8.5 | .1 | .5 | 47 | 13 | 0 | 70.0 | 6.6 | 8 |
| Dec. 15 | 320 | 12 | .07 | 3.0 | 1.3 | 6.0 | | 18 | 2.9 | 5.4 | .1 | .4 | 40 | 13 | 0 | 54.7 | 6.6 | 8 |
| Jan. 15, 1951 | 290 | 14 | .08 | 3.4 | 1.3 | 4.6 | 1.1 | 20 | 2.4 | 3.9 | .0 | .8 | 42 | 14 | 0 | 49.5 | 6.9 | 16 |
| Feb. 16 | 340 | 9.0 | .19 | 3.1 | 1.2 | 6.3 | | 18 | 4.1 | 4.9 | .1 | .4 | 42 | 13 | 0 | 56.0 | 7.0 | 3 |
| Mar. 15 | 750 | 8.1 | .02 | 2.7 | .9 | 5.9 | | 15 | 4.8 | 3.9 | .0 | .7 | 38 | 10 | 0 | 46.6 | 6.8 | 3 |
| Apr. 18 | 360 | 13 | .03 | 3.1 | 1.2 | 4.7 | 1.4 | 18 | 3.0 | 5.0 | .0 | .5 | 40 | 13 | 0 | 53.6 | 6.6 | 5 |
| May 15 | 220 | 14 | .04 | 3.1 | 1.1 | 8.0 | | 21 | 2.2 | 6.5 | .1 | 1.0 | 46 | 12 | 0 | 63.4 | 6.5 | 14 |
| June 15 | 650 | 9.0 | .05 | 1.9 | .8 | 4.6 | | 10 | 3.0 | 4.1 | .1 | .9 | 33 | 8 | 0 | 40.2 | 6.1 | 6 |
| July 18 | 240 | 11 | .08 | 2.9 | 1.0 | 5.4 | 1.2 | 16 | 4.0 | 5.6 | .1 | .7 | 42 | 11 | 0 | 56.6 | 6.8 | 12 |
| Aug. 15 | 700 | 7.3 | .04 | 2.4 | 2.4 | 1.9 | | 14 | 4.4 | 2.0 | .0 | 1.3 | 31 | 16 | 4 | 38.3 | 6.0 | 14 |
| Sept. 15 | 360 | 11 | .09 | 4.2 | 1.4 | 10 | 2.8 | 21 | 10 | 6.8 | .1 | 1.3 | 61 | 16 | 0 | 66.3 | 6.4 | 9 |

a Estimated.

SANTEE RIVER BASIN--Continued

## SALUDA RIVER NEAR GREENVILLE, S. C.

LOCATION.--At bridge on State Highway 13, 500 feet downstream from gaging station, which is 1.5 miles downstream from Saluda Lake Dam, 2.5 miles upstream from George Creek, and 4.6 miles west of County Courthouse in Greenville, Greenville County.
DRAINAGE AREA.--293 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | | Unfiltered | Filtered |
| Oct. 16, 1950 | 307 | 14 | 0.06 | 2.2 | 0.6 | 2.8 | 1.0 | 15 | 1.4 | 1.4 | 0.1 | 0.1 | 30 | 8 | 0 | 29.8 | 6.8 | 7 | 2.0 | 1.4 |
| Nov. 15 | 361 | 14 | .04 | 1.8 | .6 | 3.3 | | 13 | 1.1 | 1.6 | .0 | .1 | 28 | 7 | 0 | 29.7 | 6.5 | 7 | 1.3 | 1.2 |
| Dec. 15 | 536 | 10 | .02 | 1.4 | .5 | 3.3 | | 11 | 1.5 | 1.5 | .0 | .2 | 25 | 6 | 0 | 25.1 | 6.5 | 9 | 1.9 | 1.1 |
| Jan. 13, 1951 | 283 | 9.4 | .04 | 1.9 | .6 | 3.6 | 1.0 | 13 | 2.6 | 1.2 | .2 | .3 | 28 | 7 | 0 | 26.7 | 6.9 | 11 | 3.5 | .7 |
| Feb. 15 | 422 | 15 | .02 | 1.5 | .5 | 3.1 | | 11 | 1.6 | 1.2 | .0 | .2 | 28 | 6 | 0 | 27.5 | 6.4 | 3 | 2.2 | 1.7 |
| Mar. 15 | 660 | 14 | .02 | 1.6 | .6 | 3.2 | | 12 | 1.2 | 1.4 | .0 | .4 | 29 | 6 | 0 | 26.9 | 6.4 | 2 | 5.8 | 2.4 |
| Apr. 16 | 636 | 11 | .04 | 1.3 | .5 | 1.3 | 1.1 | 9 | 1.1 | 1.1 | .0 | .2 | 24 | 5 | 0 | 24.1 | 6.3 | 3 | 2.7 | 2.2 |
| May 15 | 436 | 13 | .04 | 2.2 | .7 | 3.7 | | 16 | 1.2 | 1.2 | .1 | .3 | 31 | 8 | 0 | 31.9 | 6.2 | 4 | 3.6 | 2.4 |
| June 16 | 344 | 12 | .05 | 1.6 | .6 | 3.7 | | 13 | 1.2 | 1.5 | .1 | .4 | 28 | 6 | 0 | 26.8 | 6.2 | 4 | 4.1 | 2.4 |
| July 16 | 406 | 15 | .03 | 2.2 | .8 | 3.9 | .8 | 16 | 3.3 | 1.5 | .0 | .3 | 36 | 9 | 0 | 32.1 | 6.9 | 23 | 2.0 | 1.6 |
| Aug. 15 | 227 | 13 | .04 | 2.4 | .9 | 4.2 | | 18 | 1.3 | 1.6 | .1 | .2 | 32 | 10 | 0 | 31.3 | 6.2 | 5 | 3.8 | 1.6 |
| Sept. 17 | 210 | 11 | .02 | 2.0 | .7 | 2.9 | 1.2 | 14 | 2.0 | 1.4 | .0 | .3 | 28 | 8 | 0 | 28.8 | 6.2 | 7 | 3.9 | 2.4 |

MISCELLANEOUS ANALYSES OF STREAMS IN SANTEE RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1950 to September 1951

| Date of collection | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| SECOND BROAD RIVER AT BOSTIC | | | | | | | | | | | | | | | | | | |
| Apr. 24, 1951..... | 172 | 17 | 0.21 | 3.8 | 1.6 | 11 | 29 | 4.6 | 7.2 | 0.2 | 0.5 | 61 | 16 | 0 | 93.1 | 6.4 | 7 | |

SANTEE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN SANTEE RIVER BASIN IN SOUTH CAROLINA

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Noncarbonate | | | |
| **WATEREE RIVER NEAR CAMDEN** | | | | | | | | | | | | | | | | | | |
| Jan. 10, 1951 | 6,650 | 9.4 | 0.03 | 3.7 | 1.6 | 6.9 | 22 | 6.1 | 4.2 | 0.1 | 0.5 | 47 | 16 | 0 | 66.0 | 7.0 | 5 |
| May 10 | 7,070 | 11 | .03 | 4.6 | 2.0 | 7.2 | 26 | 6.6 | 4.5 | .1 | .7 | 52 | 20 | 0 | 94.1 | 7.2 | 7 |
| **WATEREE RIVER NEAR EASTOVER** | | | | | | | | | | | | | | | | | | |
| Apr. 24, 1951 | a4,300 | 11 | 0.03 | 4.2 | 1.8 | 6.0 | 23 | 5.1 | 4.1 | 0.1 | 1.0 | 51 | 18 | 0 | 69.8 | 6.6 | 17 |
| June 21 | a3,900 | 11 | .05 | 4.4 | 1.7 | 7.7 | 26 | 6.0 | 4.4 | .1 | .8 | 51 | 18 | 0 | 71.2 | 6.3 | 11 |
| **BUFFALO CREEK NEAR BLACKSBURG** | | | | | | | | | | | | | | | | | | |
| Nov. 16, 1950 | a96.9 | 19 | 0.11 | 3.8 | 1.5 | 7.8 | 23 | 3.3 | 6.9 | 0.1 | 0.4 | 54 | 16 | 0 | 69.6 | 7.1 | 7 |
| May 8, 1951 | a126 | 16 | .03 | 4.0 | 1.7 | 5.3 | 24 | 2.6 | 3.6 | .1 | .9 | 48 | 17 | 0 | 59.1 | 6.8 | 3 |
| **BROAD RIVER NEAR GAFFNEY** | | | | | | | | | | | | | | | | | | |
| Nov. 16, 1950 | 1,580 | 14 | 0.18 | 3.2 | 1.3 | 4.1 | 19 | 2.5 | 2.4 | 0.2 | 0.3 | 38 | 13 | 0 | 43.1 | 6.8 | 9 |
| May 8, 1951 | 1,980 | 13 | .02 | 3.6 | 1.3 | 4.5 | 20 | 2.7 | 2.5 | .1 | 1.3 | 39 | 14 | 0 | 46.3 | 6.5 | 2 |
| **KINGS CREEK AT KINGS CREEK** | | | | | | | | | | | | | | | | | | |
| Nov. 16, 1950 | a18.0 | 16 | 0.09 | 14 | 3.8 | 4.0 | 63 | 4.0 | 2.2 | 0.1 | 0.1 | 75 | 51 | 0 | 118 | 7.6 | 6 |
| May 8, 1951 | a33.8 | 12 | .01 | 14 | 3.8 | 4.9 | 64 | 4.4 | 2.6 | .1 | .4 | 74 | 51 | 0 | 118 | 6.8 | 3 |
| **BULLOCK CREEK NEAR SHARON** | | | | | | | | | | | | | | | | | | |
| Nov. 16, 1950 | a20.2 | 26 | 0.24 | 7.8 | 3.8 | 4.9 | 43 | 4.2 | 3.8 | 0.2 | 0.2 | 73 | 35 | 0 | 94.1 | 7.2 | 5 |
| Feb. 6, 1951 | a39.9 | 22 | .03 | 7.4 | 2.8 | 7.6 | 43 | 5.3 | 4.0 | .0 | .1 | 71 | 30 | 0 | 97.4 | 6.5 | 6 |
| May 8 | a30.3 | 22 | .03 | 7.2 | 2.6 | 8.3 | 46 | 3.9 | 3.2 | .1 | .3 | 71 | 29 | 0 | 96.3 | 6.8 | 14 |
| **PACOLET RIVER NEAR FINGERVILLE** | | | | | | | | | | | | | | | | | | |
| Dec. 6, 1950 | 211 | 14 | 0.09 | 2.6 | 2.2 | 5.5 | 24 | 3.2 | 2.8 | 0.1 | 0.3 | 48 | 16 | 0 | 46.1 | 6.9 | 4 |
| May 24, 1951 | 174 | 14 | .06 | 3.6 | 1.0 | 4.5 | 22 | 2.0 | 1.5 | .1 | .5 | 40 | 13 | 0 | 47.6 | 6.6 | 7 |

a Instantaneous discharge.

BROAD RIVER NEAR CARLISLE

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nov. 15, 1950 | 1,540 | 16 | 0.19 | 5.1 | 2.4 | 4.2 | 28 | 3.7 | 2.9 | 0.2 | 0.3 | 48 | 23 | 0 | 60.4 | 7.0 | 7 |
| May 3, 1951 | 3,840 | 12 | .01 | 3.6 | 1.4 | 4.3 | 22 | 2.5 | 2.2 | .0 | .5 | 38 | 15 | 0 | 52.1 | 6.6 | 4 |

NORTH TYGER RIVER NEAR MOORE

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nov. 15, 1950 | 131 | 14 | 0.04 | 3.2 | 1.3 | 42 | 63 | 31 | 14 | 0.0 | 1.5 | 142 | 13 | 0 | 227 | 6.5 | 5 |
| Jan. 11, 1951 | 110 | 8.9 | .13 | 2.4 | 1.0 | 60 | 115 | 22 | 16 | .0 | 1.5 | 177 | 10 | 0 | 288 | 7.1 | 6 |
| May 8 | 170 | 11 | .05 | 1.6 | .6 | 31 | 65 | 8.4 | 7.8 | .2 | .1 | 92 | 6 | 0 | 146 | 7.2 | 16 |
| June 19 | 310 | 10 | .04 | 2.2 | .9 | 20 | 32 | 15 | 5.1 | .2 | 2.8 | 72 | 9 | 0 | 103 | 6.4 | 10 |

TYGER RIVER NEAR DELTA

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Feb. 5, 1951 | a518 | 18 | 0.06 | 4.4 | 1.8 | 17 | 42 | 9.8 | 6.5 | 0.5 | 1.1 | 83 | 18 | 0 | 122 | 7.7 | 16 |
| May 3 | a517 | 16 | .02 | 4.4 | 1.7 | 14 | 41 | 5.1 | 5.0 | .4 | .9 | 70 | 18 | 0 | 107 | 7.3 | 7 |

WILSON CREEK NEAR NINETY SIX

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan. 9, 1951 b | a37.5 | 23 | 0.07 | 7.1 | 3.1 | 8.6 | 37 | 6.4 | 7.4 | 0.2 | 1.4 | 84 | 30 | 0 | 105 | 7.2 | 7 |
| Jan. 9 c | a12.6 | 20 | .11 | 7.2 | 3.8 | 7.8 | 41 | 7.4 | 6.0 | .2 | .2 | 76 | 34 | 0 | 107 | 6.8 | 6 |
| May 9 | a23.0 | 28 | .04 | 8.3 | 3.3 | 11 | 49 | 3.5 | 7.4 | .2 | 3.0 | 98 | 34 | 0 | 123 | 6.6 | 8 |

CONGAREE RIVER AT COLUMBIA

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dec. 15, 1950 | 8,400 | 11 | 0.03 | 4.1 | 1.4 | 6.1 | 21 | 4.4 | 3.9 | 0.4 | 1.1 | 47 | 16 | 0 | 64.6 | 6.7 | 9 |
| May 17, 1951 | 3,930 | 13 | .01 | 5.5 | 1.7 | 8.5 | 32 | 4.7 | 4.1 | .6 | .9 | 54 | 21 | 0 | 88.9 | 7.3 | 2 |

CONGAREE CREEK NEAR CAYCE

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan. 26, 1951 | a216 | 4.8 | 0.04 | 0.6 | 0.2 | 1.9 | 3 | 0.9 | 1.9 | 0.1 | 0.2 | 16 | 2 | 0 | 13.3 | -- | 7 |
| May 17 | a162 | 3.5 | .03 | 1.1 | .4 | 11.7 | 4 | 1.0 | 2.2 | .1 | .6 | 13 | 4 | 1 | 17.3 | 7.5 | 14 |
| Sept. 12 | a149 | 4.9 | .04 | 1.0 | .4 | 1.3 | 3 | .9 | 2.2 | .1 | .3 | 14 | 4 | 2 | 14.6 | 7.1 | 9 |

a Instantaneous discharge.
b Collected at bridge on State Highway 22.
c Collected at bridge on State Highway 248.

## COOPER RIVER BASIN

### LAKE MOULTRIE TAILRACE NEAR MONCKS CORNER, S. C.

LOCATION.--At Lake Moultrie Tailrace near Moncks Corner, Berkeley County. Sample collected below Pinopolis power plant.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | | Unfiltered | Filtered |
| Oct. 16, 1950 | 11,200 | 12 | 0.10 | 4.4 | 1.4 | 6.7 | 1.2 | 27 | 4.2 | 3.5 | 0.1 | 0.3 | 48 | 17 | 0 | 67.5 | 7.0 | 6 | 3.6 | 2.2 |
| Nov. 15 | 13,400 | 10 | .03 | 4.0 | 1.4 | 6.6 | | 25 | 4.0 | 3.5 | .1 | .4 | 43 | 16 | 0 | 66.3 | 6.6 | 4 | 3.2 | 2.4 |
| Dec. 15 | 15,200 | 11 | .08 | 3.8 | 1.5 | 7.0 | | 25 | 4.1 | 4.1 | .0 | .4 | 45 | 16 | 0 | 65.1 | 6.8 | .6 | 2.6 | 2.4 |
| Jan. 15, 1951 | 14,900 | 9.9 | .05 | 4.0 | 1.5 | 5.9 | .5 | 26 | 2.9 | 4.1 | .1 | .2 | 47 | 16 | 0 | 67.0 | 7.1 | 18 | 4.8 | 2.3 |
| Feb. 15 | 15,900 | 11 | .02 | 3.5 | 1.4 | 7.9 | | 24 | 4.9 | 4.2 | .2 | .5 | 45 | 14 | 0 | 64.6 | 6.4 | 3 | 3.2 | 2.8 |
| Mar. 15 | 11,200 | 10 | .03 | 3.7 | 1.5 | 8.0 | | 26 | 4.9 | 4.1 | .1 | .3 | 46 | 15 | 0 | 66.7 | 6.4 | 4 | 5.4 | 5.2 |
| Apr. 16 | 12,700 | 4.5 | .04 | 4.0 | 1.6 | 5.4 | 2.0 | 25 | 4.8 | 3.8 | .0 | .4 | 41 | 16 | 0 | 68.8 | 6.5 | 3 | 3.2 | 3.0 |
| May 15 | 13,000 | 5.9 | .04 | 4.1 | 1.6 | 7.2 | | 25 | 4.5 | 4.4 | .2 | .8 | 43 | 17 | 0 | 68.8 | 6.2 | 7 | 3.8 | 2.8 |
| June 15 | 13,500 | 6.6 | .10 | 4.4 | 1.7 | 6.9 | | 26 | 4.7 | 4.2 | .2 | .5 | 47 | 18 | 0 | 69.6 | 6.6 | 8 | 5.6 | 3.8 |
| July 16 | 14,000 | 8.2 | .03 | 5.2 | 1.6 | 7.1 | 1.6 | 29 | 5.6 | 4.4 | .1 | .4 | 51 | 20 | 0 | 72.9 | 6.7 | 7 | 2.7 | 2.5 |
| Aug. 20 | 11,800 | 8.5 | .02 | 4.7 | 1.7 | 7.6 | | 30 | 4.5 | 3.9 | .1 | .3 | 45 | 19 | 0 | 70.4 | 6.5 | 3 | 4.4 | 2.4 |
| Sept. 14 | 10,100 | 9.4 | .08 | 4.3 | 1.6 | 6.5 | 1.6 | 28 | 4.9 | 3.6 | .0 | .5 | 47 | 17 | 0 | 67.8 | 6.9 | 8 | 3.0 | 2.6 |

## SOUTH FORK EDISTO RIVER NEAR DENMARK, S. C.

LOCATION.--At gaging station at bridge on U. S. Highway 321, 200 feet downstream from Seaboard Air Line Railroad bridge, 1.8 miles (revised) downstream from Little River, and 4.8 miles (revised) north of Denmark, Bamberg County.
DRAINAGE AREA.--720 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1203.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $CaCO_3$: Calcium, magnesium | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed: Unfiltered | Oxygen consumed: Filtered |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 17, 1950 | 375 | 7.6 | 0.04 | 1.8 | 0.4 | 3.2 | 0.5 | 9 | 1.4 | 2.9 | 0.1 | 0.4 | 24 | 6 | 0 | 22.7 | 6.1 | 13 | 4.3 | 3.1 |
| Nov. 16 | 519 | 8.0 | .08 | 1.9 | .9 | 1.8 | | 8 | 1.2 | 3.1 | .0 | .2 | 26 | 8 | 2 | 24.2 | 6.2 | 45 | 5.8 | 3.7 |
| Dec. 15 | 944 | 7.9 | .06 | 2.0 | .7 | 2.9 | | 7 | 1.8 | 4.6 | .0 | .1 | 31 | 8 | 2 | 41.8 | 6.0 | 65 | 8.2 | 6.3 |
| Jan. 16, 1951 | 747 | 8.6 | .03 | 1.9 | .6 | 2.5 | .5 | 7 | 1.0 | 3.5 | .2 | .6 | 30 | 7 | 1 | 25.8 | 6.2 | 34 | 7.5 | 4.3 |
| Feb. 17 | 747 | 6.7 | .08 | 1.8 | .6 | 3.0 | | 8 | 2.0 | 3.2 | .1 | .2 | 27 | 7 | 0 | 26.3 | 6.0 | 18 | 7.6 | 5.1 |
| Mar. 15 | 899 | 8.3 | .20 | 2.2 | .7 | 2.3 | | 8 | 1.8 | 3.5 | .0 | .1 | 35 | 8 | 2 | 26.3 | 5.9 | 32 | 8.0 | 7.8 |
| Apr. 15 | 917 | 4.2 | .09 | 1.8 | .5 | 2.0 | .8 | 7 | 1.5 | 3.0 | .0 | .2 | a29 | 7 | 1 | 27.0 | 5.7 | 45 | 9.6 | 9.2 |
| May 15 | 394 | 6.7 | .11 | 1.5 | .5 | 3.1 | | 8 | 1.1 | 2.8 | .1 | .8 | 24 | 6 | 0 | 25.2 | 5.5 | 30 | 6.2 | 4.5 |
| June 18 | 608 | 8.5 | .16 | 2.0 | .5 | 3.2 | | 8 | 2.0 | 3.4 | .0 | .6 | 38 | 7 | 0 | 29.3 | 6.4 | 54 | 8.3 | 7.8 |
| July 16 | 341 | 7.0 | .08 | 1.4 | .4 | 2.7 | .4 | 8 | 1.5 | 2.9 | .0 | .4 | 25 | 5 | 0 | 24.6 | 6.1 | 30 | 3.8 | 2.6 |
| Aug. 16 | 452 | 8.3 | .08 | 2.3 | 1.0 | 2.9 | | 10 | 2.6 | 3.4 | .1 | .4 | 29 | 10 | 2 | 26.1 | 5.7 | 30 | 7.0 | 4.8 |
| Sept. 14 | 279 | 6.8 | .07 | 2.2 | .7 | 2.5 | .9 | 9 | 1.9 | 3.0 | .0 | .4 | 27 | 8 | 1 | 25.8 | 5.7 | 32 | 6.0 | 3.0 |

a Large proportion of organic matter present; sum of mineral constituents 17 parts per million.

EDISTO RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN EDISTO RIVER BASIN IN SOUTH CAROLINA

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Noncarbonate | | | |
| **SHAW CREEK NEAR EUREKA** | | | | | | | | | | | | | | | | | | |
| Nov. 10, 1950 | a32.0 | 8.1 | 0.07 | 1.1 | 1.1 | 3.2 | 7 | 1.7 | 4.0 | 0.2 | 0.7 | 27 | 7 | 2 | 30.5 | 6.5 | 26 |
| June 14, 1951 | a39.1 | 6.6 | .11 | 1.8 | .8 | 3.2 | 9 | 1.8 | 3.6 | .0 | .6 | 30 | 8 | 0 | 34.0 | 6.1 | 30 |
| **NORTH FORK EDISTO RIVER NEAR NORTH** | | | | | | | | | | | | | | | | | | |
| Jan. 31, 1951 | a451 | 5.5 | 0.05 | 1.0 | 0.3 | 3.4 | 7 | 1.3 | 2.5 | 0.1 | 0.3 | 23 | 4 | 0 | 17.4 | 5.6 | 13 |
| May 1 | a561 | 4.9 | .07 | 1.6 | 1.1 | 1.4 | 8 | 1.4 | 2.4 | .0 | .1 | 26 | 8 | 2 | 23.5 | 5.7 | 46 |
| Sept. 12 | a344 | 6.3 | .07 | 1.4 | .4 | 2.0 | 6 | 1.2 | 2.1 | .1 | .3 | 17 | 5 | 0 | 18.8 | 6.3 | 11 |
| **EDISTO RIVER NEAR BRANCHVILLE** | | | | | | | | | | | | | | | | | | |
| Dec. 13, 1950 | 1,610 | 7.1 | 0.07 | 2.6 | 0.7 | 2.0 | 6 | 2.3 | 4.4 | 0.0 | 0.3 | 34 | 9 | 5 | 31.2 | 5.8 | 27 |
| June 21, 1951 | 1,160 | 8.0 | .05 | 1.9 | .7 | 2.8 | 6 | 2.8 | 4.0 | .0 | .3 | 31 | 8 | 3 | 35.6 | 6.9 | 36 |

a Instantaneous discharge.

## MISCELLANEOUS ANALYSES OF STREAMS IN SAVANNAH RIVER BASIN IN SOUTH CAROLINA

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Noncarbonate | | | |
| **CONEROSS CREEK AT RICHLAND** | | | | | | | | | | | | | | | | | | |
| Nov. 16, 1950 | a 50.2 | 15 | 0.10 | 3.1 | 1.4 | 3.9 | 17 | 3.7 | 2.1 | 0.1 | 1.2 | 40 | 14 | 0 | 44.6 | 7.1 | 5 |
| May 17, 1951 | a 48.8 | 15 | .03 | 2.8 | 1.2 | 5.6 | 20 | 3.2 | 2.8 | .0 | .5 | 40 | 12 | 0 | 46.3 | 6.9 | 3 |
| **ROCKY RIVER NEAR CALHOUN FALLS** | | | | | | | | | | | | | | | | | | |
| Jan. 17, 1951 | 167 | 17 | 0.08 | 3.1 | 1.3 | 6.4 | 21 | 3.3 | 3.5 | 0.2 | 1.2 | 50 | 13 | 0 | 57.9 | 7.2 | 17 |
| May 31 | 198 | 15 | .01 | 3.8 | 1.3 | 5.9 | 24 | 3.1 | 2.8 | .1 | .6 | 45 | 15 | 0 | 57.5 | 6.3 | 3 |
| **LITTLE RIVER NEAR MOUNT CARMEL** | | | | | | | | | | | | | | | | | | |
| Oct. 16, 1950 | 44 | 22 | 0.20 | 6.0 | 3.1 | 4.6 | 36 | 3.0 | 3.2 | 0.2 | 0.2 | 61 | 28 | 0 | 75.0 | 7.1 | 23 |
| May 31, 1951 | 56 | 23 | .02 | 6.2 | 2.4 | 5.8 | 37 | 2.7 | 2.9 | .1 | .5 | 63 | 25 | 0 | 78.8 | 6.6 | 4 |
| **SAVANNAH RIVER AT AUGUSTA, GEORGIA** | | | | | | | | | | | | | | | | | | |
| Dec. 19, 1950 | 6,030 | 12 | 0.03 | 3.0 | 1.4 | 4.3 | 18 | 3.0 | 2.8 | 0.1 | 0.6 | 40 | 13 | 0 | 51.0 | 6.3 | 10 |
| June 13, 1951 | 7,150 | 13 | .03 | 3.0 | 1.3 | 5.8 | 22 | 2.4 | 3.1 | .0 | .8 | 41 | 13 | 0 | 55.0 | 7.0 | 5 |

a Instantaneous discharge.

PART 2-B. SOUTH ATLANTIC SLOPE AND EASTERN GULF OF MEXICO BASINS, OGEECHEE 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 September 1951.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Noncarbonate | | | |
| Nov. 1, 1950 | | 8.0 | 0.12 | 42 | 8.8 | 22 | 1.0 | 142 | 30 | 28 | 0.2 | 0.4 | 229 | 141 | 25 | 341 | 7.2 | 10 |
| Dec. 5 | | 7.1 | .01 | 34 | 7.3 | 16 | 1.7 | 117 | 21 | 25 | .1 | 1.4 | 202 | 115 | 19 | 313 | 7.3 | 104 |
| Dec. 14 | | 3.2 | .00 | 38 | 7.8 | 19 | 1.3 | 125 | 24 | 28 | .2 | 1.3 | 215 | 127 | 24 | 345 | 7.6 | 60 |
| Jan. 2, 1951 | | 7.6 | .00 | 44 | 8.0 | 21 | 1.2 | 142 | 29 | 28 | .2 | 1.4 | 254 | 143 | 26 | 383 | 7.7 | 35 |
| Feb. 6 | | 7.7 | .00 | 42 | 8.2 | 26 | 1.4 | 146 | 29 | 30 | .2 | 1.4 | 249 | 138 | 19 | 380 | 7.9 | 41 |
| Mar. 6 | | 7.7 | .01 | 43 | 7.7 | 23 | 1.4 | 131 | 30 | 32 | .2 | 1.3 | 249 | 139 | 32 | 375 | 8.2 | 40 |
| Mar. 20 | | 7.5 | .01 | 38 | 8.0 | 23 | 1.8 | 134 | 26 | 32 | .2 | 1.3 | 255 | 128 | 18 | 392 | 8.0 | 40 |
| Apr. 6 | | 7.8 | .02 | 36 | 8.6 | 22 | 1.6 | 117 | 32 | 34 | .2 | 1.2 | 266 | 125 | 29 | 400 | 8.1 | 40 |
| May 1 | | 7.1 | .02 | 44 | 9.5 | 23 | 1.3 | a144 | 32 | 34 | .2 | 1.3 | 257 | 149 | 31 | 392 | 8.3 | 40 |
| June 5 | | 8.4 | .00 | 46 | 8.4 | 25 | .8 | 146 | 31 | 36 | .2 | .9 | 252 | 149 | 30 | 416 | 8.0 | 27 |
| July 6 | | 9.9 | .00 | 44 | 8.6 | 23 | 1.2 | 144 | 29 | 33 | .2 | 1.1 | 243 | 145 | 27 | 385 | 8.1 | 32 |
| Aug. 2 | | 10 | .00 | 45 | 8.1 | 24 | 1.2 | b146 | 29 | 34 | .1 | .5 | 239 | 146 | 26 | 383 | 8.3 | 32 |
| Sept. 4 | | 7.2 | .00 | 44 | 11 | 25 | 1.6 | 156 | 29 | 36 | .3 | .3 | 254 | 155 | 27 | 403 | 7.9 | 27 |

a Includes equivalent of 2 parts per million of carbonate ($CO_3$).
b Includes equivalent of 4 parts per million of carbonate ($CO_3$).

## 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 1950 to September 1950, November 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 753 ppm July 5-9; minimum, 258 ppm Nov. 1-9.
Hardness: Maximum, 328 ppm Aug. 11-20; minimum, 131 ppm Nov. 1-9.
EXTREMES, July 1950 to September 1951.--Dissolved solids: Maximum, 753 ppm July 5-9, 1951; minimum, 235 ppm Aug. 2-11, 1950.
Hardness: Maximum, 328 ppm Aug. 11-20, 1951; minimum, 122 ppm Sept. 8-17, 1950.
REMARKS.--Records of specific conductance of daily samples available in district office at Ocala, Fla. During period July to September 1950, samples collected at 20-mile Bend, which is approximately 7 miles upstream from present location. No discharge records available for this station.

Chemical analyses, in parts per million, November 1950 to September 1951

| 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 | Noncarbonate | | | |
| Nov. 1-9, 1950 | | 6.5 | 0.22 | 42 | 6.4 | 27 | 1.6 | 142 | 17 | 40 | 0.3 | 1.4 | 258 | 131 | 15 | 365 | 7.3 | 160 |
| Nov. 10 | | -- | -- | 75 | 13 | 60 | | 336 | 15 | 57 | -- | .8 | -- | 241 | 0 | 638 | 6.8 | 160 |
| Nov. 11-20 | | 21 | .37 | 58 | 8.1 | 48 | 1.8 | 221 | 8.5 | 68 | .2 | .2 | 408 | 178 | 0 | 618 | 7.4 | 220 |
| Nov. 21-30 | | 32 | .74 | 67 | 7.7 | 60 | 2.2 | 259 | 10 | 83 | .2 | .4 | 466 | 198 | 0 | 726 | 7.3 | 180 |
| Dec. 1-10 | | 26 | .05 | 54 | 13 | 73 | 2.2 | 237 | 20 | 105 | .2 | .2 | 481 | 188 | 0 | 762 | 7.5 | 180 |
| Dec. 11-20 | | 27 | .37 | 65 | 11 | 88 | 2.4 | 257 | 20 | 122 | .2 | .5 | 524 | 207 | 0 | 843 | 7.7 | 150 |
| Dec. 21-31 | | 29 | .25 | 61 | 13 | 84 | 2.3 | 247 | 22 | 122 | .0 | .3 | 502 | 206 | 3 | 808 | 7.6 | 150 |
| Jan. 1-10, 1951 | | 26 | .42 | 63 | 13 | 67 | 2.2 | 237 | 20 | 98 | .1 | .9 | 459 | 210 | 16 | 746 | 7.6 | 150 |
| Jan. 11-20 | | 26 | .21 | 63 | 12 | 67 | 2.1 | 249 | 24 | 99 | .1 | .6 | 462 | 206 | 2 | 751 | 7.6 | 110 |
| Jan. 21-31 | | 26 | .06 | 60 | 12 | 61 | 2.0 | 245 | 20 | 85 | .1 | .3 | 432 | 199 | 0 | 692 | 7.5 | 105 |
| Feb. 1-10 | | 36 | .01 | 73 | 14 | 93 | 3.1 | 306 | 24 | 119 | .2 | .5 | 547 | 240 | 0 | 859 | 7.5 | 150 |
| Feb. 11-20 | | 34 | .01 | 69 | 14 | 74 | 2.6 | 280 | 18 | 103 | .1 | .4 | 488 | 230 | 0 | 768 | 7.5 | 140 |
| Feb. 21-28 | | 32 | .01 | 66 | 11 | 65 | 2.5 | 272 | 20 | 80 | .1 | .5 | 479 | 210 | 0 | 693 | 7.5 | 130 |
| Mar. 1-10 | | 14 | .00 | 57 | 11 | 59 | 2.0 | 194 | 38 | 83 | .2 | 2.1 | 388 | 187 | 28 | 641 | 7.6 | 70 |
| Mar. 11-20 | | 16 | .02 | 58 | 11 | 64 | 1.8 | 204 | 39 | 86 | .2 | 1.4 | 416 | 190 | 23 | 664 | 7.6 | 75 |
| Mar. 21-31 | | 22 | .01 | 53 | 11 | 67 | 2.0 | 193 | 40 | 89 | .2 | 2.1 | 414 | 178 | 19 | 663 | 7.8 | 75 |
| Apr. 1-10 | | 13 | .00 | 57 | 9.6 | 54 | 1.8 | 188 | 40 | 74 | .1 | 2.4 | 367 | 182 | 28 | 603 | 7.6 | 75 |
| Apr. 11-20 | | 13 | .00 | 57 | 9.2 | 47 | 1.6 | 189 | 37 | 64 | .1 | 2.1 | 355 | 180 | 25 | 570 | 7.6 | 70 |
| Apr. 21-30 | | 22 | .20 | 69 | 15 | 76 | 2.8 | 232 | 51 | 106 | .3 | 4.7 | 516 | 234 | 44 | 808 | 7.5 | 110 |
| May 1-10 | | 17 | .20 | 57 | 10 | 50 | 2.0 | 192 | 33 | 71 | .1 | 1.2 | 380 | 183 | 26 | 608 | 7.5 | 55 |
| May 11-20 | | 19 | .15 | 58 | 12 | 53 | 2.2 | 204 | 33 | 79 | .1 | .9 | 390 | 194 | 27 | 632 | 7.3 | 60 |
| May 21-24 | | 18 | .05 | 58 | 10 | 50 | 2.0 | 202 | 30 | 74 | .1 | .6 | 373 | 186 | 20 | 608 | 7.4 | 65 |
| June 5-10 | | 17 | .00 | 59 | 11 | 70 | 2.2 | 206 | 37 | 97 | .3 | 1.8 | 430 | 192 | 23 | 705 | 7.7 | 50 |
| June 11-20 | | 19 | .00 | 66 | 12 | 68 | 2.4 | 232 | 37 | 95 | .2 | 2.6 | 449 | 214 | 24 | 724 | 7.8 | 80 |
| June 21-30 | | 18 | .00 | 68 | 11 | 79 | 2.5 | 248 | 33 | 105 | .1 | 4.7 | 478 | 214 | 12 | 776 | 7.7 | 90 |

LAKE OKEECHOBEE AND THE EVERGLADES--Continued

WEST PALM BEACH CANAL AT LOXAHATCHEE, FLA.--Continued

Chemical analyses, in parts per million, November 1950 to September 1951--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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| July 1-4, 10, 1951 | | 18 | 0.00 | 70 | 15 | 96 | 3.0 | 252 | 47 | 132 | 0.3 | 5.5 | 578 | 236 | 30 | 897 | 7.8 | 140 |
| July 5-9 | | 24 | .00 | 82 | 22 | 124 | 4.0 | 328 | 66 | 162 | .3 | 4.8 | 753 | 295 | 26 | 1,110 | 7.7 | 260 |
| July 11-20 | | 23 | .00 | 73 | 18 | 107 | 3.3 | 292 | 52 | 141 | .2 | 6.0 | 662 | 256 | 16 | 959 | 7.8 | 220 |
| July 21-31 | | 16 | .00 | 59 | 11 | 78 | 2.2 | 232 | 29 | 105 | .3 | 1.7 | 498 | 192 | 2 | 727 | 7.8 | 300 |
| Aug. 1-10 | | 14 | .03 | 56 | 14 | 68 | 1.9 | 216 | 24 | 94 | .3 | 1.0 | 438 | 197 | 20 | 654 | 7.5 | 240 |
| Aug. 11-20 | | 25 | .02 | 82 | 30 | 104 | 3.0 | 342 | 70 | 140 | .4 | 2.8 | 718 | 328 | 48 | 1,020 | 7.6 | 280 |
| Aug. 21-27, 29, 30 | | 23 | .01 | 77 | 25 | 103 | 2.9 | 310 | 62 | 142 | .4 | 2.0 | 676 | 295 | 41 | 970 | 7.5 | 280 |
| Aug. 28, 31 | | 12 | .00 | 60 | 13 | 64 | 1.8 | 218 | 30 | 90 | .3 | 1.8 | -- | 203 | 24 | 657 | 7.8 | 180 |
| Sept. 1-10 | | 13 | .02 | 55 | 10 | 59 | 2.1 | 206 | 24 | 84 | .3 | 1.2 | 430 | 178 | 9 | 624 | 7.4 | 260 |
| Sept. 11-20 | | 16 | .06 | 65 | 13 | 79 | 2.6 | 248 | 26 | 108 | .4 | 1.8 | 540 | 216 | 12 | 770 | 7.5 | 340 |
| Sept. 21-30 | | 18 | .03 | 72 | 15 | 99 | 2.8 | 262 | 53 | 137 | .4 | 2.8 | 603 | 241 | 26 | 911 | 7.4 | 200 |
| Average | | 21 | 0.10 | 63 | 13.0 | 72 | 2.3 | 241 | 32 | 98 | 0.2 | 1.8 | 481 | 212 | 16 | 738 | 7.5 | 154 |

## HILLSBORO CANAL AT SHAWANO, 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 September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 863 ppm Aug. 21-31; minimum, 286 ppm June 1-10.
Hardness: Maximum, 418 ppm Aug. 21-31; minimum, 153 ppm Dec. 20-21.
EXTREMES, July 1950 to September 1951.--Dissolved solids: Maximum, 863 ppm Aug. 21-31, 1951; minimum, 284 ppm Aug. 1-11, 1950.
Hardness: Maximum, 423 ppm Aug. 30-31, 1950; 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, water year October 1950 to September 1951

| 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 $CaCO_3$: Calcium, magnesium | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 1-10, 1950 | | 18 | 0.00 | 53 | 14 | 42 | 2.0 | 204 | 34 | 59 | 0.4 | 1.0 | 358 | 190 | 12 | 575 | 7.5 | 70 |
| Oct. 11-17, 19-20 | | 21 | .00 | 74 | 26 | 107 | 4.5 | 340 | 75 | 115 | .8 | 23 | 696 | 292 | 13 | 1,010 | 7.4 | 400 |
| Oct. 21-31 | | 20 | .00 | 69 | 28 | 90 | 4.2 | 344 | 49 | 100 | .7 | 18 | 690 | 287 | 5 | 938 | 7.2 | 450 |
| Nov. 1-10 | | 13 | .00 | 61 | 19 | 58 | 2.8 | 266 | 29 | 79 | .6 | 1.5 | 494 | 239 | 12 | 699 | 7.4 | 480 |
| Nov. 11-20 | | 16 | .00 | 54 | 17 | 72 | 2.8 | 288 | 31 | 68 | .4 | 1.4 | 520 | 205 | 0 | 695 | 7.3 | 480 |
| Nov. 21-30 | | 27 | .00 | 83 | 23 | 78 | 3.3 | 357 | 37 | 104 | .4 | 1.5 | 640 | 302 | 9 | 907 | 7.4 | 560 |
| Dec. 1-10 | | 21 | .00 | 83 | 25 | 106 | 3.6 | 360 | 44 | 136 | .5 | 1.8 | 680 | 310 | 8 | 1,040 | 7.6 | 400 |
| Dec. 11-19 | | 21 | .02 | 82 | 22 | 102 | 3.5 | 346 | 53 | 124 | .6 | 1.8 | 687 | 295 | 12 | 968 | 7.8 | 200 |
| Dec. 20, 21 | | 10 | .02 | -- | -- | 35 | 1.7 | 183 | 36 | 43 | .3 | 2.2 | 333 | 153 | 3 | 485 | 8.3 | 600 |
| Dec. 22-31 | | 19 | .02 | 70 | 20 | 93 | 2.8 | 308 | 35 | 117 | .5 | 2.0 | 604 | 257 | 4 | 878 | 7.8 | 150 |
| Jan. 1-10, 1951 | | 17 | .03 | 72 | 20 | 93 | 3.3 | 316 | 40 | 119 | .4 | 2.5 | 612 | 262 | 3 | 896 | 7.7 | 150 |
| Jan. 11-20 | | 16 | .03 | 70 | 19 | 80 | 2.0 | 290 | 42 | 110 | .6 | 1.8 | 553 | 253 | 15 | 820 | 7.7 | 120 |
| Jan. 21-31 | | 11 | .03 | 56 | 13 | 33 | 1.6 | 204 | 32 | 47 | .3 | 1.8 | 344 | 193 | 26 | 509 | 7.7 | 70 |
| Feb. 1-9 | | 14 | .03 | 72 | 20 | 59 | 2.6 | 273 | 52 | 88 | .6 | 2.4 | 520 | 262 | 38 | 753 | 7.8 | 120 |
| Feb. 10 | | 19 | -- | 110 | 26 | 117 | -- | 434 | 100 | 155 | .5 | -- | -- | 381 | 26 | 1,260 | 7.9 | 210 |
| Feb. 11-20 | | 14 | .02 | 66 | 18 | 68 | 2.3 | 260 | 49 | 90 | .3 | 2.7 | 491 | 239 | 26 | 732 | 7.7 | 100 |
| Feb. 21-28 | | 11 | .02 | 62 | 13 | 48 | 1.7 | 218 | 40 | 64 | .3 | 2.0 | 389 | 208 | 30 | 578 | 7.9 | 80 |
| Mar. 1-10 | | 8.7 | .02 | 56 | 12 | 29 | 1.2 | 186 | 33 | 45 | .2 | 2.6 | 339 | 188 | 36 | 475 | 7.7 | 60 |
| Mar. 11-20 | | 8.0 | .03 | 54 | 9.2 | 26 | 1.4 | 172 | 35 | 41 | .2 | 1.5 | 306 | 173 | 32 | 449 | 7.8 | 50 |
| Mar. 21-31 | | 25 | .03 | 47 | 11 | 40 | 1.3 | 183 | 40 | 40 | .2 | .5 | 338 | 162 | 13 | 482 | 8.0 | 50 |
| Apr. 1-10 | | 14 | .01 | 59 | 9.1 | 29 | 1.4 | 188 | 38 | 40 | .2 | 1.3 | 316 | 185 | 31 | 493 | 7.7 | 75 |
| Apr. 11-20 | | 10 | .01 | 55 | 9.8 | 37 | 1.5 | 186 | 37 | 48 | .2 | 1.2 | 329 | 178 | 25 | 511 | 7.6 | 75 |
| Apr. 21,22 | | 26 | .00 | 86 | 26 | 77 | 3.0 | 314 | 84 | 98 | .5 | 6.8 | 673 | 321 | 64 | 929 | 7.9 | 80 |
| Apr. 23-30 | | 11 | .00 | 56 | 12 | 43 | 1.8 | 193 | 45 | 55 | .2 | 1.9 | 362 | 189 | 31 | 559 | 7.8 | 85 |
| May 1-10 | | 13 | .05 | 56 | 10 | 31 | 1.7 | 183 | 35 | 46 | .1 | .5 | 398 | 180 | 32 | 491 | 7.7 | 45 |
| May 11-20 | | 19 | .10 | 62 | 12 | 30 | 1.7 | 206 | 36 | 44 | .1 | .7 | 331 | 204 | 35 | 519 | 7.6 | 65 |
| May 21-31 | | 15 | .05 | 57 | 9.6 | 30 | 1.8 | 184 | 34 | 43 | .1 | 1.0 | 316 | 182 | 31 | 494 | 7.5 | 50 |

LAKE OKEECHOBEE AND THE EVERGLADES--Continued

HILLSBORO CANAL AT SHAWANO, FLA.--Continued

Chemical analyses, in parts per million, water year October 1950 to September 1951--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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| June 1-10, 1951 | | 11 | 0.05 | 46 | 12 | 30 | 1.7 | 162 | 36 | 44 | 0.3 | 1.3 | 286 | 164 | 31 | 458 | 7.6 | 45 |
| June 11-20 | | 16 | .20 | 61 | 13 | 37 | 1.9 | 202 | 43 | 54 | .3 | 1.3 | 358 | 206 | 40 | 558 | 7.8 | 75 |
| June 21-30 | | 18 | .30 | 76 | 23 | 71 | 3.2 | 270 | 82 | 96 | .2 | 2.6 | 573 | 284 | 63 | 846 | 7.5 | 130 |
| July 1-10 | | 21 | .00 | 76 | 21 | 74 | 3.9 | 316 | 41 | 92 | .4 | 13 | 612 | 276 | 17 | 838 | 7.7 | 200 |
| July 11-20 | | 25 | .00 | 90 | 31 | 106 | 4.7 | 426 | 46 | 133 | .8 | 5.8 | 786 | 352 | 3 | 1,090 | 7.8 | 200 |
| July 21-31 | | 28 | .00 | 92 | 32 | 111 | 5.0 | 448 | 47 | 138 | .9 | 1.5 | 799 | 361 | 0 | 1,100 | 7.8 | 220 |
| Aug. 1-10 | | 27 | .00 | 90 | 33 | 106 | 4.4 | 470 | 26 | 126 | 1.0 | 2.5 | 767 | 360 | 0 | 1,090 | 7.8 | 220 |
| Aug. 11-20 | | 28 | .00 | 98 | 33 | 111 | 4.5 | 476 | 41 | 136 | .9 | 4.2 | 832 | 380 | 0 | 1,140 | 7.8 | 240 |
| Aug. 21-31 | | 28 | .00 | 105 | 38 | 113 | 4.5 | 502 | 52 | 136 | 1.0 | 3.2 | 863 | 418 | 6 | 1,170 | 7.8 | 280 |
| Sept. 1-10 | | 22 | .00 | 80 | 34 | 88 | 3.9 | 417 | 24 | 115 | .9 | 2.2 | 653 | 340 | 0 | 952 | 7.7 | 220 |
| Sept. 11-20 | | 25 | .00 | 90 | 39 | 104 | 4.1 | 472 | 54 | 124 | .0 | 1.8 | 747 | 385 | 0 | 1,040 | 7.4 | 220 |
| Sept. 21-30 | | 27 | .02 | 95 | 41 | 110 | 4.0 | 490 | 53 | 135 | .9 | 2.8 | 815 | 406 | 4 | 1,120 | 7.6 | 320 |
| Average | | 18 | 0.03 | 72 | 21 | 70 | 2.8 | 299 | 45 | 88 | 0.5 | 3.3 | 535 | 262 | 19 | 784 | 7.7 | 182 |

## 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 September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 686 ppm Sept. 21-30, 1951; minimum, 269 ppm Mar. 6-10, 1951.
Hardness: Maximum, 386 ppm Aug. 21-31, 1951; minimum, 145 ppm Mar. 6-10, 1951.
REMARKS.--Records of specific conductance of daily samples available in district office at Ocala, Fla. During period July 1950 to January 1951 samples collected at 20-Mile Bend, 18 miles west of Fort Lauderdale. During period January to March 1951 samples collected at L Bar W Ranch, 18½ miles upstream from 20-Mile Bend, near Okeelanta. No discharge records available for this station.

Chemical analyses, in parts per million, January to September 1951

| 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 $CaCO_3$: Calcium, magnesium | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NORTH NEW RIVER CANAL AT L BAR W RANCH, NEAR OKEELANTA** | | | | | | | | | | | | | | | | | | |
| Jan. 25-31, 1951 | | 13 | 0.00 | 47 | 11 | 30 | 1.7 | 168 | 31 | 45 | 0.3 | 1.4 | 307 | 162 | 25 | 479 | 7.8 | 50 |
| Feb. 1, 4-10 | | 15 | .00 | 74 | 18 | 51 | 2.0 | 262 | 62 | 65 | .4 | 2.6 | 462 | 267 | 52 | 719 | 7.6 | 85 |
| Feb. 2-3 | | 12 | .01 | 53 | 12 | 35 | 1.8 | 181 | 38 | 48 | .4 | 1.5 | 321 | 182 | 34 | 517 | 7.7 | 75 |
| Feb. 11, 13, 17, 19, 20 | | 13 | .01 | 62 | 14 | 43 | 2.0 | 219 | 45 | 58 | .2 | 1.8 | 382 | 220 | 41 | 600 | 7.7 | 80 |
| Feb. 21, 23-25, Mar. 1 | | 13 | .00 | 54 | 12 | 39 | 1.7 | 184 | 43 | 51 | .1 | 1.4 | 330 | 184 | 33 | 527 | 7.7 | 60 |
| Average | | 13 | 0.00 | 58 | 13 | 40 | 1.8 | 203 | 44 | 53 | 0.3 | 1.7 | 360 | 203 | 37 | 568 | 7.7 | 70 |
| **NORTH NEW RIVER CANAL AT HOLLOWAY LATERAL, NEAR FORT LAUDERDALE** | | | | | | | | | | | | | | | | | | |
| Mar. 6-10, 1951 | | 10 | 0.01 | 45 | 7.9 | 32 | 1.6 | 152 | 33 | 39 | 0.1 | 1.5 | 269 | 145 | 20 | 426 | 7.8 | 65 |
| Mar. 13-20 | | 22 | .01 | 54 | 9.2 | 41 | 1.8 | 205 | 34 | 43 | .2 | .7 | 324 | 173 | 5 | 503 | 7.7 | 60 |
| Mar. 21-31 | | 8.5 | .02 | 51 | 9.0 | 33 | 1.7 | 169 | 38 | 42 | .2 | 1.1 | 289 | 164 | 27 | 464 | 7.8 | 60 |
| Apr. 1-10 | | 11 | .01 | 50 | 8.6 | 31 | 1.6 | 169 | 34 | 40 | .1 | .7 | 286 | 160 | 23 | 457 | 7.7 | 55 |
| Apr. 11-20 | | 11 | .00 | 51 | 9.8 | 37 | 1.7 | 175 | 40 | 47 | .1 | .7 | 316 | 168 | 24 | 495 | 7.7 | 55 |
| Apr. 21-23 | | 10 | .00 | 49 | 8.2 | 35 | 1.5 | 164 | 38 | 44 | .2 | .6 | 294 | 156 | 22 | 463 | 7.9 | 55 |
| Apr. 24-30 | | 13 | .01 | 62 | 16 | 53 | 1.8 | 217 | 64 | 64 | .2 | .9 | 419 | 220 | 43 | 652 | 7.7 | 75 |
| May 1-10 | | 9.2 | .00 | 48 | 12 | 33 | 1.6 | 168 | 36 | 48 | .3 | 1.0 | 302 | 169 | 31 | 474 | 7.8 | 38 |
| May 11-20 | | 22 | .00 | 57 | 11 | 37 | 1.7 | 208 | 23 | 55 | .3 | 1.3 | 342 | 187 | 16 | 532 | 7.7 | 45 |
| May 21-31 | | 11 | .00 | 50 | 11 | 30 | 1.6 | 166 | 35 | 47 | .2 | 1.1 | 303 | 170 | 34 | 470 | 7.8 | 37 |
| June 1-10 | | 11 | .00 | 45 | 12 | 33 | 1.7 | 158 | 35 | 47 | .3 | 1.0 | 293 | 162 | 32 | 462 | 7.8 | 37 |
| June 11-20 | | 13 | .00 | 44 | 12 | 34 | 1.8 | 156 | 38 | 48 | .3 | 1.4 | 293 | 159 | 31 | 464 | 7.8 | 38 |
| June 23-25, 30 | | 17 | .00 | 79 | 23 | 58 | 2.4 | 276 | 80 | 75 | .1 | 3.5 | 540 | 292 | 66 | 783 | 7.6 | 110 |
| June 21, 22, 26-29 | | 13 | .00 | 50 | 15 | 42 | 1.8 | 178 | 50 | 57 | .2 | 1.3 | 350 | 186 | 40 | 541 | 7.9 | 55 |
| July 1, 3-10 | | 16 | .00 | 58 | 21 | 50 | 1.4 | 234 | 50 | 70 | .4 | 2.2 | 434 | 231 | 40 | 665 | 7.8 | 85 |
| July 11-20 | | 20 | .00 | 92 | 29 | 60 | 2.1 | 308 | 94 | 84 | .6 | 5.3 | 632 | 348 | 92 | 881 | 7.7 | 190 |
| July 21-24, 26, 27 | | 20 | .00 | 92 | 32 | 63 | 2.0 | 326 | 92 | 90 | .6 | 4.6 | 646 | 356 | 89 | 904 | 7.9 | 190 |

LAKE OKEECHOBEE AND THE EVERGLADES--Continued

NORTH NEW RIVER CANAL AT HOLLOWAY LATERAL, NEAR FORT LAUDERDALE, FLA.--Continued

Chemical analyses, in parts per million, January to September 1951--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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| NORTH NEW RIVER CANAL AT HOLLOWAY LATERAL, NEAR FORT LAUDERDALE--Continued | | | | | | | | | | | | | | | | | | |
| Aug. 1-10, 1951..... | | 21 | 0.00 | 98 | 32 | 70 | 2.2 | 364 | 90 | 96 | 0.6 | 3.1 | 684 | 376 | 78 | 961 | 7.7 | 180 |
| Aug. 11-20..... | | 19 | .00 | 94 | 33 | 61 | 1.7 | 344 | 90 | 85 | .6 | 3.3 | 658 | 370 | 88 | 898 | 7.8 | 320 |
| Aug. 21-31..... | | 19 | .02 | 99 | 34 | 57 | 1.9 | 358 | 98 | 80 | .6 | 3.9 | 676 | 386 | 98 | 908 | 7.9 | 340 |
| Sept. 1-4, 7-10..... | | 20 | .02 | 94 | 31 | 61 | 1.8 | 356 | 84 | 82 | .6 | 2.9 | 662 | 362 | 70 | 889 | 8.0 | 320 |
| Sept. 11-20..... | | 19 | .00 | 90 | 31 | 60 | 1.9 | 360 | 65 | 83 | .6 | 3.1 | 684 | 352 | 57 | 864 | 7.8 | 340 |
| Sept. 21-30..... | | 21 | .05 | 98 | 32 | 68 | 2.3 | 376 | 82 | 92 | .6 | 3.7 | 686 | 376 | 68 | 940 | 7.9 | 340 |
| Average ..... | | 16 | 0.01 | 67 | 19 | 47 | 1.8 | 243 | 57 | 63 | 0.3 | 2.1 | 451 | 246 | 48 | 656 | 7.8 | 134 |

MISCELLANEOUS ANALYSES OF STREAMS IN LAKE OKEECHOBEE AND THE EVERGLADES IN FLORIDA

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (sum) a | Hardness as $CaCO_3$: Calcium, magnesium | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **WEST PALM BEACH CANAL AT CANAL POINT** | | | | | | | | | | | | | | | | | | |
| Dec. 14, 1950 | 272 | | | 47 | 11 | 22 | | 146 | 37 | 36 | | 1.6 | 227 | 162 | 43 | 416 | 8.0 | -- |
| Mar. 28, 1951 | 327 | | | 44 | 9.2 | 21 | | 140 | 32 | 32 | | 2.0 | 209 | 148 | 33 | 387 | 8.0 | -- |
| June 5 | 438 | | | 44 | 7.3 | 31 | | 140 | 40 | 35 | | 1.4 | 229 | 140 | 25 | 386 | 7.7 | 25 |
| Sept. 4 | 328 | | | 116 | 37 | 212 | | 419 | 169 | 270 | | 1.6 | 1,010 | 442 | 98 | 1,660 | 7.8 | 360 |
| **BIG MOUND CANAL AT WEST PALM BEACH CANAL NEAR CANAL POINT** | | | | | | | | | | | | | | | | | | |
| Dec. 14, 1950 | | | | 32 | 7.5 | 116 | | 120 | 82 | 126 | | 1.1 | 424 | 111 | 12 | 674 | 7.1 | -- |
| Mar. 28, 1951 | | | | 82 | 25 | 251 | | 342 | 100 | 332 | | 1.1 | 959 | 307 | 27 | 1,750 | 7.9 | -- |
| June 5 | | | | 45 | 9.7 | 30 | | 141 | 48 | 36 | | 1.2 | 239 | 152 | 37 | 390 | 7.8 | 25 |
| Sept. 4 | | | | 54 | 5.2 | 39 | | 189 | 22 | 44 | | 1.7 | 259 | 156 | 1 | 411 | 7.7 | 550 |
| **LATERAL FROM NORTH AT WEST PALM BEACH CANAL, ABOVE CONTROL, LOXAHATCHEE** | | | | | | | | | | | | | | | | | | |
| Dec. 14, 1950 | | | | 84 | 9.4 | 22 | | 267 | 17 | 42 | | 0.5 | 306 | 248 | 29 | 560 | 7.6 | -- |
| Mar. 28, 1951 | | | | 52 | 11 | 55 | | 174 | 40 | 77 | | 2.2 | 323 | 174 | 31 | 597 | 7.8 | -- |
| June 5 | | | | 75 | 7.3 | 28 | | 219 | 34 | 44 | | .8 | 297 | 217 | 38 | 516 | 7.2 | 40 |
| Sept. 4 | | | | 62 | 9.8 | 23 | | 216 | 27 | 28 | | .5 | 256 | 195 | 18 | 442 | 7.5 | 110 |
| **RANGELINE CANAL AT WEST PALM BEACH CANAL ABOVE CONTROL NEAR WEST PALM BEACH** | | | | | | | | | | | | | | | | | | |
| Dec. 14, 1950 | | | | 54 | 2.9 | 12 | | 160 | 11 | 22 | | 0.6 | 182 | 147 | 16 | 336 | 7.6 | -- |
| Mar. 28, 1951 | | | | 56 | 9.8 | 60 | | 194 | 40 | 77 | | 1.4 | 339 | 180 | 21 | 614 | 8.0 | -- |
| June 5 | | | | 92 | 5.8 | 19 | | 263 | 20 | 41 | | .8 | 309 | 254 | 38 | 556 | 7.5 | 35 |
| Sept. 4 | | | | 70 | 2.8 | 16 | | 211 | 12 | 25 | | .5 | 229 | 186 | 13 | 408 | 7.7 | 100 |
| **WEST PALM BEACH CANAL ABOVE CONTROL AT WEST PALM BEACH** | | | | | | | | | | | | | | | | | | |
| Dec. 14, 1950 | 572 | | | 37 | 24 | 74 | | 192 | 30 | 108 | | 2.4 | 378 | 191 | 34 | 712 | 7.5 | -- |
| Mar. 28, 1951 | 284 | | | 56 | 11 | 64 | | 185 | 40 | 92 | | 1.8 | 356 | 186 | 34 | 722 | 7.5 | -- |
| June 5 | 596 | | | 62 | 11 | 65 | | 197 | 54 | 87 | | 1.8 | 378 | 200 | 38 | 648 | 7.4 | 30 |
| Sept. 4 | 1,380 | | | 58 | 11 | 62 | | 195 | 32 | 92 | | .7 | 352 | 190 | 30 | 631 | 7.7 | 320 |
| **LAKE OKEECHOBEE AT HURRICANE GATE STRUCTURE 4, NEAR BELLE GLADE** | | | | | | | | | | | | | | | | | | |
| Dec. 14, 1950 | | | | 50 | 12 | 30 | | 164 | 43 | 41 | | 1.2 | 258 | 174 | 40 | 479 | 7.9 | |
| Mar. 28, 1951 | | | | 47 | 8.8 | 29 | | 155 | 36 | 37 | | 1.2 | 235 | 154 | 26 | 428 | 8.0 | |

a Values reported are sum of determined constituents.

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 1950 to September 1951--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 (sum) a | Hardness as $CaCO_3$ | | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| **LAKE OKEECHOBEE AT HURRICAN GATE STRUCTURE 4, NEAR BELLE GLADE--Continued** | | | | | | | | | | | | | | | | | | |
| June 5, 1951 | | | | 42 | 13 | 26 | | 135 | 41 | 42 | | 2.3 | 233 | 158 | 48 | 400 | 7.8 | 25 |
| Sept. 4 | | | | 74 | 36 | 65 | | 244 | 122 | 103 | | 1.6 | 522 | 332 | 132 | 903 | 7.7 | 160 |
| **HILLSBORO CANAL AT BELLE GLADE** | | | | | | | | | | | | | | | | | | |
| Dec. 14, 1950 | | | | 47 | 12 | 27 | | 158 | 42 | 37 | | 1.1 | 244 | 167 | 37 | 429 | 8.1 | |
| Mar. 28, 1951 | | | | 47 | 10 | 32 | | 161 | 39 | 38 | | 1.4 | 245 | 158 | 26 | 443 | 7.9 | |
| June 5 | | | | 38 | 11 | 27 | | 131 | 34 | 39 | | 1.1 | 150 | 140 | 33 | 386 | 7.5 | 25 |
| Sept. 4 | | | | 117 | 54 | 100 | | 486 | 134 | 135 | | 3.4 | 782 | 514 | 116 | 1,260 | 7.7 | |
| **CROSS CANAL AT BEND NEAR BELLE GLADE** | | | | | | | | | | | | | | | | | | |
| Dec. 14, 1950 | | | | 69 | 31 | 179 | | 384 | 37 | 236 | | 3.2 | 744 | 300 | 0 | 1,350 | 7.6 | -- |
| Mar. 28, 1951 | | | | 58 | 14 | 42 | | 208 | 40 | 57 | | 1.9 | 315 | 203 | 33 | 571 | 7.5 | -- |
| June 5 | | | | 58 | 16 | 34 | | 235 | 30 | 40 | | 4.6 | 340 | 210 | 18 | 571 | 7.3 | 90 |
| Sept. 4 | | | | 93 | 51 | 98 | | 474 | 63 | 140 | | 3.5 | 682 | 442 | 53 | 1,190 | 7.6 | 400 |
| **BOLLES CANAL AT HILLSBORO CANAL, NEAR BELLE GLADE** | | | | | | | | | | | | | | | | | | |
| Dec. 14, 1950 | | | | 73 | 23 | 94 | | 310 | 49 | 123 | | 1.9 | 516 | 277 | 23 | 964 | 7.9 | -- |
| Mar. 28, 1951 | | | | 50 | 7.8 | 32 | | 165 | 36 | 37 | | 1.4 | 245 | 157 | 22 | 449 | 7.5 | -- |
| June 5 | | | | 40 | 13 | 25 | | 141 | 34 | 40 | | 1.6 | 223 | 153 | 38 | 410 | 7.4 | 27 |
| Sept. 4 | | | | 96 | 57 | 89 | | 476 | 67 | 141 | | 12 | 691 | 474 | 84 | 1,180 | 7.7 | 480 |
| **INDIAN RUN AT HILLSBORO CANAL NEAR DEERFIELD BEACH** | | | | | | | | | | | | | | | | | | |
| Dec. 14, 1950 | | | | 11 | 1.8 | 13 | | 26 | 2.0 | 28 | | 0.8 | 70 | 35 | 14 | 150 | 6.4 | -- |
| Mar. 28, 1951 | | | | 33 | 4.9 | 88 | | 86 | 9.0 | 151 | | 1.5 | 329 | 102 | 32 | 665 | 7.1 | -- |
| June 6 | | | | 51 | 9.7 | 141 | | 143 | 8.0 | 245 | | 3.0 | 528 | 167 | 50 | 1,030 | 6.6 | 100 |
| Sept. 5 | | | | 18 | 1.9 | 32 | | 54 | 3.0 | 53 | | .2 | 135 | 53 | 8 | 266 | 6.6 | 320 |
| **RANGELINE CANAL AT HILLSBORO CANAL, NEAR DEERFIELD BEACH, ABOVE CONTROL** | | | | | | | | | | | | | | | | | | |
| Dec. 14, 1950 | | | | 67 | 20 | 81 | | 278 | 28 | 117 | | 2.4 | 453 | 249 | 22 | 817 | 7.5 | -- |
| Mar. 28, 1951 | | | | 59 | 14 | 28 | | 214 | 36 | 74 | | 1.7 | 318 | 204 | 28 | 633 | 7.6 | -- |
| June 6 | | | | 69 | 13 | 55 | | 237 | 40 | 78 | | .5 | 372 | 226 | 32 | 652 | 7.2 | 35 |
| Sept. 5 | | | | 50 | 5.8 | 46 | | 156 | 18 | 72 | | .6 | 269 | 149 | 21 | 482 | 7.1 | 560 |

a Values reported are sum of determined constituents.

HILLSBORO CANAL NEAR DEERFIELD BEACH, ABOVE CONTROL

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dec. 14, 1950..... | 260 | | | 68 | 20 | 104 | b336 | 29 | 120 | | 3.2 | 511 | 252 | 0 | 895 | 8.6 | -- |
| Mar. 28, 1951..... | 50 | | | 69 | 9.3 | 52 | 240 | 26 | 70 | | 1.7 | 346 | 210 | 14 | 636 | 7.6 | -- |
| June 5..... | 130 | | | 59 | 16 | 42 | 207 | 42 | 62 | | 5.4 | 327 | 213 | 44 | 585 | 7.4 | 40 |
| Sept. 4..... | 915 | | | 42 | 9.2 | 32 | 152 | 18 | 47 | | 3.1 | 226 | 143 | 18 | 410 | 7.1 | 480 |

NORTH NEW RIVER CANAL AT SOUTH BAY

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dec. 14, 1950..... | 183 | | | 50 | 15 | 38 | 175 | 49 | 52 | | 1.6 | 292 | 186 | 43 | 517 | 7.8 | -- |
| Mar. 28, 1951..... | 263 | | | 46 | 10 | 27 | 154 | 37 | 36 | | 1.3 | 233 | 157 | 31 | 427 | 7.9 | -- |
| June 5..... | 375 | | | 39 | 12 | 23 | 127 | 35 | 39 | | 1.0 | 212 | 147 | 43 | 388 | 7.5 | 25 |
| Sept. 4..... | 419 | | | 111 | 60 | 97 | 460 | 169 | 128 | | 1.3 | 792 | 524 | 146 | 1,310 | 7.7 | 320 |

NORTH NEW RIVER CANAL AT BEND 4 MILES SOUTH OF OKEELANTA

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dec. 14, 1950..... | | | | 76 | 25 | 66 | 267 | 81 | 94 | | 1.5 | 474 | 292 | 74 | 875 | 7.4 | -- |
| Mar. 28, 1951..... | | | | 48 | 1.6 | 45 | 163 | 41 | 42 | | 1.6 | 262 | 139 | 5 | 456 | 7.9 | -- |
| June 5..... | | | | 40 | 9.7 | 32 | 131 | 40 | 42 | | 1.2 | 229 | 140 | 32 | 405 | 7.3 | 25 |
| Sept. 4..... | | | | 119 | 60 | 94 | 490 | 131 | 148 | | 1.0 | 794 | 544 | 142 | 1,370 | 7.8 | 320 |

NORTH NEW RIVER CANAL LATERAL FROM WEST, 10.0 MILES SOUTH OF OKEELANTA

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dec. 14, 1950..... | | | | 139 | 49 | 105 | 577 | 178 | 84 | | 0.2 | 838 | 548 | 76 | 1,220 | 7.3 | |
| Mar. 28, 1951..... | | | | 66 | 15 | 47 | 308 | 17 | 40 | | 1.2 | 337 | 225 | 0 | 607 | 7.0 | |
| June 5..... | | | | 69 | 6.9 | 77 | 318 | 29 | 54 | | .5 | 392 | 200 | 0 | 655 | 7.4 | |
| Sept. 4..... | | | | 58 | 28 | 7.1 | 254 | 23 | 30 | | .6 | 272 | 260 | 52 | 495 | 7.4 | |

DIKE C BORROW PIT AT NORTH NEW RIVER CANAL AT BROWARD-PALM BEACH COUNTY LINE

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dec. 14, 1950..... | | | | 95 | 22 | 17 | 340 | 36 | 32 | | 0.1 | 369 | 328 | 46 | 678 | 7.4 | |
| Mar. 27, 1951..... | | | | 51 | 12 | 34 | 190 | 36 | 41 | | 1.2 | 268 | 178 | 22 | 469 | 7.7 | |
| June 5..... | | | | 47 | 9.3 | 38 | 165 | 37 | 45 | | 1.6 | 259 | 156 | 20 | 458 | 7.4 | |
| Sept. 4..... | | | | 48 | 17 | 9.4 | 194 | 12 | 27 | | .6 | 209 | 190 | 31 | 405 | 7.5 | |

a Values reported are sum of determined constituents.
b Includes equivalent of 16 parts per million of carbonate ($CO_3$).

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 1950 to September 1951--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 (sum) a | Hardness as $CaCO_3$ | | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| **DIKE E BORROW PIT AT NORTH NEW RIVER CANAL NEAR FORT LAUDERDALE** | | | | | | | | | | | | | | | | | | |
| Dec. 14, 1950 | | | | 26 | 4.5 | 42 | | 80 | 5.0 | 26 | | 1.4 | 144 | 83 | 0 | 228 | 6.8 | |
| Mar. 27, 1951 | | | | 56 | 11 | 33 | | 215 | 24 | 38 | | .9 | 260 | 184 | 8 | 483 | 7.[illegible] | |
| June 5 | | | | 50 | 9.8 | 37 | | 189 | 30 | 42 | | .4 | 262 | 165 | 10 | 460 | 7.8 | |
| Sept. 4 | | | | 35 | 22 | 4.7 | | 140 | 51 | 14 | | .5 | 196 | 178 | 63 | 354 | 7.4 | 240 |
| **HOLLOWAY LATERAL AT NORTH NEW RIVER CANAL NEAR FORT LAUDERDALE** | | | | | | | | | | | | | | | | | | |
| Dec. 13, 1950 | | | | 98 | 2.9 | 15 | | 284 | 11 | 30 | | 2.4 | 299 | 256 | 25 | 541 | 7.4 | |
| Mar. 28, 1951 | | | | 51 | 11 | 35 | | 174 | 42 | 44 | | 1.8 | 271 | 174 | 31 | 497 | 7.9 | |
| June 6 | | | | 44 | 13 | 29 | | 143 | 38 | 49 | | 1.0 | 244 | 163 | 46 | 442 | 7.8 | |
| Sept. 5 | | | | 77 | 28 | 39 | | 280 | 65 | 66 | | 1.5 | 414 | 307 | 78 | 678 | 7.8 | 200 |
| **SNAKE CREEK CANAL AT SOUTH NEW RIVER CANAL, NEAR DAVIE** | | | | | | | | | | | | | | | | | | |
| Dec. 13, 1950 | | | | 98 | 6.2 | 12 | | c 260 | 52 | 20 | | 1.0 | 317 | 270 | 56 | 539 | 8.5 | |
| Mar. 27, 1951 | | | | 61 | 7.9 | 33 | | 210 | 34 | 34 | | 2.1 | 725 | 184 | 12 | 494 | 7.4 | |
| June 6 | | | | 49 | 9.3 | 40 | | 195 | 23 | 45 | | .3 | 263 | 160 | 1 | 462 | 7.6 | |
| Sept. 5 | | | | 80 | 5.3 | 6.6 | | 208 | 44 | 13 | | 1.4 | 252 | 221 | 51 | 438 | 7.5 | 160 |
| **SOUTH NEW RIVER CANAL AT DAVIE, ABOVE CONTROL** | | | | | | | | | | | | | | | | | | |
| Dec. 13, 1950 | | | | 93 | 11 | 14 | | 287 | 28 | 30 | | 1.7 | 319 | 277 | 42 | 616 | 7.4 | |
| Mar. 27, 1951 | | | | 81 | 8.9 | 21 | | 264 | 27 | 27 | | 1.7 | 297 | 238 | 22 | 560 | 7.9 | |
| June 6 | | | | 52 | 10 | 37 | | 191 | 30 | 44 | | 1.3 | 268 | 171 | 14 | 487 | 7.6 | |
| Sept. 5 | | | | 94 | 6.8 | 16 | | 286 | 24 | 25 | | 2.7 | 310 | 262 | 28 | 544 | 7.4 | 120 |
| **MIAMI CANAL AT LAKE HARBOR** | | | | | | | | | | | | | | | | | | |
| Dec. 14, 1950 | | | | 51 | 15 | 29 | | 171 | 47 | 44 | | 1.8 | 272 | 189 | 49 | 489 | 7.9 | |
| Mar. 28, 1951 | | | | 46 | 9.3 | 28 | | 153 | 35 | 36 | | 1.5 | 231 | 153 | 28 | 417 | 7.9 | |
| June 5 | | | | 34 | 13 | 27 | | 127 | 34 | 41 | | 1.0 | 212 | 138 | 34 | 400 | 7.6 | |
| Sept. 4 | | | | 99 | 18 | 32 | | 284 | 70 | 60 | | 1.7 | 421 | 321 | 88 | 733 | 7.0 | 560 |

a Values reported are sum of determined constituents.
c Includes equivalent of 12 parts per million of carbonate ($CO_3$).

MIAMI CANAL AT JUNCTION WITH SOUTH NEW RIVER CANAL

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dec. 14, 1950..... | | | | 81 | 7.8 | 4.0 | 249 | 15 | 16 | | 0.7 | 246 | 234 | 30 | 469 | 7.4 | |
| Mar. 27, 1951..... | | | | 94 | 7.4 | 22 | 316 | 16 | 26 | | 1.9 | 322 | 265 | 6 | 564 | 7.8 | |
| June 6..... | | | | 94 | 9.8 | 5.1 | 298 | 5.0 | 25 | | 1.6 | 288 | 275 | 31 | 534 | 7.6 | |
| Sept. 5..... | | | | 80 | 6.8 | 18 | 274 | 10 | 22 | | .1 | 272 | 228 | 3 | 488 | 7.5 | 120 |

PENNSUCO LATERAL AT PENNSUCO

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dec. 13, 1950..... | | | | 93 | 7.8 | 5.4 | 304 | 7.0 | 15 | | 1.0 | 278 | 264 | 15 | 509 | 7.9 | |
| Mar. 27, 1951..... | | | | 99 | 6.4 | 14 | 336 | 5.5 | 16 | | .9 | 207 | 274 | 0 | 598 | 7.6 | |
| June 6..... | | | | 86 | 7.4 | 7.8 | 271 | 7.5 | 21 | | 2.9 | 266 | 245 | 23 | 480 | 7.6 | |
| Sept. 6..... | | | | 105 | 6.3 | 12 | 356 | 2.5 | 15 | | .1 | 316 | 288 | 0 | 573 | 8.0 | 160 |

MIAMI CANAL AT WATER PLANT, HIALEAH

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dec. 13, 1950..... | 863 | | | 89 | 6.3 | 6.6 | 279 | 10 | 16 | | 0.8 | 266 | 248 | 19 | 490 | 7.4 | |
| Mar. 27, 1951..... | 35 | | | 85 | 7.4 | 12 | 286 | 7.5 | 18 | | 1.4 | 272 | 242 | 8 | 496 | 7.8 | |
| June 6..... | 0 | | | 84 | 11 | 9.4 | 291 | 7.0 | 20 | | 1.1 | 276 | 254 | 16 | 497 | 8.1 | |
| Sept. 6..... | 542 | | | 92 | 6.3 | 14 | 298 | 13 | 19 | | 1.3 | 293 | 256 | 12 | 505 | 7.4 | 120 |

TAMIAMI CANAL NEAR CORAL GABLES (FOOTBRIDGE)

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dec. 13, 1950..... | | | | 61 | 20 | 5.8 | 256 | 16 | 14 | | 1.0 | 244 | 234 | 25 | 449 | 7.4 | |
| Mar. 29, 1951..... | | | | 85 | 5.0 | 12 | 276 | 6.5 | 17 | | 1.3 | 248 | 232 | 6 | 476 | 7.9 | |
| June 7..... | | | | 79 | 7.4 | 13 | 267 | 9.5 | 18 | | 1.0 | 259 | 228 | 8 | 462 | 7.9 | |
| Sept. 6..... | | | | 86 | 6.7 | 9.9 | 279 | 10 | 17 | | .8 | 267 | 242 | 14 | 468 | 7.7 | 50 |

TAMIAMI CANAL AT BRIDGE 45, 27 MILES WEST OF MIAMI

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dec. 13, 1950..... | | | | 47 | 12 | 5.3 | 183 | 4.0 | 17 | | 0.2 | 176 | 167 | 17 | 347 | 7.3 | |
| Mar. 29, 1951..... | | | | 96 | 3.0 | 20 | 322 | 5.5 | 17 | | 1.3 | 304 | 252 | 0 | 575 | 7.4 | |
| June 7..... | | | | 90 | 16 | 23 | 368 | 6.5 | 22 | | 1.4 | 340 | 290 | 0 | 608 | 7.8 | |
| Sept. 6..... | | | | 63 | 6.6 | 8.5 | 203 | 45 | 22 | | .5 | 205 | 184 | 18 | 373 | 7.7 | |

a Values reported are sum of determined constituents.

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 1950 to September 1951--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 (sum) a | Hardness as $CaCO_3$ | | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| **TAMIAMI CANAL AT BRIDGE 115, 46 MILES WEST OF MIAMI** | | | | | | | | | | | | | | | | | | |
| Dec. 13, 1950..... | | | | 65 | 5.4 | 7.8 | | 215 | 5.0 | 14 | | 0.2 | 203 | 184 | 8 | 279 | 7.4 | |
| Mar. 29, 1951..... | | | | 64 | 2.0 | 18 | | 200 | 6.5 | 25 | | 2.1 | 216 | 168 | 4 | 401 | 7.5 | |
| June 7..... | | | | 68 | 4.0 | 25 | | 249 | 6.5 | 21 | | .3 | 247 | 186 | 0 | 442 | 7.6 | |
| Sept. 6..... | | | | 50 | .2 | 6.4 | | 152 | 2.5 | 9.0 | | .7 | 144 | 126 | 2 | 256 | 7.5 | 60 |
| **TAMIAMI CANAL AT BRIDGE 96, MONROE** | | | | | | | | | | | | | | | | | | |
| Dec. 14, 1950..... | | | | 46 | 15 | 5.2 | | 201 | 3.0 | 14 | | 0.1 | 182 | 176 | 12 | 352 | 7.5 | |
| Mar. 29, 1951..... | | | | 49 | 2.5 | 8.3 | | 161 | 3.5 | 10 | | 1.1 | 153 | 132 | 1 | 290 | 7.4 | |
| June 7..... | | | | 42 | 3.5 | 10 | | 141 | 4.0 | 14 | | 2.4 | 145 | 119 | 4 | 260 | 7.6 | |
| Sept. 6..... | | | | 50 | 1.7 | 4.1 | | 153 | 2.5 | 9.0 | | .4 | 143 | 132 | 6 | 254 | 7.8 | 60 |

a Values reported are sum of determined constituents.

## WITHLACOOCHEE RIVER NEAR HOLDER, FLA.

LOCATION.--At gaging station at bridge on State Highway 200, 4½ miles northeast of Holder, Citrus County.
DRAINAGE AREA.--1,590 square miles.
RECORDS AVAILABLE.--Chemical analyses: January 1950 to December 1951.
Water temperatures: January 1950 to December 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 209 ppm Apr. 11-20; minimum, 128 ppm Oct. 11-20.
Hardness: Maximum, 151 ppm Aug. 1-10; minimum, 80 ppm Oct. 11-20.
Water temperatures: Maximum, 89°F July 16; minimum, 56°F Jan. 9-12.
EXTREMES, January 1950 to December 1951.--Dissolved solids: Maximum, 275 ppm July 11-20, 1950; minimum, 119 ppm Sept. 21-30, 1950.
Hardness: Maximum, 191 ppm July 11-20, 1950; minimum, 63 ppm Sept. 21-30, 1950.
Water temperatures: Maximum, 92°F July 17, 1950; minimum, 56°F Jan. 9-12, 1951.
REMARKS.--Records of specific conductance of daily samples available in district office at Ocala, Fla. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1204. Values reported for dissolved solids are residue on evaporation at 180°C.

Chemical analyses, in parts per million, October 1950 to December 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 1-10, 1950 | | 78 | 6.0 | 0.02 | 26 | 2.5 | 3.7 | 0.8 | 77 | 8.1 | 4.0 | 0.1 | 4.4 | 126 | 75 | 12 | 164 | 7.1 | 150 |
| Oct. 11-20 | | 75 | 6.0 | .01 | 32 | 3.0 | 4.0 | .6 | 96 | 8.7 | 6.0 | .2 | 1.3 | 141 | 92 | 14 | 197 | 7.2 | 150 |
| Oct. 21-31 | | 78 | 6.0 | .01 | 33 | 3.4 | 4.5 | .6 | 106 | 9.6 | 6.0 | .2 | 1.0 | 153 | 96 | 10 | 236 | 7.3 | 150 |
| Nov. 1-10 | | 70 | 8.0 | .01 | 38 | 3.2 | 5.1 | .4 | 112 | 10 | 7.0 | .2 | 1.9 | 161 | 108 | 15 | 228 | 7.4 | 150 |
| Nov. 11-20 | | 70 | 6.0 | .02 | 40 | 3.9 | 5.3 | .3 | 117 | 12 | 8.0 | .2 | 3.4 | 166 | 116 | 20 | 236 | 7.6 | 150 |
| Nov. 21-30 | | 59 | 6.0 | .01 | 43 | 3.9 | 5.0 | .3 | 126 | 15 | 8.0 | .2 | 4.4 | 177 | 123 | 20 | 253 | 7.5 | 120 |
| Dec. 1-10 | | 60 | 6.3 | .10 | 50 | 4.0 | 5.0 | .4 | 133 | 24 | 9.0 | .2 | .7 | 184 | 141 | 32 | 287 | 7.7 | 70 |
| Dec. 11-20 | | 57 | 6.2 | .10 | 52 | 4.2 | 5.2 | .4 | 141 | 28 | 10 | .2 | .6 | 191 | 147 | 31 | 308 | 7.5 | 50 |
| Dec. 21-31 | | 60 | 8.5 | .09 | 52 | 4.2 | 5.7 | .5 | 140 | 27 | 9.0 | .2 | .4 | 190 | 147 | 32 | 306 | 7.6 | 50 |
| Jan. 1-10, 1951 | | 62 | 3.8 | 0.07 | 50 | 4.2 | 5.3 | 0.4 | 128 | 30 | 10 | 0.2 | 1.1 | 182 | 142 | 37 | 291 | 7.5 | 60 |
| Jan. 11-20 | | 60 | 4.2 | .10 | 45 | 3.2 | 5.7 | .5 | 122 | 24 | 10 | .2 | 1.0 | 170 | 125 | 26 | 270 | 7.6 | 70 |
| Jan. 21-31 | | 64 | 3.8 | .10 | 49 | 4.0 | 5.4 | .3 | 130 | 21 | 11 | .1 | 1.0 | 177 | 139 | 32 | 289 | 7.6 | 50 |
| Feb. 1-10 | | 59 | 4.2 | .10 | 51 | 4.2 | 5.0 | .4 | 132 | 29 | 10 | .1 | 1.0 | 185 | 144 | 36 | 301 | 7.7 | 50 |
| Feb. 11-20 | | 62 | 3.7 | .11 | 50 | 4.0 | 5.3 | .3 | 135 | 28 | 10 | .1 | .7 | 204 | 142 | 31 | 296 | 7.7 | 40 |
| Feb. 21-28 | | 68 | 4.8 | .12 | 48 | 3.8 | 5.6 | .3 | 129 | 22 | 11 | .1 | .7 | 173 | 135 | 30 | 276 | 7.7 | 60 |
| Mar. 1-10 | | 72 | 6.4 | .00 | 46 | 3.3 | 5.7 | .3 | 128 | 19 | 11 | .2 | 1.0 | 186 | 128 | 23 | 277 | 7.3 | 70 |
| Mar. 11-20 | | 69 | 7.3 | .00 | 50 | 3.2 | 5.7 | .3 | 136 | 26 | 10 | .2 | .8 | 195 | 138 | 26 | 294 | 7.5 | 60 |
| Mar. 21-31 | | 70 | 7.3 | .00 | 53 | 3.6 | 5.8 | .2 | 143 | 27 | 9.8 | .2 | .7 | 201 | 147 | 30 | 307 | 7.5 | 50 |
| Apr. 1-10 | | 67 | 8.2 | .01 | 51 | 3.8 | 5.3 | .2 | 144 | 24 | 9.8 | .2 | .7 | 197 | 143 | 25 | 304 | 7.7 | 40 |
| Apr. 11-20 | | 73 | 7.8 | .00 | 54 | 3.8 | 5.5 | .2 | 145 | 28 | 10 | .2 | .6 | 209 | 150 | 32 | 313 | 7.7 | 40 |
| Apr. 21-30 | | 80 | 7.8 | .01 | 51 | 3.6 | 5.1 | .1 | 137 | 27 | 9.0 | .2 | .6 | 197 | 142 | 30 | 297 | 7.7 | 40 |

WITHLACOOCHEE RIVER BASIN--Continued

WITHLACOOCHEE RIVER NEAR HOLDER, FLA.--Continued

Chemical analyses, in parts per million, October 1950 to December 1951--Continued

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| May 1-10, 1951 | | 81 | 8.1 | 0.00 | 44 | 4.4 | 5.9 | 0.2 | 128 | 15 | 12 | 0.0 | 0.7 | 166 | 128 | 23 | 261 | 7.6 | 60 |
| May 11-20 | | 79 | 8.7 | .00 | 34 | 4.6 | 5.7 | .4 | 102 | 11 | 13 | .0 | .6 | 148 | 93 | 9 | 216 | 7.5 | 90 |
| May 21-31 | | 81 | 10 | .00 | 40 | 3.2 | 5.4 | .2 | 117 | 14 | 11 | .0 | .5 | 164 | 113 | 17 | 236 | 7.4 | 60 |
| June 1-10 | | 84 | 8.1 | .00 | 44 | 3.9 | 5.4 | .2 | 129 | 18 | 9.2 | .0 | .6 | 169 | 126 | 20 | 252 | 7.5 | 28 |
| June 11-20 | | 84 | 8.5 | .00 | 46 | 4.0 | 5.0 | .2 | 136 | 19 | 8.5 | .1 | .6 | 169 | 131 | 20 | 275 | 7.7 | 16 |
| June 21-30 | | 87 | 9.6 | .00 | 47 | 4.0 | 5.0 | .5 | 138 | 22 | 9.2 | .1 | .5 | 173 | 134 | 21 | 284 | 7.7 | 18 |
| July 1-10 | | 86 | 11 | .00 | 48 | 4.2 | 5.0 | .5 | 139 | 22 | 8.5 | .0 | .5 | 176 | 137 | 23 | 287 | 7.8 | 13 |
| July 11-20 | | 86 | 12 | .00 | 47 | 4.4 | 5.0 | .6 | 137 | 22 | 8.9 | .0 | .5 | 176 | 135 | 23 | 283 | 7.8 | 10 |
| July 21-31 | | 86 | 11 | .00 | 50 | 4.2 | 4.8 | .6 | 139 | 24 | 9.4 | .0 | .5 | 184 | 142 | 28 | 293 | 7.7 | 12 |
| Aug. 1-10 | | 84 | 10 | .00 | 53 | 4.6 | 4.4 | .6 | 129 | 40 | 8.5 | .0 | .8 | 202 | 151 | 45 | 310 | 7.6 | 27 |
| Aug. 11-20 | | 87 | 10 | .00 | 48 | 4.1 | 4.8 | .6 | 135 | 22 | 10 | .1 | .4 | 185 | 137 | 26 | 279 | 7.7 | 30 |
| Aug. 21-31 | | 86 | 8.5 | .00 | 41 | 3.2 | 4.6 | .6 | 108 | 20 | 11 | .1 | .7 | 173 | 115 | 27 | 239 | 7.5 | 110 |
| Sept. 1-10 | | 85 | 9.3 | .20 | 38 | 3.2 | 4.8 | .3 | 100 | 25 | 10 | .1 | .8 | 156 | 108 | 26 | 220 | 7.4 | 120 |
| Sept. 11-20 | | 84 | 8.7 | .40 | 39 | 5.0 | 4.6 | .2 | 99 | 30 | 10 | .1 | .8 | 170 | 118 | 37 | 239 | 7.2 | 110 |
| Sept. 21-30 | | 84 | 9.9 | .00 | 45 | 4.8 | 4.6 | .2 | 105 | 40 | 10 | .1 | .6 | 189 | 132 | 46 | 264 | 7.4 | 100 |
| Oct. 1-10 | | 80 | 8.6 | .05 | 38 | 3.0 | 4.2 | .2 | 92 | 28 | 10 | .1 | .6 | 165 | 107 | 32 | 224 | 7.4 | 120 |
| Oct. 11-20 | | 78 | 5.9 | .00 | 29 | 1.9 | 4.2 | .2 | 71 | 15 | 9.5 | .1 | .5 | 128 | 80 | 22 | 162 | 7.3 | 190 |
| Oct. 21-31 | | 78 | 6.9 | .10 | 29 | 3.8 | 4.3 | .2 | 77 | 17 | 9.8 | .1 | .4 | 137 | 88 | 25 | 173 | 7.3 | 200 |
| Nov. 1-10 | | 69 | 7.9 | .02 | 37 | 3.4 | 4.4 | .2 | 99 | 20 | 8.5 | .1 | .6 | 166 | 106 | 25 | 222 | 7.3 | 140 |
| Nov. 11-20 | | 66 | 7.9 | .00 | 42 | 3.8 | 4.4 | .1 | 108 | 26 | 9.0 | .2 | 1.2 | 181 | 120 | 32 | 251 | 7.3 | 100 |
| Nov. 21-30 | | 63 | 6.4 | .01 | 39 | 3.6 | 4.4 | .4 | 102 | 21 | 12 | .2 | .5 | 166 | 112 | 28 | 236 | 7.4 | 90 |
| Dec. 1-10 | | 67 | 5.4 | .00 | 28 | 3.4 | 4.7 | .0 | 75 | 14 | 14 | .2 | .2 | 146 | 84 | 22 | 174 | 7.2 | 100 |
| Dec. 11-20 | | 61 | 5.7 | .00 | 31 | 3.6 | 5.0 | .0 | 86 | 15 | 14 | .2 | .5 | 142 | 92 | 23 | 191 | 7.6 | 160 |
| Dec. 21-31 | | 64 | 6.6 | .00 | 37 | 4.3 | 5.1 | .0 | 101 | 18 | 14 | .3 | .5 | 170 | 110 | 27 | 225 | 7.4 | 160 |
| Average [a] | | 75 | 7.6 | 0.04 | 44 | 3.8 | 5.0 | 0.3 | 118 | 23 | 10 | 0.1 | 0.7 | 174 | 124 | 27 | 259 | 7.5 | 75 |

a Average for calandar year January to December 1951.

WITHLACOOCHEE RIVER BASIN--Continued

WITHLACOOCHEE RIVER NEAR HOLDER, FLA.--Continued

Temperature (°F) of water, October 1950 to December 1951

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

Temperature (°F) of water, October 1950 to December 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 78 | 77 | 62 | | | | | | | | | |
| 2 | 78 | 79 | 64 | | | | | | | | | |
| 3 | 80 | 72 | 64 | | | | | | | | | |
| 4 | 80 | 65 | 65 | | | | | | | | | |
| 5 | 82 | 66 | 66 | | | | | | | | | |
| 6 | 82 | 68 | 68 | | | | | | | | | |
| 7 | 84 | 68 | 70 | | | | | | | | | |
| 8 | 83 | 63 | 70 | | | | | | | | | |
| 9 | 80 | -- | 71 | | | | | | | | | |
| 10 | 78 | 63 | 67 | | | | | | | | | |
| 11 | 78 | 66 | 67 | | | | | | | | | |
| 12 | 82 | 68 | 67 | | | | | | | | | |
| 13 | 83 | 68 | 65 | | | | | | | | | |
| 14 | 84 | 70 | 65 | | | | | | | | | |
| 15 | 76 | 72 | 62 | | | | | | | | | |
| 16 | 77 | 72 | 62 | | | | | | | | | |
| 17 | 76 | 66 | 58 | | | | | | | | | |
| 18 | 77 | 60 | 58 | | | | | | | | | |
| 19 | 75 | 63 | 58 | | | | | | | | | |
| 20 | 75 | 56 | 55 | | | | | | | | | |
| 21 | 77 | 57 | 60 | | | | | | | | | |
| 22 | 77 | 60 | 66 | | | | | | | | | |
| 23 | 77 | 62 | 65 | | | | | | | | | |
| 24 | 77 | 63 | 65 | | | | | | | | | |
| 25 | 76 | 68 | 64 | | | | | | | | | |
| 26 | 78 | 66 | 65 | | | | | | | | | |
| 27 | -- | 66 | 64 | | | | | | | | | |
| 28 | 78 | 63 | 62 | | | | | | | | | |
| 29 | 80 | 63 | 64 | | | | | | | | | |
| 30 | 80 | 62 | 65 | | | | | | | | | |
| 31 | 78 | -- | 65 | | | | | | | | | |
| Average | 76 | 70 | 64 | | | | | | | | | |

PART 3-A. OHIO RIVER BASIN EXCEPT CUMBERLAND AND TENNESSEE RIVER BASINS

OHIO RIVER MAIN STEM

ALLEGHENY RIVER NEAR WARREN, PA.

LOCATION.--At bridge on U. S. Highway 6, Warren County, approximately 9½ miles downstream from gaging station near Kinzua.
DRAINAGE AREA.--2,233 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1951.
Water temperatures: October 1948 to September 1951.
EXTREMES, 1950-51.--Hardness: Maximum, 162 ppm Sept. 1-10; minimum, 27 ppm Mar. 1-10.
Specific conductance: Maximum daily, 964 micromhos Sept. 11; minimum daily, 85.7 micromhos Apr. 2.
Water temperatures: Maximum, 79°F Aug. 1, 13; minimum, freezing point on many days during winter months.
EXTREMES, 1948-51.--Dissolved solids (1948-49): Maximum, 573 ppm Sept. 11-20, 1949; minimum, 100 ppm July 11-20, 1949.
Hardness: Maximum, 180 ppm Oct. 1-10, 1948; minimum, 28 ppm Apr. 1-10, 1950.
Specific conductance: Maximum daily, 964 micromhos Sept. 11, 1950; minimum daily, 85.7 micromhos Apr. 2, 1951.
Water temperatures: Maximum, 84°F July 13-14, 1949; minimum, freezing point on many days during winter months.
REMARKS.--Records of specific conductance, pH and chloride of daily samples available in district office at Philadelphia, Pa. Discharge records for gaging station near Kinzua for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 1-10, 1950 | 471 | 3.4 | 0.04 | 45 | 8.6 | 78 | | 68 | 21 | 170 | 0.2 | 0.0 | 406 | 148 | 92 | 722 | 7.6 | 4 |
| Oct. 11 | 4,120 | -- | -- | -- | -- | -- | | 66 | 23 | 140 | -- | .1 | -- | 114 | 60 | 632 | 7.6 | 9 |
| Oct. 12-20 | 3,776 | -- | -- | -- | -- | -- | | 30 | 16 | 50 | -- | .5 | -- | 55 | 30 | 272 | 7.2 | 6 |
| Oct. 21-31 | 1,121 | -- | -- | -- | -- | -- | | 48 | 17 | 99 | -- | .1 | -- | 89 | 50 | 448 | 7.7 | 4 |
| Nov. 1-5 | 3,668 | -- | -- | -- | -- | -- | | 54 | 18 | 105 | -- | .1 | -- | 96 | 52 | 489 | 7.8 | 3 |
| Nov. 6-10 | 9,392 | -- | -- | -- | -- | -- | | 18 | 14 | 30 | -- | .6 | -- | 38 | 23 | 166 | 7.2 | 9 |
| Nov. 11-20 | 3,638 | -- | -- | -- | -- | -- | | 28 | 14 | 40 | -- | .3 | -- | 52 | 29 | 241 | 7.3 | 5 |
| Nov. 21-30 | 18,763 | -- | -- | -- | -- | -- | | 12 | 14 | 18 | -- | .2 | -- | 28 | 18 | 119 | 6.9 | 22 |
| Dec. 1-10 | 14,500 | 5.0 | .10 | 10 | 2.8 | 7.0 | | 18 | 12 | 17 | .1 | .3 | 75 | 36 | 22 | 117 | 6.5 | 7 |
| Dec. 11-20 | 4,513 | -- | -- | -- | -- | -- | | 30 | 13 | 37 | -- | .3 | -- | 50 | 25 | 210 | 6.9 | 6 |
| Dec. 21-31 | 2,023 | -- | -- | -- | -- | -- | | 45 | 15 | 63 | -- | .6 | -- | 74 | 37 | 316 | 7.0 | 4 |
| Jan. 1-2, 1951 | 2,100 | -- | -- | -- | -- | -- | | 46 | 24 | 73 | -- | .8 | -- | 78 | 40 | 352 | 7.3 | 5 |
| Jan. 3-10 | 1,206 | -- | -- | -- | -- | -- | | 17 | 12 | 23 | -- | .4 | -- | 34 | 20 | 137 | 6.8 | 8 |
| Jan. 11-20 | 5,497 | -- | -- | -- | -- | -- | | 28 | 13 | 37 | -- | .2 | -- | 48 | 25 | 202 | 7.0 | 4 |
| Jan. 21-31 | 7,923 | -- | -- | -- | -- | 15 | | 21 | 12 | 28 | -- | 1.4 | -- | 38 | 21 | 162 | 7.3 | 3 |
| Feb. 1-10 | 2,920 | -- | -- | -- | -- | 24 | | 29 | 13 | 47 | -- | 1.4 | -- | 52 | 28 | 238 | 7.4 | 4 |
| Feb. 11-13 | 4,267 | -- | -- | -- | -- | 24 | | 31 | 14 | 48 | -- | 1.2 | -- | 56 | 31 | 252 | 7.8 | 3 |
| Feb. 14-20 | 8,607 | -- | -- | -- | -- | 10 | | 18 | 12 | 20 | -- | 1.6 | -- | 35 | 20 | 143 | 7.5 | 4 |
| Feb. 21-28 | 12,596 | -- | -- | -- | -- | 11 | | 17 | 11 | 19 | -- | 1.2 | -- | 30 | 16 | 124 | 7.5 | 6 |
| Mar. 1-10 | 13,080 | -- | -- | -- | -- | 9.2 | | 13 | 11 | 17 | -- | 1.1 | -- | 27 | 16 | 113 | 7.3 | 5 |
| Mar. 11-20 | 5,834 | -- | -- | -- | -- | 15 | | 24 | 12 | 28 | -- | 1.1 | -- | 41 | 21 | 176 | 7.1 | 1 |
| Mar. 21-30 | 6,005 | -- | -- | -- | -- | 17 | | 22 | 12 | 31 | -- | 1.1 | -- | 39 | 21 | 179 | 7.2 | 7 |
| Mar. 31 | 21,000 | -- | -- | -- | -- | 13 | | 10 | 9.5 | 13 | -- | 1.5 | -- | 10 | 2 | 97.2 | 6.0 | 16 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apr. 1-3 | 20,133 | -- | -- | -- | -- | 8.0 | 12 | 11 | 13 | -- | 1.0 | -- | 23 | 13 | 93.2 | 7.0 | 15 |
| Apr. 4-9 | 8,617 | -- | -- | -- | -- | 13 | 19 | 12 | 23 | -- | 1.0 | -- | 34 | 18 | 144 | 7.2 | 4 |
| Apr. 10 | 4,740 | -- | -- | -- | -- | 16 | 28 | 14 | 31 | -- | 1.0 | -- | 48 | 25 | 205 | 7.1 | 3 |
| Apr. 11-20 | 7,115 | -- | -- | -- | -- | 13 | 22 | 12 | 27 | -- | .8 | -- | 40 | 22 | 165 | 7.3 | 6 |
| Apr. 21-30 | 6,312 | -- | -- | -- | -- | 15 | 23 | 12 | 28 | -- | .7 | -- | 39 | 20 | 167 | 7.4 | 5 |
| May 1-10 | 3,054 | 3.1 | .11 | 18 | 4.0 | 21 | 38 | 13 | 44 | -- | .5 | -- | 61 | 30 | 242 | 7.7 | 4 |
| May 11-20 | 2,296 | 4.6 | .06 | 20 | 4.5 | 28 | 42 | 14 | 56 | -- | .5 | -- | 68 | 34 | 276 | 7.7 | 2 |
| May 21-31 | 1,502 | -- | -- | -- | -- | 36 | 42 | 15 | 75 | -- | .4 | -- | 78 | 44 | 359 | 7.4 | 4 |
| June 1-10 | 1,828 | -- | -- | -- | -- | 38 | 44 | 14 | 77 | -- | .5 | -- | 76 | 40 | 356 | 7.5 | 3 |
| June 11-20 | 4,419 | -- | -- | -- | -- | 15 | 26 | 13 | 30 | -- | 1.1 | -- | 46 | 25 | 198 | 7.6 | 6 |
| June 21-30 | 1,876 | -- | -- | -- | -- | 22 | 38 | 14 | 50 | -- | .6 | -- | 68 | 37 | 308 | 7.5 | 4 |
| July 1 | 3,550 | -- | -- | -- | -- | 37 | 38 | 18 | 68 | -- | .3 | -- | 66 | 35 | 332 | 7.4 | 7 |
| July 2-10 | 4,731 | 6.7 | .04 | 13 | 3.0 | 15 | 23 | 11 | 32 | .1 | 1.8 | 115 | 45 | 26 | 190 | 7.4 | 7 |
| July 11-20 | 2,307 | -- | -- | -- | -- | 26 | 42 | 13 | 52 | -- | .8 | -- | 65 | 31 | 273 | 7.7 | 4 |
| July 21-31 | 902 | -- | -- | -- | -- | 44 | 54 | 16 | 91 | -- | .6 | -- | 94 | 50 | 442 | 7.9 | 4 |
| Aug. 1-10 | 516 | -- | -- | -- | -- | 57 | 70 | 18 | 119 | -- | .5 | -- | 120 | 63 | 563 | 7.7 | 6 |
| Aug. 11-20 | 410 | -- | -- | -- | -- | 73 | 74 | 21 | 153 | -- | .8 | -- | 140 | 79 | 672 | 7.9 | 3 |
| Aug. 21-31 | 300 | -- | -- | -- | -- | 80 | 78 | 23 | 171 | -- | .2 | -- | 156 | 92 | 760 | 7.9 | 8 |
| Sept. 1-10 | 356 | 3.1 | .03 | 49 | 9.7 | 102 | 77 | 23 | 210 | .1 | .6 | 466 | 162 | 99 | 811 | 7.6 | 3 |
| Sept. 11-14, 16-20 | 509 | -- | -- | -- | -- | 90 | 68 | 26 | 190 | -- | .7 | -- | 155 | 99 | 788 | 7.4 | 4 |
| Sept. 15 | 863 | -- | -- | -- | -- | 38 | 71 | 21 | 73 | -- | 2.6 | -- | 102 | 44 | 409 | 6.7 | -- |
| Sept. 21-30 | 345 | -- | -- | -- | -- | 99 | 72 | 25 | 181 | -- | 1.2 | -- | 156 | 97 | 770 | 7.9 | 3 |
| Average | 4,901 | -- | -- | -- | --- | 34 | 38 | 15 | 65 | -- | 0.8 | -- | 69 | 38 | 321 | 7.4 | 6 |

OHIO RIVER MAIN STEM--Continued

ALLEGHENY RIVER NEAR WARREN, PA.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

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

## 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.--951 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1951.
Water temperatures: October 1949 to September 1951.
EXTREMES, 1950-51.--Hardness: Maximum, 104 ppm Sept. 21-30; minimum, 29 ppm Apr. 1-10.
Specific conductance: Maximum daily, 355 micromhos Sept. 30; minimum daily, 80.0 micromhos Mar. 7.
Water temperatures: Maximum, 75°F July 30; minimum, 33°F on several days during winter months.
EXTREMES, 1946-51.--Dissolved solids (1946-47): Maximum, 317 ppm Sept. 11-20, 1947; minimum, 59 ppm Apr. 1-10, 1947.
Hardness (1946-47) (1949-51): Maximum, 220 ppm Nov. 21-30, 1949; minimum, 28 ppm Apr. 1-10, 1947.
Specific conductance: Maximum, 668 micromhos Nov. 21-30, 1950; minimum daily, 80.0 micromhos 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 1950 to September 1951 given in Water-Supply Paper 1205.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 1-10, 1950 | 397 | | | | | | -- | | 23 | 53 | 26 | | 0.7 | | 73 | 54 | 242 | 6.6 | 40 |
| Oct. 11-20 | 1,645 | | | | | | -- | | 24 | 55 | 28 | | 1.0 | | 82 | 62 | 263 | 7.1 | 40 |
| Oct. 21-31 | 665 | | | | | | -- | | 21 | 44 | 19 | | .7 | | 64 | 46 | 202 | 6.6 | 25 |
| Nov. 1-5 | 3,309 | | | | | | -- | | 20 | 44 | 20 | | .7 | | 63 | 46 | 202 | 6.6 | 20 |
| Nov. 6-10 | 4,696 | | | | | | -- | | 9 | 30 | 7 | | .9 | | 39 | 32 | 117 | 6.1 | 10 |
| Nov. 11-20 | 2,116 | | | | | | -- | | 9 | 34 | 10 | | .6 | | 44 | 36 | 130 | 6.4 | 10 |
| Nov. 21-30 | 8,243 | | | | | | -- | | 4 | 32 | 6 | | .9 | | 33 | 30 | 104 | 6.1 | 10 |
| Dec. 1-10 | 6,642 | | | | | | 3.6 | | 3 | 33 | 6 | | .8 | | 38 | 36 | 110 | 5.2 | 5 |
| Dec. 11-20 | 2,184 | | | | | | 4.4 | | 3 | 38 | 7 | | .8 | | 43 | 41 | 120 | 5.7 | 3 |
| Dec. 21-31 | 999 | | | | | | 8.3 | | 7 | 47 | 12 | | .6 | | 54 | 48 | 162 | 6.2 | 25 |
| Jan. 1-5, 1951 | 5,010 | | | | | | 9.8 | | 12 | 49 | 14 | | .8 | | 60 | 50 | 180 | 6.3 | 35 |
| Jan. 6-10 | 4,376 | | | | | | 4.6 | | 6 | 27 | 6 | | .6 | | 32 | 27 | 99.1 | 6.2 | 20 |
| Jan. 11-20 | 3,225 | | | | | | 7.8 | | 12 | 36 | 8 | | .5 | | 42 | 32 | 131 | 6.5 | 15 |
| Jan. 21-31 | 4,361 | | | | | | -- | | 6 | 30 | 7 | | .8 | | 33 | 28 | 103 | 7.0 | 15 |
| Feb. 1-10 | 3,116 | | | | | | -- | | 9 | 32 | 7 | | .9 | | 38 | 31 | 119 | 7.0 | 20 |
| Feb. 11-20 | 4,589 | | | | | | -- | | 8 | 32 | 8 | | .6 | | 36 | 29 | 115 | 6.4 | 20 |
| Feb. 21-28 | 7,089 | | | | | | 4.1 | | 6 | 26 | 6 | | .7 | | 32 | 27 | 93.6 | 6.2 | 10 |
| Mar. 1-10 | 7,311 | | | | | | -- | | 8 | 29 | 6 | | .6 | | 33 | 26 | 93.9 | 6.4 | 10 |
| Mar. 11-20 | 2,655 | | | | | | -- | | 6 | 32 | 7 | | .6 | | 34 | 29 | 107 | 6.3 | 14 |
| Mar. 21-31 | 3,030 | | | | | | -- | | 11 | 38 | 9 | | .7 | | 42 | 33 | 135 | 6.6 | 20 |
| Apr. 1-10 | 4,278 | | | | | | 5.4 | | 5 | 28 | 5 | | .6 | | 29 | 25 | 101 | 5.9 | 2 |
| Apr. 11-20 | 3,176 | | | | | | 4.1 | | 4 | 32 | 7 | | .5 | | 38 | 35 | 119 | 5.9 | 2 |
| Apr. 21-30 | 3,320 | | | | | | 5.1 | | 6 | 32 | 6 | | .6 | | 36 | 31 | 112 | 6.0 | 2 |
| May 1-10 | 1,649 | | | | | | 5.4 | | 6 | 34 | 7 | | .6 | | 39 | 34 | 119 | 6.1 | 1 |
| May 11-20 | 1,307 | | | | | | 9.0 | | 9 | 40 | 10 | | .6 | | 44 | 37 | 141 | 6.0 | 3 |
| May 21-31 | 1,294 | | | | | | 7.7 | | 10 | 42 | 13 | | .7 | | 54 | 46 | 166 | 6.0 | 4 |

CLARION RIVER BASIN--Continued

CLARION RIVER NEAR PINEY, PA.--Continued

Chemical analyses, in parts per million, water year October 1950 to September 1951--Continued

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| June 1-10, 1951 | 1,190 | | | | | | 8.9 | | 9 | 48 | 14 | | 0.4 | | 58 | 51 | 171 | 6.4 | 27 |
| June 11-20 | 2,119 | | | | | | 7.3 | | 9 | 38 | 13 | | .7 | | 50 | 43 | 148 | 6.5 | 32 |
| June 21-30 | 864 | | | | | | 5.0 | | 7 | 27 | 9 | | .5 | | 36 | 30 | 111 | 6.4 | 18 |
| July 1-10 | 1,299 | | | | | | 11 | | 6 | 43 | 13 | | .7 | | 45 | 40 | 153 | 5.8 | 4 |
| July 11-20 | 697 | | | | | | 10 | | 6 | 38 | 13 | | .4 | | 41 | 36 | 139 | 6.0 | 8 |
| July 21-31 | 310 | | | | | | 5.3 | | 6 | 39 | 11 | | .7 | | 50 | 45 | 151 | 6.3 | 10 |
| Aug. 1-10 | 185 | | | | | | 5.8 | | 6 | 41 | 13 | | .8 | | 54 | 49 | 162 | 6.1 | 8 |
| Aug. 11-20 | 132 | | | | | | 5.8 | | 6 | 47 | 13 | | .6 | | 60 | 55 | 179 | 6.0 | 10 |
| Aug. 21-31 | 110 | | | | | | -- | | 8 | 55 | 20 | | 1.0 | | 62 | 55 | 216 | 6.3 | 2 |
| Sept. 1-10 | 82 | | | | | | -- | | 11 | 55 | 24 | | .8 | | 71 | 62 | 242 | 6.1 | 10 |
| Sept. 11-20 | 158 | | | | | | -- | | 11 | 64 | 35 | | 1.5 | | 91 | 82 | 307 | 6.9 | 60 |
| Sept. 21-30 | 121 | | | | | | -- | | 13 | 73 | 42 | | 1.4 | | 104 | 93 | 333 | 6.8 | 80 |
| Average | 2,437 | | | | | | -- | | 9 | 40 | 13 | | 0.7 | | 49 | 42 | 155 | 6.3 | 17 |

## CLARION RIVER BASIN--Continued

### CLARION RIVER NEAR PINEY, PA.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

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

## *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.
RECORDS AVAILABLE.--Chemical analyses: September 1906 to September 1907, October 1944 to September 1951.
Water temperatures: October 1944 to September 1951 (unpublished).
EXTREMES, 1950-51.--Hardness: Maximum, 122 ppm Sept. 21-30; minimum, 34 ppm Feb. 21-28, Mar. 1-10.
Specific conductance: Maximum daily, 436 micromhos Sept. 16, 28, 30; minimum daily, 93.9 micromhos Dec. 6.
EXTREMES, 1906-07, 1944-51.--Dissolved solids (1906-07) (1944-47): Maximum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.
Hardness (1906-07) (1944-51): Maximum, 135 ppm Oct. 1-20, 1946; minimum, 29 ppm Jan. 7-15, 1907.
Specific conductance (1944-51): Maximum, 521 micromhos Oct. 11-20, 1946; minimum daily 93.9 micromhos Dec. 6, 1950.
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. Discharge records for gaging station at Kittanning for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 1-10, 1950 | 2,220 | | | | | 19 | | 47 | 40 | 30 | | 0.4 | | 81 | 42 | 259 | 7.2 | 10 |
| Oct. 11-15 | 13,428 | | | | | 24 | | 47 | 48 | 40 | | .4 | | 92 | 54 | 308 | 7.0 | 10 |
| Oct. 16-20 | 12,408 | | | | | 13 | | 34 | 30 | 19 | | .7 | | 58 | 30 | 185 | 7.0 | 10 |
| Oct. 21-31 | 5,147 | | | | | 15 | | 40 | 32 | 23 | | .4 | | 66 | 33 | 212 | 7.0 | 10 |
| Nov. 1-10 | 22,314 | | | | | 15 | | 33 | 38 | 22 | | .5 | | 65 | 38 | 212 | 6.9 | 10 |
| Nov. 11-20 | 15,930 | | | | | 11 | | 25 | 31 | 16 | | .8 | | 53 | 32 | 164 | 6.9 | 10 |
| Nov. 21-30 | 53,630 | | | | | -- | | 18 | 25 | 11 | | 1.1 | | 45 | 30 | 123 | 6.8 | 4 |
| Dec. 1-10 | 67,090 | | | | | -- | | 15 | 24 | 8 | | 1.3 | | 36 | 24 | 112 | 6.8 | 4 |
| Dec. 11-20 | 23,350 | | | | | 8.5 | | 20 | 32 | 12 | | 1.1 | | 49 | 33 | 153 | 7.1 | 1 |
| Dec. 21-31 | 8,887 | | | | | 13 | | 31 | 42 | 18 | | 1.4 | | 68 | 43 | 210 | 7.2 | 1 |
| Jan. 1-4, 1951 | 25,670 | | | | | 13 | | 30 | 47 | 18 | | 1.4 | | 71 | 46 | 226 | 7.3 | 1 |
| Jan. 5-10 | 59,717 | | | | | 6.2 | | 13 | 24 | 9 | | 1.4 | | 36 | 25 | 115 | 6.9 | 5 |
| Jan. 11-20 | 29,260 | | | | | 6.7 | | 17 | 34 | 10 | | 1.5 | | 50 | 36 | 147 | 6.9 | 1 |
| Jan. 21-31 | 35,191 | | | | | -- | | 18 | 30 | 9 | | .2 | | 40 | 25 | 128 | 6.9 | 10 |
| Feb. 1-10 | 18,460 | | | | | -- | | 18 | 40 | 12 | | .3 | | 53 | 38 | 163 | 6.9 | 10 |
| Feb. 11-20 | 40,110 | | | | | -- | | 18 | 31 | 12 | | .3 | | 45 | 30 | 140 | 7.0 | 10 |
| Feb. 21-28 | 53,537 | | | | | -- | | 15 | 25 | 7 | | .2 | | 34 | 22 | 110 | 6.9 | 12 |
| Mar. 1-10 | 53,750 | | | | | 5.1 | | 14 | 22 | 7 | | 1.0 | | 34 | 23 | 106 | 6.5 | 10 |
| Mar. 11-20 | 24,540 | | | | | 5.8 | | 19 | 24 | 10 | | 1.1 | | 43 | 27 | 134 | 6.7 | 10 |
| Mar. 21-31 | 27,736 | | | | | 5.9 | | 20 | 26 | 11 | | 1.0 | | 47 | 31 | 144 | 6.9 | 10 |
| Apr. 1-10 | 41,910 | | | | | 4.6 | | 15 | 23 | 7 | | 1.2 | | 37 | 25 | 113 | 6.7 | 10 |
| Apr. 11-20 | 32,900 | | | | | 6.0 | | 18 | 28 | 8 | | 1.1 | | 43 | 28 | 134 | 6.7 | 10 |
| Apr. 21-30 | 28,480 | | | | | 8.3 | | 19 | 30 | 9 | | .7 | | 42 | 26 | 141 | 6.9 | 7 |
| May 1-10 | 16,252 | | | | | 8.9 | | 22 | 34 | 11 | | .6 | | 50 | 32 | 159 | 6.9 | 7 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| May 11-20 | 11,776 | | | | | 11 | 32 | 35 | 16 | | .5 | | 62 | 36 | 194 | 7.1 | 6 |
| May 21-31 | 8,664 | | | | | 11 | 29 | 39 | 17 | | .6 | | 64 | 40 | 208 | 7.1 | 5 |
| June 1-10 | 8,615 | | | | | 10 | 25 | 35 | 23 | | .5 | | 68 | 48 | 219 | 7.2 | 5 |
| June 11-20 | 18,020 | | | | | 8.3 | 21 | 31 | 17 | | .7 | | 56 | 39 | 175 | 7.1 | 5 |
| June 21-30 | 6,913 | | | | | 11 | 27 | 33 | 18 | | .6 | | 58 | 36 | 190 | 7.1 | 5 |
| July 1-10 | 15,070 | | | | | 11 | 28 | 29 | 21 | | .7 | | 60 | 37 | 192 | 7.1 | 15 |
| July 11-20 | 6,974 | | | | | 9.5 | 32 | 26 | 19 | | .8 | | 60 | 34 | 179 | 7.0 | 7 |
| July 21-31 | 3,732 | | | | | 15 | 36 | 36 | 26 | | .6 | | 72 | 42 | 237 | 7.1 | 6 |
| Aug. 1-10 | 2,345 | | | | | 18 | 44 | 44 | 31 | | .7 | | 88 | 52 | 281 | 7.1 | 7 |
| Aug. 11-20 | 1,602 | | | | | 20 | 46 | 48 | 37 | | .5 | | 97 | 59 | 316 | 7.3 | 5 |
| Aug. 21-31 | 1,261 | | | | | -- | 56 | 57 | 47 | | .5 | | 102 | 56 | 366 | 7.4 | 5 |
| Sept. 1-10 | 1,285 | | | | | -- | 57 | 64 | 50 | | .5 | | 106 | 59 | 379 | 7.1 | 8 |
| Sept. 11-20 | 2,157 | | | | | -- | 28 | 67 | 56 | | .7 | | 116 | 93 | 422 | 7.4 | 5 |
| Sept. 21-30 | 1,374 | | | | | -- | 27 | 66 | 60 | | .3 | | 122 | 100 | 439 | 7.5 | 7 |
| Average | 20,490 | | | | | -- | 28 | 36 | 20 | | 0.7 | | 62 | 40 | 202 | 7.0 | 7 |

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 1951.
REMARKS.--Station 100 is approximately 100 feet from north (right) bank and station 800 is approximately 90 feet from south (left) bank. Records of discharge for water year October 1950 to September 1951 based on records for Allegheny River at Natrona which are given in Water-Supply Paper 1205.

Chemical analyses of cross-section samples, water year October 1950 to September 1951

| Date | Discharge (cfs) | Sampling point | | | Temperature (°F) | Parts per million | | | | | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Channel | Station | Time | | Bicarbonate ($HCO_3$) | Sulfate ($SO_4$) | Chloride (Cl) | Nitrate ($NO_3$) | Hardness as $CaCO_3$ | | | |
| Oct. 13, 1950... | | | 800 | 7:50 a.m. | 58 | 2 | 196 | 25 | 0.9 | 186 | 518 | 4.8 | 1 |
| | | | 600 | 7:45 a.m. | 57 | 1 | 217 | 24 | 1.1 | 190 | 551 | 4.6 | 1 |
| | | | 410 | 7:45 a.m. | 57 | 0 | 225 | 23 | 1.0 | 198 | 577 | 4.30 | 1 |
| | | | 250 | 7:40 a.m. | 58 | 0 | 212 | 23 | .4 | 194 | 559 | 4.5 | 1 |
| | | | 100 | 7:35 a.m. | 58 | 1 | 197 | 24 | .7 | 192 | 528 | 4.7 | 1 |
| Nov. 14.. | | | 800 | 8:55 a.m. | 43 | 10 | 46 | 12 | 1.8 | 61 | 196 | 5.8 | 3 |
| | | | 600 | 9:00 a.m. | 43 | 7 | 47 | 13 | 1.7 | 60 | 193 | 6.1 | 3 |
| | | | 410 | 9:10 a.m. | 43 | 8 | 48 | 13 | 1.6 | 60 | 188 | 5.8 | 3 |
| | | | 250 | 9:15 a.m. | 43 | 9 | 49 | 12 | 1.7 | 58 | 186 | 6.0 | 4 |
| | | | 100 | 4:55 p.m. | 43 | 10 | 46 | 13 | 1.5 | 59 | 191 | 5.9 | 3 |
| Dec. 13.. | | | 800 | 7:20 a.m. | 32 | 1 | 70 | 8 | 1.3 | 65 | 205 | 4.7 | 2 |
| | | | 600 | 7:15 a.m. | 32 | 0 | 68 | 8 | 1.0 | 62 | 206 | 4.40 | 2 |
| | | | 410 | 7:10 a.m. | 32 | 6 | 58 | 7 | 1.5 | 60 | 184 | 5.8 | 2 |
| | | | 250 | 7:05 a.m. | 32 | 3 | 53 | 7 | 1.2 | 55 | 167 | 5.3 | 3 |
| | | | 100 | 7:00 a.m. | 33 | 5 | 49 | 7 | 1.3 | 52 | 164 | 5.6 | 3 |
| Jan. 17, 1951... | | | 800 | 8:40 a.m. | 35 | 2 | 59 | 8 | 2.1 | 62 | 188 | 4.8 | 2 |
| | | | 600 | 8:45 a.m. | 35 | 1 | 56 | 8 | 2.2 | 61 | 185 | 4.7 | 1 |
| | | | 410 | 8:50 a.m. | 35 | 2 | 52 | 9 | 2.0 | 58 | 175 | 5.5 | 1 |
| | | | 250 | 8:55 a.m. | 35 | 5 | 49 | 9 | 2.0 | 55 | 170 | 5.8 | 1 |
| | | | 100 | 9:00 a.m. | 35 | 9 | 47 | 9 | 2.0 | 56 | 173 | 6.1 | 1 |
| Feb. 21.. | | | 800 | 7:15 a.m. | 39 | 6 | 52 | 9 | 1.8 | 56 | 168 | 6.3 | 1 |
| | | | 600 | 7:20 a.m. | 38 | 8 | 50 | 8 | 1.6 | 54 | 165 | 6.1 | 1 |
| | | | 410 | 7:23 a.m. | 38 | 9 | 45 | 8 | 1.6 | 51 | 154 | 6.2 | 1 |
| | | | 250 | 7:25 a.m. | 38 | 13 | 40 | 8 | 1.7 | 50 | 151 | 6.4 | 5 |
| | | | 100 | 7:30 a.m. | 38 | 10 | 40 | 8 | 1.8 | 49 | 146 | 6.3 | 3 |
| Mar. 14 . | | | 800 | 8:45 a.m. | 38 | 1 | 63 | 9 | 1.4 | 57 | 201 | 4.6 | 4 |
| | | | 600 | 8:50 a.m. | 38 | 2 | 59 | 10 | 1.1 | 55 | 185 | 4.9 | 5 |
| | | | 410 | 8:53 a.m. | 38 | 3 | 61 | 7 | 1.3 | 52 | 170 | 5.3 | 6 |
| | | | 250 | 8:58 a.m. | 39 | 7 | 49 | 9 | 1.3 | 48 | 161 | 5.8 | 4 |
| | | | 100 | 8:59 a.m. | 39 | 9 | 44 | 6 | 1.4 | 45 | 158 | 6.2 | 5 |
| Apr. 20.. | | | 800 | 9:15 a.m. | 45 | 4 | 59 | 15 | 2.2 | 68 | 185 | 5.6 | 5 |
| | | | 600 | 9:20 a.m. | 44 | 4 | 55 | 15 | 1.4 | 64 | 176 | 5.8 | 5 |
| | | | 410 | 9:25 a.m. | 44 | 8 | 52 | 15 | 1.3 | 62 | 169 | 6.1 | 5 |
| | | | 250 | 9:30 a.m. | 44 | 9 | 47 | 15 | 1.6 | 54 | 158 | 6.3 | 5 |
| | | | 100 | 9:35 a.m. | 46 | 11 | 43 | 16 | 1.7 | 54 | 159 | 6.6 | 5 |
| May 15.. | | | 800 | 11:15 a.m. | 63 | 6 | 83 | 7 | 2.1 | 92 | 259 | 6.0 | 5 |
| | | | 600 | 11:20 a.m. | 62 | 7 | 80 | 8 | 1.8 | 92 | 252 | 6.2 | 5 |
| | | | 410 | 11:25 a.m. | 62 | 8 | 78 | 8 | 1.1 | 90 | 248 | 6.4 | 5 |
| | | | 250 | 11:25 a.m. | 62 | 9 | 78 | 7 | 1.3 | 90 | 248 | 6.4 | 5 |
| | | | 100 | 11:30 a.m. | 62 | 8 | 81 | 8 | 1.7 | 92 | 248 | 6.2 | 5 |
| June 27.. | | | 800 | 7:40 a.m. | 76 | 0 | 112 | 15 | .7 | 70 | 337 | 4.10 | 3 |
| | | | 600 | 7:45 a.m. | 76 | 0 | 103 | 14 | .8 | 74 | 330 | 4.20 | 4 |
| | | | 410 | 7:50 a.m. | 76 | 0 | 112 | 14 | 1.6 | 68 | 336 | 4.25 | 1 |
| | | | 250 | 7:55 a.m. | 76 | 0 | 112 | 13 | 1.8 | 72 | 337 | 4.25 | 2 |
| | | | 100 | 7:55 a.m. | 76 | 0 | 115 | 12 | 1.3 | 72 | 330 | 4.10 | 3 |
| July 16.. | | | 800 | 7:00 a.m. | 77 | 3 | 100 | 15 | .4 | 76 | 292 | 5.3 | 4 |
| | | | 600 | 6:55 a.m. | 77 | 4 | 105 | 16 | .5 | 68 | 291 | 5.5 | 3 |
| | | | 410 | 6:50 a.m. | 76 | 4 | 103 | 14 | .5 | 70 | 287 | 5.5 | 2 |
| | | | 250 | 6:45 a.m. | 77 | 3 | 100 | 16 | .7 | 70 | 289 | 5.2 | 2 |
| | | | 100 | 6:40 a.m. | 77 | 4 | 110 | 14 | .7 | 86 | 295 | 5.2 | 1 |
| Aug. 20.. | | | 800 | 10:00 a.m. | 80 | 2 | 202 | 30 | .6 | 98 | 549 | 4.8 | 1 |
| | | | 600 | 10:05 a.m. | 80 | 2 | 202 | 29 | .7 | 94 | 548 | 4.8 | 2 |
| | | | 410 | 10:10 a.m. | 80 | 2 | 208 | 29 | .7 | 102 | 549 | 4.8 | 3 |
| | | | 250 | 10:15 a.m. | 80 | 2 | 208 | 26 | .7 | 105 | 548 | 4.8 | 1 |
| | | | 100 | 10:20 a.m. | 80 | 1 | 200 | 32 | .6 | 112 | 548 | 4.7 | 3 |

OHIO RIVER MAIN STEM--Continued

ALLEGHENY RIVER AT SHARPSBURG, PA.--Continued

Chemical analyses of cross-section samples, water year October 1950 to September 1951--Continued

| Date | Discharge (cfs) | Sampling point | | | Temperature (°F) | Parts per million | | | | | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Channel | Station | Time | | Bicarbonate ($HCO_3$) | Sulfate ($SO_4$) | Chloride (Cl) | Nitrate ($NO_3$) | Hardness as $CaCO_3$ | | | |
| Sept. 12, 1951... | | | 800 | 7:30 a. m. | 75 | 1 | 248 | 36 | 0.8 | 216 | 679 | 4.6 | 1 |
| | | | 600 | 7:37 a. m. | 75 | 2 | 252 | 36 | .6 | 216 | 676 | 4.7 | 1 |
| | | | 410 | 7:50 a. m. | 75 | 2 | 238 | 38 | .7 | 224 | 675 | 4.7 | 1 |
| | | | 250 | 8:00 a. m. | 76 | 1 | 245 | 38 | .6 | 220 | 675 | 4.7 | 1 |
| | | | 100 | 8:05 a. m. | 75 | 1 | 250 | 38 | .6 | 216 | 680 | 4.6 | 1 |

## KISKIMINETAS RIVER BASIN

### KISKIMINETAS RIVER AT LEECHBURG, PA.

LOCATION.--At raw-water intake of West Leechburg Plant of Allegheny-Ludlum Steel Corporation, 0.2 miles below Brady Run, Armstrong County, and 6.7 miles downstream from gaging station at Vandergrift.
DRAINAGE AREA.--1,860 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1951.
Water temperatures: October 1946 to September 1951.
EXTREMES, 1950-51.--Hardness: Maximum, 480 ppm Sept. 21-30; minimum, 82 ppm June 11-18.
Specific conductance: Maximum daily, 5,420 micromhos Aug. 12; minimum daily, 231 micromhos Dec. 5.
EXTREMES, 1946-51.--Dissolved solids (1946-47): Maximum, 786 ppm Oct. 1-10, 1946; minimum, 183 ppm Jan. 1-10, 1947.
Hardness (1946-47) (1949-51: Maximum, 514 ppm Oct. 1-10, 1946; minimum, 76 ppm Dec. 14-18, 1950.
Specific conductance: Maximum daily, 5,420 micromhos Aug. 12, 1951; minimum daily, 178 micromhos July 22, 23, 1950.
Water temperatures: Maximum, 90°F July 25, 1950; minimum, freezing point on many days during winter months.
REMARKS.--Chemical quality fluctuates rapidly due to presence of industrial wastes. Samples collected by Allegheny-Ludlum Steel Corporation. Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1950 to September 1951 based on records for Kiskiminetas River at Vandergrift, which are given in Water-Supply Paper 1205.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| Oct. 1-10, 1950. | 1,007 | | | | | | | | 99 | | 0 | 490 | 14 | 14 | 16 | | 293 | 293 | 223 | 1,370 | 2.90 | 4 |
| Oct. 11-20 ..... | 2,217 | | | | | | | | 37 | | 0 | 245 | 8 | 8.0 | 2.2 | | 163 | 163 | 117 | 831 | 3.10 | 3 |
| Oct. 21-31 ..... | 1,079 | | | | | | | | 55 | | 0 | 355 | 11 | 10 | 2.2 | | 230 | 230 | 167 | 1,150 | 2.95 | 3 |
| Nov. 1-4 ..... | 1,514 | | | | | | | | 61 | | 0 | 335 | 10 | 16 | 18 | | 230 | 230 | 196 | 1,080 | 3.00 | 4 |
| Nov. 5-10 ..... | 6,430 | | | | | | | | 16 | | 0 | 136 | 5 | 1.0 | .9 | | 104 | 104 | 41 | 443 | 3.55 | 4 |
| Nov. 11-13 ..... | 3,463 | | | | | | | | 27 | | 0 | 160 | 6 | 4.0 | .7 | | 109 | 109 | 61 | 488 | 3.45 | 3 |
| Nov. 14-20 ..... | 2,047 | | | | | | | | 43 | | 0 | 235 | 6 | 14 | .5 | | 156 | 156 | 138 | 797 | 3.15 | 4 |
| Nov. 21-30 ..... | 3,914 | | | | | | | | 22 | | 0 | 160 | 6 | 2.0 | .6 | | 121 | 121 | 54 | 473 | 3.60 | 5 |
| Dec. 1,2,4-10 .. | 12,581 | | | | | | | | -- | | 0 | 114 | 5 | .1 | .8 | | 88 | 88 | 37 | 343 | 4.05 | 5 |
| Dec. 3 ..... | 11,100 | | | | | | | | -- | | 0 | 240 | 11 | 6.0 | 2.4 | | 139 | 139 | 178 | 1,170 | 2.80 | 5 |
| Dec. 11-13 ..... | 7,200 | | | | | | | | -- | | 0 | 192 | 6 | .2 | 1.3 | | 123 | 123 | 80 | 607 | 3.40 | 6 |
| Dec. 14-20 ..... | 3,121 | | | | | | | | 47 | | 0 | 320 | 7 | 3.6 | 5.4 | | 184 | 184 | 176 | 1,090 | 2.90 | 8 |
| Dec. 21-31 ..... | 31,355 | | | | | | | | -- | | 0 | 315 | 7 | 7.0 | 5.3 | | 178 | 178 | 170 | 1,080 | 2.95 | 6 |
| Jan. 1-3, 1951.. | 2,800 | | | | | | | | -- | | 0 | 305 | 8 | 10 | 5.6 | | 170 | 170 | 182 | 1,110 | 2.90 | 10 |
| Jan. 4-10..... | 11,457 | | | | | | | | -- | | 0 | 140 | 5 | .4 | 1.3 | | 100 | 100 | 56 | 449 | 3.50 | 6 |
| Jan. 11-20..... | 8,846 | | | | | | | | -- | | 0 | 163 | 5 | .7 | 1.4 | | 109 | 109 | 64 | 537 | 3.30 | 5 |
| Jan. 21-31..... | 7,566 | | | | | | | | -- | | -- | -- | -- | -- | -- | | -- | -- | -- | -- | -- | -- |
| Feb. 1-10 ..... | 8,089 | | | | | | | | -- | | 0 | 188 | 5 | .3 | .8 | | 119 | 119 | 78 | 623 | 3.30 | 5 |
| Feb. 11-13 ..... | 5,087 | | | | | | | | 38 | | 0 | 275 | 5 | 2.0 | 2.2 | | 161 | 161 | 178 | 905 | 3.00 | 5 |
| Feb. 14-20 ..... | 7,360 | | | | | | | | -- | | 0 | 145 | 3 | .2 | .9 | | 103 | 103 | 60 | 471 | 3.40 | 5 |
| Feb. 21-23 ..... | 10,480 | | | | | | | | -- | | 0 | 105 | 4 | .3 | 2.9 | | 78 | 78 | 37 | 316 | 3.70 | 3 |
| Feb. 24-28 ..... | 6,408 | | | | | | | | -- | | 0 | 172 | 5 | .5 | .2 | | 119 | 119 | 38 | 571 | 3.25 | 2 |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mar. 1-10..... | 6,986 | | | | | | | | -- | 0 | 170 | 5 | .9 | 3.8 | | 114 | 114 | 34 | 558 | 3.10 | 2 |
| Mar. 11-20..... | 3,510 | | | | | | | | -- | 0 | 268 | 6 | 3.4 | 2.0 | | 166 | 166 | 66 | 910 | 2.90 | 2 |
| Mar. 21-31..... | 5,993 | | | | | | | | -- | 0 | 180 | 6 | 1.4 | 4.6 | | 120 | 120 | 39 | 593 | 3.20 | 2 |
| Apr. 1-10..... | 8,744 | | | | | | | | 16 | 0 | 130 | 4 | .6 | 2.9 | | 94 | 94 | 53 | 421 | 3.50 | 6 |
| Apr.11-15,17-18 | 8,191 | | | | | | | | 21 | 0 | 151 | 3 | .6 | 3.2 | | 101 | 101 | 53 | 455 | 3.45 | 6 |
| Apr. 16, 19, 20. | 5,637 | | | | | | | | 29 | 0 | 218 | 5 | 9.5 | 32 | | 142 | 142 | 138 | 888 | 2.85 | 8 |
| Apr. 21-29..... | 4,764 | | | | | | | | 29 | 0 | 208 | 5 | 3.0 | 12 | | 134 | 134 | 98 | 714 | 3.10 | 7 |
| Apr. 30..... | 18,500 | | | | | | | | 14 | 0 | 130 | 3 | .4 | 2.4 | | 102 | 102 | 60 | 388 | 3.65 | 6 |
| May 1-5..... | 7,948 | | | | | | | | 15 | 0 | 125 | 3 | .4 | 2.6 | | 91 | 91 | 46 | 387 | 3.55 | 5 |
| May 6-10..... | 3,116 | | | | | | | | 34 | 0 | 262 | 4 | 5.5 | 18 | | 163 | 163 | 134 | 936 | 2.90 | 5 |
| May 11, 17-20.. | 2,312 | | | | | | | | 45 | 0 | 278 | 8 | 9.5 | 26 | | 178 | 178 | 154 | 1,000 | 2.90 | 6 |
| May 12-16..... | 4,122 | | | | | | | | 25 | 0 | 185 | 6 | 1.0 | 4.1 | | 129 | 129 | 72 | 572 | 3.35 | 6 |
| May 21-31..... | 1,610 | | | | | | | | 56 | 0 | 358 | 10 | 14 | 2.5 | | 222 | 222 | 219 | 1,330 | 2.85 | 2 |
| June 1-9..... | 1,967 | | | | | | | | 79 | 0 | 440 | 10 | 8.0 | 1.0 | | 242 | 242 | 228 | 1,440 | 2.85 | 2 |
| June 10..... | 10,000 | | | | | | | | 19 | 0 | 122 | 4 | .5 | .6 | | 84 | 84 | 48 | 430 | 3.65 | 3 |
| June 11-18..... | 12,177 | | | | | | | | 25 | 0 | 116 | 4 | 6.0 | .3 | | 82 | 82 | 36 | 319 | 3.90 | 1 |
| June 19-20..... | 4,730 | | | | | | | | 30 | 0 | 205 | 5 | 10 | 1.2 | | 126 | 126 | 138 | 814 | 3.00 | 2 |
| June 21-28..... | 3,460 | | | | | | | | 39 | 0 | 312 | 6 | 9.0 | .8 | | 181 | 181 | 179 | 1,120 | 2.80 | 2 |
| June 29-30..... | 10,420 | | | | | | | | 11 | 0 | 130 | 4 | .4 | .4 | | 104 | 104 | 42 | 405 | 3.55 | 3 |
| July 1-10..... | 4,772 | | | | | | | | 15 | 0 | 200 | 6 | 3.6 | .5 | | 135 | 135 | 89 | 687 | 2.90 | 2 |
| July 11-20..... | 1,700 | | | | | | | | 112 | 0 | 430 | 7 | 10 | 25 | | 260 | 260 | 196 | 1,320 | 3.00 | 5 |
| July 21-22,28-31 | 1,543 | | | | | | | | 140 | 0 | 398 | 6 | 18 | 51 | | 200 | 200 | 227 | 1,280 | 3.00 | 5 |
| July 23-27..... | 5,766 | | | | | | | | 40 | 0 | 181 | 4 | 4.0 | 9.2 | | 126 | 126 | 71 | 590 | 3.40 | 5 |
| Aug. 1-10..... | 913 | | | | | | | | 166 | 0 | 532 | 9 | 20 | 49 | | 298 | 298 | 284 | 1,500 | 2.95 | 5 |
| Aug. 11, 13-20.. | 822 | | | | | | | | -- | 0 | 530 | 12 | 15 | 75 | | 204 | 204 | 343 | 1,740 | 2.75 | 2 |
| Aug. 12..... | 732 | | | | | | | | -- | 0 | 560 | 2 | 22 | 770 | | 328 | 328 | 930 | 5,420 | 2.10 | -- |
| Aug. 21-31..... | 516 | | | | | | | | -- | 0 | 645 | 18 | 11 | 61 | | 340 | 340 | 320 | 1,850 | 2.80 | 2 |
| Sept. 1-10..... | 538 | | | | | | | | -- | 0 | 660 | 16 | 18 | 92 | | 312 | 312 | 751 | 2,010 | 2.70 | 1 |
| Sept. 11-20..... | 505 | | | | | | | | -- | 0 | 678 | 18 | -- | 46 | | 415 | 415 | 269 | 1,830 | 2.80 | 10 |
| Sept. 21-30..... | 432 | | | | | | | | -- | 0 | 750 | 22 | -- | 62 | | 480 | 480 | 292 | 1,910 | 2.80 | 20 |
| Average..... | 4,511 | | | | | | | | -- | 0 | 281 | 7 | 6.2 | 13.3 | | 172 | 172 | 156 | 975 | 3.15 | 5 |

KISKIMINETAS RIVER BASIN--Continued

KISKIMINETAS RIVER AT LEECHBURG, PA.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

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

## MONONGAHELA RIVER AT CHARLEROI, PA.

LOCATION.--At Mercantile Bridge Company toll bridge approximately 1¼ miles downstream from gaging station at Charleroi, Washington County, and 1 mile downstream from lock 4.
DRAINAGE AREA.--5,213 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1951.
Water temperatures: October 1944 to September 1951.
EXTREMES, 1950-51.--Hardness: Maximum, 218 ppm Sept. 11-20, 21-30; minimum, 60 ppm Feb. 1-10.
Specific conductance: Maximum daily, 940 micromhos Sept. 1, 25; minimum daily, 154 micromhos Feb. 2.
Water temperatures: Maximum, 82°F July 31; minimum, 40°F Mar. 20.
EXTREMES, 1944-51.--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 micromhos Sept. 11-20, 1946; minimum, 149 micromhos Dec. 1-10, 1949.
Water temperatures: Maximum, 86°F Sept. 1, 1948; 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. Discharge records for gaging station at Charleroi for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| Oct. 1-10, 1950 .. | 2,829 | | | | | | | | 18 | | 0 | 144 | 8 | | 2.0 | | 123 | 123 | 20 | 381 | 4.40 | 3 |
| Oct. 11-20 ..... | 4,864 | | | | | | | | 17 | | 0 | 107 | 9 | | 1.2 | | 88 | 88 | 12 | 323 | 4.40 | 3 |
| Oct. 21-31 ..... | 2,907 | | | | | | | | 20 | | 0 | 147 | 9 | | 1.4 | | 121 | 121 | 28 | 408 | 4.15 | 3 |
| Nov. 1-10 ..... | 14,407 | | | | | | | | 13 | | 3 | 92 | 8 | | 1.4 | | 83 | 81 | -- | 263 | 4.9 | 2 |
| Nov. 11-20 ..... | 6,604 | | | | | | | | 11 | | 4 | 86 | 5 | | 1.1 | | 76 | 73 | -- | 239 | 5.6 | 2 |
| Nov. 21-23 ..... | 11,243 | | | | | | | | 16 | | 2 | 97 | 7 | | 1.2 | | 79 | 77 | -- | 250 | 4.8 | 1 |
| Nov. 24-30 ..... | 11,252 | | | | | | | | -- | | -- | -- | -- | | -- | | -- | -- | -- | -- | -- | -- |
| Dec. 1-10 ..... | 40,630 | | | | | | | | 7.8 | | 0 | 75 | 4 | | 1.4 | | 67 | 67 | 18 | 213 | 4.45 | 1 |
| Dec. 11-15, 17-20. | 16,111 | | | | | | | | 12 | | 0 | 88 | 3 | | .5 | | 66 | 66 | 24 | 244 | 4.05 | 1 |
| Dec. 16 ..... | 16,800 | | | | | | | | 28 | | 0 | 179 | 8 | | .2 | | 122 | 122 | 56 | 494 | 3.55 | 1 |
| Dec. 21-31 ..... | 8,297 | | | | | | | | 22 | | 0 | 145 | 5 | | .6 | | 103 | 103 | 38 | 393 | 3.80 | 1 |
| Jan. 1-4, 1951 ... | 10,685 | | | | | | | | 21 | | 0 | 156 | 5 | | .7 | | 117 | 117 | 37 | 414 | 3.80 | 1 |
| Jan. 5-10..... | 21,800 | | | | | | | | 7.2 | | 0 | 84 | 4 | | .8 | | 70 | 70 | 17 | 238 | 3.80 | 2 |
| Jan. 11-20 ..... | 23,970 | | | | | | | | -- | | 0 | 86 | 3 | | .4 | | 63 | 63 | 14 | 221 | 4.40 | 3 |
| Jan. 21-31 ..... | 16,404 | | | | | | | | -- | | 0 | 100 | 3 | | .3 | | 75 | 75 | 20 | 259 | 4.25 | 5 |
| Feb. 1-10 ..... | 35,700 | | | | | | | | -- | | 0 | 76 | 1 | | .4 | | 60 | 60 | 15 | 207 | 4.45 | 4 |
| Feb. 11-20 ..... | 13,590 | | | | | | | | -- | | 0 | 117 | 4 | | .8 | | 92 | 92 | 28 | 319 | 4.00 | 4 |
| Feb. 21-28 ..... | 18,956 | | | | | | | | -- | | 0 | 97 | 3 | | .5 | | 71 | 71 | 16 | 246 | 4.45 | 5 |
| Mar. 1-10 ..... | 17,548 | | | | | | | | -- | | 0 | 102 | 3 | | .3 | | 79 | 79 | 19 | 269 | 4.35 | 5 |
| Mar. 11-17, 20 ... | 12,575 | | | | | | | | 15 | | 2 | 95 | 3 | | .9 | | 72 | 70 | -- | 261 | 4.9 | 2 |
| Mar. 18-19 ..... | 8,650 | | | | | | | | 19 | | 0 | 141 | 4 | | .8 | | 107 | 107 | 26 | 379 | 4.10 | 2 |
| Mar. 21-31 ..... | 16,602 | | | | | | | | 12 | | 0 | 89 | 4 | | .8 | | 72 | 72 | 13 | 249 | 4.40 | 2 |

MONONGAHELA RIVER BASIN--Continued

MONONGAHELA RIVER AT CHARLEROI, PA.--Continued

Chemical analyses, in parts per million, water year October 1950 to September 1951--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 $H_2SO_4$ | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | |
| Apr. 1-10, 1951.. | 21,220 | | | | | | | | 9.2 | | 2 | 81 | 3 | | 0.9 | | 71 | 69 | -- | 222 | 5.0 | 3 |
| Apr. 11-20 ..... | 32,120 | | | | | | | | 10 | | 2 | 78 | 3 | | .9 | | 66 | 64 | -- | 214 | 4.9 | 5 |
| Apr. 21-30 ..... | 12,233 | | | | | | | | 13 | | 2 | 99 | 3 | | .9 | | 82 | 80 | -- | 265 | 4.8 | 5 |
| May 1-10 ..... | 15,120 | | | | | | | | 14 | | 0 | 104 | 2 | | .8 | | 81 | 81 | 24 | 271 | 4.40 | 8 |
| May 11-20 ..... | 11,013 | | | | | | | | 16 | | 0 | 121 | 4 | | .8 | | 97 | 97 | 25 | 299 | 4.40 | 7 |
| May 21-31 ..... | 3,893 | | | | | | | | 29 | | 0 | 182 | 5 | | 1.0 | | 129 | 129 | 37 | 444 | 3.95 | 5 |
| June 1-10 ..... | 5,264 | | | | | | | | 35 | | 0 | 208 | 5 | | .8 | | 135 | 135 | 60 | 552 | 3.60 | 4 |
| June 11-20 ..... | 29,253 | | | | | | | | 10 | | 0 | 82 | 4 | | .7 | | 68 | 68 | 12 | 221 | 4.40 | 1 |
| June 21-30 ..... | 6,600 | | | | | | | | 21 | | 0 | 128 | 5 | | .5 | | 91 | 91 | 26 | 319 | 4.00 | 2 |
| July 1-10 ..... | 8,251 | | | | | | | | 17 | | 0 | 138 | 6 | | .3 | | 113 | 113 | 22 | 358 | 4.30 | 2 |
| July 11-20 ..... | 3,236 | | | | | | | | 26 | | 0 | 169 | 5 | | .8 | | 126 | 126 | 33 | 428 | 4.15 | 4 |
| July 21-31 ..... | 4,283 | | | | | | | | 34 | | 0 | 208 | 5 | | .9 | | 150 | 150 | 33 | 510 | 3.80 | 5 |
| Aug. 1-10 ..... | 1,531 | | | | | | | | 43 | | 0 | 268 | 7 | | .8 | | 196 | 196 | 32 | 630 | 4.10 | 3 |
| Aug. 11-20 ..... | 1,249 | | | | | | | | 46 | | 0 | 260 | 7 | | .8 | | 182 | 182 | 31 | 621 | 4.10 | 5 |
| Aug. 21-31 ..... | 1,001 | | | | | | | | -- | | 0 | 305 | 10 | | .8 | | 188 | 188 | 57 | 753 | 3.60 | 5 |
| Sept. 1-10 ..... | 1,556 | | | | | | | | -- | | 0 | 362 | 10 | | .8 | | 212 | 212 | 68 | 872 | 3.30 | 5 |
| Sept. 11-20 ..... | 1,251 | | | | | | | | -- | | 0 | 342 | 10 | | 1.0 | | 218 | 218 | 74 | 860 | 3.40 | 5 |
| Sept. 21-30 ..... | 874 | | | | | | | | -- | | 0 | 355 | 11 | | 1.3 | | 218 | 218 | 70 | 867 | 3.50 | 3 |
| Average ..... | 11,810 | | | | | | | | 19 | | -- | 149 | 5 | | 0.8 | | 108 | 108 | 31 | 384 | 4.22 | 3 |

MONONGAHELA RIVER BASIN--Continued

MONONGAHELA RIVER AT CHARLEROI, PA.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

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

## OHIO RIVER MAIN STEM

### 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 1951.
Water temperatures: October 1945 to September 1951.
EXTREMES, 1950-51.--Hardness: Maximum, 244 ppm Sept. 1-10; minimum, 48 ppm Dec. 1-10.
Specific conductance: Maximum daily, 798 micromhos Sept. 18, 20, 21; minimum daily, 126 micromhos Nov. 29.
Water temperatures: Maximum, 84°F on several days in August; minimum, freezing point on several days during winter months.
EXTREMES, 1945-51.--Dissolved solids (1945-47): Maximum, 600 ppm Oct. 1-10, 1946; minimum, 79 ppm Apr. 1-10, 1947.
Hardness (1945-47) (1949-51): Maximum, 302 ppm Oct. 1-10, 1946; minimum, 43 ppm Apr. 1-10, 1947.
Specific conductance: Maximum, 921 micromhos Oct. 1-10, 1946; minimum, 125 micromhos Apr. 1-10, 1950.
Water temperatures: Maximum, 86°F Aug. 20, 21, 1947; minimum, freezing point on many days during winter months.
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, 1090 and 1380 feet from east bank of river. Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1950 to September 1951 based on records for Ohio River at Sewickley, which are given in Water-Supply Paper 1205.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 1-10, 1950 | 8,530 | | | | | 22 | | 4 | 138 | 15 | | 4.7 | | 123 | 120 | 381 | 5.7 | 1 |
| Oct. 11-20 | 23,790 | | | | | 24 | | 11 | 121 | 24 | | 3.0 | | 120 | 111 | 383 | 6.2 | 1 |
| Oct. 21-31 | 11,764 | | | | | 18 | | 4 | 107 | 17 | | 3.2 | | 101 | 98 | 333 | 5.5 | 0 |
| Nov. 1-5 | 32,100 | | | | | 22 | | 3 | 138 | 17 | | 2.6 | | 124 | 122 | 399 | 5.5 | 5 |
| Nov. 6-10 | 65,680 | | | | | 13 | | 13 | 61 | 17 | | 1.1 | | 71 | 60 | 235 | 6.4 | 0 |
| Nov. 11-20 | 31,050 | | | | | 12 | | 9 | 66 | 14 | | 2.4 | | 72 | 65 | 229 | 6.1 | 0 |
| Nov. 21-30 | 76,070 | | | | | 7.2 | | 13 | 40 | 11 | | 1.1 | | 53 | 42 | 167 | 6.4 | 0 |
| Dec. 1-10 | 143,700 | | | | | 6.3 | | 7 | 41 | 8 | | 2.5 | | 48 | 42 | 147 | 6.1 | 0 |
| Dec. 11-20 | 55,630 | | | | | 8.6 | | 1 | 72 | 9 | | 1.5 | | 71 | 70 | 226 | 4.6 | 0 |
| Dec. 21-31 | 26,918 | | | | | 16 | | 0 | 122 | 11 | | 2.1 | | 105 | 105 | 349 | 4.05 | 0 |
| Jan. 1-3, 1951 | 24,400 | | | | | 14 | | 1 | 114 | 14 | | 1.4 | | 108 | 107 | 327 | 4.7 | 0 |
| Jan. 4-10 | 111,942 | | | | | 6.1 | | 6 | 44 | 8 | | 1.6 | | 50 | 45 | 153 | 6.1 | 0 |
| Jan. 11-20 | 78,660 | | | | | -- | | 5 | 62 | 9 | | 2.1 | | 67 | 63 | 198 | 5.8 | 3 |
| Jan. 21-27 | 83,715 | | | | | -- | | 5 | 47 | 8 | | 1.0 | | 54 | 50 | 162 | 6.4 | 1 |
| Jan. 28-31 | 58,900 | | | | | -- | | 2 | 79 | 9 | | 1.4 | | 76 | 74 | 225 | 4.7 | 1 |
| Feb. 1-10 | 80,390 | | | | | 11 | | 3 | 72 | 10 | | 2.0 | | 70 | 68 | 214 | 5.4 | 3 |
| Feb. 11-20 | 73,560 | | | | | 8.3 | | 6 | 63 | 11 | | 1.4 | | 69 | 64 | 204 | 5.9 | 5 |
| Feb. 21-28 | 95,800 | | | | | 7.9 | | 8 | 45 | 9 | | 1.4 | | 50 | 43 | 151 | 6.3 | 4 |
| Mar. 1-10 | 93,020 | | | | | -- | | 6 | 41 | 8 | | 1.8 | | 51 | 46 | 150 | 6.3 | 8 |
| Mar. 11-20 | 48,890 | | | | | -- | | 7 | 59 | 10 | | 1.5 | | 66 | 60 | 193 | 6.2 | 8 |
| Mar. 21-31 | 59,018 | | | | | -- | | 12 | 59 | 11 | | 1.1 | | 67 | 57 | 203 | 6.6 | 8 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apr. 1-10 ..... | 87,940 | | | | | 3.9 | 8 | 41 | 7 | | 1.7 | | 52 | 45 | 158 | 6.1 | 7 |
| Apr. 11-20 ..... | 75,820 | | | | | 6.4 | 9 | 52 | 8 | | 1.3 | | 60 | 53 | 182 | 6.1 | 6 |
| Apr. 21-30 ..... | 57,390 | | | | | 7.1 | 9 | 59 | 7 | | 1.3 | | 65 | 58 | 196 | 6.1 | 6 |
| May 1-10 ..... | 49,840 | | | | | 9.2 | 4 | 78 | 7 | | .9 | | 75 | 72 | 230 | 5.4 | 7 |
| May 11-20 ..... | 32,560 | | | | | 14 | 6 | 100 | 12 | | 1.0 | | 97 | 92 | 293 | 5.7 | 7 |
| May 21-31 ..... | 17,791 | | | | | 21 | 6 | 131 | 14 | | 1.2 | | 117 | 112 | 370 | 5.8 | 7 |
| June 1-10..... | 20,250 | | | | | 22 | 3 | 150 | 17 | | .5 | | 136 | 134 | 408 | 5.3 | 7 |
| June 11-20..... | 74,770 | | | | | 11 | 4 | 78 | 11 | | 1.7 | | 78 | 75 | 237 | 5.8 | 7 |
| June 21-30 ..... | 25,390 | | | | | 13 | 2 | 115 | 12 | | .8 | | 110 | 108 | 316 | 5.0 | 6 |
| July 1-10 ..... | 34,780 | | | | | 14 | 7 | 101 | 17 | | .8 | | 104 | 98 | 308 | 5.9 | 5 |
| July 11-20 ..... | 15,387 | | | | | 15 | 4 | 128 | 15 | | 1.5 | | 126 | 123 | 355 | 5.9 | 5 |
| July 21-31 ..... | 15,106 | | | | | 31 | 3 | 181 | 17 | | 1.8 | | 148 | 146 | 459 | 4.7 | 5 |
| Aug. 1-10 ..... | 6,245 | | | | | 42 | 2 | 222 | 18 | | 1.0 | | 168 | 166 | 506 | 4.7 | 4 |
| Aug. 11-20 ..... | 5,295 | | | | | 40 | 3 | 225 | 23 | | 1.5 | | 184 | 182 | 574 | 5.1 | 5 |
| Aug. 21-31 ..... | 4,139 | | | | | -- | 1 | 262 | 27 | | .7 | | 228 | 227 | 700 | 4.8 | 1 |
| Sept. 1-10 ..... | 4,855 | | | | | -- | 2 | 295 | 30 | | .5 | | 244 | 242 | 735 | 5.2 | 1 |
| Sept. 11-20 ..... | 5,405 | | | | | -- | 1 | 305 | 29 | | .7 | | 232 | 231 | 760 | 4.7 | 2 |
| Sept. 21-30 ..... | 4,142 | | | | | -- | 2 | 310 | 36 | | 3.1 | | 240 | 238 | 786 | 4.9 | 5 |
| Average ..... | 45,230 | | | | | 15 | 5 | 113 | 14 | | 1.6 | | 105 | 100 | 323 | 5.6 | 5 |

## OHIO RIVER MAIN STEM--Continued

### OHIO RIVER AT AMBRIDGE, PA.--Continued

Chemical analyses of cross-section samples, water year October 1950 to September 1951

| Date | Discharge (cfs) | Sampling point | | | Temperature (°F) | Parts per million | | | | | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Channel | Station | Time | | Bicarbonate ($HCO_3$) | Sulfate ($SO_4$) | Chloride (Cl) | Nitrate ($NO_3$) | Hardness as $CaCO_3$ | | | |
| Oct. 13, 1950... | | | 1380 | 9:15 a. m. | 62 | 2 | 164 | 20 | 3.4 | 135 | 452 | 5.0 | 1 |
| | | | 1090 | 9:10 a. m. | 62 | 1 | 167 | 20 | 3.1 | 151 | 459 | 4.8 | 1 |
| | | | 870 | 9:05 a. m. | 62 | 2 | 171 | 20 | 3.1 | 147 | 454 | 5.0 | 1 |
| | | | 625 | 9:00 a. m. | 62 | 2 | 161 | 21 | 3.3 | 143 | 449 | 4.9 | 1 |
| | | | 340 | 8:56 a. m. | 62 | 3 | 165 | 21 | 4.4 | 139 | 450 | 5.1 | 1 |
| Nov. 14.. | | | 1380 | 11:20 a. m. | 48 | 10 | 77 | 10 | 3.0 | 82 | 260 | 5.8 | 3 |
| | | | 1090 | 11:15 a. m. | 47 | 15 | 75 | 12 | 2.7 | 82 | 258 | 6.2 | 3 |
| | | | 870 | 11:10 a. m. | 46 | 10 | 66 | 11 | 2.7 | 75 | 238 | 5.8 | 2 |
| | | | 625 | 11:05 a. m. | 46 | 10 | 59 | 11 | 2.4 | 69 | 216 | 6.1 | 2 |
| | | | 340 | 11:00 a. m. | 45 | 12 | 59 | 11 | 2.4 | 67 | 215 | 6.0 | 3 |
| Dec. 13.. | | | 1380 | 9:30 a. m. | 34 | 1 | 101 | 6 | 1.8 | 91 | 271 | 4.6 | 1 |
| | | | 1090 | 9:25 a. m. | 34 | 0 | 93 | 5 | 1.4 | 82 | 255 | 4.45 | 2 |
| | | | 870 | 9:20 a. m. | 34 | 1 | 81 | 6 | 1.4 | 78 | 235 | 4.7 | 1 |
| | | | 625 | 9:15 a. m. | 33 | 1 | 67 | 7 | 1.5 | 62 | 201 | 4.7 | 3 |
| | | | 340 | 9:10 a. m. | 33 | 3 | 58 | 7 | 1.7 | 61 | 180 | 5.3 | 1 |
| Jan. 17, 1951... | | | 1380 | 10:40 a. m. | 36 | 5 | 81 | 6 | 3.2 | 83 | 229 | 5.6 | 0 |
| | | | 1090 | 10:45 a. m. | 36 | 4 | 73 | 6 | 2.7 | 76 | 221 | 5.4 | 0 |
| | | | 870 | 10:50 a. m. | 36 | 4 | 65 | 6 | 2.5 | 71 | 207 | 5.4 | 0 |
| | | | 625 | 10:55 a. m. | 36 | 5 | 57 | 8 | 2.5 | 65 | 196 | 5.8 | 1 |
| | | | 340 | 11:00 a. m. | 36 | 8 | 54 | 8 | 2.5 | 62 | 186 | 6.0 | 1 |
| Feb. 21.. | | | 1380 | 8:45 a. m. | 42 | 5 | 88 | 8 | 2.1 | 86 | 252 | 5.6 | 2 |
| | | | 1090 | 8:48 a. m. | 41 | 6 | 81 | 8 | 1.9 | 78 | 233 | 5.7 | 2 |
| | | | 870 | 8:50 a. m. | 41 | 6 | 69 | 8 | 1.8 | 70 | 209 | 5.7 | 2 |
| | | | 625 | 8:55 a. m. | 40 | 10 | 53 | 8 | 1.4 | 58 | 181 | 6.0 | 2 |
| | | | 340 | 9:00 a. m. | 40 | 11 | 45 | 9 | 2.4 | 54 | 163 | 6.2 | 2 |
| Mar. 14.. | | | 1380 | 10:46 a. m. | 43 | 1 | 97 | 9 | 1.7 | 91 | 292 | 4.7 | 4 |
| | | | 1090 | 10:42 a. m. | 42 | 2 | 89 | 8 | 1.6 | 76 | 250 | 4.8 | 4 |
| | | | 870 | 11:05 a. m. | 41 | 24 | 64 | 9 | .5 | 68 | 218 | 6.0 | 6 |
| | | | 625 | 10:38 a. m. | 41 | 3 | 67 | 10 | 1.8 | 57 | 207 | 5.1 | 5 |
| | | | 340 | 10:30 a. m. | 40 | 5 | 55 | 9 | 1.9 | 55 | 185 | 5.6 | 4 |
| Apr. 20.. | | | 1380 | 12:20 p. m. | 49 | 2 | 103 | 6 | 2.0 | 96 | 271 | 4.7 | 1 |
| | | | 1090 | 12:25 p. m. | 48 | 1 | 98 | 6 | 2.0 | 94 | 268 | 4.7 | 1 |
| | | | 870 | 12:30 p. m. | 47 | 1 | 88 | 6 | 1.8 | 87 | 252 | 4.8 | 2 |
| | | | 625 | 12:35 p. m. | 46 | 4 | 69 | 7 | 1.9 | 75 | 208 | 5.5 | 2 |
| | | | 340 | 12:40 p. m. | 46 | 8 | 55 | 8 | 2.1 | 63 | 189 | 5.9 | 2 |
| May 15.. | | | 1380 | 9:45 a. m. | 63 | 1 | 114 | 8 | 1.8 | 112 | 312 | 4.7 | 1 |
| | | | 1090 | 9:50 a. m. | 62 | 1 | 116 | 9 | 2.1 | 112 | 312 | 4.6 | 2 |
| | | | 870 | 9:55 a. m. | 62 | 1 | 105 | 10 | 2.0 | 101 | 299 | 4.7 | 2 |
| | | | 625 | 9:55 a. m. | 62 | 3 | 97 | 11 | 2.2 | 101 | 281 | 5.7 | 2 |
| | | | 340 | 10:00 a. m. | 61 | 2 | 90 | 12 | 2.0 | 98 | 271 | 5.6 | 2 |
| June 27.. | | | 1380 | 9:40 a. m. | 78 | 0 | 134 | 10 | 1.8 | 118 | 351 | 4.5 | 3 |
| | | | 1090 | 9:50 a. m. | 78 | 0 | 134 | 10 | 1.8 | 120 | 355 | 4.35 | 4 |
| | | | 870 | 9:55 a. m. | 78 | 0 | 134 | 10 | 1.8 | 120 | 351 | 4.40 | 3 |
| | | | 625 | 10:00 a. m. | 77 | 6 | 120 | 10 | .7 | 120 | 332 | 6.0 | 2 |
| | | | 340 | 10:05 a. m. | 77 | 0 | 122 | 12 | 1.4 | 110 | 326 | 4.5 | 3 |
| July 16.. | | | 1380 | 8:20 a. m. | 78 | 0 | 146 | 12 | 1.8 | 128 | 379 | 4.5 | 4 |
| | | | 1090 | 8:15 a. m. | 79 | 0 | 144 | 14 | 1.3 | 134 | 375 | 4.40 | 4 |
| | | | 870 | 8:10 a. m. | 79 | 3 | 142 | 12 | .8 | 126 | 369 | 5.3 | 4 |
| | | | 625 | 8:05 a. m. | 78 | 0 | 144 | 13 | 1.9 | 130 | 376 | 4.40 | 2 |
| | | | 340 | 8:00 a. m. | 78 | 3 | 144 | 16 | 1.3 | 126 | 371 | 5.2 | 2 |
| Aug. 20.. | | | 1380 | 1:45 p. m. | 84 | 2 | 242 | 23 | .3 | 192 | 598 | 5.1 | 5 |
| | | | 1090 | 1:50 p. m. | 83 | 2 | 245 | 22 | .3 | 198 | 597 | 5.1 | 6 |
| | | | 870 | 1:55 p. m. | 83 | 2 | 245 | 23 | .4 | 194 | 599 | 5.0 | 7 |
| | | | 625 | 2:00 p. m. | 84 | 5 | 245 | 24 | .4 | 200 | 599 | 5.4 | 7 |
| | | | 340 | 2:10 p. m. | 84 | 4 | 245 | 24 | .5 | 192 | 601 | 5.1 | 6 |
| Sept. 12. | | | 1380 | 10:05 a. m. | 79 | 3 | 285 | 28 | .8 | 216 | 720 | 5.1 | 0 |
| | | | 1090 | 10:15 a. m. | 79 | 2 | 285 | 28 | .8 | 218 | 718 | 5.0 | 0 |
| | | | 870 | 10:20 a. m. | 79 | 3 | 272 | 28 | .7 | 222 | 717 | 5.1 | 1 |
| | | | 625 | 10:27 a. m. | 79 | 3 | 282 | 27 | .7 | 220 | 715 | 5.3 | 1 |
| | | | 340 | 10:35 a. m. | 79 | 3 | 295 | 27 | .7 | 220 | 721 | 5.1 | 1 |

## OHIO RIVER MAIN STEM--Continued

### OHIO RIVER AT AMBRIDGE, PA.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

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

## BEAVER RIVER BASIN

### MAHONING RIVER AT LEAVITTSBURG, OHIO

LOCATION.--At gaging station at Leavittsburg, Trumbull County, 350 feet downstream from Duck Creek, and 1¼ miles downstream from Eagle Creek.
DRAINAGE AREA.--580 square miles.
RECORDS AVAILABLE.--Water temperatures: April 1943 to December 1945, October 1946 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 76°F July 19, Aug. 16, Sept. 1; minimum, freezing point on several days in December, February, and March.
EXTREMES, 1943-45, 1946-51.--Water temperatures: Maximum, 86°F July 2, 1949; minimum, freezing point on some days during each winter.
REMARKS.--Temperatures given are once-daily measurements. Prior to May 1947 twice-daily temperature measurements were made. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Temperature (°F) of water, water year October 1950 to September 1951

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

BEAVER RIVER BASIN--Continued

MAHONING RIVER AT NILES, OHIO

LOCATION.--At Belmont Street Bridge at 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.--Water temperatures: April 1943 to December 1945, October 1949 to September 1951 (incomplete).
EXTREMES, 1950-51.--Water temperatures: Maximum recorded, 86°F June 1, July 26, 27.
EXTREMES, 1943-45, 1949-51.--Water temperatures: Maximum observed, 92°F June 28, 1943; minimum observed, freezing point several times during period.
REMARKS.--Temperatures given are daily means computed from continuous recorder measurements. Prior to October 1950 twice-daily temperature measurements were made. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Temperature (°F) of water, water year October 1950 to September 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | -- | 71 | | -- | -- | | | -- | 82 | 77 | 82 | 81 |
| 2 | -- | 69 | | -- | -- | | | -- | 80 | 78 | 80 | 78 |
| 3 | -- | 68 | | -- | -- | | | -- | 76 | 80 | 80 | 74 |
| 4 | -- | 65 | | 35 | -- | | | -- | 73 | 80 | 78 | 76 |
| 5 | -- | 59 | | 34 | 37 | | | -- | 73 | 76 | 76 | 78 |
| 6 | -- | 58 | | 36 | 38 | | | -- | 75 | 76 | 76 | 78 |
| 7 | -- | 64 | | 36 | 39 | | | -- | 77 | 79 | 77 | 78 |
| 8 | -- | 67 | | 36 | -- | | | -- | 78 | 79 | 79 | 78 |
| 9 | -- | 70 | | 38 | -- | | | -- | 76 | 79 | 81 | 79 |
| 10 | -- | 64 | | 40 | -- | | | -- | 75 | 81 | 82 | 77 |
| 11 | -- | -- | | 40 | -- | | | -- | 76 | 82 | 82 | 80 |
| 12 | -- | -- | | 40 | -- | | | -- | 78 | 81 | 82 | 78 |
| 13 | -- | -- | | 40 | -- | | | -- | 78 | 80 | 80 | 79 |
| 14 | -- | -- | | 39 | -- | | | -- | 78 | 80 | 83 | 77 |
| 15 | -- | -- | | 37 | -- | | | -- | 78 | 80 | 82 | 79 |
| 16 | -- | -- | | 36 | -- | | | -- | 78 | 82 | 82 | 78 |
| 17 | -- | -- | | 37 | -- | | | -- | 79 | 83 | 80 | 75 |
| 18 | -- | -- | | 39 | -- | | | -- | 78 | 83 | 79 | 78 |
| 19 | -- | -- | | 40 | -- | | | -- | 78 | 82 | 79 | 78 |
| 20 | -- | -- | | 42 | -- | | | -- | 77 | 80 | 79 | 76 |
| 21 | -- | -- | | 40 | -- | | | 76 | 78 | 78 | 81 | 77 |
| 22 | -- | -- | 37 | 38 | -- | | | -- | 77 | 78 | 78 | 78 |
| 23 | -- | -- | | 39 | -- | | | -- | 79 | 78 | 78 | 76 |
| 24 | -- | -- | | -- | -- | | | -- | 80 | 82 | 78 | 74 |
| 25 | 71 | -- | | -- | -- | | | 78 | 79 | 81 | 80 | 78 |
| 26 | 70 | -- | | -- | -- | | | 74 | 79 | 83 | 78 | 77 |
| 27 | 68 | -- | | -- | -- | | | 68 | 81 | 84 | 78 | 78 |
| 28 | 66 | -- | | -- | -- | | | 68 | 81 | 81 | 80 | 74 |
| 29 | 66 | -- | | 36 | -- | | | 72 | 81 | 78 | 81 | 73 |
| 30 | 65 | -- | | -- | -- | | | 76 | 80 | 80 | 82 | 72 |
| 31 | 69 | -- | | -- | -- | | | 76 | -- | 82 | 82 | -- |
| Average | -- | -- | | -- | -- | | | -- | 78 | 80 | 80 | 77 |

BEAVER RIVER BASIN--Continued

MAHONING RIVER AT LOWELLVILLE, OHIO

LOCATION.--At gaging station 300 feet upstream from Washington Street Bridge at Lowellville, Mahoning County, 1 mile upstream from Ohio-Pennsylvania State line, and 3 miles downstream from Yellow Creek.
DRAINAGE AREA.--1,076 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1943 to November 1944 (incomplete), October 1949 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum recorded, 109°F June 2; minimum recorded, freezing point Dec. 5.
EXTREMES, 1943-44, 1949-51.--Water temperatures: Maximum observed, 111°F Aug. 6, 1944; minimum observed or recorded, freezing point Dec. 5, 1950.
REMARKS.--Water temperatures affected by cooling water from steel mills. Temperatures given are daily means computed from continuous recorder measurements. Prior to November 1949 twice-daily temperature measurements were made. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Temperature (°F) of water, water year October 1950 to September 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 91 | 100 | 53 | 68 | 46 | 48 | 47 | 70 | 102 | 89 | 98 | 101 |
| 2 | 91 | 94 | 56 | 73 | 43 | 48 | 49 | 76 | 105 | 93 | 97 | 95 |
| 3 | 91 | 91 | 43 | 64 | 41 | 50 | 50 | 81 | 101 | 97 | 96 | 90 |
| 4 | 86 | 83 | 33 | 43 | 43 | 45 | 50 | 80 | 92 | 97 | 94 | 90 |
| 5 | 88 | 76 | 33 | 37 | 47 | 44 | 51 | 80 | 90 | 91 | 93 | 92 |
| 6 | 91 | 81 | 37 | 41 | 49 | 49 | 54 | 77 | 90 | 91 | 93 | 96 |
| 7 | 93 | 89 | 44 | 44 | 48 | 52 | 57 | 78 | 94 | 93 | 95 | 92 |
| 8 | 94 | 92 | 37 | 46 | 45 | 48 | 57 | 83 | 96 | 96 | 100 | 92 |
| 9 | 92 | 90 | 56 | 51 | 43 | 47 | 56 | 89 | 94 | 98 | 102 | 94 |
| 10 | 89 | 84 | 39 | 57 | 43 | 48 | 55 | 88 | 87 | 101 | 101 | 97 |
| 11 | 91 | 82 | 45 | 59 | 48 | 47 | 57 | 84 | 91 | 102 | 102 | 98 |
| 12 | 85 | 80 | 50 | 57 | 44 | 49 | 59 | 67 | 95 | 98 | 99 | 99 |
| 13 | 81 | 81 | 53 | 57 | 38 | 50 | 52 | 59 | 92 | 96 | 98 | 98 |
| 14 | 81 | 83 | 52 | 57 | 34 | 46 | 49 | 65 | 89 | 96 | 99 | 88 |
| 15 | 82 | 85 | 50 | 55 | 37 | 46 | 51 | 77 | 94 | 96 | 99 | 93 |
| 16 | 84 | 90 | 43 | 40 | 43 | 45 | 52 | 87 | 93 | 99 | 98 | 91 |
| 17 | 90 | 83 | 43 | 43 | 45 | 45 | 55 | 90 | 94 | 101 | 95 | 94 |
| 18 | 94 | 85 | 43 | 47 | 41 | 43 | 60 | 91 | 96 | 96 | 96 | 96 |
| 19 | 96 | 85 | 47 | 47 | 41 | 41 | 65 | 90 | 96 | 97 | 95 | 98 |
| 20 | 94 | 76 | 48 | 47 | 43 | 38 | 66 | 90 | 94 | 98 | 98 | 98 |
| 21 | 90 | 64 | 52 | 45 | 44 | 38 | 68 | 92 | 95 | 99 | 98 | 98 |
| 22 | 88 | 60 | 53 | 45 | 40 | 42 | 69 | 94 | 93 | 94 | 95 | 97 |
| 23 | 86 | 65 | 54 | 49 | 40 | 47 | 59 | 88 | 95 | 95 | 93 | 91 |
| 24 | 87 | 65 | 54 | 51 | 43 | 45 | 58 | 87 | 97 | 97 | 95 | 92 |
| 25 | 89 | 54 | 48 | 47 | 42 | 39 | 66 | 92 | 96 | 98 | 97 | 95 |
| 26 | 91 | 41 | 48 | 47 | 44 | 42 | 69 | 94 | 96 | 100 | 96 | 94 |
| 27 | 88 | 39 | 49 | 47 | 44 | 49 | 72 | 89 | 98 | 102 | 96 | 95 |
| 28 | 92 | 39 | 57 | 47 | 44 | 48 | 75 | 87 | 99 | 98 | 97 | 88 |
| 29 | 97 | 42 | 66 | 47 | -- | 52 | 76 | 88 | 96 | 90 | 98 | 89 |
| 30 | 98 | 48 | 70 | 46 | -- | 52 | 68 | 91 | 95 | 92 | 101 | 89 |
| 31 | 100 | -- | 69 | 48 | -- | 48 | -- | 96 | -- | 97 | 101 | -- |
| Average | 90 | 74 | 49 | 50 | 43 | 46 | 59 | 84 | 95 | 96 | 97 | 94 |

## BEAVER RIVER AT NEW BRIGHTON, PA.

LOCATION.--At head of intake canal of Beaver Falls Municipal Authority, 3 miles upstream from mouth, and 2.5 miles downstream from gaging station at Beaver Falls, Beaver County.
DRAINAGE AREA.--3,112 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1951.
Water temperatures: October 1945 to September 1951.
EXTREMES, 1950-51.--Hardness: Maximum, 190 ppm Aug. 21-31, Sept. 21-30; minimum, 85 ppm Feb. 11-20.
Specific conductance: Maximum daily, 584 micromhos Nov. 3; minimum daily, 167 micromhos Feb. 15.
Water temperatures: Maximum, 84°F July 17, 19, 20, 29; minimum, freezing point Feb. 9.
EXTREMES, 1945-51.--Dissolved solids (1945-47): Maximum, 362 ppm Nov. 21-30, 1946; minimum, 136 ppm Apr. 1-10, 1947.
Hardness: Maximum, 236 ppm Dec. 1-10, 1949; minimum, 85 ppm Mar. 1-10, 1946, Feb. 11-20, 1951.
Specific conductance: Maximum, 665 micromhos Feb. 1-10, 1948; minimum daily, 167 micromhos Feb. 15.
Water temperatures: Maximum, 88°F July 6, 1949; minimum, freezing point Feb. 7, 11, 1947, Dec. 27, 1948, and 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 1950 to September 1951 based on records for Beaver River at Beaver Falls which are given in Water-Supply Paper 1205.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 1-10, 1950 | -- | | | | | -- | | 10 | 164 | 25 | | 7.2 | | 167 | 159 | 471 | 6.2 | 3 |
| Oct. 11-20 | -- | | | | | 18 | | 30 | 137 | 28 | | 8.5 | | 174 | 149 | 479 | 6.6 | 1 |
| Oct. 21-31 | -- | | | | | 17 | | 19 | 153 | 29 | | 10 | | 186 | 170 | 520 | 6.3 | 4 |
| Nov. 1-10 | -- | | | | | 16 | | 27 | 115 | 26 | | 7.5 | | 149 | 127 | 432 | 6.6 | 4 |
| Nov. 11-20 | -- | | | | | 17 | | 34 | 110 | 25 | | 6.9 | | 147 | 119 | 426 | 6.7 | 3 |
| Nov. 21-30 | 4,420 | | | | | 9.8 | | 27 | 76 | 17 | | 5.0 | | 108 | 86 | 310 | 6.7 | 4 |
| Dec. 1-10 | 20,198 | | | | | 7.0 | | 30 | 59 | 9 | | 3.2 | | 86 | 61 | 225 | 6.9 | 20 |
| Dec. 11-20 | 4,922 | | | | | 11 | | 32 | 88 | 14 | | 5.3 | | 119 | 93 | 303 | 6.8 | 10 |
| Dec. 21-31 | 3,204 | | | | | 4.8 | | 32 | 104 | 17 | | 6.3 | | 153 | 127 | 352 | 6.9 | 10 |
| Jan. 1-10, 1951 | 11,499 | | | | | -- | | 25 | 68 | 14 | | 4.4 | | 100 | 80 | 270 | 6.6 | 1 |
| Jan. 11-20 | 10,831 | | | | | -- | | 27 | 68 | 11 | | 3.6 | | 100 | 78 | 258 | 6.7 | 2 |
| Jan. 21-31 | 6,297 | | | | | -- | | 28 | 70 | 12 | | 4.7 | | 101 | 78 | 264 | 6.9 | 1 |
| Feb. 1-10 | 4,905 | | | | | 13 | | 30 | 82 | 14 | | 5.8 | | 107 | 82 | 286 | 6.8 | 10 |
| Feb. 11-20 | 15,580 | | | | | 7.3 | | 27 | 61 | 9 | | 3.3 | | 85 | 63 | 218 | 6.8 | 25 |
| Feb. 21-28 | 13,844 | | | | | -- | | 30 | 59 | 9 | | 4.5 | | 94 | 69 | 232 | 7.0 | 8 |
| Mar. 1-10 | 13,108 | | | | | -- | | 28 | 61 | 9 | | 3.9 | | 88 | 65 | 228 | 6.8 | 15 |
| Mar. 11-20 | 8,957 | | | | | -- | | 35 | 71 | 10 | | 4.0 | | 109 | 80 | 263 | 7.0 | 12 |
| Mar. 21-31 | 11,451 | | | | | -- | | 34 | 61 | 9 | | 3.7 | | 96 | 68 | 237 | 7.0 | 15 |
| Apr. 1-10 | 8,661 | | | | | 6.0 | | 32 | 66 | 10 | | 3.8 | | 99 | 73 | 247 | 6.8 | 12 |
| Apr. 11-20 | 7,821 | | | | | 7.0 | | 35 | 68 | 10 | | 3.2 | | 101 | 72 | 253 | 6.7 | 10 |
| Apr. 21-30 | 7,776 | | | | | 7.9 | | 33 | 70 | 11 | | 3.5 | | 101 | 74 | 255 | 6.6 | 18 |

BEAVER RIVER BASIN--Continued

BEAVER RIVER AT NEW BRIGHTON, PA.--Continued

Chemical analyses, in parts per million, water year October 1950 to September 1951--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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| May 1-10, 1951 | 4,492 | | | | | 9.4 | | 39 | 77 | 12 | | 3.1 | | 111 | 79 | 284 | 6.8 | 10 |
| May 11-20 | 3,594 | | | | | 11 | | 44 | 90 | 13 | | 3.9 | | 128 | 92 | 321 | 6.7 | 13 |
| May 21-31 | 2,075 | | | | | 15 | | 43 | 112 | 20 | | 4.6 | | 151 | 116 | 401 | 6.7 | 15 |
| June 1-10 | -- | | | | | 13 | | 47 | 118 | 21 | | 5.2 | | 162 | 140 | 425 | 6.8 | 15 |
| June 11-20 | -- | | | | | 13 | | 38 | 94 | 19 | | 5.7 | | 132 | 101 | 352 | 6.8 | 15 |
| June 21-30 | -- | | | | | 16 | | 36 | 124 | 23 | | 4.4 | | 159 | 130 | 429 | 6.6 | 15 |
| July 1-10 | -- | | | | | 13 | | 49 | 92 | 17 | | 5.0 | | 136 | 96 | 350 | 6.9 | 20 |
| July 11-20 | -- | | | | | 14 | | 44 | 110 | 20 | | 4.8 | | 152 | 116 | 399 | 6.9 | 20 |
| July 21-31 | -- | | | | | 11 | | 40 | 108 | 20 | | 6.5 | | 154 | 120 | 388 | 6.9 | 5 |
| Aug. 1-10 | -- | | | | | 11 | | 39 | 112 | 20 | | 7.8 | | 160 | 128 | 399 | 6.9 | 5 |
| Aug. 11-20 | -- | | | | | 15 | | 28 | 140 | 24 | | 8.5 | | 176 | 153 | 456 | 6.7 | 5 |
| Aug. 21-31 | -- | | | | | 13 | | 32 | 142 | 26 | | 9.2 | | 190 | 164 | 474 | 6.7 | 5 |
| Sept. 1-10 | -- | | | | | -- | | 20 | 130 | 23 | | 9.2 | | 156 | 140 | 451 | 6.7 | 10 |
| Sept. 11-20 | -- | | | | | -- | | 52 | 130 | 25 | | 3.3 | | 180 | 137 | 460 | 6.9 | 13 |
| Sept. 21-30 | -- | | | | | -- | | 48 | 137 | 30 | | 3.5 | | 190 | 151 | 490 | 6.9 | 15 |
| Average | -- | | | | | 12 | | 33 | 98 | 18 | | 5.4 | | 134 | 107 | 350 | 6.8 | 10 |

BEAVER RIVER BASIN--Continued

BEAVER RIVER AT NEW BRIGHTON, PA.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

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

## MUSKINGUM RIVER BASIN

### MUSKINGUM RIVER AT McCONNELSVILLE, OHIO

LOCATION.--At bridge on State Route 37 at north edge of McConnelsville, Morgan County, 0.5 mile upstream from gaging station and dam 7, and 3 miles downstream from Oilspring Run.
DRAINAGE AREA.--7,411 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
Water temperatures: October 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 1,210 ppm Nov. 1-10; minimum, 188 ppm Feb. 21-28.
Hardness: Maximum, 604 ppm Nov. 1-10; minimum, 118 ppm Feb. 21-28.
Specific conductance: Maximum daily, 2,660 micromhos, Nov. 9; minimum daily, 249 micromhos Dec. 8.
Water temperatures: Maximum, 85°F July 18, 19, Aug. 8; minimum, freezing point Feb. 2.
REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed: Unfiltered | Oxygen consumed: Filtered |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 1-10, 1950 . | 1,286 | 5.2 | 0.07 | 0.00 | 0.0 | 119 | 18 | 80 | | 126 | 123 | 220 | 0.4 | 1.8 | 681 | 371 | 268 | 1,130 | 7.9 | 4 | 3.1 | 2.8 |
| Oct. 11-20 ..... | 1,480 | 6.7 | .08 | | | 162 | 19 | 115 | | 146 | 140 | 330 | .6 | 2.5 | 936 | 484 | 364 | 1,500 | 7.7 | 6 | 3.0 | 2.6 |
| Oct. 21-31 ..... | 1,155 | 3.3 | .07 | | | 176 | 22 | 124 | | 150 | 140 | 375 | .7 | 3.0 | 1,020 | 532 | 409 | 1,640 | 7.6 | 5 | 3.3 | 2.8 |
| Nov. 1-10 ..... | 1,763 | 4.6 | .12 | | | 212 | 18 | 158 | | 152 | 150 | 470 | .7 | 3.4 | 1,210 | 604 | 479 | 1,960 | 7.5 | 6 | 3.3 | 2.9 |
| Nov. 11-20 ..... | 2,461 | 7.6 | .08 | | | 136 | 18 | 94 | | 128 | 129 | 265 | .6 | 3.4 | 784 | 412 | 307 | 1,270 | 7.6 | 5 | 3.5 | 2.8 |
| Nov. 21-30 ..... | 7,588 | 7.8 | .07 | | | 74 | 12 | 39 | | 94 | 87 | 104 | .3 | 3.3 | 404 | 232 | 155 | 667 | 7.6 | 5 | 5.4 | 3.3 |
| Dec. 1-10 ..... | 27,340 | 7.4 | .06 | | | 48 | 8.7 | 23 | | 70 | 71 | 50 | .3 | 3.3 | 256 | 156 | 98 | 417 | 7.5 | 3 | 13 | 2.9 |
| Dec. 11-20 ..... | 17,220 | 9.5 | .11 | | | 52 | 10 | 19 | 2.1 | 86 | 72 | 50 | .1 | 3.6 | 274 | 172 | 100 | 452 | 7.7 | 5 | — | -- |
| Dec. 21-31 ..... | 5,102 | 9.0 | .06 | | | 79 | 15 | 35 | 2.4 | 122 | 101 | 94 | .3 | 2.8 | 420 | 260 | 159 | 698 | 7.7 | 5 | — | -- |
| Jan. 1-10, 1951.. | 25,220 | 8.0 | .04 | | | 51 | 11 | 24 | | 80 | 70 | 58 | .2 | 3.9 | 276 | 172 | 107 | 450 | 7.4 | 7 | -- | -- |
| Jan. 11-20 ..... | 27,170 | 7.6 | .09 | | | 40 | 9.2 | 13 | 2.1 | 65 | 66 | 34 | .2 | 4.6 | 216 | 138 | 84 | 358 | 7.2 | 7 | — | — |
| Jan. 21-31 ..... | 14,220 | 8.1 | .05 | | | 51 | 11 | 20 | 2.1 | 84 | 78 | 46 | .2 | 3.9 | 271 | 174 | 104 | 446 | 7.3 | 5 | -- | -- |
| Feb. 1-10 ..... | 8,185 | 8.9 | .05 | | | 65 | 13 | 28 | 2.1 | 97 | 92 | 74 | .2 | 2.9 | 356 | 214 | 136 | 572 | 7.4 | 5 | -- | -- |
| Feb. 11-20 ..... | 32,880 | 7.0 | .05 | | | 37 | 8.3 | 14 | 2.3 | 60 | 55 | 33 | .2 | 3.6 | 200 | 126 | 77 | 337 | 7.3 | 7 | -- | -- |
| Feb. 21-28 ..... | 34,320 | 7.6 | .03 | | | 34 | 8.3 | 11 | 2.4 | 59 | 53 | 24 | .2 | 4.2 | 188 | 118 | 71 | 306 | 7.5 | 5 | -- | -- |
| Mar. 1-10 ..... | 23,910 | 8.6 | .03 | | | 43 | 9.2 | 14 | 2.3 | 72 | 69 | 34 | .2 | 3.1 | 229 | 146 | 86 | 375 | 7.4 | 5 | -- | -- |
| Mar. 11-20 ..... | 20,650 | 8.2 | .04 | | | 43 | 9.2 | 17 | 1.9 | 74 | 69 | 44 | .2 | 2.4 | 249 | 158 | 97 | 419 | 7.4 | 5 | -- | -- |
| Mar. 21-31 ..... | 23,350 | 7.0 | .08 | | | 42 | 10 | 15 | 1.9 | 70 | 68 | 36 | .1 | 3.4 | 237 | 147 | 89 | 385 | 7.3 | 4 | -- | -- |
| Apr. 1-10 ..... | 20,600 | 7.4 | .05 | | | 43 | 9.6 | 13 | 2.1 | 75 | 67 | 32 | .1 | 2.8 | 228 | 146 | 84 | 370 | 7.7 | 4 | -- | -- |
| Apr. 11-20 ..... | 18,150 | 7.7 | .14 | | | 46 | 11 | 15 | 2.1 | 82 | 70 | 36 | .1 | 2.8 | 252 | 159 | 93 | 401 | 7.7 | 3 | -- | -- |
| Apr. 21-30 ..... | 12,950 | 9.4 | .02 | | | 57 | 11 | 22 | 1.9 | 92 | 77 | 53 | .2 | 2.7 | 297 | 186 | 112 | 494 | 7.6 | 3 | -- | -- |
| May 1-10 ..... | 10,320 | 6.1 | .02 | | | 53 | 12 | 21 | 2.1 | 96 | 81 | 47 | .2 | 1.0 | 292 | 182 | 103 | 467 | 7.7 | 4 | -- | -- |
| May 11-20 ..... | 8,093 | 7.7 | .03 | | | 62 | 11 | 24 | 2.3 | 106 | 85 | 59 | .2 | 2.9 | 317 | 203 | 113 | 548 | 7.7 | 4 | -- | -- |
| May 21-31 ..... | 4,237 | 7.9 | .02 | | | 88 | 15 | 42 | 2.5 | 126 | 104 | 113 | .3 | 2.5 | 456 | 281 | 178 | 787 | 7.8 | 3 | -- | -- |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| June 1-10..... | 3,221 | 7.0 | .01 | | | 107 | 16 | 60 | 7.1 | 138 | 109 | 168 | .5 | 2.2 | 582 | 334 | 220 | 983 | 7.8 | 3 | -- | -- |
| June 11-20 ..... | 3,493 | 8.1 | .03 | | | 111 | 16 | 65 | 7.2 | 130 | 116 | 188 | .2 | 3.3 | 626 | 344 | 236 | 1,040 | 7.6 | 6 | -- | -- |
| June 21-30 ..... | 5,000 | 8.4 | .04 | | | 96 | 15 | 56 | 4.8 | 113 | 110 | 155 | .2 | 3.6 | 542 | 302 | 258 | 906 | 7.6 | 6 | -- | -- |
| July 1-10..... | 6,245 | 11 | .01 | | | 66 | 13 | 35 | 7.9 | 100 | 85 | 89 | .2 | 2.6 | 360 | 220 | 136 | 632 | 7.2 | 7 | -- | -- |
| July 11-20 ..... | 2,957 | 8.8 | .01 | | | 89 | 14 | 50 | 8.5 | 126 | 99 | 131 | .2 | 2.6 | 481 | 280 | 176 | 847 | 7.5 | 7 | -- | -- |
| July 21-31 ..... | 2,843 | 7.7 | .02 | | | 120 | 16 | 77 | 14 | 129 | 113 | 222 | .4 | 3.1 | 660 | 365 | 260 | 1,170 | 7.5 | 7 | -- | -- |
| Aug. 1-10..... | 1,712 | 9.9 | .01 | | | 115 | 20 | 80 | 6.5 | 124 | 119 | 222 | .6 | 2.5 | 686 | 370 | 268 | 1,130 | 7.7 | 7 | -- | -- |
| Aug. 11-20 ..... | 1,176 | 7.6 | .01 | | | 122 | 24 | 86 | 5.5 | 140 | 117 | 247 | .8 | 2.5 | 727 | 404 | 288 | 1,250 | 7.7 | 5 | -- | -- |
| Aug. 21-31 ..... | 946 | 8.7 | .01 | | | 174 | 28 | 134 | 6.5 | 136 | 138 | 405 | .8 | 2.5 | 1,016 | 548 | 438 | 1,740 | 7.6 | 5 | -- | -- |
| Sept. 1-10 ..... | 1,231 | 7.5 | .01 | | | 180 | 25 | 150 | 7.0 | 128 | 135 | 460 | .8 | 2.0 | 1,094 | 554 | 447 | 1,880 | 7.6 | 5 | -- | -- |
| Sept. 11-20 .... | 1,499 | 4.4 | .02 | | | 187 | 25 | 150 | 6.5 | 110 | 151 | 460 | .8 | 2.5 | 1,110 | 572 | 479 | 1,920 | 7.4 | 5 | -- | -- |
| Sept. 21-30 .... | 1,112 | 2.0 | .01 | | | 174 | 23 | 138 | 6.5 | 108 | 157 | 422 | 1.0 | 2.5 | 1,048 | 530 | 440 | 1,790 | 7.7 | 5 | -- | -- |
| Average ..... | 10,400 | 7.4 | 0.05 | | | 93 | 15 | 59 | | 105 | 99 | 162 | 0.4 | 2.9 | 527 | 294 | 208 | 882 | -- | 5 | -- | -- |

MUSKINGUM RIVER BASIN--Continued

MUSKINGUM RIVER AT McCONNELSVILLE, OHIO--Continued

Temperature (°F) of water, water year October 1950 to September 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 68 | 68 | 38 | 35 | 35 | 45 | 49 | 67 | 72 | 77 | 84 | 82 |
| 2 | 69 | 62 | 38 | 42 | 32 | 45 | 48 | 68 | 75 | 77 | 83 | 80 |
| 3 | 70 | 84 | 37 | 42 | 34 | 46 | 46 | -- | 76 | 75 | 82 | 81 |
| 4 | 67 | 64 | 40 | 38 | 34 | 46 | 45 | 69 | -- | 77 | 81 | 81 |
| 5 | 67 | 61 | 41 | 39 | 35 | 47 | 46 | 67 | 76 | 75 | 81 | 80 |
| 6 | 68 | 60 | 41 | 38 | 35 | 47 | 48 | 65 | 77 | 75 | -- | 78 |
| 7 | 68 | 60 | 42 | 38 | 34 | 49 | 50 | 63 | 75 | 75 | 84 | 77 |
| 8 | 69 | 52 | 40 | 36 | 33 | 49 | 51 | 63 | 77 | 78 | 85 | 76 |
| 9 | 68 | 56 | 38 | 33 | 35 | 49 | 53 | 64 | 77 | 76 | 80 | 76 |
| 10 | 67 | 53 | 37 | 34 | 34 | 47 | 51 | 64 | 77 | 78 | 80 | 77 |
| 11 | 67 | 53 | 47 | 35 | 34 | 44 | 50 | 65 | 75 | 80 | 82 | 77 |
| 12 | 65 | 52 | 37 | 35 | 35 | 45 | 50 | 64 | 74 | 80 | 81 | 77 |
| 13 | 64 | 49 | 37 | 36 | 35 | 44 | 50 | 64 | 75 | 80 | 82 | 77 |
| 14 | 64 | 47 | 37 | 36 | 35 | 43 | 48 | 64 | 74 | 79 | 82 | 77 |
| 15 | 65 | 47 | 38 | 37 | 36 | 42 | 48 | 65 | 75 | 80 | 82 | 78 |
| 16 | 63 | 48 | 39 | 36 | 36 | 42 | 47 | 67 | 75 | 81 | 83 | 78 |
| 17 | 65 | 47 | 36 | 37 | 38 | 43 | 47 | 70 | 75 | 82 | 82 | 77 |
| 18 | 67 | 47 | 36 | 38 | 37 | 41 | 49 | 71 | 76 | 85 | 83 | 74 |
| 19 | 64 | 47 | 36 | 40 | 41 | 42 | 47 | 74 | 77 | 85 | 84 | 74 |
| 20 | 65 | 49 | 37 | 44 | 43 | 42 | 51 | 74 | 78 | 83 | 82 | 75 |
| 21 | 65 | 45 | 35 | 43 | 38 | 40 | 53 | 76 | 80 | 82 | 82 | 76 |
| 22 | 64 | 44 | 37 | 41 | 44 | 40 | 54 | 77 | 81 | 83 | 81 | 76 |
| 23 | 65 | 43 | 38 | 40 | 43 | 40 | 54 | 74 | 83 | 84 | 80 | 75 |
| 24 | 64 | 40 | 38 | 39 | 42 | 42 | 56 | 73 | 81 | 83 | 79 | 74 |
| 25 | 65 | 40 | 36 | 38 | 42 | 44 | 58 | 72 | 80 | 79 | 79 | 74 |
| 26 | 63 | 35 | 36 | 37 | 43 | 44 | 58 | 71 | 80 | 80 | 79 | 74 |
| 27 | 62 | 34 | 34 | 37 | 44 | 45 | 61 | 69 | 79 | 80 | 77 | 74 |
| 28 | 64 | 36 | 35 | 37 | 43 | 44 | 62 | 77 | 80 | 81 | 78 | 72 |
| 29 | 67 | 35 | 37 | 37 | -- | 49 | 64 | 67 | 79 | 80 | 78 | 73 |
| 30 | 65 | 38 | 36 | 36 | -- | 50 | 68 | 73 | 76 | 82 | 80 | 72 |
| 31 | 70 | -- | 35 | 35 | -- | 50 | -- | 68 | -- | 84 | 80 | -- |
| Average | 66 | 49 | 38 | 38 | 38 | 45 | 52 | 69 | 77 | 80 | 81 | 76 |

## 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.--2,143 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1951.
Water temperatures: October 1949 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 274 ppm Aug. 21-31; minimum, 76 ppm Apr. 1-10.
Hardness: Maximum, 128 ppm Aug. 21-31; minimum, 41 ppm Apr. 1-10.
Specific conductance: Maximum daily, 583 micromhos Aug. 28; minimum daily, 87.7 micromhos Feb. 3.
Water temperatures: Maximum, 86°F on several days in July and August; minimum, freezing point Nov. 26-28.
EXTREMES, 1949-51.--Dissolved solids: Maximum, 274 ppm Aug. 21-31, 1951; minimum, 76 ppm Apr. 1-10, 1951.
Hardness: Maximum, 128 ppm Aug. 21-31, 1951; minimum, 41 ppm Apr. 1-10, 1951.
Specific conductance: Maximum daily, 768 micromhos Oct. 16, 1949; minimum daily, 83.1 micromhos Feb. 3, 1950.
Water temperatures: Maximum, 86°F on several days in July and August, 1951; 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 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 1950 to September 1951 given in Water-Supply Paper 1205.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $CaCO_3$: Calcium, magnesium | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 1-10, 1950 | 572 | 9.6 | 0.02 | 18 | 8.0 | 23 | | 58 | 52 | 18 | 0.0 | 1.4 | 157 | 79 | 30 | 253 | 7.4 | 6 |
| Oct. 11-20 | 555 | 11 | .02 | 21 | 8.0 | 25 | | 61 | 62 | 17 | .0 | 1.0 | 174 | 85 | 35 | 283 | 7.7 | 4 |
| Oct. 21-31 | 793 | 12 | .02 | 20 | 10 | 23 | | 60 | 64 | 18 | .0 | 1.1 | 176 | 92 | 42 | 286 | 7.6 | 4 |
| Nov. 1-10 | 2,700 | 9.8 | .06 | 16 | 8.0 | 18 | | 47 | 51 | 13 | .1 | 2.6 | 141 | 72 | 34 | 228 | 7.5 | 5 |
| Nov. 11-20 | 1,050 | 9.6 | .05 | 16 | 9.0 | 14 | | 44 | 49 | 13 | .1 | 1.5 | 131 | 77 | 41 | 211 | 7.2 | 3 |
| Nov. 21-30 | 2,700 | 11 | .10 | 11 | 6.8 | 14 | | 35 | 40 | 10 | .1 | 1.5 | 108 | 56 | 27 | 167 | 7.2 | 3 |
| Dec. 1-10 | 11,400 | 8.9 | .10 | 8.8 | 4.9 | 11 | | 22 | 30 | 10 | .1 | 2.4 | 79 | 42 | 24 | 117 | 7.1 | 5 |
| Dec. 11-20 | 3,280 | -- | -- | -- | -- | -- | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Dec. 21-31 | 9,680 | 9.6 | .02 | 18 | 9.0 | 13 | | 39 | 60 | 11 | .0 | 1.9 | 138 | 82 | 50 | 216 | 7.2 | 3 |
| Jan. 1-10, 1951 | 1,430 | 8.3 | .03 | 17 | 7.3 | 17 | | 38 | 61 | 9.8 | .0 | 1.7 | 143 | 72 | 41 | 236 | 7.2 | 4 |
| Jan. 11-20 | 5,280 | 8.2 | .13 | 13 | 5.3 | 12 | | 28 | 45 | 6.5 | .1 | 1.9 | 110 | 55 | 31 | 174 | 6.8 | 3 |
| Jan. 21-31 | 2,560 | 8.2 | .16 | 12 | 4.9 | 10 | | 26 | 40 | 5.2 | .1 | 1.7 | 95 | 49 | 29 | 156 | 6.8 | 3 |
| Feb. 1-10 | 14,700 | 7.4 | .18 | 9.2 | 4.6 | 7.1 | | 19 | 32 | 4.5 | .1 | 2.2 | 79 | 42 | 26 | 114 | 6.8 | 7 |
| Feb. 11-20 | 3,270 | 8.7 | .12 | 12 | 5.1 | 8.6 | 2.0 | 24 | 44 | 4.8 | .0 | 2.0 | 101 | 51 | 31 | 158 | 7.1 | 3 |
| Feb. 21-28 | 6,520 | 9.2 | .12 | 11 | 4.9 | 8.0 | 1.8 | 23 | 40 | 3.8 | .0 | 1.8 | 93 | 48 | 29 | 145 | 7.1 | 3 |
| Mar. 1-10 | 5,470 | 8.0 | .10 | 10 | 4.4 | 7.3 | 2.0 | 24 | 37 | 3.5 | .0 | 1.2 | 87 | 44 | 23 | 134 | 7.1 | 3 |
| Mar. 11-20 | 5,540 | 8.6 | .08 | 10 | 4.9 | 6.6 | 1.7 | 22 | 38 | 3.2 | .0 | 1.0 | 87 | 46 | 27 | 134 | 7.0 | 3 |
| Mar. 21-31 | 5,220 | 8.7 | .12 | 10 | 4.9 | 7.9 | | 22 | 37 | 2.9 | .1 | 1.7 | 86 | 45 | 27 | 136 | 7.1 | 3 |
| Apr. 1-10 | 6,480 | 8.7 | .12 | 9.6 | 4.1 | 5.5 | 1.4 | 22 | 32 | 2.1 | .1 | 1.0 | 76 | 41 | 23 | 122 | 6.9 | 3 |
| Apr. 11-20 | 4,970 | 12 | .02 | 11 | 5.6 | 7.3 | 3.7 | 28 | 40 | 3.1 | .0 | 1.3 | 100 | 51 | 38 | 151 | 7.5 | 2 |
| Apr. 21-31 | 1,890 | 11 | .02 | 14 | 6.6 | 11 | 4.4 | 31 | 53 | 6.1 | .0 | 1.2 | 118 | 62 | 37 | 197 | 7.5 | 2 |

BIG SANDY RIVER BASIN--Continued

LEVISA FORK AT PAINTSVILLE, KY.--Continued

Chemical analyses, in parts per million, water year October 1950 to September 1951--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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| May 1-10, 1951 | 6,600 | 11 | 0.02 | 11 | 5.3 | 7.3 | 4.1 | 28 | 41 | 3.6 | 0.1 | 2.0 | 93 | 49 | 26 | 150 | 7.5 | 3 |
| May 11-20 | 1,870 | 11 | .02 | 13 | 6.6 | 9.6 | 4.2 | 35 | 46 | 4.4 | .1 | 1.2 | 109 | 59 | 31 | 177 | 7.6 | 3 |
| May 21-31 | 1,250 | 11 | .03 | 19 | 8.5 | 16 | 5.3 | 49 | 67 | 7.5 | .0 | 1.6 | 155 | 82 | 42 | 255 | 7.9 | 3 |
| June 1-10 | 2,860 | 13 | .03 | 13 | 5.1 | 8.3 | 4.4 | 35 | 41 | 4.2 | .0 | 2.4 | 101 | 54 | 25 | 164 | 7.7 | 3 |
| June 11-20 | 1,970 | 11 | .03 | 11 | 5.8 | 8.0 | 3.8 | 36 | 34 | 5.2 | .1 | 1.6 | 89 | 52 | 22 | 161 | 7.7 | 5 |
| June 21-30 | 474 | 9.4 | .02 | 17 | 7.8 | 16 | 4.8 | 50 | 54 | 10 | .1 | 1.0 | 138 | 74 | 34 | 241 | 7.8 | 3 |
| July 1-10 | 617 | 7.5 | .06 | 20 | 8.7 | 16 | 5.6 | 46 | 72 | 10 | .1 | 1.5 | 159 | 86 | 48 | 270 | 8.0 | 4 |
| July 11-20 | 370 | 9.5 | .02 | 21 | 8.7 | 18 | 5.7 | 54 | 69 | 10 | .1 | 1.1 | 165 | 88 | 44 | 283 | 7.9 | 4 |
| July 21-31 | 398 | 8.9 | .05 | 20 | 8.7 | 20 | 6.7 | 62 | 62 | 12 | .1 | 1.0 | 160 | 86 | 35 | 280 | 8.0 | 5 |
| Aug. 1-10 | 170 | 5.5 | .04 | 20 | 9.0 | 20 | 3.1 | 58 | 63 | 16 | .1 | 1.0 | 176 | 87 | 39 | 283 | 7.4 | 3 |
| Aug. 11-20 | 185 | 4.0 | .04 | 23 | 10 | 22 | 3.3 | 64 | 72 | 19 | .0 | .6 | 198 | 99 | 46 | 321 | 7.4 | 3 |
| Aug. 21-31 | 89 | 7.3 | .04 | 29 | 14 | 36 | 3.9 | 71 | 96 | 38 | .1 | .8 | 274 | 128 | 72 | 442 | 7.7 | 3 |
| Sept. 1-10 | 290 | 10 | .02 | 26 | 13 | 26 | 4.1 | 59 | 102 | 22 | .0 | 1.4 | 238 | 120 | 70 | 390 | 7.4 | 5 |
| Sept. 11-20 | 581 | 7.4 | .02 | 22 | 10 | 18 | 4.1 | 53 | 77 | 10 | .0 | 2.0 | 182 | 96 | 53 | 291 | 7.6 | 6 |
| Sept. 21-30 | 287 | 11 | .04 | 22 | 11 | 20 | 4.7 | 53 | 80 | 17 | .0 | 1.2 | 190 | 100 | 57 | 308 | 7.5 | 7 |
| Average | 2,884 | 9.3 | 0.06 | 16 | 7.4 | 16 | | 41 | 54 | 10 | 0.1 | 1.5 | 134 | 70 | 37 | 218 | -- | 4 |

BIG SANDY RIVER BASIN--Continued

LEVISA FORK AT PAINTSVILLE, KY.--Continued

Temperature (°F) of water, water year October 1950 to September 1951
(Averages of twice-daily temperature measurements at approximately 7 a.m. and 5 p.m.)

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

## SCIOTO RIVER BASIN

### SCIOTO RIVER NEAR PROSPECT, OHIO

LOCATION.--At gaging station at Hoskins Bridge, Delaware County, 1¼ 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 to September 1951.
EXTREMES, April to September 1951.--Sediment concentrations: Maximum daily, 758 ppm June 9; minimum daily, 2 ppm June 4, 5.
Sediment loads: Maximum daily, 2,020 tons June 9; minimum daily, less than 0.50 ton on some days in June, July, and September.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Suspended sediment, April to September 1951

| 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 | -- | -- | -- | 537 | 61 | 88 | 101 | 10 | 3 |
| 2 | -- | -- | -- | 374 | 64 | 65 | 95 | 8 | 2 |
| 3 | -- | -- | -- | 380 | 65 | a 75 | 87 | 5 | 1 |
| 4 | -- | -- | -- | 756 | 300 | a 600 | 86 | 2 | (t) |
| 5 | -- | -- | -- | 635 | 190 | s 344 | 78 | 2 | (t) |
| 6 | -- | -- | -- | 346 | 55 | 51 | 75 | 4 | 1 |
| 7 | -- | -- | -- | 252 | 28 | 19 | 72 | 4 | 1 |
| 8 | -- | -- | -- | 205 | 24 | 13 | 93 | 20 | s 13 |
| 9 | -- | -- | -- | 178 | 28 | 13 | 945 | 758 | s 2,020 |
| 10 | -- | -- | -- | 170 | 20 | 9 | 756 | 504 | s 1,060 |
| 11 | -- | -- | -- | 352 | 19 | s 20 | 343 | 178 | s 182 |
| 12 | -- | -- | -- | 1,040 | 156 | s 452 | 182 | 68 | 33 |
| 13 | 1,300 | 66 | 232 | 1,160 | 176 | 551 | 152 | 50 | 20 |
| 14 | 1,560 | 64 | 270 | 735 | 72 | 143 | 156 | 43 | 18 |
| 15 | 1,860 | 92 | 462 | 387 | 34 | 36 | 125 | 32 | 11 |
| 16 | 1,800 | 77 | 374 | 281 | 20 | 15 | 109 | 33 | 10 |
| 17 | 1,080 | 46 | 134 | 225 | 15 | 9 | 88 | 33 | 8 |
| 18 | 695 | 21 | 39 | 190 | 8 | 4 | 72 | 28 | 5 |
| 19 | 537 | 18 | 26 | 164 | 13 | 6 | 69 | 33 | 6 |
| 20 | 428 | 17 | 20 | 154 | 14 | 6 | 193 | 133 | 69 |
| 21 | 349 | 17 | 16 | 347 | 200 | a 260 | 90 | 62 | 15 |
| 22 | 355 | 16 | 15 | 715 | 420 | a 850 | 100 | 84 | 23 |
| 23 | 518 | 9 | 13 | 410 | 94 | 104 | 111 | 49 | 15 |
| 24 | 494 | 20 | 27 | 257 | 33 | 23 | 132 | 35 | 12 |
| 25 | 380 | 20 | 21 | 190 | 24 | 12 | 150 | 40 | 16 |
| 26 | 331 | 16 | 14 | 152 | | | 109 | 17 | 5 |
| 27 | 303 | 12 | 10 | 143 | | | 90 | 18 | 4 |
| 28 | 281 | 11 | 8 | 141 | 10 | 4 | 111 | 19 | 6 |
| 29 | 364 | 17 | 17 | 147 | | | 106 | 29 | 8 |
| 30 | 655 | 88 | s 155 | 137 | | | 104 | 25 | 7 |
| 31 | -- | -- | -- | 116 | | | -- | -- | -- |
| Total- | b 13,290 | -- | b 1,853 | 11,276 | -- | 3,792 | 4,980 | -- | 3,575 |

s Computed by subdividing day.
t Less than 0.50 ton.
a Computed from partly estimated concentration graph.
b Total for period Apr. 13-30.

SCIOTO RIVER BASIN--Continued

SCIOTO RIVER NEAR PROSPECT, OHIO--Continued

Suspended sediment, April to September 1951--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 | 121 | 18 | 6 | 20 | | | 16 | | |
| 2 | 118 | 22 | 7 | 19 | | | 13 | | |
| 3 | 95 | 22 | 6 | 20 | | | 12 | 17 | 1 |
| 4 | 76 | 22 | 5 | 22 | 21 | 1 | 12 | | |
| 5 | 69 | 20 | 4 | 20 | | | 12 | | |
| 6 | 56 | 33 | 5 | 17 | | | 13 | | |
| 7 | 51 | 41 | 6 | 29 | 36 | 3 | 14 | 11 | (t) |
| 8 | 44 | 14 | 2 | 24 | 32 | 2 | 12 | | |
| 9 | 37 | 7 | 1 | 20 | 26 | 1 | 12 | | |
| 10 | 35 | 7 | 1 | 19 | 19 | 1 | 13 | 23 | 1 |
| 11 | 51 | 13 | 2 | 19 | | | 28 | 49 | 4 |
| 12 | 104 | 38 | 11 | 18 | | | 17 | 6 | (t) |
| 13 | 68 | 12 | 2 | 17 | 34 | 2 | 17 | 14 | 1 |
| 14 | 52 | 4 | 1 | 17 | | | 27 | 6 | (t) |
| 15 | 42 | 5 | 1 | 17 | | | 18 | | |
| 16 | 36 | 5 | (t) | 17 | | | 15 | | |
| 17 | 34 | 5 | (t) | 17 | | | 14 | | |
| 18 | 32 | 9 | 1 | 16 | 20 | 1 | 14 | | |
| 19 | 32 | 15 | 1 | 16 | | | 13 | 5 | (t) |
| 20 | 30 | 20 | 2 | 16 | | | 13 | | |
| 21 | 29 | 34 | 3 | 15 | | | 12 | | |
| 22 | 28 | 26 | 2 | 15 | | | 13 | | |
| 23 | 34 | 17 | 2 | 15 | 27 | 1 | 16 | | |
| 24 | 35 | 19 | 2 | 15 | | | 14 | | |
| 25 | 36 | 20 | 2 | 14 | | | 14 | | |
| 26 | 33 | 16 | 1 | 14 | | | 14 | | |
| 27 | 29 | 14 | 1 | 14 | | | 15 | 6 | (t) |
| 28 | 27 | 25 | 2 | 14 | 17 | 1 | 14 | | |
| 29 | 24 | 27 | 2 | 14 | | | 12 | | |
| 30 | 21 | 26 | 1 | 14 | | | 12 | | |
| 31 | 21 | 25 | 1 | 15 | | | -- | -- | -- |
| Total | 1,500 | -- | 84 | 539 | -- | 38 | 441 | -- | 16 |

Total discharge for period (cfs-days) ..... 32,026
Total load for period (tons) ..... 9,358

t Less than 0.50 ton.

SCIOTO RIVER BASIN--Continued

OLENTANGY RIVER AT DELAWARE, OHIO

LOCATION.--At Stone Mill Bridge, three-quarters of a mile 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: June 1946 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 85°F July 27, Aug. 29; minimum, freezing point on several days in January.
EXTREMES, 1946-51.--Water temperatures: Maximum, 88°F Aug. 27, 1948, July 5, 6, 8, 1949; minimum, freezing point on many days during most winters.
REMARKS.--Temperatures given are once-daily measurements. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Temperature (°F) of water, water year October 1950 to September 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 72 | 63 | 33 | 33 | 33 | 44 | 46 | 78 | 72 | 71 | 81 | 77 |
| 2 | 68 | 63 | 33 | 33 | 33 | 43 | 44 | 77 | 77 | 74 | 81 | 78 |
| 3 | 63 | 53 | 40 | 44 | 33 | 44 | 44 | 69 | 75 | 75 | 78 | 74 |
| 4 | 63 | 50 | 37 | 39 | 33 | 49 | 45 | 60 | 68 | 78 | 76 | 74 |
| 5 | 63 | 48 | 37 | 39 | 33 | 49 | 45 | 60 | 67 | 74 | 74 | 74 |
| 6 | 63 | 53 | 40 | 38 | 33 | 49 | 47 | 65 | 67 | 76 | 69 | 74 |
| 7 | 63 | 53 | 39 | 34 | 33 | 50 | 51 | 65 | 72 | 76 | 70 | 70 |
| 8 | 62 | 53 | 33 | 33 | 33 | 50 | 51 | 65 | 72 | 76 | 72 | 71 |
| 9 | 58 | 50 | 33 | 32 | 33 | 45 | 51 | 65 | 70 | 76 | 75 | 67 |
| 10 | 58 | 50 | 33 | 32 | 33 | 45 | 52 | 59 | 70 | 80 | 75 | 73 |
| 11 | 57 | 43 | 33 | 32 | 33 | 43 | 52 | 61 | 78 | 80 | 80 | 74 |
| 12 | 57 | 43 | 33 | 32 | 33 | 45 | 51 | 67 | 75 | 80 | 80 | 75 |
| 13 | 56 | 40 | 33 | 32 | 35 | 45 | 48 | 67 | 69 | 80 | 81 | 72 |
| 14 | 56 | 44 | 33 | 32 | 34 | 42 | 47 | 67 | 71 | 80 | 82 | 73 |
| 15 | 59 | 44 | 33 | 33 | 35 | 42 | 48 | 70 | 71 | 80 | 82 | 74 |
| 16 | 59 | 44 | 33 | 33 | 47 | 42 | 44 | 71 | 73 | 80 | 79 | 73 |
| 17 | 60 | 46 | 33 | 35 | 47 | 43 | 44 | 68 | 73 | 80 | 77 | 71 |
| 18 | 60 | 46 | 33 | 39 | 47 | 43 | 45 | 72 | 74 | 80 | 77 | 70 |
| 19 | 60 | 44 | 33 | 45 | 48 | 42 | 49 | 71 | 75 | 80 | 75 | 68 |
| 20 | 61 | 44 | 33 | 45 | 45 | 43 | 53 | 71 | 71 | 77 | 82 | 68 |
| 21 | 62 | 40 | 33 | 40 | 42 | 43 | 54 | 71 | 70 | 77 | 76 | 72 |
| 22 | 62 | 40 | 33 | 35 | 42 | 43 | 54 | 71 | 73 | 78 | 74 | 74 |
| 23 | 58 | 40 | 33 | 33 | 43 | 47 | 51 | 64 | 75 | 79 | 73 | 68 |
| 24 | 58 | 35 | 33 | 33 | 45 | 47 | 54 | 70 | 76 | 80 | 73 | 67 |
| 25 | 55 | 33 | 33 | 33 | 45 | 47 | 54 | 72 | 75 | 80 | 72 | 66 |
| 26 | 55 | 33 | 33 | 33 | 45 | 44 | 54 | 72 | 74 | 80 | 70 | 67 |
| 27 | 58 | 33 | 33 | 33 | 45 | 46 | 60 | 61 | 74 | 85 | 70 | 62 |
| 28 | 60 | 33 | 33 | 33 | 41 | 45 | 65 | 61 | 76 | 80 | 74 | 60 |
| 29 | 60 | 33 | 33 | 33 | -- | 48 | 70 | 64 | 74 | 80 | 85 | 60 |
| 30 | 63 | 33 | 33 | 33 | -- | 47 | 70 | 69 | 71 | 82 | 79 | 59 |
| 31 | 63 | -- | 33 | 33 | -- | 47 | -- | 72 | -- | 83 | 80 | -- |
| Average | 60 | 44 | 34 | 35 | 39 | 45 | 51 | 68 | 73 | 79 | 77 | 70 |

## SCIOTO RIVER AT CHILLICOTHE, OHIO

LOCATION.--At bridge on U. S. Highway 23 at north edge of Chillicothe, Ross County, 500 feet upstream from gaging station, and 6½ miles upstream from Paint Creek.
DRAINAGE AREA.--3,847 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
Water temperatures: October 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 511 ppm Sept. 1-10; minimum, 182 ppm Feb. 11-20.
Hardness: Maximum, 350 ppm Aug. 21-31; minimum, 144 ppm Feb. 11-20.
Specific conductance: Maximum daily, 803 micromhos Sept. 4, 5; minimum daily, 245 micromhos Dec. 9.
Water temperatures: Maximum, 84°F July 18; minimum, freezing point on several days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $CaCO_3$: Calcium, magnesium | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 1-10, 1950 | 621 | 11 | 0.09 | 69 | 27 | 29 | | 266 | 93 | 17 | 1.0 | 5.4 | 403 | 283 | 65 | 628 | 8.1 | 38 |
| Oct. 11-20 | 2,284 | 8.2 | .04 | 68 | 23 | 16 | | 222 | 96 | 7.8 | .8 | 5.0 | 359 | 264 | 82 | 546 | 7.3 | 23 |
| Oct. 21-31 | 519 | 11 | .06 | 78 | 28 | 26 | | 284 | 99 | 16 | 1.2 | 4.9 | 423 | 312 | 77 | 646 | 7.7 | 23 |
| Nov. 1-10 | 550 | 11 | .09 | 82 | 30 | 35 | | 306 | 108 | 24 | 1.7 | 4.2 | 457 | 328 | 77 | 705 | 7.8 | 30 |
| Nov. 11-20 | 1,548 | 9.5 | .06 | 71 | 26 | 20 | | 242 | 98 | 14 | .8 | 7.4 | 383 | 284 | 86 | 579 | 7.7 | 27 |
| Nov. 21-30 | 7,479 | 8.4 | .06 | 58 | 19 | 11 | | 190 | 78 | 8.0 | .6 | 10 | 282 | 222 | 67 | 438 | 7.8 | 25 |
| Dec. 1-10 | 23,180 | 7.6 | .05 | 42 | 14 | 7.4 | | 138 | 47 | 6.0 | .6 | 7.8 | 204 | 160 | 49 | 327 | 7.8 | 25 |
| Dec. 11-20 | 4,892 | 10 | .04 | 69 | 23 | 11 | | 242 | 70 | 8.5 | .4 | 9.2 | 330 | 268 | 68 | 514 | 7.6 | 17 |
| Dec. 21-31 | 2,325 | 13 | .10 | 79 | 28 | 9.6 | 2.1 | 276 | 84 | 11 | .5 | 9.0 | 380 | 314 | 86 | 705 | 7.9 | 8 |
| Jan. 1-10, 1951 | 15,530 | 7.1 | .02 | 57 | 19 | 9.3 | | 194 | 60 | 8.2 | .4 | 8.0 | 280 | 220 | 61 | 425 | 7.7 | 22 |
| Jan. 11-20 | 14,720 | 6.5 | .01 | 43 | 15 | 6.1 | | 148 | 46 | 6.0 | .3 | 4.8 | 213 | 170 | 48 | 333 | 7.9 | 15 |
| Jan. 21-31 | 4,975 | 8.7 | .03 | 66 | 22 | 7.3 | 1.7 | 228 | 68 | 7.5 | .3 | 9.8 | 312 | 256 | 68 | 502 | 7.7 | 12 |
| Feb. 1-10 | 2,410 | 9.5 | .04 | 77 | 26 | 11 | 2.7 | 250 | 93 | 10 | .3 | 13 | 375 | 298 | 94 | 586 | 7.9 | 10 |
| Feb. 11-20 | 20,350 | 5.1 | .10 | 38 | 12 | 3.8 | 1.9 | 126 | 41 | 5.5 | .2 | 6.6 | 182 | 144 | 41 | 298 | 7.6 | 20 |
| Feb. 21-28 | 19,480 | 7.1 | .06 | 48 | 15 | 5.0 | 2.1 | 156 | 47 | 5.8 | .2 | 8.6 | 224 | 180 | 54 | 365 | 7.8 | 20 |
| Mar. 1-10 | 7,493 | 7.5 | .04 | 60 | 19 | 6.5 | 1.8 | 198 | 63 | 7.0 | .3 | 8.1 | 279 | 228 | 66 | 448 | 7.8 | 21 |
| Mar. 11-20 | 7,738 | 7.4 | .05 | 60 | 21 | 6.7 | 1.8 | 206 | 66 | 7.0 | .3 | 7.2 | 290 | 236 | 67 | 461 | 7.8 | 20 |
| Mar. 21-31 | 6,665 | 7.3 | .05 | 60 | 20 | 6.0 | 1.9 | 200 | 63 | 7.5 | .2 | 7.9 | 288 | 231 | 68 | 457 | 7.5 | 15 |
| Apr. 1-10 | 6,244 | 7.3 | .07 | 64 | 22 | 7.4 | 1.7 | 222 | 65 | 8.0 | .3 | 7.6 | 308 | 248 | 68 | 488 | 7.7 | 22 |
| Apr. 11-20 | 8,870 | 6.8 | .11 | 56 | 20 | 5.3 | 1.5 | 192 | 59 | 6.5 | .3 | 6.8 | 274 | 221 | 65 | 436 | 7.8 | 22 |
| Apr. 21-30 | 3,836 | 6.0 | .02 | 64 | | 9.1 | 2.5 | 224 | 68 | 8.8 | .2 | 7.4 | 311 | 252 | 67 | 493 | 7.6 | 8 |
| May 1-10 | 4,031 | 7.8 | .02 | 66 | 23 | 9.4 | 2.2 | 232 | 70 | 8.4 | .2 | 7.0 | 321 | 260 | 69 | 505 | 7.9 | 18 |
| May 11-20 | 2,690 | 5.3 | .02 | 68 | 23 | 9.3 | 2.7 | 238 | 72 | 9.0 | .4 | 5.6 | 324 | 262 | 69 | 515 | 7.8 | 14 |
| May 21-31 | 1,842 | 9.1 | .03 | 70 | 25 | 12 | 2.6 | a255 | 77 | 10 | .4 | 6.2 | 348 | 278 | 68 | 567 | 8.1 | 12 |

a Includes equivalent of 6 parts per million of carbonate ($CO_3$).

SCIOTO RIVER AT CHILLICOTHE, OHIO--Continued

*Chemical analyses, in parts per million, water year October 1950 to September 1951--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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| June 1-10, 1951 | 1,074 | 10 | 0.03 | 75 | 28 | 15 | 3.0 | a286 | 82 | 12 | 0.7 | 6.5 | 385 | 305 | 68 | 624 | 8.3 | 12 |
| June 11-20 | 1,319 | 7.0 | .01 | 72 | 27 | 15 | 5.6 | 261 | 87 | 12 | .8 | 6.4 | 372 | 289 | 77 | 602 | 7.9 | 9 |
| June 21-30 | 2,053 | 10 | .05 | 65 | 23 | 15 | 7.2 | a228 | 81 | 12 | .6 | 5.8 | 346 | 256 | 70 | 543 | 8.0 | 15 |
| July 1-10 | 1,569 | 12 | .03 | 68 | 25 | 12 | 5.9 | a249 | 72 | 11 | .6 | 8.8 | 355 | 272 | 68 | 560 | 8.0 | 15 |
| July 11-20 | 740 | 14 | .02 | 74 | 25 | 21 | 8.7 | 274 | 83 | 15 | 1.0 | 3.3 | 377 | 286 | 73 | 632 | 7.9 | 15 |
| July 21-31 | 583 | 9.2 | .02 | 73 | 28 | 21 | 9.3 | 281 | 91 | 16 | .9 | 2.9 | 391 | 298 | 67 | 654 | 7.9 | 18 |
| Aug. 1-10 | 405 | 10 | .02 | 79 | 28 | 27 | 10 | 295 | 96 | 21 | 1.1 | 2.5 | 423 | 313 | 70 | 703 | 7.9 | 25 |
| Aug. 11-20 | 342 | 14 | .36 | 79 | 36 | 34 | 5.2 | 336 | 107 | 27 | 2.2 | .5 | 480 | 344 | 70 | 765 | 8.0 | 30 |
| Aug. 21-31 | 308 | 11 | .06 | 81 | 36 | 38 | 4.1 | 333 | 119 | 33 | 2.2 | .5 | 500 | 350 | 77 | 798 | 8.0 | 25 |
| Sept. 1-10 | 306 | 17 | .06 | 80 | 35 | 41 | 7.2 | 332 | 121 | 31 | 2.4 | .5 | 511 | 344 | 71 | 782 | 8.1 | 20 |
| Sept. 11-20 | 367 | 13 | .04 | 74 | 31 | 38 | 6.3 | 289 | 119 | 28 | 2.2 | 2.0 | 462 | 313 | 75 | 722 | 8.1 | 20 |
| Sept. 21-30 | 310 | 12 | .05 | 81 | 30 | 33 | 5.1 | a302 | 110 | 27 | 2.2 | 2.6 | 460 | 327 | 78 | 720 | 7.9 | 24 |
| Average | 4,909 | 9.4 | 0.06 | 67 | 24 | 18 | | 242 | 80 | 13 | 0.8 | 6.1 | 350 | 266 | 68 | 555 | -- | 19 |

a Includes equivalent of 6 parts per million carbonate ($CO_3$).

SCIOTO RIVER BASIN--Continued

SCIOTO RIVER AT CHILLICOTHE, OHIO--Continued

Temperature (°F) of water, wtaer year October 1950 to September 1951

| Day | Oct. | Nov. | Dac. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 69 | 66 | 39 | 33 | 36 | 45 | 46 | 70 | 75 | 75 | 81 | 82 |
| 2 | 69 | 63 | 36 | 36 | (a) | 46 | 47 | 71 | 77 | 75 | 80 | 78 |
| 3 | 68 | 59 | 37 | 49 | (a) | 47 | 46 | 69 | 78 | 78 | 80 | 77 |
| 4 | 66 | 55 | 36 | 39 | (a) | 47 | 48 | 60 | 76 | 79 | 80 | 76 |
| 5 | 62 | 58 | 35 | 38 | 33 | 46 | 50 | 67 | 76 | 76 | 80 | 75 |
| 6 | 62 | 63 | 37 | 38 | 33 | 47 | 52 | 64 | 74 | 78 | 75 | 76 |
| 7 | 62 | 54 | 38 | 35 | 35 | 50 | 54 | 65 | 72 | 79 | 75 | 73 |
| 8 | 61 | 55 | 36 | 35 | 33 | 51 | 55 | 65 | 72 | 78 | 79 | 70 |
| 9 | 61 | 53 | 34 | 34 | 34 | 49 | 54 | 66 | 72 | 78 | 80 | 73 |
| 10 | 59 | 50 | 33 | 35 | 33 | 48 | 51 | 67 | 72 | 79 | -- | 72 |
| 11 | 59 | 49 | 35 | 36 | 35 | 45 | 49 | 65 | 72 | 78 | 82 | 74 |
| 12 | 60 | 47 | 35 | 36 | 35 | 46 | 48 | 65 | 72 | 79 | 80 | 76 |
| 13 | 59 | 45 | 35 | 36 | 37 | 48 | 49 | 66 | 72 | 79 | 80 | 74 |
| 14 | 60 | 44 | 36 | 36 | 34 | 44 | 46 | 67 | 71 | 79 | 80 | 72 |
| 15 | 62 | 45 | 36 | 35 | 34 | 40 | 48 | 68 | 73 | 81 | 80 | 70 |
| 16 | 62 | 48 | 37 | 33 | 35 | 41 | 48 | 70 | 74 | 82 | 80 | 72 |
| 17 | 62 | 45 | 35 | 34 | 37 | 42 | 47 | 75 | 74 | 83 | 79 | 72 |
| 18 | 64 | 44 | 35 | 38 | 39 | 45 | 47 | 75 | 75 | 64 | 79 | 72 |
| 19 | 64 | 47 | 35 | 42 | 41 | 43 | 48 | 76 | 78 | 83 | 80 | 72 |
| 20 | 63 | 48 | 35 | 44 | 43 | 40 | -- | 75 | 76 | 82 | 78 | 72 |
| 21 | 62 | 45 | 35 | 40 | 43 | 40 | 55 | 73 | 79 | 79 | 78 | 73 |
| 22 | 63 | 42 | 37 | 40 | 41 | 40 | 55 | 74 | 79 | 80 | 76 | 70 |
| 23 | 62 | 42 | 37 | 39 | 41 | 43 | 56 | 71 | 79 | 80 | 76 | 69 |
| 24 | 60 | 39 | 37 | 32 | 41 | 42 | 56 | 73 | 80 | 79 | 75 | 68 |
| 25 | 60 | 33 | 36 | 32 | 40 | 43 | 59 | 71 | 80 | 79 | 76 | 66 |
| 26 | 59 | 33 | 34 | 37 | 42 | 44 | 59 | 70 | 80 | 79 | 75 | 65 |
| 27 | 69 | 34 | 34 | 38 | 44 | 45 | 63 | 67 | 80 | 80 | 70 | 68 |
| 28 | 61 | 34 | 32 | 37 | 45 | 47 | 66 | 68 | 81 | 81 | 73 | 65 |
| 29 | 64 | 34 | 33 | 38 | -- | 50 | 69 | 64 | 78 | 81 | 75 | 62 |
| 30 | 64 | 36 | 35 | 36 | -- | 51 | 69 | 68 | 77 | 82 | 78 | 63 |
| 31 | 63 | -- | 36 | 35 | -- | 49 | -- | 69 | -- | 81 | 80 | -- |
| Average | 63 | 47 | 36 | 37 | b37 | 45 | 53 | 69 | 76 | 80 | 78 | 72 |

a No measurement; stream frozen over.
b Includes estimated temperature, 32°F, on missing days.

## LICKING RIVER BASIN

### 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.--Water temperatures October 1949 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 92°F July 19; minimum, freezing point on many days during November to February.
EXTREMES, 1949-51.--Water temperatures: Maximum, 92°F July 19, 1951; minimum, freezing point at times during both years.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Temperature (°F) of water, water year October 1950 to September 1951
/Mean of 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 | 63 | 61 | 34 | 34 | 32 | 46 | 49 | 67 | 70 | 77 | 80 | 76 |
| 2 | 64 | 61 | 40 | 36 | 32 | 45 | 48 | 64 | 72 | 76 | 78 | 76 |
| 3 | 64 | 58 | 44 | 40 | 32 | 48 | 46 | 66 | 74 | 78 | 78 | 74 |
| 4 | 63 | 54 | 44 | 43 | 32 | 48 | 44 | 66 | 74 | 77 | 74 | 71 |
| 5 | 60 | 52 | 42 | 42 | 32 | 48 | 44 | 64 | 74 | 74 | 76 | 74 |
| 6 | 60 | 50 | 42 | 40 | 33 | 48 | 46 | 61 | 72 | 73 | 75 | 75 |
| 7 | 60 | 50 | 40 | 38 | 33 | 50 | 50 | 58 | 71 | 72 | 76 | 72 |
| 8 | 60 | 52 | 36 | 44 | 32 | 52 | 50 | 56 | 70 | 74 | 78 | 68 |
| 9 | 58 | 52 | 36 | 33 | 33 | 50 | 51 | 58 | 68 | 74 | 76 | 69 |
| 10 | 58 | 50 | 36 | 33 | 33 | 48 | 50 | 60 | 68 | 75 | 75 | 70 |
| 11 | 58 | 53 | 36 | 35 | 34 | 46 | 49 | 60 | 68 | 76 | 78 | 76 |
| 12 | 58 | 42 | 36 | 34 | 38 | 44 | 48 | 54 | 67 | 78 | 76 | 72 |
| 13 | 57 | 43 | 35 | 35 | 41 | 42 | 48 | 61 | 68 | 78 | 76 | 73 |
| 14 | 58 | 39 | 37 | 38 | 41 | 40 | 48 | 62 | 67 | 78 | 78 | 72 |
| 15 | 58 | 44 | 38 | 40 | 42 | 39 | 50 | 63 | 68 | 78 | 80 | 70 |
| 16 | 58 | 48 | 36 | 41 | 42 | 40 | 50 | 64 | 66 | 78 | 76 | 68 |
| 17 | 58 | 48 | 34 | 40 | 43 | 40 | 49 | 66 | 71 | 80 | 70 | 67 |
| 18 | 59 | 43 | 34 | 42 | 42 | 42 | 50 | 68 | 72 | 84 | 74 | 66 |
| 19 | 59 | 45 | 33 | 44 | 44 | 43 | 52 | 70 | 70 | 91 | 76 | 66 |
| 20 | 60 | 46 | 32 | 46 | 46 | 43 | 52 | 70 | 72 | 91 | 75 | 67 |
| 21 | 60 | 38 | 34 | 45 | 47 | 42 | 54 | 70 | 72 | -- | 77 | 67 |
| 22 | 61 | 44 | 36 | 42 | 46 | 42 | 56 | 72 | 76 | -- | 75 | 68 |
| 23 | 62 | 44 | 34 | 42 | 43 | 43 | 56 | 68 | 76 | -- | 74 | 67 |
| 24 | 62 | 38 | 38 | 40 | 42 | 44 | 56 | 66 | 80 | -- | 70 | 64 |
| 25 | 61 | 34 | 34 | 38 | 41 | 44 | 60 | 67 | 77 | 81 | 70 | 64 |
| 26 | 58 | 32 | 36 | 36 | 44 | 44 | 60 | 66 | 76 | 79 | 71 | 66 |
| 27 | 58 | 32 | 32 | 37 | 45 | 44 | 62 | 63 | 83 | 79 | 70 | 68 |
| 28 | 60 | 32 | 32 | 38 | 44 | 46 | 64 | 64 | 81 | 82 | 71 | 64 |
| 29 | 60 | 33 | 34 | 38 | -- | 49 | 66 | 64 | 80 | 78 | 72 | 60 |
| 30 | 60 | 33 | 36 | 36 | -- | 50 | 66 | 65 | 78 | 79 | 74 | 62 |
| 31 | 60 | -- | 35 | 34 | -- | 50 | -- | 66 | -- | 80 | 76 | -- |
| Average | 60 | 45 | 36 | 39 | 39 | 45 | 52 | 64 | 73 | 79 | 75 | 69 |

## 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 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 86°F July 27; minimum, 33°F on several days in November, December, and February.
EXTREMES, 1949-51.--Water temperatures: Maximum, 86°F July 27, 1951; minimum, 33°F on several days in November and December 1950 and February 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Chemical analyses, in parts per million, October 1950 to August 1951

| 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 | Noncarbonate | | | |
| Oct. 11, 1950 | 1,400 | 3.2 | 0.06 | 52 | 5.9 | 2.6 | 2.2 | 166 | 17 | 3.0 | 0.1 | 5.1 | 178 | 154 | 18 | 304 | 7.7 | 40 |
| Nov. 7 | 149 | 3.9 | .03 | 74 | 9.0 | 2.1 | | 244 | 19 | 4.0 | .2 | .4 | 239 | 221 | 22 | 413 | 7.9 | 6 |
| Dec. 12 | 1,000 | 7.7 | .07 | 18 | 4.4 | .5 | | 56 | 14 | 1.9 | .0 | 1.2 | 80 | 62 | 17 | 134 | 7.6 | 5 |
| Jan. 16, 1951 | 9,320 | 4.7 | .38 | 31 | 1.7 | 4.2 | | 88 | 12 | 2.2 | .0 | 7.2 | 113 | 84 | 12 | 182 | 7.4 | 20 |
| Feb. 21 | 3,940 | 5.5 | .12 | 51 | 4.6 | 2.6 | | 152 | 17 | 1.4 | .1 | 9.2 | 175 | 147 | 21 | 290 | 7.5 | 11 |
| Mar. 27 | 710 | 4.6 | .04 | 62 | 5.3 | 10 | | 183 | 37 | 2.2 | .1 | 8.1 | 216 | 176 | 27 | 342 | 7.9 | 2 |
| Apr. 30 | 264 | .7 | .04 | 58 | 6.1 | 4.0 | 1.2 | 184 | 19 | 3.1 | .4 | 3.4 | 192 | 169 | 19 | 340 | 7.9 | 2 |
| June 5 | 38 | 2.7 | .07 | 54 | 7.8 | 4.9 | 2.6 | 174 | 24 | 5.0 | .3 | 4.9 | 191 | 166 | 24 | 337 | 7.8 | 4 |
| July 10 | 6.6 | 1.2 | .05 | 50 | 8.0 | 5.9 | 5.6 | 174 | 20 | 7.2 | .2 | 1.4 | 199 | 158 | 15 | 336 | 8.0 | 8 |
| Aug. 13 | 8.3 | 7.0 | .05 | 45 | 9.2 | 6.7 | 3.0 | 150 | 25 | 7.5 | .8 | 1.5 | 185 | 150 | 27 | 311 | 7.6 | 6 |

LICKING RIVER BASIN--Continued

SOUTH FORK LICKING RIVER AT CYNTHIANA, KY.--Continued

Temperature (°F) of water, water year October 1950 to September 1951
/Mean of 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 | 64 | 61 | 37 | 34 | 34 | 48 | 50 | 74 | 74 | 80 | 84 | 80 |
| 2 | 64 | 61 | 40 | 36 | 33 | 49 | 48 | 74 | 76 | 80 | 84 | 80 |
| 3 | 64 | 59 | 45 | 42 | 33 | 50 | 48 | 74 | 76 | 80 | 84 | 79 |
| 4 | 64 | 55 | 45 | 42 | 34 | 48 | 48 | 70 | 76 | 80 | 80 | 78 |
| 5 | 60 | 52 | 45 | 42 | 35 | 48 | 48 | 68 | 76 | 78 | 78 | 80 |
| 6 | 58 | 49 | 45 | 41 | 36 | 50 | 49 | 67 | 73 | 77 | 76 | 78 |
| 7 | 59 | 50 | 44 | 40 | 34 | 50 | 51 | 63 | 74 | 78 | 78 | 75 |
| 8 | 60 | 50 | 40 | 38 | 34 | 49 | 52 | 64 | 74 | 76 | 82 | 72 |
| 9 | 58 | 50 | 37 | 36 | 34 | 49 | 52 | 65 | 74 | 78 | 84 | 72 |
| 10 | 58 | 48 | 35 | 37 | 34 | 48 | 51 | 67 | 72 | 80 | 84 | 74 |
| 11 | 58 | 44 | 35 | 38 | 35 | 48 | 51 | 66 | 72 | 81 | 82 | 74 |
| 12 | 59 | 40 | 35 | 37 | 38 | 48 | 48 | 62 | 73 | 81 | 80 | 74 |
| 13 | 58 | 42 | 35 | 38 | 39 | 45 | 47 | 64 | 74 | 81 | 81 | 74 |
| 14 | 58 | 44 | 35 | 43 | 40 | 44 | 48 | 65 | 75 | 80 | 82 | 72 |
| 15 | 59 | 46 | 35 | 43 | 40 | 44 | 50 | 68 | 76 | 80 | 82 | 71 |
| 16 | 60 | 47 | 35 | 43 | 42 | 43 | 48 | 72 | 76 | 82 | 82 | 72 |
| 17 | 60 | 48 | 34 | 44 | 44 | 43 | 48 | 72 | 76 | 84 | 80 | 71 |
| 18 | 60 | 48 | 33 | 45 | 44 | 43 | 52 | 75 | 78 | 85 | 80 | 70 |
| 19 | 61 | 48 | 33 | 47 | 47 | 42 | 54 | 76 | 78 | 84 | 80 | 68 |
| 20 | 61 | 46 | 34 | 48 | 50 | 42 | 52 | 76 | 80 | 83 | 80 | 69 |
| 21 | 61 | 40 | 34 | 44 | 49 | 44 | 57 | 77 | 80 | 82 | 79 | 71 |
| 22 | 62 | 44 | 34 | 41 | 48 | 44 | 58 | 77 | 80 | 82 | 79 | 70 |
| 23 | 61 | 46 | 36 | 40 | 46 | 44 | 56 | 74 | 80 | 83 | 78 | 69 |
| 24 | 60 | 36 | 37 | 40 | 45 | 45 | 58 | 70 | 82 | 82 | 78 | 68 |
| 25 | 60 | 34 | 36 | 38 | 46 | 44 | 63 | 70 | 83 | 84 | 78 | 68 |
| 26 | 58 | 33 | 36 | 36 | 47 | 43 | 65 | 70 | 82 | 84 | 76 | 69 |
| 27 | 58 | 34 | 33 | 38 | 48 | 44 | 66 | 67 | 82 | 86 | 74 | 68 |
| 28 | 58 | 34 | 34 | 38 | 48 | 47 | 68 | 67 | 82 | 85 | 74 | 65 |
| 29 | 58 | 34 | 34 | 36 | -- | 51 | 70 | 66 | 82 | 84 | 74 | 62 |
| 30 | 60 | 35 | 34 | 35 | -- | 52 | 72 | 69 | 81 | 84 | 75 | 63 |
| 31 | 61 | -- | 34 | 35 | -- | 50 | -- | 71 | -- | 85 | 77 | -- |
| Average | 60 | 45 | 37 | 40 | 41 | 46 | 54 | 70 | 77 | 82 | 80 | 72 |

LICKING RIVER BASIN--Continued

LICKING RIVER AT BUTLER, KY.

LOCATION.--At bridge on U. S. Highway 27, at Butler, Pendleton County, 0.3 mile downstream from Lick Creek, 4.4 miles upstream from Grassy Creek, and 12.8 miles downstream from gaging station at Catawba.
DRAINAGE AREA.--3,330 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 85°F July 19, Aug. 13; minimum, freezing point on several days during November to February.
EXTREMES, 1949-51.--Water temperatures: Maximum, 85°F July 19, Aug. 13, 1951; minimum, freezing point on several days during November, December 1950, January, and February 1951.
REMARKS.--Discharge records for gaging station at Catawba for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Temperature (°F) of water, water year October 1950 to September 1951
(Once-daily measurement at approximately 7:30 a. m.)

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 64 | 61 | 32 | 32 | -- | 45 | 50 | 69 | 69 | 76 | 82 | 80 |
| 2 | 64 | 62 | 36 | 33 | -- | 44 | 49 | 68 | 73 | 77 | 79 | 78 |
| 3 | 65 | 58 | 44 | 34 | -- | 46 | 45 | 70 | 76 | 77 | 80 | 78 |
| 4 | 61 | 52 | 41 | 44 | 34 | 48 | 46 | 68 | 77 | 78 | 78 | 75 |
| 5 | 58 | 56 | 40 | 40 | 32 | 45 | 45 | 65 | 77 | 74 | 76 | 76 |
| 6 | 64 | 50 | 42 | 44 | 32 | 44 | 47 | 65 | 76 | 72 | 77 | 77 |
| 7 | 58 | 52 | 42 | 40 | -- | 52 | 48 | 60 | 76 | 73 | 74 | 72 |
| 8 | 60 | 54 | 36 | 36 | -- | 52 | 52 | 60 | 76 | 76 | 77 | 68 |
| 9 | 58 | 54 | 34 | 34 | 32 | 50 | 50 | 62 | 73 | 75 | 78 | 69 |
| 10 | 58 | 47 | 36 | 34 | -- | 45 | 49 | 63 | 70 | 78 | 78 | 70 |
| 11 | 57 | 46 | 36 | 35 | 32 | 46 | 42 | 63 | 71 | 77 | 80 | 68 |
| 12 | 56 | 42 | 34 | 34 | 34 | 45 | 46 | 57 | 69 | 80 | 78 | 71 |
| 13 | 56 | 42 | 34 | 35 | 38 | 44 | 45 | 60 | 72 | 78 | 85 | 73 |
| 14 | 58 | 40 | 36 | 36 | 36 | 41 | 46 | 60 | 70 | 79 | 82 | 70 |
| 15 | 57 | 42 | -- | 40 | 34 | 42 | 48 | 62 | 70 | 81 | 79 | 68 |
| 16 | 58 | 42 | 32 | 40 | 38 | 40 | 48 | 63 | 72 | 80 | 80 | 68 |
| 17 | 58 | 41 | 32 | 40 | 42 | 36 | 47 | 70 | 73 | 80 | 80 | 65 |
| 18 | 57 | 42 | 32 | 41 | 40 | 40 | 47 | 70 | 73 | 81 | 78 | 65 |
| 19 | 58 | 42 | 32 | 43 | 45 | 40 | 48 | 71 | 74 | 85 | 77 | 66 |
| 20 | 58 | 43 | 33 | 43 | 44 | 36 | 50 | 72 | 72 | 77 | 75 | 67 |
| 21 | 56 | 41 | 33 | 42 | 46 | 40 | 52 | 74 | 75 | 75 | 78 | 67 |
| 22 | 61 | 40 | 34 | 39 | 45 | 39 | 57 | 74 | 77 | 78 | 74 | 68 |
| 23 | 61 | 44 | 33 | 41 | 44 | 43 | 52 | 70 | 77 | 81 | 75 | 62 |
| 24 | 58 | 34 | 37 | 40 | 41 | 34 | 53 | 67 | 80 | 81 | 76 | 65 |
| 25 | 57 | 34 | 32 | 35 | 43 | 40 | 57 | 68 | 79 | 78 | 69 | 66 |
| 26 | 56 | -- | 33 | 34 | 45 | 38 | 62 | 70 | 80 | 80 | 76 | 67 |
| 27 | 55 | 33 | 32 | 36 | 44 | 42 | 60 | 67 | 78 | 79 | 72 | 68 |
| 28 | 58 | 33 | 31 | 37 | 43 | 45 | 62 | 65 | 80 | 80 | 76 | 63 |
| 29 | 60 | 32 | 32 | 35 | -- | 48 | 65 | 64 | 78 | 81 | 76 | 58 |
| 30 | 59 | 32 | 33 | 35 | -- | 50 | 67 | 69 | 79 | 80 | 76 | 60 |
| 31 | 58 | -- | 32 | 34 | -- | 46 | -- | 70 | -- | 80 | 76 | -- |
| Average | 59 | 45 | 35 | 38 | 39 | 43 | 51 | 66 | 75 | 78 | 77 | 69 |

## MIAMI RIVER BASIN

### MIAMI RIVER AT HAMILTON, OHIO

LOCATION.--At Columbia Bridge at Hamilton, Butler County, 1,000 feet upstream from gaging station, and 3 miles downstream from Talawanda Creek.
DRAINAGE AREA.--3,639 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
Water temperatures: October 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 520 ppm Sept. 21-30; minimum, 241 ppm Feb. 21-28.
Hardness: Maximum, 379 ppm Sept. 21-30; minimum, 202 ppm Feb. 21-28.
Specific conductance: Maximum daily, 842 micromhos Aug. 29; minimum daily, 261 micromhos Nov. 20.
Water temperatures: Maximum, 86°F Sept. 1; minimum, freezing point on several days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed: Unfiltered | Oxygen consumed: Filtered |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 1-10, 1950.. | 3,247 | 8.9 | 0.05 | 0.00 | 0.0 | 76 | 28 | 16 | | 276 | 86 | 13 | 0.3 | 4.6 | 386 | 305 | 79 | 613 | 8.1 | 11 | 5.9 | 4.6 |
| Oct. 11-20 ..... | 3,986 | 10 | .06 | -- | -- | 83 | 27 | 8.3 | | 286 | 77 | 12 | .3 | 7.3 | 388 | 320 | 86 | 611 | 7.6 | 13 | 6.0 | 4.0 |
| Oct. 21-31 ..... | 1,274 | 9.5 | .06 | -- | -- | 96 | 28 | 17 | | 322 | 99 | 17 | .3 | 2.3 | 446 | 356 | 92 | 698 | 7.7 | 7 | 4.2 | 3.2 |
| Nov. 1-10 ..... | 1,744 | 6.6 | .06 | -- | -- | 90 | 33 | 14 | | 314 | 101 | 18 | .4 | 1.0 | 448 | 360 | 103 | 701 | 7.8 | 7 | 5.7 | 3.6 |
| Nov. 11-20 ..... | 4,809 | 8.4 | .06 | -- | -- | 82 | 24 | 11 | | 276 | 77 | 14 | .3 | 2.5 | 378 | 304 | 78 | 596 | 7.6 | 13 | 8.9 | 4.8 |
| Nov. 21-30 ..... | 9,396 | 8.8 | .10 | -- | -- | 83 | 27 | 9.9 | | 305 | 72 | 10 | .2 | 2.4 | 378 | 320 | 70 | 612 | 7.7 | 8 | 6.7 | 3.7 |
| Dec. 1-10 ..... | 19,050 | 8.2 | .05 | -- | -- | 57 | 18 | 9.2 | | 208 | 47 | 8.0 | .3 | 5.9 | 260 | 216 | 46 | 418 | 7.9 | 17 | 13 | 4.7 |
| Dec. 11-20 ..... | 4,429 | 9.5 | .06 | .00 | .0 | 85 | 30 | 10 | | 308 | 78 | 14 | .1 | 5.1 | 397 | 336 | 83 | 639 | 7.9 | 7 | -- | -- |
| Dec. 21-31 ..... | 2,849 | 9.3 | .12 | -- | -- | 91 | 32 | 11 | 1.8 | 328 | 88 | 15 | .2 | 3.4 | 423 | 358 | 90 | 672 | 7.8 | 5 | -- | -- |
| Jan. 1-10, 1951 . | 11,490 | 8.4 | .07 | -- | -- | 67 | 23 | 6.3 | 2.1 | 244 | 58 | 10 | .2 | 6.4 | 310 | 262 | 62 | 510 | 7.9 | 10 | -- | -- |
| Jan. 11-20 ..... | 13,130 | 6.5 | .02 | -- | -- | 59 | 21 | 5.8 | | 222 | 46 | 7.8 | .2 | 6.0 | 279 | 234 | 52 | 432 | 7.7 | 10 | -- | -- |
| Jan. 21-31 ..... | 4,931 | 8.2 | .04 | -- | -- | 82 | 27 | 8.0 | 1.8 | 290 | 70 | 11 | .2 | 9.2 | 367 | 314 | 78 | 593 | 7.7 | 8 | -- | -- |
| Feb. 1-10 ..... | 3,222 | 8.4 | .06 | -- | -- | 88 | 31 | 12 | 2.2 | 324 | 83 | 16 | .2 | 5.0 | 416 | 346 | 82 | 663 | 7.6 | 6 | -- | -- |
| Feb. 11-20 ..... | 12,520 | 6.2 | .08 | -- | -- | 58 | 19 | 4.8 | 2.3 | 208 | 47 | 8.5 | .2 | 6.8 | 262 | 222 | 52 | 431 | 7.6 | 17 | -- | -- |
| Feb. 21-28 ..... | 21,320 | 6.6 | .04 | -- | -- | 54 | 16 | 4.2 | 1.8 | 192 | 39 | 6.0 | .2 | 8.1 | 241 | 202 | 43 | 393 | 7.8 | 11 | -- | -- |
| Mar. 1-10 ..... | 6,939 | 8.1 | .04 | -- | -- | 71 | 24 | 6.6 | 1.9 | 258 | 58 | 8.0 | .2 | 7.6 | 318 | 276 | 64 | 524 | 7.7 | 10 | -- | -- |
| Mar. 11-20 ..... | 7,304 | 6.9 | .04 | -- | -- | 71 | 24 | 6.7 | 1.8 | 262 | 58 | 8.0 | .2 | 7.0 | 318 | 276 | 61 | 528 | 7.8 | 10 | -- | -- |
| Mar. 21-29 ..... | 8,505 | 7.0 | .09 | -- | -- | 66 | 23 | 5.5 | 1.7 | 246 | 52 | 8.0 | .1 | 7.5 | 306 | 260 | 58 | 499 | 7.7 | 7 | -- | -- |
| Apr. 1-10 ..... | 5,150 | 6.6 | .04 | -- | -- | 76 | 28 | 7.6 | 1.5 | 284 | 64 | 9.5 | .1 | 8.8 | 352 | 302 | 72 | 570 | 7.8 | 8 | -- | -- |
| Apr. 11-20 ..... | 8,839 | 6.7 | .05 | -- | -- | 65 | 24 | 5.8 | 1.4 | 250 | 51 | 8.5 | .1 | 8.0 | 303 | 262 | 56 | 499 | 8.0 | 8 | -- | -- |
| Apr. 21-30 ..... | 3,792 | 4.1 | .02 | -- | -- | 76 | 28 | 8.5 | 2.2 | 288 | 71 | 10 | .2 | 7.2 | 357 | 306 | 69 | 589 | 7.6 | 7 | -- | -- |
| May 1-10 ..... | 3,182 | 5.6 | .01 | -- | -- | 74 | 27 | 9.7 | 2.8 | 278 | 69 | 13 | .2 | 6.4 | 355 | 295 | 68 | 566 | 7.7 | 4 | -- | -- |
| May 11-20 ..... | 3,555 | 5.5 | .01 | -- | -- | 69 | 26 | 9.8 | 2.6 | 252 | 67 | 14 | .1 | 6.8 | 339 | 279 | 73 | 531 | 7.7 | 17 | -- | -- |
| May 21-31 ..... | 2,844 | 8.6 | .02 | -- | -- | 71 | 25 | 9.7 | 2.1 | a271 | 61 | 12 | .2 | 7.6 | 344 | 282 | 58 | 562 | 8.2 | 6 | -- | -- |

a Includes equivalent of 12 parts per million of carbonate ($CO_3$).

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| June 1-10 | 1,954 | 7.6 | .03 | -- | -- | 81 | 30 | 14 | 2.5 | 310 | 84 | 14 | .2 | 2.1 | 395 | 326 | 71 | 657 | 7.8 | 4 | -- | -- |
| June 11-20 | 1,745 | 9.8 | .01 | -- | -- | 77 | 28 | 13 | 5.6 | 288 | 75 | 13 | .4 | 8.5 | 388 | 310 | 71 | 627 | 7.9 | 7 | -- | -- |
| June 21-30 | 3,408 | 8.7 | .03 | -- | -- | 67 | 23 | 11 | 5.5 | 243 | 69 | 12 | .1 | 4.6 | 334 | 261 | 63 | 538 | 7.9 | 8 | -- | -- |
| July 1-10 | 2,265 | 11 | .04 | -- | -- | 75 | 28 | 10 | 4.6 | 292 | 67 | 12 | .1 | 8.4 | 373 | 305 | 63 | 604 | 7.9 | 6 | -- | -- |
| July 11-20 | 1,227 | 11 | .01 | -- | -- | 82 | 29 | 17 | 6.0 | b308 | 89 | 18 | .1 | .9 | 410 | 326 | 71 | 683 | 8.0 | 8 | -- | -- |
| July 21-31 | 924 | 6.8 | .03 | -- | -- | 85 | 29 | 20 | 6.5 | c308 | 102 | 19 | .1 | .4 | 423 | 333 | 79 | 707 | 8.0 | 7 | -- | -- |
| Aug. 1-10 | 732 | 5.6 | .02 | -- | -- | 84 | 35 | 21 | 7.0 | 302 | 115 | 22 | .2 | 1.5 | 444 | 354 | 106 | 732 | 7.9 | 7 | -- | -- |
| Aug. 11-20 | 637 | 13 | .03 | -- | -- | 83 | 36 | 25 | 3.6 | c306 | 128 | 25 | .5 | 1.5 | 484 | 356 | 104 | 722 | 8.0 | 8 | -- | -- |
| Aug. 21-31 | 562 | 12 | .03 | -- | -- | 89 | 37 | 28 | 4.1 | d337 | 126 | 29 | .4 | .5 | 509 | 375 | 98 | 774 | 8.2 | 8 | -- | -- |
| Sept. 1-10 | 525 | 14 | .03 | -- | -- | 88 | 37 | 28 | 4.1 | b328 | 131 | 30 | .5 | 1.5 | 511 | 372 | 103 | 773 | 8.1 | 8 | -- | -- |
| Sept. 11-20 | 651 | 9.0 | .03 | -- | -- | 89 | 34 | 26 | 4.1 | 306 | 132 | 28 | .4 | 1.0 | 496 | 362 | 111 | 753 | 7.9 | 5 | -- | -- |
| Sept. 21-30 | 560 | 9.5 | .10 | -- | -- | 96 | 34 | 28 | 4.2 | 316 | 138 | 27 | .6 | .2 | 520 | 379 | 120 | 784 | 7.8 | 8 | -- | -- |
| Average | 4,948 | 8.4 | 0.05 | -- | -- | 77 | 28 | 14 | | 282 | 80 | 14 | 0.2 | 4.8 | 379 | 307 | 76 | 606 | -- | 9 | -- | -- |

b Includes equivalent of 6 parts per million of carbonate ($CO_3$).
c Includes equivalent of 7 parts per million of carbonate ($CO_3$).
d Includes equivalent of 10 parts per million of carbonate ($CO_3$).

MIAMI RIVER BASIN--Continued

MIAMI RIVER AT HAMILTON, OHIO--Continued

Temperature (°F) of water, water year October 1950 to September 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 71 | 66 | 39 | 38 | 34 | 45 | 47 | 69 | 69 | 75 | 84 | 86 |
| 2 | 60 | 64 | 43 | 40 | 32 | 45 | 45 | 72 | 75 | 75 | 82 | 83 |
| 3 | 69 | 60 | 44 | 40 | 32 | 45 | 45 | 72 | 77 | 73 | 82 | 80 |
| 4 | 65 | 56 | 37 | 42 | 32 | -- | 45 | 69 | 77 | 75 | 80 | 78 |
| 5 | 65 | 52 | 35 | 40 | 33 | 44 | 46 | 65 | 73 | 74 | 78 | 78 |
| 6 | 64 | 52 | 37 | 38 | 35 | 46 | 49 | 64 | 72 | 73 | 78 | 77 |
| 7 | 66 | 55 | 40 | 37 | 35 | 52 | 53 | 61 | 73 | 75 | 77 | -- |
| 8 | 63 | 57 | 34 | 32 | 32 | 52 | 53 | 62 | 72 | 77 | 79 | 74 |
| 9 | 65 | 56 | 32 | 32 | 33 | 49 | 53 | 64 | 71 | 77 | -- | 73 |
| 10 | 63 | 50 | 35 | 34 | 33 | 45 | 51 | 66 | -- | 77 | 81 | 74 |
| 11 | 60 | 45 | 37 | 36 | 33 | 43 | 47 | 65 | 69 | 79 | 82 | 74 |
| 12 | 60 | 45 | -- | 34 | 33 | 43 | 45 | 60 | 71 | 80 | 81 | 75 |
| 13 | 60 | 43 | 38 | 35 | 37 | 44 | 45 | 60 | 72 | 80 | 82 | 78 |
| 14 | 61 | 43 | -- | 36 | 35 | 40 | 44 | 61 | 72 | 78 | 83 | 74 |
| 15 | 64 | 46 | 40 | 35 | 35 | 40 | 48 | 64 | 73 | 80 | 83 | 74 |
| 16 | 64 | 50 | 37 | 35 | 37 | 40 | 48 | 67 | 73 | 81 | 84 | 74 |
| 17 | 64 | 50 | 35 | 37 | 39 | 40 | 45 | 70 | 74 | 81 | 82 | 72 |
| 18 | 62 | 48 | 34 | 40 | 39 | 41 | 45 | 71 | 75 | 82 | -- | 71 |
| 19 | 67 | 50 | 32 | 44 | 43 | 41 | 51 | 73 | 77 | 83 | 79 | 72 |
| 20 | 63 | 50 | 35 | 45 | 46 | 37 | 51 | 71 | 79 | 80 | 80 | 73 |
| 21 | -- | -- | -- | 44 | 43 | 40 | 54 | 73 | 78 | 79 | 81 | 73 |
| 22 | 65 | -- | -- | 39 | 40 | 49 | 57 | 74 | 80 | 81 | 78 | 76 |
| 23 | 65 | -- | -- | 40 | 39 | 50 | 53 | 68 | 77 | 83 | 78 | 70 |
| 24 | -- | -- | -- | 49 | 39 | 45 | 54 | 67 | -- | 80 | 75 | 71 |
| 25 | 66 | 35 | -- | 36 | 40 | 41 | 58 | 69 | 78 | 79 | 78 | 73 |
| 26 | 58 | 34 | 35 | 35 | 43 | 40 | 61 | 70 | 79 | 81 | 76 | 71 |
| 27 | 60 | 34 | 32 | 37 | 45 | 43 | 60 | 67 | 79 | 83 | 77 | 72 |
| 28 | 64 | 35 | 34 | 39 | 45 | 48 | 65 | 63 | 74 | 83 | 76 | 69 |
| 29 | 68 | 36 | 35 | 37 | -- | 49 | 68 | 61 | 74 | 84 | 78 | 67 |
| 30 | 68 | 37 | 37 | 34 | -- | -- | 68 | 67 | 73 | 82 | 80 | 66 |
| 31 | 68 | -- | 38 | 35 | -- | 45 | -- | -- | -- | 84 | 85 | -- |
| Average | 64 | 48 | -- | 38 | 37 | 44 | 52 | 67 | 74 | 79 | 80 | 74 |

KENTUCKY RIVER BASIN

NORTH FORK KENTUCKY RIVER AT HAZARD, KY.

LOCATION.--At gaging station at Woodland Park Bridge at 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.--Water temperatures: October 1949 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 90°F July 24; minimum, 33°F Nov. 26, Feb. 3.
EXTREMES, 1949-51.--Water temperatures: Maximum, 90°F July 24, 1951; minimum, 33°F Nov. 26, 1950, Feb. 3, 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Temperature (°F) of water, water year October 1950 to September 1951
/Mean of 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 | 68 | 69 | 36 | 37 | 38 | 50 | 52 | 70 | 72 | 78 | 86 | 82 |
| 2 | 72 | 68 | 40 | 40 | 36 | 50 | 51 | 69 | 77 | 76 | 86 | 78 |
| 3 | 74 | 62 | 44 | 46 | 34 | 49 | 47 | 64 | 78 | 76 | 86 | 78 |
| 4 | 72 | 56 | 45 | 48 | 35 | 52 | 45 | 65 | 82 | 77 | 85 | 78 |
| 5 | 68 | 52 | 45 | 46 | 38 | 52 | 46 | 60 | 78 | 76 | 82 | 79 |
| 6 | 64 | 51 | 45 | 41 | 40 | 52 | 51 | 58 | 74 | 76 | 78 | 80 |
| 7 | 66 | 53 | 46 | 40 | 40 | 55 | 52 | 57 | 74 | 77 | 82 | 75 |
| 8 | 65 | 54 | 42 | 38 | 34 | 56 | 54 | 59 | 71 | 78 | 86 | 71 |
| 9 | 64 | 54 | 41 | 36 | 36 | 52 | 54 | 62 | 70 | 78 | 88 | 72 |
| 10 | 62 | 50 | 40 | 36 | 36 | 48 | 51 | 64 | 70 | 82 | 88 | 76 |
| 11 | 64 | 46 | 40 | 38 | 39 | 47 | 52 | 64 | 72 | 84 | 84 | 76 |
| 12 | 64 | 44 | 39 | 38 | 42 | 46 | 51 | 63 | 72 | 82 | 80 | 78 |
| 13 | 63 | 43 | 40 | 36 | 46 | 46 | 50 | 64 | 73 | 84 | 82 | 80 |
| 14 | 62 | 43 | 40 | 39 | 47 | 43 | 48 | 67 | 72 | 84 | 84 | 76 |
| 15 | 62 | 46 | 41 | 45 | 47 | 42 | 52 | 70 | 71 | 82 | 88 | 69 |
| 16 | 68 | 48 | 38 | 42 | 46 | 41 | 52 | 72 | 72 | 83 | 89 | 68 |
| 17 | 72 | 47 | 37 | 40 | 48 | 40 | 51 | 73 | 72 | 84 | 86 | 70 |
| 18 | 74 | 44 | 36 | 44 | 46 | 44 | 52 | 74 | 74 | 86 | 84 | 70 |
| 19 | 74 | 44 | 34 | 47 | 50 | 48 | 54 | 76 | 77 | 85 | 84 | 70 |
| 20 | 74 | 49 | 36 | 48 | 51 | 44 | 54 | 70 | 78 | 84 | 79 | 72 |
| 21 | 72 | 45 | 36 | 47 | 50 | 44 | 57 | 76 | 79 | 84 | 82 | 75 |
| 22 | 68 | 44 | 38 | 46 | 46 | 44 | 60 | 76 | 82 | 82 | 84 | 72 |
| 23 | 68 | 44 | 36 | 44 | 45 | 47 | 60 | 71 | 80 | 86 | 81 | 70 |
| 24 | 66 | 42 | 38 | 44 | 46 | 50 | 62 | 68 | 81 | 88 | 79 | 70 |
| 25 | 64 | 34 | 36 | 42 | 46 | 46 | 64 | 69 | 82 | 84 | 79 | 70 |
| 26 | 64 | 34 | 40 | 40 | 48 | 46 | 66 | 66 | 85 | 84 | 80 | 72 |
| 27 | 62 | 35 | 38 | 38 | 52 | 46 | 66 | 68 | 84 | 84 | 77 | 74 |
| 28 | 64 | 35 | 38 | 40 | 51 | 49 | 68 | 65 | 84 | 80 | 78 | 69 |
| 29 | 64 | 36 | 39 | 43 | -- | 53 | 68 | 66 | 83 | 80 | 79 | 66 |
| 30 | 66 | 37 | 38 | 40 | -- | 55 | 69 | 66 | 82 | 82 | 82 | 66 |
| 31 | 68 | -- | 38 | 38 | -- | 52 | -- | 70 | -- | 83 | 81 | -- |
| Average | 67 | 47 | 39 | 42 | 43 | 48 | 55 | 67 | 77 | 82 | 83 | 73 |

KENTUCKY RIVER BASIN--Continued

KENTUCKY RIVER AT LOCK 14, AT HEIDELBERG, KY.

LOCATION.--At gaging station at Heidelberg, Lee County, 1,000 feet upstream from lock 14, and half a mile upstream from Sturgeon Creek.
DRAINAGE AREA.--2,648 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to August 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Chemical analyses, in parts per million, October 1950 to August 1951

| 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 | Noncarbonate | | | |
| Oct. 10, 1950 | 646 | 7.0 | 0.05 | 15 | 6.1 | 4.8 | | 43 | 29 | 4.5 | 0.2 | 0.7 | 99 | 62 | 27 | 168 | 7.3 | 2 |
| Nov. 29 | 3,250 | 7.3 | .12 | 7.6 | 3.2 | 5.0 | | 18 | 22 | 3.1 | .0 | 1.3 | 61 | 32 | 17 | 96.4 | 6.9 | 7 |
| Jan. 15, 1951 | 19,100 | 6.1 | .05 | 4.6 | 2.1 | 4.0 | | 13 | 14 | 2.1 | .0 | 1.0 | 42 | 20 | 10 | 63.0 | 6.8 | 10 |
| Feb. 26 | 5,700 | 7.5 | .17 | 6.4 | 3.6 | 5.0 | | 12 | 27 | 1.8 | .1 | 1.0 | 58 | 31 | 21 | 85.3 | 6.8 | 6 |
| Apr. 2 | 7,420 | 6.7 | .12 | 6.0 | 3.4 | 2.8 | 1.2 | 14 | 21 | 1.4 | .3 | 1.0 | 55 | 29 | 18 | 86.6 | 7.3 | 8 |
| May 7 | 8,770 | 7.1 | .02 | 6.8 | 2.4 | 3.2 | 2.9 | 20 | 20 | .4 | .1 | .2 | 58 | 27 | 10 | 78.3 | 7.5 | 4 |
| June 18 | 658 | 6.3 | .04 | 16 | 6.3 | 8.5 | 4.5 | 38 | 49 | 5.8 | .1 | 1.7 | 118 | 66 | 35 | 195 | 7.0 | 3 |
| July 23 | 205 | 4.0 | .11 | 15 | 6.3 | 8.9 | 3.0 | 38 | 46 | 6.0 | .2 | 1.6 | 109 | 64 | 32 | 187 | 8.2 | 6 |
| Aug. 28 | 116 | 1.3 | .04 | 14 | 6.8 | 8.5 | 3.2 | 44 | 39 | 7.0 | .1 | 1.0 | 107 | 64 | 27 | 184 | 7.4 | 6 |

## 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 1951.
Water temperatures: October 1949 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 160 ppm Sept. 1-10; minimum, 76 ppm Feb. 1-10.
Hardness: Maximum, 117 ppm Oct. 1-10; minimum, 57 ppm Feb. 1-10.
Specific conductance: Maximum daily, 299 micromhos Nov. 1; minimum daily, 79.8 micromhos Feb. 4.
Water temperatures: Maximum, 85°F July 29, Aug. 1, 2, 4; minimum, 34°F Feb. 8.
EXTREMES, 1949-51.--Dissolved solids: Maximum, 244 ppm Nov. 21-30, 1949; minimum, 76 ppm Feb. 1-10, 1951.
Hardness: Maximum, 121 ppm Nov. 21-30, 1949; minimum, 55 ppm May 21-31, 1950.
Specific conductance: Maximum daily, 443 micromhos Nov. 29, 1949; minimum daily, 79.8 micromhos Feb. 4, 1951.
Water temperatures: Maximum, 85°F July 29, Aug. 1, 2, 4, 1951; minimum, 34°F Feb. 8, 1951.
REMARKS.--Daily water temperatures reported in the temperature table are averages of twice-daily messurements. 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 1950 to September 1951 given in Water-Supply Paper 1205.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $CaCO_3$: Calcium, magnesium | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 1-10, 1950 | 1,730 | 13 | 0.02 | 34 | 7.5 | 6.3 | | 113 | 23 | 7.0 | 0.2 | 3.1 | 157 | 117 | 23 | 253 | 7.5 | 1 |
| Oct. 11-20 | 1,820 | 7.0 | .01 | 30 | 6.8 | 4.0 | | 101 | 18 | 5.7 | .1 | 2.0 | 132 | 103 | 20 | 223 | 7.4 | 2 |
| Oct. 21-31 | 2,570 | 7.7 | .01 | 33 | 8.5 | 4.1 | | 103 | 24 | 11 | .0 | 1.7 | 153 | 117 | 33 | 257 | 7.9 | 1 |
| Nov. 1-10 | 9,200 | 7.6 | .02 | 25 | 9.4 | 1.1 | | 78 | 22 | 11 | .0 | 1.3 | 126 | 100 | 37 | 233 | 7.8 | 1 |
| Nov. 11-30 | 11,500 | 7.7 | .10 | 27 | 7.0 | 5.4 | | 94 | 18 | 6.8 | .1 | 2.8 | 121 | 97 | 19 | 201 | 7.4 | 8 |
| Dec. 1-10 | 26,300 | 7.9 | .07 | 25 | 5.3 | 5.5 | | 83 | 16 | 6.5 | .1 | 2.7 | 109 | 85 | 16 | 174 | 7.5 | 7 |
| Dec. 11-20 | 11,100 | 8.0 | .02 | 25 | 6.8 | 3.4 | | 84 | 19 | 6.2 | .1 | 3.4 | 109 | 90 | 25 | 178 | 7.6 | 5 |
| Dec. 21-31 | 4,720 | 6.9 | .06 | 31 | 6.8 | 4.1 | | 100 | 19 | 6.8 | .1 | 3.3 | 129 | 105 | 23 | 211 | 7.7 | 7 |
| Jan. 1-10, 1951 | 15,200 | 6.4 | .06 | 31 | 5.8 | 3.0 | | 96 | 19 | 5.5 | .0 | 2.0 | 125 | 102 | 23 | 216 | 7.5 | 7 |
| Jan. 11-20 | 26,400 | 6.4 | .07 | 24 | 4.6 | 3.4 | | 76 | 17 | 3.9 | .0 | 1.0 | 103 | 80 | 16 | 176 | 7.4 | 7 |
| Jan. 21-31 | 12,100 | 6.8 | .08 | 25 | 4.9 | 3.6 | | 79 | 17 | 3.5 | .1 | 3.3 | 107 | 82 | 18 | 186 | 7.4 | 3 |
| Feb. 1-10 | 47,800 | 5.5 | .09 | 17 | 3.6 | 3.8 | | 53 | 16 | 2.2 | .1 | 2.4 | 76 | 57 | 14 | 130 | 7.2 | 5 |
| Feb. 11-20 | 21,700 | 8.7 | .13 | 26 | 4.4 | 3.3 | 1.3 | 79 | 18 | 2.8 | .2 | 3.9 | 114 | 82 | 18 | 180 | 7.6 | 3 |
| Feb. 21-28 | 22,200 | 6.6 | .12 | 22 | 4.4 | 3.4 | 1.4 | 66 | 18 | 3.0 | .1 | 2.6 | 98 | 72 | 19 | 159 | 7.4 | 6 |
| Mar. 1-10 | 14,900 | 6.8 | .07 | 22 | 4.9 | 3.7 | 1.2 | 68 | 20 | 3.8 | .0 | 2.7 | 103 | 74 | 19 | 167 | 7.6 | 3 |
| Mar. 11-20 | 18,900 | 6.4 | .27 | 23 | 3.9 | 3.4 | 1.5 | 72 | 19 | 3.2 | .2 | 2.1 | 99 | 74 | 14 | 165 | 7.6 | 6 |
| Mar. 21-31 | 15,900 | 7.3 | .24 | 21 | 3.9 | 4.2 | | 64 | 18 | 2.9 | .2 | 2.1 | 95 | 69 | 16 | 157 | 7.4 | 3 |

KENTUCKY RIVER BASIN--Continued

KENTUCKY RIVER AT LOCK 4, AT FRANKFORT, KY.--Continued

Chemical analyses, in parts per million, water year October 1950 to September 1951--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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| Apr. 1-10, 1951 | 15,200 | 8.4 | 0.09 | 21 | 4.6 | 3.6 | 1.3 | 63 | 21 | 3.6 | 0.1 | 1.6 | 101 | 71 | 20 | 164 | 7.4 | 3 |
| Apr. 11-20 | 12,200 | 9.5 | .11 | 21 | 5.3 | 3.9 | 1.2 | 72 | 19 | 3.5 | .1 | 1.8 | 104 | 75 | 15 | 174 | 7.6 | 3 |
| Apr. 21-30 | 5,120 | 9.4 | .08 | 21 | 3.9 | 3.8 | 1.3 | 64 | 18 | 3.4 | .1 | 1.4 | 100 | 68 | 16 | 162 | 7.5 | 3 |
| May 1-10 | 8,920 | 11 | .02 | 20 | 6.3 | 5.5 | 3.7 | 65 | 29 | 5.2 | .0 | 1.9 | 110 | 76 | 23 | 177 | 8.0 | 2 |
| May 11-20 | 4,330 | 10 | .02 | 17 | 4.6 | 5.0 | 3.4 | 54 | 24 | 4.0 | .0 | 1.9 | 92 | 61 | 17 | 151 | 7.8 | 5 |
| May 21-31 | 1,790 | 9.6 | .02 | 20 | 4.9 | 5.0 | 3.2 | 63 | 22 | 4.6 | .0 | 2.0 | 101 | 70 | 18 | 169 | 7.9 | 5 |
| June 1-10 | 1,610 | 11 | .03 | 22 | 5.3 | 4.8 | 2.9 | 75 | 22 | 4.5 | .1 | 2.2 | 113 | 78 | 15 | 184 | 8.1 | 5 |
| June 11-20 | 1,920 | 11 | .05 | 22 | 6.3 | 6.9 | 3.6 | 78 | 24 | 7.8 | .2 | 1.7 | 123 | 82 | 17 | 208 | 8.2 | 2 |
| June 21-30 | 1,130 | 8.0 | .03 | 23 | 6.3 | 8.7 | 3.8 | 76 | 27 | 11 | .1 | 1.4 | 120 | 84 | 21 | 218 | 7.7 | 3 |
| July 1-10 | 1,140 | 3.9 | .02 | 27 | 6.3 | 8.0 | 3.6 | 88 | 26 | 10 | .1 | 1.5 | 127 | 94 | 21 | 231 | 8.1 | 4 |
| July 11-20 | 749 | 4.2 | .03 | 28 | 6.8 | 7.6 | 4.3 | 94 | 29 | 8.0 | .1 | 1.1 | 130 | 98 | 21 | 239 | 8.1 | 4 |
| July 21-31 | 655 | 6.8 | .03 | 30 | 7.8 | 11 | 4.7 | 92 | 37 | 12 | .1 | 1.0 | 156 | 106 | 32 | 275 | 8.0 | 5 |
| Aug. 1-10 | 799 | 5.8 | .02 | 29 | 7.3 | 10 | 4.4 | 94 | 34 | 10 | .1 | .5 | 146 | 102 | 25 | 262 | 8.1 | 4 |
| Aug. 11-20 | 11,000 | 6.9 | .01 | 30 | 6.8 | 10 | 2.4 | 94 | 33 | 11 | .1 | 1.0 | 151 | 102 | 26 | 255 | 8.2 | 3 |
| Aug. 21-31 | 361 | 9.0 | .02 | 29 | 9.0 | 10 | 2.3 | 89 | 36 | 12 | .0 | 2.0 | 159 | 110 | 36 | 274 | 7.8 | 3 |
| Sept. 1-10 | 335 | 10 | .02 | 30 | 8.3 | 10 | 2.3 | 98 | 36 | 12 | .0 | 1.6 | 160 | 110 | 29 | 276 | 8.0 | 3 |
| Sept. 11-20 | 899 | 7.6 | .08 | 29 | 8.0 | 10 | 2.7 | 92 | 35 | 15 | .0 | 1.0 | 156 | 106 | 30 | 276 | 8.0 | 3 |
| Sept. 21-30 | 1,010 | 5.7 | .06 | 30 | 7.8 | 8.7 | 2.7 | 99 | 29 | 10 | .0 | 1.4 | 146 | 106 | 26 | 259 | 8.1 | 4 |
| Average | 9,150 | 7.8 | 0.06 | 25 | 6.1 | 6.6 | | 82 | 23 | 6.8 | 0.1 | 2.0 | 121 | 88 | 20 | 206 | -- | 4 |

KENTUCKY RIVER BASIN--Continued

KENTUCKY RIVER AT LOCK 4, AT FRANKFORT, KY.--Continued

Temperature (°F) of water, water year October 1950 to September 1951
[Averages of twice-daily temperature measurements at approximately 7 a. m. and 2 p. m.]

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 68 | 66 | 44 | 40 | 40 | 47 | 50 | 62 | 72 | 80 | 84 | 80 |
| 2 | 68 | 65 | 44 | 41 | 40 | 46 | 50 | 62 | 73 | 80 | 84 | 80 |
| 3 | 68 | 64 | 43 | 42 | 40 | 48 | 49 | 65 | 74 | 79 | 84 | 80 |
| 4 | 66 | 60 | 42 | 42 | 38 | 48 | 50 | 64 | 74 | 79 | 84 | 80 |
| 5 | 66 | 58 | 42 | 44 | 39 | 48 | 50 | 66 | 73 | 78 | 84 | 79 |
| 6 | 66 | 58 | 42 | 44 | 37 | 49 | 50 | -- | 74 | 78 | 82 | 78 |
| 7 | 67 | 58 | 44 | 42 | 37 | 50 | 50 | 66 | 74 | 78 | 83 | 79 |
| 8 | 66 | 58 | 44 | 42 | 34 | 52 | 48 | 66 | -- | 78 | 83 | 79 |
| 9 | 65 | 54 | 44 | 42 | 36 | 50 | 48 | 66 | 74 | 78 | 82 | 78 |
| 10 | 65 | 54 | 42 | 42 | 36 | 48 | 51 | 67 | 74 | 78 | 82 | 78 |
| 11 | 65 | 54 | 42 | 41 | 38 | 48 | 50 | 66 | 74 | 78 | 82 | 78 |
| 12 | 64 | 54 | 41 | 42 | 40 | 48 | 49 | 65 | 75 | 78 | 82 | 79 |
| 13 | 64 | 52 | 42 | 42 | 40 | 48 | 49 | 66 | 74 | 79 | 82 | 78 |
| 14 | 64 | 52 | 42 | -- | 41 | 46 | 50 | 66 | 74 | 80 | 82 | 76 |
| 15 | 65 | 52 | 42 | 43 | 42 | 47 | 51 | 68 | 74 | 80 | 82 | 76 |
| 16 | 64 | 52 | 42 | 43 | 42 | -- | 50 | 68 | 74 | 80 | 81 | 77 |
| 17 | 66 | -- | 40 | 44 | 43 | 44 | 52 | 68 | 75 | 81 | 80 | 76 |
| 18 | 64 | -- | 40 | 44 | 44 | 44 | 53 | 68 | 76 | 82 | 80 | 76 |
| 19 | 66 | 50 | 40 | 46 | 46 | 44 | 53 | 70 | 77 | 82 | 80 | 76 |
| 20 | 66 | 50 | 40 | 46 | 47 | 44 | 54 | 70 | 78 | 82 | 80 | 76 |
| 21 | 66 | 50 | 40 | 44 | 47 | 45 | 55 | 71 | 77 | 82 | 80 | 75 |
| 22 | 66 | 50 | 40 | 44 | 48 | 46 | 54 | 71 | 78 | 82 | 79 | 74 |
| 23 | 66 | 49 | 40 | 44 | 48 | 46 | 55 | 68 | 78 | 82 | 78 | 73 |
| 24 | 66 | 47 | 40 | 44 | 48 | 47 | 56 | 70 | 80 | 82 | 79 | 73 |
| 25 | 64 | -- | 40 | 43 | 48 | 46 | 58 | 70 | 80 | 82 | 78 | 72 |
| 26 | 64 | -- | 40 | 42 | 48 | 46 | 58 | 70 | 80 | 82 | 78 | 72 |
| 27 | 64 | -- | 40 | 42 | 49 | 47 | 58 | 70 | 80 | 82 | 78 | 72 |
| 28 | 64 | 44 | 40 | 42 | 44 | 48 | 60 | 70 | 80 | 83 | 78 | 70 |
| 29 | 65 | 44 | 40 | 42 | -- | 48 | 60 | 70 | 81 | 84 | 79 | 70 |
| 30 | 66 | 44 | 41 | 42 | -- | 48 | 61 | 71 | 81 | 83 | 80 | 70 |
| 31 | 66 | -- | 41 | 41 | -- | 48 | -- | 72 | -- | 82 | 80 | -- |
| Average | 65 | 54 | 41 | 43 | 42 | 47 | 53 | 68 | 76 | 80 | 81 | 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 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 90°F July 17, Aug. 2, Sept. 1; minimum, freezing point on several days during November to February.
EXTREMES, 1949-51.--Water temperatures: Maximum, 90°F July 17, Aug. 2, Sept. 1, 1951; minimum, freezing point on several days in each year.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Temperature (°F) of water, water year October 1950 to September 1951
/Mean of twice-daily measurements of approximately 8 a. m. and 6 p. m./

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

## 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 1951.
Water temperatures: October 1949 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 85°F July 22; minimum, freezing point on several days in December, January, and February.
EXTREMES, 1949-51.--Water temperatures: Maximum, 87°F July 4, 1950; minimum, freezing point on several days in December 1950, January and February 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Noncarbonate | | | |
| Oct. 20, 1950 | 103 | 6.6 | 0.03 | 62 | 14 | 2.7 | | 234 | 20 | 3.5 | 0.0 | 0.9 | 231 | 210 | 20 | 402 | 8.0 | 6 |
| Dec. 5 | 5,810 | 7.3 | .14 | 48 | 9.0 | 2.0 | | 158 | 23 | 3.0 | .0 | 4.2 | 185 | 158 | 27 | 313 | 7.9 | 17 |
| Jan. 8, 1951 | 6,070 | 7.0 | .18 | 36 | 7.8 | 5.0 | | 128 | 19 | 3.0 | .0 | 4.8 | 146 | 122 | 17 | 249 | 7.7 | 20 |
| Feb. 14 | 20,300 | 3.9 | .05 | 22 | 4.4 | 1.1 | | 74 | 10 | 1.5 | .0 | 2.7 | 86 | 72 | 12 | 149 | 7.4 | 7 |
| Apr. 23 | 1,510 | 3.8 | .03 | 50 | 12 | 4.0 | 3.0 | 182 | 34 | 3.8 | .2 | 2.4 | 205 | 176 | 25 | 354 | 7.8 | 4 |
| May 28 | 194 | 5.2 | .03 | 55 | 12 | 4.1 | 4.0 | 208 | 31 | 3.8 | .1 | 2.3 | 226 | 188 | 16 | 387 | 7.7 | 5 |
| July 5 | 327 | 6.3 | .07 | 41 | 9.7 | 4.1 | 2.8 | 146 | 28 | 3.0 | .2 | 4.1 | 173 | 142 | 23 | 297 | 8.2 | 5 |
| Sept. 17 | 25 | 5.5 | .02 | 43 | 11 | 4.0 | 3.1 | 177 | 17 | 4.0 | .1 | 1.5 | 181 | 154 | 8 | 326 | 8.2 | 2 |

SALT RIVER BASIN--Continued

ROLLING FORK NEAR BOSTON, KY.--Continued

Temperature (°F) of water, water year October 1950 to September 1951
/Mean of 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 | 66 | 66 | 36 | 38 | -- | 50 | 50 | 72 | 74 | 79 | 82 | 74 |
| 2 | 66 | 63 | 40 | 40 | -- | 50 | 48 | 74 | 72 | 76 | 82 | 76 |
| 3 | 67 | 64 | 38 | 40 | -- | 50 | 48 | 76 | 73 | 76 | 82 | 76 |
| 4 | 64 | 60 | 43 | 38 | 32 | 50 | 48 | 75 | 76 | 77 | 82 | 75 |
| 5 | 62 | 52 | 42 | 38 | 33 | 50 | 49 | 70 | 74 | 75 | 82 | 76 |
| 6 | 62 | 52 | 41 | 38 | 34 | 51 | 50 | 68 | 74 | 74 | 80 | 75 |
| 7 | 64 | 53 | 39 | 36 | 32 | 51 | 50 | 64 | 72 | 74 | 78 | 75 |
| 8 | 62 | 54 | 40 | 40 | 32 | 50 | 50 | 64 | 74 | 74 | 77 | 74 |
| 9 | 60 | 50 | 37 | 36 | 32 | 49 | 48 | 65 | 74 | 78 | 77 | 75 |
| 10 | 64 | 52 | 34 | 38 | 32 | 49 | 50 | 66 | 74 | 76 | 80 | 70 |
| 11 | 65 | 48 | 38 | 38 | 34 | 46 | 50 | 64 | 74 | 76 | 80 | 70 |
| 12 | 62 | 48 | 38 | 40 | 36 | 44 | 48 | 67 | 72 | 75 | 80 | 71 |
| 13 | 62 | 45 | 36 | 38 | 34 | 41 | 50 | 70 | 70 | 76 | 80 | 71 |
| 14 | 62 | 43 | 38 | 39 | 36 | 40 | 50 | 68 | 72 | 78 | 78 | 71 |
| 15 | 62 | 45 | 38 | 38 | 38 | 40 | 50 | 70 | 72 | 78 | 80 | 70 |
| 16 | 62 | 48 | 36 | 36 | 36 | 40 | 50 | 70 | 74 | 78 | 80 | 70 |
| 17 | 63 | 48 | 36 | 39 | 36 | 40 | 50 | 70 | 74 | 80 | 80 | 70 |
| 18 | 63 | 40 | 36 | 44 | 40 | 40 | 52 | 74 | 78 | 82 | 80 | 66 |
| 19 | 63 | 48 | 32 | 48 | 46 | 39 | 54 | 72 | 76 | 82 | 80 | 66 |
| 20 | 62 | 48 | 32 | 45 | 48 | 42 | 54 | 73 | 77 | 81 | 79 | 65 |
| 21 | 63 | 49 | 32 | 45 | 47 | 42 | 54 | 76 | 76 | 82 | 80 | 66 |
| 22 | 65 | 49 | 38 | 44 | 50 | 41 | 52 | 78 | 76 | 84 | 79 | 65 |
| 23 | 60 | 50 | 40 | 46 | 48 | 45 | 52 | 87 | 78 | 82 | 80 | 68 |
| 24 | 62 | 42 | 38 | 41 | 49 | 44 | 56 | 74 | 77 | 80 | 78 | 66 |
| 25 | 62 | 40 | 39 | 40 | 50 | 45 | 60 | 74 | 78 | 80 | 78 | 68 |
| 26 | 59 | 42 | 38 | 39 | 50 | 46 | 64 | 74 | 78 | 82 | 78 | 66 |
| 27 | 60 | 39 | 33 | 38 | 50 | 46 | 68 | 72 | 80 | 82 | 75 | 66 |
| 28 | 61 | 37 | 33 | 38 | 50 | 50 | 66 | 68 | 84 | 81 | 75 | 64 |
| 29 | 63 | 35 | 36 | 38 | -- | 50 | 70 | 70 | 81 | 82 | 75 | 62 |
| 30 | 60 | 35 | 36 | 32 | -- | 48 | 72 | 70 | 80 | 82 | 74 | 61 |
| 31 | 61 | -- | 36 | 32 | -- | 47 | -- | 71 | -- | 84 | 76 | -- |
| Average | 63 | 49 | 38 | 39 | 40 | 46 | 54 | 71 | 75 | 79 | 79 | 69 |

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 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 85°F July 18, 31; minimum 33°F Feb. 9.
EXTREMES, 1949-51.--Water temperatures: Maximum, 85°F July 18, 31, 1951; minimum, 33°F Feb. 9, 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Temperature (°F) of water, water year October 1950 to September 1951
(Mean of 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 | 65 | -- | -- | 48 | 40 | 50 | 50 | 65 | 75 | 72 | 82 | 76 |
| 2 | 64 | -- | -- | 50 | 38 | 50 | 49 | 66 | 76 | 72 | 80 | 79 |
| 3 | 64 | -- | -- | 52 | 35 | 52 | 48 | 62 | 78 | 72 | 80 | 76 |
| 4 | 63 | -- | -- | 47 | 36 | 50 | 48 | 58 | 78 | 76 | 80 | 76 |
| 5 | 63 | -- | -- | 46 | 38 | 49 | 49 | 54 | 75 | 74 | 80 | 76 |
| 6 | 64 | -- | -- | 47 | 38 | 50 | 50 | 60 | 74 | 72 | 78 | 76 |
| 7 | 63 | -- | 48 | 46 | 46 | 52 | 52 | 58 | 74 | 74 | 78 | 76 |
| 8 | -- | -- | 45 | 44 | 36 | 51 | 50 | 58 | 74 | 76 | 80 | 74 |
| 9 | -- | -- | 46 | 46 | 33 | 50 | 50 | 58 | 72 | 76 | 80 | 74 |
| 10 | -- | -- | 48 | 47 | -- | 49 | 50 | 58 | 72 | 76 | 78 | 74 |
| 11 | -- | -- | 48 | 48 | -- | 48 | 50 | 58 | 70 | 74 | 78 | 74 |
| 12 | -- | -- | 48 | 47 | -- | 48 | 50 | 57 | -- | 75 | 78 | 74 |
| 13 | -- | -- | 48 | 48 | 44 | 46 | 48 | 56 | 72 | 74 | 79 | 74 |
| 14 | -- | -- | 50 | 49 | 40 | 43 | 50 | 57 | 72 | 78 | 78 | 74 |
| 15 | -- | -- | 50 | 46 | 40 | 46 | 52 | 57 | 73 | 80 | 78 | 74 |
| 16 | -- | -- | 49 | 44 | 44 | 46 | 51 | 58 | 74 | 81 | 78 | 68 |
| 17 | -- | -- | 48 | 46 | 45 | 46 | 50 | 58 | 75 | 82 | 76 | 68 |
| 18 | -- | -- | 48 | 48 | 46 | 49 | 50 | 58 | 76 | 82 | 76 | 67 |
| 19 | -- | -- | 47 | 49 | 48 | 45 | 52 | 56 | 78 | 82 | 76 | 68 |
| 20 | -- | -- | 47 | 50 | 48 | 44 | 54 | 58 | 76 | 82 | 75 | 67 |
| 21 | -- | -- | 48 | 48 | 47 | 45 | 56 | 58 | 79 | 80 | 74 | 68 |
| 22 | -- | -- | 48 | 45 | 46 | 46 | 57 | 56 | 78 | 82 | 74 | 67 |
| 23 | -- | -- | 48 | 48 | 46 | 48 | 55 | 56 | 79 | 81 | 74 | 68 |
| 24 | -- | -- | 50 | 48 | 48 | 48 | 56 | 56 | 78 | 80 | 72 | 66 |
| 25 | -- | -- | 48 | 47 | 48 | 48 | 60 | 57 | 80 | 78 | 74 | 66 |
| 26 | -- | -- | 50 | 46 | 49 | 48 | 61 | 57 | 80 | 78 | 77 | 66 |
| 27 | -- | -- | 46 | 48 | 50 | 49 | 61 | 56 | 82 | 80 | 76 | 68 |
| 28 | -- | 50 | 44 | 51 | 49 | 50 | 61 | 57 | 81 | 82 | 75 | 66 |
| 29 | -- | 53 | 48 | 52 | -- | 51 | 64 | 56 | 80 | 82 | 72 | 66 |
| 30 | -- | -- | 48 | 43 | -- | 50 | 64 | 57 | 73 | 81 | 76 | 62 |
| 31 | -- | -- | 48 | 43 | -- | 50 | -- | 58 | -- | 82 | 78 | -- |
| Average | -- | -- | 48 | 47 | 43 | 48 | 53 | 58 | 76 | 78 | 77 | 71 |

GREEN RIVER BASIN--Continued

GREEN RIVER AT MUNFORDVILLE, KY.

LOCATION.--At gaging station at bridge on U. S. Highway 31-W at Munfordville, Hart County.
DRAINAGE AREA.--1,790 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1951.
Water temperatures: October 1950 to September 1951.
Sediment records: April to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 167 ppm Oct. 1-10; minimum, 86 ppm Feb. 1-10.
Hardness: Maximum, 144 ppm Oct. 1-10; minimum, 68 ppm Feb. 1-10.
Specific conductance: Maximum daily, 284 micromhos Oct. 9, Aug. 29; minimum daily, 110 micromhos Jan. 6.
Water temperatures: Maximum, 77°F on several days in June, July, and August; minimum, 34°F Dec. 19, Feb. 3, 4, 5, 9.
REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Noncarbonate | | | |
| Oct. 1-10, 1950 | 729 | 12 | 0.03 | 47 | 6.6 | 3.5 | | 164 | 9.3 | 4.0 | 0.1 | 2.5 | 167 | 144 | 10 | 279 | 7.8 | 2 |
| Oct. 11-20 | 633 | 8.1 | .02 | 41 | 6.1 | 5.5 | | 148 | 9.8 | 4.2 | .1 | 2.0 | 150 | 128 | 6 | 254 | 7.7 | 2 |
| Oct. 21-31 | 1,910 | 8.1 | .04 | 37 | 6.3 | 2.5 | | 131 | 8.8 | 3.9 | .1 | 1.6 | 139 | 118 | 11 | 233 | 7.7 | 6 |
| Nov. 1-10 | 2,160 | 10 | .05 | 36 | 5.6 | 6.0 | | 131 | 11 | 3.9 | .1 | 1.5 | 141 | 114 | 5 | 232 | 7.8 | 5 |
| Nov. 11-20 | 3,290 | 8.8 | .04 | 36 | 4.6 | 4.2 | | 122 | 11 | 3.2 | .1 | 2.1 | 131 | 108 | 9 | 216 | 7.7 | 5 |
| Nov. 21-30 | 6,710 | 9.9 | .06 | 29 | 5.8 | 3.4 | | 106 | 9.7 | 2.8 | .1 | 3.0 | 116 | 96 | 9 | 190 | 7.8 | 6 |
| Dec. 1-10 | 7,840 | 9.8 | .09 | 27 | 5.8 | 5.8 | | 96 | 15 | 5.5 | .0 | 2.3 | 118 | 92 | 13 | 188 | 7.6 | 8 |
| Dec. 11-20 | 3,320 | 10 | .05 | 31 | 6.1 | 6.2 | | 114 | 12 | 5.8 | .0 | 2.2 | 130 | 102 | 9 | 207 | 7.6 | 3 |
| Dec. 21-31 | 1,280 | 7.7 | .06 | 36 | 5.8 | 2.7 | | 125 | 11 | 3.6 | .0 | .7 | 132 | 114 | 11 | 232 | 7.6 | 3 |
| Jan. 1-10, 1951 | 9,830 | 7.0 | .06 | 29 | 4.6 | 2.7 | | 100 | 9.2 | 3.4 | .0 | 1.0 | 110 | 92 | 9 | 192 | 7.6 | 7 |
| Jan. 11-18 | 14,900 | 7.3 | .03 | 26 | 4.4 | 2.0 | | 90 | 8.7 | 2.2 | .0 | 1.6 | 98 | 82 | 9 | 167 | 7.7 | 8 |
| Jan. 19-31 | 4,250 | 7.6 | .17 | 29 | 4.4 | 3.2 | | 98 | 12 | 2.2 | .0 | 1.8 | 116 | 90 | 10 | 189 | 7.5 | 7 |
| Feb. 1-10 | 13,000 | 7.0 | .06 | 21 | 3.6 | 2.8 | | 73 | 8.2 | 1.5 | .1 | 3.1 | 86 | 68 | 7 | 142 | 7.3 | 5 |
| Feb. 11-20 | 11,800 | 7.3 | .10 | 25 | 4.1 | 2.4 | | 86 | 8.2 | 1.9 | .1 | 3.2 | 97 | 80 | 9 | 163 | 7.5 | 3 |
| Feb. 21-28 | 8,860 | 7.7 | .05 | 26 | 3.4 | 4.0 | | 89 | 8.1 | 2.5 | .1 | 2.9 | 106 | 79 | 6 | 168 | 7.4 | 3 |
| Mar. 1-10 | 5,120 | 8.0 | .12 | 28 | 4.9 | 4.1 | | 100 | 11 | 2.2 | .1 | 2.6 | 110 | 90 | 8 | 185 | 7.5 | 5 |
| Mar. 11-20 | 9,740 | 7.2 | .11 | 25 | 4.1 | 3.0 | | 87 | 9.3 | 2.0 | .1 | 2.2 | 104 | 80 | 8 | 168 | 7.5 | 5 |
| Mar. 21-31 | 5,770 | 8.4 | .09 | 30 | 2.9 | 2.7 | 1.0 | 97 | 9.5 | 2.0 | .0 | 2.0 | 109 | 87 | 7 | 186 | 7.6 | 1 |
| Apr. 1-10 | 5,010 | 9.0 | .08 | 26 | 4.4 | 2.9 | 1.0 | 92 | 11 | 2.0 | .1 | 2.0 | 106 | 84 | 7 | 177 | 7.6 | 1 |
| Apr. 11-20 | 4,370 | 10 | .10 | 26 | 5.3 | 3.2 | .7 | 97 | 11 | 2.0 | .1 | 2.0 | 114 | 88 | 7 | 187 | 7.8 | 1 |
| Apr. 21-30 | 2,560 | 8.9 | .03 | 32 | 5.8 | 3.8 | 2.0 | 117 | 13 | 3.5 | .1 | 2.0 | 133 | 104 | 8 | 222 | 6.8 | 3 |
| May 1-10 | 1,940 | 8.9 | .05 | 32 | 6.1 | 4.1 | 2.3 | 119 | 13 | 3.2 | .1 | 2.1 | 133 | 105 | 7 | 221 | 7.5 | 4 |
| May 11-20 | 928 | 9.0 | .05 | 36 | 6.3 | 4.1 | 2.0 | 130 | 13 | 3.8 | .0 | 2.0 | 139 | 115 | 9 | 242 | 7.8 | 2 |
| May 21-31 | 556 | 8.5 | .08 | 40 | 6.8 | 4.0 | 2.2 | 140 | 12 | 4.8 | .1 | 1.7 | 152 | 127 | 13 | 263 | 7.9 | 2 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| June 1-10 | 478 | 8.0 | .06 | 40 | 6.3 | 5.3 | 2.3 | 138 | 12 | 6.5 | .1 | 2.2 | 157 | 126 | 13 | 264 | 7.9 | 2 |
| June 11-20 | 454 | 10 | .05 | 38 | 6.8 | 5.1 | 2.8 | 138 | 12 | 6.0 | .2 | 2.5 | 153 | 122 | 10 | 262 | 8.2 | 2 |
| June 21-30 | 819 | 11 | .03 | 34 | 5.8 | 5.7 | 2.8 | 124 | 13 | 5.0 | .2 | 2.8 | 144 | 108 | 7 | 243 | 7.9 | 3 |
| July 1-10 | 1,560 | 9.5 | .06 | 26 | 4.9 | 4.1 | 3.4 | 94 | 12 | 4.0 | .2 | 3.5 | 117 | 84 | 8 | 195 | 7.9 | 3 |
| July 11-20 | 787 | 9.6 | .04 | 30 | 5.3 | 4.7 | 4.3 | 112 | 11 | 4.0 | .2 | 2.9 | 128 | 96 | 5 | 216 | 8.3 | 4 |
| July 21-31 | 561 | 10 | .05 | 36 | 4.9 | 5.4 | 4.3 | 128 | 10 | 6.0 | .2 | 3.0 | 144 | 110 | 5 | 244 | 8.3 | 4 |
| Aug. 1-10 | 362 | 8.7 | .07 | 38 | 5.3 | 4.2 | 1.9 | 138 | 10 | 4.0 | .1 | 2.3 | 143 | 118 | 4 | 246 | 8.2 | 4 |
| Aug. 11-20 | 971 | 6.5 | .05 | 28 | 5.1 | 3.8 | 1.6 | 104 | 9.0 | 4.8 | .1 | 2.3 | 119 | 92 | 6 | 200 | 7.9 | 5 |
| Aug. 21-31 | 312 | 7.7 | .05 | 40 | 5.6 | 5.8 | 1.6 | 140 | 11 | 7.5 | .0 | 2.3 | 159 | 124 | 8 | 267 | 8.0 | 3 |
| Sept. 1-10 | 311 | 6.9 | .05 | 38 | 6.3 | 5.6 | 2.0 | 136 | 12 | 8.4 | .0 | 1.7 | 157 | 122 | 9 | 261 | 8.1 | 3 |
| Sept. 11-20 | 278 | 12 | .02 | 39 | 6.6 | 6.1 | 1.6 | 142 | 12 | 6.2 | .0 | 1.3 | 151 | 124 | 8 | 267 | 8.0 | 4 |
| Sept. 21-30 | 2,650 | 7.8 | .04 | 26 | 5.8 | 4.4 | 1.6 | 100 | 12 | 4.4 | .0 | 2.0 | 110 | 90 | 7 | 197 | 8.0 | 7 |
| Average | 3,660 | 8.7 | 0.06 | 32 | 5.3 | 4.8 | | 115 | 11 | 4.0 | 0.1 | 2.2 | 128 | 102 | 7 | 216 | -- | 4 |

GREEN RIVER BASIN--Continued

GREEN RIVER AT MUNFORDVILLE, KY.--Continued

Temperature (°F) of water, water year October 1950 to September 1951
(Once-daily temperature measurement at approximately 7 a. m.)

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

GREEN RIVER BASIN--Continued

GREEN RIVER AT MUNFORDVILLE, KY.--Continued

Suspended sediment, April to September 1951

| 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 | -- | -- | -- | 1,820 | 18 | 88 | 464 | 7 | 9 |
| 2 | -- | -- | -- | 2,090 | 280 | a 1,700 | 434 | 10 | 12 |
| 3 | -- | -- | -- | 1,980 | 300 | a 1,600 | 410 | 4 | 4 |
| 4 | -- | -- | -- | 1,910 | 45 | 232 | 392 | 6 | 6 |
| 5 | -- | -- | -- | 1,840 | 40 | 199 | 386 | 5 | 5 |
| 6 | -- | -- | -- | 2,330 | 76 | 478 | 374 | 5 | 5 |
| 7 | -- | -- | -- | 2,430 | 67 | 440 | 368 | 6 | 6 |
| 8 | -- | -- | -- | 1,960 | 27 | 143 | 392 | 11 | 12 |
| 9 | -- | -- | -- | 1,630 | 25 | 110 | 878 | 170 | b 460 |
| 10 | -- | -- | -- | 1,400 | 25 | 94 | 680 | 240 | a 450 |
| 11 | -- | -- | -- | 1,260 | 20 | 68 | 632 | 83 | 142 |
| 12 | -- | -- | -- | 1,200 | 20 | 65 | 572 | 39 | 60 |
| 13 | -- | -- | -- | 1,150 | 20 | 62 | 566 | 28 | 43 |
| 14 | -- | -- | -- | 1,050 | 16 | 45 | 506 | 33 | 45 |
| 15 | -- | -- | -- | 938 | 15 | 38 | 440 | 22 | 26 |
| 16 | -- | -- | -- | 848 | 15 | 34 | 410 | 22 | 24 |
| 17 | 3,880 | 15 | 157 | 788 | 15 | 32 | 380 | 20 | 21 |
| 18 | 3,260 | 11 | 97 | 728 | 11 | 22 | 356 | 13 | 12 |
| 19 | 2,850 | 7 | 54 | 680 | 12 | 22 | 338 | 11 | 10 |
| 20 | 2,540 | 6 | 41 | 638 | 11 | 19 | 338 | 14 | 13 |
| 21 | 2,260 | 5 | 31 | 602 | 7 | 11 | 332 | 13 | 12 |
| 22 | 2,480 | 24 | 161 | 572 | 5 | 8 | 338 | 15 | 14 |
| 23 | 3,280 | 40 | 354 | 554 | 6 | 9 | 842 | 150 | b 340 |
| 24 | 2,870 | 17 | 132 | 536 | 8 | 12 | 920 | 165 | 410 |
| 25 | 2,530 | 10 | 68 | 536 | 6 | 9 | 1,050 | 260 | b 750 |
| 26 | 2,300 | 14 | 87 | 560 | 12 | 18 | 758 | 104 | 213 |
| 27 | 2,690 | 90 | a 660 | 596 | 28 | 45 | 782 | 86 | 182 |
| 28 | 2,610 | 42 | 296 | 614 | 8 | 13 | 632 | 93 | 159 |
| 29 | 2,520 | 20 | 136 | 548 | 5 | 7 | 614 | 62 | 103 |
| 30 | 2,080 | 33 | 185 | 506 | 8 | 11 | 1,920 | 800 | s 5,580 |
| 31 | -- | -- | -- | 488 | 7 | 9 | -- | -- | -- |
| Total | c 38,150 | -- | c 2,459 | 34,782 | -- | 5,643 | 17,504 | -- | 9,128 |

| | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2,710 | 1,400 | a 10,000 | 332 | 20 | 18 | 422 | 15 | 17 |
| 2 | 4,270 | 920 | s 10,600 | 488 | 26 | 34 | 338 | 39 | 36 |
| 3 | 2,790 | 428 | 3,220 | 410 | 75 | 83 | 338 | 24 | 22 |
| 4 | 1,470 | 303 | 1,260 | 332 | 126 | 113 | 298 | 16 | 13 |
| 5 | 1,010 | 106 | 289 | 298 | 21 | 17 | 260 | 15 | 11 |
| 6 | 794 | 77 | 165 | 314 | 15 | 13 | 255 | 15 | 10 |
| 7 | 680 | 60 | 110 | 298 | 24 | 19 | 309 | 14 | 12 |
| 8 | 566 | 52 | 79 | 265 | 16 | 11 | 350 | 14 | 13 |
| 9 | 494 | 62 | 83 | 250 | 11 | 7 | 292 | 13 | 10 |
| 10 | 776 | 600 | b 1,300 | 632 | 100 | b 240 | 250 | 11 | 7 |
| 11 | 890 | 562 | s 1,310 | 938 | 200 | b 500 | 235 | 11 | 7 |
| 12 | 782 | 140 | b 320 | 2,590 | 1,250 | s 9,140 | 225 | 13 | 8 |
| 13 | 1,140 | 400 | b 1,200 | 1,850 | 900 | 4,500 | 344 | 19 | 18 |
| 14 | 998 | 312 | 841 | 1,260 | 485 | 1,650 | 344 | 21 | 30 |
| 15 | 806 | 96 | 209 | 944 | 125 | 319 | 356 | 21 | 20 |
| 16 | 1,070 | 360 | b 1,100 | 644 | 87 | 151 | 314 | 18 | 15 |
| 17 | 758 | 157 | 321 | 476 | 60 | 77 | 265 | 17 | 12 |
| 18 | 560 | 132 | 200 | 386 | 62 | 65 | 250 | 16 | 11 |
| 19 | 464 | 72 | 90 | 332 | 39 | 35 | 235 | 14 | 9 |
| 20 | 404 | 42 | 46 | 292 | 30 | 24 | 210 | 13 | 7 |
| 21 | 350 | 21 | 20 | 265 | 29 | 21 | 197 | 12 | 6 |
| 22 | 314 | 33 | 28 | 240 | 26 | 17 | 215 | 20 | 12 |
| 23 | 304 | 26 | 21 | 225 | 24 | 15 | 3,600 | 1,180 | s 13,500 |
| 24 | 584 | 150 | a 370 | 206 | 17 | 9 | 3,780 | 814 | s 8,270 |
| 25 | 1,760 | 640 | a 3,300 | 197 | 20 | 11 | 6,470 | 736 | s 12,700 |
| 26 | 818 | 268 | 592 | 188 | 14 | 7 | 4,610 | 342 | s 4,350 |
| 27 | 524 | 186 | 263 | 184 | 11 | 5 | 2,740 | 222 | s 2,270 |
| 28 | 458 | 111 | 137 | 197 | 10 | 5 | 1,540 | 131 | s 575 |
| 29 | 380 | 50 | 51 | 524 | 25 | 35 | 1,370 | 80 | 296 |
| 30 | 332 | 29 | 26 | 698 | 65 | 122 | 980 | 45 | b 120 |
| 31 | 344 | 28 | 26 | 506 | 55 | 75 | -- | -- | -- |
| Total | 29,600 | -- | 37,577 | 16,761 | -- | 17,338 | 32,392 | -- | 42,377 |

Total discharge for period (cfs-days) ..... 169,189
Total load for period (tons) ..... 114,522

s Computed by subdividing day.
a Computed from partly estimated concentration graph.
b Computed from estimated concentration graph.
c Total for period Apr. 17-30.

GREEN RIVER BASIN--Continued

GREEN RIVER AT MUNFORDVILLE, KY.--Continued

Particle-size analyses of suspended sediment, June to September 1951
(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 | |
| June 30, 1951 | 3:30 p.m. | 2,680 | 1,150 | 724 | 20 | 39 | 60 | 85 | 100 | -- | | | | | | BN |
| July 1 | 7:00 a.m. | 2,130 | 1,510 | 866 | 21 | 45 | 76 | 96 | 100 | -- | | | | | | BN |
| July 25 | 7:00 a.m. | 2,190 | 888 | 585 | 23 | 38 | 61 | 81 | 99 | -- | | | | | | BN |
| Aug. 12 | 7:00 a.m. | 2,510 | 1,300 | 893 | 30 | 39 | 57 | 81 | 97 | 99 | | | | | | BN |
| Sept. 23 | 1:55 p.m. | 4,780 | 1,700 | 1,230 | 22 | 31 | 52 | 78 | 100 | -- | | | | | | BN |
| Sept. 25 | 1:15 p.m. | 6,560 | 842 | 610 | 39 | 43 | 58 | 73 | 88 | 95 | 98 | | | | | 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 and 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.--Water temperatures: October 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 84°F July 22; minimum, freezing point Feb. 2, 3.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Temperature (°F) of water, water year October 1950 to September 1951
/Mean of twice-daily measurements at approximately 6:30 a. m. and 6:00 p. m./

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

GREEN RIVER BASIN--Continued

ROUGH RIVER AT DUNDEE, KY.

LOCATION.--At auxiliary wire-weight gage at bridge on State Highway 69 at Dundee, Ohio County, 7.1 miles downstream from Caney Creek.
DRAINAGE AREA.--775 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 88°F Sept. 2; minimum, freezing point on several days in February.
EXTREMES, 1949-51.--Water temperatures: Maximum, 88°F Sept. 2, 1951; minimum, freezing point on several days in February 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Temperature (°F) of water, water year October 1950 to September 1951
/Mean of twice-daily measurements of approximately 7 a. m. and 4 p. m./

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

## GREEN RIVER AT LIVERMORE, KY.

LOCATION.--At auxiliary gage at Louisville and Nashville Railroad bridge at Livermore, McLean County, 650 feet downstream from Rough River, and 7.8 miles upstream from base gage at Calhoun.
DRAINAGE AREA.--7,580 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1951.
Water temperatures: October 1949 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 207 ppm Oct. 21-31; minimum, 95 ppm Feb. 21-28.
Hardness: Maximum, 168 ppm Oct. 21-31; minimum, 73 ppm Jan. 11-20, Feb. 21-28.
Specific conductance: Maximum daily, 325 micromhos June 25; minimum daily, 120 micromhos Feb. 6.
Water temperatures: Maximum, 83°F on several days in July and August; minimum, 36°F Feb. 5, 7, 8.
EXTREMES, 1949-51.--Dissolved solids: Maximum, 207 ppm Oct. 21-31, 1950; minimum, 84 ppm Feb. 1-10, 1950.
Hardness: Maximum, 168 ppm Oct. 21-31, 1950; minimum, 60 ppm Feb. 1-10, 1950.
Specific conductance: Maximum daily, 326 micromhos Nov. 21, 1949; minimum daily, 106 micromhos June 26, 1950.
Water temperatures: Maximum, 83°F on several days in July and August, 1951; minimum, 36°F Feb. 5, 7, 8, 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 specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1205.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $CaCO_3$: Calcium, magnesium | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 1-10, 1950 | 2,600 | 11 | 0.00 | -- | 8.2 | -- | | 132 | 17 | -- | 0.0 | 2.6 | -- | -- | -- | 253 | 7.4 | 1 |
| Oct. 11-20 | 2,230 | 7.6 | .02 | 44 | 8.9 | 2.0 | | 147 | 21 | 4.4 | .0 | 2.9 | 168 | 148 | 26 | 286 | 7.6 | 1 |
| Oct. 21-31 | 3,640 | 7.6 | .01 | 51 | 9.5 | 7.0 | | 160 | 21 | 19 | .0 | 2.2 | 207 | 168 | 35 | 302 | 7.6 | 2 |
| Nov. 1-10 | 3,680 | 7.3 | .00 | 41 | 8.0 | 2.3 | | 139 | 17 | 5.2 | .0 | 1.7 | 164 | 134 | 21 | 283 | 7.7 | 1 |
| Nov. 11-20 | 9,090 | 7.6 | .04 | 37 | 8.5 | 2.5 | | 121 | 24 | 5.0 | .1 | 1.5 | 155 | 128 | 28 | 268 | 7.6 | 1 |
| Nov. 21-30 | 28,000 | 5.6 | .01 | 27 | 5.5 | 1.6 | | 84 | 16 | 4.4 | .1 | 1.8 | 114 | 89 | 21 | 182 | 7.7 | 2 |
| Dec. 1-10 | 23,800 | 8.1 | .07 | 31 | 5.3 | 5.7 | | 102 | 19 | 4.0 | .0 | 3.0 | 130 | 100 | 16 | 210 | 7.5 | 7 |
| Dec. 11-20 | 24,000 | 8.4 | .16 | 30 | 5.6 | 3.3 | | 94 | 20 | 3.4 | .0 | 2.9 | 130 | 98 | 21 | 203 | 7.5 | 8 |
| Dec. 21-31 | 5,990 | 9.8 | .03 | 40 | 7.0 | 3.4 | | 131 | 20 | 3.9 | .0 | 2.9 | 155 | 129 | 21 | 267 | 7.6 | 3 |
| Jan. 1-10, 1951 | 28,400 | 8.7 | .13 | 30 | 4.9 | 3.7 | | 100 | 14 | 2.9 | .0 | 2.9 | 121 | 96 | 13 | 201 | 7.6 | 7 |
| Jan. 11-20 | 47,600 | 6.7 | .06 | 23 | 3.6 | 3.6 | | 76 | 12 | 2.2 | .0 | 2.7 | 96 | 73 | 10 | 161 | 7.4 | 3 |
| Jan. 21-31 | 44,600 | 7.0 | .22 | 24 | 4.1 | 3.2 | | 76 | 15 | 2.6 | .1 | 2.3 | 102 | 78 | 14 | 171 | 7.4 | 8 |
| Feb. 1-10 | 34,400 | 6.6 | .12 | 26 | 4.6 | 1.0 | | 87 | 8.6 | 2.4 | .1 | 2.6 | 101 | 84 | 12 | 170 | 7.6 | 5 |
| Feb. 11-20 | 43,500 | 7.0 | .17 | 24 | 4.1 | 2.2 | 1.1 | 79 | 11 | 2.0 | .1 | 3.0 | 96 | 76 | 12 | 157 | 7.4 | 5 |
| Feb. 21-28 | 52,600 | 7.3 | .07 | 24 | 3.4 | 2.2 | 1.0 | 80 | 11 | 2.1 | .1 | 3.2 | 95 | 73 | 8 | 155 | 7.6 | 3 |
| Mar. 1-10 | 34,300 | 7.4 | .12 | 27 | 4.9 | 3.3 | | 82 | 20 | 2.5 | .2 | 3.2 | 105 | 87 | 20 | 188 | 7.4 | 4 |
| Mar. 11-20 | 31,400 | 7.3 | .09 | 28 | 4.4 | 3.7 | | 91 | 15 | 2.2 | .1 | 3.0 | 111 | 87 | 13 | 185 | 7.6 | 3 |
| Mar. 21-31 | 35,700 | 7.0 | .10 | 26 | 4.4 | 3.4 | | 82 | 17 | 2.2 | .1 | 2.7 | 106 | 82 | 16 | 175 | 7.5 | 3 |
| Apr. 1-10 | 20,800 | 7.6 | .08 | 28 | 5.3 | 2.8 | .7 | 92 | 18 | 2.1 | .1 | 2.4 | 119 | 93 | 16 | 196 | 7.5 | 3 |
| Apr. 11-20 | 17,900 | 8.1 | .09 | 30 | 4.6 | 3.5 | 1.4 | 95 | 17 | 2.9 | .1 | 2.4 | 119 | 94 | 16 | 199 | 7.6 | 2 |
| Apr. 21-30 | 15,000 | 8.1 | .08 | 29 | 4.9 | 3.0 | 1.0 | 94 | 20 | 2.5 | .1 | 1.9 | 122 | 93 | 15 | 198 | 7.5 | 3 |

GREEN RIVER BASIN--Continued

GREEN RIVER AT LIVERMORE, KY.--Continued

Chemical analyses, in parts per million, water year October 1950 to September 1951--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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| May 1-10, 1951 | 6,450 | 8.1 | 0.04 | 39 | 2.9 | 4.2 | 2.7 | 114 | 17 | 3.2 | 0.1 | 2.5 | 142 | 110 | 16 | 235 | 7.8 | 2 |
| May 11-20 | 3,570 | 8.4 | .06 | 38 | 7.8 | 4.3 | 2.2 | 128 | 20 | 5.0 | .0 | 2.7 | 161 | 128 | 22 | 262 | 7.8 | 2 |
| May 21-31 | 2,330 | 6.4 | .10 | 34 | 10 | 4.1 | 2.1 | 134 | 21 | 5.0 | .0 | 3.1 | 162 | 128 | 16 | 268 | 7.9 | 2 |
| June 1-10 | 1,880 | 9.0 | .17 | 41 | 8.3 | 4.8 | 2.3 | 142 | 20 | 4.8 | .1 | 2.9 | 170 | 136 | 20 | 277 | 7.9 | 2 |
| June 11-20 | 2,520 | 7.4 | .06 | 42 | 7.8 | 4.9 | 2.6 | 148 | 23 | 5.2 | .1 | 2.9 | 179 | 138 | 16 | 289 | 7.9 | 2 |
| June 21-30 | 4,090 | 8.3 | .03 | 38 | 6.8 | 5.2 | 2.7 | 128 | 22 | 4.8 | .2 | 3.0 | 153 | 122 | 18 | 264 | 7.9 | 3 |
| July 1-10 | 5,460 | 9.8 | .04 | 32 | 5.3 | 5.0 | 3.6 | 106 | 18 | 4.5 | .2 | 3.5 | 138 | 102 | 15 | 229 | 8.1 | 2 |
| July 11-20 | 3,760 | 12 | .04 | 30 | 4.9 | 4.4 | 4.1 | 102 | 14 | 3.0 | .2 | 3.9 | 130 | 94 | 11 | 211 | 8.2 | 3 |
| July 21-31 | 2,760 | 11 | .03 | 33 | 4.9 | 3.9 | 3.4 | 112 | 15 | 3.2 | .2 | 3.4 | 139 | 102 | 11 | 227 | 7.9 | 3 |
| Aug. 1-10 | 1,750 | 8.7 | .04 | 35 | 5.6 | 4.4 | 2.0 | 114 | 20 | 4.2 | .1 | 3.1 | 150 | 110 | 17 | 240 | 8.2 | 4 |
| Aug. 11-20 | 3,260 | 10 | .05 | 38 | 6.3 | 5.0 | 2.0 | 134 | 15 | 5.8 | .1 | 3.3 | 160 | 122 | 11 | 259 | 8.1 | 3 |
| Aug. 21-31 | 1,210 | 10 | .03 | 37 | 5.3 | 4.6 | 2.5 | 128 | 12 | 5.4 | .1 | 2.6 | 150 | 114 | 9 | 244 | 8.1 | 3 |
| Sept. 1-10 | 1,660 | 7.9 | .03 | 35 | 6.1 | 4.3 | 2.5 | 118 | 18 | 4.4 | .1 | 2.4 | 146 | 112 | 16 | 238 | 8.2 | 3 |
| Sept. 11-20 | 1,400 | 14 | .03 | 32 | 6.1 | 4.7 | 2.1 | 112 | 17 | 3.9 | .0 | 2.7 | 141 | 106 | 13 | 222 | 8.0 | 5 |
| Sept. 21-30 | 6,030 | 10 | .03 | 34 | 8.0 | 5.1 | 2.3 | 114 | 28 | 5.4 | .0 | 2.4 | 152 | 118 | 24 | 254 | 8.0 | 4 |
| Average | 15,240 | 8.4 | 0.07 | 33 | 6.0 | 4.5 | | 110 | 18 | 4.2 | 0.1 | 2.7 | 137 | 107 | 17 | 226 | -- | 3 |

GREEN RIVER BASIN--Continued

GREEN RIVER AT LIVERMORE, KY.--Continued

Temperature (°F) of water, water year October 1950 to September 1951
[Averages of twice-daily temperature measurements at approximately 7:05 a.m. and 4:00 p.m.]

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

## 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 September 1951.
REMARKS.--No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Noncarbonate | | | |
| Oct. 26, 1950 | | 8.4 | 0.05 | 85 | 39 | 35 | | 52 | 378 | 6.5 | 0.5 | 2.5 | 605 | 373 | 330 | 823 | 7.5 | 5 |
| Nov. 29 | | 6.8 | .35 | 19 | 6.6 | 5.7 | | 22 | 61 | 3.5 | .0 | .6 | 135 | 74 | 56 | 201 | 7.3 | 35 |
| Jan. 4, 1951 | | 5.5 | .20 | 12 | 3.9 | 6.0 | | 22 | 32 | 4.0 | .0 | 2.4 | 91 | 46 | 28 | 132 | 7.3 | 35 |
| Feb. 13 | | 7.6 | .04 | 19 | 6.3 | 2.0 | | 25 | 52 | 1.9 | .1 | .2 | 116 | 74 | 53 | 182 | 6.3 | 4 |
| Mar. 14 | | 6.9 | .12 | 22 | 7.0 | 5.4 | 1.6 | 33 | 67 | 2.0 | .0 | .5 | 142 | 84 | 57 | 204 | 6.9 | 6 |
| Apr. 17 | | 6.2 | .08 | 30 | 8.0 | 7.2 | 5.8 | 48 | 79 | 2.9 | .3 | .6 | 160 | 107 | 68 | 261 | 7.8 | 2 |
| May 22 | | 8.8 | .04 | 93 | 52 | 39 | 5.2 | 19 | 505 | 5.8 | .5 | 2.6 | 777 | 446 | 430 | 976 | 6.6 | 2 |
| July 12 | | 9.5 | .08 | 48 | 24 | 19 | 5.1 | 38 | 224 | 4.0 | .2 | 4.0 | 392 | 220 | 187 | 533 | 6.7 | 8 |
| Aug. 9 | | 6.3 | .02 | 58 | 22 | 32 | 3.2 | 39 | 268 | 6.2 | .3 | 3.5 | 453 | 236 | 203 | 618 | 6.1 | 3 |
| Sept. 11 | | 7.9 | .05 | 68 | 31 | 28 | 3.3 | 4 | 345 | 3.5 | .3 | .6 | a 484 | 290 | 289 | 706 | 4.8 | 5 |

a Includes 3.8 parts per million of manganese (Mn).

## GREEN RIVER NEAR SEBREE, KY.

LOCATION.--At State Highway 56, 2½ miles northeast of Sebree, Webster County, 3½ miles downstream from Deer Creek, and 12 miles downstream from Pond River.
DRAINAGE AREA.--About 8,600 square miles.
RECORDS AVAILABLE.--Chemical analyses: April 1950 to September 1951.
REMARKS.--No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Noncarbonate | | | |
| Oct. 26, 1950 | | 6.6 | 0.01 | 47 | 9.6 | 5.8 | | 175 | 17 | 4.2 | 0.0 | 2.9 | 178 | 158 | 13 | 291 | 7.8 | 3 |
| Nov. 28 | | 7.0 | .01 | 23 | 5.3 | 5.3 | | 70 | 27 | 2.9 | .0 | 1.4 | 110 | 80 | 22 | 175 | 7.6 | 2 |
| Jan. 3, 1951 | | 7.7 | .03 | 31 | 8.0 | 16 | | 97 | 42 | 15 | .0 | 1.8 | 174 | 110 | 31 | 299 | 7.4 | 2 |
| Feb. 7 | | 5.8 | .17 | 19 | 3.4 | 1.8 | | 60 | 11 | 1.8 | .1 | 2.5 | 79 | 62 | 12 | 134 | 7.4 | 7 |
| Mar. 13 | | 7.2 | .22 | 24 | 4.6 | 6.4 | | 63 | 35 | 2.4 | .0 | 1.7 | 109 | 79 | 27 | 175 | 6.9 | 8 |
| Apr. 17 | | 6.6 | .08 | 29 | 4.9 | 4.3 | 0.9 | 88 | 23 | 2.4 | .1 | 3.2 | 119 | 92 | 20 | 200 | 7.7 | 3 |
| May 22 | | 5.1 | .12 | 39 | 6.6 | 4.0 | 2.1 | 130 | 27 | 3.9 | .0 | 2.4 | 153 | 125 | 18 | 267 | 8.0 | 4 |
| July 12 | | 5.3 | .04 | 30 | 4.9 | 4.6 | 3.1 | 94 | 18 | 9.0 | .1 | 3.5 | 134 | 96 | 18 | 201 | 7.7 | 6 |
| Aug. 8 | | 5.9 | .07 | 34 | 5.3 | 4.5 | 1.8 | 104 | 25 | 4.0 | .2 | 3.3 | 146 | 108 | 21 | 234 | 8.1 | 3 |
| Sept. 11 | | 5.7 | .02 | 34 | 7.8 | 3.9 | 1.7 | 110 | 31 | 4.0 | .1 | 2.4 | 151 | 118 | 27 | 252 | 7.4 | 6 |

## PART 3-B. CUMBERLAND AND TENNESSEE RIVER BASINS

### CUMBERLAND RIVER BASIN

### CUMBERLAND RIVER AT BARBOURVILLE, KY.

LOCATION.--At gaging station at bridge on State Highway 11, at Barbourville, Knox County, 0.2 mile upstream from Richland Creek.
DRAINAGE AREA.--972 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 89°F July 18; minimum, freezing point Nov. 26, Dec. 18, Feb. 2, 3.
EXTREMES, 1949-51--Water temperatures: Maximum, 89°F July 18, 1951; minimum, freezing point Nov. 26, Dec. 18, 1950, Feb. 2, 3, 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1206.

Temperature (°F) of water, water year October 1950 to September 1951
/Mean of 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 | 38 | 38 | 42 | 54 | 52 | 68 | 73 | 78 | 84 | 78 |
| 2 | -- | 64 | 41 | 40 | 32 | 52 | 50 | 69 | 76 | 78 | 85 | 80 |
| 3 | -- | 63 | 47 | 45 | 32 | 54 | 48 | 69 | 80 | 78 | 85 | 82 |
| 4 | -- | 60 | 46 | 46 | 36 | 54 | 48 | 66 | 80 | 78 | 84 | 80 |
| 5 | -- | 54 | 44 | 44 | 37 | 52 | 47 | 64 | 80 | 78 | 82 | 79 |
| 6 | -- | 51 | 44 | 44 | 38 | 52 | 50 | 60 | 76 | 76 | 81 | 79 |
| 7 | 68 | 54 | 45 | 41 | 40 | 54 | 51 | 60 | 76 | 78 | 83 | 78 |
| 8 | 68 | 54 | 43 | 36 | 34 | 56 | 53 | 60 | 74 | 79 | 84 | 76 |
| 9 | 64 | 54 | 42 | 36 | 34 | 53 | 53 | 64 | 70 | 80 | 84 | 74 |
| 10 | 63 | 52 | 41 | 35 | 36 | 50 | 52 | 64 | 69 | 82 | 84 | 74 |
| 11 | 62 | 49 | 40 | 38 | 39 | 48 | 52 | 66 | 68 | 82 | 83 | 76 |
| 12 | 65 | 47 | 38 | 36 | 42 | 48 | 51 | 63 | 70 | 84 | 82 | 78 |
| 13 | 63 | 46 | 38 | 37 | 45 | 46 | 48 | 66 | 70 | 85 | 83 | 76 |
| 14 | 62 | 46 | 39 | 42 | 46 | 42 | 47 | 70 | 71 | 84 | 84 | 76 |
| 15 | 64 | 48 | 39 | 44 | 47 | 42 | 52 | 70 | 67 | 85 | 84 | 72 |
| 16 | 66 | 51 | 36 | 42 | 48 | 42 | 52 | 72 | 72 | 88 | 82 | 70 |
| 17 | 66 | 50 | 36 | 41 | 49 | 44 | 51 | 73 | 74 | 86 | 82 | 70 |
| 18 | 66 | 46 | 35 | 44 | 50 | 47 | 51 | 74 | 75 | 87 | 80 | 72 |
| 19 | 65 | 48 | 34 | 46 | 51 | 48 | 54 | 77 | 78 | 86 | 80 | 72 |
| 20 | 66 | 50 | 36 | 50 | 51 | 45 | 52 | 77 | 78 | 86 | 80 | 72 |
| 21 | 68 | 46 | 36 | 48 | 50 | 44 | 56 | 77 | 79 | 86 | 80 | 73 |
| 22 | 68 | 44 | 36 | 44 | 46 | 44 | 60 | 78 | 80 | 86 | 82 | 74 |
| 23 | 70 | 44 | 38 | 42 | 44 | 48 | 59 | 74 | 82 | 84 | 78 | 74 |
| 24 | 68 | 40 | 39 | 42 | 46 | 50 | 61 | 72 | 82 | 82 | 78 | 72 |
| 25 | 66 | 34 | 36 | 40 | 46 | 48 | 64 | 70 | 83 | 84 | 76 | 72 |
| 26 | 64 | 32 | 38 | 38 | 50 | 48 | 65 | 70 | 84 | 84 | 76 | 76 |
| 27 | 64 | 34 | 37 | 40 | 52 | 48 | 66 | 68 | 84 | 85 | 76 | 74 |
| 28 | 65 | 35 | 36 | 42 | 51 | 50 | 66 | 67 | 84 | 84 | 76 | 72 |
| 29 | 66 | 36 | 38 | 42 | -- | 54 | 66 | 68 | 83 | 82 | 76 | 69 |
| 30 | 66 | 36 | 39 | 40 | -- | 54 | 66 | 68 | 81 | 84 | 78 | 70 |
| 31 | 66 | -- | 39 | 39 | -- | 49 | -- | 70 | -- | 86 | 79 | -- |
| Average | 66 | 48 | 39 | 41 | 43 | 49 | 55 | 69 | 77 | 83 | 81 | 75 |

## CUMBERLAND RIVER NEAR ROWENA, KY.

LOCATION.--At gaging station 2.1 miles upstream from Black Fish Creek, 2.9 miles west of Rowena, Russell County, and 3.3 miles downstream from Indian Creek.
DRAINAGE AREA.--5,790 square miles.
RECORDS AVAILABLE.--Chemical analyses: November 1950 to September 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1206.

Chemical analyses, in parts per million, November 1950 to September 1951

| 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 | Noncarbonate | | | |
| Nov. 16, 1950 | 5,640 | 5.5 | 0.03 | 19 | 6.8 | 3.2 | | 73 | 15 | 4.1 | 0.1 | 1.1 | 95 | 76 | 16 | 158 | 7.7 | 16 |
| Jan. 8, 1951 | 7,520 | 5.6 | .18 | 15 | 2.4 | 3.9 | | 46 | 13 | 2.5 | .0 | 1.2 | 72 | 48 | 10 | 114 | 7.2 | 15 |
| Feb. 13 | 10,000 | 6.1 | .03 | 22 | 4.1 | 2.4 | 1.3 | 73 | 16 | 2.8 | .0 | 2.1 | 96 | 72 | 12 | 161 | 7.8 | 3 |
| Apr. 3 | 28,000 | 5.4 | .18 | 10 | 2.7 | 3.6 | | 33 | 14 | 1.1 | .0 | .8 | 55 | 36 | 9 | 87.8 | 6.9 | 7 |
| May 15 | 11,400 | 5.9 | .14 | 11 | 3.9 | 2.3 | 2.1 | 43 | 14 | 2.5 | .0 | 1.5 | 64 | 43 | 8 | 103 | 7.5 | 8 |
| June 12 | 1,580 | 5.0 | .16 | 14 | 2.4 | 2.6 | 2.7 | 46 | 13 | 2.5 | .0 | 1.7 | 66 | 45 | 7 | 111 | 7.5 | 8 |
| July 24 | 1,210 | 9.8 | .08 | 13 | 3.4 | 3.9 | 1.2 | 44 | 15 | 2.5 | .1 | 1.0 | 66 | 46 | 10 | 113 | 7.5 | 4 |
| Sept. 5 | 40 | 5.7 | .06 | 14 | 3.4 | 3.6 | 1.1 | 46 | 13 | 3.2 | .1 | 1.4 | 70 | 48 | 11 | 117 | 7.5 | 5 |

CUMBERLAND RIVER BASIN--Continued

CUMBERLAND RIVER AT BURKESVILLE, KY.

LOCATION.--At ferry on State Highway 90 about 1 mile south of Burkesville, Cumberland County.
RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 81°F June 30, July 1; minimum, 34°F Feb. 2, 3, 4.
EXTREMES, 1949-51.--Water temperatures: Maximum, 81°F June 30, July 1, 1951; minimum, 34°F Feb. 2, 3, 4, 1951.

Temperature (°F) of water, water year October 1950 to September 1951
/Mean of 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 | 73 | 65 | 44 | 38 | 36 | 43 | 45 | 51 | 50 | 80 | 63 | -- |
| 2 | 73 | 64 | 46 | 39 | 34 | 44 | 44 | 52 | 50 | 80 | 62 | 62 |
| 3 | 72 | 62 | 46 | 40 | 34 | 43 | 44 | 52 | 60 | 78 | 60 | 60 |
| 4 | 70 | 63 | 46 | 42 | 34 | 43 | 44 | 52 | 61 | 76 | 61 | 59 |
| 5 | 68 | 57 | 44 | 42 | 36 | -- | 46 | 52 | 62 | 72 | 65 | 60 |
| 6 | 68 | 58 | 42 | 42 | 38 | -- | 46 | 50 | 62 | 68 | 62 | 60 |
| 7 | 69 | 59 | 40 | 42 | 36 | 44 | 47 | 52 | 60 | 66 | 63 | 62 |
| 8 | 69 | 58 | 40 | 40 | 36 | 46 | 43 | 52 | 60 | 64 | 64 | 66 |
| 9 | 70 | 56 | 40 | 40 | 35 | 45 | 42 | 52 | 61 | 65 | 64 | -- |
| 10 | 70 | 56 | 40 | 38 | 36 | 43 | 44 | 51 | 60 | 66 | 60 | -- |
| 11 | 68 | 54 | 40 | 38 | 40 | 42 | 44 | 50 | 62 | 66 | 60 | -- |
| 12 | 66 | 52 | 42 | 40 | 42 | 42 | 44 | 48 | 62 | 67 | 61 | -- |
| 13 | 64 | 52 | 42 | 42 | 42 | 42 | 44 | 50 | 60 | 68 | 60 | -- |
| 14 | 62 | 52 | 42 | 44 | 40 | 42 | 45 | 50 | 60 | 70 | 61 | -- |
| 15 | 62 | 54 | 42 | 44 | 42 | 44 | 44 | 51 | 61 | 70 | 64 | -- |
| 16 | 63 | 52 | 43 | 43 | 43 | 44 | 44 | 52 | 60 | 70 | 65 | -- |
| 17 | 64 | 52 | 43 | 44 | 42 | 44 | 44 | 54 | 58 | 65 | 58 | -- |
| 18 | 64 | 50 | 42 | 44 | 41 | 44 | 45 | 55 | 58 | 66 | 58 | -- |
| 19 | 66 | 50 | 40 | 44 | 42 | 45 | 44 | 56 | 59 | 64 | 58 | -- |
| 20 | 67 | 52 | 40 | 44 | 41 | 44 | 43 | 56 | 60 | 63 | 56 | -- |
| 21 | 66 | 50 | 42 | 45 | 42 | 42 | 44 | 57 | 62 | 62 | 59 | -- |
| 22 | 66 | 50 | 43 | 46 | 42 | 42 | 46 | 58 | 63 | 60 | 58 | -- |
| 23 | 66 | 48 | 42 | 44 | 42 | 43 | 46 | 58 | 64 | 60 | 60 | -- |
| 24 | 68 | 46 | 40 | 43 | 42 | 43 | 48 | 56 | 66 | 62 | 59 | -- |
| 25 | 68 | 44 | 40 | 42 | 42 | 42 | 50 | 54 | 68 | 62 | 60 | -- |
| 26 | 68 | 43 | 40 | 40 | 42 | 43 | 49 | 54 | 70 | 64 | 62 | -- |
| 27 | 66 | 42 | 40 | 42 | 43 | 42 | 48 | 49 | 74 | 68 | -- | -- |
| 28 | 66 | 43 | 40 | 42 | 42 | 42 | 50 | 50 | 76 | 68 | -- | -- |
| 29 | 64 | 42 | 40 | 42 | -- | 44 | 52 | 50 | 78 | 63 | -- | -- |
| 30 | 64 | 42 | 39 | 40 | -- | 44 | 52 | 50 | 80 | 61 | -- | -- |
| 31 | 64 | -- | 38 | 38 | -- | 45 | -- | 50 | -- | 62 | -- | -- |
| Average | 71 | 52 | 42 | 42 | 40 | 43 | 46 | 52 | 63 | 67 | 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.
RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 86°F on several days in July and August; minimum, 34°F Feb. 3, 4, 5, 7.
EXTREMES, 1949-51.--Water temperatures: Maximum, 86°F on several days in July and August 1951; minimum, 34°F Feb. 3, 4, 5, 7, 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1206.

Temperature (°F) of water, water year October 1950 to September 1951
/Mean of 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 | 66 | 45 | 40 | 36 | 50 | 50 | 62 | 72 | 76 | 84 | 82 |
| 2 | 70 | 65 | 46 | 42 | 35 | 50 | 50 | 62 | 72 | 75 | 84 | 81 |
| 3 | 68 | 63 | 46 | 44 | 34 | 52 | 50 | 63 | 72 | 74 | 84 | 81 |
| 4 | 68 | 60 | 46 | 42 | 35 | 50 | 50 | 63 | 72 | 75 | 82 | 82 |
| 5 | 67 | 59 | 47 | 46 | 36 | 51 | 50 | 62 | 72 | 74 | 82 | 82 |
| 6 | 67 | 60 | 46 | 46 | 38 | 52 | 50 | 62 | 72 | 74 | 82 | 81 |
| 7 | 68 | 60 | 43 | 44 | 35 | 52 | 50 | 62 | 72 | 74 | 84 | 80 |
| 8 | 66 | 61 | 44 | 44 | 36 | 52 | 50 | 62 | 73 | 76 | 83 | 80 |
| 9 | 66 | 58 | 44 | 44 | 38 | 52 | 50 | 62 | 72 | 76 | 82 | 80 |
| 10 | 84 | 55 | 43 | 45 | 40 | 51 | 50 | 62 | 73 | 76 | 83 | 80 |
| 11 | 66 | 54 | 42 | 44 | 42 | 51 | 50 | 60 | 74 | 77 | 82 | 80 |
| 12 | 66 | 52 | 42 | 44 | 42 | 50 | 49 | 61 | 74 | 78 | 82 | 80 |
| 13 | 65 | 52 | 44 | 44 | 42 | 48 | 49 | 62 | 74 | 78 | 84 | 79 |
| 14 | 66 | 52 | 44 | 44 | 42 | 47 | 50 | 62 | 74 | 78 | 84 | 78 |
| 15 | 68 | 54 | 44 | 45 | 44 | 47 | 50 | 64 | 75 | 78 | 82 | 78 |
| 16 | 68 | 54 | 42 | 45 | 46 | 46 | 49 | 64 | 76 | 78 | 84 | 76 |
| 17 | 68 | 52 | 40 | 46 | 46 | 46 | 50 | 64 | 76 | 79 | 82 | 76 |
| 18 | 68 | 51 | 40 | 48 | 48 | 46 | 51 | 66 | 78 | 80 | 82 | 75 |
| 19 | 67 | 52 | 40 | 50 | 48 | 46 | 52 | 66 | 77 | 80 | 82 | 76 |
| 20 | 66 | 52 | 40 | 49 | 48 | 47 | 52 | 66 | 78 | 80 | 83 | 75 |
| 21 | 67 | 51 | 40 | 46 | 49 | 47 | 53 | 68 | 78 | 82 | 82 | 75 |
| 22 | 68 | 52 | 42 | 46 | 50 | 50 | 54 | 68 | 79 | 82 | 82 | 74 |
| 23 | 66 | 51 | 41 | 48 | 50 | 50 | 54 | 67 | 78 | 82 | 81 | 73 |
| 24 | 66 | 48 | 42 | 48 | 51 | 48 | 54 | 68 | 79 | 82 | 81 | 72 |
| 25 | 64 | 46 | 42 | 44 | 51 | 48 | 56 | 68 | 80 | 82 | 82 | 73 |
| 26 | 64 | 46 | 41 | 45 | 52 | 49 | 57 | 68 | 79 | 84 | 82 | 73 |
| 27 | 66 | 46 | 39 | 45 | 51 | 49 | 58 | 68 | 80 | 84 | 81 | 72 |
| 28 | 66 | 44 | 40 | 44 | 50 | 50 | 59 | 68 | 80 | 85 | 80 | 70 |
| 29 | 66 | 44 | 40 | 41 | -- | 49 | 60 | 70 | 79 | 85 | 81 | 70 |
| 30 | 66 | 44 | 40 | 40 | -- | 49 | 61 | 70 | 78 | 85 | 81 | 70 |
| 31 | 66 | -- | 38 | 39 | -- | 50 | -- | 70 | -- | 85 | 82 | -- |
| Average | 67 | 53 | 42 | 45 | 43 | 49 | 52 | 65 | 76 | 79 | 82 | 77 |

TENNESSEE RIVER BASIN

## FRENCH BROAD RIVER AT ASHEVILLE, N.C.

LOCATION.--At gaging station at Pearson Bridge at Asheville, Buncombe County, 2.3 miles downstream from Southern Railway station, and 3.1 miles downstream from Swannanoa River.
DRAINAGE AREA.--945 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
Water temperatures: October 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 157 ppm Sept. 12; minimum, 42 ppm Apr. 1-10.
Hardness: Maximum, 32 ppm Sept. 6; minimum, 10 ppm Mar. 21-31, Apr. 1-10.
Water temperatures: Maximum, 79°F June 18; minimum, freezing point Nov. 25, 26, Dec. 11, 16, Jan. 8.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1206.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Oct. 1-10, 1950 | 1,225 | 12 | 0.07 | 3.6 | 1.4 | 13 | 1.0 | 16 | 25 | 4.5 | 0.0 | 0.4 | 72 | 15 | 2 | 103 | 6.6 | 12 | 5.8 | 4.2 |
| Oct. 11-20 | 1,499 | 12 | .03 | 3.5 | 1.5 | 15 | | 15 | 26 | 4.6 | .1 | .9 | 72 | 15 | 3 | 109 | 6.2 | 9 | 7.0 | 3.3 |
| Oct. 21-31 | 266 | 9.5 | .07 | 3.2 | 1.1 | 8.6 | | 12 | 15 | 3.5 | .1 | .8 | 53 | 12 | 3 | 76.2 | 6.2 | 10 | 5.4 | 3.4 |
| Nov. 1-10 | 1,584 | 11 | .07 | 3.3 | 1.1 | 12 | | 14 | 19 | 4.4 | .0 | .6 | 62 | 13 | 1 | 87.3 | 6.2 | 13 | 6.2 | 3.8 |
| Nov. 11-20 | 1,267 | 10 | .04 | 3.6 | 1.4 | 14 | | 16 | 24 | 4.5 | .3 | .8 | 69 | 15 | 2 | 103 | 6.1 | 13 | 5.4 | 3.6 |
| Nov. 21-30 | 1,167 | 12 | .07 | 3.5 | 1.1 | 16 | | 18 | 26 | 4.6 | .1 | .6 | 78 | 13 | 0 | 111 | 6.2 | 14 | 5.6 | 4.0 |
| Dec. 1-10 | 5,026 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Dec. 11-20 | 2,189 | 8.5 | .05 | 3.0 | 1.1 | 11 | | 16 | 15 | 3.8 | .2 | .6 | 53 | 12 | 0 | 76.3 | 6.4 | 17 | 7.6 | 3.8 |
| Dec. 21-31 | 1,596 | 10 | .07 | 3.2 | 1.2 | 11 | | 14 | 19 | 3.5 | .2 | .5 | 58 | 13 | 2 | 85.0 | 6.4 | 16 | 6.2 | 3.8 |
| Jan. 1-10, 1951 | 1,493 | 8.5 | .05 | 3.0 | 1.0 | 14 | 1.7 | 23 | 22 | 3.9 | .0 | .2 | 69 | 12 | 0 | 102 | 6.6 | 18 | 5.0 | 4.0 |
| Jan. 11-20 | 1,650 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Jan. 21-31 | 1,400 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Feb. 1-10 | 1,982 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Feb. 11-19 | 1,767 | 4.4 | .05 | 3.0 | 1.4 | 8.3 | | 15 | 12 | 4.1 | .1 | .7 | 57 | 13 | 1 | 80.9 | 6.2 | 8 | 5.9 | 3.5 |
| Feb. 20-28 | 1,796 | 5.0 | .04 | 2.8 | 1.1 | 12 | | 15 | 20 | 3.4 | .0 | .5 | 54 | 12 | 0 | 79.9 | 6.3 | 8 | 5.6 | 4.0 |
| Mar. 1-10 | 2,176 | 9.4 | .05 | 3.0 | 1.0 | 11 | | 14 | 18 | 3.4 | .0 | .5 | 54 | 12 | 0 | 73.3 | 6.4 | 7 | 6.9 | 4.2 |
| Mar. 11-20 | 2,330 | 12 | .06 | 3.2 | 1.0 | 9.0 | | 12 | 14 | 4.8 | .0 | .6 | 51 | 12 | 2 | 67.8 | 6.3 | 7 | 4.7 | 2.6 |
| Mar. 21-31 | 2,877 | 11 | .06 | 2.6 | .9 | 8.7 | | 12 | 14 | 3.0 | .0 | .7 | 48 | 10 | 0 | 65.9 | 6.3 | 9 | 5.5 | 3.2 |
| Apr. 1-10 | 3,222 | 8.2 | .05 | 2.5 | 1.0 | 5.7 | 1.3 | 11 | 11 | 2.5 | .0 | .8 | 42 | 10 | 1 | 56.4 | 6.4 | 8 | 6.6 | 3.4 |
| Apr. 11-20 | 2,258 | 9.0 | .05 | 3.0 | 1.1 | 10 | | 16 | 15 | 4.0 | .0 | .5 | 54 | 12 | 0 | 71.5 | 6.3 | 17 | 5.5 | 3.1 |
| Apr. 21-30 | 2,143 | 9.8 | .05 | 3.6 | 1.1 | 13 | | 16 | 22 | 3.9 | .0 | .8 | 65 | 14 | 0 | 98.8 | 6.4 | 17 | 7.5 | 3.7 |
| May 1-10 | 2,117 | 9.0 | .04 | 3.3 | 1.2 | 10 | | 16 | 16 | 4.0 | .0 | .6 | 56 | 13 | 0 | 83.0 | 6.3 | 22 | 8.4 | 3.2 |
| May 11-20 | 1,458 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| May 21-31 | 1,243 | 11 | .17 | 4.7 | 1.6 | 16 | | 20 | 27 | 5.0 | .1 | 1.0 | 81 | 18 | 2 | 115 | 6.2 | 27 | 8.0 | 5.7 |
| June 1-10 | 1,181 | 11 | .15 | 4.7 | 1.8 | 20 | | 21 | 35 | 6.0 | .0 | 1.4 | 94 | 19 | 2 | 143 | 6.1 | 26 | 17 | 5.1 |
| June 11-20 | 1,711 | 11 | .10 | 4.7 | 2.1 | 20 | | 20 | 38 | 5.2 | .1 | 1.3 | 95 | 20 | 4 | 144 | 6.3 | 13 | 31 | 5.4 |
| June 21-30 | 1,679 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| July 1-10 | 1,278 | 12 | .22 | 4.4 | 1.9 | 18 | 1.4 | 17 | 37 | 5.0 | .0 | 1.6 | 92 | 19 | 5 | 144 | 6.3 | 33 | 8.0 | 4.7 |
| July 11-20 | 1,024 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| July 21-31 | 1,135 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Aug. 23 | 890 | 11 | .08 | 4.6 | 1.8 | 24 | | 25 | 39 | 6.9 | .1 | .9 | 106 | 19 | 0 | 158 | 6.2 | 28 | 6.2 | 3.8 |
| Aug. 29 | 650 | 12 | .08 | 5.1 | 2.3 | 36 | | 31 | 61 | 7.5 | .0 | .2 | 141 | 22 | 0 | 220 | 6.4 | 55 | 9.9 | 4.0 |
| Sept. 6 | 857 | 11 | .91 | 9.5 | 2.0 | 31 | | 48 | 48 | 7.2 | .0 | .1 | 138 | 32 | 0 | 209 | 6.7 | 80 | 9.0 | 6.4 |
| Sept. 12 | 604 | 12 | .06 | 5.2 | 3.1 | 40 | | 26 | 78 | 6.6 | .1 | .3 | 157 | 26 | 4 | 250 | 6.2 | 45 | 8.4 | 4.3 |
| Sept. 19 | 604 | 12 | .22 | 6.8 | 3.4 | 35 | | 26 | 70 | 6.8 | .1 | .1 | 146 | 28 | 7 | 233 | 6.3 | 65 | 7.8 | 4.6 |
| Sept. 26 | 668 | 12 | .15 | 4.7 | 2.0 | 30 | 2.2 | 27 | 58 | 7.0 | .0 | .1 | 132 | 20 | 0 | 211 | 6.4 | 55 | 8.2 | 5.2 |
| Average | a1,688 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

a Mean discharge for water year October 1950 to September 1951.

TENNESSEE RIVER BASIN--Continued

FRENCH BROAD RIVER AT ASHEVILLE, N. C.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

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

## NORTH FORK HOLSTON RIVER NEAR GATE CITY, VA.

LOCATION.--At gaging station at highway bridge, 1.6 miles downstream from Big Moccasin Creek, and 2.1 miles southeast of Gate City, Scott County.
DRAINAGE AREA.--672 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1951.
Water temperatures: Intermittently, October 1949 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 5,260 ppm Sept. 3; minimum, 401 ppm Feb. 1-10.
Hardness: Maximum, 3,450 ppm Sept. 3; minimum, 275 ppm Feb. 1-10.
Specific conductance: Maximum daily, 9,240 micromhos Sept. 3; minimum daily, 516 micromhos Dec. 9, Feb. 1.
Water temperatures: Maximum, 86°F Aug. 9; minimum observed, freezing point Nov. 5, 9, 12-13, 18.
EXTREMES, 1949-51.--Dissolved solids: Maximum, 5,260 ppm Sept. 3, 1951; minimum, 197 ppm Feb. 1-4, 6, 1950.
Hardness: Maximum, 3,450 ppm Sept. 3, 1951; minimum, 141 ppm Feb. 1-4, 6, 1950.
Specific conductance: Maximum daily, 9,240 micromhos Sept. 3, 1951; minimum daily, 284 micromhos Jan. 17, 1950.
Water temperatures: Maximum observed, 86°F Aug. 9, 1951; minimum observed, freezing point Nov. 5, 9, 12-13, 18, 1950.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1206.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 $CaCO_3$: Calcium, magnesium | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 1-10, 1950 | 168 | | -- | 0.01 | 515 | 11 | 289 | | 73 | 33 | 1,320 | | 2.6 | 2,210 | 1,330 | 1,270 | 4,200 | 7.3 | 7 |
| Oct. 11-20 | 140 | | -- | .02 | 893 | 20 | 468 | | 75 | 46 | 2,280 | | 3.1 | 3,750 | 2,310 | 2,250 | 6,920 | 7.3 | 4 |
| Oct. 21-31 | 166 | | -- | .01 | 737 | 20 | 389 | | 81 | 45 | 1,880 | | 3.4 | 3,110 | 1,920 | 1,850 | 5,820 | 7.2 | 5 |
| Nov. 1-10 | 179 | | -- | .01 | 882 | 19 | 461 | | 77 | 54 | 2,240 | | 4.0 | 3,700 | 2,280 | 2,220 | 6,800 | 7.2 | 5 |
| Nov. 11-20 | 162 | | -- | .01 | 697 | 15 | 350 | | 86 | 47 | 1,730 | | 3.4 | 2,880 | 1,800 | 1,730 | 5,170 | 7.4 | 5 |
| Nov. 21-30 | 317 | | -- | .02 | 432 | 11 | 201 | | 85 | 32 | 1,030 | | 5.5 | 1,750 | 1,120 | 1,050 | 3,350 | 7.5 | 5 |
| Dec. 1-10 | 2,280 | | -- | .01 | 202 | 6.3 | 95 | | 88 | 26 | 450 | | 3.9 | 826 | 530 | 458 | 1,560 | 7.5 | 8 |
| Dec. 11-20 | 597 | | -- | .01 | 224 | 8.6 | 93 | | 95 | 23 | 490 | | 5.0 | 891 | 594 | 516 | 1,710 | 7.5 | 5 |
| Dec. 21-31 | 319 | | -- | .01 | 436 | 12 | 189 | | 95 | 38 | 1,010 | | 7.0 | 1,740 | 1,140 | 1,060 | 3,350 | 7.4 | 5 |
| Jan. 1-9, 1951 | 383 | | -- | .01 | 374 | 9.9 | 170 | | 87 | 33 | 875 | | 4.0 | 1,510 | 974 | 903 | 2,890 | 7.4 | 5 |
| Jan. 10-20 | 1,230 | | 4.4 | .01 | 235 | 7.6 | 97 | | 74 | 20 | 530 | | .8 | 931 | 618 | 557 | 1,870 | 7.8 | 3 |
| Jan. 21-31 | 767 | | 3.6 | .02 | 192 | 7.5 | 70 | | 74 | 18 | 412 | | 1.1 | 740 | 510 | 449 | 1,510 | 7.8 | 5 |
| Feb. 1-10 | 2,003 | | 4.0 | .08 | 99 | 6.7 | 39 | | 75 | 14 | 200 | | 1.1 | 401 | 275 | 213 | 796 | 7.3 | 5 |
| Feb. 11-19 | 757 | | 4.4 | .02 | 204 | 9.0 | 89 | | 71 | 18 | 468 | | 2.0 | 829 | 546 | 488 | 1,660 | 8.2 | 5 |
| Feb. 20-28 | 1,681 | | 6.0 | .05 | 132 | 8.3 | 62 | | 91 | 15 | 288 | | 2.2 | 559 | 364 | 289 | 1,070 | 7.6 | 3 |
| Mar. 1-10 | 1,764 | | 5.6 | .01 | 135 | 8.5 | 55 | | 78 | 18 | 288 | | 2.5 | 551 | 372 | 308 | 1,100 | 7.4 | 3 |
| Mar. 11-20 | 1,522 | | 9.6 | .02 | 126 | 7.8 | 55 | | 82 | 17 | 270 | | 1.7 | 527 | 346 | 279 | 1,030 | 7.4 | 3 |
| Mar. 21-31 | 1,882 | | 7.6 | .04 | 118 | 6.8 | 50 | | 77 | 14 | 250 | | 1.4 | 486 | 322 | 259 | 964 | 7.7 | 3 |
| Apr. 1-10 | 2,240 | | 4.8 | .05 | 101 | 6.7 | 41 | | 82 | 12 | 205 | | 1.1 | 412 | 280 | 212 | 804 | 7.5 | 3 |
| Apr. 11-20 | 2,327 | | 4.0 | .01 | 128 | 4.9 | 23 | | 63 | 17 | 220 | | 2.0 | 430 | 340 | 288 | 856 | 7.3 | 5 |
| Apr. 21-30 | 1,302 | | 3.2 | .01 | 154 | 6.4 | 47 | | 77 | 24 | 300 | | 1.6 | 574 | 411 | 347 | 1,120 | 7.6 | 3 |
| May 1-10 | 1,955 | | 3.2 | .01 | 157 | 5.9 | 44 | | 80 | 21 | 300 | | 1.6 | 572 | 416 | 350 | 1,130 | 7.5 | 3 |
| May 11-20 | 1,114 | | 3.6 | .01 | 179 | 7.3 | 48 | | 77 | 23 | 350 | | 1.2 | 650 | 477 | 414 | 1,250 | 7.5 | 3 |

TENNESSEE RIVER BASIN--Continued

NORTH FORK HOLSTON RIVER NEAR GATE CITY, VA.--Continued

Chemical analyses, in parts per million, water year October 1950 to September 1951--Continued

| 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 $CaCO_3$: Calcium, magnesium | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| May 21-31, 1951 | 689 | | -- | 0.04 | 215 | 8.2 | 128 | | 90 | 19 | 535 | | 0.7 | 951 | 570 | 496 | 1,850 | 7.1 | 9 |
| June 1-10 | 472 | | 3.2 | .04 | 265 | 9.7 | 137 | | 74 | 21 | 650 | | .6 | 1,120 | 701 | 640 | 2,240 | 7.1 | 10 |
| June 11-20 | 455 | | 2.0 | .04 | 304 | 11 | 164 | | 70 | 22 | 765 | | .6 | 1,300 | 804 | 746 | 2,600 | 7.0 | 11 |
| June 21-30 | 370 | | 3.6 | .08 | 407 | 14 | 241 | | 55 | 28 | 1,080 | | .7 | 1,800 | 1,070 | 1,030 | 3,460 | 7.0 | 8 |
| July 1-10 | 407 | | 2.4 | .08 | 400 | 15 | 186 | | 61 | 38 | 975 | | .8 | 1,650 | 1,060 | 1,010 | 3,300 | 7.0 | 4 |
| July 11-20 | 252 | | 2.0 | .05 | 440 | 17 | 256 | -- | 53 | 37 | 1,160 | | .8 | 1,940 | 1,170 | 1,120 | 3,630 | 7.1 | 5 |
| July 21-31 | 333 | | 4.0 | .02 | 500 | 17 | 275 | -- | 52 | 37 | 1,310 | | 1.3 | 2,170 | 1,320 | 1,270 | 4,020 | 6.8 | 5 |
| Aug. 1-10 | 231 | | 6.0 | .05 | 496 | 17 | 275 | -- | 52 | 38 | 1,290 | | .8 | 2,150 | 1,310 | 1,260 | 4,010 | 7.3 | 5 |
| Aug. 11-20 | 229 | | 5.0 | .10 | 500 | 17 | 273 | -- | 56 | 32 | 1,320 | | 1.8 | 2,180 | 1,320 | 1,270 | 4,010 | 7.4 | 5 |
| Aug. 21-Sept. 2 | 141 | | 6.0 | .02 | 832 | 20 | 455 | -- | 47 | 44 | 2,200 | | 1.5 | 3,580 | 2,160 | 2,120 | 6,400 | 7.3 | 4 |
| Sept. 3 | 248 | | -- | -- | 1,240 | -- | 660 | -- | 39 | -- | 3,340 | | -- | 5,260 | 3,450 | 3,420 | 9,240 | 7.0 | -- |
| Sept. 4-6 | 235 | | 1.0 | -- | 582 | -- | 328 | -- | 52 | 37 | 1,550 | | 1.6 | 2,530 | 1,660 | 1,620 | 4,620 | 7.5 | 3 |
| Sept. 7-11 | 520 | | 5.0 | .02 | 298 | 7.7 | 170 | 2.3 | 59 | 34 | 750 | | 1.6 | 1,300 | 775 | 727 | 2,440 | 7.4 | 9 |
| Sept. 12 | 208 | | -- | -- | 177 | -- | 129 | 1.8 | 72 | -- | 500 | | -- | 843 | 550 | 491 | 1,720 | 7.2 | -- |
| Sept. 13-20 | 278 | | 2.0 | .02 | 436 | 12 | 262 | 2.3 | 66 | 35 | 1,200 | | 3.8 | 1,990 | 1,140 | 1,080 | 3,630 | 7.4 | 4 |
| Sept. 21-23 | 170 | | 2.0 | -- | 292 | -- | 182 | 2.1 | 64 | 31 | 825 | | 5.8 | 1,370 | 930 | 878 | 2,630 | 7.2 | 5 |
| Sept. 24-30 | 166 | | 10 | .03 | 724 | 16 | 425 | 2.9 | 58 | 47 | 1,980 | | 1.4 | 3,240 | 1,870 | 1,820 | 5,800 | 7.4 | 3 |
| Average | 819 | | -- | 0.03 | 371 | 11 | -- | -- | 73 | 29 | 920 | | 2.2 | 1,560 | 977 | 916 | 2,940 | -- | 5 |

TENNESSEE RIVER BASIN--Continued

NORTH FORK HOLSTON RIVER NEAR GATE CITY, VA.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | -- | 41 | | | | | | -- | 78 | 78 | 84 | 79 |
| 2 | 54 | 42 | | | | | | -- | 78 | 77 | 84 | 82 |
| 3 | 46 | 40 | | | | | | -- | 79 | 75 | 84 | 82 |
| 4 | 44 | 34 | | | | | | -- | 78 | 77 | 83 | 80 |
| 5 | 39 | 32 | | | | | | -- | 77 | 77 | 82 | 80 |
| 6 | 44 | 34 | | | | | | -- | 77 | 76 | 79 | 76 |
| 7 | 42 | 34 | | | | | | -- | 73 | 78 | 81 | 72 |
| 8 | 45 | 33 | | | | | | -- | 72 | 80 | 83 | 74 |
| 9 | 44 | 32 | | | | | | -- | 73 | 79 | 86 | 74 |
| 10 | 38 | 36 | | | | | | -- | 71 | 81 | 83 | 74 |
| 11 | 41 | 35 | | | | | | -- | 72 | 81 | 82 | 78 |
| 12 | 39 | 32 | | | | | | -- | 73 | 85 | 84 | 77 |
| 13 | 39 | 32 | | | | | | -- | 74 | 85 | 85 | 78 |
| 14 | 41 | 33 | | | | | | -- | 73 | 84 | 84 | 75 |
| 15 | 41 | 34 | | | | | | -- | 76 | 84 | 84 | 74 |
| 16 | 45 | 33 | | | | | | -- | 74 | 84 | 85 | 74 |
| 17 | 47 | -- | | | | | | -- | 74 | 84 | 83 | 70 |
| 18 | 45 | 32 | | | | | | -- | 75 | 84 | 80 | 75 |
| 19 | 47 | 33 | | | | | | -- | 76 | 85 | 81 | 72 |
| 20 | 42 | -- | | | | | | -- | 76 | 81 | 81 | 70 |
| 21 | 45 | -- | | | | | | 72 | 78 | 82 | 82 | 72 |
| 22 | 44 | -- | | | | | | 73 | 82 | 81 | 81 | 71 |
| 23 | 46 | -- | | | | | | 68 | 83 | 84 | 82 | 73 |
| 24 | 42 | -- | | | | | | 68 | 85 | 80 | 80 | 72 |
| 25 | 44 | -- | | | | | | 69 | 85 | 81 | 79 | 74 |
| 26 | 37 | -- | | | | | | 72 | 84 | 83 | 75 | 73 |
| 27 | 35 | -- | | | | | | 69 | 84 | 85 | 76 | 74 |
| 28 | 40 | -- | | | | | | 65 | 82 | 82 | 77 | 69 |
| 29 | 42 | -- | | | | | | 73 | 82 | 82 | 76 | 69 |
| 30 | -- | -- | | | | | | 68 | 80 | 83 | 78 | 68 |
| 31 | 44 | -- | | | | | | 69 | -- | 83 | 81 | -- |
| Average | 43 | -- | | | | | | -- | 77 | 81 | 81 | 74 |

TENNESSEE RIVER BASIN--Continued

## TUCKASEGEE RIVER AT BRYSON CITY, N. C.

LOCATION.--At bridge 400 feet upstream from gaging station on State Highway 288 at Bryson City, Swain County, and 0.6 mile downstream from Deep Creek.
DRAINAGE AREA.--655 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
Water temperatures: October 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 92 ppm Dec. 1-10; minimum, 28 ppm Apr. 1-10.
Hardness: Maximum, 16 ppm Dec. 1-10; minimum, 6 ppm Dec. 11-20, 21-31, Apr. 1-10.
Water temperatures: Maximum, 78°F July 13; minimum, 33°F Nov. 26, Feb. 3.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1206.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Oct. 1-10, 1950 | 850 | 11 | 0.08 | 2.0 | 0.7 | 7.1 | 1.0 | 18 | 8.7 | 1.4 | 0.0 | 0.0 | 47 | 8 | 0 | 48.6 | 6.5 | 45 | 12 | 10 |
| Oct. 11-20 | 974 | 10 | .05 | 2.6 | .7 | 7.3 | | 18 | 7.9 | 1.5 | .0 | .2 | 46 | 9 | 0 | 52.3 | 6.3 | 45 | 11 | 9.0 |
| Oct. 21-31 | 937 | 8.0 | .07 | 2.6 | .7 | 7.6 | | 18 | 7.7 | 2.0 | .1 | .2 | 49 | 9 | 0 | 49.9 | 6.3 | 34 | 10 | 8.9 |
| Nov. 1-10 | 841 | 8.2 | .11 | 2.6 | .7 | 8.5 | | 19 | 8.8 | 2.2 | .0 | .2 | 50 | 9 | 0 | 62.7 | 6.4 | 45 | 12 | 12 |
| Nov. 11-20 | 765 | 8.4 | .18 | 2.2 | .6 | 10 | | 20 | 10 | 1.8 | .1 | .1 | 50 | 8 | 0 | 56.1 | 6.3 | 45 | 11 | 11 |
| Nov. 21-30 | 863 | 9.4 | .10 | 2.3 | .5 | 10 | | 20 | 10 | 1.9 | .0 | .2 | 51 | 8 | 0 | 49.3 | 6.2 | 55 | 12 | 9.8 |
| Dec. 1-10 | 2,372 | 8.3 | .29 | 2.8 | 2.3 | 26 | | 15 | 10 | 36 | .0 | .2 | 92 | 16 | 4 | 175 | 6.2 | 38 | 12 | 7.6 |
| Dec. 11-20 | 1,320 | 8.3 | .08 | 1.9 | .3 | 7.0 | | 15 | 6.0 | 1.8 | .0 | .1 | 34 | 6 | 0 | 33.8 | 6.1 | 28 | 7.2 | 5.5 |
| Dec. 21-31 | 1,031 | 8.3 | .04 | 1.8 | .4 | 5.8 | | 13 | 5.7 | 1.2 | .1 | .2 | 31 | 6 | 0 | 35.3 | 6.3 | 24 | 8.4 | 6.8 |
| Jan. 1-10, 1951 | 1,061 | 7.3 | .06 | 2.0 | .4 | 5.2 | 1.0 | 14 | 6.9 | 1.2 | .0 | .1 | 37 | 7 | 0 | 37.5 | 6.3 | 45 | 7.9 | 7.5 |
| Jan. 11-20 | 1,664 | 8.4 | .06 | 2.1 | .6 | 4.5 | | 11 | 6.1 | 1.2 | .1 | .3 | 31 | 8 | 0 | 31.3 | 6.3 | 23 | 5.5 | 4.6 |
| Jan. 21-31 | 1,346 | 7.1 | .09 | 2.9 | .7 | 3.9 | | 13 | 5.3 | 1.2 | .0 | .2 | 33 | 10 | 0 | 31.4 | 6.2 | 18 | 7.2 | 6.1 |
| Feb. 1-10 | 1,733 | 6.7 | .14 | 2.4 | .7 | 4.6 | | 14 | 5.6 | 1.0 | .0 | .3 | 31 | 9 | 0 | 30.9 | 6.2 | 20 | 7.2 | 5.7 |
| Feb. 11-19 | 1,432 | 8.2 | .08 | 2.3 | .5 | 5.0 | | 12 | 6.9 | 1.0 | .0 | .3 | 35 | 8 | 0 | 34.9 | 6.5 | 23 | 7.8 | 7.4 |
| Feb. 20-28 | 1,759 | 2.4 | .06 | 2.3 | .5 | 7.3 | | 15 | 8.2 | 1.8 | .0 | .4 | 35 | 8 | 0 | 41.6 | 6.3 | 22 | 6.8 | 6.3 |
| Mar. 1-10 | 2,182 | 10 | .04 | 2.2 | .6 | 4.6 | | 11 | 6.4 | 1.4 | .1 | .2 | 34 | 8 | 0 | 32.4 | 6.2 | 22 | 13 | 6.1 |
| Mar. 11-20 | 2,024 | 10 | .03 | 1.8 | .5 | 5.3 | | 12 | 5.9 | 1.4 | .0 | .2 | 32 | 7 | 0 | 31.8 | 6.1 | 23 | 8.7 | 5.3 |
| Mar. 21-31 | 2,938 | 10 | .11 | 1.9 | .6 | 4.8 | | 12 | 5.4 | 1.5 | .0 | .2 | 31 | 7 | 0 | 31.9 | 6.2 | 22 | 6.6 | 5.0 |
| Apr. 1-10 | 2,737 | 7.9 | .05 | 1.6 | .6 | 2.8 | 1.1 | 10 | 4.5 | .8 | .0 | .3 | 28 | 6 | 0 | 27.6 | 6.3 | 18 | 7.4 | 5.9 |
| Apr. 11-20 | 2,085 | 8.7 | .02 | 2.3 | .7 | 5.1 | | 13 | 5.3 | 2.4 | .0 | .3 | 35 | 9 | 0 | 31.2 | 6.1 | 16 | 13 | 12 |
| Apr. 21-30 | 1,810 | 7.9 | .04 | 2.3 | .4 | 5.8 | | 15 | 5.0 | 1.6 | .0 | .3 | 35 | 7 | 0 | 36.6 | 6.2 | 17 | 8.2 | 4.2 |
| May 1-10 | 1,534 | 9.2 | .10 | 2.1 | .7 | 5.8 | | 15 | 5.6 | 1.8 | .0 | .2 | 36 | 8 | 0 | 35.3 | 6.3 | 25 | 9.2 | 6.2 |
| May 11-20 | 1,162 | 9.7 | .10 | 2.5 | .6 | 6.8 | | 16 | 7.5 | 1.8 | .0 | .1 | 44 | 9 | 0 | 43.5 | 6.3 | 33 | 8.2 | 8.0 |
| May 21-31 | 940 | 9.1 | .16 | 2.0 | .7 | 8.9 | | 19 | 8.6 | 1.8 | .0 | .2 | 46 | 8 | 0 | 47.6 | 6.4 | 40 | 16 | 12 |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| June 1-10 | 1,260 | 8.9 | .18 | 3.1 | .5 | 6.4 | | 18 | 6.3 | 1.6 | .0 | .3 | 45 | 10 | 0 | 42.6 | 6.3 | 35 | 16 | 7.2 |
| June 11-20 | 1,465 | 10 | .10 | 3.7 | .5 | 6.9 | | 18 | 6.0 | 3.6 | .0 | .2 | 45 | 11 | 0 | 50.1 | 6.2 | 27 | 12 | 6.6 |
| June 21-30 | 1,300 | 13 | .15 | 2.7 | .9 | 6.8 | | 19 | 7.4 | 1.4 | .0 | .1 | 49 | 10 | 0 | 47.5 | 6.4 | 45 | 10 | 6.4 |
| July 1-10 | 1,224 | 12 | .06 | 1.8 | .6 | 5.7 | .9 | 15 | 6.5 | 1.8 | .0 | .3 | 42 | 7 | 0 | 41.8 | 6.5 | 45 | 11 | 6.4 |
| July 11-20 | 939 | 11 | .22 | 3.0 | 1.0 | 9.9 | | 23 | 11 | 1.9 | .0 | .1 | 62 | 12 | 0 | 57.6 | 6.2 | 60 | 14 | 9.8 |
| July 21-31 | 1,110 | 8.8 | .08 | 3.0 | .6 | 7.9 | | 18 | 9.2 | 1.9 | .0 | .2 | 48 | 10 | 0 | 48.0 | 6.5 | 50 | 13 | 10 |
| Aug. 1-10 | 727 | 9.7 | .07 | 3.0 | .5 | 9.7 | | 21 | 10 | 2.0 | .0 | .2 | 54 | 10 | 0 | 59.5 | 6.6 | 60 | 16 | 15 |
| Aug. 11-20 | 704 | 9.4 | .27 | 3.5 | .8 | 11 | | 26 | 11 | 2.8 | .0 | .1 | 60 | 12 | 0 | 57.0 | 6.3 | 55 | 11 | 8.5 |
| Aug. 21-31 | 640 | 9.4 | .15 | 3.2 | .8 | 14 | | 28 | 14 | 3.0 | .0 | .1 | 62 | 11 | 0 | 69.5 | 6.3 | 110 | 13 | 12 |
| Sept. 1-10 | 690 | 8.6 | .12 | 3.1 | .5 | 9.6 | | 19 | 11 | 2.5 | .0 | .1 | 51 | 10 | 0 | 51.0 | 6.3 | 65 | 10 | 9.7 |
| Sept. 11-20 | 785 | 9.8 | .10 | 3.2 | .9 | 14 | | 30 | 12 | 2.9 | .0 | .2 | 61 | 12 | 0 | 65.0 | 6.4 | 75 | 15 | 9.2 |
| Sept. 21-30 | 873 | 9.3 | .10 | 2.1 | .5 | 10 | 1.0 | 24 | 14 | 2.6 | .0 | .1 | 64 | 7 | 0 | 68.2 | 6.5 | 120 | 14 | 7.7 |
| Average | 1,333 | 9.0 | 0.10 | 2.5 | 0.7 | 7.9 | | 17 | 8.0 | 2.8 | 0.0 | 0.2 | 45 | 9 | 0 | 48.5 | -- | 40 | 11 | 8.1 |

TENNESSEE RIVER BASIN--Continued

TUCKASEGEE RIVER AT BRYSON CITY, N. C.--Continued

Temperature (°F) of water, water year October 1950 to September 1951

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

## DEEP CREEK NEAR BRYSON CITY, N. C.

LOCATION.--At Deep Creek Ranger Station, 100 feet downstream from Juney Whank Branch, 0.6 mile upstream from Great Smoky National Park boundary, 2.4 miles upstream from mouth, and 2.6 miles north of Bryson City, Swain County.
DRAINAGE AREA.--40.2 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| Date of collection | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| Oct. 15, 1950 | 39.3 | 8.0 | 0.02 | 1.2 | 0.4 | 1.8 | | 7 | 1.6 | 0.8 | 0.0 | 0.1 | 16 | 5 | 0 | 16.2 | 6.7 | 3 |
| Nov. 15 | 37.5 | 6.8 | .01 | 1.6 | .4 | 1.8 | | 8 | 1.8 | .6 | .1 | .1 | 17 | 6 | 0 | 14.1 | 6.2 | 3 |
| Dec. 15 | 72.6 | 6.6 | .01 | 1.0 | .3 | 2.0 | | 6 | 1.9 | .6 | .1 | .1 | 16 | 4 | 0 | 12.5 | 6.4 | 3 |
| Jan. 15, 1951 | 273 | 4.6 | .02 | 1.0 | .3 | 1.5 | 0.5 | 5 | 2.1 | .8 | .0 | .5 | 14 | 4 | 0 | 13.5 | 6.4 | 4 |
| Feb. 15 | 93.6 | 5.2 | .02 | 1.0 | .2 | 2.1 | | 6 | 2.1 | .5 | .0 | .1 | 14 | 3 | 0 | 13.1 | 6.3 | 3 |
| Mar. 15 | 172 | 4.9 | .02 | 1.1 | .3 | 1.3 | | 4 | 2.1 | .8 | .0 | .1 | 13 | 4 | 1 | 12.7 | 6.3 | 2 |
| Apr. 15 | 168 | 7.2 | .02 | 1.0 | .2 | 1.5 | .3 | 6 | 1.7 | .6 | .0 | .1 | 14 | 3 | 0 | 14.1 | 6.5 | 3 |
| May 15 | 89.0 | 6.4 | .05 | 1.1 | .3 | 1.6 | | 6 | 1.2 | .9 | .0 | .2 | 14 | 4 | 0 | 14.2 | 6.2 | 7 |
| June 15 | 79.5 | 6.2 | .04 | 1.2 | .3 | 2.6 | | 8 | 1.7 | .9 | .0 | .3 | 17 | 4 | 0 | 15.6 | 6.0 | 7 |
| July 15 | 68.9 | 7.7 | .02 | 1.8 | .4 | 1.5 | .4 | 8 | 2.2 | 1.0 | .0 | .2 | 18 | 6 | 0 | 19.0 | 6.8 | 13 |
| Aug. 15 | 43.8 | 7.3 | .03 | 1.4 | .6 | 2.3 | | 9 | 1.9 | .8 | .1 | .1 | 20 | 6 | 0 | 14.3 | 6.2 | 8 |
| Sept. 15 | 98.6 | 6.9 | .04 | 1.8 | .5 | 1.7 | .8 | 8 | 2.1 | .6 | .1 | .5 | 19 | 7 | 0 | 15.4 | 6.5 | 12 |

TENNESSEE RIVER BASIN--Continued

EAST FORK CLARKS RIVER NEAR BENTON, KY.

LOCATION.--At gaging station at bridge on U. S. Highway 68 and State Highway 95, 1 mile north of Benton, Marshall County, and 6.8 miles upstream from Middle Fork Creek.
DRAINAGE AREA.--227 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 81°F Aug. 30; minimum, freezing point on several days in December, January, and February.
EXTREMES, 1949-51.--Water temperatures: Maximum, 81°F Aug. 11, 1950, Aug. 30, 1951; minimum, freezing point on several days in December 1950, January and February 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1206.

Temperature (°F) of water, water year October 1950 to September 1951
/Mean of twice-daily measurements at approximately 6:30 a. m. and 4:30 p. m./

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 66 | 66 | 65 | 39 | -- | 38 | 53 | 68 | 65 | 72 | 80 | 78 |
| 2 | 66 | 62 | -- | 46 | -- | 37 | 48 | 68 | -- | 75 | 80 | 76 |
| 3 | 64 | 56 | -- | 50 | -- | 42 | 44 | 68 | 69 | 72 | 80 | 73 |
| 4 | 57 | 51 | -- | 45 | -- | 38 | 47 | 66 | -- | 71 | 76 | 72 |
| 5 | 60 | 50 | -- | 46 | -- | 42 | 50 | 63 | 66 | 70 | 74 | 66 |
| 6 | 62 | 51 | -- | 44 | 35 | 48 | 54 | 62 | 66 | 70 | 74 | 70 |
| 7 | 61 | 54 | -- | 36 | 34 | 44 | 56 | 60 | 66 | 68 | 76 | 68 |
| 8 | 60 | 54 | -- | 36 | 34 | 50 | 54 | -- | 66 | 74 | 77 | 70 |
| 9 | 60 | 54 | -- | 36 | 32 | 55 | 50 | 59 | 68 | 72 | 77 | 66 |
| 10 | 58 | 48 | -- | 39 | 34 | 51 | 50 | 60 | 68 | 72 | 76 | 70 |
| 11 | 60 | 42 | -- | 38 | 37 | 48 | 50 | 60 | 67 | 73 | 76 | 70 |
| 12 | 62 | 44 | -- | 38 | 40 | 43 | 46 | 59 | 67 | 74 | 75 | 70 |
| 13 | 54 | 44 | -- | 44 | 43 | 38 | 46 | 60 | 70 | 74 | 74 | 70 |
| 14 | 64 | 46 | -- | 48 | 42 | 38 | 51 | 59 | 68 | 74 | 75 | 65 |
| 15 | 68 | 54 | -- | 47 | 43 | 38 | 50 | 62 | 69 | 74 | 72 | 66 |
| 16 | 62 | 56 | 38 | 42 | 46 | 41 | 51 | 64 | 68 | 74 | 72 | 66 |
| 17 | 64 | 52 | 38 | 44 | 44 | 49 | 52 | 64 | 72 | 75 | 72 | 68 |
| 18 | 66 | 50 | 35 | 48 | 46 | 56 | 51 | 67 | 72 | 74 | 72 | -- |
| 19 | 64 | 53 | 35 | 55 | 58 | 42 | 52 | 66 | 72 | 76 | 74 | -- |
| 20 | 64 | 48 | 34 | 49 | 56 | 44 | 57 | 64 | 72 | 76 | 72 | -- |
| 21 | 66 | 46 | 34 | 45 | 44 | 44 | 58 | 66 | 70 | 76 | 74 | -- |
| 22 | 65 | 48 | 38 | 42 | 45 | 46 | 57 | 68 | 74 | 76 | 72 | -- |
| 23 | 64 | 48 | 37 | 42 | 45 | 50 | 52 | 64 | 73 | 76 | 70 | -- |
| 24 | 61 | 42 | 35 | 40 | 46 | 48 | 57 | 63 | 75 | 76 | 68 | -- |
| 25 | 60 | 44 | 34 | 37 | 52 | 48 | 60 | 64 | 76 | 76 | 70 | -- |
| 26 | 58 | 58 | 36 | 38 | 52 | 50 | 62 | 64 | 76 | 76 | 71 | -- |
| 27 | 64 | 62 | 34 | 40 | 52 | 50 | 64 | 64 | 74 | 76 | 72 | -- |
| 28 | 64 | 62 | 36 | 39 | 48 | 52 | 64 | 63 | 70 | 76 | 73 | -- |
| 29 | 66 | 52 | 38 | 34 | -- | 56 | 68 | 64 | 72 | 76 | 75 | -- |
| 30 | 65 | 58 | 44 | 32 | -- | 52 | 66 | 66 | 72 | 78 | 78 | -- |
| 31 | 66 | -- | 34 | 32 | -- | 51 | -- | 67 | -- | 78 | 78 | -- |
| Average | 63 | 52 | -- | 42 | a42 | 46 | 54 | 62 | 70 | 74 | 74 | -- |

a Includes estimated temperature, 32°F, on missing days.

## MISCELLANEOUS ANALYSES OF STREAMS IN TENNESSEE RIVER BASIN IN VIRGINIA

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | |
| **LITTLE RIVER AT WARDELL** | | | | | | | | | | | | | | | | | | | |
| Oct. 17, 1950 | 33 | | | 0.03 | 38 | 8.7 | -- | | 150 | 4.3 | 1.5 | -- | 2.3 | 131 | 131 | 8 | 238 | 7.9 | 2 |
| Nov. 8 | 45 | | | .03 | 38 | 8.5 | 1.1 | | 151 | 3.9 | 1.5 | 0.1 | 2.4 | 138 | 130 | 6 | 241 | 8.1 | 7 |
| Dec. 20 | 89 | | 3.4 | .02 | 36 | 7.8 | .5 | | 140 | 2.4 | 1.1 | .0 | 5.2 | 128 | 122 | 7 | 216 | 8.2 | 7 |
| **GUEST RIVER AT COEBURN** | | | | | | | | | | | | | | | | | | | |
| Oct. 4, 1950 | 19 | | | 0.04 | 19 | 9.6 | 16 | | 59 | 66 | 2.5 | 0.1 | 1.4 | 153 | 87 | 38 | 245 | 8.0 | 9 |
| Nov. 14 | 31 | | | .12 | 15 | 7.2 | 8.5 | | 37 | 46 | 3.8 | .1 | 2.1 | 108 | 67 | 37 | 175 | 7.1 | 12 |
| Dec. 19 | 60 | | 6.1 | .02 | 14 | 7.1 | 11 | | 35 | 51 | 2.8 | .0 | 1.7 | 110 | 64 | 35 | 176 | 7.2 | 3 |
| **STONY CREEK AT FORT BLACKMORE** | | | | | | | | | | | | | | | | | | | |
| Oct. 3, 1950 | 9.5 | | | 0.01 | 17 | 5.1 | 1.1 | | 71 | 5.4 | 1.2 | 0.0 | 0.4 | 70 | 63 | 5 | 124 | 7.8 | 6 |
| Nov. 13 | 12 | | | .02 | 14 | 4.6 | 2.6 | | 63 | 5.4 | 1.5 | .0 | .3 | 60 | 54 | 2 | 106 | 7.4 | 7 |
| Dec. 18 | 31 | | 3.4 | .03 | 11 | 3.2 | 1.6 | | 46 | 4.6 | .8 | .0 | .6 | 49 | 41 | 3 | 82.1 | 7.4 | 3 |

## MISCELLANEOUS ANALYSES OF STREAMS IN TENNESSEE RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1950 to September 1951

| Date of collection | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Total | Noncarbonate | | | |
| **HYATT CREEK AT MARBLE** | | | | | | | | | | | | | | | | | | |
| Aug. 3, 1951 | | 7.9 | 0.06 | 1.4 | 0.6 | 2.6 | | 8 | 3.0 | 1.1 | 0.1 | 0.1 | 21 | 6 | 0 | 21.7 | 6.2 | 7 |

PART 4. ST. LAWRENCE RIVER BASIN

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, Otsego County, and 10½ miles southeast of Wolverine.
DRAINAGE AREA.--63 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 75°F July 26; minimum, freezing point on many days during November to March.
REMARKS.--Stream frozen Jan. 22 to Feb. 22. Temperatures given for this period are for the underflow. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1207.

Temperature (°F) of water, water year October 1950 to September 1951
/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 | 61 | 56 | 52 | 48 | 34 | 33 | 32 | 32 | 32 | 32 | 31 | 31 | 36 | 36 | 59 | 52 | 63 | 59 | 69 | 61 | 72 | 66 | 61 | 56 |
| 2 | 60 | 58 | 51 | 47 | 34 | 32 | 32 | 32 | 32 | 32 | 34 | 31 | 38 | 36 | 60 | 54 | 59 | 57 | 69 | 60 | 71 | 64 | 63 | 56 |
| 3 | 59 | 53 | 47 | 43 | 34 | 34 | 32 | 32 | 32 | 31 | 33 | 31 | 38 | 36 | 57 | 53 | 58 | 56 | 64 | 60 | 68 | 63 | 63 | 57 |
| 4 | 53 | 49 | 43 | 39 | 35 | 34 | 32 | 32 | 32 | 31 | 35 | 31 | 40 | 37 | 53 | 49 | 57 | 54 | 61 | 56 | 68 | 60 | 64 | 56 |
| 5 | 50 | 46 | 40 | 38 | 35 | 34 | 32 | 32 | 31 | 31 | 36 | 31 | 42 | 38 | 52 | 49 | 60 | 53 | 60 | 55 | 69 | 59 | 62 | 56 |
| 6 | 51 | 48 | 40 | 39 | 34 | 34 | 32 | 32 | 31 | 31 | 38 | 32 | 42 | 40 | 51 | 48 | 63 | 53 | 64 | 59 | 63 | 61 | 61 | 58 |
| 7 | 50 | 49 | 41 | 40 | 34 | 34 | 32 | 32 | 31 | 31 | 39 | 34 | 42 | 40 | 56 | 47 | 65 | 55 | 64 | 61 | 61 | 58 | 61 | 55 |
| 8 | 54 | 49 | 43 | 40 | 34 | 32 | 32 | 32 | 31 | 31 | 36 | 32 | 42 | 40 | 60 | 51 | 65 | 56 | 65 | 61 | 65 | 58 | 62 | 54 |
| 9 | 54 | 49 | 42 | 40 | 32 | 32 | 32 | 32 | 32 | 32 | 36 | 31 | 42 | 40 | 58 | 52 | 59 | 56 | 68 | 63 | 68 | 61 | 62 | 54 |
| 10 | 53 | 51 | 40 | 38 | 34 | 32 | 32 | 32 | 32 | 32 | 38 | 31 | 41 | 40 | 57 | 51 | 62 | 55 | 67 | 62 | 68 | 60 | 56 | 56 |
| 11 | 52 | 50 | 38 | 36 | 34 | 33 | 32 | 32 | 31 | 31 | 37 | 31 | 43 | 41 | 55 | 50 | 66 | 56 | 64 | 62 | 66 | 60 | 61 | 55 |
| 12 | 50 | 48 | 37 | 35 | 34 | 33 | 33 | 31 | 31 | 31 | 35 | 31 | 43 | 41 | 56 | 49 | 63 | 57 | 68 | 60 | 67 | 61 | 67 | 59 |
| 13 | 50 | 48 | 36 | 34 | 33 | 33 | 32 | 31 | 31 | 31 | 36 | 32 | 41 | 39 | 59 | 49 | 64 | 57 | 69 | 60 | 61 | 60 | 64 | 60 |
| 14 | 50 | 47 | 38 | 34 | 33 | 32 | 32 | 32 | 31 | 31 | 37 | 33 | 40 | 40 | 61 | 51 | 67 | 58 | 72 | 62 | 64 | 58 | 63 | 59 |
| 15 | 50 | 47 | 39 | 36 | 34 | 33 | 33 | 32 | 31 | 31 | 36 | 34 | 41 | 39 | 64 | 55 | 69 | 58 | 73 | 64 | 62 | 59 | 60 | 57 |
| 16 | 51 | 47 | 42 | 39 | 33 | 32 | 34 | 32 | 31 | 31 | 39 | 33 | 40 | 38 | 60 | 57 | 69 | 60 | 67 | 63 | 66 | 59 | 58 | 55 |
| 17 | 53 | 50 | 41 | 39 | 32 | 32 | 34 | 32 | 31 | 31 | 40 | 33 | 39 | 37 | 62 | 55 | 71 | 60 | 67 | 61 | 65 | 59 | 56 | 52 |
| 18 | 56 | 50 | 40 | 38 | 32 | 32 | 34 | 32 | 31 | 31 | 38 | 33 | 38 | 36 | 60 | 54 | 70 | 62 | 68 | 61 | 63 | 59 | 58 | 52 |
| 19 | 56 | 52 | 40 | 38 | 32 | 32 | 34 | 32 | 31 | 31 | 37 | 34 | 40 | 36 | 65 | 54 | 65 | 62 | 68 | 60 | 65 | 58 | 60 | 53 |
| 20 | 54 | 50 | 40 | 37 | 32 | 32 | 33 | 32 | 32 | 31 | 37 | 32 | 44 | 38 | 64 | 58 | 63 | 59 | 68 | 59 | 66 | 58 | 60 | 56 |
| 21 | 52 | 49 | 37 | 36 | 32 | 32 | 32 | 32 | 34 | 31 | 36 | 32 | 42 | 40 | 62 | 60 | 61 | 58 | 64 | 61 | 64 | 61 | 62 | 58 |
| 22 | 49 | 47 | 37 | 35 | 32 | 32 | 32 | 32 | 34 | 33 | 34 | 32 | 40 | 39 | 61 | 56 | 62 | 59 | 68 | 61 | 62 | 57 | 59 | 57 |
| 23 | 46 | 44 | 37 | 34 | 32 | 32 | 32 | 32 | 37 | 33 | 34 | 32 | 42 | 37 | 60 | 53 | 66 | 59 | 71 | 62 | 64 | 56 | 57 | 54 |
| 24 | 44 | 42 | 34 | 33 | 32 | 32 | 32 | 32 | 37 | 33 | 33 | 32 | 44 | 41 | 61 | 54 | 66 | 61 | 72 | 62 | 66 | 56 | 55 | 53 |
| 25 | 42 | 42 | 32 | 32 | 32 | 32 | 32 | 32 | 35 | 33 | 35 | 32 | 43 | 41 | 66 | 56 | 67 | 59 | 72 | 64 | 67 | 57 | 54 | 51 |
| 26 | 44 | 40 | 32 | 32 | 32 | 32 | 32 | 32 | 35 | 34 | 36 | 33 | 44 | 40 | 64 | 59 | 62 | 61 | 75 | 67 | 62 | 60 | 51 | 50 |
| 27 | 43 | 42 | 32 | 32 | 32 | 32 | 32 | 32 | 35 | 32 | 37 | 33 | 47 | 44 | 60 | 56 | 66 | 59 | 68 | 65 | 67 | 60 | 50 | 48 |
| 28 | 44 | 43 | 33 | 32 | 32 | 32 | 32 | 32 | 33 | 31 | 38 | 34 | 54 | 46 | 56 | 54 | 65 | 60 | 70 | 63 | 68 | 60 | 49 | 46 |
| 29 | 47 | 45 | 33 | 32 | 32 | 32 | 32 | 32 | -- | -- | 38 | 37 | 57 | 52 | 58 | 54 | 68 | 60 | 72 | 63 | 69 | 62 | 50 | 45 |
| 30 | 49 | 46 | 33 | 32 | 32 | 32 | 32 | 32 | -- | -- | 37 | 37 | 58 | 53 | 64 | 56 | 69 | 60 | 73 | 65 | 68 | 63 | 49 | 48 |
| 31 | 50 | 47 | -- | -- | 32 | 32 | 32 | 32 | -- | -- | 37 | 36 | -- | -- | 65 | 59 | -- | -- | 74 | 65 | 64 | 61 | -- | -- |
| Average | 51 | 48 | 39 | 37 | 33 | 32 | 32 | 32 | 32 | 32 | 36 | 33 | 43 | 40 | 60 | 53 | 64 | 58 | 68 | 62 | 66 | 60 | 59 | 54 |

## 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 southwest of Lupton Ogemaw County.
DRAINAGE AREA.--27 square miles.
RECORDS AVAILABLE.--Water temperatures: July 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 66°F July 26; minimum, freezing point on many days during December to March.
EXTREMES, 1950-51.--Water temperatures: Maximum, 66°F July 26, 1951; minimum, freezing point on many days December 1950 to March 1951.
REMARKS.--Stream frozen Dec. 27-30, Jan. 30 to Feb. 5, Feb. 9-12, 14-16. Temperatures given for these periods are the underflow. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1207.

Temperature (°F) of water, water year October 1950 to September 1951

/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 | 57 | 55 | 53 | 50 | 37 | 36 | 34 | 34 | 32 | 32 | 34 | 32 | 34 | 34 | 54 | 48 | 60 | 57 | 60 | 57 | 64 | 59 | 56 | 54 |
| 2 | 58 | 56 | 53 | 48 | 37 | 36 | 36 | 34 | 32 | 32 | 35 | 33 | 38 | 34 | 53 | 50 | 59 | 56 | 61 | 55 | 61 | 57 | 56 | 53 |
| 3 | 58 | 53 | 48 | 46 | 37 | 37 | 36 | 34 | 32 | 32 | 35 | 34 | 37 | 35 | 53 | 47 | 58 | 55 | 60 | 56 | 62 | 59 | 57 | 54 |
| 4 | 53 | 50 | 46 | 43 | 37 | 37 | 34 | 33 | 32 | 32 | 36 | 34 | 39 | 36 | 51 | 45 | 58 | 52 | 60 | 56 | 60 | 55 | 57 | 53 |
| 5 | 50 | 48 | 43 | 40 | 37 | 36 | 34 | 34 | 32 | 32 | 37 | 33 | 42 | 35 | 50 | 46 | 57 | 49 | 61 | 58 | 59 | 54 | 57 | 53 |
| 6 | 51 | 49 | 44 | 42 | 37 | 37 | 34 | 33 | 32 | 32 | 39 | 35 | 42 | 37 | 48 | 44 | 57 | 51 | 63 | 57 | 58 | 56 | 57 | 55 |
| 7 | 52 | 50 | 44 | 44 | 37 | 34 | 34 | 32 | 33 | 32 | 36 | 34 | 43 | 40 | 52 | 44 | 58 | 52 | 62 | 57 | 56 | 55 | 57 | 53 |
| 8 | 53 | 52 | 45 | 44 | 34 | 33 | 33 | 32 | 32 | 32 | 35 | 33 | 43 | 41 | 56 | 47 | 58 | 53 | 61 | 57 | 61 | 56 | 55 | 50 |
| 9 | 53 | 52 | 45 | 43 | 35 | 33 | 33 | 33 | 32 | 32 | 35 | 32 | 43 | 42 | 54 | 50 | 58 | 54 | 63 | 59 | 61 | 58 | 54 | 50 |
| 10 | 52 | 52 | 43 | 42 | 36 | 35 | 35 | 33 | 32 | 32 | 35 | 32 | 44 | 41 | 50 | 46 | 60 | 53 | 63 | 59 | 61 | 57 | 54 | 53 |
| 11 | 52 | 51 | 42 | 40 | 36 | 35 | 36 | 35 | 32 | 32 | 36 | 32 | 45 | 42 | 47 | 44 | 60 | 54 | 62 | 57 | 60 | 56 | 58 | 54 |
| 12 | 51 | 51 | 40 | 38 | 36 | 35 | 36 | 36 | 36 | 32 | 37 | 34 | 44 | 41 | 51 | 45 | 58 | 55 | 60 | 55 | 60 | 58 | 59 | 56 |
| 13 | 50 | 49 | 39 | 39 | 35 | 35 | 36 | 34 | 35 | 32 | 37 | 34 | 41 | 39 | 53 | 45 | 58 | 54 | 60 | 56 | 59 | 56 | 59 | 56 |
| 14 | 50 | 49 | 40 | 38 | 35 | 35 | 36 | 35 | 33 | 32 | 35 | 35 | 40 | 39 | 56 | 47 | 61 | 54 | 63 | 57 | 59 | 56 | 56 | 52 |
| 15 | 50 | 50 | 42 | 40 | 35 | 35 | 36 | 36 | 32 | 32 | 36 | 35 | 42 | 39 | 59 | 52 | 61 | 54 | 63 | 58 | 59 | 57 | 55 | 53 |
| 16 | 50 | 49 | 44 | 42 | 35 | 34 | 36 | 35 | 32 | 32 | 37 | 34 | 41 | 39 | 58 | 54 | 62 | 56 | 63 | 59 | 59 | 56 | 54 | 52 |
| 17 | 53 | 50 | 42 | 41 | 34 | 32 | 35 | 35 | 36 | 32 | 38 | 34 | 40 | 38 | 57 | 51 | 62 | 56 | 61 | 57 | 59 | 55 | 53 | 49 |
| 18 | 54 | 52 | 41 | 40 | 33 | 32 | 35 | 33 | 37 | 36 | 36 | 34 | 39 | 36 | 56 | 51 | 63 | 58 | 61 | 57 | 59 | 55 | 53 | 49 |
| 19 | 54 | 52 | 42 | 40 | 33 | 32 | 36 | 35 | 37 | 36 | 36 | 34 | 41 | 36 | 59 | 51 | 63 | 59 | 61 | 57 | 59 | 56 | 56 | 50 |
| 20 | 54 | 50 | 42 | 39 | 33 | 33 | 36 | 33 | 36 | 36 | 34 | 32 | 44 | 36 | 58 | 54 | 60 | 57 | 60 | 55 | 58 | 56 | 56 | 55 |
| 21 | 50 | 47 | 39 | 38 | 34 | 32 | 33 | 32 | 36 | 36 | 33 | 31 | 42 | 39 | 60 | 54 | 59 | 56 | 60 | 56 | 58 | 57 | 56 | 54 |
| 22 | 50 | 50 | 39 | 38 | 34 | 34 | 33 | 32 | 36 | 35 | 35 | 31 | 42 | 39 | 58 | 51 | 59 | 57 | 60 | 57 | 57 | 55 | 55 | 53 |
| 23 | 49 | 47 | 39 | 38 | 34 | 34 | 32 | 32 | 36 | 36 | 34 | 32 | 44 | 37 | 56 | 49 | 60 | 56 | 61 | 57 | 57 | 53 | 54 | 51 |
| 24 | 47 | 47 | 38 | 34 | 34 | 33 | 33 | 32 | 36 | 34 | 32 | 31 | 43 | 41 | 56 | 53 | 61 | 57 | 61 | 57 | 58 | 53 | 53 | 52 |
| 25 | 47 | 46 | 35 | 34 | 33 | 32 | 34 | 33 | 36 | 35 | 34 | 31 | 41 | 39 | 61 | 53 | 62 | 57 | 63 | 58 | 58 | 53 | 53 | 51 |
| 26 | 46 | 44 | 36 | 34 | 32 | 32 | 34 | 33 | 36 | 34 | 37 | 32 | 46 | 37 | 60 | 56 | 61 | 58 | 66 | 60 | 58 | 55 | 51 | 48 |
| 27 | 46 | 46 | 37 | 36 | 32 | 31 | 34 | 32 | 34 | 33 | 40 | 35 | 47 | 41 | 57 | 55 | 62 | 56 | 65 | 58 | 58 | 54 | 50 | 49 |
| 28 | 48 | 46 | 36 | 35 | 32 | 32 | 32 | 32 | 34 | 32 | 36 | 34 | 54 | 45 | 55 | 53 | 61 | 58 | 62 | 56 | 60 | 56 | 49 | 47 |
| 29 | 49 | 47 | 37 | 36 | 32 | 32 | 32 | 32 | -- | -- | 34 | 31 | 55 | 50 | 57 | 53 | 60 | 55 | 62 | 57 | 61 | 58 | 49 | 46 |
| 30 | 50 | 48 | 37 | 37 | 32 | 32 | 32 | 32 | -- | -- | 33 | 31 | 54 | 49 | 60 | 53 | 61 | 57 | 64 | 59 | 61 | 59 | 49 | 48 |
| 31 | 50 | 50 | -- | -- | 34 | 32 | 32 | 32 | -- | -- | 34 | 32 | -- | -- | 61 | 56 | -- | -- | 65 | 61 | 60 | 56 | -- | -- |
| Average | 51 | 50 | 42 | 40 | 35 | 34 | 34 | 33 | 34 | 33 | 36 | 33 | 43 | 39 | 55 | 50 | 60 | 55 | 62 | 57 | 59 | 56 | 55 | 52 |

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 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 71°F July 26; minimum, freezing point on several days during December, January, February, and March.
EXTREMES, 1950-51.--Water temperatures: Maximum, 71°F July 10, 11, 1950, July 26, 1951; minimum, freezing point on several days during December to March of first water year.
REMARKS.--Stream frozen Dec. 26-29, Jan. 22, Jan. 30 to Feb. 6, Feb. 8-10, 14-16. Temperatures given for these periods are for the underflow. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1207.

Temperature (°F) of water, water year October 1950 to September 1951
/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 | 58 | 56 | 52 | 50 | 35 | 35 | 33 | 33 | 33 | 33 | 34 | 33 | 34 | 34 | 56 | 51 | 65 | 61 | 64 | 61 | 66 | 62 | 58 | 55 |
| 2 | 58 | 57 | 52 | 49 | 35 | 35 | 34 | 33 | 33 | 33 | 34 | 33 | 36 | 34 | 56 | 52 | 64 | 61 | 64 | 59 | 64 | 59 | 59 | 54 |
| 3 | 58 | 54 | 49 | 47 | 36 | 35 | 34 | 34 | 33 | 33 | 34 | 34 | 36 | 35 | 55 | 50 | 62 | 60 | 63 | 60 | 67 | 61 | 59 | 54 |
| 4 | 54 | 52 | 47 | 45 | 36 | 36 | 34 | 34 | 33 | 33 | 34 | 34 | 37 | 35 | 54 | 49 | 61 | 56 | 62 | 60 | 63 | 56 | 59 | 53 |
| 5 | 52 | 50 | 44 | 42 | 36 | 36 | 34 | 34 | 33 | 32 | 34 | 34 | 39 | 35 | 53 | 50 | 62 | 54 | 65 | 60 | 62 | 55 | 58 | 54 |
| 6 | 52 | 51 | 43 | 43 | 36 | 36 | 34 | 34 | 32 | 32 | 36 | 34 | 40 | 37 | 52 | 49 | 62 | 56 | 66 | 61 | 60 | 58 | 59 | 56 |
| 7 | 52 | 52 | 44 | 43 | 36 | 36 | 34 | 33 | 33 | 32 | 36 | 35 | 41 | 39 | 53 | 48 | 62 | 57 | 65 | 63 | 59 | 57 | 58 | 54 |
| 8 | 54 | 52 | 44 | 44 | 36 | 34 | 33 | 33 | 33 | 33 | 35 | 35 | 41 | 40 | 55 | 50 | 63 | 57 | 65 | 62 | 65 | 57 | 56 | 50 |
| 9 | 54 | 53 | 44 | 43 | 34 | 34 | 33 | 32 | 33 | 32 | 35 | 34 | 41 | 41 | 56 | 52 | 61 | 58 | 66 | 63 | 65 | 59 | 57 | 50 |
| 10 | 54 | 53 | 43 | 42 | 35 | 34 | 33 | 32 | 32 | 32 | 35 | 34 | 42 | 41 | 52 | 50 | 64 | 57 | 67 | 64 | 63 | 57 | 55 | 53 |
| 11 | 54 | 53 | 42 | 41 | 35 | 34 | 34 | 33 | 32 | 32 | 35 | 34 | 44 | 42 | 51 | 48 | 64 | 57 | 66 | 63 | 63 | 56 | 61 | 54 |
| 12 | 53 | 52 | 41 | 40 | 34 | 34 | 34 | 34 | 33 | 32 | 35 | 35 | 44 | 42 | 52 | 47 | 62 | 59 | 66 | 62 | 64 | 59 | 62 | 58 |
| 13 | 51 | 51 | 40 | 40 | 34 | 34 | 34 | 34 | 34 | 33 | 36 | 35 | 42 | 40 | 55 | 48 | 63 | 58 | 66 | 62 | 61 | 56 | 61 | 57 |
| 14 | 52 | 51 | 40 | 39 | 34 | 34 | 34 | 34 | 33 | 33 | 36 | 35 | 40 | 40 | 56 | 50 | 64 | 58 | 68 | 63 | 63 | 56 | 57 | 53 |
| 15 | 52 | 52 | 40 | 38 | 34 | 34 | 34 | 34 | 33 | 33 | 36 | 35 | 41 | 40 | 58 | 53 | 65 | 59 | 68 | 64 | 61 | 58 | 56 | 53 |
| 16 | 52 | 51 | 41 | 40 | 34 | 34 | 34 | 34 | 33 | 32 | 36 | 35 | 41 | 40 | 58 | 55 | 66 | 59 | 67 | 64 | 63 | 57 | 55 | 52 |
| 17 | 55 | 52 | 41 | 40 | 34 | 33 | 34 | 34 | 34 | 32 | 36 | 35 | 40 | 39 | 59 | 53 | 66 | 61 | 68 | 62 | 60 | 56 | 54 | 49 |
| 18 | 55 | 54 | 40 | 40 | 33 | 33 | 34 | 34 | 34 | 34 | 36 | 36 | 40 | 38 | 60 | 55 | 68 | 62 | 67 | 62 | 62 | 56 | 55 | 49 |
| 19 | 55 | 54 | 40 | 40 | 33 | 33 | 34 | 34 | 34 | 34 | 35 | 35 | 41 | 38 | 64 | 56 | 66 | 63 | 64 | 61 | 62 | 56 | 56 | 50 |
| 20 | 55 | 52 | 40 | 39 | 33 | 33 | 34 | 33 | 34 | 34 | 35 | 34 | 42 | 38 | 63 | 59 | 64 | 60 | 64 | 59 | 61 | 56 | 57 | 55 |
| 21 | 52 | 50 | 39 | 39 | 33 | 33 | 33 | 33 | 34 | 34 | 34 | 34 | 42 | 40 | 66 | 59 | 63 | 59 | 62 | 61 | 60 | 59 | 57 | 55 |
| 22 | 51 | 51 | 39 | 38 | 33 | 33 | 33 | 33 | 34 | 34 | 34 | 34 | 42 | 40 | 63 | 56 | 63 | 61 | 66 | 61 | 60 | 55 | 56 | 55 |
| 23 | 51 | 49 | 38 | 38 | 34 | 33 | 33 | 32 | 34 | 34 | 34 | 34 | 42 | 39 | 60 | 54 | 65 | 60 | 66 | 61 | 61 | 53 | 56 | 52 |
| 24 | 49 | 49 | 38 | 36 | 34 | 33 | 33 | 32 | 34 | 34 | 34 | 33 | 42 | 41 | 59 | 57 | 65 | 61 | 68 | 62 | 61 | 53 | 55 | 53 |
| 25 | 49 | 48 | 36 | 34 | 33 | 33 | 33 | 33 | 34 | 34 | 34 | 33 | 41 | 40 | 62 | 56 | 67 | 60 | 68 | 63 | 61 | 53 | 54 | 51 |
| 26 | 48 | 47 | 34 | 34 | 33 | 33 | 33 | 33 | 34 | 34 | 35 | 34 | 46 | 39 | 62 | 58 | 65 | 61 | 71 | 64 | 59 | 56 | 51 | 49 |
| 27 | 47 | 47 | 35 | 34 | 33 | 32 | 33 | 33 | 34 | 34 | 37 | 35 | 46 | 43 | 59 | 58 | 66 | 60 | 69 | 63 | 61 | 55 | 51 | 49 |
| 28 | 49 | 47 | 35 | 35 | 32 | 32 | 33 | 33 | 34 | 34 | 36 | 35 | 51 | 46 | 58 | 57 | 66 | 62 | 68 | 61 | 63 | 57 | 50 | 47 |
| 29 | 49 | 49 | 35 | 35 | 32 | 32 | 33 | 33 | -- | -- | 35 | 32 | 56 | 50 | 60 | 56 | 63 | 59 | 68 | 61 | 65 | 59 | 49 | 46 |
| 30 | 50 | 49 | 35 | 35 | 32 | 32 | 33 | 33 | -- | -- | 34 | 32 | 54 | 51 | 63 | 56 | 65 | 61 | 69 | 63 | 63 | 60 | 49 | 48 |
| 31 | 50 | 50 | -- | -- | 33 | 32 | 33 | 33 | -- | -- | 34 | 34 | -- | -- | 64 | 59 | -- | -- | 69 | 65 | 62 | 57 | -- | -- |
| Average | 52 | 51 | 41 | 40 | 34 | 34 | 34 | 33 | 33 | 33 | 35 | 34 | 42 | 40 | 58 | 53 | 64 | 59 | 66 | 62 | 62 | 57 | 56 | 52 |

## 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 Ammond Creek, and 1½ miles north of Selkirk, Ogemaw County.
DRAINAGE AREA.--19 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 70°F July 26; minimum, freezing point on many days during December, January, February, and March.
REMARKS.--Stream frozen Nov. 24,to Dec. 1, Dec. 17 to Feb. 25, Mar. 25, 26. Temperatures given for these periods are for the underflow. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1207.

Temperature (°F) of water, water year October 1950 to September 1951
/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 | 60 | 57 | 56 | 52 | 33 | 33 | 32 | 32 | 34 | 34 | 32 | 32 | 33 | 33 | 59 | 51 | 63 | 60 | 62 | 58 | 66 | 62 | 60 | 57 |
| 2 | 60 | 57 | 56 | 49 | 33 | 33 | 32 | 32 | 34 | 34 | 32 | 32 | 35 | 33 | 58 | 52 | 61 | 58 | 60 | 55 | 63 | 58 | 59 | 56 |
| 3 | 60 | 53 | 48 | 45 | 33 | 33 | 32 | 32 | 33 | 33 | 32 | 32 | 36 | 34 | 57 | 50 | 60 | 56 | 60 | 57 | 64 | 61 | 59 | 55 |
| 4 | 53 | 49 | 45 | 41 | 33 | 33 | 32 | 32 | 33 | 33 | 33 | 32 | 39 | 35 | 54 | 46 | 60 | 53 | 61 | 57 | 61 | 56 | 58 | 53 |
| 5 | 49 | 46 | 41 | 38 | 33 | 33 | 32 | 32 | 33 | 33 | 33 | 33 | 43 | 34 | 51 | 48 | 56 | 49 | 62 | 59 | 59 | 54 | 58 | 54 |
| 6 | 51 | 48 | 43 | 39 | 33 | 33 | 32 | 32 | 33 | 33 | 34 | 33 | 44 | 37 | 50 | 45 | 57 | 51 | 63 | 58 | 59 | 58 | 59 | 58 |
| 7 | 52 | 50 | 42 | 42 | 33 | 33 | 32 | 32 | 33 | 33 | 34 | 32 | 45 | 41 | 55 | 45 | 57 | 52 | 63 | 58 | 59 | 59 | 59 | 55 |
| 8 | 54 | 52 | 44 | 42 | 33 | 33 | 32 | 32 | 34 | 33 | 32 | 32 | 45 | 42 | 59 | 48 | 58 | 52 | 63 | 60 | 65 | 59 | 55 | 50 |
| 9 | 53 | 51 | 44 | 41 | 33 | 33 | 32 | 32 | 34 | 34 | 32 | 32 | 45 | 43 | 57 | 52 | 57 | 55 | 65 | 61 | 65 | 61 | 55 | 49 |
| 10 | 53 | 52 | 42 | 39 | 33 | 32 | 32 | 32 | 34 | 34 | 32 | 32 | 46 | 42 | 52 | 47 | 59 | 54 | 65 | 61 | 64 | 59 | 55 | 54 |
| 11 | 52 | 50 | 39 | 37 | 32 | 32 | 32 | 32 | 34 | 33 | 32 | 32 | 46 | 43 | 48 | 45 | 59 | 54 | 63 | 59 | 62 | 58 | 61 | 55 |
| 12 | 51 | 49 | 36 | 34 | 32 | 32 | 32 | 32 | 33 | 33 | 35 | 32 | 46 | 44 | 53 | 44 | 59 | 56 | 61 | 57 | 64 | 61 | 64 | 60 |
| 13 | 49 | 48 | 35 | 35 | 32 | 32 | 32 | 32 | 33 | 33 | 35 | 33 | 44 | 41 | 55 | 44 | 57 | 55 | 62 | 57 | 62 | 57 | 64 | 59 |
| 14 | 49 | 48 | 35 | 34 | 32 | 32 | 32 | 32 | 33 | 33 | 34 | 33 | 42 | 40 | 59 | 47 | 60 | 55 | 64 | 58 | 63 | 58 | 59 | 55 |
| 15 | 51 | 48 | 40 | 35 | 32 | 32 | 32 | 32 | 33 | 33 | 34 | 33 | 43 | 39 | 63 | 53 | 61 | 54 | 65 | 60 | 62 | 60 | 57 | 55 |
| 16 | 50 | 47 | 42 | 40 | 32 | 32 | 32 | 32 | 33 | 33 | 36 | 33 | 42 | 39 | 61 | 56 | 62 | 56 | 65 | 62 | 62 | 59 | 55 | 52 |
| 17 | 54 | 50 | 41 | 38 | 32 | 32 | 32 | 32 | 33 | 33 | 37 | 33 | 40 | 37 | 60 | 52 | 63 | 57 | 63 | 58 | 61 | 57 | 54 | 50 |
| 18 | 56 | 52 | 38 | 36 | 32 | 32 | 32 | 32 | 33 | 33 | 36 | 33 | 40 | 35 | 60 | 52 | 66 | 59 | 62 | 58 | 61 | 58 | 53 | 48 |
| 19 | 56 | 53 | 38 | 37 | 32 | 32 | 32 | 32 | 33 | 33 | 33 | 33 | 41 | 35 | 62 | 53 | 64 | 61 | 62 | 59 | 62 | 58 | 56 | 50 |
| 20 | 54 | 49 | 38 | 36 | 32 | 32 | 32 | 32 | 33 | 33 | 33 | 33 | 45 | 36 | 62 | 57 | 62 | 59 | 61 | 55 | 61 | 58 | 58 | 55 |
| 21 | 50 | 46 | 36 | 35 | 32 | 32 | 32 | 32 | 33 | 33 | 33 | 33 | 44 | 40 | 64 | 57 | 60 | 57 | 61 | 59 | 61 | 60 | 58 | 56 |
| 22 | 50 | 48 | 35 | 34 | 32 | 32 | 32 | 32 | 33 | 33 | 33 | 32 | 44 | 40 | 62 | 53 | 60 | 59 | 63 | 60 | 60 | 57 | 57 | 54 |
| 23 | 48 | 45 | 34 | 34 | 32 | 32 | 32 | 32 | 33 | 33 | 32 | 32 | 45 | 36 | 58 | 50 | 62 | 57 | 62 | 58 | 59 | 53 | 54 | 51 |
| 24 | 45 | 44 | 35 | 33 | 32 | 32 | 32 | 32 | 34 | 33 | 32 | 32 | 44 | 41 | 57 | 54 | 63 | 59 | 64 | 58 | 59 | 53 | 53 | 52 |
| 25 | 44 | 43 | 34 | 33 | 32 | 32 | 32 | 32 | 34 | 33 | 32 | 32 | 41 | 40 | 62 | 54 | 63 | 58 | 66 | 60 | 59 | 53 | 53 | 49 |
| 26 | 43 | 40 | 33 | 33 | 32 | 32 | 32 | 32 | 33 | 33 | 32 | 32 | 52 | 38 | 62 | 58 | 62 | 59 | 70 | 64 | 59 | 57 | 49 | 46 |
| 27 | 43 | 42 | 33 | 33 | 32 | 32 | 32 | 32 | 33 | 32 | 34 | 32 | 52 | 42 | 59 | 56 | 63 | 58 | 68 | 62 | 61 | 57 | 50 | 48 |
| 28 | 46 | 43 | 33 | 33 | 32 | 32 | 32 | 32 | 32 | 32 | 33 | 32 | 58 | 47 | 56 | 54 | 63 | 60 | 64 | 59 | 64 | 61 | 48 | 46 |
| 29 | 47 | 44 | 33 | 33 | 32 | 32 | 32 | 32 | -- | -- | 32 | 32 | 60 | 53 | 59 | 53 | 61 | 56 | 65 | 59 | 66 | 63 | 47 | 44 |
| 30 | 52 | 46 | 33 | 33 | 32 | 32 | 33 | 32 | -- | -- | 34 | 32 | 57 | 50 | 62 | 54 | 63 | 59 | 68 | 63 | 66 | 64 | 47 | 47 |
| 31 | 53 | 50 | -- | -- | 32 | 32 | 34 | 33 | -- | -- | 34 | 33 | -- | -- | 62 | 57 | -- | -- | 69 | 66 | 66 | 60 | -- | -- |
| Average | 51 | 48 | 39 | 37 | 32 | 32 | 32 | 32 | 33 | 33 | 33 | 32 | 45 | 40 | 58 | 51 | 61 | 56 | 64 | 59 | 62 | 58 | 56 | 52 |

STREAMS TRIBUTARY TO LAKE HURON--Continued

RIFLE RIVER AT SELKIRK, MICH.

LOCATION.--Temperature recorder at gaging station on left bank upstream from highway bridge at Selkirk, Ogenaw County, and 1½ miles downstream from Prior Creek.
DRAINAGE AREA.--110 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 75°F July 26; minimum, freezing point on many days during November to January.
REMARKS.--Stream frozen Nov. 24-28, Dec. 11, 21, 22, Dec. 25 to Jan. 1, Jan. 7-13, 18, 22-29, Feb. 3-18, Mar. 21, 22, 25, 26. Temperatures given for these periods are for the underflow. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1207.

Temperature (°F) of water, water year October 1950 to September 1951
/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 | 58 | 54 | 50 | 34 | 33 | 32 | 32 | 34 | 34 | 34 | 33 | 36 | 36 | 61 | 54 | 67 | 62 | 67 | 60 | 71 | 64 | 60 | 57 |
| 2 | 62 | 58 | 54 | 48 | 34 | 34 | 32 | 32 | 34 | 33 | 36 | 34 | 38 | 36 | 60 | 56 | 64 | 60 | 65 | 59 | 68 | 62 | 60 | 56 |
| 3 | 62 | 56 | 48 | 45 | 36 | 34 | 32 | 32 | 34 | 34 | 36 | 34 | 38 | 37 | 60 | 54 | 63 | 58 | 66 | 60 | 69 | 63 | 63 | 56 |
| 4 | 56 | 52 | 45 | 41 | 36 | 34 | 32 | 32 | 34 | 34 | 37 | 34 | 41 | 37 | 58 | 51 | 62 | 55 | 63 | 60 | 67 | 59 | 63 | 55 |
| 5 | 52 | 48 | 41 | 38 | 34 | 33 | 32 | 32 | 34 | 33 | 37 | 34 | 45 | 37 | 56 | 52 | 62 | 51 | 63 | 60 | 65 | 58 | 61 | 56 |
| 6 | 55 | 50 | 44 | 41 | 34 | 34 | 32 | 32 | 33 | 33 | 38 | 36 | 45 | 40 | 55 | 49 | 63 | 54 | 67 | 61 | 63 | 60 | 62 | 59 |
| 7 | 54 | 52 | 44 | 43 | 34 | 34 | 32 | 32 | 34 | 33 | 38 | 36 | 47 | 42 | 58 | 50 | 64 | 54 | 67 | 62 | 61 | 59 | 61 | 56 |
| 8 | 58 | 54 | 45 | 43 | 34 | 32 | 32 | 32 | 34 | 34 | 36 | 35 | 46 | 44 | 63 | 52 | 65 | 55 | 68 | 63 | 68 | 60 | 58 | 52 |
| 9 | 56 | 53 | 45 | 42 | 32 | 32 | 32 | 32 | 34 | 33 | 36 | 34 | 46 | 45 | 61 | 55 | 62 | 58 | 71 | 64 | 69 | 62 | 59 | 52 |
| 10 | 56 | 54 | 41 | 39 | 33 | 32 | 32 | 32 | 34 | 34 | 36 | 34 | 48 | 44 | 57 | 52 | 66 | 56 | 70 | 64 | 67 | 61 | 57 | 56 |
| 11 | 55 | 52 | 39 | 37 | 33 | 32 | 32 | 32 | 34 | 33 | 37 | 34 | 49 | 46 | 54 | 50 | 66 | 56 | 69 | 63 | 68 | 60 | 63 | 56 |
| 12 | 54 | 52 | 37 | 34 | 33 | 32 | 32 | 32 | 33 | 33 | 38 | 36 | 48 | 46 | 57 | 49 | 63 | 58 | 68 | 61 | 67 | 62 | 66 | 60 |
| 13 | 52 | 50 | 36 | 35 | 33 | 33 | 32 | 32 | 33 | 33 | 38 | 36 | 46 | 44 | 59 | 49 | 62 | 57 | 70 | 61 | 64 | 60 | 65 | 60 |
| 14 | 53 | 50 | 37 | 34 | 33 | 33 | 32 | 32 | 34 | 33 | 38 | 36 | 44 | 42 | 63 | 52 | 67 | 57 | 71 | 61 | 66 | 59 | 61 | 56 |
| 15 | 54 | 51 | 41 | 37 | 33 | 33 | 34 | 32 | 34 | 33 | 37 | 36 | 46 | 42 | 66 | 57 | 68 | 58 | 72 | 63 | 64 | 60 | 59 | 56 |
| 16 | 54 | 49 | 43 | 41 | 33 | 32 | 34 | 33 | 34 | 33 | 38 | 36 | 44 | 42 | 65 | 59 | 69 | 59 | 71 | 65 | 65 | 59 | 57 | 54 |
| 17 | 56 | 52 | 41 | 39 | 32 | 32 | 33 | 32 | 33 | 33 | 40 | 36 | 43 | 41 | 65 | 57 | 70 | 60 | 70 | 62 | 63 | 59 | 56 | 51 |
| 18 | 58 | 54 | 39 | 37 | -- | -- | 33 | 32 | 33 | 33 | 38 | 36 | 42 | 39 | 64 | 57 | 71 | 62 | 68 | 61 | 65 | 59 | 57 | 51 |
| 19 | 58 | 54 | 40 | 38 | -- | -- | 34 | 32 | -- | -- | 37 | 35 | 44 | 39 | 67 | 58 | 69 | 63 | 68 | 62 | 66 | 59 | 60 | 53 |
| 20 | 56 | 50 | 40 | 37 | 32 | 32 | 34 | 32 | -- | -- | 35 | 34 | 48 | 40 | 67 | 61 | 66 | 61 | 68 | 58 | 64 | 60 | 60 | 57 |
| 21 | 53 | 48 | 37 | 36 | 32 | 32 | 32 | 32 | -- | -- | 34 | 34 | 47 | 43 | 70 | 61 | 65 | 58 | 67 | 62 | 63 | 61 | 59 | 57 |
| 22 | 53 | 51 | 36 | 34 | 32 | 32 | 32 | 32 | -- | -- | 35 | 34 | 46 | 43 | 67 | 56 | 65 | 61 | 68 | 62 | 64 | 58 | 58 | 55 |
| 23 | 51 | 48 | 36 | 34 | 32 | 32 | 33 | 32 | -- | -- | 36 | 34 | 48 | 40 | 62 | 52 | 68 | 60 | 68 | 62 | 63 | 55 | 56 | 52 |
| 24 | 48 | 47 | 34 | 32 | 32 | 32 | 33 | 33 | -- | -- | 34 | 34 | 47 | 44 | 60 | 56 | 68 | 62 | 72 | 62 | 64 | 56 | 55 | 54 |
| 25 | 48 | 46 | 32 | 32 | 32 | 32 | 33 | 33 | -- | -- | 35 | 34 | 44 | 43 | 66 | 56 | 70 | 61 | 72 | 64 | 64 | 56 | 54 | 51 |
| 26 | 47 | 43 | 32 | 32 | 32 | 32 | 33 | 33 | 36 | 35 | 38 | 34 | 51 | 41 | 64 | 59 | 67 | 63 | 75 | 66 | 62 | 59 | 51 | 48 |
| 27 | 46 | 46 | 32 | 32 | 32 | 32 | 33 | 33 | 35 | 34 | 41 | 36 | 53 | 46 | 62 | 58 | 70 | 60 | 73 | 67 | 63 | 58 | 51 | 49 |
| 28 | 49 | 46 | 32 | 32 | 32 | 32 | 33 | 33 | 34 | 34 | 39 | 37 | 58 | 50 | 59 | 56 | 68 | 63 | 71 | 63 | 66 | 60 | 50 | 47 |
| 29 | 50 | 47 | 34 | 32 | 32 | 32 | 34 | 33 | -- | -- | 37 | 36 | 61 | 55 | 63 | 55 | 68 | 60 | 72 | 63 | 69 | 62 | 50 | 45 |
| 30 | 51 | 48 | 34 | 34 | 32 | 32 | 34 | 34 | -- | -- | 36 | 35 | 60 | 55 | 65 | 56 | 69 | 61 | 74 | 66 | 67 | 64 | 50 | 49 |
| 31 | 52 | 48 | -- | -- | 32 | 32 | 34 | 34 | -- | -- | 36 | 36 | -- | -- | 67 | 58 | -- | -- | 74 | 68 | 66 | 60 | -- | -- |
| Average | 54 | 51 | 40 | 38 | a33 | a33 | 33 | 32 | -- | -- | 37 | 35 | 47 | 43 | 62 | 55 | 66 | 59 | 69 | 62 | 65 | 60 | 58 | 54 |

a Includes estimated temperature, 32°F, on missing days.

## LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE, TOLEDO OHIO

LOCATION.--At Toledo public water-supply intake, at submerged crib 2 miles offshore from Reno Beach, and approximately 11 miles from Collins Park Filtration Plant. Samples collected from raw-water tap at filtration plant in Toledo, Lucae County.
RECORDS AVAILABLE.--Chemical analyses: September 1950 to September 1951.

Chemical analyses, in parts per million, September 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Sept. 1, 1950 | | 1.6 | 0.06 | 0.00 | 0.0 | 34 | 6.8 | 11 | | 109 | 21 | 15 | 0.1 | 0.6 | 148 | 113 | 24 | 280 | 8.2 | 4 | 3.1 | 2.1 |
| Sept. 29 | | 1.2 | .06 | .00 | .0 | 33 | 10 | 7.8 | | 111 | 25 | 16 | .1 | .7 | 172 | 123 | 32 | 264 | 8.1 | 4 | 3.4 | 3.7 |
| Nov. 1 | | .7 | .10 | .00 | .0 | 38 | 11 | 7.3 | | 112 | 34 | 21 | .1 | 1.5 | 171 | 142 | 46 | 296 | 7.7 | 5 | 3.9 | 3.4 |
| Dec. 1 | | 2.6 | .02 | .00 | .0 | 38 | 8.0 | 12 | | 115 | 24 | 24 | .0 | 1.0 | 180 | 127 | 33 | 308 | 7.7 | 1 | 3.4 | 2.8 |
| Jan. 1, 1951 | | 4.4 | .11 | .00 | .0 | 43 | 12 | 2.4 | | 122 | 33 | 18 | .0 | 2.7 | 199 | 158 | 57 | 321 | 7.8 | 16 | -- | 2.8 |
| Feb. 1 | | 6.5 | .08 | .00 | .0 | 54 | 12 | 10 | | 160 | 51 | 10 | .1 | 9.6 | 240 | 186 | 53 | 386 | 7.7 | 15 | 7.0 | 6.4 |
| Mar. 1 | | 4.9 | .02 | .00 | .0 | 40 | 8.3 | 7.2 | | 112 | 34 | 14 | .0 | 3.3 | 181 | 134 | 42 | 318 | 7.4 | 15 | 6.7 | 4.7 |
| Apr. 1 | | 4.1 | .02 | .00 | .0 | 37 | 7.8 | 11 | | 114 | 22 | 21 | .0 | 1.8 | 169 | 125 | 31 | 295 | 7.6 | 2 | 3.5 | 2.8 |
| May 1 | | 3.3 | .02 | .00 | .0 | 42 | 10 | 7.7 | 1.4 | 127 | 30 | 19 | .2 | 4.4 | 192 | 146 | 42 | 314 | 7.6 | 5 | 4.8 | 4.2 |
| June 1 | | .4 | .06 | .00 | .0 | 35 | 7.3 | 7.8 | 1.2 | 116 | 19 | 17 | .0 | 1.1 | 161 | 118 | 22 | 274 | 8.0 | 8 | 4.4 | 3.0 |
| July 1 | | 3.3 | .02 | .00 | .0 | 34 | 6.8 | 11 | 2.6 | 112 | 14 | 22 | .0 | 2.0 | 174 | 114 | 21 | 296 | 8.0 | 2 | 2.0 | 1.8 |
| Aug. 1 | | 3.6 | .04 | .00 | .0 | 35 | 8.3 | 10 | 1.5 | 112 | 24 | 21 | .0 | 1.5 | 181 | 122 | 30 | 298 | 8.0 | 5 | 2.3 | 2.2 |
| Sept. 1 | | 1.9 | .02 | .00 | .0 | 32 | 9.0 | 10 | 1.2 | 96 | 23 | 24 | .1 | 1.4 | 157 | 116 | 38 | 297 | 7.4 | 2 | -- | -- |

LAKE ERIE--Continued

## LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE, PORT CLINTON, OHIO

LOCATION.--At Port Clinton public water-supply intake, at stone filled crib, 1,000 feet offshore, and 2,100 feet north of filtration plant. Samples collected from raw-water tap at filtration plant in Port Clinton, Ottawa County.
RECORDS AVAILABLE.--Chemical analyses: August 1950 to September 1951.

Chemical analyses, in parts per million, August 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Aug. 29, 1950 | | 1.8 | 0.06 | 0.00 | 0.0 | 36 | 7.1 | 11 | | 115 | 20 | 16 | 0.1 | 0.7 | 151 | 119 | 25 | 282 | 7.9 | 5 | 3.6 | 2.2 |
| Sept. 28 | | .9 | .08 | .00 | .0 | 39 | 12 | 7.1 | | 124 | 34 | 17 | .1 | 1.0 | 177 | 147 | 45 | 314 | 8.0 | 6 | 5.0 | 4.3 |
| Nov. 1 | | .6 | .03 | .00 | .0 | 35 | 8.4 | 9.7 | | 118 | 22 | 16 | .1 | .7 | 156 | 122 | 25 | 279 | 7.9 | 15 | 3.7 | 2.6 |
| Dec. 1 | | 4.6 | .01 | .00 | .0 | 44 | 12 | 7.2 | | 140 | 37 | 14 | .2 | 2.8 | 202 | 160 | 45 | 343 | 7.9 | 8 | 7.4 | 5.1 |
| Jan. 1, 1951 | | 3.2 | .06 | .00 | .0 | 39 | 9.7 | 6.3 | | 117 | 27 | 18 | .0 | 2.0 | 176 | 138 | 41 | 314 | 7.6 | 5 | 3.2 | 2.9 |
| Feb. 1 | | 4.1 | .08 | .00 | .0 | 40 | 9.2 | 9.5 | | 125 | 27 | 18 | .1 | 2.5 | 180 | 138 | 35 | 310 | 7.9 | 7 | 3.4 | 3.3 |
| Mar. 1 | | 4.7 | .04 | .00 | .0 | 37 | 9.7 | 5.7 | | 115 | 29 | 13 | .0 | 2.2 | 169 | 132 | 38 | 299 | 7.4 | 7 | 4.2 | 3.8 |
| Apr. 1 | | 6.9 | .06 | .00 | .0 | 39 | 8.5 | 9.8 | | 112 | 28 | 21 | .0 | 3.6 | 180 | 132 | 40 | 311 | 7.7 | 5 | 4.0 | 3.4 |
| May 1 | | 1.8 | .03 | .00 | .0 | 49 | 11 | 8.8 | 1.4 | 148 | 41 | 18 | .1 | 5.4 | 226 | 170 | 46 | 365 | 7.9 | 7 | 4.5 | 4.1 |
| June 1 | | 1.9 | .01 | .00 | .0 | 42 | 9.2 | 9.0 | 3.1 | 128 | 30 | 20 | .2 | 4.1 | 192 | 144 | 38 | 331 | 7.6 | 5 | 5.0 | 4.4 |
| July 1 | | 2.3 | .04 | .00 | .0 | 37 | 7.8 | 8.9 | 2.7 | 120 | 19 | 18 | .1 | 2.5 | 177 | 124 | 26 | 299 | 7.4 | 3 | 3.0 | 1.7 |
| Aug. 1 | | 2.8 | .02 | .00 | .0 | 38 | 8.3 | 13 | 1.6 | 122 | 26 | 24 | .1 | 2.2 | 187 | 130 | 29 | 324 | 7.8 | 5 | 3.3 | 2.5 |
| Sept. 4 | | 1.0 | .04 | .00 | .0 | 35 | 7.8 | 10 | 1.0 | 118 | 20 | 20 | .1 | .5 | 167 | 120 | 23 | 289 | 7.9 | 5 | 4.5 | 2.7 |

## LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE, SANDUSKY, OHIO

LOCATION.--At Sandusky public water-supply intake, at submerged crib, 1,900 feet northeast of Cedar Point Beach, and 8,500 feet northeast of filtration plant. Samples collected from raw-water tap at filtration plant in Sandusky, Erie County.
RECORDS AVAILABLE.--Chemical analyses: September 1950 to September 1951.

Chemical analyses, in parts per million, September 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Sept. 1, 1950 | | 3.4 | 0.04 | 0.00 | 0.0 | 37 | 9.8 | 7.4 | 1.2 | 116 | 24 | 18 | 0.1 | 0.6 | 170 | 133 | 38 | 268 | 8.1 | 3 | 2.5 | 2.6 |
| Oct. 1 | | 1.0 | .07 | .00 | .0 | 38 | 9.1 | 9.6 | | 120 | 30 | 16 | .2 | .5 | 174 | 132 | 34 | 294 | 8.1 | 10 | 4.1 | 2.7 |
| Nov. 1 | | 1.3 | .05 | .00 | .0 | 34 | 8.8 | 10 | | 114 | 24 | 16 | .1 | .8 | 156 | 120 | 27 | 273 | 7.6 | 2 | 2.6 | 2.6 |
| Dec. 1 | | 2.8 | .06 | .00 | .0 | 38 | 9.0 | 9.2 | | 122 | 26 | 16 | .1 | 1.5 | 170 | 131 | 31 | 293 | 7.7 | 5 | 3.8 | 3.2 |
| Jan. 2, 1951 | | 1.5 | .04 | .00 | .0 | 38 | 8.7 | 6.7 | | 114 | 25 | 18 | .0 | .5 | 162 | 132 | 37 | 296 | 7.8 | 3 | 3.5 | 3.2 |
| Feb. 1 | | 3.2 | .03 | .00 | .0 | 38 | 8.3 | 8.5 | | 115 | 25 | 18 | .1 | 1.9 | 171 | 130 | 35 | 296 | 8.0 | 4 | -- | 3.7 |
| Mar. 1 | | 3.3 | .06 | .00 | .0 | 38 | 8.3 | 12 | | 118 | 26 | 20 | .1 | 2.2 | 175 | 130 | 32 | 300 | 7.8 | 5 | 3.7 | 3.3 |
| Apr. 2 | | 3.2 | .02 | .00 | .0 | 38 | 8.0 | 8.9 | | 113 | 28 | 17 | .0 | 1.8 | 167 | 129 | 35 | 291 | 7.9 | 2 | 3.0 | 1.8 |
| May 1 | | 4.5 | .02 | .00 | .0 | 40 | 8.3 | 9.3 | 1.6 | a122 | 25 | 19 | .1 | 2.5 | 181 | 134 | 34 | 307 | 8.1 | 5 | 4.6 | 3.8 |
| June 1 | | 2.2 | .03 | .00 | .0 | 42 | 9.7 | 8.6 | 1.3 | b131 | 31 | 16 | .1 | 2.2 | 186 | 144 | 37 | 322 | 8.1 | 4 | 3.5 | 5.8 |
| July 1 | | 1.9 | .03 | .00 | .0 | 38 | 8.3 | 8.4 | 2.7 | 121 | 27 | 17 | .0 | 1.0 | 170 | 128 | 30 | 297 | 8.0 | 3 | 3.0 | 2.9 |
| Aug. 1 | | 3.1 | .02 | .00 | .0 | 38 | 8.3 | 9.8 | 1.3 | 118 | 23 | 22 | .1 | .5 | 185 | 128 | 32 | 305 | 8.0 | 3 | 1.3 | 1.3 |
| Sept. 1 | | 1.7 | .03 | .00 | .0 | 35 | 9.7 | 9.2 | 1.0 | 116 | 22 | 20 | .2 | .8 | 164 | 128 | 32 | 282 | 7.8 | 3 | 2.1 | 2.1 |

a Includes equivalent of 5 parts per million of carbonate ($CO_3$).
b Includes equivalent of 6 parts per million of carbonate ($CO_3$).

LAKE ERIE--Continued

## LAKE ERIE (SANDUSKY BAY) AT PUBLIC WATER-SUPPLY INTAKE, CEDAR POINT, OHIO

LOCATION.--At Cedar Point public water-supply intake, at submerged crib in Lake Erie-Sandusky Bay, at C. & B. Dock at tip of Cedar Point Peninsula, and about half a mile north of filtration plant. Samples collected from raw-water tap at filtration plant in Cedar Point, Erie County.
RECORDS AVAILABLE.--Chemical analyses: September 1950 to September 1951.

Chemical analyses, in parts per million, September 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Sept. 1, 1950 | | 2.3 | 0.04 | 0.00 | 0.0 | 42 | 10 | 7.0 | 1.2 | 121 | 36 | 18 | 0.1 | 0.9 | 194 | 146 | 47 | 326 | 8.2 | 6 | 4.4 | 3.3 |
| Oct. 1 | | .9 | .06 | .00 | .0 | 46 | 11 | 9.5 | | 124 | 53 | 16 | .4 | .5 | 212 | 160 | 58 | 349 | 8.2 | 7 | 3.7 | 3.3 |
| Nov. 1 | | .9 | .04 | -- | -- | 45 | 10 | 9.1 | | 122 | 48 | 16 | .2 | .9 | 200 | 154 | 54 | 342 | 8.0 | 4 | 3.3 | 3.0 |
| Dec. 1 | | 2.9 | .01 | .00 | .0 | 38 | 9.2 | 9.9 | | 119 | 34 | 15 | .1 | 1.4 | 173 | 134 | 36 | 293 | 7.7 | 3 | 4.9 | 2.9 |
| Jan. 2, 1951 | | 3.5 | .07 | .00 | .0 | 45 | 9.2 | 4.3 | | 120 | 38 | 14 | .0 | 2.2 | 188 | 150 | 52 | 327 | 7.5 | 6 | 3.6 | 3.5 |
| Jan. 31 | | 3.7 | .05 | .00 | .0 | 42 | 9.2 | 9.9 | | 117 | 39 | 17 | .4 | 2.8 | 191 | 144 | 47 | 322 | 7.9 | 6 | -- | 4.3 |
| Mar. 1 | | 4.2 | .06 | .00 | .0 | 53 | 12 | 7.3 | | 126 | 71 | 10 | .5 | 6.0 | 235 | 180 | 78 | 393 | 7.7 | 10 | 4.8 | 4.4 |
| Apr. 2 | | 4.1 | .02 | .00 | .0 | 48 | 10 | 9.3 | | 126 | 51 | 15 | .1 | 4.2 | 211 | 160 | 58 | 357 | 7.6 | 5 | 4.5 | 3.4 |
| May 1 | | .9 | .02 | .00 | .0 | 46 | 10 | 8.8 | 1.5 | 129 | 48 | 16 | .2 | 1.5 | 208 | 158 | 50 | 359 | 7.9 | 15 | 4.9 | 4.0 |
| June 1 | | 2.3 | .01 | .00 | .0 | 52 | 11 | 8.0 | 4.1 | 134 | 65 | 16 | .2 | 1.6 | 222 | 177 | 65 | 390 | 7.9 | 5 | 5.1 | 3.7 |
| July 1 | | 4.5 | .02 | .00 | .0 | 50 | 10 | 9.4 | 4.3 | a132 | 50 | 16 | .1 | 2.2 | 223 | 168 | 58 | 374 | 8.3 | 3 | 5.1 | 2.3 |
| Aug. 1 | | 1.7 | .02 | .00 | .0 | 44 | 9.2 | 9.4 | 1.6 | 122 | 45 | 19 | .4 | 1.2 | 212 | 148 | 48 | 345 | 7.9 | 5 | 2.0 | 1.4 |
| Sept. 1 | | 1.0 | .02 | .00 | .0 | 39 | 11 | 9.7 | 1.6 | 118 | 35 | 20 | .6 | 1.0 | 184 | 144 | 46 | 313 | 7.6 | 4 | 3.1 | 2.6 |

a Includes equivalent of 6 parts per million of carbonate ($CO_3$).

## LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE AT HURON, OHIO

LOCATION.--At Huron public water-supply intake, at submerged crib, 1,200 feet offshore, directly north of Huron, and 2,000 feet from filtration plant. Samples collected from raw-water tap at filtration plant in Huron, Erie County.
RECORDS AVAILABLE.--Chemical analyses: September 1950 to September 1951.

Chemical analyses, in parts per million, September 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Sept. 1, 1950 | | 2.0 | 0.03 | 0.00 | 0.0 | 37 | 9.6 | 7.6 | 1.0 | 118 | 26 | 18 | 0.1 | 1.3 | 181 | 132 | 35 | 289 | 8.1 | 4 | 2.7 | 2.8 |
| Sept. 28 | | 1.1 | .04 | .00 | .0 | 38 | 10 | 6.4 | 1.2 | 120 | 29 | 17 | .1 | .3 | 177 | 136 | 38 | 286 | 8.1 | 4 | 3.2 | 3.4 |
| Nov. 1 | | .3 | .03 | .00 | .0 | 36 | 9.0 | 5.4 | | 112 | 25 | 14 | .0 | .4 | 151 | 126 | 34 | 288 | 8.0 | 12 | 3.3 | 2.6 |
| Dec. 1 | | 2.8 | .02 | .00 | .0 | 36 | 8.8 | 9.9 | | 116 | 26 | 17 | .1 | 1.5 | 166 | 126 | 31 | 283 | 7.7 | 3 | 4.2 | 2.6 |
| Jan. 1, 1951 | | 2.7 | .06 | .00 | .0 | 37 | 8.7 | 8.9 | | 114 | 27 | 18 | .0 | .8 | 174 | 128 | 35 | 302 | 7.8 | 3 | 3.0 | 2.8 |
| Feb. 1 | | 3.3 | .05 | .00 | .0 | 37 | 9.0 | 8.8 | | 114 | 28 | 17 | .1 | 2.1 | 171 | 130 | 36 | 292 | 8.0 | 6 | -- | 4.6 |
| Mar. 1 | | 5.6 | .06 | .00 | .0 | 41 | 9.2 | 8.3 | | 116 | 35 | 17 | .2 | 2.5 | 183 | 140 | 45 | 317 | 7.7 | 10 | 4.0 | 3.6 |
| Apr. 1 | | 4.4 | .06 | .00 | .0 | 36 | 7.8 | 7.9 | | 109 | 24 | 17 | .0 | 1.0 | 160 | 122 | 33 | 283 | 7.9 | 5 | 3.1 | 2.7 |
| May 1 | | 3.4 | .02 | .00 | .0 | 43 | 10 | 8.8 | 1.6 | 124 | 41 | 17 | .1 | 2.5 | 202 | 149 | 47 | 340 | 7.8 | 5 | 4.6 | 3.4 |
| June 1 | | .6 | .03 | .00 | .0 | 41 | 8.7 | 8.8 | 1.2 | a 132 | 28 | 16 | .0 | 2.4 | 182 | 138 | 30 | 308 | 8.1 | 5 | 4.2 | 3.2 |
| July 1 | | 1.5 | .03 | .00 | .0 | 37 | 7.5 | 8.4 | 2.5 | 118 | 23 | 18 | .0 | 1.2 | 167 | 124 | 26 | 284 | 8.0 | 3 | 3.1 | 3.0 |
| Aug. 1 | | 2.7 | .02 | .00 | .0 | 36 | 7.8 | 8.8 | 1.4 | 116 | 24 | 18 | .1 | .8 | 168 | 123 | 27 | 294 | 7.4 | 5 | 1.3 | 1.3 |
| Sept. 1 | | 1.0 | .02 | .00 | .0 | 37 | 7.8 | 8.3 | .9 | b 122 | 22 | 17 | .1 | .2 | 168 | 124 | 24 | 288 | 8.0 | 3 | 3.0 | 2.4 |

a Includes equivalent of 6 parts per million of carbonate ($CO_3$).
b Includes equivalent of 5 parts per million of carbonate ($CO_3$).

LAKE ERIE--Continued

## LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE, VERMILION, OHIO

LOCATION.--At Vermilion public water-supply intake, at submerged crib, 1,600 feet offshore, north-northwest from shore well, and approximately 1,500 feet from old lighthouse pier. Samples collected from raw-water pump discharge at filtration plant in Vermilion, Erie County.
RECORDS AVAILABLE.--Chemical analyses: August 1950 to September 1951

Chemical analyses, in parts per million, August 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Aug. 31, 1950..... | | 0.8 | 0.06 | 0.00 | 0.0 | 36 | 7.2 | 12 | | 111 | 24 | 18 | 0.1 | 0.6 | 169 | 119 | 28 | 298 | 8.0 | 3 | 3.0 | 2.0 |
| Oct. 1 ..... | | .8 | .05 | .00 | .0 | 36 | 9.0 | 9.1 | | 116 | 26 | 17 | .1 | .3 | 169 | 127 | 32 | 287 | 8.2 | 5 | 3.3 | 2.7 |
| Nov. 1 ..... | | .3 | .03 | .00 | .0 | 36 | 11 | 2.0 | | 111 | 26 | 14 | .1 | .3 | 150 | 134 | 43 | 290 | 8.1 | 8 | 2.7 | 2.3 |
| Dec. 1 ..... | | 3.4 | .04 | .00 | .0 | 34 | 10 | 5.9 | | 115 | 20 | 16 | .1 | 1.2 | 153 | 127 | 32 | 272 | 7.9 | 3 | -- | 3.5 |
| Jan. 3, 1951..... | | 1.4 | .04 | .00 | .0 | 36 | 7.8 | 8.2 | | 114 | 22 | 16 | .1 | .8 | 158 | 122 | 28 | 284 | 7.8 | 3 | 3.3 | 3.1 |
| Feb. 1 ..... | | 4.1 | .05 | .00 | .0 | 42 | 9.7 | 11 | | 126 | 39 | 16 | .0 | 2.2 | 194 | 144 | 41 | 324 | 7.8 | 7 | 3.4 | 2.9 |
| Mar. 1 ..... | | 3.3 | .02 | .00 | .0 | 37 | 8.5 | 7.9 | | 102 | 37 | 14 | .2 | 2.6 | 171 | 128 | 44 | 294 | 7.7 | 7 | 5.4 | 4.0 |
| Apr. 1 ..... | | 2.9 | .04 | .00 | .0 | 35 | 7.0 | 8.8 | | 109 | 19 | 18 | .0 | 1.0 | 156 | 116 | 27 | 274 | 7.8 | 2 | 3.2 | 3.2 |
| May 1 ..... | | 1.7 | .03 | .00 | .0 | 37 | 8.3 | 8.0 | 1.3 | 118 | 26 | 17 | .0 | 2.5 | 174 | 126 | 30 | 293 | 7.4 | 7 | 4.2 | 3.0 |
| June 1 ..... | | .9 | .04 | .00 | .0 | 38 | 8.5 | 8.1 | 1.2 | a 120 | 24 | 17 | .1 | 1.0 | 171 | 130 | 31 | 299 | 8.1 | 3 | 3.6 | 3.0 |
| July 1 ..... | | 1.9 | .02 | .00 | .0 | 36 | 8.0 | 8.1 | 2.5 | 119 | 22 | 15 | .0 | 1.0 | 165 | 124 | 25 | 286 | 8.1 | 5 | 3.1 | 2.8 |
| Aug. 1 ..... | | 3.3 | .02 | .00 | .0 | 37 | 6.8 | 8.6 | 2.8 | 118 | 21 | 18 | .1 | .5 | 178 | 120 | 24 | 290 | 7.8 | 5 | 2.3 | 1.5 |
| Sept. 1..... | | 1.3 | .02 | .00 | .0 | 37 | 7.8 | 8.2 | 1.2 | 119 | 21 | 18 | .1 | .5 | 165 | 124 | 27 | 287 | 8.0 | 5 | 3.1 | 2.5 |

a Includes equivalent of 5 parts per million of carbonate ($CO_3$).

## LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE, LORAIN, OHIO

LOCATION.--At Lorain public water-supply intake, at submerged crib, 2,800 feet offshore, and 4,000 feet north-northwest of filtration plant. Samples collected from raw-water tap at filtration plant in Lorain, Lorain County.
RECORDS AVAILABLE.--Chemical analyses: September 1950 to September 1951.

Chemical analyses, in parts per million, September 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Sept. 1, 1950 | | 0.8 | 0.06 | 0.00 | 0.0 | 39 | 7.3 | 11 | | 115 | 24 | 19 | 0.1 | 0.7 | 168 | 127 | 33 | 302 | 8.0 | 3 | 2.3 | 2.0 |
| Oct. 2 | | .8 | .04 | .00 | .0 | 35 | 8.5 | 9.5 | | a116 | 21 | 18 | .1 | .3 | 160 | 122 | 27 | 271 | 8.4 | 5 | 2.8 | 2.6 |
| Nov. 1 | | .6 | .02 | .00 | .0 | 34 | 8.8 | 7.7 | | 112 | 23 | 16 | .1 | .3 | 155 | 122 | 30 | 278 | 7.9 | 3 | 2.4 | 2.2 |
| Dec. 1 | | 2.0 | .01 | .00 | .0 | 35 | 10 | 7.9 | | 112 | 29 | 17 | .1 | 1.2 | 169 | 130 | 38 | 295 | 7.9 | 2 | 5.5 | 3.3 |
| Jan. 5, 1951 | | 1.9 | .03 | .00 | .0 | 36 | 9.0 | 6.2 | | 110 | 22 | 19 | .0 | .6 | 157 | 126 | 37 | 281 | 7.9 | 4 | -- | 2.6 |
| Feb. 1 | | 2.6 | .04 | .00 | .0 | 37 | 8.3 | 9.6 | | 116 | 25 | 18 | .0 | 1.0 | 167 | 126 | 31 | 287 | 7.9 | 5 | 3.2 | 3.1 |
| Mar. 1 | | 3.3 | .06 | .00 | .0 | 35 | 8.5 | 9.6 | | 106 | 29 | 17 | .2 | 2.0 | 164 | 123 | 35 | 284 | 7.6 | 7 | 3.9 | 3.4 |
| Apr. 1 | | 3.5 | .12 | .00 | .0 | 37 | 8.3 | 9.1 | | 111 | 27 | 18 | .1 | 2.0 | 166 | 126 | 36 | 303 | 7.7 | 4 | 3.5 | 2.7 |
| May 1 | | 1.1 | .04 | .00 | .0 | 32 | 11 | 8.6 | 0.9 | 113 | 27 | 18 | .1 | 1.2 | 164 | 125 | 32 | 293 | 7.7 | 10 | 3.3 | 3.0 |
| June 1 | | 1.8 | .03 | .00 | .0 | 38 | 9.0 | 8.8 | 2.5 | 122 | 30 | 17 | .0 | 1.7 | 173 | 133 | 32 | 301 | 8.0 | 3 | 3.0 | 2.9 |
| July 1 | | 1.7 | .03 | .00 | .0 | 37 | 8.0 | 8.5 | 2.5 | 118 | 24 | 17 | .0 | 1.1 | 173 | 125 | 28 | 287 | 8.0 | 3 | 3.1 | 2.9 |
| Aug. 1 | | 2.5 | .02 | .00 | .0 | 38 | 6.6 | 9.4 | 1.3 | 116 | 23 | 20 | .0 | 1.2 | 178 | 122 | 27 | 295 | 8.0 | 5 | 1.0 | 1.0 |
| Sept. 1 | | 1.7 | .04 | .00 | .0 | 37 | 7.8 | 9.2 | 1.3 | 120 | 23 | 20 | .0 | .8 | 172 | 125 | 26 | 294 | 7.9 | 5 | 2.8 | 2.3 |

a Includes equivalent of 8 parts per million of carbonate ($CO_3$).

LAKE ERIE--Continued

## LAKE ERIE AT PUBLIC WATER SUPPLY INTAKE, ELYRIA, OHIO

LOCATION.--At Elyria public water-supply intake consisting of two submerged cribs, 100 feet apart and 1,500 feet offshore, west-northwest from Elyria filtration plant, and 2.5 miles west of mouth of Black River. Samples collected from raw-water tap at Elyria filtration plant located near Lorain, Lorain County.
RECORDS AVAILABLE.--Chemical analyses: September 1950 to September 1951.

Chemical analyses, in parts per million, September 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Sept. 1, 1950 | | 1.1 | 0.06 | 0.00 | 0.0 | 37 | 6.7 | 13 | | 111 | 24 | 19 | 0.1 | 0.6 | 160 | 120 | 29 | 298 | 8.1 | 3 | 2.4 | 2.1 |
| Oct. 2 | | 1.5 | .07 | .00 | .0 | 36 | 10 | 7.0 | | 115 | 21 | 21 | .1 | .1 | 165 | 131 | 37 | 266 | 8.2 | 2 | 3.0 | 3.0 |
| Nov. 1 | | .5 | .02 | .00 | .0 | 36 | 7.8 | 9.0 | | 114 | 23 | 17 | .0 | .4 | 160 | 122 | 29 | 283 | 7.7 | 1 | 3.0 | 2.2 |
| Dec. 1 | | 2.6 | .02 | .00 | .0 | 38 | 9.5 | 7.6 | | 114 | 32 | 16 | .1 | 1.2 | 177 | 134 | 41 | 305 | 7.8 | 3 | 4.6 | 2.6 |
| Jan. 3, 1951 | | 2.0 | .06 | .00 | .0 | 34 | 8.7 | 7.4 | | 108 | 21 | 18 | .0 | 1.2 | 153 | 122 | 32 | 275 | 7.7 | 3 | 3.3 | 3.1 |
| Feb. 1 | | 2.4 | .03 | .00 | .0 | 37 | 8.5 | 6.7 | | 110 | 25 | 17 | .2 | 1.4 | 162 | 127 | 37 | 283 | 8.2 | 4 | -- | 3.4 |
| Mar. 1 | | 2.7 | .06 | .00 | .0 | 35 | 8.3 | 10 | | 106 | 31 | 16 | .2 | 2.2 | 165 | 122 | 35 | 287 | 7.8 | 5 | 5.8 | 3.7 |
| Apr. 1 | | 3.1 | .04 | .00 | .0 | 37 | 7.3 | 8.2 | | 108 | 24 | 18 | .0 | 1.5 | 163 | 122 | 34 | 283 | 7.9 | 5 | 3.1 | 2.6 |
| May 1 | | 2.4 | .02 | .00 | .0 | 37 | 8.5 | 8.8 | 1.5 | 108 | 27 | 17 | .1 | 1.5 | 179 | 128 | 39 | 301 | 7.7 | 5 | 3.5 | 3.0 |
| June 1 | | 2.1 | .01 | .00 | .0 | 38 | 8.3 | 8.2 | 2.9 | 117 | 26 | 18 | .1 | 1.8 | 167 | 129 | 33 | 300 | 8.0 | 3 | 3.2 | 3.6 |
| July 1 | | 2.1 | .03 | .00 | .0 | 37 | 8.0 | 8.1 | 2.7 | 118 | 22 | 18 | .0 | 1.0 | 170 | 125 | 28 | 288 | 8.1 | 3 | 3.0 | 2.7 |
| Aug. 1 | | 1.9 | .04 | .00 | .0 | 36 | 7.3 | 8.9 | 2.6 | 116 | 21 | 18 | .1 | .8 | 176 | 120 | 25 | 293 | 8.3 | 5 | 2.2 | 1.7 |
| Sept. 1 | | 2.2 | .02 | .00 | .0 | 36 | 8.7 | 8.6 | 1.4 | 116 | 24 | 18 | .1 | 1.0 | 167 | 126 | 31 | 284 | 7.8 | 4 | 3.3 | 3.0 |

## LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE, AVON LAKE, OHIO

LOCATION.--At Avon Lake public water-supply intake, at submerged crib, 1,480 feet offshore, directly north of Avon Lake, and half a mile from filtration plant. Samples collected from raw-water tap at filtration plant in Avon Lake, Lorain County.
RECORDS AVAILABLE.--Chemical analyses: September 1950 to September 1951.

Chemical analyses, in parts per million, September 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Sept. 1, 1950 | | 1.0 | 0.06 | 0.00 | 0.0 | 39 | 7.4 | 12 | | 118 | 23 | 19 | 0.1 | 0.7 | 157 | 128 | 31 | 300 | 7.8 | 3 | 3.0 | 1.9 |
| Oct. 3 | | .6 | .03 | .00 | .0 | 32 | 8.9 | 11 | | 114 | 21 | 17 | .1 | .2 | 170 | 116 | 23 | 277 | 8.1 | 2 | 3.2 | 2.4 |
| Nov. 1 | | .4 | .03 | .00 | .0 | 35 | 8.2 | 9.7 | | 116 | 23 | 16 | .1 | .5 | 148 | 121 | 26 | 278 | 8.1 | 7 | 3.8 | 2.3 |
| Dec. 1 | | 2.6 | .04 | .00 | .0 | 42 | 13 | 4.2 | | 119 | 40 | 18 | .1 | 3.3 | 193 | 158 | 61 | 337 | 7.8 | 4 | -- | 2.4 |
| Jan. 2, 1951 | | 1.3 | .04 | .00 | .0 | 37 | 7.8 | 4.9 | | 108 | 20 | 18 | .0 | .5 | 158 | 124 | 36 | 284 | 7.7 | 4 | 4.9 | 2.8 |
| Feb. 1 | | 2.4 | .04 | .00 | .0 | 37 | 8.3 | 7.9 | | 110 | 27 | 17 | .1 | 1.5 | 173 | 126 | 36 | 287 | 7.7 | 5 | 2.8 | 2.8 |
| Apr. 2 | | 5.0 | .04 | .00 | .0 | 38 | 8.7 | 9.0 | | 100 | 42 | 16 | .0 | 2.5 | 179 | 130 | 49 | 307 | 7.7 | 5 | 6.3 | 4.0 |
| May 1 | | 2.4 | .04 | .00 | .0 | 41 | 6.3 | 9.0 | 1.6 | 117 | 25 | 19 | .1 | 2.0 | 173 | 128 | 32 | 304 | 7.9 | 5 | 5.1 | 3.0 |
| June 1 | | 1.5 | .03 | .00 | .0 | 40 | 8.0 | 8.1 | 2.9 | 121 | 30 | 19 | .1 | 2.4 | 179 | 133 | 34 | 312 | 7.8 | 2 | 3.5 | 3.1 |
| July 2 | | 2.5 | .02 | .00 | .0 | 38 | 7.3 | 8.2 | 2.5 | 118 | 21 | 17 | .1 | 1.8 | 174 | 124 | 28 | 294 | 7.6 | 5 | 1.9 | 1.7 |
| Aug. 1 | | 2.3 | .02 | .00 | .0 | 37 | 8.7 | 10 | 1.2 | 117 | 24 | 22 | .1 | 1.2 | 177 | 128 | 32 | 307 | 7.9 | 5 | 4.9 | 2.2 |
| Sept. 4 | | .8 | .02 | .00 | .0 | 38 | 7.8 | 9.8 | 1.2 | 117 | 25 | 20 | .1 | 1.0 | 177 | 126 | 31 | 299 | 8.0 | 7 | 2.5 | 2.2 |

[a] Includes equivalent of 5 parts per million of carbonate ($CO_3$).

LAKE ERIE--Continued

## LAKE ERIE AT DIAMOND ALKALI COMPANY INTAKE, PAINESVILLE, OHIO

LOCATION.--At Diamond Alkall Company intake consisting of two supply lines 200 feet apart in Lake Erie, outside of breakwater wall, and 3,000 feet offshore from Fairport. Samples collected from raw-water pump at Diamond Alkali plant near Painesville, Lake County.
RECORDS AVAILABLE.--Chemical analyses: September 1950 to September 1951.

Chemical analyses, in parts per million September 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Sept. 2, 1950 | | 1.7 | 0.07 | 0.00 | 0.0 | 39 | 10 | 6.3 | | 114 | 23 | 24 | 0.2 | 0.5 | 184 | 138 | 45 | 308 | 8.1 | 1 | 2.8 | 2.8 |
| Sept. 30 | | 1.1 | .10 | .00 | .0 | 39 | 11 | 8.4 | 1.0 | 115 | 27 | 23 | .1 | .4 | 182 | 143 | 48 | 309 | 8.1 | 4 | 2.6 | 2.8 |
| Nov. 2 | | .5 | .02 | .00 | .0 | 51 | 8.5 | 13 | | 114 | 26 | 49 | .0 | 1.0 | 211 | 161 | 68 | 433 | 7.8 | 6 | 2.8 | 2.6 |
| Dec. 1 | | 1.6 | .01 | .00 | .0 | 38 | 9.0 | 13 | | 108 | 29 | 30 | .1 | 1.0 | 199 | 133 | 44 | 331 | 7.9 | 2 | 7.2 | 2.7 |
| Jan. 2, 1951 | | 1.4 | .02 | .00 | .0 | 44 | 8.7 | 14 | | 110 | 30 | 39 | .0 | .3 | 198 | 145 | 55 | 365 | 7.9 | 2 | 2.9 | 2.8 |
| Feb. 2 | | 2.5 | .05 | .00 | .0 | 45 | 8.3 | 21 | | 116 | 28 | 48 | .1 | .5 | 220 | 146 | 51 | 378 | 7.8 | 3 | 2.8 | 2.8 |
| Mar. 1 | | 3.2 | .04 | .00 | .0 | 36 | 8.7 | 12 | | 105 | 28 | 26 | .0 | .5 | 173 | 126 | 40 | 306 | 7.5 | 5 | 3.0 | 2.5 |
| Apr. 3 | | 5.3 | .05 | .00 | .0 | 46 | 8.3 | 21 | | 102 | 36 | 50 | .2 | 2.0 | 235 | 148 | 65 | 401 | 7.6 | 10 | 5.0 | 3.9 |
| May 1 | | .7 | .02 | .01 | .0 | 47 | 8.3 | 20 | | 106 | 32 | 53 | .1 | .8 | 239 | 151 | 65 | 399 | 7.7 | 2 | 2.9 | 3.6 |
| June 1 | | 2.1 | .01 | .00 | .0 | 40 | 7.3 | 12 | 3.4 | 110 | 25 | 30 | .1 | 2.1 | 185 | 131 | 40 | 327 | 7.7 | 1 | 3.0 | 3.8 |
| July 2 | | 1.7 | .03 | .00 | .0 | 52 | 8.3 | 24 | 3.3 | 115 | 27 | 67 | .0 | 1.9 | 268 | 164 | 70 | 471 | 7.6 | 3 | 3.2 | 2.9 |
| Aug. 1 | | 2.3 | .04 | .00 | .0 | 38 | 7.3 | 11 | 1.2 | 114 | 25 | 25 | .1 | 1.0 | 184 | 126 | 31 | 312 | 7.9 | 3 | 1.4 | 1.0 |
| Sept. 1 | | 1.5 | .04 | .00 | .0 | 41 | 8.0 | 13 | 1.2 | 118 | 25 | 32 | .1 | 1.0 | 196 | 136 | 38 | 340 | 7.4 | 7 | 2.7 | 2.8 |

## LAKE ERIE AT INDUSTRIAL RAYON CORPORATION INTAKE, PAINESVILLE, OHIO

LOCATION.--At Industrial Rayon Corporation intake, at submerged crib, 4,000 feet offshore, directly north of Painesville, and 5,000 feet from filtration plant. Samples collected from raw-water tap at Industrial Rayon Corporation filtration plant near Painesville, Lake County.
RECORDS AVAILABLE.--Chemical analyses: September 1950 to September 1951.

Chemical analyses, in parts per million, September 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Sept. 1, 1950 | | 0.2 | 0.03 | 0.00 | 0.0 | 38 | 9.4 | 7.8 | 1.2 | 117 | 24 | 21 | 0.1 | 0.6 | 177 | 133 | 38 | 300 | 8.0 | 5 | 2.2 | 2.8 |
| Oct. 2 | | .7 | .07 | .00 | .0 | 38 | 10 | 6.9 | | 117 | 24 | 21 | .1 | .4 | 182 | 136 | 40 | 302 | 7.6 | 1 | 3.2 | 3.3 |
| Nov. 1 | | .3 | .01 | .00 | .0 | 51 | 8.2 | 17 | | 111 | 29 | 54 | .1 | .5 | 223 | 161 | 70 | 444 | 8.0 | 3 | 2.2 | 2.7 |
| Dec. 1 | | 1.4 | .01 | .00 | .0 | 34 | 8.5 | 10 | | 111 | 24 | 18 | .1 | .8 | 157 | 120 | 29 | 273 | 7.9 | 2 | 4.6 | 2.6 |
| Jan. 1, 1951 | | 1.2 | .04 | .00 | .0 | 42 | 8.3 | 18 | | 106 | 43 | 32 | .0 | .5 | 208 | 138 | 52 | 369 | 7.5 | 3 | 2.8 | 2.8 |
| Feb. 1 | | 2.8 | .05 | .00 | .0 | 40 | 8.0 | 17 | | 117 | 24 | 34 | .1 | .5 | 189 | 133 | 37 | 327 | 7.8 | 5 | 3.1 | 2.9 |
| Mar. 1 | | 2.7 | .05 | .00 | .0 | 46 | 7.3 | 21 | | 98 | 30 | 54 | .1 | 1.8 | 225 | 144 | 64 | 397 | 7.7 | 7 | 3.2 | 2.5 |
| Apr. 1 | | 3.5 | .04 | .00 | .0 | 40 | 8.3 | 12 | | 102 | 31 | 30 | .2 | 2.0 | 185 | 134 | 50 | 321 | 7.8 | 7 | 5.0 | 3.5 |
| May 1 | | 1.0 | .03 | .00 | .0 | 39 | 7.0 | 10 | 1.2 | 112 | 23 | 24 | .0 | 1.8 | 177 | 126 | 34 | 310 | 7.2 | 4 | 2.9 | 2.3 |
| June 1 | | 3.2 | .02 | .00 | .0 | 37 | 7.8 | 10 | 2.3 | 113 | 25 | 25 | .1 | 2.2 | 170 | 125 | 32 | 307 | 7.9 | 2 | 3.0 | 3.0 |
| July 2 | | 1.9 | .03 | .00 | .0 | 52 | 6.3 | 22 | 2.9 | 114 | 27 | 57 | .0 | 2.9 | 256 | 156 | 62 | 440 | 7.9 | 3 | 3.1 | 3.0 |
| Aug. 1 | | 1.6 | .02 | .00 | .0 | 38 | 8.0 | 11 | 2.8 | 118 | 20 | 23 | .0 | 2.5 | 175 | 129 | 31 | 315 | 7.7 | 1 | 1.5 | 1.6 |
| Sept. 1 | | 1.5 | .02 | .00 | .0 | 40 | 7.5 | 13 | 1.0 | 116 | 25 | 28 | .1 | 1.0 | 193 | 132 | 36 | 324 | 8.0 | 5 | 3.4 | 2.1 |

LAKE ERIE--Continued

## LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE, PAINESVILLE, OHIO

LOCATION.--At Painesville public water-supply intake at submerged crib, 1,500 feet offshore, about a quarter of a mile west of Fairport intake, and 4 miles north of Painesville. Samples collected from raw-water well outside pumping station in Painesville, Lake County.
RECORDS AVAILABLE.--Chemical analyses: September 1950 to September 1951.

Chemical analyses, in parts per million, September 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Sept. 2, 1950 | | 2.0 | 0.06 | 0.00 | 0.0 | 55 | 6.7 | 29 | | 108 | 26 | 76 | 0.1 | 0.6 | 267 | 165 | 76 | 487 | 8.2 | 3 | 2.0 | 2.0 |
| Sept. 30 | | .7 | .05 | .00 | .0 | 39 | 10 | 9.2 | 1.2 | 120 | 26 | 24 | .1 | .5 | 187 | 138 | 40 | 311 | 8.0 | 4 | 2.8 | 2.7 |
| Nov. 2 | | 1.1 | .09 | .00 | .0 | 39 | 8.3 | 10 | | 116 | 29 | 20 | .0 | 1.0 | 177 | 132 | 37 | 312 | 7.8 | 2 | 4.0 | 1.6 |
| Dec. 1 | | 1.4 | .01 | .00 | .0 | 34 | 9.5 | 9.5 | | 110 | 28 | 18 | .1 | .9 | 164 | 125 | 35 | 284 | 7.8 | 2 | 6.3 | 3.0 |
| Jan. 2, 1951 | | 1.7 | .02 | .00 | .0 | 41 | 13 | 7.6 | | 111 | 29 | 36 | .0 | .4 | 196 | 156 | 65 | 349 | 7.9 | 3 | 3.0 | 3.0 |
| Feb. 1 | | 1.7 | .05 | .00 | .0 | 38 | 8.0 | 15 | | 118 | 28 | 23 | .1 | 1.0 | 178 | 129 | 31 | 309 | 7.9 | 2 | 2.8 | 2.8 |
| Mar. 1 | | 2.6 | .02 | .00 | .0 | 34 | 7.5 | 9.3 | | 98 | 27 | 19 | .0 | .8 | 161 | 116 | 35 | 292 | 7.7 | 5 | 3.0 | 2.5 |
| Apr. 2 | | 3.9 | .09 | .00 | .0 | 39 | 8.7 | 13 | | 106 | 43 | 20 | .2 | 2.2 | 189 | 134 | 46 | 315 | 7.8 | 5 | 5.9 | 3.2 |
| May 1 | | .7 | .02 | .01 | .0 | 58 | 7.8 | 30 | 1.7 | 105 | 31 | 86 | .1 | .8 | 321 | 177 | 91 | 503 | 7.9 | 5 | 3.2 | 3.4 |
| June 1 | | .2 | .02 | .00 | .0 | 36 | 8.7 | 9.0 | 1.2 | 116 | 26 | 18 | .0 | 1.6 | 173 | 127 | 31 | 297 | 7.2 | 3 | 3.2 | 2.7 |
| July 2 | | 3.2 | .02 | .00 | .0 | 38 | 7.8 | 9.1 | 3.0 | 118 | 24 | 18 | .1 | 2.5 | 178 | 128 | 30 | 306 | 7.8 | 3 | 2.3 | 2.3 |
| Aug. 1 | | 1.7 | .04 | .00 | .0 | 43 | 7.0 | 15 | 2.8 | 114 | 21 | 40 | .1 | 1.0 | 215 | 137 | 43 | 362 | 7.9 | 5 | 1.6 | 1.6 |
| Sept. 1 | | 2.2 | .02 | .00 | .0 | 64 | 8.3 | 34 | 1.4 | a 119 | 26 | 106 | .0 | 1.2 | 324 | 193 | 96 | 579 | 8.0 | 2 | 6.7 | 2.1 |

a Includes equivalent of 5 parts per million of carbonate ($CO_3$).

## LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE, FAIRPORT, OHIO

LOCATION.--At Fairport public water-supply intake, 1,000 feet offshore, and about 1,000 feet west of mouth of Grand River. Samples collected from raw-water tap at filtration plant in Fairport, Lake County.
RECORDS AVAILABLE.--Chemical analyses: September 1950 to September 1951.

Chemical analyses, in parts per million, September 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Sept. 2, 1950 | | 2.3 | 0.05 | 0.00 | 0.0 | 56 | 9.8 | 26 | 1.2 | 114 | 27 | 81 | 0.1 | 0.6 | 310 | 180 | 87 | 499 | 8.0 | 4 | 2.4 | 2.6 |
| Sept. 30 | | 1.4 | .07 | .00 | .0 | 42 | 11 | 7.1 | | 116 | 25 | 31 | .1 | .5 | 201 | 150 | 55 | 331 | 8.1 | 2 | 2.8 | 3.1 |
| Nov. 2 | | .9 | .07 | .00 | .0 | 39 | 9.3 | 4.6 | | 112 | 27 | 17 | .1 | .5 | 162 | 134 | 43 | 313 | 8.0 | 1 | 2.8 | 2.1 |
| Dec. 1 | | 1.5 | .01 | .00 | .0 | 36 | 8.8 | 12 | | 108 | 32 | 20 | .1 | 1.0 | 168 | 126 | 38 | 292 | 7.7 | 2 | 7.2 | 2.6 |
| Jan. 2, 1951 | | 1.3 | .02 | .00 | .0 | 45 | 9.2 | 15 | | 112 | 27 | 45 | .0 | .3 | 208 | 150 | 58 | 371 | 7.9 | 3 | 2.8 | 2.9 |
| Feb. 1 | | 1.7 | .05 | .00 | .0 | 40 | 7.5 | 16 | | 120 | 27 | 27 | .1 | .8 | 185 | 130 | 32 | 321 | 7.8 | 5 | 2.7 | 2.5 |
| Mar. 1 | | 2.1 | .04 | .00 | .0 | 35 | 7.8 | 11 | | 100 | 30 | 20 | .1 | 1.2 | 169 | 120 | 37 | 298 | 7.7 | 7 | 3.5 | 3.4 |
| Apr. 2 | | 4.3 | .03 | .00 | .0 | 36 | 7.8 | 9.8 | | 94 | 40 | 16 | .1 | 1.9 | 167 | 122 | 45 | 283 | 7.7 | 7 | 6.4 | 3.8 |
| May 1 | | .5 | .02 | .02 | .0 | 55 | 7.0 | 27 | 1.6 | 109 | 28 | 78 | .1 | 1.0 | 297 | 166 | 77 | 473 | 7.8 | 3 | 3.2 | 3.6 |
| June 1 | | 1.0 | .04 | .00 | .0 | 37 | 7.8 | 9.8 | 1.4 | 108 | 25 | 19 | .1 | .8 | 173 | 124 | 36 | 294 | 8.0 | 5 | 3.0 | 3.3 |
| July 2 | | 2.1 | .03 | .00 | .0 | 38 | 8.3 | 9.1 | 2.8 | 117 | 28 | 18 | .0 | 1.8 | 172 | 130 | 33 | 303 | 8.1 | 3 | 3.0 | 2.9 |
| Aug. 1 | | 1.4 | .04 | .00 | .0 | 43 | 7.8 | 16 | 2.6 | 114 | 19 | 42 | .1 | 1.2 | 216 | 140 | 46 | 368 | 8.1 | 5 | 2.2 | 1.6 |
| Sept. 1 | | 2.5 | .02 | .00 | .0 | 71 | 9.2 | 40 | 1.3 | 115 | 26 | 130 | .1 | 1.0 | 367 | 216 | 121 | 662 | 7.6 | 5 | 3.7 | 2.3 |

## LAKE ERIE--Continued

### LAKE ERIE AT CLEVELAND ELECTRIC ILLUMINATING COMPANY INTAKE, ASHTABULA, OHIO

LOCATION.--At Cleveland Electric Illiminating Company Intake at flume in Lake Erie at Ashtabula, Ashtabula County.
RECORDS AVAILABLE.--Chemical analyses: September 1950 to November 1951.

[Chemical analyses, in parts per million, September 1950 to November 1951]

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Sept. 1, 1950 | | 0.8 | 0.06 | 0.00 | 0.0 | 38 | 7.0 | 10 | | 108 | 25 | 19 | 0.1 | 0.6 | 161 | 124 | 35 | 287 | 8.0 | 3 | 2.4 | 1.8 |
| Oct. 3 | | 2.0 | .08 | .00 | .0 | 38 | 10 | 8.6 | | 118 | 24 | 23 | .1 | .2 | 180 | 136 | 39 | 306 | 7.1 | 4 | 3.6 | 3.1 |
| Nov. 1 | | .4 | .04 | .00 | .0 | 39 | 8.5 | 9.2 | | 115 | 25 | 22 | .0 | 1.0 | 174 | 132 | 38 | 308 | 7.6 | 2 | 2.2 | 2.4 |
| Dec. 1 | | 3.0 | .06 | .00 | .0 | 33 | 7.3 | 14 | | 70 | 43 | 28 | .2 | 1.0 | 172 | 112 | 55 | 284 | 7.7 | 7 | 6.7 | 4.4 |
| Jan. 1, 1951 | | 1.2 | .02 | .00 | .0 | 43 | 10 | 9.5 | | 112 | 28 | 34 | .0 | .3 | 190 | 150 | 57 | 332 | 8.0 | 3 | 3.0 | 2.6 |
| Mar. 1 | | 2.4 | .08 | .00 | .0 | 37 | 7.8 | 12 | | 92 | 34 | 27 | .1 | 1.0 | 182 | 124 | 49 | 315 | 7.5 | 7 | 4.4 | 3.2 |
| Apr. 2 | | 2.9 | .07 | .00 | .0 | 34 | 6.3 | 13 | | 88 | 32 | 22 | .2 | 1.4 | 161 | 112 | 39 | 274 | 7.7 | 15 | 6.2 | 4.4 |
| May 1 | | 1.0 | .02 | .00 | .0 | 39 | 7.3 | 12 | 1.4 | 109 | 27 | 24 | .1 | 1.0 | 176 | 127 | 38 | 314 | 8.2 | 3 | 3.3 | 2.9 |
| June 4 | | 1.7 | .02 | .00 | .0 | 40 | 8.5 | 12 | 3.1 | 113 | 29 | 29 | .1 | 2.8 | 189 | 135 | 42 | 329 | 7.7 | 1 | 3.5 | 3.0 |
| Aug. 1 | | 1.8 | .06 | .00 | .0 | 38 | 7.3 | 9.3 | 1.4 | 116 | 24 | 20 | .1 | 1.5 | 175 | 124 | 30 | 298 | 7.6 | 2 | 1.1 | 1.1 |
| Sept. 4 | | 1.4 | .02 | .00 | .0 | 36 | 8.5 | 7.6 | 2.1 | 112 | 23 | 19 | .2 | 1.4 | 165 | 125 | 33 | 291 | 7.3 | 2 | 2.1 | 2.0 |
| Nov. 1 | | 1.0 | .04 | .00 | .0 | 38 | 9.2 | 12 | 1.9 | 114 | 26 | 29 | .0 | 1.1 | 182 | 134 | 39 | 330 | 7.9 | 2 | 4.0 | 4.0 |

## LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE, ASHTABULA, OHIO

LOCATION.--At Ashtabula public water-supply intake, at submerged crib, 1,500 feet off breakwater, and 3,000 feet from filtration plant. Samples collected from raw-water tap at filtration plant in Ashtabula, Ashtabula County.
RECORDS AVAILABLE.--Chemical analyses: September 1950 to September 1951.

Chemical analyses, in parts per million, September 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Sept. 1, 1950 | | 0.8 | 0.06 | 0.00 | 0.0 | 39 | 7.3 | 12 | | 110 | 29 | 20 | 0.1 | 0.5 | 176 | 127 | 37 | 307 | 7.9 | 3 | 2.1 | 1.9 |
| Oct. 3 | | 1.1 | .08 | .00 | .0 | 39 | 10 | 5.4 | | 116 | 24 | 21 | .1 | .2 | 181 | 138 | 43 | 299 | 8.1 | 1 | 2.8 | 3.0 |
| Nov. 1 | | .2 | .03 | -- | -- | 38 | 7.5 | 12 | | 120 | 26 | 19 | .1 | .4 | 169 | 127 | 29 | 294 | 8.0 | 3 | 1.7 | 1.8 |
| Dec. 1 | | 1.6 | .01 | .00 | .0 | 42 | 9.7 | 22 | | 114 | 34 | 44 | .2 | .8 | 225 | 144 | 51 | 390 | 7.9 | 2 | 6.5 | 3.2 |
| Jan. 1, 1951 | | 1.4 | .01 | .00 | .0 | 40 | 13 | 2.8 | | 112 | 28 | 27 | .0 | .4 | 185 | 152 | 61 | 323 | 7.9 | 3 | -- | 2.6 |
| Mar. 1 | | 2.5 | .04 | .00 | .0 | 38 | 7.8 | 13 | | 101 | 30 | 29 | .1 | 1.2 | 179 | 126 | 44 | 325 | 7.6 | 7 | 3.6 | 3.6 |
| Apr. 2 | | 3.1 | .04 | .00 | .0 | 39 | 7.3 | 14 | | 108 | 32 | 24 | .1 | 1.8 | 181 | 128 | 39 | 316 | 7.7 | 5 | 5.4 | 2.9 |
| May 1 | | 1.0 | .02 | .00 | .0 | 38 | 8.3 | 9.3 | 1.0 | 112 | 24 | 23 | .1 | .5 | 172 | 128 | 37 | 301 | 7.9 | 5 | 3.2 | 3.1 |
| June 2 | | 1.5 | .01 | .00 | .0 | 38 | 7.8 | 9.1 | 2.7 | 112 | 25 | 22 | .1 | 2.1 | 171 | 126 | 35 | 320 | 7.7 | 2 | 3.0 | 2.7 |
| Aug. 1 | | 2.2 | .02 | .00 | .0 | 38 | 7.3 | 9.4 | 1.1 | 116 | 24 | 18 | .0 | 1.0 | 177 | 124 | 30 | 297 | 7.9 | 1 | 1.0 | 1.0 |
| Sept. 4 | | 1.1 | .03 | .00 | .0 | 36 | 9.0 | 9.6 | 1.4 | 114 | 25 | 22 | .1 | 1.0 | 165 | 127 | 33 | 285 | 7.9 | 4 | 1.8 | 1.7 |

## LAKE ERIE--Continued

### LAKE ERIE AT PUBLIC WATER-SUPPLY INTAKE AT CONNEAUT, OHIO

LOCATION.--At Conneaut public water-supply intake, at submerged crib, 1,900 feet offshore, north of Conneaut, and 2,100 feet from filtration plant. Samples collected from raw-water tap at filtration plant in Conneaut, Ashtabula County.
RECORDS AVAILABLE.--Chemical analyses: September 1950 to September 1951.

Chemical analyses, in parts per million, September 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Total | Noncarbonate | | | | Unfiltered | Filtered |
| Sept. 2, 1950 | | 1.6 | 0.06 | 0.00 | 0.0 | 38 | 7.2 | 10 | | 110 | 24 | 19 | 0.1 | 0.6 | 160 | 124 | 34 | 295 | 8.1 | 2 | 2.4 | 1.9 |
| Sept. 25 | | 1.4 | .05 | .00 | .0 | 39 | 9.9 | 8.0 | 1.0 | 117 | 29 | 20 | .1 | .8 | 181 | 138 | 42 | 289 | 8.2 | 5 | 2.8 | 3.6 |
| Nov. 2 | | .2 | .03 | .00 | .0 | 38 | 9.3 | 4.7 | | 112 | 24 | 18 | .1 | .3 | 154 | 132 | 41 | 305 | 8.1 | 3 | 2.8 | 2.3 |
| Dec. 1 | | 1.0 | .02 | .00 | .0 | 37 | 8.5 | 11 | | 114 | 28 | 19 | .1 | .8 | 169 | 127 | 34 | 294 | 7.8 | 3 | 4.8 | 2.8 |
| Jan. 1, 1951 | | 1.7 | .04 | .00 | .0 | 40 | 7.8 | 15 | | 112 | 31 | 28 | .0 | 1.0 | 187 | 132 | 40 | 337 | 7.7 | 4 | 4.2 | 4.0 |
| Feb. 1 | | 2.0 | .05 | .00 | .0 | 38 | 7.8 | 21 | | 132 | 28 | 25 | .1 | .8 | 190 | 126 | 19 | 304 | 7.7 | 5 | 2.5 | 2.4 |
| Mar. 1 | | 1.0 | .02 | .00 | .0 | 36 | 6.8 | 12 | | 100 | 26 | 24 | .1 | 1.0 | 164 | 118 | 36 | 292 | 7.7 | 5 | 4.2 | 3.3 |
| Apr. 2 | | 3.2 | .04 | .00 | .0 | 37 | 7.8 | 9.5 | | 106 | 26 | 21 | .1 | 1.5 | 173 | 124 | 38 | 296 | 7.8 | 3 | 4.7 | 3.0 |
| May 1 | | .8 | .03 | .00 | .0 | 42 | 4.9 | 8.7 | 1.3 | 110 | 24 | 22 | .1 | .8 | 175 | 124 | 35 | 282 | 7.8 | 3 | 3.0 | 2.9 |
| June 1 | | .4 | .02 | .00 | .0 | 40 | 7.8 | 12 | 1.2 | 112 | 25 | 30 | .0 | 1.7 | 191 | 133 | 40 | 331 | 7.1 | 5 | 3.2 | 2.6 |
| July 1 | | 1.8 | .03 | .00 | .0 | 38 | 8.5 | 11 | 2.9 | 116 | 26 | 22 | .0 | 1.3 | 174 | 131 | 35 | 310 | 8.1 | 3 | 3.0 | 2.8 |
| Aug. 2 | | 2.2 | .02 | .00 | .0 | 37 | 7.5 | 9.3 | 1.2 | 116 | 24 | 20 | .1 | 1.2 | 172 | 123 | 28 | 293 | 8.0 | 3 | 1.3 | 1.3 |
| Sept. 1 | | 4.1 | .01 | .00 | .0 | 36 | 9.0 | 9.0 | 1.4 | 115 | 23 | 20 | .1 | 1.0 | 174 | 126 | 33 | 288 | 7.8 | 7 | 2.1 | 1.7 |

## TENMILE CREEK AT TOLEDO, OHIO

LOCATION.--At bridge on Lagrange Street near intersection of Lagrange Street and Windermere Boulevard in Toledo, Lucas County, 6¼ miles upstream from mouth of Ottawa River.
DRAINAGE AREA.--179 square miles.
RECORDS AVAILABLE.--Chemical analyses: March to September 1951.
REMARKS.--No discharge records available for this station.

Chemical analyses, in parts per million, March to September 1951

| 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 | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed: Unfiltered | Oxygen consumed: Filtered |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mar. 7, 1951 ... | | 6.7 | 0.02 | 0.16 | 0.0 | 81 | 15 | 10 | | 204 | 83 | 14 | 1.4 | 11 | 334 | 264 | 97 | 559 | 7.4 | 7 | 6.2 | 5.3 |
| Apr. 3 ..... | | 7.0 | .04 | .00 | .0 | 84 | 16 | 8.9 | | 220 | 87 | 11 | .4 | 9.2 | 348 | 274 | 95 | 547 | 7.8 | 10 | 5.7 | 5.6 |
| May 2 ..... | | 4.2 | .04 | .00 | .0 | 80 | 19 | 7.9 | 1.6 | 234 | 84 | 11 | .5 | 7.0 | 346 | 279 | 86 | 558 | 7.6 | 20 | 6.0 | 5.2 |
| June 4 ..... | | 4.1 | .03 | .00 | .0 | 74 | 17 | 12 | 6.3 | a196 | 85 | 17 | 1.6 | 4.8 | 327 | 253 | 94 | 535 | 8.1 | 12 | 6.8 | 5.7 |
| July 3 ..... | | 7.2 | .03 | .00 | .0 | 84 | 18 | 12 | 2.8 | b243 | 85 | 17 | .2 | 8.0 | 373 | 287 | 84 | 578 | 8.5 | 10 | 6.2 | 5.0 |
| Aug. 1 ..... | | 10 | .01 | .02 | .0 | 81 | 18 | 19 | 4.5 | c226 | 92 | 21 | .1 | 12 | 379 | 276 | 91 | 591 | 8.2 | 20 | 6.4 | 5.6 |
| Sept. 15 ..... | | 4.7 | .06 | .00 | .0 | 48 | 14 | 22 | 5.9 | 152 | 87 | 22 | .1 | .2 | 292 | 176 | 53 | 485 | 7.1 | 20 | 6.8 | 5.9 |

a Includes equivalent of 5 parts per million of carbonate ($CO_3$).
b Includes equivalent of 12 parts per million of carbonate ($CO_3$).
c Includes equivalent of 7 parts per million of carbonate ($CO_3$).

Dissolved oxygen, cyanide, and phenols, March to September 1951

| Date of collection | Time | Mean discharge (cfs) | Temperature °F | Temperature °C | Dissolved oxygen: Parts per million | Dissolved oxygen: Percent saturation | Cyanide (CN) Parts per million | Phenols as $C_6H_5OH$ Parts per million |
|---|---|---|---|---|---|---|---|---|
| Mar. 7, 1951..... | 2:30 p.m. | | 49 | 9.4 | 9.0 | 78 | -- | 0.000 |
| Apr. 3..... | 11:00 a.m. | | 42 | 5.6 | 10.6 | 84 | -- | -- |
| May 2..... | 12:05 p.m. | | 61 | 16.1 | 8.9 | 90 | 0.0 | .000 |
| June 4 ..... | 3:15 p.m. | | 72 | 22.2 | 3.8 | 43 | .0 | .002 |
| July 3 ..... | 10:00 a.m. | | 71 | 21.7 | 2.2 | 25 | .0 | .009 |
| July 18 ..... | 11:00 a.m. | | 75 | 23.9 | 1.4 | 16 | .1 | .008 |
| Aug. 1..... | 3:00 p.m. | | 78 | 25.6 | 1.5 | 18 | .1 | .000 |
| Aug. 15 ..... | 12:15 p.m. | | 73 | 22.8 | .0 | 0 | 1.0 | .010 |
| Aug. 29..... | 12:15 p.m. | | 74 | 23.3 | 2.0 | 23 | .1 | .000 |
| Sept. 15 ..... | 7:15 a.m. | | 65 | 18.3 | .0 | 0 | .4 | .000 |
| Sept. 28 ..... | 5:45 p.m. | | 60 | 15.6 | 2.8 | 28 | .0 | .011 |

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 September 1951.
Water temperatures: March 1950 to September 1951. Continuous recorder measurements beginning June 1950.
Sediment records: April 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 356 ppm Dec. 21-31; minimum, 164 ppm Feb. 21-28.
Hardness: Maximum, 290 ppm Dec. 21-31; minimum, 128 ppm Feb. 21-28.
Specific conductance: Maximum daily, 641 micromhos Nov. 9; minimum daily, 221 micromhos Dec. 6.
Water temperatures: Maximum, 85°F Aug. 30; minimum, freezing point on many days during winter months. Maximum and minimum based on once-daily measurement.
Sediment concentrations: Maximum daily, 888 ppm May 12; minimum daily, 5 ppm Jan. 2, Sept. 29, 30.
Sediment loads: Maximum daily, 88,600 tons May 12; minimum daily, 2 tons Sept. 29.
EXTREMES, March 1950 to September 1951.--Dissolved solids: Maximum, 356 ppm Dec. 21-31, 1950; minimum, 164 ppm Feb. 21-28, 1951.
Hardness: Maximum, 290 ppm Dec. 21-31, 1950; minimum, 128 ppm Feb. 21-28, 1951.
Specific conductance: Maximum daily, 641 micromhos Nov. 9, 1950; minimum daily, 221 micromhos Dec. 6, 1950.
Water temperatures: Maximum, 85°F July 18, Aug. 17, 1950, Aug. 30, 1951; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 888 ppm May 12, 1951; minimum daily, 5 ppm May 30, 1950, Jan. 2, Sept. 29, 30, 1951.
Sediment loads: Maximum daily, 88,600 tons May 12, 1951; minimum daily, 2 tons Sept. 29, 1951.
REMARKS.--Flow affected by ice Dec. 17 to Jan. 1, Jan. 3, Jan. 26 to Feb. 11, Feb. 13, 14. Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1207.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed: Unfiltered | Oxygen consumed: Filtered |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 1-10, 1950.. | 3,380 | 4.3 | 0.04 | 0.00 | 0.0 | 64 | 15 | 8.9 | | 194 | 60 | 9.0 | 0.2 | 5.7 | 284 | 220 | 61 | 432 | 7.7 | 32 | 12 | 8.6 |
| Oct. 11-20..... | 15,100 | 6.4 | .05 | .00 | .0 | 49 | 10 | 6.2 | | 142 | 41 | 7.0 | .2 | 10 | 219 | 164 | 48 | 329 | 7.9 | 40 | 14 | 8.2 |
| Oct. 21-31..... | 916 | 5.1 | .04 | .00 | .0 | 63 | 15 | 8.5 | | 190 | 59 | 8.5 | .2 | 8.4 | 279 | 218 | 62 | 424 | 8.0 | 30 | 10 | 7.3 |
| Nov. 1-10 ..... | 3,300 | 7.7 | .04 | .00 | .0 | 74 | 19 | 9.2 | | a224 | 75 | 11 | .2 | 5.8 | 335 | 262 | 79 | 532 | 8.0 | 25 | -- | 7.1 |
| Nov. 11-20 ..... | 7,160 | 9.2 | .05 | .00 | .0 | 63 | 16 | 11 | | a188 | 64 | 11 | .3 | 13 | 291 | 223 | 69 | 440 | 8.0 | 30 | 11 | 7.3 |
| Nov. 21-30 ..... | 16,700 | 7.0 | .06 | .00 | .0 | 49 | 11 | 8.6 | | 146 | 48 | 6.0 | .0 | 10 | 228 | 168 | 48 | 342 | 8.1 | 30 | 13 | 9.3 |
| Dec. 1-10 ..... | 33,100 | 4.4 | .07 | .00 | .0 | 45 | 9.2 | 11 | | 133 | 41 | 11 | .2 | 9.0 | 203 | 150 | 41 | 312 | 8.0 | 25 | 9.0 | 6.8 |
| Dec. 11-20 ..... | 9,550 | 8.3 | .06 | .00 | .0 | 53 | 15 | 3.3 | | 154 | 54 | 8.5 | .0 | 8.4 | 231 | 192 | 68 | 395 | 7.5 | 30 | 9.2 | 6.0 |
| Dec. 21-31 ..... | 1,680 | 9.5 | .06 | .00 | .0 | 84 | 19 | 7.4 | | 251 | 77 | 10 | .1 | 4.4 | 356 | 290 | 82 | 555 | 7.9 | 27 | 6.6 | 6.1 |
| Jan. 1-10, 1951 .. | 19,900 | 8.1 | .04 | .00 | .1 | 38 | 25 | 7.8 | | 168 | 56 | 8.0 | .1 | 8.8 | 247 | 200 | 60 | 405 | 7.8 | 18 | 7.7 | 5.4 |
| Jan. 11-20..... | 8,780 | 7.9 | .02 | .00 | .0 | 61 | 15 | 6.1 | | 180 | 60 | 7.5 | .0 | 8.3 | 270 | 214 | 66 | 461 | 7.8 | 24 | 6.4 | 5.7 |
| Jan. 21-31..... | 7,810 | 7.9 | .04 | .00 | .0 | 54 | 13 | 8.6 | | 160 | 55 | 7.5 | .0 | 10 | 247 | 190 | 57 | 393 | 7.8 | 32 | 7.6 | 6.1 |
| Feb. 1-10 ..... | 1,470 | 9.2 | .02 | .00 | .0 | 77 | 22 | 10 | 2.2 | 239 | 77 | 9.2 | .1 | 9.0 | 351 | 281 | 87 | 560 | 7.8 | 18 | 6.0 | 6.0 |
| Feb. 11-20 ..... | 19,700 | 6.7 | .04 | .00 | .0 | 51 | 13 | 6.5 | 2.8 | 153 | 50 | 7.0 | .1 | 8.3 | 241 | 182 | 55 | 386 | 7.7 | 20 | 8.4 | 5.4 |
| Feb. 21-28 ..... | 36,800 | 6.4 | .08 | .00 | .0 | 38 | 8.3 | 3.5 | 2.4 | 108 | 31 | 4.0 | .0 | 8.2 | 164 | 128 | 40 | 272 | 7.7 | 25 | 9.8 | 5.9 |
| Mar. 1-10 ..... | 12,000 | 10 | .05 | .00 | .0 | 57 | 13 | 8.2 | | 162 | 59 | 8.2 | .1 | 9.4 | 250 | 197 | 63 | 403 | 7.7 | 20 | 10 | 6.0 |
| Mar. 11-20 ..... | 13,000 | 7.3 | .04 | .00 | .1 | 57 | 14 | 3.8 | | 162 | 55 | 7.5 | .1 | 8.8 | 250 | 198 | 67 | 397 | 7.8 | 20 | 8.9 | 5.0 |
| Mar. 21-31 ..... | 11,500 | 7.3 | .02 | .00 | .0 | 58 | 14 | 8.6 | | 173 | 59 | 7.0 | .1 | 9.4 | 256 | 204 | 60 | 412 | 7.9 | 19 | 8.9 | 5.2 |

a Includes equivalent of 14 parts per million of carbonate ($CO_3$).

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apr. 1-10..... | 11,400 | 8.1 | -- | -- | -- | 53 | 11 | 19 | | 146 | 75 | 10 | .5 | 8.2 | -- | 176 | 58 | 389 | 7.9 | 25 | -- | -- |
| Apr. 11-20..... | 15,400 | 6.2 | .01 | .00 | .1 | 52 | 12 | 5.5 | 2.4 | 158 | 50 | 6.2 | .1 | 10 | 230 | 181 | 50 | 364 | 8.0 | 22 | 9.2 | 7.1 |
| Apr. 21-30..... | 7,740 | 5.5 | .01 | .00 | .0 | 61 | 15 | 5.9 | 3.0 | 184 | 57 | 6.0 | .2 | 8.0 | 267 | 212 | 63 | 441 | 8.1 | 17 | 8.4 | 6.8 |
| May 1-10 ..... | 10,400 | 5.5 | .01 | .00 | .1 | 52 | 11 | 5.5 | 2.5 | 161 | 44 | 6.0 | .2 | 6.4 | 223 | 173 | 43 | 349 | 8.2 | 25 | 9.9 | 7.0 |
| May 11-20 ..... | 17,600 | 8.4 | .03 | .00 | .0 | 48 | 10 | 5.3 | 2.0 | 145 | 40 | 5.8 | .2 | 8.2 | 188 | 161 | 42 | 346 | 7.8 | 22 | 12 | 6.6 |
| May 21-31 ..... | 2,220 | 7.5 | .03 | .00 | .0 | 65 | 15 | 7.5 | 2.1 | 208 | 58 | 7.2 | .2 | 5.0 | 280 | 225 | 53 | 463 | 8.0 | 20 | 11 | 6.6 |
| June 1-10..... | 2,270 | 3.7 | .01 | .00 | .0 | 67 | 20 | 10 | 4.6 | b 230 | 70 | 9.0 | .2 | 3.1 | 316 | 250 | 61 | 516 | 8.0 | 17 | 7.3 | 6.3 |
| June 11-20..... | 8,120 | 9.8 | .04 | .00 | .0 | 56 | 13 | 8.6 | 5.4 | 166 | 52 | 8.5 | .1 | 19 | 269 | 195 | 57 | 423 | 7.8 | 20 | 9.7 | 6.1 |
| June 21-30..... | 4,410 | 11 | .03 | .00 | .0 | 60 | 13 | 7.4 | 5.5 | 174 | 52 | 9.0 | .1 | 19 | 278 | 205 | 61 | 435 | 7.6 | 23 | 9.1 | 6.6 |
| July 1-10 ..... | 2,130 | 12 | .02 | .00 | .1 | 66 | 15 | 8.5 | 5.5 | c 206 | 53 | 8.5 | .2 | 13 | 293 | 227 | 57 | 472 | 8.2 | 30 | 9.1 | 7.2 |
| July 11-20 ..... | 8,960 | 12 | .04 | .00 | .0 | 47 | 10 | 5.4 | 6.4 | 152 | 34 | 5.5 | .1 | 9.4 | 213 | 160 | 34 | 341 | 8.0 | 40 | 12 | 8.2 |
| July 21-31 ..... | 1,990 | 12 | .02 | .00 | .1 | 60 | 13 | 5.9 | 5.8 | 202 | 41 | 6.5 | .2 | 4.2 | 264 | 204 | 38 | 419 | 8.1 | 40 | 12 | 8.9 |
| Aug. 1-10 ..... | 835 | 12 | .08 | .00 | .1 | 56 | 15 | 6.2 | 4.1 | 204 | 41 | 7.0 | .2 | 2.5 | 261 | 202 | 34 | 407 | 8.0 | 25 | 8.5 | 8.1 |
| Aug. 11-20 ..... | 874 | 12 | .08 | .00 | .1 | 60 | 18 | 8.8 | 4.1 | 222 | 50 | 10 | .2 | 2.5 | 290 | 226 | 42 | 449 | 7.9 | 25 | 8.1 | 7.8 |
| Aug. 21-31 ..... | 718 | 6.2 | .06 | .00 | .1 | 62 | 22 | 14 | 4.7 | 232 | 70 | 11 | .4 | 2.5 | 325 | 246 | 55 | 510 | 7.9 | 20 | 7.2 | 6.5 |
| 6ept. 1-10 ..... | 409 | 5.1 | .04 | .00 | .0 | 54 | 21 | 13 | 4.2 | 202 | 70 | 12 | .4 | 2.5 | 300 | 224 | 56 | 476 | 8.1 | 25 | 7.1 | 6.6 |
| Sept. 11-20 ..... | 358 | 4.7 | .04 | .00 | .1 | 54 | 18 | 11 | 4.6 | 198 | 63 | 12 | .3 | 2.5 | 280 | 210 | 46 | 440 | 8.0 | 30 | 8.1 | 7.2 |
| Sept. 21-30 ..... | 300 | 4.1 | .06 | .00 | .1 | 60 | 20 | 16 | 3.3 | 210 | 73 | 14 | .3 | 2.5 | 317 | 233 | 60 | 501 | 8.1 | 25 | 7.9 | 7.4 |
| Average ..... | 8,587 | 7.7 | 0.04 | 0.00 | 0.0 | 57 | 15 | 9.6 | | 181 | 56 | 8.4 | 0.2 | 7.9 | 266 | 204 | 56 | 422 | -- | 25 | 9.2 | 6.8 |

b Includes equivalent of 6 parts per million of carbonate ($CO_3$).
c Includes equivalent of 8 parts per million of carbonate ($CO_3$).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

MAUMEE RIVER AT WATERVILLE, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, water year October 1950 to September 1951

| 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. 10, 1950 | 11:00 a. m. | 25,800 | 60 | 15.6 | 7.8 | 78 | -- | -- |
| Oct. 25 | 4:20 p. m. | 695 | 57 | 13.9 | 11.2 | 108 | 0.0 | 0.00 |
| Nov. 8 | 10:45 a. m. | 2,720 | 48 | 8.9 | 12.8 | 110 | -- | -- |
| Nov. 20 | 10:00 a. m. | 11,900 | 43 | 6.1 | 11.3 | 91 | .0 | .00 |
| Mar. 7, 1951 | 11:10 a. m. | 10,600 | 44 | 6.7 | 10.8 | 88 | -- | .005 |
| Apr. 19 | 8:45 a. m. | 9,410 | 44 | 6.7 | 11.0 | 90 | .0 | .000 |
| July 18 | 9:15 a. m. | 4,740 | 86 | 30.0 | 6.6 | 87 | .0 | .008 |
| Aug. 29 | 10:45 a. m. | 534 | 78 | 25.6 | 13.1 | 158 | .0 | .005 |
| Sept. 14 | 4:00 p. m. | 508 | 73 | 22.8 | 10.5 | 121 | .0 | .000 |
| Sept. 28 | 4:00 p. m. | 264 | 63 | 17.2 | 15.6 | 161 | .0 | .008 |

Temperature (°F) of water, water year October 1950 to September 1951

/Daily means computed from continuous recorder measurements/

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

STREAMS TRIBUTARY TO LAKE ERIE--Continued

MAUMEE RIVER AT WATERVILLE, OHIO--Continued

Suspended sediment, water year October 1950 to September 1951

| Day | October | | | November | | | December | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean discharge (second-feet) | Suspended sediment | | Mean discharge (second-feet) | Suspended sediment | | Mean discharge (second-feet) | Suspended sediment | |
| | | Mean concentration (ppm) | Tons per day | | Mean concentration (ppm) | Tons per day | | Mean concentration (ppm) | Tons per day |
| 1 | 1,030 | 55 | 153 | 928 | 29 | 73 | 3,860 | 61 | 636 |
| 2 | 896 | 47 | 114 | 636 | 22 | 38 | 3,890 | 59 | 620 |
| 3 | 944 | 48 | 122 | 510 | 16 | 22 | 23,600 | 150 | s 11,000 |
| 4 | 725 | 44 | 86 | 832 | 15 | 34 | 45,100 | 356 | 43,400 |
| 5 | 755 | 53 | 108 | 912 | 14 | 34 | 50,400 | 362 | 49,300 |
| 6 | 710 | 25 | 48 | 994 | 18 | 48 | 48,600 | 238 | 31,200 |
| 7 | 650 | 22 | 39 | 896 | 14 | 34 | 45,100 | 139 | 16,900 |
| 8 | 650 | 23 | 40 | 2,720 | 25 | s 217 | 43,500 | 192 | 22,600 |
| 9 | 1,600 | 41 | 244 | 9,830 | 42 | 1,110 | 36,300 | 149 | 14,600 |
| 10 | 25,800 | 311 | s 24,000 | 14,700 | 136 | 5,400 | 30,400 | 115 | 9,440 |
| 11 | 36,300 | 581 | s 57,200 | 14,700 | 216 | 8,570 | 24,800 | 95 | 6,360 |
| 12 | 36,300 | 532 | s 52,800 | 11,800 | 162 | 5,160 | 18,800 | 72 | 3,650 |
| 13 | 28,300 | 272 | s 21,400 | 8,230 | 92 | 2,040 | 15,100 | 59 | 2,410 |
| 14 | 16,700 | 132 | 5,950 | 5,410 | 58 | 847 | 11,600 | 48 | 1,500 |
| 15 | 10,300 | 86 | 2,390 | 3,770 | 48 | 489 | 8,240 | 45 | 1,000 |
| 16 | 7,160 | 71 | 1,370 | 5,230 | 45 | 635 | 5,690 | 51 | 784 |
| 17 | 5,230 | 61 | 861 | 3,950 | 39 | 416 | 4,000 | 42 | 454 |
| 18 | 3,860 | 63 | 657 | 3,640 | 32 | 314 | 3,000 | 31 | 251 |
| 19 | 4,380 | 68 | 804 | 3,020 | 39 | 318 | 2,400 | 26 | 168 |
| 20 | 2,390 | 57 | 368 | 11,900 | 88 | s 3,340 | 1,900 | 23 | 118 |
| 21 | 2,010 | 42 | 228 | 31,100 | 447 | s 38,400 | 1,600 | 21 | 91 |
| 22 | 1,180 | 37 | 118 | 34,700 | 516 | 48,300 | 1,500 | 16 | 65 |
| 23 | 864 | 32 | 75 | 31,100 | 360 | s 30,700 | 1,800 | 14 | 68 |
| 24 | 755 | 29 | 59 | 22,700 | 205 | 12,600 | 2,000 | 11 | 59 |
| 25 | 695 | 28 | 53 | 16,200 | 150 | a 6,500 | 2,100 | 12 | 68 |
| 26 | 580 | 24 | 38 | 10,300 | 111 | 3,090 | 1,800 | 13 | 63 |
| 27 | 650 | 26 | 46 | 6,750 | 81 | 1,480 | 1,600 | 9 | 39 |
| 28 | 710 | 23 | 44 | 5,590 | 58 | 875 | 1,500 | 8 | 32 |
| 29 | 880 | 23 | 55 | 4,710 | 55 | 699 | 1,500 | 7 | 28 |
| 30 | 710 | 24 | 46 | 4,210 | 55 | 625 | 1,500 | 8 | 32 |
| 31 | 1,040 | 26 | 73 | -- | -- | -- | 1,600 | 7 | 30 |
| Total | 194,754 | -- | 169,589 | 271,968 | -- | 172,408 | 444,780 | -- | 216,966 |
| | January | | | February | | | March | | |
| 1 | 1,700 | 7 | 32 | 1,200 | 22 | a 70 | 16,200 | 122 | 5,340 |
| 2 | 1,870 | 5 | 25 | 1,050 | 19 | 54 | 14,600 | 162 | 6,390 |
| 3 | 10,000 | 120 | b 5,200 | 1,150 | 17 | 53 | 14,600 | 195 | 7,690 |
| 4 | 33,900 | 400 | b 36,000 | 1,400 | 19 | 72 | 13,600 | 153 | 5,620 |
| 5 | 42,700 | 302 | 34,800 | 2,000 | 18 | 97 | 11,400 | 213 | 6,560 |
| 6 | 37,100 | 204 | 20,400 | 1,800 | 15 | 73 | 9,650 | 137 | 3,570 |
| 7 | 26,900 | 127 | 9,220 | 1,600 | 11 | 48 | 10,600 | 124 | 3,550 |
| 8 | 19,300 | 85 | 4,430 | 1,350 | 11 | 40 | 12,400 | 238 | 7,970 |
| 9 | 14,600 | 64 | 2,520 | 1,450 | 10 | 39 | 9,650 | 280 | b 7,500 |
| 10 | 11,100 | 52 | 1,560 | 1,700 | 9 | 41 | 7,140 | 215 | 4,140 |
| 11 | 9,170 | 38 | 941 | 2,200 | 7 | 42 | 5,690 | 193 | 2,970 |
| 12 | 7,140 | 31 | 598 | 4,750 | 9 | s 128 | 4,220 | 138 | 1,570 |
| 13 | 5,300 | 29 | 415 | 15,000 | 161 | s 8,310 | 5,500 | 111 | 1,650 |
| 14 | 4,220 | 27 | 308 | 27,000 | 271 | s 20,100 | 15,100 | 135 | 5,500 |
| 15 | 4,390 | 23 | 273 | 25,500 | 198 | 13,600 | 19,800 | 292 | 15,600 |
| 16 | 4,920 | 16 | 213 | 21,300 | 137 | 7,880 | 21,600 | 278 | 16,200 |
| 17 | 6,090 | 16 | 263 | 17,700 | 105 | 5,020 | 18,800 | 181 | s 9,100 |
| 18 | 7,570 | 15 | 307 | 18,300 | 120 | 5,930 | 15,600 | 128 | 5,390 |
| 19 | 15,600 | 70 | s 3,170 | 26,900 | 193 | s 14,300 | 13,100 | 93 | 3,290 |
| 20 | 23,400 | 164 | 10,400 | 38,700 | 428 | s 45,000 | 10,900 | 75 | 2,210 |
| 21 | 23,400 | 184 | 11,600 | 44,300 | 479 | s 58,200 | 8,470 | 64 | 1,460 |
| 22 | 18,200 | 149 | 7,320 | 52,200 | 530 | s 75,400 | 6,300 | 48 | 816 |
| 23 | 13,600 | 106 | 3,890 | 53,100 | 491 | s 70,500 | 6,500 | 44 | 772 |
| 24 | 9,890 | 68 | 1,820 | 44,300 | 357 | 42,700 | 10,400 | 87 | 2,440 |
| 25 | 6,300 | 57 | 970 | 31,800 | 242 | 20,800 | 13,100 | 72 | 2,550 |
| 26 | 4,000 | 42 | 454 | 26,900 | 178 | 12,900 | 11,100 | 98 | 2,940 |
| 27 | 3,100 | 43 | 360 | 23,400 | 168 | 10,600 | 8,470 | 106 | 2,420 |
| 28 | 2,400 | 43 | 279 | 18,300 | 145 | 7,160 | 6,920 | 76 | 1,420 |
| 29 | 2,000 | 38 | 205 | -- | -- | -- | 11,600 | 85 | 2,660 |
| 30 | 1,600 | 32 | 138 | -- | -- | -- | 18,800 | 260 | s 14,800 |
| 31 | 1,450 | 27 | 106 | -- | -- | -- | 24,800 | 609 | s 40,900 |
| Total | 372,910 | -- | 158,217 | 506,350 | -- | 419,157 | 376,610 | -- | 194,988 |

s Computed by subdividing day.
a Computed from estimated concentration graph.
b Computed from partly estimated concentration graph.

STREAMS TRIBUTARY TO LAKE ERIE--Continued

MAUMEE RIVER AT WATERVILLE, OHIO--Continued

Suspended sediment, water year October 1950 to September 1951--Continued

| Day | April | | | May | | | June | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean discharge (second-feet) | Suspended sediment | | Mean discharge (second-feet) | Suspended sediment | | Mean discharge (second-feet) | Suspended sediment | |
| | | Mean concentration (ppm) | Tons per day | | Mean concentration (ppm) | Tons per day | | Mean concentration (ppm) | Tons per day |
| 1 | 21,600 | 518 | 30,200 | 17,700 | 800 | b38,000 | 1,380 | 23 | 86 |
| 2 | 17,200 | 371 | 17,200 | 17,700 | 596 | s28,800 | 1,500 | 26 | 105 |
| 3 | 14,100 | 289 | 11,000 | 16,200 | 533 | s23,500 | 1,210 | 24 | 78 |
| 4 | 11,800 | 205 | 6,530 | 14,100 | 395 | 15,000 | 973 | 22 | 58 |
| 5 | 9,410 | 171 | 4,340 | 12,100 | 303 | s9,830 | 990 | 24 | 64 |
| 6 | 7,350 | 121 | 2,400 | 8,940 | 244 | 5,890 | 1,010 | 17 | 46 |
| 7 | 5,690 | 105 | 1,610 | 6,300 | 167 | 2,840 | 939 | 12 | 30 |
| 8 | 5,690 | 87 | 1,340 | 4,560 | 132 | 1,630 | 1,170 | 12 | 38 |
| 9 | 7,790 | 71 | 1,490 | 3,660 | 126 | 1,250 | 3,640 | 40 | a420 |
| 10 | 13,600 | 118 | s4,930 | 3,230 | 117 | 1,020 | 9,890 | 110 | b2,900 |
| 11 | 19,300 | 400 | b21,000 | 18,800 | 317 | s19,800 | 5,300 | 57 | 816 |
| 12 | 17,700 | 271 | 13,000 | 37,100 | 888 | s88,600 | 3,400 | 128 | 1,180 |
| 13 | 17,200 | 252 | 11,700 | 36,300 | 616 | s61,300 | 7,940 | 214 | s5,730 |
| 14 | 17,200 | 241 | 11,200 | 26,200 | 305 | s22,000 | 15,600 | 262 | 11,000 |
| 15 | 18,800 | 195 | 9,900 | 18,200 | 198 | 9,730 | 15,100 | 184 | 7,500 |
| 16 | 19,300 | 165 | 8,600 | 13,600 | 171 | 6,280 | 11,800 | 166 | 5,290 |
| 17 | 15,600 | 127 | 5,350 | 9,890 | 109 | 2,910 | 8,700 | 187 | 4,390 |
| 18 | 12,100 | 106 | 3,460 | 7,140 | 83 | 1,600 | 5,110 | 122 | 1,680 |
| 19 | 9,410 | 78 | 1,980 | 4,920 | 63 | 837 | 3,110 | 118 | 991 |
| 20 | 6,920 | 66 | 1,239 | 3,930 | 62 | 658 | 5,160 | 151 | s2,160 |
| 21 | 5,110 | 60 | 828 | 3,900 | 61 | 642 | 4,390 | 131 | 1,550 |
| 22 | 6,500 | 56 | 983 | 3,570 | 75 | 723 | 5,300 | 106 | 1,520 |
| 23 | 9,650 | 52 | 1,350 | 3,280 | 75 | 664 | 6,500 | 126 | 2,210 |
| 24 | 9,410 | 128 | 3,250 | 2,230 | 58 | 349 | 6,090 | 145 | 2,380 |
| 25 | 8,940 | 120 | 2,900 | 2,010 | 39 | 212 | 4,740 | 116 | 1,480 |
| 26 | 6,920 | 89 | 1,660 | 1,870 | 25 | 126 | 4,030 | 112 | 1,220 |
| 27 | 4,390 | 102 | 1,210 | 1,560 | 13 | 55 | 2,980 | 110 | 885 |
| 28 | 4,560 | 102 | 1,260 | 1,460 | 24 | 95 | 2,630 | 91 | 646 |
| 29 | 7,350 | 114 | 2,260 | 1,760 | 42 | 200 | 4,390 | 174 | 2,060 |
| 30 | 14,600 | 230 | a9,400 | 1,560 | 42 | 177 | 3,060 | 139 | 1,150 |
| 31 | -- | -- | -- | 1,190 | 33 | 106 | -- | -- | -- |
| Total | 345,190 | -- | 193,561 | 304,960 | -- | 344,624 | 148,032 | -- | 59,663 |

| | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2,420 | 116 | 758 | 1,240 | 85 | 282 | 420 | 9 | 10 |
| 2 | 1,940 | 103 | 540 | 1,010 | 63 | 172 | 420 | 13 | 15 |
| 3 | 1,540 | 93 | 387 | 922 | 65 | 162 | 420 | 17 | 19 |
| 4 | 1,710 | 74 | 342 | 742 | 54 | 108 | 374 | 12 | 12 |
| 5 | 1,400 | 75 | 284 | 696 | 37 | 70 | 364 | 12 | 12 |
| 6 | 1,710 | 87 | 402 | 774 | 38 | 79 | 592 | 22 | 35 |
| 7 | 1,360 | 81 | 297 | 837 | 46 | 104 | 364 | 21 | 21 |
| 8 | 1,190 | 72 | 231 | 712 | 40 | 77 | 311 | 18 | 15 |
| 9 | 1,260 | 70 | s242 | 758 | 32 | 65 | 445 | 18 | 22 |
| 10 | 6,770 | 120 | a2,200 | 665 | 33 | 59 | 384 | 14 | 15 |
| 11 | 12,600 | 175 | s6,060 | 636 | 28 | 48 | 432 | 23 | 27 |
| 12 | 12,400 | 274 | 9,170 | 636 | 30 | 52 | 342 | 21 | 19 |
| 13 | 16,200 | 327 | 14,300 | 549 | 30 | 44 | 420 | 24 | 27 |
| 14 | 13,600 | 294 | 10,800 | 495 | 23 | 31 | 508 | 22 | 30 |
| 15 | 9,890 | 187 | 4,990 | 622 | 24 | 40 | 395 | 18 | 19 |
| 16 | 8,020 | 137 | 2,970 | 636 | 30 | 52 | 322 | 21 | 18 |
| 17 | 6,090 | 124 | 2,040 | 804 | 38 | 82 | 300 | 21 | 17 |
| 18 | 4,740 | 108 | 1,380 | 1,630 | 42 | 185 | 311 | 25 | 21 |
| 19 | 3,310 | 86 | 769 | 1,580 | 43 | 183 | 282 | 19 | 14 |
| 20 | 2,790 | 83 | 625 | 1,150 | 50 | 155 | 266 | 18 | 13 |
| 21 | 2,870 | 91 | 705 | 1,190 | 58 | 186 | 300 | 17 | 14 |
| 22 | 2,250 | 101 | 614 | 871 | 47 | 111 | 300 | 12 | 10 |
| 23 | 1,500 | 92 | 373 | 871 | 43 | 101 | 266 | 17 | 12 |
| 24 | 1,600 | 80 | 346 | 742 | 39 | 78 | 210 | 8 | 5 |
| 25 | 1,560 | 70 | 295 | 789 | 31 | 66 | 250 | 7 | 5 |
| 26 | 1,740 | 55 | 258 | 650 | 30 | 53 | 274 | 7 | 5 |
| 27 | 2,010 | 32 | 174 | 607 | 31 | 51 | 776 | 60 | a130 |
| 28 | 2,300 | 48 | 298 | 592 | 25 | 40 | 264 | 12 | 9 |
| 29 | 2,420 | 79 | 516 | 534 | 22 | 32 | 168 | 5 | 2 |
| 30 | 2,130 | 82 | 472 | 520 | 18 | 25 | 192 | 5 | 3 |
| 31 | 1,560 | 96 | 404 | 534 | 10 | 14 | -- | -- | -- |
| Total | 132,880 | -- | 63,242 | 24,984 | -- | 2,807 | 10,672 | -- | 576 |

Total discharge for year (cfs-days) ..... 3,134,090
Total load for year (tons) ..... 1,995,798

s Computed by subdividing day.
a Computed from estimated concentration graph.
b Computed from partly estimated concentration graph.

MAUMEE RIVER AT WATERVILLE, OHIO--Continued

Particle-size analyses of suspended sediment, October 1950 to June 1951
(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 disperzed)

| 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 | |
| Oct. 12, 1950 | 11:10 a.m. | 37,100 | 526 | -- | -- | 40 | 60 | 82 | 94 | 99 | | | | | | a BN |
| Mar. 31, 1951 | 11:00 a.m. | 25,500 | 679 | 585 | -- | 63 | 77 | 90 | 99 | 100 | | | | | | BN |
| May 2 | 5:05 p.m. | 17,700 | 539 | 466 | 43 | 66 | 84 | 96 | 100 | -- | | | | | | BN |
| May 3 | 11:15 a.m. | 16,700 | 605 | 836 | 49 | 65 | 82 | 98 | 100 | -- | | | | | | BN |
| May 12 | 3:50 p.m. | 38,700 | 906 | 766 | 42 | 60 | 80 | 88 | 96 | 99 | | | | | | BN |
| June 14 | 11:30 a.m. | 16,200 | 276 | 326 | 54 | 70 | 88 | 96 | 99 | 100 | | | | | | BN |

a Average for nine verticals analyzed separately.

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 to September 1951.
REMARKS.--No discharge records available for this station.

Chemical analyses, in parts per million, March to September 1951

| 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 | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed: Unfiltered | Oxygen consumed: Filtered |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mar. 7, 1951 .. | | 6.5 | 0.02 | 0.00 | 0.1 | 69 | 15 | 12 | | 191 | 67 | 20 | 0.1 | 6.4 | 292 | 232 | 77 | 488 | 7.8 | 7 | 12 | 4.6 |
| Apr. 3 ..... | | 6.6 | .02 | .00 | .1 | 69 | 15 | 5.3 | | 194 | 66 | 9.0 | .1 | 6.0 | 284 | 232 | 75 | 474 | 7.9 | 8 | 7.2 | 4.5 |
| May 2 ..... | | 6.7 | .04 | .00 | .0 | 67 | 14 | 5.1 | 1.3 | 200 | 57 | 7.0 | .2 | 5.4 | 272 | 224 | 61 | 449 | 7.7 | 30 | 7.8 | 5.8 |
| June 4 ..... | | 6.9 | .03 | .00 | .0 | 66 | 15 | 11 | 5.5 | 186 | 73 | 14 | .1 | 8.9 | 300 | 228 | 74 | 490 | 7.9 | 18 | 7.8 | 6.0 |
| July 3 ..... | | 11 | .03 | .00 | .0 | 78 | 16 | 7.5 | 1.5 | a 238 | 71 | 10 | .1 | 4.6 | 328 | 262 | 65 | 516 | 8.5 | 12 | 6.9 | 5.1 |
| Aug. 1 ..... | | 8.1 | .01 | .00 | .0 | 88 | 22 | 17 | 3.0 | b 235 | 113 | 22 | .1 | 7.0 | 410 | 309 | 117 | 630 | 8.3 | 20 | 6.9 | 5.6 |
| Sept. 15 ..... | | 4.9 | .01 | .00 | .0 | 82 | 25 | 24 | 3.8 | 174 | 170 | 34 | .2 | .2 | 473 | 310 | 165 | 679 | 7.3 | 15 | 7.4 | 6.0 |

a Includes equivalent of 13 parts per million of carbonate ($CO_3$).
b Includes equivalent of 7 parts per million of carbonate ($CO_3$).

Dissolved oxygen, cyanide, and phenols, March to September 1951

| Date of collection | Time | Mean discharge (cfs) | Temperature °F | Temperature °C | Dissolved oxygen: Parts per million | Dissolved oxygen: Percent saturation | Cyanide (CN): Parts per million | Phenols as $C_6H_5OH$: Parts per million |
|---|---|---|---|---|---|---|---|---|
| Mar. 7, 1951..... | 12:45 p. m. | | 47 | 8.3 | 8.9 | 76 | -- | 0.000 |
| May 2 ..... | 12:05 p. m. | | 61 | 16.1 | 8.3 | 84 | 0.0 | .000 |
| June 4 ..... | 2:15 p. m. | | 71 | 21.7 | .0 | 0 | .0 | .007 |
| July 3 ..... | 10:45 a. m. | | 70 | 21.1 | .0 | 0 | .0 | .000 |
| July 18 ..... | 10:45 a. m. | | 76 | 24.4 | 2.3 | 27 | .0 | .016 |
| Aug. 1 ..... | 3:45 p. m. | | 82 | 27.8 | 8.8 | 111 | .1 | .000 |
| Aug. 15 ..... | 11:45 a. m. | | 76 | 24.4 | .0 | 0 | .0 | .019 |
| Aug. 29 ..... | 11:45 a. m. | | 79 | 26.1 | 4.5 | 55 | .0 | .009 |
| Sept. 15 ..... | 6:45 a. m. | | 65 | 18.3 | .0 | 0 | .0 | .046 |
| Sept. 28 ..... | 5:15 p. m. | | 62 | 16.7 | 2.4 | 24 | .0 | .010 |

## MAUMEE RIVER AT TOLEDO, OHIO

LOCATION.--At Toledo Terminal Railroad Bridge in Toledo, Lucas County, 1 mile upstream from mouth, and 3¾ miles downstream from Swan Creek.
DRAINAGE AREA.--6,586 square miles (at mouth).
RECORDS AVAILABLE.--Chemical analyses: March 1950 to September 1951.
Water temperatures: March 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 311 ppm Dec. 21-31; minimum, 169 ppm Feb. 21-28.
Hardness: Maximum, 240 ppm Dec. 21-31; minimum, 130 ppm Feb. 21-28.
Specific conductance: Maximum daily, 597 micromhos Nov. 10; minimum daily, 236 micromhos Feb. 24.
Water temperatures: Maximum, 82°F July 31; minimum, freezing point Nov. 25, 26, Dec. 9, 10, 16.
EXTREMES, March 1950 to September 1951.--Dissolved solids: Maximum, 311 ppm Dec. 21-31, 1950; minimum, 169 ppm Feb. 21-28, 1951.
Hardness: Maximum, 240 ppm Dec. 21-31, 1950; minimum, 130 ppm Feb. 21-28, 1951.
Specific conductance: Maximum daily, 597 micromhos Nov. 10, 1950; minimum daily, 236 micromhos Feb. 24, 1951.
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 from March 1950 to September 1951 available in district office at Columbus, Ohio. Discharge records for gaging station at Waterville for water year October 1950 to September 1951 given in Water-Supply Paper 1207.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed: Unfiltered | Oxygen consumed: Filtered |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 1-10, 1950 .. | 3,380 | 8.6 | 0.04 | 0.00 | 0.0 | 57 | 14 | 14 | | 174 | 61 | 14 | 0.3 | 4.8 | 282 | 200 | 57 | 443 | 7.8 | 26 | 11 | 7.5 |
| Oct. 11-20..... | 15,100 | 5.3 | .04 | .00 | .0 | 49 | 11 | 6.0 | | 142 | 42 | 7.0 | .1 | 11 | 221 | 166 | 50 | 335 | 7.8 | 40 | 14 | 8.2 |
| Oct. 21-31 ..... | 916 | 5.9 | .08 | .00 | .0 | 61 | 13 | 9.9 | | 172 | 61 | 11 | .1 | 9.2 | 276 | 206 | 65 | 422 | 7.6 | 33 | 12 | 8.2 |
| Nov. 1-10 ..... | 3,300 | 10 | .05 | .00 | .0 | 62 | 17 | 11 | | 186 | 67 | 14 | .2 | 8.1 | 300 | 224 | 72 | 483 | 7.8 | 30 | 8.2 | 8.1 |
| Nov. 11-20 ..... | 7,160 | 8.2 | .05 | .00 | .0 | 64 | 16 | 8.9 | | a180 | 67 | 12 | .3 | 12 | 294 | 224 | 78 | 470 | 7.9 | 35 | 9.0 | 8.9 |
| Nov. 21-30 ..... | 16,700 | 6.9 | .05 | .00 | .0 | 50 | 11 | 10 | | 140 | 47 | 14 | .1 | 10 | 224 | 171 | 55 | 362 | 7.7 | 40 | 10 | 9.0 |
| Dec. 1-10 ..... | 33,100 | 5.8 | .06 | .00 | .0 | 44 | 11 | 3.9 | | 124 | 42 | 7.0 | .2 | 9.7 | 200 | 154 | 53 | 315 | 7.8 | 25 | 9.9 | 7.1 |
| Dec. 11-20 ..... | 9,550 | 7.9 | .10 | .00 | .0 | 50 | 13 | 2.8 | | 143 | 48 | 8.0 | .1 | 6.8 | 226 | 176 | 61 | 361 | 7.5 | 33 | 10 | 7.0 |
| Dec. 21-31 ..... | 1,680 | 9.3 | .05 | .00 | .0 | 70 | 16 | 10 | | 210 | 69 | 10 | .0 | 5.6 | 311 | 240 | 68 | 495 | 7.7 | 29 | 8.2 | 6.9 |
| Jan. 1-10, 1951 .. | 19,900 | 7.2 | .02 | .00 | .0 | 52 | 16 | 5.4 | | 164 | 54 | 7.0 | .1 | 8.1 | 240 | 196 | 61 | 401 | 7.9 | 20 | 8.4 | 5.6 |
| Jan. 11-20 ..... | 8,780 | 11 | .04 | .00 | .0 | 54 | 15 | 6.0 | | 167 | 54 | 7.5 | .1 | 6.8 | 249 | 196 | 60 | 412 | 7.5 | 23 | 7.4 | 5.7 |
| Jan. 21-31..... | 7,810 | 9.3 | .04 | .00 | .0 | 52 | 12 | 5.7 | | 147 | 52 | 7.0 | .1 | 8.4 | 234 | 180 | 59 | 389 | 7.4 | 20 | 6.4 | 4.9 |
| Feb. 1-10 ..... | 1,470 | 9.2 | .02 | .00 | .0 | 65 | 17 | 10 | 3.0 | 188 | 70 | 11 | .2 | 12 | 303 | 230 | 78 | 485 | 7.6 | 20 | 6.7 | 6.2 |
| Feb. 11-20 ..... | 19,700 | 7.5 | .04 | .00 | .0 | 56 | 12 | 8.8 | 2.4 | 161 | 53 | 8.5 | .1 | 9.6 | 247 | 190 | 57 | 403 | 7.7 | 19 | 8.2 | 5.7 |
| Feb. 21-28 ..... | 36,800 | 6.6 | .06 | .00 | .0 | 38 | 8.2 | 4.6 | 3.0 | 112 | 33 | 5.0 | .1 | 8.0 | 169 | 130 | 37 | 277 | 7.5 | 25 | 11 | 6.3 |
| Mar. 1-10 ..... | 12,000 | 9.8 | .02 | .00 | .0 | 57 | 13 | 5.6 | | 162 | 55 | 6.8 | .2 | 9.4 | 244 | 196 | 63 | 394 | 7.7 | 15 | 10 | 5.8 |
| Mar. 11-20 ..... | 13,000 | 7.9 | .04 | .00 | .1 | 58 | 14 | 5.5 | | 166 | 58 | 7.0 | .1 | 9.4 | 256 | 204 | 66 | 404 | 7.8 | 21 | 9.9 | 4.1 |
| Mar. 21-31 ..... | 11,500 | 8.5 | .02 | .00 | .0 | 61 | 16 | 5.0 | | 174 | 63 | 8.5 | .2 | 10 | 278 | 216 | 75 | 425 | 7.8 | 18 | 7.1 | 5.2 |
| Apr. 1-10..... | 11,400 | 7.2 | .02 | .00 | .0 | 54 | 13 | 5.3 | 2.5 | 157 | 52 | 7.0 | .2 | 11 | 239 | 188 | 60 | 388 | 7.8 | 18 | 9.4 | 7.1 |
| Apr. 11-20 ..... | 15,400 | 6.2 | .02 | .00 | .0 | 54 | 13 | 5.9 | 2.0 | 156 | 53 | 6.5 | .3 | 11 | 260 | 188 | 60 | 392 | 7.7 | 18 | 9.3 | 7.2 |
| Apr. 21-30 ..... | 7,740 | 6.1 | .02 | .00 | .0 | 62 | 15 | 6.5 | 2.2 | 184 | 62 | 7.5 | .3 | 8.8 | 270 | 216 | 66 | 441 | 8.0 | 18 | 7.8 | 6.8 |

a Includes equivalent of 6 parts per million of carbonate ($CO_3$).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

MAUMEE RIVER AT TOLEDO, OHIO--Continued

Chemical analyses, in parts per million, water year October 1950 to September 1951--Continued

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | | Unfiltered | Filtered |
| May 1-10, 1951... | 10,400 | 5.9 | 0.02 | 0.00 | 0.1 | 50 | 12 | 6.2 | 2.8 | 154 | 47 | 6.5 | 0.1 | 8.2 | 227 | 174 | 48 | 356 | 8.0 | 25 | 9.6 | 7.2 |
| May 11-20 ..... | 17,600 | 9.4 | .06 | .00 | .1 | 46 | 9.5 | 3.9 | 2.2 | a137 | 37 | 5.0 | .1 | 9.0 | 204 | 155 | 41 | 332 | 8.1 | 30 | 11 | 6.9 |
| May 21-31 ..... | 2,220 | 9.4 | .08 | .00 | .1 | 65 | 9.7 | 14 | 2.8 | a166 | 54 | 26 | .0 | 6.4 | 281 | 202 | 66 | 483 | 8.3 | 30 | 7.8 | 7.1 |
| June 1-10..... | 2,270 | 6.4 | .01 | .00 | .0 | 64 | 16 | 11 | 6.8 | 207 | 65 | 12 | .3 | 1.2 | 294 | 224 | 56 | 490 | 7.9 | 18 | 8.5 | 7.0 |
| June 11-20..... | 8,120 | 12 | .04 | .00 | .1 | 61 | 15 | 8.7 | 5.0 | 181 | 59 | 10 | .2 | 12 | 282 | 214 | 66 | 453 | 8.0 | 25 | 9.3 | 6.6 |
| June 21-30..... | 4,410 | 12 | .02 | .00 | .1 | 61 | 13 | 8.2 | 5.9 | 170 | 52 | 10 | .1 | 20 | 276 | 206 | 66 | 442 | 7.9 | 25 | 8.3 | 5.9 |
| July 1-10 ..... | 2,130 | 22 | .04 | .00 | .1 | 62 | 14 | 12 | 7.2 | 193 | 54 | 12 | .2 | 8.6 | 303 | 214 | 54 | 472 | 8.1 | 20 | 8.1 | 6.4 |
| July 11-20 ..... | 8,960 | 12 | .06 | .00 | .2 | 51 | 11 | 7.0 | 6.6 | 158 | 42 | 7.0 | .0 | 9.4 | 236 | 172 | 43 | 373 | 8.0 | 30 | 11 | 7.5 |
| July 21-31 ..... | 1,990 | 12 | .04 | .00 | .1 | 53 | 11 | 7.0 | | 165 | 40 | 8.5 | .0 | 4.8 | 239 | 176 | 42 | 382 | 7.9 | 40 | 12 | 8.5 |
| Aug. 1-10..... | 835 | 12 | .04 | .00 | .0 | 57 | 14 | 12 | 4.0 | a197 | 54 | 13 | .2 | 1.4 | 277 | 200 | 38 | 436 | 8.1 | 30 | 9.8 | 9.2 |
| Aug. 11-20 ..... | 874 | 11 | .05 | .00 | .0 | 57 | 16 | 14 | 4.5 | 203 | 58 | 17 | .2 | 1.0 | 294 | 209 | 42 | 471 | 7.9 | 27 | 9.6 | 9.0 |
| Aug. 21-31 ..... | 718 | 7.1 | .13 | .00 | .0 | 54 | 16 | 13 | 4.5 | 195 | 55 | 15 | .2 | .8 | 275 | 202 | 41 | 454 | 8.0 | 25 | 8.0 | 7.4 |
| Sept. 1-10 ..... | 409 | 6.3 | .04 | .00 | .1 | 55 | 17 | 17 | 4.3 | 186 | 60 | 23 | .2 | 8.5 | 299 | 207 | 55 | 485 | 7.6 | 25 | 8.0 | 7.7 |
| Sept. 11-20 ..... | 358 | 8.5 | .02 | .00 | .0 | 50 | 16 | 16 | 3.3 | 176 | 53 | 22 | .4 | 1.5 | 261 | 188 | 46 | 444 | 7.8 | 10 | 8.4 | 6.4 |
| Sept. 21-30 ..... | 300 | 5.2 | .06 | .00 | .0 | 48 | 15 | 18 | 3.6 | 166 | 56 | 24 | .4 | 2.0 | 255 | 183 | 45 | 449 | 7.7 | 15 | 7.0 | 6.2 |
| Average ..... | 8,587 | 8.8 | 0.05 | 0.00 | 0.0 | 56 | 14 | 10 | | 168 | 54 | 11 | 0.2 | 7.9 | 259 | 197 | 60 | 417 | -- | 25 | 9.2 | 7.0 |

a Includes equivalent of 6 parts per million of carbonate ($CO_3$).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

MAUMEE RIVER AT TOLEDO, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, water year October 1950 to September 1951

| 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. 10, 1950 .. | 12:30 p.m. | 25,800 | 60 | 15.6 | 7.4 | 74 | -- | -- |
| Oct. 25 ..... | 2:05 p.m. | 895 | 61 | 16.1 | 5.0 | 50 | -- | 0.00 |
| Nov. 8 ..... | 12:45 p.m. | 2,720 | 54 | 12.2 | 7.2 | 67 | 0.0 | -- |
| Nov. 20 ..... | 11:30 a.m. | 11,900 | 43 | 6.1 | 10.9 | 88 | .0 | .00 |
| Jan. 18, 1951 .. | 9:30 a.m. | 7,570 | -- | -- | -- | -- | -- | .047 |
| Mar. 7..... | 3:05 p.m. | 10,600 | 45 | 7.2 | 10.5 | 87 | -- | .019 |
| Apr. 3 ..... | 11:30 a.m. | 14,100 | 43 | 6.1 | 9.8 | 79 | -- | -- |
| July 3 ..... | 10:00 a.m. | 1,540 | 76 | 24.4 | 1.7 | 20 | -- | .004 |
| July 18 ..... | 11:30 a.m. | 4,740 | 80 | 26.7 | 4.3 | 53 | .1 | .028 |
| Aug. 1 ..... | 2:15 p.m. | 1,230 | 83 | 28.3 | 1.6 | 20 | .0 | .003 |
| Aug. 15 ..... | 12:45 p.m. | 622 | 80 | 26.7 | .0 | 0 | .1 | .015 |
| Aug. 29 ..... | 1:00 p.m. | 534 | 80 | 26.7 | .6 | 7 | .0 | .010 |
| Sept. 15 ..... | 8:00 a.m. | 395 | 70 | 21.1 | .4 | 4 | .0 | .027 |
| Sept. 29 ..... | 8:00 a.m. | 168 | 60 | 15.6 | 4.6 | 46 | .0 | .005 |

Temperature (°F) of water, water year October 1950 to September 1951
/Once-daily temperature measurement at approximately 12 m./

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

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 1951.
EXTREMES, 1950-51.--Sediment concentrations: Maximum daily, 930 ppm Apr. 30; minimum daily, 1 ppm Oct. 25, 29, 30, Dec. 27, 29.
Sediment loads: Maximum daily, 6,600 tons Jan. 4; minimum daily, 0.1 ton Dec. 28.
REMARKS.--Flow affected by ice Nov. 27 to Dec. 1, Dec. 15 to Jan. 3, Jan. 9-17, Jan. 23 to Feb. 13. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1207.

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 | 41 | 6 | a0.7 | 59 | 7 | 1.1 | 200 | 10 | 5.4 |
| 2 | 34 | 5 | .5 | 56 | 5 | .8 | 550 | 32 | 48 |
| 3 | 28 | 7 | .5 | 53 | 4 | .6 | 3,900 | 340 | c3,600 |
| 4 | 27 | 7 | .5 | 59 | 5 | .8 | 6,560 | 157 | 2,780 |
| 5 | 27 | 4 | .3 | 151 | 6 | a2.4 | 2,860 | 84 | s668 |
| 6 | 26 | 3 | a.2 | 277 | 13 | 9.7 | 1,380 | 57 | 212 |
| 7 | 22 | 6 | .4 | 214 | 11 | 6.4 | 2,150 | 140 | b1,000 |
| 8 | 22 | 12 | .7 | 312 | 13 | 11 | 3,710 | 210 | b2,100 |
| 9 | 550 | 55 | b220 | 1,610 | 150 | b650 | 1,610 | 81 | s372 |
| 10 | 4,240 | 280 | b3,100 | 1,800 | 95 | 462 | 795 | 43 | 92 |
| 11 | 6,430 | 106 | 1,840 | 895 | 54 | 130 | 571 | 27 | 42 |
| 12 | 4,360 | 74 | s882 | 531 | 29 | 42 | 455 | 23 | 28 |
| 13 | 1,800 | 56 | 272 | 353 | 18 | 17 | 349 | 15 | 14 |
| 14 | 1,160 | 45 | 163 | 259 | 10 | 7.0 | 217 | 13 | 7.6 |
| 15 | 945 | 45 | a110 | 217 | 12 | 7.0 | 170 | 12 | 5.5 |
| 16 | 615 | 37 | 61 | 326 | 15 | 13 | 140 | 7 | 2.6 |
| 17 | 417 | 28 | 32 | 322 | 12 | 10 | 120 | 6 | 1.9 |
| 18 | 299 | 23 | 19 | 228 | 6 | 3.7 | 110 | 4 | 1.2 |
| 19 | 224 | 15 | 9.1 | 187 | 12 | 6.1 | 100 | 5 | 1.4 |
| 20 | 179 | 10 | 4.8 | 2,210 | 360 | b2,900 | 90 | 4 | 1.0 |
| 21 | 144 | 6 | 2.3 | 5,780 | 420 | b6,400 | 80 | 3 | .6 |
| 22 | 118 | 5 | a1.6 | 3,860 | 142 | s1,600 | 80 | 7 | 1.5 |
| 23 | 99 | 5 | 1.3 | 1,620 | 82 | 359 | 85 | 5 | 1.1 |
| 24 | 85 | 3 | .7 | 1,160 | 64 | 200 | 85 | 4 | .9 |
| 25 | 74 | 1 | .2 | 705 | 32 | 61 | 75 | 3 | .6 |
| 26 | 64 | 2 | .3 | 434 | 16 | a19 | 65 | 2 | .4 |
| 27 | 62 | 2 | .3 | 340 | 18 | 17 | 60 | 1 | .2 |
| 28 | 69 | 2 | .4 | 280 | 14 | 11 | 55 | 2 | .3 |
| 29 | 78 | 1 | a.2 | 230 | 12 | 7.5 | 50 | 1 | .1 |
| 30 | 69 | 1 | .2 | 200 | 10 | 5.4 | 50 | 2 | .3 |
| 31 | 62 | 4 | .7 | -- | -- | -- | 50 | 4 | .5 |
| Total | 22,370 | -- | 6,724.9 | 24,728 | -- | 12,960.5 | 26,772 | -- | 10,989.1 |

s Computed by subdividing day.
a Computed from estimated concentration curve.
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 1950 to September 1951--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 | 55 | 2 | 0.3 | 75 | 2 | 0.4 | 728 | 64 | 126 |
| 2 | 70 | 3 | .6 | 70 | 2 | a.4 | 870 | 86 | 202 |
| 3 | 2,500 | 210 | b2,000 | 70 | 3 | a.6 | 660 | 66 | 118 |
| 4 | 6,950 | 360 | b6,600 | 70 | 4 | .8 | 945 | 97 | 247 |
| 5 | 4,730 | 156 | s2,040 | 70 | 4 | .8 | 638 | 57 | 98 |
| 6 | 1,940 | 100 | 524 | 75 | 2 | .4 | 450 | 33 | 40 |
| 7 | 1,180 | 75 | 239 | 85 | 3 | .7 | 1,050 | 202 | s773 |
| 8 | 660 | 40 | a70 | 100 | 5 | 1.4 | 1,130 | 230 | s756 |
| 9 | 400 | 17 | 18 | 130 | 5 | 1.8 | 615 | 73 | 121 |
| 10 | 310 | 15 | 13 | 120 | 5 | 1.6 | 377 | 29 | 30 |
| 11 | 230 | 13 | 8.1 | 110 | 7 | 2.1 | 277 | 18 | 13 |
| 12 | 160 | 8 | 3.5 | 1,000 | 110 | b650 | 238 | 10 | 6.4 |
| 13 | 140 | 5 | a1.9 | 4,100 | 440 | b4,900 | 262 | 8 | 5.7 |
| 14 | 160 | 6 | a2.6 | 3,380 | 229 | s2,210 | 2,040 | 270 | b1,800 |
| 15 | 250 | 12 | 8.1 | 1,320 | 94 | 335 | 3,040 | 241 | s2,000 |
| 16 | 450 | 37 | 45 | 820 | 68 | 151 | 2,080 | 130 | 730 |
| 17 | 400 | 24 | 26 | 1,580 | 209 | s903 | 1,160 | 82 | 257 |
| 18 | 1,270 | 195 | s765 | 2,080 | 175 | 983 | 750 | 38 | 77 |
| 19 | 2,530 | 308 | 2,100 | 2,770 | 281 | s2,240 | 584 | 27 | 43 |
| 20 | 2,080 | 157 | s912 | 3,130 | 260 | s2,250 | 455 | 19 | 23 |
| 21 | 1,320 | 90 | a320 | 2,950 | 320 | b3,000 | 506 | 20 | 27 |
| 22 | 660 | 61 | 109 | 4,030 | 360 | b4,000 | 493 | 18 | 24 |
| 23 | 400 | 39 | 42 | 1,800 | 148 | 719 | 657 | 26 | s55 |
| 24 | 250 | 23 | 16 | 1,130 | 82 | 250 | 2,450 | 330 | b2,300 |
| 25 | 180 | 12 | a5.8 | 845 | 57 | 130 | 1,210 | 132 | 431 |
| 26 | 150 | 6 | 2.4 | 728 | 42 | 83 | 638 | 62 | 107 |
| 27 | 130 | 6 | 2.1 | 870 | 67 | 157 | 488 | 25 | 33 |
| 28 | 110 | 3 | .9 | 638 | 64 | 110 | 562 | 37 | 56 |
| 29 | 95 | 3 | .8 | -- | -- | -- | 1,940 | 326 | s1,810 |
| 30 | 85 | 2 | .5 | -- | -- | -- | 2,770 | 256 | s1,880 |
| 31 | 80 | 2 | .4 | -- | -- | -- | 1,760 | 120 | a570 |
| Total | 29,925 | -- | 15,877.0 | 34,146 | -- | 23,082.0 | 31,823 | -- | 14,759.1 |

| Day | April | | | May | | | June | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 945 | 85 | 217 | 1,250 | 523 | s2,030 | 36 | 36 | a3.5 |
| 2 | 705 | 63 | 120 | 549 | 180 | 267 | 31 | 33 | 2.8 |
| 3 | 549 | 33 | 49 | 995 | 536 | s1,620 | 29 | 32 | 2.5 |
| 4 | 430 | 17 | 20 | 795 | 310 | s743 | 27 | 29 | 2.1 |
| 5 | 330 | 12 | 11 | 393 | 107 | 114 | 29 | 31 | 2.4 |
| 6 | 259 | 10 | 7.0 | 234 | 57 | 36 | 31 | 39 | 3.3 |
| 7 | 234 | 10 | 6.3 | 158 | 41 | 17 | 26 | 32 | a2.2 |
| 8 | 280 | 10 | 7.6 | 122 | 30 | 9.9 | 28 | 21 | 1.6 |
| 9 | 401 | 12 | 13 | 103 | 24 | 6.7 | 2,010 | 480 | b3,600 |
| 10 | 597 | 37 | 60 | 108 | 25 | a7.3 | 2,300 | 274 | s1,870 |
| 11 | 531 | 38 | 54 | 2,260 | 390 | c2,900 | 772 | 126 | 263 |
| 12 | 455 | 33 | 41 | 2,950 | 264 | s2,100 | 318 | 74 | 64 |
| 13 | 638 | 28 | 48 | 1,570 | 147 | s649 | 1,880 | 400 | b3,800 |
| 14 | 1,100 | 94 | s310 | 705 | 83 | 158 | 6,560 | 330 | s5,700 |
| 15 | 1,500 | 130 | b560 | 422 | 48 | 55 | 6,040 | 157 | 2,560 |
| 16 | 1,290 | 114 | 397 | 284 | 34 | 26 | 2,230 | 93 | s582 |
| 17 | 728 | 53 | 104 | 208 | 29 | 16 | 995 | 75 | a200 |
| 18 | 506 | 23 | 31 | 158 | 25 | 11 | 506 | 49 | 67 |
| 19 | 397 | 15 | 16 | 124 | 20 | 6.7 | 299 | 29 | 23 |
| 20 | 284 | 10 | 7.7 | 104 | 12 | 3.4 | 211 | 28 | 16 |
| 21 | 208 | 9 | 5.1 | 158 | 8 | 3.4 | 163 | 28 | 12 |
| 22 | 241 | 7 | 4.6 | 248 | 45 | 30 | 135 | 17 | 6.2 |
| 23 | 455 | 15 | 18 | 151 | 92 | 38 | 156 | 12 | 5.1 |
| 24 | 303 | 14 | 11 | 118 | 68 | 22 | 114 | 9 | 2.8 |
| 25 | 238 | 8 | 5.1 | 88 | 38 | 9.0 | 78 | 8 | 1.7 |
| 26 | 208 | 6 | 3.4 | 70 | 33 | 6.2 | 60 | 15 | 2.4 |
| 27 | 174 | 5 | 2.3 | 63 | 22 | 3.7 | 55 | 14 | 2.1 |
| 28 | 163 | 6 | a2.6 | 62 | 13 | 2.2 | 52 | 17 | 2.4 |
| 29 | 506 | 100 | a140 | 60 | 21 | 3.4 | 60 | 17 | 2.8 |
| 30 | 1,610 | 930 | s5,380 | 55 | 16 | 2.4 | 78 | 9 | 1.9 |
| 31 | -- | -- | -- | 43 | 26 | 3.0 | -- | -- | -- |
| Total | 16,265 | -- | 7,651.7 | 14,608 | -- | 10,899.3 | 25,309 | -- | 18,804.8 |

s Computed by subdividing day.
a Computed from estimated concentration curve.
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 1950 to September 1951--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 | 5 | 0.9 | 7.4 | | | 7.9 | | |
| 2 | 50 | 7 | .9 | 7.0 | | | 7.9 | | |
| 3 | 40 | 20 | 2.2 | 12 | | | 6.5 | | |
| 4 | 33 | 17 | 1.5 | 9.3 | 16 | 0.4 | 5.9 | | |
| 5 | 32 | 12 | 1.0 | 7.9 | | | 4.9 | | |
| 6 | 37 | 8 | .8 | 7.4 | | | 5.2 | 19 | 0.4 |
| 7 | 37 | 4 | .4 | 7.9 | | | 5.9 | | |
| 8 | 29 | 7 | .5 | 8.3 | | | 8.3 | | |
| 9 | 27 | 6 | .4 | 10 | | | 8.8 | | |
| 10 | 49 | 6 | .8 | 9.7 | | | 8.3 | | |
| 11 | 74 | 6 | 1.2 | 8.3 | 11 | .2 | 8.3 | | |
| 12 | 118 | 14 | c 16 | 8.3 | | | 7.0 | | |
| 13 | 288 | 75 | c 60 | 7.4 | | | 9.3 | | |
| 14 | 133 | 35 | 13 | 6.5 | | | 10 | | |
| 15 | 72 | 12 | 2.3 | 7.9 | | | 13 | 9 | .2 |
| 16 | 44 | 18 | 2.1 | 9.3 | | | 13 | | |
| 17 | 32 | 27 | 2.3 | 11 | | | 7.9 | | |
| 18 | 27 | 22 | 1.6 | 10 | 15 | .4 | 5.9 | | |
| 19 | 24 | 25 | 1.6 | 9.7 | | | 4.3 | | |
| 20 | 19 | 13 | .7 | 8.8 | | | 3.9 | | |
| 21 | 16 | 14 | .6 | 7.4 | | | 3.9 | | |
| 22 | 18 | 15 | .7 | 6.5 | | | 6.2 | | |
| 23 | 16 | 13 | .6 | 6.5 | | | 8.3 | | |
| 24 | 14 | 13 | .5 | 7.0 | | | 8.8 | | |
| 25 | 14 | 14 | .5 | 7.0 | | | 9.3 | 10 | .2 |
| 26 | 12 | 15 | .5 | 7.0 | 15 | .3 | 7.9 | | |
| 27 | 10 | 26 | .7 | 7.9 | | | 9.3 | | |
| 28 | 9.7 | 22 | .6 | 7.0 | | | 9.3 | | |
| 29 | 9.7 | 15 | .4 | 6.5 | | | 7.4 | | |
| 30 | 9.3 | 15 | .4 | 6.2 | | | 6.5 | | |
| 31 | 8.8 | 15 | .4 | 7.4 | | | -- | -- | -- |
| Total | 1,371.5 | -- | 116.1 | 250.5 | -- | 9.8 | 229.1 | -- | 8.0 |

Total discharge for year (cfs-days) ..... 227,797.1
Total load for year (tons) ..... 121,882.3

c Computed from partly estimated concentration graph.

PORTAGE RIVER AT WOODVILLE, OHIO--Continued

Particle-size analyses of suspended sediment, March to June 1951
(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 | 0.006 | 0.016 | 0.031 | 0.062 | 0.125 | 0.250 | 0.350 | 0.500 | 1.000 | |
| Mar. 29, 1951 | 7:25 a.m. | 1,940 | 374 | 269 | -- | 67 | 82 | 91 | 94 | 98 | -- | | | | | BN |
| May 1 | 1:15 p.m. | 1,040 | 425 | 689 | 45 | 66 | 84 | 98 | 100 | -- | -- | | | | | BN |
| May 11 | 4:30 p.m. | 3,130 | 623 | 520 | 39 | 51 | 74 | 88 | 96 | 100 | -- | | | | | BN |
| June 13 | 4:15 p.m. | 3,310 | 730 | 567 | 44 | 62 | 75 | 84 | 93 | 97 | 99 | | | | | BN |

STREAMS TRIBUTARY TO LAKE ERIE--Continued

PORTAGE RIVER AT ELMORE, OHIO

LOCATION.--At bridge on 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 October 1948; March 1950 to September 1951.
Water temperatures: March 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 944 ppm Aug. 21-31; minimum, 273 ppm Feb. 11-20.
Hardness: Maximum, 400 ppm Dec. 21-31; minimum, 206 ppm Feb. 11-20.
Specific conductance: Maximum daily, 2,440 micromhos Sept. 19, 20; minimum daily, 224 micromhos June 14.
Water temperatures: Maximum, 90°F Aug. 30; minimum, freezing point on several days in November, December, and January.
EXTREMES, March 1950 to September 1951.--Dissolved solids: 944 ppm Aug. 21-31, 1951; minimum, 262 ppm Mar. 21-31, 1950.
Hardness: Maximum, 400 ppm Dec. 21-31, 1950; minimum, 198 ppm Mar. 21-31, 1950.
Specific conductance: Maximum daily, 2,440 micromhos Sept. 19, 20, 1951; minimum daily, 224 micromhos June 14, 1951.
Water temperatures: Maximum, 90°F Aug. 30, 1951; minimum, freezing point on several days in March, November, December 1950, and January 1951.
REMARKS.--Records of specific conductance of daily samples from March 1950 to September 1951 available in district office at Columbus, Ohio. Discharge records for gaging station at Woodville for water year October 1950 to September 1951 given in Water-Supply Paper 1207. No appreciable inflow between gage and sampling station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed: Unfiltered | Oxygen consumed: Filtered |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 1-10, 1950 ... | 502 | 2.1 | 0.06 | 0.00 | 0.0 | 66 | 20 | | 35 | a164 | 96 | 50 | 0.3 | 4.4 | 391 | 247 | 99 | 628 | 8.0 | 25 | 11 | 6.6 |
| Oct. 11-20..... | 1,640 | 4.8 | .03 | .00 | .1 | 79 | 19 | | 12 | 232 | 76 | 18 | .4 | 6.5 | 344 | 275 | 85 | 541 | 7.9 | 35 | 8.8 | 6.4 |
| Oct. 21-31..... | 84 | 2.4 | .04 | .00 | .0 | 105 | 25 | | 35 | 292 | 124 | 50 | .2 | 3.3 | 511 | 366 | 127 | 786 | 8.0 | 15 | 6.8 | 5.1 |
| Nov. 1-10..... | 459 | 6.2 | .02 | .00 | .0 | 96 | 26 | | 35 | b242 | 113 | 55 | .2 | 5.6 | 502 | 349 | 125 | 806 | 7.9 | 12 | 6.0 | 5.7 |
| Nov. 11-20 ..... | 553 | 7.3 | .04 | .00 | .0 | 95 | 23 | | 16 | c244 | 95 | 26 | .1 | 8.1 | 434 | 332 | 107 | 688 | 8.0 | 15 | 5.6 | 5.0 |
| Nov. 21-30 ..... | 1,460 | 7.5 | .05 | .00 | .0 | 85 | 21 | | 14 | d204 | 86 | 21 | .1 | 7.8 | 386 | 297 | 95 | 612 | 7.9 | 18 | 6.4 | 5.4 |
| Dec. 1-10 ..... | 2,370 | 7.2 | .10 | .00 | .0 | 64 | 15 | | 17 | e165 | 65 | 20 | .1 | 8.8 | 307 | 222 | 66 | 470 | 8.0 | 25 | 7.6 | 5.5 |
| Dec. 11-20 ..... | 232 | 9.5 | .05 | .00 | .0 | 106 | 27 | | 24 | 310 | 119 | 32 | .2 | 6.0 | 500 | 375 | 121 | 776 | 8.2 | 23 | 3.8 | 5.3 |
| Dec. 21-31 ..... | 67 | 7.8 | .02 | .00 | .0 | 115 | 27 | | 40 | 322 | 140 | 48 | .2 | 8.4 | 559 | 400 | 134 | 876 | 7.8 | 7 | -- | 4.9 |
| Jan. 1-10, 1951 ... | 1,880 | 7.8 | .07 | .00 | .0 | 77 | 19 | | 20 | 228 | 86 | 22 | .0 | 8.8 | 366 | 272 | 83 | 598 | 7.8 | 10 | 6.4 | 4.5 |
| Jan. 11-20..... | 767 | 8.9 | .02 | .00 | .0 | 79 | 19 | | 23 | 222 | 83 | 36 | .0 | 8.5 | 395 | 276 | 93 | 638 | 7.8 | 8 | 6.2 | 4.0 |
| Jan. 21-31 ..... | 315 | 6.8 | .02 | .00 | .0 | 94 | 24 | | 26 | 276 | 110 | 30 | .1 | 7.5 | 456 | 332 | 107 | 721 | 7.9 | 8 | 6.7 | 3.8 |
| Feb. 1-10 ..... | 86 | 6.7 | .03 | .00 | .0 | 108 | 31 | 36 | 3.4 | 307 | 142 | 44 | .2 | 11 | 565 | 398 | 145 | 876 | 7.7 | 7 | 4.3 | 2.9 |
| Feb. 11-20..... | 2,030 | 6.8 | .06 | .00 | .0 | 63 | 12 | 10 | 2.9 | 168 | 60 | 12 | .0 | 11 | 273 | 206 | 69 | 453 | 7.6 | 14 | 8.4 | 5.0 |
| Feb. 21-28 ..... | 1,620 | 9.5 | .05 | .00 | .0 | 66 | 15 | | 18 | 186 | 71 | 20 | .2 | 12 | 299 | 228 | 74 | 481 | 7.7 | 15 | 8.0 | 5.2 |

a Includes equivalent of 8 parts per million of carbonate ($CO_3$).
b Includes equivalent of 14 parts per million of carbonate ($CO_3$).
c Includes equivalent of 15 parts per million of carbonate ($CO_3$).
d Includes equivalent of 22 parts per million of carbonate ($CO_3$).
e Includes equivalent of 12 parts per million of carbonate ($CO_3$).

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mar. 1-10 | 746 | 10 | .02 | .00 | .0 | 81 | 19 | | 18 | | 232 | 87 | 20 | .2 | 11 | 376 | 280 | 90 | 590 | 7.9 | 10 | 6.8 | 5.0 |
| Mar. 11-20 | 1,090 | 7.5 | .04 | .00 | .1 | 72 | 16 | | 12 | | 200 | 75 | 14 | .1 | 11 | 324 | 244 | 82 | 510 | 7.8 | 17 | 9.5 | 4.8 |
| Mar. 21-31 | 1,220 | 8.8 | .08 | .00 | .0 | 78 | 18 | 24 | | 2.0 | 214 | 78 | 40 | .2 | 9.8 | 383 | 270 | 93 | 636 | 7.6 | 15 | 7.0 | 4.4 |
| Apr. 1-10 | 473 | 6.4 | .05 | .00 | .0 | 82 | 19 | 22 | | 2.3 | a219 | 93 | 27 | .2 | 8.9 | 399 | 286 | 90 | 632 | 8.1 | 10 | 5.3 | 4.6 |
| Apr. 11-20 | 743 | 6.8 | .04 | .00 | .0 | 80 | 20 | 24 | | 2.4 | f216 | 82 | 38 | .1 | 9.0 | 398 | 284 | 95 | 653 | 8.3 | 5 | 5.6 | 4.3 |
| Apr. 21-30 | 411 | 4.4 | .04 | .00 | .0 | 76 | 20 | 24 | | 4.1 | 214 | 94 | 36 | .1 | 5.0 | 388 | 274 | 96 | 622 | 8.0 | 5 | 7.3 | 4.1 |
| May 1-10 | 471 | 5.7 | .04 | .00 | .1 | 75 | 17 | 21 | | 2.9 | 212 | 78 | 30 | .1 | 7.0 | 366 | 258 | 83 | 580 | 7.8 | 15 | 6.8 | 5.7 |
| May 11-20 | 878 | 7.8 | .04 | .00 | .0 | 80 | 16 | 25 | | 2.3 | 208 | 77 | 46 | .0 | 8.5 | 386 | 266 | 95 | 639 | 8.0 | 20 | 7.7 | 5.0 |
| May 21-31 | 101 | 5.1 | .02 | .00 | .0 | 82 | 21 | 33 | | 3.6 | 234 | 104 | 46 | .2 | 6.6 | 439 | 291 | 99 | 710 | 7.9 | 14 | 5.7 | 6.2 |
| June 1-10 | 455 | 3.5 | .01 | .00 | .0 | 70 | 25 | 48 | | 10 | g162 | 125 | 74 | .4 | 4.3 | 472 | 276 | 128 | 770 | 8.2 | 7 | 8.7 | 6.6 |
| June 11-20 | 1,980 | 12 | .04 | .00 | .0 | 62 | 14 | 15 | | 5.3 | 183 | 58 | 22 | .1 | 11 | 304 | 212 | 62 | 484 | 7.9 | 28 | 8.9 | 6.6 |
| June 21-30 | 95 | 5.8 | .03 | .00 | .0 | 74 | 22 | 32 | | 7.7 | 219 | 107 | 41 | .1 | 3.5 | 424 | 276 | 96 | 675 | 7.9 | 18 | 5.7 | 5.6 |
| July 1-10 | 40 | 4.5 | .05 | .00 | .0 | 66 | 26 | 49 | | 9.8 | 184 | 115 | 75 | .2 | 2.5 | 467 | 271 | 121 | 768 | 7.8 | 15 | 4.9 | 4.7 |
| July 11-20 | 83 | 10 | .02 | .00 | .1 | 59 | 19 | 39 | | 9.5 | 156 | 88 | 62 | .2 | 9.6 | 384 | 226 | 97 | 643 | 8.0 | 25 | 6.6 | 6.4 |
| July 21-31 | 13 | 9.1 | .01 | .00 | .1 | 64 | 28 | 65 | | 16 | 160 | 149 | 94 | .2 | 2.0 | 513 | 274 | 144 | 858 | 7.2 | 17 | 8.7 | 6.6 |
| Aug. 1-10 | 8.7 | 4.4 | .04 | .00 | .1 | 71 | 35 | 89 | | 9.1 | 146 | 203 | 139 | .4 | 4.8 | 666 | 323 | 201 | 1,070 | 8.0 | 15 | 7.4 | 6.1 |
| Aug. 11-20 | 8.7 | 4.7 | .02 | .00 | .0 | 72 | 33 | 122 | | 8.9 | 144 | 220 | 182 | .4 | 3.4 | 758 | 316 | 197 | 1,210 | 7.7 | 15 | 7.0 | 6.0 |
| Aug. 21-31 | 6.9 | 5.0 | .02 | .00 | .1 | 87 | 44 | 147 | | 9.1 | f120 | 269 | 244 | .5 | 3.3 | 944 | 398 | 290 | 1,470 | 8.0 | 15 | 8.0 | 6.5 |
| Sept. 1-10 | 7.0 | 3.7 | .02 | .00 | .0 | 79 | 39 | 153 | | 11 | f146 | 237 | 240 | .5 | 3.3 | 907 | 358 | 228 | 1,450 | 8.0 | 15 | 8.8 | 6.4 |
| Sept. 11-20 | 8.3 | 3.4 | .02 | .00 | .0 | 78 | 36 | 170 | | 14 | a174 | 214 | 252 | .4 | 3.0 | 907 | 344 | 237 | 1,510 | 8.0 | 12 | 8.2 | 6.1 |
| Sept. 21-30 | 7.7 | 4.0 | .04 | .00 | .0 | 89 | 37 | 131 | | 19 | 205 | 198 | 204 | .3 | 2.5 | 812 | 375 | 206 | 1,310 | 7.9 | 20 | 6.7 | 5.9 |
| Average | 634 | 6.5 | 0.04 | 0.00 | 0.0 | 80 | 24 | | 48 | | h209 | 117 | 67 | 0.2 | 6.9 | 481 | 298 | 122 | 771 | -- | 15 | 7.1 | 5.4 |

a Includes equivalent of 8 parts per million of carbonate ($CO_3$).
f Includes equivalent of 6 parts per million of carbonate ($CO_3$).
g Includes equivalent of 10 parts per million of carbonate ($CO_3$).
h Includes equivalent of 3 parts per million of carbonate ($CO_3$).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

PORTAGE RIVER AT ELMORE, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, water year October 1950 to September 1951

| 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. 10, 1950 | 1:45 p.m. | 4,240 | 58 | 14.4 | 6.6 | 64 | -- | -- |
| Oct. 25 | 12:45 p.m. | 74 | 53 | 11.7 | -- | -- | 0.0 | 0.00 |
| Nov. 8 | 2:00 p.m. | 312 | 49 | 9.4 | 11.4 | 99 | -- | -- |
| Nov. 20 | 12:45 p.m. | 2,210 | 44 | 6.7 | 10.0 | 81 | .0 | .00 |
| Mar. 7, 1951 | 4:15 p.m. | 1,050 | 50 | 10.0 | 8.9 | 79 | -- | .000 |
| Aug. 29 | 2:30 p.m. | 6.5 | 86 | 30.0 | -- | -- | .0 | .010 |
| Sept. 15 | 9:15 a.m. | 13 | 66 | 18.9 | 9.1 | 97 | .0 | .000 |
| Sept. 29 | 9:00 a.m. | 7.4 | 54 | 12.2 | 9.8 | 91 | .0 | .002 |

Temperature (°F) of water, water year October 1950 to September 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 65 | 60 | 34 | 34 | 35 | 45 | 46 | 61 | 75 | 78 | 74 | 71 |
| 2 | 51 | 55 | 35 | 39 | 34 | 43 | 47 | 60 | 82 | 72 | 85 | 73 |
| 3 | 50 | 47 | 40 | 36 | 35 | 44 | 47 | 62 | 79 | 78 | 83 | 75 |
| 4 | 52 | 40 | 35 | 37 | 36 | 44 | 45 | 57 | 73 | 70 | 76 | 70 |
| 5 | 50 | 43 | 36 | 35 | 37 | 46 | 51 | 64 | 69 | 69 | 75 | 72 |
| 6 | 52 | 45 | 40 | 34 | 39 | 50 | 55 | 62 | 67 | 72 | 75 | 69 |
| 7 | 59 | 45 | 33 | 34 | 35 | 49 | 57 | 64 | 74 | 82 | 76 | 68 |
| 8 | 52 | 52 | 33 | 35 | 36 | 47 | 55 | 62 | 69 | 78 | 82 | 70 |
| 9 | 58 | 50 | 34 | 37 | 37 | 40 | 53 | 61 | 65 | 80 | 77 | 72 |
| 10 | 60 | 38 | 35 | 35 | 36 | 38 | 50 | 56 | 65 | 85 | 85 | 69 |
| 11 | 55 | 43 | 35 | 36 | 38 | 39 | 52 | 52 | 68 | 80 | 85 | 76 |
| 12 | 52 | 45 | 34 | 37 | 36 | 41 | 52 | 54 | 67 | 73 | 87 | 69 |
| 13 | 52 | 40 | 34 | 34 | 37 | 40 | 48 | 60 | 65 | 76 | 86 | 65 |
| 14 | 52 | 51 | 35 | 39 | 36 | 39 | 47 | -- | 67 | 80 | 74 | -- |
| 15 | 51 | 50 | 33 | 37 | 37 | 39 | 47 | 72 | 70 | 74 | 85 | 70 |
| 16 | 55 | 54 | 34 | 38 | 38 | 40 | 45 | 75 | 70 | 80 | 75 | 65 |
| 17 | 52 | 42 | 33 | 38 | 39 | 39 | 46 | 72 | 74 | 78 | 77 | 68 |
| 18 | 60 | 43 | 34 | 40 | 46 | 40 | 55 | 74 | 79 | 82 | 75 | 69 |
| 19 | 55 | 44 | 35 | 44 | 45 | 35 | 50 | 76 | 78 | 75 | 77 | 69 |
| 20 | 57 | 40 | 32 | 48 | 44 | 41 | 55 | 78 | 80 | 77 | 78 | 70 |
| 21 | 62 | 39 | 34 | 37 | 36 | 40 | 55 | 78 | 75 | 83 | 80 | 69 |
| 22 | 55 | 38 | 35 | 36 | 35 | 40 | 56 | 72 | 77 | 82 | 73 | 65 |
| 23 | 54 | 35 | 33 | 34 | 40 | 42 | 58 | 62 | 78 | 84 | 75 | 63 |
| 24 | 52 | 34 | 34 | 35 | 41 | 40 | 56 | 70 | 80 | 80 | 78 | 65 |
| 25 | 49 | 32 | 35 | 35 | 45 | 41 | 62 | 74 | 72 | 83 | 77 | 67 |
| 26 | 45 | 32 | 38 | 36 | 50 | 45 | 64 | 72 | 80 | 79 | 70 | 65 |
| 27 | 59 | 32 | 32 | 37 | 46 | 48 | 65 | 62 | 80 | 82 | 80 | 60 |
| 28 | 60 | 34 | 35 | 35 | 44 | 50 | 72 | 68 | 72 | 85 | 83 | -- |
| 29 | 58 | 32 | 38 | 34 | -- | 49 | 62 | 71 | 75 | 84 | 89 | 58 |
| 30 | 55 | 32 | 34 | 32 | -- | 48 | 64 | 70 | 74 | 86 | 90 | 67 |
| 31 | 59 | -- | 35 | 33 | -- | 48 | -- | 80 | -- | 85 | 89 | -- |
| Average | 55 | 42 | 35 | 36 | 39 | 43 | 54 | 67 | 73 | 79 | 80 | 68 |

## 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 September 1951.
Water temperatures: October 1950 to September 1951.
Sediment records: October 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 585 ppm Sept. 11-20; minimum, 207 ppm Feb. 11-20.
Hardness: Maximum, 404 ppm Sept. 21-30; minimum, 156 ppm Feb. 11-20.
Specific conductance: Maximum daily, 879 micromhos Sept. 30; minimum daily, 224 micromhos Feb. 15.
Water temperatures: Maximum, 88°F July 26, Aug. 29; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 719 ppm May 1; minimum daily, 1 ppm Feb. 4-6.
Sediment loads: Maximum daily, 15,000 tons Nov. 21; minimum daily, 1 ton Feb. 4-6, Aug. 21 to Sept. 21, Sept. 28-30.
REMARKS.--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. The chemical analysis records were published as Sandusky River at Fremont. Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1207.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed: Unfiltered | Oxygen consumed: Filtered |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 1-10, 1950 .. | 554 | 7.2 | 0.04 | 0.00 | 0.0 | 68 | 20 | 13 | | 198 | 93 | 12 | 0.3 | 4.1 | 332 | 252 | 90 | 516 | 8.0 | 22 | 8.0 | 5.6 |
| Oct. 11-20..... | 1,260 | 11 | .04 | -- | -- | 63 | 18 | 15 | | 164 | 89 | 20 | .1 | 10 | 325 | 230 | 96 | 503 | 7.5 | 27 | 10 | 6.3 |
| Oct. 21-31..... | 151 | 7.6 | .04 | -- | -- | 87 | 25 | 15 | | 235 | 127 | 15 | .2 | 5.2 | 415 | 319 | 126 | 623 | 7.9 | 13 | 5.7 | 5.2 |
| Nov. 1-10 ..... | 604 | 4.6 | .04 | .00 | .0 | 90 | 30 | 8.4 | | a219 | 138 | 15 | .4 | 3.1 | 443 | 346 | 150 | 683 | 8.0 | 18 | 6.2 | 5.5 |
| Nov. 11-20..... | 959 | 3.5 | .05 | .00 | .0 | 75 | 22 | 17 | | b196 | 111 | 12 | .2 | 10 | 365 | 278 | 104 | 568 | 8.0 | 25 | 8.0 | 6.4 |
| Nov. 21-30..... | 2,860 | 8.1 | .05 | .00 | .0 | 57 | 16 | 7.1 | | 146 | 78 | 8.8 | .2 | 12 | 273 | 208 | 88 | 437 | 7.0 | 25 | 9.2 | 6.6 |
| Dec. 1-10 ..... | 6,690 | 8.2 | .04 | .00 | .0 | 45 | 12 | 4.6 | | 123 | 52 | 8.0 | .2 | 6.1 | 221 | 164 | 61 | 343 | 7.6 | 25 | 8.4 | 6.4 |
| Dec. 11-20 ..... | 907 | 9.7 | .02 | .00 | .0 | 76 | 23 | 5.4 | | 202 | 106 | 10 | .1 | 7.0 | 357 | 286 | 119 | 548 | 8.0 | 18 | 4.9 | 4.3 |
| Dec. 21-31 ..... | 355 | 10 | .03 | .00 | .0 | 105 | 28 | 15 | | 284 | 149 | 12 | .2 | 4.9 | 483 | 378 | 144 | 718 | 8.2 | 8 | 3.9 | 4.2 |
| Jan. 1-10, 1951 .. | 4,720 | 7.3 | .08 | .00 | .1 | 58 | 16 | 5.2 | | 150 | 77 | 7.5 | .1 | 9.8 | 264 | 210 | 88 | 425 | 7.7 | 18 | 8.1 | 4.6 |
| Jan. 11-20 ..... | 3,260 | 8.0 | .04 | .00 | .0 | 57 | 16 | 6.8 | | 150 | 78 | 7.5 | .1 | 9.6 | 271 | 208 | 85 | 428 | 7.7 | 16 | 6.7 | 5.2 |
| Jan. 21-31..... | 1,230 | 8.5 | .02 | .00 | .0 | 69 | 18 | 8.9 | | 182 | 94 | 8.0 | .1 | 8.5 | 322 | 248 | 97 | 503 | 7.7 | 17 | 6.3 | 5.0 |
| Feb. 1-10..... | 451 | 10 | .08 | .00 | .1 | 97 | 26 | 11 | 1.8 | 257 | 125 | 18 | .2 | 7.8 | 448 | 348 | 152 | 669 | 7.7 | 10 | 6.0 | 4.0 |
| Feb. 11-20..... | 5,090 | 6.8 | .10 | .00 | .0 | 42 | 12 | 5.8 | 2.8 | 112 | 55 | 6.5 | .2 | 9.2 | 207 | 156 | 62 | 341 | 7.4 | 19 | 8.6 | 4.6 |
| Feb. 21-28 ..... | 5,020 | 7.8 | .08 | .00 | .0 | 47 | 12 | 4.6 | 3.1 | 120 | 60 | 5.5 | .2 | 8.8 | 209 | 166 | 68 | 355 | 7.6 | 20 | 9.1 | 5.8 |
| Mar. 1-10 ..... | 1,990 | 9.3 | .08 | .00 | .0 | 58 | 15 | 9.3 | | 146 | 83 | 8.5 | .5 | 9.0 | 269 | 208 | 87 | 433 | 7.3 | 15 | 11 | 5.6 |
| Mar. 11-20 ..... | 2,470 | 9.6 | .08 | .00 | .0 | 73 | 6.8 | 4.8 | | 146 | 80 | 7.5 | .1 | 8.4 | 272 | 210 | 90 | 423 | 7.7 | 19 | 6.9 | 4.5 |
| Mar. 21-31 ..... | 3,030 | 8.8 | .08 | .00 | .0 | 54 | 14 | 6.8 | | 140 | 73 | 7.0 | .1 | 7.7 | 252 | 194 | 78 | 391 | 7.8 | 19 | 8.3 | 4.2 |
| Apr. 1-10..... | 1,550 | 9.0 | .05 | .00 | .0 | 65 | 18 | 6.7 | 1.8 | 173 | 89 | 7.8 | .2 | 8.4 | 302 | 237 | 94 | 485 | 8.0 | 20 | 6.9 | 4.8 |
| Apr. 11-20 ..... | 2,270 | 6.4 | .01 | .00 | .0 | 54 | 15 | 6.1 | 2.2 | 141 | 75 | 6.8 | .2 | 8.0 | 254 | 196 | 81 | 410 | 7.9 | 20 | 7.7 | 5.8 |
| Apr. 21-30..... | 1,470 | 5.3 | .03 | .00 | .0 | 60 | 16 | 7.2 | 2.1 | 156 | 83 | 7.0 | .2 | 6.4 | 276 | 213 | 88 | 441 | 8.0 | 18 | 8.1 | 5.7 |

a Includes equivalent of 11 parts per million of carbonate ($CO_3$).

b Includes equivalent of 8 parts per million of carbonate ($CO_3$).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

SANDUSKY RIVER NEAR FREMONT, OHIO--Continued

Chemical analyses, in parts per million, water year October 1950 to September 1951--Continued

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | | Unfiltered | Filtered |
| May 1-10, 1951 .. | 1,000 | 4.5 | 0.06 | 0.00 | 0.0 | 67 | 18 | 7.4 | 2.5 | 184 | 89 | 11 | 0.2 | 3.4 | 321 | 244 | 90 | 486 | 8.1 | 20 | 8.6 | 6.2 |
| May 11-20 ..... | 1,850 | 12 | .04 | .00 | .0 | 55 | 14 | 7.7 | 2.4 | 149 | 74 | 7.5 | .0 | 7.7 | 263 | 196 | 73 | 422 | 7.9 | 20 | 8.9 | 6.2 |
| May 21-31 ..... | 283 | 15 | .04 | .00 | .0 | 81 | 24 | 12 | 2.5 | b212 | 118 | 14 | .2 | 2.5 | 386 | 300 | 114 | 614 | 8.1 | 10 | 6.2 | 5.5 |
| June 1-10 ..... | 194 | 3.8 | .01 | .00 | .0 | 82 | 28 | 14 | 6.0 | c220 | 136 | 16 | .4 | 2.9 | 431 | 320 | 130 | 654 | 8.1 | 12 | 5.3 | 4.7 |
| June 11-20 ..... | 359 | 8.0 | .04 | .00 | .1 | 77 | 23 | 12 | 7.0 | 209 | 112 | 14 | .2 | 10 | 385 | 288 | 115 | 601 | 8.0 | 20 | 6.7 | 4.6 |
| June 21-30 ..... | 204 | 11 | .02 | .00 | .0 | 73 | 24 | 13 | 7.0 | 200 | 118 | 14 | .3 | 4.6 | 387 | 282 | 117 | 591 | 8.0 | 15 | 6.1 | 4.2 |
| July 1-10 ..... | 162 | 11 | .04 | .00 | .0 | 74 | 26 | 15 | 7.6 | 204 | 131 | 18 | .4 | .8 | 412 | 290 | 124 | 621 | 8.1 | 10 | 5.2 | 4.2 |
| July 11-20..... | 88 | 13 | .04 | .00 | .0 | 65 | 26 | 16 | 7.8 | 180 | 132 | 15 | .3 | 2.0 | 387 | 268 | 122 | 586 | 8.2 | 15 | 5.9 | 4.6 |
| July 21-31 ..... | 51 | 3.8 | .04 | .00 | .1 | 69 | 29 | 17 | 8.0 | 189 | 146 | 18 | .4 | .5 | 414 | 292 | 137 | 629 | 8.1 | 10 | 7.1 | 5.5 |
| Aug. 1-10 ..... | 35 | 3.4 | .02 | .00 | .0 | 75 | 37 | 22 | 3.7 | 222 | 165 | 24 | .6 | .8 | 478 | 342 | 157 | 699 | 8.1 | 10 | 6.6 | 5.6 |
| Aug. 11-20 ..... | 29 | 2.3 | .04 | .00 | .0 | 77 | 39 | 23 | 4.2 | 208 | 178 | 30 | .7 | 1.2 | 513 | 354 | 182 | 741 | 8.2 | 10 | 5.8 | 4.6 |
| Aug. 21-31 ..... | 22 | 3.3 | .04 | .00 | .0 | 83 | 40 | 26 | 4.3 | d212 | 202 | 29 | .8 | 1.0 | 547 | 372 | 181 | 796 | 8.4 | 7 | 6.0 | 4.7 |
| Sept. 1-10 ..... | 17 | 4.0 | .04 | .00 | .0 | 84 | 43 | 28 | 4.9 | d206 | 213 | 32 | .9 | 1.8 | 571 | 390 | 201 | 826 | 8.3 | 10 | 6.4 | 4.7 |
| Sept. 11-20 ..... | 27 | 3.3 | .06 | .00 | .0 | 86 | 43 | 32 | 5.4 | e194 | 222 | 36 | .9 | .8 | 585 | 394 | 196 | 847 | 8.3 | 10 | 6.0 | 4.6 |
| Sept. 21-30 ..... | 29 | 4.2 | .08 | .00 | .0 | 89 | 44 | 30 | 5.5 | 238 | 221 | 32 | .8 | 1.5 | 579 | 404 | 208 | 837 | 7.9 | 15 | 5.8 | 4.2 |
| Average ..... | 1,391 | 7.6 | 0.05 | 0.00 | 0.0 | 70 | 23 | 14 | | f185 | 116 | 14 | 0.3 | 5.7 | 367 | 269 | 114 | 561 | -- | 16 | 7.1 | 5.1 |

b Includes equivalent of 8 parts per million of carbonate ($CO_3$).
c Includes equivalent of 6 parts per million of carbonate ($CO_3$).
d Includes equivalent of 10 parts per million of carbonate ($CO_3$).
e Includes equivalent of 22 parts per million of carbonate ($CO_3$).
f Includes equivalent of 2 parts per million of carbonate ($CO_3$).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

SANDUSKY RIVER NEAR FREMONT, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, water year October 1950 to September 1951

| 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. 10, 1950 | 3:30 p. m. | 4,400 | 58 | 14.4 | 7.7 | 75 | -- | -- |
| Oct. 25 | 10:00 a. m. | 144 | 53 | 11.7 | 12.6 | 116 | 0.0 | 0.00 |
| Nov. 8 | 4:00 p. m. | 524 | 49 | 9.4 | 10.4 | 91 | -- | -- |
| Nov. 20 | 2:15 p. m. | 4,320 | 44 | 6.7 | 9.8 | 80 | .0 | .00 |
| Mar. 7, 1951 | 5:45 p. m. | 1,760 | 49 | 9.4 | 8.9 | 78 | -- | -- |
| July 18 | 3:00 p. m. | 64 | 87 | 30.6 | -- | -- | .0 | .025 |
| Aug. 1 | 12:05 p. m. | 43 | 83 | 28.3 | 10.4 | 132 | .0 | .000 |
| Aug. 15 | 3:15 p. m. | 30 | 86 | 30.0 | 10.0 | 131 | .0 | .020 |
| Aug. 29 | 3:45 p. m. | 23 | 86 | 30.0 | 10.6 | 139 | .0 | .003 |
| Sept. 15 | 10:45 a. m. | 32 | 69 | 20.6 | 9.4 | 104 | .0 | .016 |
| Sept. 29 | 10:15 a. m. | 30 | 56 | 13.3 | 10.3 | 98 | .0 | .017 |

Temperature (°F) of water, water year October 1950 to September 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 71 | 60 | 32 | 32 | 32 | 39 | 46 | -- | 80 | 81 | 85 | 75 |
| 2 | 63 | 59 | 33 | 32 | 32 | 40 | -- | 66 | 83 | 81 | 84 | 74 |
| 3 | 65 | 56 | 37 | 33 | 32 | 49 | 41 | 65 | 81 | 82 | 83 | 76 |
| 4 | 57 | 48 | 37 | 34 | 32 | 41 | 42 | 62 | 80 | 79 | 80 | 76 |
| 5 | 53 | 48 | 36 | 34 | -- | 42 | 45 | 54 | 73 | 79 | 76 | 73 |
| 6 | 54 | -- | 37 | 35 | 33 | -- | 48 | 63 | 75 | 81 | 74 | 74 |
| 7 | 54 | 45 | 37 | 35 | 32 | 48 | 50 | 64 | 72 | 82 | 75 | 66 |
| 8 | 60 | 59 | 34 | 33 | 32 | 46 | 51 | 66 | 72 | 83 | 81 | 70 |
| 9 | 57 | 50 | 34 | -- | 32 | 44 | 49 | 66 | 70 | 80 | 81 | 75 |
| 10 | 54 | -- | 34 | 33 | 32 | 43 | 49 | 55 | 73 | 85 | 83 | 70 |
| 11 | 56 | 44 | 35 | 33 | 34 | 44 | 48 | 52 | 76 | 80 | 81 | 76 |
| 12 | 56 | 42 | 35 | 33 | 33 | 43 | 45 | 65 | 75 | 77 | 81 | 79 |
| 13 | 53 | 40 | 35 | 33 | 32 | 44 | 46 | 57 | 63 | 80 | 85 | 70 |
| 14 | 55 | 35 | 34 | 34 | 32 | 38 | 45 | 60 | 69 | 85 | 83 | 72 |
| 15 | 57 | 43 | 34 | 33 | 32 | 40 | 45 | 65 | 73 | 75 | 83 | 74 |
| 16 | 54 | 44 | 33 | 32 | 33 | 39 | 42 | 69 | 76 | 84 | 79 | 69 |
| 17 | 54 | -- | 32 | 33 | 33 | 39 | 42 | 71 | 81 | 85 | 78 | 69 |
| 18 | 56 | 42 | 32 | 35 | 34 | 39 | -- | 72 | 82 | 82 | 79 | 70 |
| 19 | 57 | 43 | 32 | 39 | 36 | 39 | 46 | 75 | 82 | 81 | 80 | 71 |
| 20 | 56 | 45 | 32 | 42 | 42 | 38 | -- | 75 | 81 | 81 | 80 | 72 |
| 21 | 54 | -- | 32 | 40 | 39 | 37 | 51 | 77 | 79 | 78 | 77 | 75 |
| 22 | 60 | 39 | 32 | 36 | 38 | 37 | 53 | 72 | 80 | 83 | 75 | 69 |
| 23 | 56 | 39 | 34 | 37 | 39 | 40 | 54 | 72 | 77 | 82 | 75 | 70 |
| 24 | 54 | 35 | 33 | 34 | 40 | 39 | 52 | 67 | 84 | 85 | 75 | 69 |
| 25 | 51 | 33 | 32 | 34 | 49 | 39 | 55 | 72 | 82 | 87 | 77 | 67 |
| 26 | 46 | 33 | 32 | 32 | 42 | 39 | 55 | 70 | 81 | 88 | 74 | 67 |
| 27 | 49 | 34 | 32 | 33 | 41 | 42 | 57 | 65 | 81 | 87 | 77 | 69 |
| 28 | 53 | 33 | 32 | 32 | 40 | 44 | 65 | 64 | 83 | 84 | 81 | 60 |
| 29 | 59 | 33 | 32 | 32 | -- | 48 | 67 | 70 | 81 | 85 | 88 | 60 |
| 30 | 55 | 33 | 32 | 32 | -- | 48 | 64 | 74 | 73 | 87 | 85 | 58 |
| 31 | 52 | -- | 32 | 32 | -- | 45 | -- | 75 | -- | 84 | 85 | -- |
| Average | 56 | 43 | 34 | 34 | 35 | 41 | 50 | 67 | 77 | 82 | 80 | 70 |

STREAMS TRIBUTARY TO LAKE ERIE--Continued

SANDUSKY RIVER NEAR FREMONT, OHIO--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 | 120 | 26 | 8 | 120 | 25 | 8 | 550 | 15 | 22 |
| 2 | 101 | 25 | 7 | 110 | 20 | 6 | 1,180 | 35 | s 204 |
| 3 | 92 | 20 | 5 | 105 | 22 | 6 | 10,600 | 268 | s 8,050 |
| 4 | 84 | 20 | 5 | 125 | 21 | 7 | 11,100 | 260 | 7,790 |
| 5 | 84 | 20 | 5 | 186 | 18 | 9 | 8,820 | 227 | 5,410 |
| 6 | 76 | 20 | 4 | 301 | 19 | 15 | 7,420 | 152 | 3,050 |
| 7 | 71 | 16 | 3 | 341 | 15 | 14 | 6,340 | 92 | 1,570 |
| 8 | 71 | 12 | 2 | 524 | 39 | s 59 | 9,100 | 190 | 4,670 |
| 9 | 440 | 36 | s 77 | 1,740 | 90 | a 460 | 6,610 | 175 | 3,120 |
| 10 | 4,400 | 240 | a 2,900 | 2,490 | 110 | 739 | 5,150 | 114 | 1,590 |
| 11 | 4,910 | 203 | 2,690 | 1,380 | 58 | 216 | 2,610 | 83 | 585 |
| 12 | 2,560 | 138 | 954 | 938 | 36 | 91 | 1,500 | 52 | 211 |
| 13 | 1,510 | 82 | 334 | 660 | 24 | 43 | 1,000 | 42 | 113 |
| 14 | 938 | 68 | 172 | 502 | 16 | 22 | 800 | 23 | 50 |
| 15 | 760 | 63 | 129 | 414 | 12 | 13 | 650 | 21 | 37 |
| 16 | 588 | 61 | 97 | 392 | 14 | 15 | 600 | 17 | 28 |
| 17 | 446 | 55 | 66 | 356 | 15 | 14 | 550 | 15 | 22 |
| 18 | 356 | 52 | 50 | 327 | 17 | 15 | 490 | 10 | 13 |
| 19 | 301 | 48 | 39 | 301 | 8 | 7 | 450 | 8 | 10 |
| 20 | 244 | 40 | 26 | 4,320 | 380 | a 6,500 | 420 | 7 | 8 |
| 21 | 208 | 27 | 15 | 9,890 | 545 | s 15,000 | 390 | 6 | 6 |
| 22 | 192 | 20 | 10 | 6,500 | 352 | 6,180 | 390 | | |
| 23 | 176 | 26 | 12 | 4,780 | 209 | 2,700 | 400 | | |
| 24 | 159 | 30 | 13 | 2,630 | 115 | 817 | 420 | 3 | 3 |
| 25 | 144 | 29 | 11 | 1,400 | 85 | 321 | 400 | | |
| 26 | 134 | 22 | 8 | 700 | 52 | 98 | 370 | | |
| 27 | 130 | 19 | 7 | 650 | 33 | 58 | 340 | | |
| 28 | 134 | 20 | 7 | 700 | 22 | 42 | 320 | | |
| 29 | 125 | 12 | 4 | 700 | 17 | 32 | 300 | 2 | 2 |
| 30 | 130 | 22 | 8 | 650 | 9 | 16 | 290 | | |
| 31 | 125 | 20 | 7 | -- | -- | -- | 290 | | |
| Total | 19,809 | -- | 7,675 | 44,232 | -- | 33,523 | 79,850 | -- | 36,584 |

| Day | January | | | February | | | March | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 300 | 2 | 2 | 310 | 11 | 9 | 1,820 | 82 | 403 |
| 2 | 370 | 4 | 4 | 310 | 3 | 3 | 2,810 | 300 | a 2,300 |
| 3 | 5,000 | 260 | b 3,900 | 310 | 2 | 2 | 2,100 | 216 | 1,220 |
| 4 | 12,300 | 386 | 12,800 | 320 | 1 | 1 | 1,980 | 128 | 684 |
| 5 | 10,200 | 291 | 8,010 | 340 | 1 | 1 | 2,810 | 145 | 1,100 |
| 6 | 9,100 | 212 | 5,210 | 360 | 1 | 1 | 2,480 | 201 | 1,350 |
| 7 | 5,540 | 120 | 1,790 | 410 | 3 | 3 | 1,760 | 161 | 765 |
| 8 | 2,410 | 73 | 475 | 500 | 7 | 9 | 1,660 | 112 | 502 |
| 9 | 1,100 | 48 | 143 | 850 | 5 | 11 | 1,440 | 88 | 342 |
| 10 | 900 | 31 | 75 | 800 | 5 | 11 | 1,060 | 70 | 200 |
| 11 | 950 | 24 | 62 | 750 | 6 | 12 | 803 | 68 | 147 |
| 12 | 950 | 18 | 46 | 700 | 100 | a 220 | 675 | 58 | 106 |
| 13 | 900 | 14 | 34 | 3,000 | 453 | s 3,560 | 655 | 42 | 74 |
| 14 | 900 | 11 | 27 | 8,000 | 243 | 5,250 | 2,250 | 110 | a 840 |
| 15 | 1,350 | 25 | s 191 | 10,000 | 199 | 5,370 | 5,150 | 240 | a 3,300 |
| 16 | 4,000 | 121 | 1,310 | 6,200 | 140 | 2,340 | 5,020 | 157 | 2,130 |
| 17 | 3,500 | 148 | 1,400 | 3,500 | 105 | 992 | 3,880 | 111 | 1,160 |
| 18 | 5,280 | 162 | 2,310 | 4,760 | 128 | 1,650 | 2,740 | 65 | 481 |
| 19 | 8,260 | 216 | 4,820 | 6,610 | 260 | a 4,900 | 1,980 | 54 | 289 |
| 20 | 6,480 | 191 | 3,340 | 7,420 | 374 | s 7,550 | 1,570 | 40 | 170 |
| 21 | 4,630 | 144 | 1,800 | 9,100 | 400 | b 10,000 | 1,390 | 28 | 105 |
| 22 | 2,810 | 120 | 910 | 9,940 | 410 | a 11,000 | 1,360 | 20 | 73 |
| 23 | 1,680 | 83 | 376 | 7,980 | 308 | 6,640 | 1,660 | 23 | s 114 |
| 24 | 1,100 | 66 | 196 | 5,020 | 213 | 2,890 | 4,380 | 150 | b 1,800 |
| 25 | 750 | 43 | 87 | 2,590 | 118 | 825 | 3,630 | 210 | b 2,100 |
| 26 | 600 | 36 | 58 | 1,860 | 85 | 427 | 2,480 | 158 | 1,060 |
| 27 | 500 | 20 | 27 | 1,960 | 62 | 328 | 1,480 | 95 | 380 |
| 28 | 450 | 17 | 21 | 1,680 | 72 | 327 | 1,360 | 74 | 272 |
| 29 | 380 | 11 | 11 | -- | -- | -- | 3,630 | 220 | b 2,200 |
| 30 | 340 | 11 | 10 | -- | -- | -- | 6,200 | 400 | b 6,700 |
| 31 | 320 | 13 | 11 | -- | -- | -- | 5,800 | 362 | 5,670 |
| Total | 93,350 | -- | 49,456 | 95,580 | -- | 64,332 | 78,013 | -- | 38,037 |

s Computed by subdividing day.
a Computed from partly estimated concentration graph.
b Computed from estimated concentration graph.

STREAMS TRIBUTARY TO LAKE ERIE--Continued

SANDUSKY RIVER NEAR FREMONT, OHIO--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 | 3,880 | 235 | 2,460 | 2,500 | 719 | s 5,120 | 219 | 32 | 19 |
| 2 | 2,350 | 155 | 983 | 1,390 | 243 | s 939 | 196 | 27 | 14 |
| 3 | 1,590 | 88 | 378 | 1,660 | 220 | a 990 | 180 | 23 | 11 |
| 4 | 1,250 | 54 | 182 | 1,220 | 149 | 491 | 170 | 27 | 12 |
| 5 | 1,040 | 37 | 104 | 855 | 67 | 155 | 159 | 26 | 11 |
| 6 | 881 | 28 | 67 | 655 | 60 | 106 | 159 | 28 | 12 |
| 7 | 778 | 25 | 53 | 510 | 56 | 77 | 154 | 29 | 12 |
| 8 | 767 | 27 | 56 | 426 | 41 | 47 | 144 | 26 | 10 |
| 9 | 992 | 28 | 75 | 379 | 26 | 27 | 254 | 54 | 37 |
| 10 | 2,000 | 59 | s 342 | 409 | 17 | 19 | 307 | 131 | 109 |
| 11 | 2,590 | 135 | 944 | 3,180 | 240 | b 2,500 | 213 | 76 | 44 |
| 12 | 2,140 | 89 | 514 | 4,890 | 300 | b 4,000 | 165 | 36 | 16 |
| 13 | 1,800 | 122 | 593 | 4,000 | 238 | 2,570 | 345 | 160 | s 189 |
| 14 | 2,680 | 129 | 933 | 2,350 | 160 | 1,020 | 744 | 228 | 458 |
| 15 | 3,750 | 113 | 1,140 | 1,270 | 82 | 281 | 594 | 131 | 210 |
| 16 | 3,750 | 138 | 1,400 | 829 | 71 | 159 | 417 | 83 | 94 |
| 17 | 2,480 | 87 | 583 | 624 | 55 | 93 | 260 | 53 | 37 |
| 18 | 1,530 | 67 | 277 | 510 | 42 | 58 | 280 | 51 | 39 |
| 19 | 1,130 | 48 | 146 | 426 | 39 | 45 | 307 | 42 | 35 |
| 20 | 894 | 38 | 92 | 379 | 31 | 32 | 267 | 34 | 25 |
| 21 | 756 | 32 | 65 | 357 | 28 | 27 | 294 | 103 | 82 |
| 22 | 721 | 26 | 51 | 357 | 28 | 27 | 196 | 80 | 42 |
| 23 | 2,300 | 60 | a 440 | 364 | 27 | 27 | 254 | 81 | 56 |
| 24 | 2,810 | 220 | a 1,700 | 327 | 29 | 26 | 236 | 85 | 54 |
| 25 | 1,700 | 148 | 679 | 294 | 32 | 25 | 191 | 64 | 33 |
| 26 | 1,130 | 84 | 256 | 254 | 26 | 18 | 175 | 55 | 26 |
| 27 | 964 | 59 | 154 | 230 | 23 | 14 | 154 | 47 | 20 |
| 28 | 816 | 48 | 106 | 230 | 29 | 18 | 159 | 36 | 15 |
| 29 | 829 | 41 | 92 | 225 | 32 | 19 | 191 | 47 | 24 |
| 30 | 2,670 | 380 | a 3,400 | 236 | 34 | 22 | 191 | 56 | 29 |
| 31 | -- | -- | -- | 236 | 34 | 22 | -- | -- | -- |
| Total | 52,968 | -- | 18,265 | 31,572 | -- | 18,974 | 7,575 | -- | 1,774 |

| Day | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 159 | 51 | 22 | 43 | | | 15 | | |
| 2 | 140 | 31 | 12 | 40 | | | 15 | | |
| 3 | 126 | 24 | 8 | 32 | 31 | 3 | 15 | 17 | 1 |
| 4 | 117 | 23 | 7 | 37 | | | 14 | | |
| 5 | 236 | 55 | s 40 | 32 | | | 14 | | |
| 6 | 294 | 75 | 60 | 34 | | | 17 | | |
| 7 | 185 | 44 | 22 | 34 | | | 19 | | |
| 8 | 135 | 37 | 13 | 34 | | | 21 | | |
| 9 | 121 | 34 | 11 | 30 | | | 19 | | |
| 10 | 103 | 30 | 8 | 30 | 29 | 2 | 19 | 14 | 1 |
| 11 | 95 | 30 | 8 | 37 | | | 21 | | |
| 12 | 135 | 54 | 20 | 32 | | | 24 | | |
| 13 | 135 | 47 | 17 | 23 | | | 26 | | |
| 14 | 103 | 34 | b 9 | 24 | | | 32 | | |
| 15 | 87 | 24 | 6 | 30 | | | 32 | | |
| 16 | 76 | 18 | 4 | 32 | | | 32 | | |
| 17 | 68 | | | 32 | 20 | 2 | 32 | 16 | 1 |
| 18 | 64 | | | 30 | | | 28 | | |
| 19 | 61 | | | 28 | | | 24 | | |
| 20 | 58 | 19 | 3 | 26 | | | 21 | | |
| 21 | 52 | | | 24 | | | 21 | | |
| 22 | 55 | | | 23 | | | 23 | | |
| 23 | 61 | | | 21 | | | 26 | | |
| 24 | 55 | | | 21 | | | 30 | 20 | 2 |
| 25 | 52 | | | 23 | | | 32 | | |
| 26 | 55 | | | 23 | 10 | 1 | 35 | | |
| 27 | 49 | 24 | 3 | 23 | | | 35 | | |
| 28 | 46 | | | 23 | | | 35 | | |
| 29 | 49 | | | 23 | | | 30 | 13 | 1 |
| 30 | 43 | | | 21 | | | 26 | | |
| 31 | 43 | | | 19 | | | -- | -- | -- |
| Total | 3,058 | -- | 312 | 884 | -- | 56 | 733 | -- | 36 |

Total discharge for year (cfs-days) ..... 507,624
Total load for year (tons) ..... 269,024

s Computed by subdividing day.
a Computed from partly estimated concentration graph.
b Computed from estimated concentration graph.

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, 2 miles downstream from confluence of East Branch and West Branch.
DRAINAGE AREA.--363 square miles.
RECORDS AVAILABLE.--Chemical analyses: March 1950 to September 1951.
Water temperatures: March to August 1950.
REMARKS.--Records of specific conductance of daily samples from March 1950 to August 1950 available in district office at Columbus, Ohio. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1207.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed: Unfiltered | Oxygen consumed: Filtered |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 10, 1950 | 840 | 4.7 | 0.08 | 0.00 | 0.0 | 50 | 11 | 9.2 | | 96 | 73 | 20 | 0.1 | 8.7 | 243 | 170 | 91 | 351 | 7.2 | 55 | 11 | 7.2 |
| Nov. 8 | 306 | 9.8 | .04 | .00 | .0 | 71 | 24 | 4.8 | | 177 | 116 | 11 | .2 | 5.4 | 348 | 273 | 131 | 535 | 8.0 | 12 | -- | 8.4 |
| Dec. 7 | 3,830 | 5.6 | .10 | .00 | .0 | 30 | 8.7 | 5.4 | | 62 | 56 | 5.0 | .1 | 7.4 | 154 | 110 | 60 | 242 | 7.8 | 33 | -- | 3.6 |
| Jan. 2, 1951 | 4,160 | 10 | .04 | .00 | .0 | 98 | 25 | 21 | | 244 | 154 | 21 | .2 | 3.2 | 474 | 348 | 147 | 715 | 7.9 | 5 | 4.1 | 4.5 |
| Feb. 20 | 1,470 | 7.5 | .02 | .00 | .0 | 44 | 11 | 4.5 | | 88 | 75 | 7.0 | .0 | 5.9 | 219 | 156 | 83 | 348 | 7.7 | 18 | 7.3 | 5.4 |
| Mar. 7 | 1,250 | 6.3 | .08 | .00 | .1 | 44 | 11 | 9.2 | | 92 | 80 | 7.2 | .0 | 7.6 | 217 | 155 | 80 | 347 | 7.2 | 20 | 14 | 5.3 |
| Apr. 3 | 330 | 6.7 | .04 | .00 | .0 | 67 | 16 | 15 | | 154 | 118 | 9.0 | .1 | 4.4 | 322 | 235 | 107 | 494 | 7.7 | 10 | 4.7 | 3.3 |
| May 2 | 282 | 3.4 | .02 | .00 | .0 | 62 | 16 | 8.4 | 2.0 | a138 | 99 | 7.5 | .2 | 1.8 | 285 | 222 | 92 | 457 | 8.4 | 35 | 5.3 | 5.0 |
| June 5 | 83 | 2.4 | .04 | .00 | .0 | 93 | 26 | 16 | 6.6 | 240 | 156 | 11 | .2 | 2.0 | 453 | 338 | 142 | 684 | 8.0 | 15 | 7.0 | 5.6 |
| July 2 | 56 | 6.1 | .02 | .00 | .0 | 73 | 20 | 14 | 3.4 | b175 | 114 | 13 | .1 | 7.4 | 361 | 263 | 103 | 554 | 8.5 | 8 | 6.2 | 4.9 |
| Aug. 1 | 19 | 5.3 | .02 | .00 | .0 | 80 | 23 | 22 | 5.1 | c173 | 152 | 19 | .1 | 5.8 | 413 | 284 | 132 | 632 | 8.5 | 8 | 6.3 | 5.2 |
| Sept. 15 | 19 | 6.7 | .04 | .00 | .0 | 83 | 29 | 26 | 4.4 | d204 | 178 | 22 | .1 | 2.4 | 500 | 326 | 148 | 691 | 8.2 | 10 | 5.1 | 4.3 |

a Includes equivalent of 9 parts per million of carbonate ($CO_3$).
b Includes equivalent of 11 parts per million of carbonate ($CO_3$).
c Includes equivalent of 12 parts per million of carbonate ($CO_3$).
d Includes equivalent of 7 parts per million of carbonate ($CO_3$).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

HURON RIVER AT MILAN, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, water year October 1950 to September 1951

| 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. 10, 1950 | 4:30 p. m. | 840 | 58 | 14.4 | 8.6 | 84 | -- | -- |
| Nov. 8 | 5:15 p. m. | 306 | 51 | 10.6 | 10.1 | 90 | -- | -- |
| Feb. 20, 1951 | 2:13 p. m. | 1,470 | 42 | 5.6 | -- | -- | -- | 0.000 |
| Mar. 20 | 3:00 p. m. | 330 | 34 | 1.1 | 12.7 | 89 | -- | .000 |
| July 18 | 5:00 p. m. | 26 | 86 | 30.0 | 9.6 | 126 | 0.0 | .030 |
| Aug. 1 | 9:30 a. m. | 19 | 76 | 24.4 | 6.5 | 77 | .0 | .002 |
| Aug. 15 | 4:45 p. m. | 10 | 82 | 27.8 | 8.8 | 111 | .0 | .008 |
| Aug. 29 | 5:15 p. m. | 9.1 | 82 | 27.8 | 11.7 | 147 | .0 | .008 |
| Sept. 15 | 12:15 p. m. | 19 | 68 | 20.0 | 10.4 | 113 | .0 | .000 |
| Sept. 29 | 12:15 p. m. | 10 | 55 | 12.8 | 14.3 | 134 | .0 | .006 |

STREAMS TRIBUTARY TO LAKE ERIE--Continued

VERMILION RIVER NEAR VERMILION, OHIO

LOCATION.--At gaging station at bridge on North Ridge Road, Lorain County, 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 September 1951.
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 1950 to September 1951 given in Water-Supply Paper 1207.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | | Unfiltered | Filtered |
| Oct. 25, 1950 | 15 | 0.9 | 0.06 | 0.00 | 0.0 | 70 | 20 | 21 | | 192 | 112 | 19 | 0.2 | 0.3 | 346 | 257 | 100 | 556 | 7.8 | 20 | 6.2 | 5.1 |
| Nov. 20 | 1,270 | 5.5 | .05 | -- | -- | 37 | 9.0 | 10 | | 94 | 56 | 9.0 | .1 | 4.9 | 187 | 130 | 53 | 290 | 7.9 | 30 | 16 | 7.7 |
| Dec. 19 | 65 | 9.0 | .10 | .00 | .0 | 69 | 18 | 11 | | 172 | 107 | 11 | .2 | 2.2 | 327 | 246 | 105 | 505 | 7.9 | 16 | -- | 6.4 |
| Jan. 18, 1951 | 1,610 | 6.9 | .02 | .00 | .0 | 24 | 16 | 8.1 | | 78 | 61 | 7.0 | .0 | 7.6 | 181 | 124 | 62 | 293 | 7.6 | 18 | 7.1 | 5.3 |
| Feb. 20 | 850 | 6.9 | .10 | .00 | .0 | 37 | 10 | 5.8 | | 82 | 63 | 7.0 | .0 | 4.0 | 200 | 134 | 66 | 302 | 7.4 | 28 | 13 | 11 |
| Mar. 20 | 276 | 5.2 | .13 | .00 | .1 | 42 | 11 | 7.3 | | 99 | 71 | 5.5 | .1 | 3.7 | 210 | 152 | 69 | 344 | 7.6 | 22 | 6.2 | 5.0 |
| Apr. 18 | 216 | 4.8 | .04 | .00 | .0 | 48 | 13 | 7.6 | 1.7 | 119 | 78 | 7.8 | .0 | 2.5 | 238 | 172 | 76 | 366 | 7.2 | 17 | 6.0 | 5.7 |
| May 15 | 157 | 5.8 | .12 | .00 | .1 | 43 | 9.7 | 6.1 | 2.0 | 113 | 58 | 5.6 | .0 | 2.5 | 211 | 148 | 55 | 325 | 7.9 | 35 | 12 | 7.2 |
| June 18 | 37 | 3.7 | .03 | .00 | .0 | 52 | 12 | 11 | 6.4 | 138 | 72 | 12 | .2 | 6.5 | 252 | 180 | 66 | 408 | 7.8 | 10 | 5.8 | 6.0 |
| July 11 | 7.9 | 3.6 | .02 | .00 | .0 | 56 | 15 | 15 | 3.4 | a155 | 90 | 15 | .2 | 1.2 | 289 | 202 | 74 | 463 | 8.3 | 10 | 5.6 | 5.6 |
| Aug. 22 | 1.2 | 4.8 | .01 | .00 | .0 | 59 | 20 | 25 | 4.0 | 158 | 128 | 24 | .3 | .6 | 378 | 232 | 100 | 559 | 7.9 | 6 | 4.3 | 4.2 |
| Sept. 22 | 5.6 | 2.4 | .01 | .00 | .0 | 55 | 19 | 26 | 3.7 | 158 | 106 | 30 | .3 | .3 | 348 | 216 | 86 | 535 | 8.0 | 7 | 4.7 | 4.4 |

a Includes equivalent of 5 parts per million of carbonate ($CO_3$).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

VERMILION RIVER NEAR VERMILION, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, water year October 1950 to September 1951

| 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. 24, 1950 | 8:20 a.m. | 18 | 49 | 9.4 | 10.2 | 89 | 0.0 | 0.00 |
| Nov. 20 | 4:30 p.m. | 1,270 | 43 | 6.1 | 10.7 | 86 | .0 | .00 |
| Feb. 20, 1951 | 2:45 p.m. | 850 | 43 | 6.1 | -- | -- | -- | .000 |
| Mar. 20 | 4:00 p.m. | 276 | 38 | 3.3 | 12.3 | 92 | -- | .023 |
| Apr. 18 | 2:00 p.m. | 216 | 47 | 8.3 | 12.5 | 106 | .0 | .000 |
| July 12 | 9:00 a.m. | 24 | 77 | 25.0 | 7.9 | 94 | .0 | .008 |
| July 25 | 5:00 p.m. | 27 | 85 | 29.4 | 8.2 | 106 | .0 | .000 |
| Aug. 9 | 9:45 a.m. | 2.3 | 78 | 24.4 | 7.6 | 90 | .0 | .004 |
| Aug. 22 | 7:30 p.m. | 1.2 | 67 | 19.4 | 6.3 | 68 | .0 | .004 |
| Sept. 5 | 9:15 a.m. | .5 | 63 | 17.2 | 7.7 | 79 | .0 | .010 |
| Sept. 22 | 10:45 a.m. | 5.6 | 69 | 20.6 | 8.2 | 90 | .0 | .005 |

STREAMS TRIBUTARY TO LAKE ERIE--Continued

BLACK RIVER NEAR ELYRIA, OHIO

LOCATION.--At bridge on State Highway 254, Lorain County, 4½ miles upstream from French Creek, and 6½ miles downstream from Elyria.
DRAINAGE AREA.--392 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: March 1950 to September 1951.
Water temperatures: March 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 568 ppm Dec. 21-31; minimum, 202 ppm Feb. 11-20.
Hardness: Maximum, 330 ppm Dec. 21-31; minimum, 124 ppm Feb. 11-20.
Specific conductance: Maximum daily, 958 micromhos Sept. 5; minimum daily, 195 micromhos Dec. 3, Feb. 20.
Water temperatures: Maximum, 83°F Aug. 10; minimum, freezing point on many days during November to February.
EXTREMES, March 1950 to September 1951.--Dissolved solids: Maximum, 568 ppm Dec. 21-31; minimum, 202 ppm Feb. 11-20.
Hardness: Maximum, 330 ppm Dec. 21-31; minimum, 124 ppm Feb. 11-20.
Specific conductance: Maximum daily, 958 micromhos Sept. 5, 1951; minimum daily, 175 micromhos Apr. 24, 1950.
Water temperatures: Maximum, 86°F June 26, 1950; minimum, freezing point on many days during March, November, and December 1950; January, and February 1951.
REMARKS.--Records of specific conductance of daily samples from March 1950 to September 1951 available in district office at Columbus, Ohio. Discharge records reported are for gaging station at Elyria. No appreciable inflow between gage and sampling station except during periods of heavy local runoff. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1207.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed: Unfiltered | Oxygen consumed: Filtered |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 1-10, 1950 .. | 11 | 4.7 | 0.04 | 0.40 | 0.3 | 58 | 16 | 59 | | 132 | 151 | 46 | 0.6 | 8.8 | 412 | 210 | 102 | 673 | 7.7 | 25 | 9.2 | 5.9 |
| Oct. 11-20..... | 21 | 4.5 | .03 | .30 | .4 | 59 | 17 | 55 | | 132 | 162 | 40 | .6 | 3.3 | 424 | 217 | 109 | 672 | 7.7 | 25 | 12 | 5.9 |
| Oct. 21-31..... | 17 | 4.3 | .03 | .20 | .5 | 59 | 18 | 63 | | 140 | 163 | 48 | .5 | 6.0 | 439 | 221 | 106 | 703 | 7.6 | 25 | 13 | 7.2 |
| Nov. 1-10..... | 49 | 7.0 | .05 | .40 | .2 | 63 | 19 | 57 | | 141 | 160 | 50 | .5 | 6.0 | 446 | 238 | 120 | 695 | 7.8 | 25 | 7.6 | 6.2 |
| Nov. 11-20 ..... | 149 | 6.1 | .08 | .60 | .1 | 67 | 19 | 47 | | 149 | 138 | 52 | .5 | 8.8 | 450 | 248 | 123 | 685 | 7.7 | 25 | 8.2 | 6.6 |
| Nov. 21-30 ..... | 388 | 8.3 | .08 | .00 | .1 | 55 | 17 | 17 | | 84 | 112 | 36 | .0 | 9.2 | 318 | 206 | 138 | 504 | 7.2 | 12 | 8.2 | 5.9 |
| Dec. 1-10 ..... | 2,300 | 7.4 | .08 | .00 | .0 | 42 | 7.3 | 19 | | 51 | 66 | 41 | .0 | 8.5 | 214 | 134 | 93 | 390 | 7.4 | 12 | 8.8 | 5.6 |
| Dec. 11-20 ..... | 126 | 12 | .09 | .10 | .0 | 70 | 18 | 28 | 4.2 | 136 | 148 | 34 | .2 | 7.6 | 402 | 252 | 137 | 645 | 7.6 | 20 | 7.8 | 6.1 |
| Dec. 21-31..... | 48 | 13 | .09 | .30 | .1 | 91 | 25 | 55 | 4.2 | 202 | 205 | 62 | .3 | 4.1 | 568 | 330 | 164 | 884 | 7.7 | 15 | 9.4 | 5.0 |
| Jan. 1-10, 1951 .. | 1,410 | 7.9 | .05 | .01 | .1 | 51 | 16 | 30 | | 116 | 116 | 26 | .2 | 6.6 | 322 | 192 | 98 | 517 | 7.6 | 10 | 6.9 | 4.1 |
| Jan. 11-20..... | 1,020 | 8.1 | .06 | .02 | .0 | 47 | 15 | 18 | | 88 | 106 | 20 | .1 | 8.1 | 285 | 178 | 107 | 449 | 7.3 | 19 | 6.7 | 4.7 |
| Jan. 21-31 ..... | 227 | 9.2 | .05 | .10 | .0 | 64 | 17 | 31 | | 128 | 135 | 34 | .1 | 4.9 | 377 | 229 | 125 | 595 | 7.5 | 7 | 6.0 | 4.5 |
| Feb. 1-10..... | 69 | 10 | .05 | .20 | .1 | 79 | 20 | 41 | 3.0 | 169 | 161 | 47 | .2 | 5.9 | 470 | 281 | 141 | 716 | 7.5 | 5 | 5.4 | 4.6 |
| Feb. 11-20 ..... | 1,980 | 6.6 | .08 | .00 | .1 | 37 | 7.8 | 13 | 2.8 | 62 | 61 | 24 | .1 | 8.2 | 202 | 124 | 74 | 320 | 7.3 | 10 | 8.9 | 5.7 |
| Feb. 21-28 ..... | 1,350 | 7.0 | .11 | .20 | .1 | 42 | 9.7 | 12 | 2.8 | 80 | 77 | 14 | .1 | 5.4 | 221 | 146 | 79 | 345 | 7.4 | 15 | 9.2 | 6.1 |
| Mar. 1-10 ..... | 845 | 6.6 | .08 | .10 | .0 | 44 | 12 | 18 | | 84 | 95 | 18 | .2 | 5.2 | 253 | 159 | 90 | 408 | 7.3 | 20 | 11 | 6.2 |
| Mar. 11-20 ..... | 716 | 7.3 | .10 | .14 | .1 | 46 | 13 | 17 | | 90 | 97 | 16 | .1 | 8.3 | 267 | 166 | 94 | 418 | 7.5 | 18 | 6.7 | 3.6 |
| Mar. 21-31 ..... | 1,190 | 5.9 | .04 | .20 | .1 | 42 | 11 | 12 | | 80 | 88 | 12 | .1 | 3.4 | 232 | 148 | 84 | 370 | 7.6 | 20 | 12 | 4.1 |
| Apr. 1-10 ..... | 494 | 7.4 | .08 | .20 | .1 | 49 | 12 | 17 | 2.6 | 100 | 100 | 16 | .2 | 4.1 | 278 | 173 | 90 | 434 | 8.0 | 15 | 8.6 | 5.2 |
| Apr. 11-20 ..... | 467 | 7.0 | .04 | .20 | .1 | 52 | 13 | 22 | 2.6 | 106 | 106 | 25 | .2 | 4.0 | 302 | 186 | 96 | 472 | 7.8 | 10 | 6.4 | 5.3 |
| Apr. 21-30 ..... | 662 | 7.5 | .06 | .30 | .2 | 50 | 13 | 24 | 3.4 | 113 | 110 | 20 | .2 | 1.8 | 303 | 181 | 86 | 471 | 7.9 | 20 | 8.4 | 6.1 |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| May 1-10 | 326 | 6.3 | .08 | .20 | .2 | 48 | 13 | 22 | 4.0 | 123 | 93 | 15 | .3 | 1.8 | 284 | 173 | 72 | 439 | 7.8 | 20 | 9.0 | 7.4 |
| May 11-20 | 786 | 8.5 | .06 | .10 | .1 | 50 | 13 | 22 | 3.5 | 118 | 100 | 16 | .1 | 3.6 | 286 | 176 | 82 | 460 | 8.0 | 20 | 9.4 | 6.3 |
| May 21-31 | 77 | 5.8 | .04 | .30 | .1 | 65 | 18 | 39 | 4.4 | 162 | 145 | 26 | .1 | 2.5 | 415 | 238 | 103 | 662 | 7.6 | 10 | 6.8 | 5.4 |
| June 1-10 | 67 | 6.5 | .05 | 1.0 | .1 | 73 | 19 | 51 | 7.4 | 178 | 153 | 50 | .6 | 5.4 | 476 | 260 | 114 | 751 | 8.2 | 25 | 5.5 | 5.4 |
| June 11-20 | 146 | 7.3 | .05 | .00 | .1 | 59 | 13 | 34 | 10 | 134 | 110 | 38 | .3 | 7.6 | 354 | 203 | 91 | 581 | 8.0 | 20 | 8.4 | 7.3 |
| June 21-30 | 64 | 7.9 | .05 | .40 | .1 | 55 | 15 | 53 | 13 | 142 | 139 | 38 | .6 | 7.8 | 410 | 200 | 83 | 661 | 8.1 | 30 | 6.0 | 6.4 |
| July 1-10 | 62 | 6.6 | .05 | .40 | .1 | 62 | 17 | 45 | 11 | 138 | 124 | 52 | .5 | 10 | 406 | 225 | 112 | 658 | 8.0 | 25 | 5.9 | 5.5 |
| July 11-20 | 18 | 8.1 | .08 | 1.0 | .1 | 58 | 16 | 66 | 14 | 136 | 159 | 54 | .7 | 10 | 465 | 212 | 99 | 745 | 8.0 | 25 | 6.8 | 7.2 |
| July 21-31 | 24 | 9.5 | .10 | 3.0 | .1 | 56 | 15 | 84 | 13 | 136 | 188 | 52 | .8 | 15 | 515 | 202 | 90 | 809 | 7.7 | 50 | 4.7 | 4.0 |
| Aug. 1-10 | 11 | 20 | .02 | .80 | .1 | 61 | 15 | 86 | 7.0 | 140 | 170 | 73 | .6 | 6.8 | 540 | 215 | 99 | 835 | 8.0 | 25 | 6.7 | 6.9 |
| Aug. 11-20 | 7.0 | 12 | .05 | 1.2 | .2 | 61 | 14 | 100 | 8.1 | a176 | 172 | 75 | .6 | 6.6 | 564 | 208 | 65 | 896 | 8.2 | 40 | 8.1 | 8.0 |
| Aug. 21-31 | 7.4 | 8.3 | .02 | .60 | .2 | 52 | 15 | 104 | 9.6 | 194 | 183 | 56 | .6 | 5.6 | 547 | 191 | 32 | 866 | 8.1 | 35 | 9.1 | 8.0 |
| Sept. 1-10 | 11 | 12 | .06 | .10 | .1 | 51 | 17 | 99 | 6.6 | 166 | 204 | 52 | .5 | 1.5 | 531 | 196 | 61 | 863 | 7.9 | 25 | 9.2 | 7.4 |
| Sept. 11-20 | 38 | 15 | .10 | .30 | .1 | 56 | 18 | 51 | 6.6 | 144 | 147 | 36 | .5 | 6.6 | 415 | 208 | 96 | 655 | 7.6 | 25 | 7.0 | 6.4 |
| Sept. 21-30 | 14 | 9.1 | .06 | .20 | .1 | 56 | 20 | 81 | 7.9 | 170 | 172 | 58 | .6 | 2.5 | 500 | 222 | 83 | 811 | 7.8 | 30 | 7.2 | 6.8 |
| Average | 414 | 8.4 | 0.06 | 0.38 | 0.1 | 56 | 15 | 47 | | 129 | 134 | 38 | 0.3 | 6.2 | 386 | 201 | 96 | 613 | -- | 21 | 8.1 | 5.9 |

a Includes equivalent of 6 parts per million of carbonate ($CO_3$).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

BLACK RIVER NEAR ELYRIA, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, water year October 1950 to September 1951

| 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. 10, 1950 | 6:00 p.m. | 12 | 63 | 17.2 | 7.9 | 81 | -- | -- |
| Oct. 25 | 7:30 a.m. | 16 | 53 | 11.7 | 8.0 | 73 | -- | 0.00 |
| Nov. 8 | 7:10 p.m. | 50 | 53 | 11.7 | 9.3 | 85 | 0.0 | -- |
| Nov. 20 | 5:15 p.m. | 1,160 | 43 | 6.1 | 10.7 | 86 | .0 | .00 |
| Dec. 7 | 5:00 p.m. | 2,000 | -- | -- | -- | -- | .0 | -- |
| Mar. 20, 1951 | 5:30 p.m. | 594 | 37 | 2.8 | 13.2 | 97 | -- | .000 |
| May 2 | 5:45 p.m. | 436 | 65 | 18.3 | 8.5 | 90 | .3 | .000 |
| May 15 | 3:30 p.m. | 251 | 69 | 20.6 | 8.5 | 94 | .1 | .000 |
| June 5 | 7:45 a.m. | 78 | 66 | 18.9 | 8.5 | 91 | 8.0 | .000 |
| July 2 | 2:30 p.m. | 71 | 76 | 24.4 | 10.0 | 118 | 8.0 | .020 |
| July 12 | 10:00 a.m. | 24 | 76 | 24.4 | 8.8 | 104 | .2 | .000 |
| July 25 | 4:00 p.m. | 38 | 80 | 26.7 | 9.8 | 121 | .4 | .000 |
| Aug. 9 | 9:00 a.m. | 9.6 | 73 | 22.8 | 5.0 | 57 | .1 | .000 |
| Aug. 22 | 6:15 a.m. | 6.6 | 70 | 21.1 | 5.5 | 61 | .1 | .000 |
| Sept. 4 | 6:15 p.m. | 18 | 72 | 22.2 | 8.2 | 93 | .1 | .007 |
| Sept. 22 | 10:00 a.m. | 24 | 69 | 20.6 | 7.8 | 88 | 1.5 | .000 |

Temperature (°F) of water, water year October 1950 to September 1951

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

## ROCKY RIVER AT CLEVELAND, OHIO

LOCATION.--At bridge on Puritas Spring Road in Cleveland, Cuyahoga County, 3¾ 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 September 1951.
Water temperatures: March to August 1950.
REMARKS.--Records of specific conductance of daily samples from March 1950 to August 1950 available in district office at Columbus, Ohio. Descharge records for gaging station near Berea for water year October 1950 to September 1951 given in Water-Supply Paper 1207. No appreciable inflow between gaging station and sampling point except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | | Unfiltered | Filtered |
| Oct. 25, 1950 | 9.1 | 2.0 | 0.04 | 0.00 | 0.0 | 68 | 22 | 54 | | 143 | 158 | 64 | 0.2 | 6.8 | 456 | 260 | 143 | 743 | 7.6 | 7 | 4.5 | 4.5 |
| Nov. 20 | 627 | 6.5 | .04 | -- | -- | 50 | 14 | 20 | | 91 | 111 | 21 | .1 | 6.1 | 287 | 181 | 106 | 452 | 7.8 | 24 | 8.8 | 5.0 |
| Dec. 19 | 60 | 8.5 | .04 | .00 | .0 | 64 | 18 | 27 | | 132 | 136 | 28 | .2 | 3.3 | 364 | 236 | 126 | 571 | 7.3 | 7 | -- | 5.5 |
| Jan. 18, 1951 | 1,390 | 6.6 | .03 | .00 | .0 | 35 | 9.7 | 15 | | 66 | 77 | 14 | .0 | 6.2 | 200 | 128 | 73 | 344 | 7.6 | 7 | 5.8 | 3.8 |
| Feb. 20 | 789 | 6.2 | .06 | .00 | .0 | 35 | 9.7 | 10 | | 66 | 73 | 12 | .0 | 3.8 | 198 | 128 | 73 | 324 | 7.6 | 8 | 4.6 | 2.9 |
| Mar. 20 | 1,160 | 5.5 | .12 | .00 | .1 | 33 | 11 | 7.5 | | 62 | 65 | 16 | .1 | 3.4 | 185 | 126 | 77 | 316 | 7.4 | 15 | 4.9 | 3.5 |
| Apr. 18 | 222 | 5.4 | .04 | .00 | .0 | 43 | 12 | 9.4 | 1.9 | 91 | 83 | 10 | .1 | 2.2 | 220 | 156 | 82 | 361 | 7.4 | 7 | 4.0 | 4.0 |
| May 15 | 166 | 5.6 | .04 | .00 | .0 | 46 | 12 | 11 | 2.5 | 103 | 82 | 10 | .2 | 1.0 | 237 | 162 | 80 | 365 | 7.9 | 10 | 5.2 | 4.5 |
| June 18 | 55 | 5.6 | .03 | .00 | .0 | 52 | 12 | 14 | 6.8 | 124 | 86 | 16 | .2 | 3.1 | 264 | 178 | 78 | 424 | 7.9 | 8 | 5.9 | 4.8 |
| July 11 | 51 | 3.1 | .03 | .00 | .0 | 52 | 15 | 25 | 5.0 | 132 | 103 | 28 | .1 | 2.5 | 309 | 191 | 83 | 507 | 7.8 | 7 | 7.2 | 5.2 |
| Aug. 8 | 4.2 | 3.0 | .01 | .00 | .0 | 61 | 16 | 38 | 7.0 | 147 | 118 | 46 | .1 | 2.4 | 377 | 217 | 98 | 609 | 8.0 | 12 | 5.7 | 5.5 |
| Sept. 4 | 8.0 | 5.5 | .01 | .00 | .0 | 66 | 18 | 48 | 9.7 | 124 | 163 | 52 | .1 | 5.7 | 432 | 241 | 137 | 690 | 7.9 | 10 | 6.2 | 5.5 |

STREAMS TRIBUTARY TO LAKE ERIE--Continued

ROCKY RIVER AT CLEVELAND, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, water year October 1950 to September 1951

| 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. 24, 1950 | 6:30 p.m. | 10 | 51 | 10.6 | 9.1 | 81 | 0.0 | 0.00 |
| Nov. 20 | 8:00 p.m. | 627 | 42 | 5.6 | 10.8 | 86 | .0 | .00 |
| Jan. 18, 1951 | 2:00 p.m. | 1,390 | -- | -- | -- | -- | -- | .012 |
| Feb. 20 | 3:55 p.m. | 789 | 41 | 5.0 | -- | -- | -- | .000 |
| Mar. 20 | 6:00 p.m. | 1,160 | 36 | 2.2 | 12.7 | 92 | -- | .004 |
| Apr. 18 | 11:45 a.m. | 222 | 44 | 6.7 | 13.1 | 107 | .0 | .004 |
| July 12 | 11:00 a.m. | 71 | 83 | 28.3 | 10.0 | 127 | .0 | .009 |
| July 25 | 2:30 p.m. | 16 | 83 | 28.3 | -- | -- | .0 | .002 |
| Aug. 8 | 5:30 p.m. | 4.2 | 83 | 28.3 | -- | -- | .0 | .002 |
| Aug. 21 | 8:00 p.m. | 2.7 | 75 | 23.9 | 7.0 | 82 | .0 | .003 |
| Sept. 4 | 5:00 p.m. | 8.0 | 74 | 23.3 | 10.3 | 119 | .0 | .019 |
| Sept. 22 | 9:15 a.m. | 26 | 69 | 20.6 | 6.1 | 67 | .0 | .005 |

## CUYAHOGA RIVER AT BRECKSVILLE, OHIO

LOCATION.--At bridge on Station Road at Brecksville, Cuyahoga County, 2½ miles downstream from Masos 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 September 1951.
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 reported are for gaging station at Independence, drainage area 709 square miles. Discharge records for gaging station at Independence for water year October 1950 to September 1951 given in Water-Supply Paper 1207. There is some inflow between sampling station and gaging station.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed: Unfiltered | Oxygen consumed: Filtered |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 1-10, 1950 | 136 | 3.9 | 0.13 | 0.00 | 0.0 | 78 | 17 | 85 | | 206 | 139 | 94 | 0.6 | 1.0 | 522 | 264 | 96 | 880 | 7.7 | 22 | 11 | 9.0 |
| Oct. 11-20 | 238 | 6.3 | .10 | .00 | .0 | 81 | 17 | 85 | | 188 | 142 | 106 | .5 | 1.4 | 546 | 270 | 116 | 878 | 7.5 | 22 | 10 | 9.4 |
| Oct. 21-31 | 158 | 6.0 | .13 | .00 | .0 | 82 | 18 | 89 | | 196 | 147 | 108 | .6 | 2.3 | 563 | 276 | 115 | 905 | 7.5 | 20 | 11 | 11 |
| Nov. 9 | 276 | 9.9 | .04 | .00 | .0 | 86 | 21 | 140 | | 155 | 139 | 225 | .6 | 17 | 738 | 302 | 174 | 1,250 | 7.1 | 19 | -- | 6.7 |
| Dec. 8 | 6,080 | 6.1 | .07 | .00 | .0 | 30 | 11 | 2.2 | | 46 | 64 | 11 | .2 | 5.7 | 162 | 120 | 82 | 272 | 7.4 | 17 | -- | 4.4 |
| Jan. 3, 1951 | 3,090 | 7.6 | .07 | .00 | .0 | 43 | 10 | 36 | | 72 | 68 | 54 | .2 | .4 | 295 | 150 | 89 | 493 | 7.6 | 12 | 6.4 | 5.9 |
| Feb. 7 | 390 | 8.5 | .23 | .00 | .0 | 60 | 14 | 72 | | 138 | 119 | 89 | .5 | .8 | 438 | 208 | 94 | 732 | 7.5 | 15 | -- | -- |
| Mar. 21 | 2,920 | 5.9 | .08 | .00 | .1 | 36 | 8.3 | 11 | | 64 | 67 | 16 | .1 | 3.9 | 194 | 124 | 72 | 326 | 7.1 | 10 | 6.3 | 4.3 |
| Apr. 18 | 1,450 | 5.5 | .06 | .00 | .1 | 45 | 7.3 | 17 | 2.5 | 94 | 70 | 18 | .1 | 6.6 | 227 | 143 | 65 | 359 | 6.8 | 10 | 6.8 | 6.2 |
| May 16 | 1,000 | 6.0 | .04 | .00 | .0 | 50 | 10 | 22 | 2.8 | 120 | 78 | 24 | .1 | 6.1 | 274 | 166 | 68 | 443 | 7.4 | 20 | 11 | 6.4 |
| June 19 | 348 | 9.3 | .03 | .01 | .0 | 69 | 15 | 54 | 8.8 | 184 | 115 | 56 | .2 | 12 | 450 | 234 | 83 | 711 | 7.3 | 18 | 10 | 7.4 |
| July 12 | 279 | 8.2 | .03 | .00 | .0 | 72 | 15 | 53 | 4.9 | a166 | 122 | 60 | .4 | 16 | 450 | 242 | 105 | 718 | 8.3 | 30 | 11 | 8.4 |
| Aug. 21 | 136 | 10 | .02 | .00 | .0 | 84 | 17 | 70 | 5.2 | 177 | 146 | 94 | .4 | 18 | 545 | 282 | 134 | 879 | 7.3 | 10 | -- | 8.4 |
| Sept. 21 | 136 | 10 | .05 | .00 | .0 | 82 | 18 | 77 | 7.1 | 216 | 162 | 86 | .9 | .4 | 570 | 282 | 102 | 914 | 7.3 | 40 | 11 | 7.6 |

a Includes equivalent of 6 parts per million carbonate ($CO_3$).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CUYAHOGA RIVER AT BRECKSVILLE, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, water year October 1950 to September 1951

| 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. 11, 1950 | 11:00 a.m. | 186 | 62 | 16.7 | 3.5 | 36 | -- | 0.00 |
| Oct. 24 | 10:50 a.m. | 158 | 58 | 14.4 | 4.8 | 47 | -- | .04 |
| Nov. 9 | 11:10 a.m. | 276 | 58 | 14.4 | 4.4 | 43 | 0.0 | .030 |
| Dec. 8 | 11:45 a.m. | 6,080 | 34 | 1.1 | 11.8 | 83 | -- | .009 |
| Jan. 3, 1951 | 10:05 a.m. | 3,090 | -- | -- | -- | -- | -- | .024 |
| Feb. 7 | 10:20 a.m. | 390 | -- | -- | -- | -- | -- | .024 |
| Mar. 21 | 1:30 p.m. | 2,920 | 40 | 4.4 | 10.9 | 84 | -- | .014 |
| Apr. 18 | 7:45 a.m. | 1,450 | 45 | 7.2 | 8.4 | 69 | .0 | .009 |
| May 16 | 2:00 p.m. | 1,000 | 67 | 19.4 | 5.4 | 58 | .0 | .000 |
| July 11 | 10:00 a.m. | 258 | 76 | 24.4 | 1.4 | 17 | .0 | .027 |
| July 25 | 8:45 a.m. | 197 | 72 | 22.2 | .3 | 3 | .0 | .025 |
| Aug. 8 | 8:15 a.m. | 176 | 72 | 22.2 | 1.0 | 11 | .0 | .000 |
| Aug. 21 | 9:45 a.m. | 136 | 74 | 23.3 | 2.2 | 25 | .1 | .016 |
| Sept. 4 | 9:45 a.m. | 134 | 69 | 20.6 | 4.3 | 47 | .0 | .026 |
| Sept. 21 | 3:45 p.m. | 136 | 72 | 21.7 | 2.9 | 33 | .0 | .048 |

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CUYAHOGA RIVER AT INDEPENDENCE, OHIO

LOCATION.--At gaging station at highway bridge on Rockside Road at Valley View, and 1 mile northeast of Independence, Cuyahoga County.
DRAINAGE AREA.--709 square miles.
RECORDS AVAILABLE.--Sediment records: October 1950 to September 1951.
EXTREMES, October 1950 to September 1951.--Sediment concentrations: Maximum daily, 1,070 ppm Feb. 21, 1951; minimum daily, 2 ppm Aug. 25-30, 1951.
Sediment loads: Maximum daily, 17,500 tons Feb. 21, 1951; minimum daily, 1 ton Aug. 25-30, Sept. 3-10, 1951.
REMARKS.--Flow affected by ice: Nov. 24 to Dec. 1, Dec. 26 to Jan. 2, Jan. 24 to Feb. 11. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1207.

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 | 115 | -- | | 153 | | | 650 | 38 | 67 |
| 2 | 104 | -- | | 155 | 6 | 2 | 1,790 | 450 | a3,100 |
| 3 | 113 | -- | | 163 | | | 7,000 | 621 | s11,500 |
| 4 | 138 | -- | | 231 | 13 | 8 | 6,320 | 368 | 6,280 |
| 5 | 126 | -- | | 320 | 11 | 10 | 4,160 | 333 | 3,740 |
| 6 | 128 | -- | | 261 | 9 | 6 | 3,620 | 328 | 3,210 |
| 7 | 138 | -- | | 243 | | | 5,240 | 463 | s7,120 |
| 8 | 119 | -- | | 234 | | | 6,080 | 325 | s5,660 |
| 9 | 123 | -- | e2 | 276 | 6 | 4 | 3,440 | 290 | 2,690 |
| 10 | 261 | -- | | 295 | | | 2,580 | 218 | 1,520 |
| 11 | 186 | -- | | 252 | | | 2,200 | 152 | 903 |
| 12 | 255 | -- | | 226 | | | 1,800 | 161 | 782 |
| 13 | 298 | -- | | 203 | | | 1,360 | 122 | 448 |
| 14 | 285 | -- | | 203 | | | 1,070 | 93 | 269 |
| 15 | 279 | -- | | 194 | | | 880 | 75 | 178 |
| 16 | 228 | -- | | 214 | 7 | 4 | 760 | 62 | 127 |
| 17 | 226 | -- | | 261 | | | 640 | 48 | 83 |
| 18 | 217 | | | 228 | | | 580 | 40 | 63 |
| 19 | 208 | | | 214 | | | 502 | 48 | 65 |
| 20 | 200 | 4 | 2 | 2,600 | 800 | b7,900 | 483 | 39 | 51 |
| 21 | 186 | | | 1,750 | 303 | s1,550 | 412 | 34 | 38 |
| 22 | 178 | | | 1,220 | 121 | 399 | 401 | 32 | 35 |
| 23 | 158 | | | 1,040 | 78 | 219 | 401 | 31 | 34 |
| 24 | 158 | | | 950 | 68 | 174 | 397 | 22 | 24 |
| 25 | 158 | | | 850 | 75 | a170 | 376 | 16 | 16 |
| 26 | 146 | | | 750 | 55 | a110 | 350 | 14 | 13 |
| 27 | 141 | 6 | 2 | 700 | 39 | 74 | 320 | 26 | 22 |
| 28 | 165 | | | 700 | 38 | 72 | 290 | 28 | 22 |
| 29 | 158 | | | 700 | 42 | 79 | 270 | 27 | 20 |
| 30 | 136 | | | 650 | 36 | 63 | 260 | 34 | 24 |
| 31 | 150 | | | -- | -- | -- | 260 | 22 | 15 |
| Total- | 5,471 | -- | 62 | 16,236 | -- | 10,892 | 54,892 | -- | 48,119 |

e Estimated.
s Compnted by subdividing day.
a Computed from estimated concentration graph.
b Computed from partly estimated concentration graph.

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CUYAHOGA RIVER AT INDEPENDENCE, OHIO--Continued

Suspended sediment, water year October 1950 to September 1951--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 | 250 | 16 | 11 | 270 | 27 | 20 | 1,800 | 240 | a 850 |
| 2 | 280 | 15 | 11 | 270 | 30 | 22 | 1,500 | 114 | 462 |
| 3 | 3,090 | 480 | b 5,200 | 270 | 19 | 14 | 1,550 | 95 | s 412 |
| 4 | 6,480 | 824 | 14,600 | 280 | 21 | 16 | 5,160 | 350 | b 4,000 |
| 5 | 4,160 | 368 | 4,130 | 300 | 21 | 17 | 2,970 | 239 | 1,920 |
| 6 | 3,500 | 286 | 2,700 | 330 | 25 | 22 | 2,480 | 167 | 1,120 |
| 7 | 3,260 | 257 | 2,260 | 390 | 70 | 74 | 3,380 | 464 | s 4,530 |
| 8 | 2,580 | 265 | 1,850 | 470 | 58 | 74 | 3,020 | 236 | 1,920 |
| 9 | 2,000 | 203 | 1,100 | 450 | 32 | 39 | 2,310 | 163 | 1,020 |
| 10 | 1,600 | 135 | 583 | 480 | 25 | 32 | 1,750 | 136 | 643 |
| 11 | 1,360 | 109 | 400 | 550 | 31 | 46 | 1,450 | 111 | 435 |
| 12 | 1,180 | 86 | 274 | 3,230 | 510 | a 5,900 | 1,220 | 93 | 306 |
| 13 | 940 | 64 | 162 | 5,600 | 760 | b 12,000 | 1,140 | 78 | 240 |
| 14 | 880 | 51 | 121 | 3,860 | 299 | 3,120 | 1,800 | 160 | s 786 |
| 15 | 1,950 | 210 | a 1,200 | 2,750 | 222 | 1,650 | 1,850 | 107 | 534 |
| 16 | 1,600 | 103 | 445 | 2,530 | 230 | 1,570 | 1,900 | 71 | 364 |
| 17 | 1,360 | 68 | 250 | 3,980 | 428 | s 4,680 | 1,900 | 75 | 385 |
| 18 | 2,150 | 240 | a 1,700 | 3,740 | 272 | 2,750 | 2,150 | 119 | 691 |
| 19 | 2,480 | 220 | a 1,600 | 3,380 | 240 | 2,190 | 3,380 | 320 | b 3,000 |
| 20 | 1,950 | 115 | 605 | 2,970 | 217 | 1,840 | 3,380 | 226 | s 2,060 |
| 21 | 1,750 | 92 | 435 | 5,750 | 1,070 | s 17,500 | 2,920 | 129 | 1,020 |
| 22 | 1,550 | 73 | 306 | 6,000 | 430 | s 6,770 | 2,580 | 125 | 871 |
| 23 | 1,400 | 59 | 223 | 3,740 | 314 | 3,170 | 2,920 | 190 | b 1,600 |
| 24 | 1,200 | 53 | 172 | 2,920 | 246 | 1,940 | 3,500 | 250 | b 2,400 |
| 25 | 1,000 | 47 | 127 | 2,480 | 236 | 1,580 | 2,580 | 146 | 1,020 |
| 26 | 800 | 44 | 95 | 2,000 | 207 | 1,120 | 2,150 | 115 | 668 |
| 27 | 650 | 36 | 63 | 1,750 | 149 | 704 | 1,950 | 100 | 526 |
| 28 | 440 | 34 | 40 | 1,360 | 119 | 437 | 2,000 | 113 | 610 |
| 29 | 370 | 27 | 27 | -- | -- | -- | 3,140 | 268 | s 2,480 |
| 30 | 320 | 34 | 29 | -- | -- | -- | 4,540 | 651 | s 9,190 |
| 31 | 280 | 32 | 24 | -- | -- | -- | 3,680 | 322 | s 3,360 |
| Total- | 52,810 | -- | 40,743 | 62,100 | -- | 69,197 | 77,050 | -- | 49,423 |

| Day | April | | | May | | | June | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2,920 | 183 | 1,440 | 1,500 | 125 | 506 | 258 | | |
| 2 | 2,800 | 141 | 1,070 | 1,180 | 52 | 166 | 255 | 8 | 6 |
| 3 | 2,480 | 117 | 777 | 1,070 | 43 | 124 | 255 | | |
| 4 | 2,260 | 104 | 629 | 1,040 | 44 | 124 | 320 | 12 | 10 |
| 5 | 2,000 | 89 | 481 | 940 | 40 | 102 | 279 | | |
| 6 | 1,650 | 78 | 347 | 820 | 35 | 77 | 240 | 7 | 5 |
| 7 | 1,450 | 64 | 251 | 740 | 28 | 56 | 228 | | |
| 8 | 1,360 | 41 | 151 | 680 | 23 | 42 | 1,100 | 660 | b 5,900 |
| 9 | 2,050 | 132 | 731 | 600 | 17 | 28 | 2,590 | 950 | b 7,800 |
| 10 | 1,800 | 84 | 408 | 542 | 14 | 20 | 920 | 125 | 310 |
| 11 | 1,500 | 54 | 219 | 1,520 | 310 | a 1,900 | 502 | 52 | 70 |
| 12 | 1,800 | 94 | 513 | 2,860 | 310 | s 2,440 | 344 | 28 | 26 |
| 13 | 2,150 | 123 | 714 | 1,950 | 146 | 769 | 966 | 300 | b 2,300 |
| 14 | 2,150 | 70 | 459 | 1,500 | 70 | 284 | 1,710 | 400 | b 2,500 |
| 15 | 2,050 | 55 | 304 | 1,180 | 40 | 127 | 680 | 57 | 105 |
| 16 | 1,750 | 51 | 241 | 1,000 | 33 | 89 | 453 | 33 | 40 |
| 17 | 1,600 | 40 | 173 | 880 | 28 | 67 | 348 | 16 | 15 |
| 18 | 1,450 | 47 | 184 | 740 | 26 | 52 | 330 | 12 | 11 |
| 19 | 1,360 | 35 | 129 | 620 | 28 | 47 | 348 | 12 | 11 |
| 20 | 1,220 | 37 | 122 | 522 | 17 | 24 | 288 | 13 | 10 |
| 21 | 1,040 | 41 | 115 | 434 | 12 | 14 | 273 | 10 | 7 |
| 22 | 1,400 | 90 | a 440 | 415 | 24 | 27 | 292 | 30 | a 36 |
| 23 | 2,050 | 125 | 692 | 502 | 31 | 42 | 434 | 74 | 87 |
| 24 | 1,500 | 71 | 288 | 441 | 13 | 15 | 270 | 18 | 13 |
| 25 | 1,270 | 55 | 189 | 372 | 10 | 10 | 472 | 65 | a 110 |
| 26 | 1,360 | 54 | 198 | 348 | 15 | 14 | 292 | 16 | 13 |
| 27 | 1,220 | 30 | 99 | 320 | 14 | 12 | 240 | 11 | 7 |
| 28 | 1,070 | 22 | 64 | 408 | 16 | 18 | 258 | 10 | 7 |
| 29 | 1,270 | 90 | a 310 | 383 | 13 | 13 | 307 | 13 | 11 |
| 30 | 2,200 | 290 | b 1,800 | 314 | 12 | 10 | 304 | 11 | 9 |
| 31 | -- | -- | -- | 273 | 10 | 7 | -- | -- | -- |
| Total- | 52,180 | -- | 13,538 | 26,094 | -- | 7,226 | 15,556 | -- | 19,441 |

s Computed by subdividing day.
a Computed from estimated concentration graph.
b Computed from partly estimated concentration graph.

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CUYAHOGA RIVER AT INDEPENDENCE, OHIO--Contniued

Suspended sediment, water year October 1950 to September 1951--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 | 438 | 50 | b75 | 189 | 6 | 3 | 340 | 56 | 51 |
| 2 | 397 | 26 | 28 | 173 | 5 | 2 | 228 | 9 | 6 |
| 3 | 295 | 7 | 6 | 211 | 23 | 13 | 158 | | |
| 4 | 656 | 120 | b380 | 197 | 13 | 7 | 134 | | |
| 5 | 720 | 100 | 194 | 168 | | | 136 | | |
| 6 | 344 | 24 | 22 | 150 | | | 141 | 3 | 1 |
| 7 | 282 | 13 | 10 | 173 | 11 | 5 | 160 | | |
| 8 | 255 | | | 176 | | | 138 | | |
| 9 | 234 | | | 170 | | | 117 | | |
| 10 | 249 | 9 | 6 | 173 | | | 114 | | |
| 11 | 258 | | | 160 | | | 285 | 50 | a48 |
| 12 | 279 | | | 150 | | | 155 | 8 | 3 |
| 13 | 252 | | | 132 | | | 252 | 55 | b90 |
| 14 | 228 | | | 128 | | | 740 | 170 | a440 |
| 15 | 181 | | | 136 | | | 301 | 27 | 22 |
| 16 | 163 | | | 155 | | | 217 | 9 | 5 |
| 17 | 170 | 10 | 5 | 130 | 9 | 4 | 181 | 13 | 6 |
| 18 | 194 | | | 141 | | | 173 | | |
| 19 | 194 | | | 132 | | | 155 | | |
| 20 | 168 | | | 115 | | | 143 | 5 | 2 |
| 21 | 173 | 12 | 6 | 136 | 5 | 2 | 136 | | |
| 22 | 246 | 21 | 14 | 130 | | | 145 | | |
| 23 | 273 | 12 | 9 | 113 | | | 186 | 10 | 5 |
| 24 | 206 | 7 | 4 | 113 | | | 136 | | |
| 25 | 197 | 8 | 4 | 110 | | | 150 | | |
| 26 | 178 | 11 | 5 | 106 | | | 158 | | |
| 27 | 178 | 57 | 27 | 97 | 2 | 1 | 163 | 4 | 2 |
| 28 | 340 | 97 | 89 | 111 | | | 148 | | |
| 29 | 246 | 18 | 12 | 113 | | | 130 | | |
| 30 | 194 | 7 | 4 | 106 | | | 123 | | |
| 31 | 189 | 9 | 5 | 228 | 60 | s45 | -- | -- | -- |
| Total | 8,377 | -- | 965 | 4,522 | -- | 149 | 5,743 | -- | 708 |

Total discharge for year (cfs-days) ..... 381,031
Total load for year (tons) ..... 260,463

s Computed by subdividing day.
a Computed from estimated concentration graph.
b Computed from partly estimated concentration graph.

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 3¼ miles downstream from Kingsbury Run.
DRAINAGE AREA.--813 square miles (at mouth).
RECORDS AVAILABLE.--Chemical analyses: March 1950 to September 1951.
Water temperatures: March 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 640 ppm Nov. 1-10; minimum, 243 ppm Feb. 21-28, Mar. 21-31.
Hardness: Maximum, 298 ppm Oct. 21-31, Nov. 1-10; minimum, 140 ppm Feb. 21-28.
Specific conductance: Maximum daily, 1,240 micromhos Nov. 5; minimum daily, 306 micromhos Dec. 8.
Water temperatures: Maximum, 92°F Aug. 3; minimum, 39°F Dec. 9, Feb. 14.
EXTREMES, March 1950 to September 1951.--Dissolved solids: Maximum, 640 ppm Nov. 1-10, 1950; minimum, 235 ppm Mar. 21-31, 1950.
Hardness: Maximum, 298 ppm Oct. 21-31, Nov. 1-10, 1950; minimum, 135 ppm Mar. 21-31, 1950.
Specific conductance: Maximum daily, 1,240 micromhos Nov. 5, 1950; minimum daily, 288 micromhos Mar. 27, 1950.
Water temperatures: Maximum, 92°F Aug. 3, 1951; minimum, 39°F Dec. 9, 1950, Feb. 14, 1951.
REMARKS.--Records of specific conductance of daily samples from March 1950 to September 1951 available in district office at Columbus, Ohio. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed: Unfiltered | Oxygen consumed: Filtered |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 1-10, 1950 | | 3.5 | 0.38 | 0.00 | 0.0 | 84 | 17 | | 91 | 121 | 230 | 94 | 2.2 | 0.0 | 570 | 280 | 180 | 954 | 7.4 | 8 | 11 | 6.3 |
| Oct. 11-20 | | 7.3 | 5.6 | .00 | .1 | 88 | 16 | | 89 | 120 | 241 | 88 | 2.2 | .1 | 592 | 286 | 188 | 927 | 7.2 | 5 | 13 | 7.8 |
| Oct. 21-31 | | 5.6 | 5.6 | .00 | .1 | 92 | 17 | | 100 | 126 | 258 | 98 | 2.1 | .1 | 634 | 298 | 195 | 987 | 7.1 | 5 | 13 | 7.8 |
| Nov. 1-10 | | 9.3 | 3.0 | .00 | .1 | 90 | 17 | | 105 | 122 | 256 | 106 | 2.3 | .3 | 640 | 298 | 194 | 1,020 | 7.1 | 7 | 12 | 6.8 |
| Nov. 11-20 | | 8.5 | 3.4 | .00 | .1 | 87 | 17 | | 93 | 124 | 242 | 92 | 2.5 | .3 | 604 | 288 | 185 | 941 | 7.0 | 7 | 11 | 6.6 |
| Nov. 21-30 | | 7.9 | 1.0 | .00 | .0 | 61 | 14 | | 39 | 106 | 140 | 42 | .6 | .2 | 376 | 209 | 123 | 579 | 7.4 | 20 | 8.7 | 6.4 |
| Dec. 1-10 | | 5.9 | .46 | .00 | .0 | 44 | 11 | | 25 | 69 | 106 | 29 | .5 | 1.0 | 269 | 156 | 98 | 410 | 7.3 | 10 | 9.2 | 5.2 |
| Dec. 11-20 | | 8.5 | .12 | .00 | .0 | 55 | 14 | | 43 | 70 | 152 | 50 | .7 | .8 | 373 | 194 | 137 | 612 | 6.9 | 10 | 6.8 | 5.9 |
| Dec. 21-31 | | 9.2 | .04 | .00 | .0 | 79 | 17 | | 87 | 109 | 226 | 92 | .7 | .0 | 565 | 266 | 178 | 933 | 7.1 | 10 | 7.8 | 6.7 |
| Jan. 1-10, 1951 | | 8.1 | .44 | .00 | .1 | 50 | 12 | | 43 | 80 | 129 | 46 | .8 | 1.8 | 332 | 176 | 109 | 561 | 7.1 | 28 | 7.9 | 4.1 |
| Jan. 11-30 | | 7.8 | .04 | .00 | .0 | 54 | 10 | | 46 | 74 | 130 | 55 | .7 | .8 | 345 | 176 | 115 | 571 | 7.1 | 7 | -- | 5.3 |
| Jan. 21-31 | | 7.8 | .09 | .00 | .0 | 58 | 12 | | 47 | 80 | 148 | 53 | .8 | .8 | 367 | 192 | 128 | 588 | 7.4 | 5 | -- | 5.7 |
| Feb. 1-10 | | 8.1 | .02 | .00 | .1 | 74 | 14 | 67 | 7.0 | 80 | 210 | 78 | 1.0 | .5 | 520 | 240 | 177 | 855 | 6.9 | 5 | 8.6 | 7.0 |
| Feb. 11-20 | | 8.7 | 1.5 | .00 | .1 | 46 | 9.0 | 28 | 4.3 | 76 | 97 | 41 | .5 | 2.0 | 284 | 151 | 89 | 461 | 7.1 | 50 | 9.0 | 5.5 |
| Feb. 21-28 | | 7.5 | .50 | .00 | .1 | 42 | 8.3 | 21 | 3.2 | 56 | 89 | 27 | .5 | 2.0 | 243 | 140 | 85 | 393 | 7.1 | 15 | 8.8 | 5.0 |
| Mar. 1-10 | | 8.9 | .33 | .00 | .0 | 48 | 9.0 | | 29 | 75 | 105 | 33 | .4 | .8 | 275 | 157 | 95 | 448 | 7.2 | 15 | 8.2 | 4.9 |
| Mar. 11-20 | | 10 | .10 | .00 | .0 | 50 | 11 | | 29 | 84 | 115 | 30 | .5 | 1.0 | 291 | 170 | 101 | 478 | 7.2 | 10 | 8.4 | 5.4 |
| Mar. 21-31 | | 6.9 | .04 | .00 | .0 | 42 | 9.7 | | 19 | 72 | 93 | 20 | .5 | 2.0 | 243 | 144 | 86 | 392 | 7.2 | 8 | 8.3 | 4.1 |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apr. 1-10 ..... | | 7.4 | .10 | .00 | .1 | 47 | 9.7 | 18 | 3.7 | 81 | 105 | 20 | .6 | .5 | 261 | 157 | 91 | 441 | 7.5 | 10 | 7.0 | 4.4 |
| Apr. 11-20 ..... | | 6.2 | .02 | .00 | .0 | 55 | 9.0 | 24 | 4.1 | 96 | 114 | 29 | .7 | .2 | 290 | 175 | 96 | 483 | 7.3 | 4 | 9.6 | 5.0 |
| Apr. 21-30 ..... | | 6.0 | .03 | .00 | .0 | 56 | 12 | 25 | 5.0 | 102 | 125 | 30 | .7 | .2 | 326 | 189 | 105 | 527 | 7.5 | 10 | 10 | 5.7 |
| May 1-10 ..... | | 5.9 | .02 | .00 | .0 | 60 | 13 | 28 | 5.7 | 120 | 130 | 32 | .6 | .3 | 342 | 204 | 105 | 555 | 7.3 | 7 | 8.6 | 6.1 |
| May 11-20 ..... | | 9.6 | 1.0 | .00 | .0 | 58 | 12 | 28 | 5.1 | 90 | 127 | 32 | 1.2 | .2 | 332 | 192 | 120 | 559 | 7.8 | 20 | 7.2 | 7.3 |
| May 21-31 ..... | | 7.9 | .03 | .00 | .0 | 68 | 14 | 41 | 14 | 140 | 157 | 46 | 1.1 | .5 | 414 | 228 | 112 | 698 | 7.5 | 38 | 8.9 | 6.1 |
| June 1-10 ..... | | 8.7 | .03 | .00 | .0 | 67 | 13 | 41 | 14 | 134 | 156 | 46 | 1.1 | .5 | 407 | 223 | 111 | 692 | 7.7 | 8 | 15 | 5.2 |
| June 11-20 ..... | | 9.8 | .08 | .00 | .1 | 61 | 12 | 32 | 12 | 118 | 138 | 34 | .9 | .5 | 361 | 202 | 105 | 593 | 7.8 | 10 | 12 | 8.8 |
| June 21-30 ..... | | 9.4 | .02 | .00 | .1 | 70 | 15 | 46 | 16 | 144 | 169 | 50 | 1.4 | .5 | 443 | 237 | 118 | 729 | 7.7 | 10 | 9.8 | 6.0 |
| July 1-10 ..... | | 9.2 | .15 | .00 | .0 | 67 | 15 | 43 | 14 | 154 | 144 | 45 | 1.4 | .5 | 410 | 228 | 103 | 692 | 7.6 | 10 | 13 | 5.9 |
| July 11-20 ..... | | 8.1 | .47 | .00 | .0 | 66 | 14 | 44 | 15 | 150 | 141 | 49 | 1.6 | 1.5 | 412 | 222 | 99 | 705 | 7.6 | 25 | 13 | 5.6 |
| July 21-31 ..... | | 12 | .44 | .00 | .0 | 70 | 14 | 52 | 16 | 144 | 169 | 58 | 1.6 | .5 | 471 | 234 | 114 | 797 | 7.5 | 30 | 14 | 6.0 |
| Aug. 1-10 ..... | | 12 | .05 | .00 | .0 | 78 | 15 | 60 | 11 | 146 | 188 | 67 | 1.6 | 2.8 | 534 | 256 | 137 | 837 | 8.2 | 15 | 17 | 5.5 |
| Aug. 11-20 ..... | | 11 | .02 | .00 | .0 | 74 | 16 | 59 | 9.1 | 136 | 174 | 71 | 1.8 | 2.6 | 489 | 250 | 139 | 804 | 8.1 | 5 | 7.9 | 5.2 |
| Aug. 21-31 ..... | | 11 | .02 | .00 | .0 | 75 | 17 | 61 | 11 | 148 | 189 | 64 | 1.8 | .2 | 508 | 257 | 136 | 841 | 7.6 | 5 | 7.6 | 5.7 |
| Sept. 1-10 ..... | | 9.5 | .02 | .00 | .1 | 73 | 19 | 55 | 9.6 | 165 | 175 | 56 | 1.8 | .2 | 479 | 260 | 125 | 792 | 7.8 | 10 | 7.6 | 6.9 |
| Sept. 11-20 .... | | 12 | .02 | .00 | .1 | 76 | 16 | 54 | 8.8 | 138 | 185 | 58 | 1.6 | .2 | 479 | 255 | 142 | 784 | 7.8 | 15 | 9.0 | 6.5 |
| Sept. 21-30 .... | | 9.9 | .30 | .00 | .1 | 80 | 17 | 63 | 9.8 | 142 | 207 | 64 | 1.6 | .5 | 529 | 270 | 153 | 865 | 7.4 | 25 | 9.4 | 7.0 |
| Average ..... | | 8.5 | 0.71 | 0.00 | 0.0 | 65 | 14 | 52 | | 111 | 160 | 53 | 1.2 | 0.7 | 417 | 220 | 129 | 681 | -- | 13 | 10 | 6.0 |

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CUYAHOGA RIVER AT CLEVELAND, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, water year October 1950 to September 1951

| 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. 10, 1950 | 9:00 p. m. | | 77 | 25.0 | 0.0 | 0 | -- | 0.06 |
| Oct. 24 | 5:50 p. m. | | 70 | 21.1 | .0 | 0 | -- | .05 |
| Nov. 8 | 9:20 p. m. | | 67 | 19.4 | .0 | 0 | -- | .24 |
| Nov. 20 | 9:20 p. m. | | 48 | 8.9 | 1.1 | 9 | 0.0 | .14 |
| Dec. 7 | 7:00 p. m. | | 41 | 5.0 | 9.3 | 73 | -- | .113 |
| Dec. 19 | 11:45 a. m. | | -- | -- | -- | -- | -- | .699 |
| Jan. 2, 1951 | 5:25 p. m. | | -- | -- | -- | -- | -- | .758 |
| Jan. 18 | 3:00 p. m. | | 49 | 9.4 | 8.2 | 71 | -- | .320 |
| Feb. 6 | 4:00 p. m. | | 46 | 7.8 | 6.5 | 54 | -- | .747 |
| Feb. 20 | 4:30 p. m. | | 45 | 7.2 | 9.8 | 81 | .0 | .175 |
| Mar. 8 | 9:15 a. m. | | 50 | 10.0 | 7.8 | 69 | -- | .163 |
| Mar. 21 | 9:30 a. m. | | 42 | 5.6 | 9.8 | 78 | -- | .192 |
| Apr. 3 | 4:30 p. m. | | 48 | 8.9 | 6.5 | 56 | -- | -- |
| Apr. 18 | 11:10 a. m. | | 52 | 11.1 | 3.7 | 33 | .0 | .318 |
| May 3 | 9:00 a. m. | | 64 | 17.8 | .2 | 2 | .3 | .219 |
| May 15 | 6:30 p. m. | | 70 | 21.1 | .3 | 3 | .2 | .306 |
| June 5 | 9:15 a. m. | | 80 | 26.7 | .0 | 0 | .0 | .057 |
| June 18 | 4:30 p. m. | | 84 | 28.9 | .2 | 2 | -- | .027 |
| July 2 | 1:00 p. m. | | 84 | 28.9 | .0 | 0 | .2 | .097 |
| July 11 | 4:00 p. m. | | 86 | 30.0 | .0 | 0 | .0 | .039 |
| July 25 | 1:45 p. m. | | 86 | 30.0 | .0 | 0 | .0 | .082 |
| Aug. 8 | 4:30 p. m. | | 86 | 30.0 | .0 | 0 | .1 | .104 |
| Aug. 21 | 7:00 p. m. | | 85 | 29.4 | .0 | 0 | .1 | .055 |
| Sept. 4 | 4:00 p. m. | | 81 | 27.2 | .0 | 0 | .1 | .038 |
| Sept. 22 | 8:15 a. m. | | 71 | 21.7 | .0 | 0 | .1 | .095 |

Temperature (°F) of water, water year October 1950 to September 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 76 | -- | 46 | 53 | 50 | 51 | 51 | 68 | 76 | 81 | 85 | 85 |
| 2 | 79 | -- | 49 | 51 | 50 | 51 | 49 | 70 | 76 | 82 | 85 | 80 |
| 3 | 76 | -- | 41 | 50 | 47 | 50 | 49 | 72 | 78 | 81 | 92 | 79 |
| 4 | 77 | -- | 40 | 46 | 46 | 50 | 49 | 71 | 76 | 80 | 86 | 81 |
| 5 | 76 | -- | 42 | 43 | 47 | 49 | 50 | 72 | 80 | 80 | 80 | 80 |
| 6 | 76 | -- | 42 | 43 | 44 | 51 | 55 | 70 | 75 | 78 | 84 | 82 |
| 7 | 77 | -- | 42 | 40 | 50 | 55 | 56 | 67 | 78 | 80 | 82 | 82 |
| 8 | 79 | -- | 40 | 40 | 47 | 51 | 60 | 70 | 76 | 80 | 82 | 82 |
| 9 | 76 | 72 | 39 | 40 | 45 | 51 | 56 | 70 | 69 | 82 | 86 | 79 |
| 10 | 79 | 70 | 40 | 44 | 44 | 49 | 53 | 68 | 69 | 80 | 86 | 81 |
| 11 | 79 | 67 | 41 | 46 | 47 | 51 | 56 | 75 | 72 | 82 | 87 | 78 |
| 12 | 76 | 61 | 43 | 46 | 47 | 51 | 58 | 62 | 75 | 86 | 85 | 80 |
| 13 | 75 | 63 | 44 | 48 | 41 | 52 | 55 | 65 | 74 | 86 | 82 | 78 |
| 14 | 71 | 63 | 45 | 46 | 39 | 51 | 55 | 66 | 70 | 85 | 85 | 87 |
| 15 | 70 | 63 | 46 | 45 | 40 | 52 | 53 | 60 | 72 | 84 | 86 | 78 |
| 16 | 70 | 63 | 48 | 45 | 42 | 48 | 53 | 72 | 78 | 82 | 85 | 80 |
| 17 | 71 | 66 | 48 | 46 | 44 | 48 | 52 | 75 | 76 | 82 | 85 | 77 |
| 18 | 72 | 65 | 50 | 49 | 42 | 43 | 54 | 75 | 78 | 84 | 85 | 78 |
| 19 | 73 | 65 | 51 | 46 | 44 | 46 | 56 | 70 | 78 | 79 | 83 | 81 |
| 20 | 76 | 64 | 53 | 49 | 48 | 40 | 58 | 74 | 81 | 82 | 84 | 81 |
| 21 | 75 | 50 | 50 | 49 | 45 | 43 | 58 | 75 | 82 | 86 | 84 | 81 |
| 22 | 73 | 50 | 53 | 47 | 44 | 45 | 60 | 72 | 81 | 88 | 85 | 82 |
| 23 | 75 | 53 | 53 | 46 | 44 | 46 | 51 | 73 | 82 | 86 | 83 | 78 |
| 24 | 73 | 53 | 56 | 47 | 44 | 47 | 58 | 75 | 78 | 86 | 81 | 81 |
| 25 | 74 | -- | 54 | 47 | 45 | 45 | 61 | 77 | 82 | 86 | 80 | 80 |
| 26 | 71 | -- | 53 | 48 | 47 | 45 | 61 | 70 | 81 | 88 | 82 | 81 |
| 27 | 71 | 45 | 51 | 48 | 49 | 47 | 64 | 78 | 82 | 84 | 82 | 81 |
| 28 | -- | 42 | 50 | 49 | 50 | 50 | 64 | 76 | 82 | 85 | 83 | 79 |
| 29 | -- | 44 | 51 | 50 | -- | 52 | 67 | 74 | 83 | 86 | 85 | 78 |
| 30 | -- | 48 | 52 | 49 | -- | 55 | 68 | 71 | 85 | 84 | 86 | 79 |
| 31 | -- | -- | 52 | 50 | -- | 52 | -- | 70 | -- | 82 | 91 | -- |
| Average | 75 | -- | 47 | 47 | 46 | 49 | 56 | 71 | 78 | 83 | 84 | 80 |

## STREAMS TRIBUTARY TO LAKE ERIE--Continued

### DOAN BROOK AT CLEVELAND, OHIO

**LOCATION.**--At bridge in Rockefeller Park on Liberty Row Road, near intersection of Liberty Row Road and East Boulevard in Cleveland, Cuyahoga County, 1½ miles upstream from mouth.
**DRAINAGE AREA.**--9.6 square miles (at mouth).
**RECORDS AVAILABLE.**--Chemical analyses: March to September 1951.
**REMARKS.**--No discharge records available for this station.

Chemical analyses, in parts per million, March to September 1951

| 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 (micromhos at 25°C) | pH | Color | Oxygen consumed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Calcium, magnesium | Noncarbonate | | | | Unfiltered | Filtered |
| Mar. 8, 1951 | | 15 | 0.02 | 0.00 | 0.0 | 57 | 13 | 30 | | 110 | 99 | 42 | 0.1 | 10 | 316 | 197 | 106 | 524 | 7.4 | 7 | 6.2 | 3.1 |
| Apr. 3 | | 5.6 | .02 | .00 | .0 | 53 | 12 | 30 | | 130 | 80 | 40 | .1 | .2 | 296 | 180 | 75 | 484 | 7.8 | 5. | 7.6 | 3.5 |
| May 3 | | 2.5 | .02 | .00 | .0 | 47 | 11 | 14 | 2.2 | 116 | 54 | 28 | .2 | 1.8 | 224 | 161 | 67 | 395 | 7.2 | 12 | 7.9 | 3.6 |
| June 5 | | 2.2 | .04 | .00 | .0 | 50 | 11 | 13 | 4.4 | 135 | 54 | 27 | .2 | 3.3 | 246 | 172 | 59 | 411 | 7.2 | 3 | 3.7 | 2.9 |
| July 2, | | 3.7 | .03 | .00 | .0 | 44 | 10 | 13 | 5.1 | 120 | 41 | 24 | .1 | 5.5 | 222 | 151 | 53 | 371 | 7.0 | 2 | 6.4 | 3.7 |
| Aug. 8 | | 3.9 | .01 | .00 | .0 | 48 | 12 | 14 | 2.6 | a126 | 50 | 29 | .1 | 2.8 | 234 | 170 | 66 | 388 | 8.3 | 2 | 3.9 | 3.6 |
| Sept. 4 | | 2.3 | .02 | .00 | .0 | 42 | 10 | 17 | 2.5 | 116 | 37 | 30 | .2 | 5.5 | 227 | 146 | 51 | 357 | 7.6 | 4 | 3.7 | 3.0 |

a Includes equivalent of 5 parts per million of carbonate ($CO_3$).

Dissolved oxygen, cyanide, and phenols, March to September 1951

| 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 |
| Mar. 8, 1951 | 10:40 a.m. | | 44 | 6.7 | 10.4 | 85 | -- | 0.033 |
| Apr. 3 | 5:30 p.m. | | 42 | 5.6 | 9.9 | 78 | -- | -- |
| July 11 | 1:30 p.m. | | 74 | 23.3 | 3.0 | 35 | 0.0 | .008 |
| July 25 | 1:00 p.m. | | 76 | 24.4 | 11.5 | 136 | .0 | .003 |
| Aug. 8 | 12:30 p.m. | | 73 | 22.8 | 7.7 | 88 | .0 | .003 |
| Aug. 21 | 6:15 p.m. | | 75 | 23.9 | 2.9 | 34 | .0 | .000 |
| Sept. 4 | 3:15 p.m. | | 73 | 22.8 | 5.3 | 61 | .0 | .008 |
| Sept. 22 | 7:45 a.m. | | 67 | 19.4 | 7.2 | 78 | .0 | .010 |

STREAMS TRIBUTARY TO LAKE ERIE--Continued

EUCLID 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 to September 1951.
REMARKS.--No discharge records available for this station.

Chemical analyses, in parts per million, March to September 1951

| 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 | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed: Unfiltered | Oxygen consumed: Filtered |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mar. 8, 1951 ... | | 8.9 | 0.04 | 0.00 | 0.0 | 36 | 11 | 20 | | 44 | 84 | 31 | 0.1 | 14 | 227 | 134 | 99 | 377 | 7.0 | 15 | 4.8 | 3.6 |
| Apr. 4 ..... | | 9.6 | .04 | .00 | .0 | 36 | 9.5 | 21 | | 51 | 79 | 32 | .0 | 5.6 | 224 | 130 | 87 | 371 | 7.4 | 15 | 4.0 | 2.8 |
| May 3 ..... | | 7.6 | .06 | .00 | .0 | 54 | 17 | 25 | 3.7 | 114 | 107 | 44 | .2 | .2 | 328 | 203 | 111 | 551 | 7.1 | 20 | 4.8 | 3.0 |
| June 5 ..... | | 7.0 | .02 | .00 | .0 | 56 | 15 | 33 | 10 | 88 | 87 | 78 | .2 | 5.1 | 371 | 200 | 129 | 582 | 7.9 | 2 | 3.6 | 3.5 |
| July 2 ..... | | 7.9 | .03 | .00 | .0 | 48 | 12 | 40 | 8.2 | 54 | 72 | 101 | .2 | 1.7 | 352 | 168 | 125 | 581 | 7.5 | 4 | 6.8 | 4.4 |
| Aug. 8 ..... | | 8.6 | .03 | .00 | .0 | 57 | 15 | 41 | 6.8 | 113 | 87 | 70 | .3 | 24 | 366 | 204 | 111 | 631 | 7.3 | 8 | -- | 4.2 |
| Sept. 4 ..... | | 5.9 | .07 | .00 | .0 | 55 | 15 | 34 | 4.7 | 105 | 128 | 46 | .2 | 2.8 | 379 | 201 | 113 | 560 | 7.3 | 3 | 3.0 | 2.9 |

Dissolved oxygen, cyanide, and phenols, March to September 1951

| Date of collection | Time | Mean discharge (cfs) | Temperature °F | Temperature °C | Dissolved oxygen: Parts per million | Dissolved oxygen: Percent saturation | Cyanide (CN): Parts per million | Phenols as $C_6H_5OH$: Parts per million |
|---|---|---|---|---|---|---|---|---|
| Mar. 8, 1951 ... | 11:10 a.m. | | 44 | 6.7 | 10.6 | 86 | -- | 0.000 |
| July 11 ..... | 2:00 p.m. | | 79 | 26.1 | 1.1 | 13 | 0.0 | .008 |
| July 25 ..... | 12:45 p.m. | | 75 | 23.9 | 8.5 | 99 | .0 | .000 |
| Aug. 8 ..... | 12:05 p.m. | | 74 | 23.3 | 3.0 | 35 | .0 | .009 |
| Aug. 21 ..... | 5:45 p.m. | | 73 | 22.8 | 6.5 | 75 | .0 | .002 |
| Sept. 4 ..... | 2:30 p.m. | | 73 | 22.8 | 7.0 | 80 | .0 | .005 |
| Sept. 21 ..... | 7:45 p.m. | | 72 | 22.2 | 6.3 | 72 | .0 | .016 |

## 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 4¼ miles downstream from gaging station at Willoughby, Lake County.
DRAINAGE AREA.--267 square miles (at mouth).
RECORDS AVAILABLE.--Chemical analyses: March 1950 to September 1951.
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 1950 to September 1951 given in Water-Supply Paper 1207. No appreciable inflow between gaging station and sampling point except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed: Unfiltered | Oxygen consumed: Filtered |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 11, 1950 ... | 93 | 3.7 | 0.09 | -- | -- | 56 | 15 | 10 | | 174 | 61 | 12 | 0.1 | 0.5 | 254 | 201 | 59 | 417 | 7.8 | 6 | -- | -- |
| Nov. 9 ..... | 201 | 5.5 | .03 | -- | -- | 49 | 12 | 14 | | 142 | 59 | 14 | .1 | 5.6 | 234 | 172 | 56 | 377 | 8.0 | 4 | 3.6 | 3.6 |
| Dec. 8 ..... | 2,830 | 5.4 | .07 | 0.00 | 0.0 | 21 | 5.3 | 1.4 | | 45 | 32 | 3.8 | .2 | 1.6 | 99 | 75 | 37 | 160 | 7.6 | 16 | -- | 1.1 |
| Jan. 3, 1951 ... | 2,500 | 5.8 | .06 | .00 | .0 | 35 | 7.0 | 5.2 | | 77 | 45 | 11 | .1 | 2.1 | 154 | 116 | 53 | 252 | 7.8 | 8 | -- | 3.6 |
| Feb. 20 ..... | 827 | 6.8 | .03 | .00 | .0 | 28 | 7.0 | 1.9 | | 63 | 40 | 6.2 | .0 | .9 | 135 | 98 | 48 | 225 | 7.5 | 7 | 3.9 | 2.8 |
| Mar. 8 ..... | 683 | 5.5 | .03 | .00 | .0 | 28 | 6.8 | .7 | | 59 | 40 | 5.2 | .0 | 2.5 | 132 | 98 | 49 | 228 | 7.3 | 8 | 10 | 5.5 |
| Apr. 4 ..... | 538 | 6.1 | .10 | .00 | .0 | 33 | 6.6 | 10 | | 81 | 53 | 6.5 | .1 | 1.5 | 152 | 110 | 43 | 251 | 7.0 | 10 | 4.4 | 3.6 |
| May 3 ..... | 192 | 3.0 | .04 | .00 | .0 | 43 | 9.5 | 5.6 | 1.3 | 120 | 52 | 6.5 | .0 | .2 | 186 | 147 | 48 | 318 | 7.7 | 7 | 5.1 | 5.2 |
| June 5 ..... | 124 | 4.6 | .03 | .00 | .0 | 46 | 10 | 7.2 | 5.0 | 141 | 52 | 6.2 | .1 | 1.8 | 206 | 159 | 40 | 346 | 8.1 | 7 | 5.0 | 3.7 |
| July 2 ..... | 166 | 7.0 | .02 | .00 | .0 | 42 | 10 | 7.1 | 4.8 | 122 | 50 | 10 | .1 | 2.5 | 203 | 148 | 46 | 326 | 7.6 | 5 | 5.9 | 4.2 |
| Aug. 8 ..... | 32 | 2.4 | .01 | .00 | .0 | 55 | 9.5 | 8.9 | 3.5 | 160 | 54 | 9.8 | .1 | 2.0 | 227 | 177 | 45 | 376 | 7.9 | 5 | 3.6 | 3.6 |
| Sept. 4 ..... | 34 | 3.8 | .02 | .00 | .0 | 51 | 15 | 11 | 2.4 | 166 | 64 | 12 | .2 | 2.4 | 271 | 190 | 53 | 397 | 8.0 | 5 | 2.7 | 2.7 |

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CHAGRIN RIVER NEAR WILLOUGHBY, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, water year October 1950 to September 1951

| 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. 11, 1950 | 7:30 a. m. | 93 | 57 | 13.9 | 7.7 | 74 | -- | -- |
| Nov. 9 | 8:20 a. m. | 201 | 51 | 10.6 | 10.0 | 89 | -- | -- |
| Feb. 20, 1951 | 5:50 p. m. | 827 | 38 | 3.3 | -- | -- | -- | 0.005 |
| Mar. 8 | 11:45 a. m. | 683 | 44 | 6.7 | 10.9 | 89 | -- | .000 |
| July 11 | 3:00 p. m. | 66 | 80 | 26.7 | 8.8 | 108 | 0.0 | .010 |
| July 25 | 12:15 p. m. | 48 | 74 | 23.3 | 5.8 | 67 | .0 | .002 |
| Aug. 8 | 11:30 a. m. | 32 | 71 | 21.7 | 5.3 | 60 | .0 | .005 |
| Aug. 21 | 5:15 p. m. | 23 | 76 | 24.4 | 9.5 | 112 | .0 | .003 |
| Sept. 4 | 1:45 p. m. | 34 | 72 | 22.2 | 7.7 | 88 | .0 | .007 |
| Sept. 21 | 6:30 p. m. | 32 | 71 | 21.7 | 8.6 | 97 | .0 | .008 |

## GRAND RIVER AT PAINESVILLE, OHIO

LOCATION.--At bridge on State Highway 535 in Painesville, Lake County, 2¼ miles upstream from mouth, and 8 miles downstream from Kellogg Creek.
DRAINAGE AREA.--712 square miles (at mouth).
RECORDS AVAILABLE.--Chemical analyses: March 1950 to September 1951.
Water temperatures: March 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 7,830 ppm Aug. 1-10; minimum, 430 ppm Dec. 1-10.
Hardness: Maximum, 3,600 ppm Oct. 21-31; minimum, 206 ppm Dec. 1-10.
Specific conductance: Maximum daily, 17,200 micromhos Oct. 28; minimum daily 309 micromhos Dec. 8.
Water temperatures: Maximum, 88°F July 28, Aug. 15; minimum, freezing point Nov. 24, 25, Jan. 7, 9.
EXTREMES, March 1950 to September 1951.--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, 201 ppm Mar. 21-31, 1950.
Specific conductance: Maximum daily, 26,800 micromhos Aug. 9, 1950; minimum daily, 309 micromhos Dec. 8.
Water temperatures: Maximum, 88°F July 28, Aug. 15, 1951; minimum, freezing point on several days in March and November, 1950, and January 1951.
REMARKS.--Records of specific conductance of daily samplss from March 1950 to September 1951 available in district office at Columbus, Ohio. Discharge records reported are for gaging station near Madison, drainage area 587 square miles. Discharge records for gaging station near Madison for water year October 1950 to September 1951 given in Water-Supply Paper 1207. There is some inflow between gaging station and sampling station.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed: Unfiltered | Oxygen consumed: Filtered |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 1-10, 1950 .. | 16 | 2.7 | 0.28 | 0.00 | 0.1 | 836 | 27 | 1,100 | | 68 | 94 | 3,150 | 0.2 | 0.4 | 5,330 | 2,200 | 2,140 | 8,960 | 7.5 | 16 | 11 | 8.6 |
| Oct. 11-20 ..... | 129 | 5.1 | .20 | .40 | .1 | 980 | 27 | 1,060 | | 42 | 99 | 3,350 | .1 | .2 | 5,620 | 2,560 | 2,520 | 9,390 | 7.6 | 12 | 10 | 8.6 |
| Oct. 21-31 ..... | 34 | 4.8 | .20 | .90 | .0 | 1,400 | 26 | 1,430 | | a18 | 112 | 4,650 | .1 | .0 | 7,800 | 3,600 | 3,570 | 12,600 | 8.6 | 12 | 11 | 8.8 |
| Nov. 1-5 ..... | 131 | 6.2 | .68 | .30 | .1 | 1,200 | 9.7 | 1,180 | 16 | 36 | 94 | 3,900 | .0 | .4 | 6,790 | 3,040 | 3,000 | 11,100 | 7.3 | 7 | 8.4 | 7.1 |
| Nov. 6-10 ..... | 426 | 6.2 | .60 | .20 | .0 | 456 | 15 | 400 | 16 | 53 | 67 | 1,450 | .0 | 1.6 | 2,920 | 1,200 | 1,160 | 4,510 | 7.6 | 20 | 6.8 | 5.0 |
| Nov. 11-20 ..... | 445 | 8.8 | .40 | .20 | .1 | 832 | 9.7 | 830 | 4.6 | b24 | 88 | 2,800 | .0 | .4 | 5,010 | 2,120 | 2,080 | 8,290 | 8.4 | 8 | 7.4 | 5.9 |
| Nov. 21-30 ..... | 1,890 | 5.9 | .30 | .20 | .1 | 142 | 17 | 186 | 4.0 | 54 | 54 | 550 | .0 | 1.8 | 1,180 | 424 | 380 | 1,680 | 7.7 | 15 | 7.4 | 5.5 |
| Dec. 1-10 ..... | 5,360 | 6.7 | .06 | .10 | .0 | 74 | 5.3 | 60 | 2.6 | 54 | 38 | 186 | .2 | .4 | 430 | 206 | 162 | 763 | 7.5 | 22 | 9.6 | 9.0 |
| Dec. 11-20 ..... | 290 | 7.4 | .16 | 1.4 | .1 | 552 | 4.9 | 492 | 4.0 | 54 | 79 | 1,650 | .4 | 1.0 | 2,920 | 1,400 | 1,350 | 5,180 | 7.9 | 40 | 9.2 | 7.6 |
| Dec. 21-31 ..... | 146 | 11 | .16 | .90 | .1 | 720 | 9.7 | 764 | 8.4 | c14 | 100 | 2,400 | .2 | .2 | 4,260 | 1,840 | 1,800 | 7,120 | 8.7 | 22 | 9.8 | 9.6 |
| Jan. 1-3, 9-10,1951 | 854 | 8.9 | .40 | .60 | .1 | 480 | 34 | 568 | 5.2 | 32 | 77 | 1,650 | .0 | .4 | 3,240 | 1,340 | 1,310 | 5,480 | 7.6 | 7 | 10 | 4.1 |
| Jan. 4-8 ..... | 5,980 | 5.3 | .05 | .14 | .1 | 78 | 5.8 | 64 | 2.6 | 44 | 33 | 206 | .0 | 1.5 | 461 | 220 | 182 | 822 | 7.3 | 20 | 8.3 | 5.3 |
| Jan. 11-20 ..... | 1,470 | 8.1 | .03 | .30 | .0 | 260 | 2.4 | 263 | | 46 | 61 | 800 | .0 | .5 | 1,710 | 660 | 621 | 2,700 | 7.8 | 13 | 5.3 | 5.1 |
| Jan. 21-31 ..... | 760 | 6.8 | .10 | .40 | .0 | 372 | 9.7 | 380 | | d34 | 67 | 1,200 | .0 | .3 | 2,520 | 975 | 937 | 3,870 | 8.3 | 9 | 6.1 | 5.8 |
| Feb. 1-10 ..... | 181 | 19 | .10 | .40 | .1 | 656 | 39 | 763 | 15 | e16 | 88 | 2,400 | .1 | .6 | 4,600 | 1,800 | 1,760 | 7,030 | 9.3 | 3 | 7.3 | 7.0 |
| Feb. 11-20 ..... | 3,630 | 8.9 | .10 | .10 | .1 | 146 | 3.9 | 134 | 6.5 | 52 | 41 | 412 | .1 | 2.0 | 780 | 380 | 338 | 1,500 | 7.4 | 7 | 6.9 | 5.2 |
| Feb. 21-28 ..... | 2,820 | 8.1 | .05 | .20 | .1 | 149 | 3.9 | 127 | 6.6 | 44 | 41 | 410 | .1 | 1.2 | 769 | 388 | 352 | 1,460 | 7.9 | 7 | 7.0 | 5.4 |

a Includes equivalent of 10 parts per million of carbonate ($CO_3$).
b Includes equivalent of 12 parts per million of carbonate ($CO_3$).
c Includes equivalent of 14 parts per million of carbonate ($CO_3$).
d Includes equivalent of 2 parts per million of carbonate ($CO_3$).
e Includes equivalent of 13 parts per million of carbonate ($CO_3$).

## STREAMS TRIBUTARY TO LAKE ERIE--Continued

### GRAND RIVER AT PAINESVILLE, OHIO--Continued

Chemical analyses, in parts per million, water year October 1950 to September 1951--Continued

| 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 | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed: Unfiltered | Oxygen consumed: Filtered |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mar. 1-10, 1951.. | 2,600 | 6.7 | 0.15 | 0.10 | 0.0 | 138 | 5.8 | | 121 | 36 | 41 | 395 | 0.0 | 1.2 | 881 | 368 | 339 | 1,430 | 7.3 | 7 | 9.4 | 5.7 |
| Mar. 11-20 ..... | 2,000 | 6.4 | .05 | .20 | .0 | 260 | 4.9 | | 230 | 46 | 49 | 765 | .1 | 1.0 | 1,480 | 670 | 631 | 2,540 | 7.9 | 10 | 6.8 | 5.2 |
| Mar. 21-31 ..... | 2,780 | 8.8 | .05 | .20 | .0 | 112 | 4.9 | 111 | 5.3 | 44 | 37 | 328 | .1 | 1.2 | 878 | 300 | 264 | 1,260 | 8.1 | 15 | 6.6 | 4.8 |
| Apr. 1-10 ..... | 1,430 | 7.9 | .62 | .30 | .1 | 212 | 4.9 | 190 | 1.1 | f32 | 47 | 625 | .1 | 1.0 | 1,560 | 550 | 508 | 2,200 | 8.5 | 10 | 6.4 | 4.8 |
| Apr. 11-20 ..... | 1,640 | 6.3 | .05 | .20 | .0 | 190 | 7.3 | 180 | 2.0 | 50 | 46 | 549 | .1 | 1.0 | 1,150 | 506 | 463 | 1,910 | 7.9 | 7 | 7.2 | 5.3 |
| Apr. 21-30 ..... | 857 | 7.5 | .05 | .20 | .0 | 336 | 7.3 | 285 | 7.1 | 48 | 51 | 980 | .1 | .8 | 1,860 | 870 | 829 | 3,180 | 7.9 | 7 | 6.0 | 5.1 |
| May 1-10 ..... | 209 | 5.9 | .10 | .80 | .0 | 600 | 7.3 | 574 | 16 | g35 | 68 | 1,880 | .2 | .2 | 3,670 | 1,530 | 1,490 | 5,700 | 8.3 | 10 | 6.0 | 4.9 |
| May 11-20 ..... | 804 | 18 | .10 | h2.0 | .1 | 408 | 19 | 375 | 3.0 | 58 | 80 | 1,300 | .2 | .4 | 2,392 | 1,100 | 1,048 | 4,130 | 7.5 | 40 | 6.2 | 6.6 |
| May 21-31 ..... | 81 | 11 | .30 | .30 | .0 | 996 | 9.7 | 961 | 7.7 | b18 | 82 | 3,200 | .2 | .2 | 5,606 | 2,530 | 2,490 | 9,250 | 8.8 | 15 | 7.2 | 6.4 |
| June 1-10..... | 57 | 9.1 | .20 | .15 | .0 | 960 | 39 | 1,078 | 12 | g42 | 86 | 3,500 | .4 | .5 | 6,068 | 2,560 | 2,515 | 9,760 | 8.1 | 20 | 7.2 | 7.5 |
| June 11-20 ..... | 184 | 5.1 | .10 | .40 | .0 | 944 | 49 | 925 | 11 | 50 | 73 | 3,150 | .2 | .5 | 5,636 | 2,560 | 2,516 | 8,850 | 7.8 | 20 | 6.6 | 6.6 |
| June 21-30..... | 38 | 12 | .10 | .40 | .0 | 1,120 | 49 | 1,165 | 13 | j26 | 86 | 3,850 | .2 | .4 | 6,970 | 3,000 | 2,956 | 10,540 | 8.7 | 10 | 8.6 | 7.5 |
| July 1-10 ..... | 177 | 9.8 | .30 | .60 | .1 | 704 | 19 | 774 | 10 | 46 | 68 | 2,500 | .2 | .3 | 4,620 | 1,840 | 1,797 | 7,120 | 8.1 | 20 | 6.8 | 6.8 |
| July 11-20 ..... | 38 | 14 | .10 | .50 | .0 | 1,024 | 2.4 | 1,040 | 6.2 | k27 | 74 | 3,300 | .1 | .5 | 5,822 | 2,570 | 2,529 | 9,200 | 8.3 | 7 | 6.5 | 6.4 |
| July 21-31 ..... | 17 | 13 | .10 | .40 | .0 | 1,208 | 4.9 | 1,093 | 4.3 | 53 | 74 | 3,700 | .0 | .3 | 6,568 | 3,040 | 2,991 | 10,200 | 7.7 | 5 | 6.8 | 6.9 |
| Aug. 1-10..... | 12 | 11 | .20 | .06 | .0 | 1,327 | 14 | 1,389 | 7.1 | j52 | 89 | 4,410 | .0 | .2 | 7,830 | 3,376 | 3,308 | 12,300 | 8.3 | 3 | 15 | 9.3 |
| Aug. 11-20 ..... | 9.0 | 18 | .10 | .10 | .0 | 1,112 | 9.7 | 1,106 | 4.3 | 86 | 84 | 3,530 | .0 | .1 | 6,394 | 2,820 | 2,744 | 9,790 | 7.9 | 5 | 6.6 | 6.8 |
| Aug. 21-31 ..... | 6.1 | 5.2 | .10 | .10 | .0 | 1,278 | 14 | 1,265 | 6.0 | g61 | 85 | 4,110 | .0 | .2 | 7,386 | 3,252 | 3,190 | 11,400 | 8.0 | 5 | 6.9 | 7.0 |
| Sept. 1-10 ..... | 4.3 | 5.1 | .05 | .00 | .0 | 1,320 | 39 | 1,220 | 22 | 68 | 90 | 4,150 | .0 | .3 | 7,494 | 3,460 | 3,398 | 11,500 | 7.1 | 5 | 6.6 | 6.8 |
| Sept. 11-20 ..... | 24 | 6.6 | .02 | .00 | .0 | 1,360 | 39 | 1,160 | | 62 | 97 | 4,200 | .1 | .6 | 7,220 | 3,560 | 3,503 | 11,300 | 7.0 | 2 | 7.6 | 7.4 |
| Sept. 21-30 ..... | 8.1 | 4.7 | .05 | .00 | .0 | 1,258 | 39 | 1,155 | | 78 | 96 | 4,000 | .1 | .6 | 6,878 | 3,300 | 3,230 | 10,800 | 7.1 | 5 | 7.4 | 8.2 |
| Average..... | 919 | 8.5 | 0.16 | 0.36 | 0.0 | 689 | 17 | 693 | | m45 | 71 | 2,252 | 0.1 | 0.6 | 4,055 | 1,789 | 1,747 | 6,500 | -- | 12 | 7.8 | 6.6 |

b Includes equivalent of 12 parts per million of carbonate ($CO_3$).
f Includes equivalent of 9 parts per million of carbonate ($CO_3$).
g Includes equivalent of 4 parts per million of carbonate ($CO_3$).
h Composite includes 17 parts per million of chromium (Cr) on May 16.
j Includes equivalent of 11 parts per million of carbonate ($CO_3$).
k Includes equivalent of 8 parts per million of carbonate ($CO_3$).
m Includes equivalent of 3 parts per million of carbonate ($CO_3$).

STREAMS TRIBUTARY TO LAKE ERIE --Continued

GRAND RIVER AT PAINESVILLE, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, water year October 1950 to September 1951

| 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. 11, 1950..... | 8:12 a.m. | 21 | 71 | 21.7 | 6.5 | 73 | -- | -- |
| Oct. 24..... | 3:30 p.m. | 31 | 67 | 19.4 | 7.1 | 76 | -- | 0.08 |
| Nov. 9..... | 9:30 a.m. | 220 | 55 | 12.8 | 9.8 | 92 | 0.0 | .02 |
| Nov. 21..... | 9:00 a.m. | 7,480 | 43 | 6.1 | 11.6 | 93 | .0 | .00 |
| Mar. 8, 1951..... | 12:20 p.m. | 2,540 | 44 | 6.7 | 11.2 | 91 | -- | .000 |
| May 16 ..... | 8:30 a.m. | 630 | 66 | 18.9 | 12.8 | 137 | .0 | .002 |
| July 2..... | 10:30 a.m. | 73 | 75 | 23.9 | 8.1 | 95 | .0 | .000 |
| July 12 ..... | 8:30 a.m. | 52 | 85 | 29.4 | 5.8 | 75 | .0 | .025 |
| July 25 ..... | 11:45 a.m. | 22 | 83 | 28.3 | 5.6 | 71 | .0 | .009 |
| Aug. 8..... | 11:00 a.m. | 18 | 83 | 28.3 | 4.0 | 51 | .0 | .026 |
| Aug. 21..... | 4:30 p.m. | 7.7 | 79 | 26.1 | -- | -- | .0 | .008 |
| Sept. 4..... | 12:30 p.m. | 4.0 | 82 | 27.8 | 5.5 | 69 | .0 | .049 |
| Sept. 21 ..... | 6:00 p.m. | 10 | 79 | 26.1 | 10.4 | 127 | .0 | .024 |

Temperature (°F) of water, water year October 1950 to September 1951

| Day | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 70 | 70 | 34 | 44 | 40 | 43 | 47 | 62 | 78 | 81 | 84 | 82 |
| 2 | 74 | 71 | 36 | 44 | 39 | 40 | 44 | -- | 80 | 78 | 83 | 81 |
| 3 | 72 | 67 | 36 | 37 | 40 | 43 | 45 | 67 | 79 | 82 | 86 | 80 |
| 4 | 70 | 61 | 34 | 37 | 41 | 43 | 43 | 64 | 80 | 83 | 79 | 80 |
| 5 | 70 | 53 | 34 | 37 | 42 | 41 | 44 | 61 | 75 | 73 | 84 | 82 |
| 6 | 71 | 49 | 35 | 36 | 41 | 43 | 49 | 62 | 76 | 75 | 83 | 84 |
| 7 | 72 | 52 | 34 | 32 | 40 | 45 | 49 | 63 | 75 | 76 | 84 | 76 |
| 8 | 73 | 54 | 33 | 34 | 34 | 45 | 55 | 62 | 74 | 77 | 83 | 71 |
| 9 | 74 | 57 | 34 | 32 | 38 | 44 | 53 | 68 | 74 | 78 | 86 | 79 |
| 10 | 70 | 51 | 34 | 38 | 35 | 42 | 49 | 69 | 75 | 80 | 86 | 78 |
| 11 | 71 | 49 | 35 | 38 | 37 | 45 | 50 | 65 | 76 | 83 | 84 | 78 |
| 12 | 67 | 47 | 36 | 38 | 37 | 41 | 51 | 55 | 78 | 85 | 86 | 80 |
| 13 | 63 | 48 | 36 | 40 | 35 | 45 | 43 | 55 | 76 | 83 | 78 | 82 |
| 14 | 61 | 49 | 36 | 41 | 33 | 41 | 45 | 58 | 75 | 83 | 86 | 76 |
| 15 | 58 | 52 | 39 | 38 | 36 | 40 | 47 | 62 | 75 | 81 | 88 | 78 |
| 16 | 59 | 57 | 40 | 38 | 36 | 39 | 46 | 65 | 73 | 84 | 87 | 79 |
| 17 | 61 | 54 | 38 | 37 | 36 | 38 | 45 | 70 | 77 | 82 | 86 | 78 |
| 18 | 65 | 47 | 40 | 38 | 35 | 39 | 45 | 68 | 78 | -- | 78 | 79 |
| 19 | 67 | 48 | 41 | 38 | 36 | 38 | 50 | 68 | 77 | 83 | 74 | 80 |
| 20 | 66 | 51 | 43 | 38 | 37 | 36 | 49 | 71 | 78 | 81 | 84 | 80 |
| 21 | 67 | 43 | 42 | 37 | 40 | 35 | 52 | 78 | 80 | 83 | 85 | 78 |
| 22 | 70 | 41 | 40 | 35 | 37 | 38 | 57 | 74 | 81 | 81 | 79 | 79 |
| 23 | 70 | 40 | 43 | 35 | 38 | 36 | 50 | 72 | 79 | 84 | 82 | 79 |
| 24 | 68 | 32 | 44 | 37 | 37 | 40 | 55 | 71 | 83 | 82 | 80 | 78 |
| 25 | 67 | 32 | 40 | 35 | 37 | 39 | 53 | 70 | 83 | 78 | 79 | 78 |
| 26 | 67 | 34 | 40 | 37 | 43 | 38 | 56 | 73 | 81 | 81 | 82 | 75 |
| 27 | 67 | 34 | 40 | 39 | 44 | 38 | 53 | 70 | 82 | 86 | 80 | 76 |
| 28 | 67 | 35 | 40 | 38 | 41 | 44 | 60 | 71 | 84 | 88 | 83 | 69 |
| 29 | 70 | 34 | 42 | 39 | -- | 47 | 63 | 71 | 87 | 86 | 86 | 67 |
| 30 | 70 | 34 | 42 | 39 | -- | 44 | 62 | 73 | 83 | 85 | 85 | 73 |
| 31 | 62 | -- | 42 | 40 | -- | 47 | -- | 75 | -- | 84 | 82 | -- |
| Average | 68 | 48 | 38 | 38 | 38 | 41 | 50 | 67 | 78 | 82 | 83 | 78 |

## ASHTABULA RIVER AT ASHTABULA, OHIO

LOCATION.--At Main Street bridge in Ashtabula, Ashtabula County, 1½ miles downstream from Hubbard Run, 2½ miles downstream from gaging station near Ashtabula, and 3 miles above mouth.
DRAINAGE AREA.--118 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: Intermittently March 1950 to September 1951.
REMARKS.--Discharge records for gaging station near Ashtabula for water year October 1950 to September 1951 given in Water-Supply Paper 1207. No appreciable inflow between gaging station and sampling point except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed: Unfiltered | Oxygen consumed: Filtered |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 3, 1950 .... | 3.7 | 2.5 | 0.48 | 0.00 | 0.0 | 44 | 10 | 34 | | 92 | 91 | 38 | 0.1 | 2.1 | 302 | 151 | 76 | 436 | 7.2 | 550 | 55 | 46 |
| Dec. 18 ..... | 60 | 6.4 | .05 | .00 | .0 | 27 | 6.3 | 10 | | 48 | 55 | 13 | .0 | .8 | 154 | 94 | 54 | 243 | 7.5 | 15 | 7.0 | 5.2 |
| Jan. 25, 1951 .. | 150 | 4.7 | .02 | .01 | .0 | 32 | 5.8 | 17 | | a72 | 48 | 21 | .2 | .5 | 172 | 104 | 44 | 272 | 8.8 | 28 | -- | -- |
| Mar. 23 ..... | 410 | 4.1 | .10 | .00 | .1 | 20 | 3.4 | 4.8 | | 25 | 30 | 14 | .0 | 3.4 | 110 | 64 | 43 | 191 | 6.9 | 150 | 14 | 11 |
| Apr. 24 ..... | 272 | 3.5 | .08 | .02 | .0 | 15 | 3.6 | 3.2 | 1.8 | 33 | 29 | 3.0 | .1 | .5 | 90 | 52 | 25 | 124 | 7.1 | 40 | 12 | 10 |
| June 12 ..... | 7.7 | 9.1 | .87 | .00 | .0 | 66 | 10 | 72 | 9.9 | 176 | 88 | 102 | .2 | 1.0 | 483 | 205 | 62 | 783 | 7.8 | 200 | 63 | 35 |
| July 25 ..... | .5 | 7.3 | .04 | .04 | .0 | 72 | 16 | 59 | 8.0 | b174 | 138 | 74 | .1 | 1.5 | 473 | 244 | 103 | 763 | 8.2 | 200 | 48 | 28 |
| Sept. 12 ..... | 0 | 5.2 | .15 | .00 | .0 | 69 | 18 | 141 | 5.4 | 130 | 161 | 198 | .5 | 2.0 | 676 | 245 | 140 | 1,130 | 7.2 | 120 | 17 | 15 |

a Includes equivalent of 10 parts per million of carbonate ($CO_3$).
b Includes equivalent of 5 parts per million of carbonate ($CO_3$).

## STREAMS TRIBUTARY TO LAKE ERIE--Continued

### CONNEAUT CREEK AT AMBOY, OHIO

LOCATION.--At gaging station at highway bridge, half a mile east of Amboy, Ashtabula County, 3 miles southwest of Conneaut, and about 6 miles above mouth.
DRAINAGE AREA.--178 square miles.
RECORDS AVAILABLE.--Chemical analyses: Intermittently March 1950 to September 1951.

Chemical analyses, in parts per million, water year October 1950 to September 1951

| 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 | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Oxygen consumed: Unfiltered | Oxygen consumed: Filtered |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 3, 1950 .... | 20 | 1.0 | 0.02 | 0.00 | 0.0 | 33 | 9.6 | 15 | | 96 | 53 | 15 | 0.1 | 0.0 | 185 | 122 | 43 | 314 | 8.0 | 3 | 3.1 | 2.5 |
| Dec. 19 ..... | 100 | 6.7 | .08 | .00 | .0 | 29 | 8.5 | 3.5 | | 67 | 43 | 10 | .1 | 1.2 | 141 | 107 | 52 | 236 | 7.6 | 5 | -- | 2.5 |
| Jan. 25, 1951 ... | 318 | 5.5 | .03 | .00 | .0 | 21 | 4.6 | 3.4 | | 45 | 33 | 4.8 | .0 | 1.0 | 103 | 72 | 34 | 160 | 7.6 | 8 | -- | 4.0 |
| Mar. 23 ..... | 456 | 4.1 | .05 | .00 | .1 | 17 | 4.6 | 2.8 | | 38 | 30 | 3.0 | .1 | .5 | 89 | 61 | 30 | 151 | 7.3 | 8 | 4.5 | 3.8 |
| Apr. 25 ..... | 287 | 4.1 | .07 | .00 | .0 | 17 | 3.2 | 2.2 | 1.2 | 38 | 26 | 3.2 | .2 | 1.2 | 86 | 55 | 24 | 128 | 7.2 | 25 | 5.8 | 5.8 |
| June 12 ..... | 29 | 1.5 | .03 | .00 | .0 | 39 | 8.5 | 8.5 | 4.4 | 112 | 52 | 8.2 | .1 | .4 | 180 | 133 | 40 | 309 | 7.7 | 7 | 4.4 | 4.2 |
| July 25 ..... | 16 | 2.3 | .03 | .00 | .0 | 40 | 8.7 | 8.8 | 2.4 | 110 | 55 | 10 | .1 | 1.0 | 192 | 137 | 45 | 323 | 7.8 | 5 | 4.8 | 4.2 |
| Sept. 13 ..... | 12 | 1.5 | .04 | .00 | .0 | 46 | 12 | 23 | 2.9 | 118 | 74 | 34 | .1 | .4 | 272 | 164 | 67 | 429 | 7.8 | 6 | 3.4 | 3.1 |

# INDEX

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