

# Quality of Surface Waters of the United States 1953

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



**UNITED STATES DEPARTMENT OF THE INTERIOR**

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# QUALITY OF SURFACE WATERS OF THE UNITED STATES, 1953

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## PARTS 1-4

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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, 1952, to September 30, 1953. Descriptive statements are given for each sampling station for which regular series of chemical analyses or sediment determinations have been made. These statements include the location of the stream-sampling station, drainage area, length of time for which records are available, extremes of dissolved solids, hardness, sediment loads, water temperature, and other pertinent data.

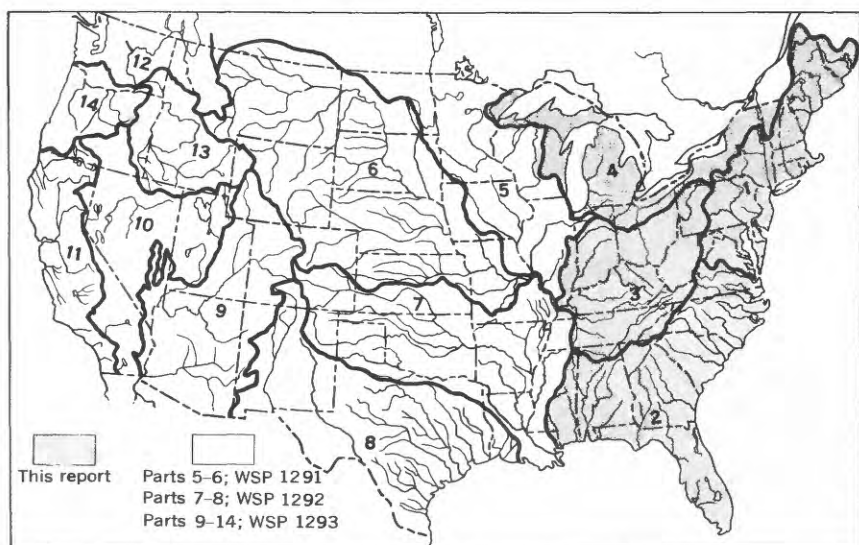


Figure 1. Map of the United States showing basins covered by the four water-supply papers on quality of surface waters in 1953. The shaded portion represents the section of the country covered by this volume; the unshaded portion represents the section of the country covered by other water-supply papers.

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.

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, 1953, 75 regular sampling stations on 51 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 117 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 22.

Quantities of suspended sediment are reported for 41 stations during the year ended September 30, 195 . The sediment samples were collected one or more times daily at most stations, depending on the rate of flow and changes in stage of the stream. Sediment samples were collected less frequently during the year at many other points. In connection with measurements of sediment discharge, sizes of sediment particles were determined at 25 of the stations. As noted under "Remarks" in the table headings, suspended-sediment concentrations also were determined from the samples collected for chemical analyses 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 analyses 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 sediment loads for missing days in an otherwise continuous period of sampling have been included in monthly and annual totals for most streams to provide a complete record.

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

## TEMPERATURE

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

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

## EXPRESSION OF RESULTS

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

Constituent	Factor	Constituent	Factor
Iron ( $\text{Fe}^{++}$ ) . . . . .	0.0358	Carbonate ( $\text{CO}_3^{--}$ ) . . .	0.0333
Iron ( $\text{Fe}^{+++}$ ) . . . . .	.0537	Bicarbonate ( $\text{HCO}_3^{-}$ ) .	.0164
Calcium ( $\text{Ca}^{++}$ ) . . . . .	.0499	Sulfate ( $\text{SO}_4^{--}$ ) . . . . .	.0208
Magnesium ( $\text{Mg}^{++}$ ) . . .	.0822	Chloride ( $\text{Cl}^{-}$ ) . . . . .	.0282
Sodium ( $\text{Na}^{+}$ ) . . . . .	.0435	Fluoride ( $\text{F}^{-}$ ) . . . . .	.0526
Potassium ( $\text{K}^{+}$ ) . . . . .	.0256	Nitrate ( $\text{NO}_3^{-}$ ) . . . . .	.0161

Results given in parts per million can be converted to grains per United States gallon by dividing by 17.12. A calculated quan-

tity of sodium and potassium is given in some analyses and is the quantity of sodium needed in addition to the calcium and magnesium to balance the acid constituents.

The hardness, as calcium carbonate ( $\text{CaCO}_3$ ), 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 is 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 moderate to high concentration, the proportion of potassium is much smaller than that of sodium.

Specific conductance values are expressed in reciprocal ohms times  $10^6$  (micromhos at  $25^\circ\text{C}$ ). The discharge of the streams is reported in cubic feet-per second (see Stream Flow, p. 22) 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 is expressed in terms of pH units. By definition the pH value of a solution is the negative logarithm of the concentration of gram ions of hydrogen. However, the pH meter which is generally used in Survey laboratories, determines the activity of the hydrogen ions as distinguished from concentration.

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

Mean daily sediment concentrations are expressed in parts per million by weight. A part per million of sediment is computed as

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

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

## COMPOSITION OF SURFACE WATERS

All natural waters contain dissolved mineral matter. Water in contact with soils or rock, even for only a few hours, will dissolve some rock materials. The quantity of dissolved mineral matter in a natural water depends primarily on the type of rocks or soils through which the water has passed and the length of time it has been in contact with the rocks or soils. Some streams are fed by both surface runoff and underground water from springs or seeps. Such streams reflect the chemical character of their concentrated underground sources during dry periods and are more dilute during periods of heavy rainfall. Underground water is usually more highly concentrated than surface runoff as it remains in contact with the rocks and soils for much longer periods. The concentration of dissolved solids in a river water is frequently increased by drainage from mines or oil fields, by the addition of industrial or municipal wastes, or--in irrigated regions--by return drain waters.

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

## MINERAL CONSTITUENTS IN SOLUTION

Silica ( $\text{SiO}_2$ )

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

## Aluminum (Al)

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

## Manganese (Mn)

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

## Iron (Fe)

Iron is dissolved from many rocks and soils. On exposure to the air, normal basic waters that contain more than 1 part per

million of iron soon become turbid with the insoluble reddish ferric oxide produced by oxidation. Surface waters, therefore, seldom contain as much as 1 part per million of dissolved iron, although some acid waters carry large quantities of iron in solution. Iron causes reddish-brown stains on white porcelain or enameled ware and fixtures and on fabrics washed in the water.

### Calcium (Ca)

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

### Magnesium (Mg)

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

### Sodium and potassium (Na and K)

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

### Carbonate and bicarbonate ( $\text{CO}_3$ and $\text{HCO}_3$ )

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 ( $\text{SO}_4$ )

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 increasing 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 ( $\text{NO}_3$ )

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  $\text{NO}_3$ ) 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  $\text{NO}_3$ ) 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  $\text{NO}_3$ ) 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  $\text{NO}_3$ ) 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 dis-



solved 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 units usually passes unnoticed. Some swamp waters have natural color of 200 to 300 units or more.

### Hydrogen-ion concentration (pH)

The degree of acidity or alkalinity of water, as indicated by the hydrogen-ion concentration, expressed as pH, is related to the corrosive properties of water, and is useful in determining the proper treatment for coagulation that may be necessary at water-treatment plants. A pH value of 7.0 indicates that the water is neither acid nor alkaline. Waters having pH values progressively lower than 7.0 denote increasing acidity, whereas values progressively higher than 7.0 denote increasing alkalinity (see p. 7 ). The pH of most natural surface waters ranges between 6

and 8. Some alkaline surface waters have pH values greater than 8.0, and waters containing free mineral acid usually have pH values less than 4.5.

### Specific conductance (micromhos at 25°C)

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

### Hardness

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

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

### Total acidity

The total acidity of a natural water represents the content of free carbon dioxide, mineral acids, and salts--especially sulfates

of iron and aluminum-- that hydrolyze to give hydrogen ions. Acid waters are very corrosive and generally contain excessive amounts of objectionable constituents, such as iron, aluminum, and manganese.

### Corrosiveness

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

### Percent sodium

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

### Sodium-adsorption-ratio

Sodium-adsorption-ratio (SAR) is the relative proportion of sodium to other cations in an irrigation water.

$$SAR = \frac{Na^+}{\sqrt{(Ca^{++} + Mg^{++})/2}}$$

where the ionic concentrations are expressed in milliequivalents per liter (or equivalents per million for most irrigation waters).

The term is used for soil extracts and irrigation waters to ex-

press the relative activity of sodium ions in exchange reactions with soil. SAR provides an estimate of the sodium or alkali hazard and reportedly is more significant for interpreting water quality than percent sodium because it relates more directly to the exchangeable sodium percentage the soil will attain when it and the water are in equilibrium.

The U. S. Salinity Laboratory diagram for classifying waters for irrigation divides water into four classes with respect to sodium hazard, the dividing points being at SAR values of 10, 18, and 26. They range from low-sodium water that can be used for irrigation on almost all soils to very high-sodium water which is generally unsatisfactory for irrigation.

### SEDIMENT

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

The quantity of sediment, transported or available for transportation, is affected by climatic conditions, form or nature of precipitation, vegetal cover, topography, and land use. An important property of fluvial sediment is the fall velocity of the particles in transport. Particle sizes, as determined by various methods, represent mechanical diameters, which are related to sedimentation diameters indirectly. Sediment particles in the sand-size (larger than 0.062 mm) range do not appear to be affected by flocculation or dispersion resulting from the mineral constituents in solution. The sedimentation diameter of clay and silt particles in suspension may vary considerably from point to point in a stream or reservoir, depending on the mineral matter in solution and in suspension and the degree of turbulence present. The size of sediment particles in transport at any point depends on the type of erodible and soluble material in the drainage area, the degree of flocculation present, time in transport, and characteristics of the transporting flow. The flow characteristics include velocity of water, turbulence, and the depth, width, and roughness of the channel. As a result of these variable charac-

teristics, the size of particles transported, as well as the total sediment load, is in constant adjustment with the characteristics and physical features of the stream and drainage area.

## PUBLICATIONS

Reports giving chemical analyses, suspended-sediment loads, and water temperatures of samples of surface water made by the Geological Survey have been published yearly since 1941. Records for the years ended September 30, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, and 1952, for many of the stations listed in this report are given in Water-Supply Papers 942, 950, 970, 1022, 1030, 1050, 1102, 1132, 1162, 1186, 1197, and 1250.

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 south-eastern Kansas, 1911.
- \* 274. Some stream waters of the western United States, with chapters on sediment carried by the Rio Grande and the industrial application of water analyses, 1911.
- \* 339. Quality of the surface waters of Washington, 1914.
- \* 363. Quality of the surface waters of Oregon, 1914.
- \* 418. Mineral springs of Alaska, with a chapter on the chemical character of some surface waters of Alaska, 1917.
- \* 596-B. Quality of water of Colorado River in 1925-26, 1928.
- \* 596-D. Quality of water of Pecos River in Texas, 1928.
- \* 596-E. Quality of the surface waters of New Jersey, 1928.
- \* 636-A. Quality of water of the Colorado River in 1926-28, 1930.
- \* 636-B. Suspended matter in the Colorado River in 1925-28, 1930.
- \* 638-D. Quality of water of the Colorado River in 1928-30, 1932.
- \* 839. Quality of water of the Rio Grande basin above Fort Quitman, Tex., 1938.
- \* 889-E. Chemical character of surface water of Georgia, 1944.
- \* 998. Suspended sediment in the Colorado River, 1925-41, 1947.
- 1048. Discharge and sediment loads in the Boise River drainage basin, Idaho, 1939-40, 1948.
- 1110-C. Quality of water of Conchas Reservoir, New Mexico, 1939-49, 1952.

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

## COOPERATION

The table on p. 19-21 lists State and local agencies that cooperated in quality-of-water investigations in the drainage basins included in this volume. The locations of quality-of-water district offices responsible for the data collected in the drainage basins are given in the table, also.

In addition to these cooperative programs, many of the stations were operated from funds appropriated directly to the Geological Survey for quality-of-water investigations.

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

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

State	Cooperating agency	Drainage basin	District office
North Carolina	North Carolina Department of Conservation and Development, George R. Ross, director. <sup>a</sup>	South Atlantic slope and Eastern Gulf of Mexico.	P. O. Box 2857, Post Office Building, Raleigh, N. C.
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, Andrew J. Sordoni, secretary. Pennsylvania Department of Forests and Waters, Samuel S. Lewis, secretary.	North Atlantic slope, Ohio River, St. Lawrence River.	1302 Custom House, Philadelphia 6, Pa.
South Carolina	South Carolina State Development Board, L. W. Bishop, director. <sup>b</sup>	South Atlantic slope and Eastern Gulf of Mexico.	P. O. Box 2857, Post Office Building, Raleigh, N. C.

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

<sup>b</sup> Succeeded by R. M. Cooper, director, Sept. 1, 1955.



State	Cooperating agency	Drainage basin	District office
Virginia	Virginia Department of Conservation and Development, S. S. Kellam, director. c	North Atlantic slope, South Atlantic slope, Ohio River.	P. O. Box 3327, University Station, Charlottesville, Va.

c Succeeded by Raymond V. Long, March 1953.

## DIVISION OF WORK

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

## STREAM FLOW

Most of the records of stream discharge, used in conjunction with the chemical analyses and in the computation of sediment loads in this volume, are published in Geological Survey reports on the surface-water supply of the United States. The discharge reported for a composite sample is usually the average of the mean daily discharges for the normal composite period. For analyses in which the composite periods differ from the normal 10 or 11-day period, the discharges reported are the averages of the mean daily discharges for the days indicated. The discharges reported in the tables of single analyses are either daily mean discharges or 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-A. NORTH ATLANTIC SLOPE BASINS, MAINE TO CONNECTICUT

## NORTH ATLANTIC SLOPE BASINS TO ST. LAWRENCE RIVER BASIN

## MISCELLANEOUS ANALYSES OF STREAMS IN NEW ENGLAND

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium, mg./l.	Non-carbonate, mg./l.			

## MISCELLANEOUS ANALYSES OF STREAMS IN ST. JOHN RIVER BASIN

## ST. JOHN RIVER AT DICKEY, MAINE

Sept. 26, 1952 .....	a 405		4.7	0.02	14	1.6	1.3	0.3	45	2.2	0.0	0.2	3.7	60	42	5	81.8	7.2	35
Apr. 10, 1953 .....	a 21, 100		3.3	.07	5.4	.4	.9	.8	12	6.2	1.6	.2	.9	48	15	7	33.4	6.4	55

## ALLAGASH RIVER NEAR ALLAGASH, MAINE

Sept. 26, 1952 .....	a 220		4.6	0.02	11	0.9	1.2	0.4	41	1.2	0.1	0.1	0.8	56	31	0	73.8	7.4	29
Apr. 10, 1953 .....	a 7, 860		3.4	.08	6.1	.6	.7	.0	17	2.4	.3	.0	.2	47	18	4	41.0	6.5	26

## AROOSTOOK RIVER AT WASHBURN, MAINE

Sept. 27, 1952 .....	a 115		4.4	0.18	13	2.6	2.0	0.4	47	7.3	2.4	0.2	0.5	61	43	5	93.9	7.5	20
Apr. 12, 1953 .....	a 14, 700		3.6	.06	4.4	1.0	1.3	.8	14	5.0	3.9	.1	.7	48	15	6	37.4	6.6	37

## MISCELLANEOUS ANALYSES OF STREAMS IN ST. CROIX RIVER BASIN

## ST. CROIX RIVER NEAR BAILEYVILLE, MAINE

Sept. 23, 1952 .....	a 1, 470		2.9	0.10	3.4	0.2	1.1	0.4	10	1.6	1.0	0.1	2.1	26	9	1	27.1	6.7	35
May 7, 1953 .....	a 2, 480		1.8	.17	3.0	.4	.9	.3	9	1.6	1.6	.0	.3	40	9	2	26.6	6.2	38

## MISCELLANEOUS ANALYSES OF STREAMS IN MACHIAS RIVER BASIN

## MACHIAS RIVER AT WHITNEYVILLE, MAINE

Sept. 22, 1952 .....	a 593		6.5	0.12	2.3	1.0	2.6	0.8	10	1.3	2.5	0.2	1.9	40	10	2	31.6	6.3	75
May 6, 1953 .....	a 1, 090		3.8	.22	2.0	.2	1.5	.4	.7	1.6	2.4	.0	.5	42	6	1	24.7	6.0	55

a Discharge at time of sampling.

MISCELLANEOUS ANALYSES OF STREAMS IN PENOBSCOT RIVER BASIN  
EAST BRANCH OF PENOBSCOT RIVER AT GRINDSTONE, MAINE

Sept. 27, 1952 .....	a 440	5.0	0.17	4.2	0.8	1.0	0.4	17	3.0	0.0	0.1	0.5	34	14	0	35.2	6.7	35
Apr. 6, 1953 .....	a 9,530	4.0	.06	2.3	.8	1.4	.8	10	2.0	3.9	.1	1.1	33	11	4	27.9	6.2	22

PISCATAQUIS RIVER AT MEDFORD, MAINE

Sept. 27, 1952 .....	a 225	4.2	0.06	3.8	1.1	2.3	0.6	15	5.5	2.6	0.1	0.8	34	14	2	42.5	6.8	29
Apr. 24, 1953 .....	a 8,040	2.6	.34	2.3	.4	.8	.1	6	1.6	1.1	.0	.3	46	7	3	22.8	6.1	42

MISCELLANEOUS ANALYSES OF STREAMS IN KENNEBEC RIVER BASIN  
KENNEBEC RIVER AT THE FORKS, MAINE

Sept. 9, 1952 .....	a 2,980	3.5	0.07	3.6	0.8	0.6	0.3	11	3.2	0.2	0.1	1.6	26	12	3	29.1	6.7	28
Apr. 28, 1953 .....	a 11,400	2.3	.06	3.6	.4	.7	.1	10	1.8	.7	.0	.3	46	11	3	29.2	6.4	17

DEAD RIVER AT THE FORKS, MAINE

Sept. 9, 1952 .....	a 112	4.7	0.15	4.7	1.0	1.1	0.6	17	7.3	0.2	0.1	0.5	34	16	2	35.8	7.0	39
Apr. 28, 1953 .....	a 9,260	3.7	.10	2.4	.5	1.4	.8	8	1.6	1.0	.1	.8	35	8	3	24.4	6.1	37

SEBASTICOOK RIVER NEAR PITTSFIELD, MAINE

Sept. 28, 1952 .....	a 31	4.4	0.16	10	2.7	8.2	1.2	34	13	9.1	0.1	3.5	72	36	8	111	7.0	29
Apr. 8, 1953 .....	a 4,280	1.7	.14	5.7	.9	2.4	1.0	16	8.2	2.9	.1	1.6	73	18	6	48.8	6.5	32

<sup>a</sup> Discharge at time of sampling.

NORTH ATLANTIC SLOPE BASINS TO ST. LAWRENCE RIVER BASIN—Continued  
MISCELLANEOUS ANALYSES OF STREAMS IN NEW ENGLAND—Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953—Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium, magnesium	Non-carbonate			
MISCELLANEOUS ANALYSES OF STREAMS IN ANDROSCOGGIN RIVER BASIN																			
ANDROSCOGGIN RIVER AT RUMFORD, MAINE																			
Oct. 11, 1952.....	1,730		4.5	1.4	4.9	0.4	12	0.7	25	10	3.1	0.2	1.8	89	14	0	92.2	7.3	110
Apr. 23, 1953.....	a 7,250		5.3	.19	3.0	1.1	2.0	.8	10	12	1.2	.2	1.3	77	12	7	51.5	6.1	65
LITTLE ANDROSCOGGIN RIVER NEAR AUBURN, MAINE																			
Oct. 8, 1952.....	a 168		5.4	0.28	4.7	0.4	4.6	1.0	17	3.4	3.9	0.1	1.8	40	13	0	54.9	6.7	30
Apr. 23, 1953.....	a 1,600		4.1	.13	4.1	.1	1.4	.3	10	2.0	2.2	.0	.2	42	11	3	35.3	6.3	18
MISCELLANEOUS ANALYSES OF STREAMS IN PRESUMPSHOT RIVER BASIN																			
PRESUMPSHOT RIVER NEAR SEBAGO LAKE, MAINE																			
Oct. 8, 1952.....	813		3.0	0.04	3.1	0.3	1.9	0.6	10	1.6	0.7	0.3	0.5	24	9	1	30.9	7.3	10
Apr. 23, 1953.....	a 3,230		2.9	.03	2.9	.2	1.4	.3	9	2.6	1.9	.0	.3	30	8	1	27.9	6.3	4
MISCELLANEOUS ANALYSES OF STREAMS IN MERRIMACK RIVER BASIN																			
PEMIGEWASSET RIVER AT PLYMOUTH, N. H.																			
Oct. 2, 1952.....	a 154		9.1	0.86	4.5	1.2	3.2	1.5	12	13	3.5	0.2	0.7	48	16	6	53.0	6.2	30
Apr. 30, 1953.....	a 2,660		5.2	.15	2.9	.3	1.2	.3	5.7	3.0	2.5	.1	.3	43	8	4	32.0	6.5	4
WINNIPESAUKEE RIVER AT TILTON, N. H.																			
Oct. 10, 1952.....	a 796		1.5	0.07	2.9	0.5	5.8	0.7	9	9.4	2.5	0.0	0.5	29	9	2	35.0	6.6	5
May 6, 1953.....	a 2,810		2.5	.02	3.0	.5	1.8	.3	8.2	4.8	1.6	.0	.3	28	10	3	34.1	6.7	2

a Discharge at time of sampling.

## MISCELLANEOUS ANALYSES OF STREAMS IN MERRIMACK RIVER BASIN--Continued

## CONTOOCOOK RIVER NEAR HENNIKER, N. H.

Oct. 7, 1952.....	a 194		4.3	0.38	3.1	0.4	2.8	0.9	6	4.6	4.1	0.2	0.6		32	9	4	42.8	6.5	15
May 4, 1953.....	a 2,200		4.0	.14	2.6	.4	1.9	.3	4.5	6.6	2.0	.0	.4		32	8	4	31.7	6.0	20

## MERRIMACK RIVER NEAR GOFFS FALLS BELOW MANCHESTER, N. H.

Oct. 23, 1952.....	a 318		4.2	0.44	4.9	0.9	5.0	1.1	13	8.6	6.0	0.2	0.6		49	16	5	63.0	6.3	25
Apr. 28, 1953.....	a 14,000		4.0	.04	3.5	.3	2.2	.7	3.2	11	3.2	.2	1.0		37	11	8	38.8	4.7	13

## SOUHEGAN RIVER AT MERRIMACK, N. H.

Oct. 24, 1952.....	a 45		5.9	0.47	4.3	0.8	6.0	3.6	22	4.6	5.8	0.3	0.6		45	14	0	69.3	6.6	12
Apr. 23, 1953.....	a 1,030		4.2	.11	2.8	.6	2.6	.6	5.4	3.4	4.1	.0	.6		46	9	5	42.3	6.4	12

## NASHUA RIVER AT EAST PEPPERELL, MASS.

Oct. 17, 1952.....	a 172		3.1	--	13	1.1	30	0.3	48	30	19	0.3	2.6		128	37	0	208	6.4	20
Apr. 15, 1953.....	a 3,680		3.5	2.0	4.3	.5	3.1	.8	6.0	11	2.7	.0	1.0		40	13	7	53.2	5.6	15

## CONCORD RIVER BELOW RIVER MEADOW BROOK AT LOWELL, MASS.

Oct. 21, 1952.....	a 271		5.2	0.51	7.6	2.0	18	3.0	19	21	22	0.5	2.9		96	27	12	165	6.5	30
Apr. 23, 1953.....	a 2,700		1.5	.19	6.7	1.0	7.4	1.0	9.3	17	10	.2	.9		63	21	13	92.7	5.7	28

a Discharge at time of sampling.

## NORTH ATLANTIC SLOPE BASINS TO ST. LAWRENCE RIVER BASIN--Continued

## MISCELLANEOUS ANALYSES OF STREAMS IN NEW ENGLAND--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium, magnesium, nesium	Non-carbonate			
MISCELLANEOUS ANALYSES OF STREAMS IN CONNECTICUT RIVER BASIN																			
CONNECTICUT RIVER NEAR DALTON, N. H.																			
Oct. 12, 1952.....	a 380		7.6	0.99	9.2	1.1	5.3	1.3	23	16	2.2	0.3	0.7	88	27	9	87.4	6.1	70
Apr. 26, 1953.....	a 8,810		4.4	.20	4.5	.9	1.8	.5	8.1	4.0	6.2	.2	.5	44	15	8	43.3	5.2	28
PASSUMPSIC RIVER AT PASSUMPSIC, VT.																			
Oct. 18, 1952.....	165		8.3	0.42	34	1.4	2.5	2.4	99	13	4.0	0.2	1.2	110	91	10	196	7.3	10
May 5, 1953.....	1,730		1.5	.53	17	.6	1.1	.8	46	6.2	1.0	.1	.4	82	45	7	107	7.8	12
AMMONOOSIC RIVER NEAR BATH, N. H.																			
Oct. 18, 1952.....	115		6.4	0.15	5.8	1.4	3.4	1.1	21	8	3.2	0.2	0.2	42	20	3	60.9	6.8	15
May 5, 1953.....	a 1,890		5.2	.06	3.7	.6	3.7	.3	8.5	3.6	1.2	.1	.5	36	12	5	37.5	6.8	7
WHITE RIVER NEAR BETHEL, VT.																			
Oct. 23, 1952.....	a 65		2.1	--	9.6	2.4	1.6	0.9	30	9.6	3.2	0.1	0.3	47	35	9	77.3	6.7	5
May 6, 1953.....	a 1,510		2.1	0.01	4.5	.9	.6	.1	12	4.8	.5	.0	.5	29	15	5	36.7	7.0	3
WHITE RIVER AT WEST HARTFORD, VT.																			
Oct. 23, 1952.....	a 122		5.8	0.08	30	1.6	2.5	1.6	92	13	4.0	0.0	0.5	111	81	6	181	7.4	4
May 7, 1953.....	a 3,440		3.4	.13	16	.8	1.4	.7	44	9.2	2.0	.0	.7	65	43	7	96.8	7.9	7
CONNECTICUT RIVER AT VERNON, VT.																			
Oct. 22, 1952.....	a 5,640		7.7	0.29	17	1.3	5.0	1.8	51	14	4.5	0.5	0.8	92	48	6	126	6.6	45
Apr. 24, 1953.....	a 20,500		4.9	.29	10	1.0	1.8	.8	29	9.6	2.5	.0	.7	68	29	5	78.5	7.2	8
a Discharge at time of sampling.																			

a Discharge at time of sampling.



## MISCELLANEOUS ANALYSES OF STREAMS IN CONNECTICUT RIVER BASIN--Continued

## ASHUELOT RIVER AT HINSDALE, N. H.

Oct. 22, 1952.....	a 70	7.6	1.2	8.3	0.8	38	2.8	35	23	44	0.0	1.2	144	24	0	256	6.5	10
Apr. 30, 1953 .....	a 1,500	4.2	.41	3.0	.5	4.5	.4	4.6	8.0	6.5	.6	.5	35	10	6	48.3	6.6	18

## MILLERS RIVER AT ERVING, MASS.

Oct. 21, 1952.....	a 180	2.1	--	4.9	1.2	6.1	1.5	10	15	6.8	0.2	1.1	52	17	9	71.2	6.0	20
May 1, 1953 .....	a 1,420	3.9	0.24	3.2	.4	2.1	.6	3.7	12	1.3	.0	.5	36	10	7	37.5	6.0	28

## DEERFIELD RIVER NEAR W. DEERFIELD, MASS.

Oct. 23, 1952.....	a 1,480	2.5	--	4.0	0.7	1.6	1.1	11	7.0	2.0	0.3	0.5	34	13	4	39.9	6.1	10
Apr. 23, 1953 .....	a 2,060	8.7	0.12	8.0	1.1	4.8	1.4	13	12	11	.0	.7	67	24	14	91.9	5.4	5

## QUABOAG RIVER AT W. BRIMFIELD, MASS.

Oct. 17, 1952.....	a 77	3.1	--	4.0	1.5	12	2.5	18	12	15	0.2	0.8	68	18	3	101	6.3	12
May 8, 1953 .....	a 400	3.5	0.30	3.7	.8	2.2	.8	5.7	9.6	2.6	.2	.7	38	13	8	42.2	5.5	15

## CHICOPEE RIVER AT INDIAN ORCHARD, MASS.

Oct. 17, 1952.....	a 61	3.9	--	7.2	2.4	24	0.4	13	36	16	1.0	12	129	28	17	197	6.0	25
May 8, 1953 .....	a 3,070	3.5	0.64	3.6	.7	2.1	.6	4.6	11	2.8	.0	.5	50	12	8	46.2	6.3	17

## WESTFIELD RIVER AT KNIGHTVILLE, MASS.

Oct. 17, 1952.....	a 45	2.7	--	6.3	3.0	1.7	1.3	24	6.6	3.0	0.2	0.2	42	28	8	58.2	6.4	10
Apr. 30, 1953 .....	a 456	3.9	0.10	4.1	.7	1.4	.7	12	6.0	2.0	.1	.3	19	13	3	38.9	6.9	8

a Discharge at time of sampling.

## NORTH ATLANTIC SLOPE BASINS TO ST. LAWRENCE RIVER BASIN--Continued

## MISCELLANEOUS ANALYSES OF STREAMS IN NEW ENGLAND--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium	Non-carbonate			

## MISCELLANEOUS ANALYSES OF STREAMS IN CONNECTICUT RIVER BASIN--Continued

## WESTFIELD RIVER NEAR WESTFIELD, MASS.

Oct. 17, 1952.....	a 238		4.0	--	10	3.4	3.2	1.4	32	15	5.0	0.1	1.1	66	39	13	99.1	6.4	7
May 1, 1953.....	a 1,770		4.3	0.20	5.2	1.5	1.9	.6	12	11	2.2	.0	1.0	40	19	9	54.1	5.8	10

## CONNECTICUT RIVER AT THOMPSONVILLE, CONN.

Oct. 10, 1952.....	a 4,820		3.0	0.50	16	1.5	7.0	2.3	42	18	5.8	0.2	1.6	84	46	12	133	7.0	20
May 8, 1953.....	a 41,700		4.5	.14	8.6	1.1	2.3	.9	20	13	1.8	.1	1.1	63	26	10	66.3	7.2	18

## SCANTIC RIVER AT BROAD BROOK, CONN.

Oct. 10, 1952.....	a 53		11	0.14	22	3.2	11	1.9	38	46	5.8	0.1	1.9	138	68	40	210	7.1	10
Mar. 31, 1953.....	a 1,120		5.9	.33	6.0	1.3	2.2	.8	9	17	2.5	.1	1.1	52	20	13	64.9	6.2	33

## FARMINGTON RIVER AT RAINBOW, CONN.

Sept. 11, 1952.....	a 1,940		6.6	0.55	10	2.8	4.5	1.3	30	15	4.8	0.3	1.5	77	36	12	95.4	6.6	10
Apr. 8, 1953.....	a 4,200		5.1	.29	6.3	1.2	2.5	.8	16	12	3.0	.1	1.0	49	21	8	61.0	6.4	27

a Discharge at time of sampling.

## CONNECTICUT RIVER BASIN

## SCANTIC RIVER AT BROAD BROOK, CONN.

LOCATION.--Highway bridge, on State Highway 140, 300 feet downstream from gaging station, 1 mile southwest of Broad Brook, Hartford County, and 8 1/4 miles upstream from mouth.

DRAINAGE AREA.--98.4 square miles.

RECORDS AVAILABLE.--November 1952 to September 1953.

EXTREMES, 1952-53.--Sediment concentrations: Maximum daily 360 ppm Feb. 7, 1953; minimum daily, 1 ppm Jan. 22, 23, 1953.

Sediment loads: Maximum daily, 708 tons, Jan. 28, 1953; minimum daily, 0.2 tons Aug. 23, 1953.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1271.

## Suspended sediment, November 1952 to September 1953

Day	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.....				--	--	--	87	3	0.5
2.....				--	--	--	81	3	.6
3.....				--	--	--	57	4	.6
4.....				--	--	--	58	3	.5
5.....				--	--	--	65	3	.5
6.....				--	--	--	118	9	a3
7.....				--	--	--	138	4	1.5
8.....				--	--	--	111	3	.9
9.....				--	--	--	89	2	.5
10.....				--	--	--	82	3	.7
11.....				--	--	--	135	24	s10
12.....				--	--	--	378	73	s76
13.....				--	--	--	400	57	62
14.....				--	--	--	333	22	20
15.....				--	--	--	202	11	6.0
16.....				--	--	--	150	6	2.4
17.....				--	--	--	121	4	1.3
18.....				--	--	--	109	9	2.6
19.....				--	--	--	100	7	1.9
20.....				--	--	--	96	4	1.0
21.....				--	--	--	91	2	.5
22.....				--	--	--	93	4	1.0
23.....				--	--	--	95	4	1.0
24.....				--	--	--	99	4	1.1
25.....				107	6	1.7	102	4	a1
26.....				86	3	.7	103	4	1.1
27.....				76	2	.4	99	5	1.3
28.....				78	2	.4	80	8	1.7
29.....				70	2	.4	76	6	1.2
30.....				64	2	.3	75	6	1.2
31.....				--	--	--	73	6	1.2
Total.				481	--	3.9	3,856	--	204.7

s Computed by subdividing day.

a Computed from partly-estimated concentration graph.

## NORTH ATLANTIC SLOPE BASINS, MAINE TO CONNECTICUT

## CONNECTICUT RIVER BASIN--Continued

## SCANTIC RIVER AT BROAD BROOK, CONN.--Continued

Suspended sediment, November 1952 to September 1953--Continued									
Day	January			February			March		
	Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment	
		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day
1.....	71	3	0.6	321	14	12	178	8	3.8
2.....	73	2	.4	275	10	7.4	161	10	4.3
3.....	122	--	e 12	256	9	6.2	150	8	3.2
4.....	190	23	12	223	6	3.6	272	120	88
5.....	178	12	5.8	196	7	3.7	339	26	24
6.....	137	6	2.2	178	5	2.4	339	15	14
7.....	106	4	1.1	268	360	s 334	256	8	5.5
8.....	99	6	1.6	389	82	86	202	5	2.7
9.....	91	5	1.2	389	30	32	172	5	2.3
10.....	108	4	1.2	307	15	12	156	6	2.5
11.....	138	8	3.0	231	9	5.6	150	7	2.8
12.....	156	8	3.4	202	7	3.8	144	6	2.3
13.....	144	5	1.9	190	6	3.1	366	--	e 236
14.....	126	3	1.0	184	6	3.0	577	101	a 160
15.....	116	4	1.2	243	--	e 48	627	105	a 180
16.....	117	6	1.9	450	74	a 90	912	125	s 297
17.....	138	5	1.9	450	94	114	1,020	78	215
18.....	201	--	e 21	345	27	25	583	50	79
19.....	292	22	17	256	10	6.9	450	30	36
20.....	266	8	5.7	223	9	5.4	430	20	23
21.....	209	2	1.1	281	40	30	389	18	19
22.....	190	1	.5	345	24	22	356	17	16
23.....	172	1	.5	345	20	19	321	16	14
24.....	483	201	s 335	284	11	8.4	321	43	37
25.....	1,430	187	s 708	239	16	10	400	58	63
26.....	1,060	60	172	216	10	5.8	470	45	57
27.....	528	25	36	202	10	5.4	536	38	55
28.....	430	34	39	190	12	6.2	536	27	39
29.....	410	30	33	--	--	--	480	40	a 52
30.....	367	19	19	--	--	--	756	141	s 275
31.....	307	10	8.3	--	--	--	1,040	100	a 281
Total.	8,455	--	1,448.5	7,678	--	910.9	13,089	--	2,289.4

e Estimated.

s Computed by subdividing day.

a Computed from partly-estimated concentration graph.

CONNECTICUT RIVER BASIN  
CONNECTICUT RIVER BASIN--Continued

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SCANTIC RIVER AT BROAD BROOK, CONN.--Continued

Suspended sediment, November 1952 to September 1953--Continued

Day	July			August			September		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	88	11	2.6	48	8	1.0	37	10	1.0
2.....	80	11	2.4	48	8	1.0	36	7	.7
3.....	73	7	1.4	50	7	.9	33	6	.5
4.....	52	5	.7	48	7	.9	33	5	.4
5.....	50	5	.7	48	8	1.0	31	5	.4
6.....	57	6	.9	47	8	1.0	31	8	.7
7.....	54	4	.6	46	8	1.0	32	8	.7
8.....	52	7	1.0	40	6	.6	32	8	.7
9.....	71	8	1.5	41	8	.9	35	9	.9
10.....	85	8	1.8	54	10	1.5	33	8	.7
11.....	65	7	1.2	52	10	1.4	33	9	.8
12.....	58	7	1.1	49	9	1.2	33	8	.7
13.....	65	8	1.4	48	6	.8	53	19	2.7
14.....	62	7	1.2	44	7	.8	39	11	1.2
15.....	62	6	1.0	58	11	1.7	38	9	.9
16.....	58	7	1.1	58	9	1.4	36	8	.8
17.....	54	7	1.0	57	9	1.4	39	8	.8
18.....	47	5	.6	47	8	1.0	40	11	1.2
19.....	47	6	.8	44	12	1.4	40	10	1.1
20.....	50	7	.9	46	12	1.5	35	7	.7
21.....	64	8	1.4	44	7	.8	38	6	.6
22.....	65	7	1.2	42	6	.7	42	8	.9
23.....	78	54	s 14	42	2	.2	38	7	.7
24.....	161	38	17	42	8	.9	40	8	.9
25.....	113	20	6.1	40	9	1.0	42	5	.6
26.....	76	12	2.5	39	10	1.1	39	5	.5
27.....	70	12	2.3	38	8	.8	35	5	.5
28.....	64	12	2.1	38	9	.9	33	5	.4
29.....	60	8	1.3	37	8	.8	34	5	.5
30.....	57	7	1.1	32	8	.7	32	5	.4
31.....	55	7	1.0	36	11	1.1	--	--	--
Total.	2,093	--	73.9	1,403	--	31.4	1,092	--	23.6
Total for period November 25 to September 30 (cfs-days).....									66,908
Total load for period November 25 to September 30 (tons).....									7,471.0

s Computed by subdividing day.

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

## HUDSON RIVER BASIN

## GLOWEGEE CREEK AT WEST MILTON, N.Y.

LOCATION --At highway bridge at gage, 0.5 mile south of West Milton, Saratoga County, 1.5 miles upstream from Kayaderoseras Creek and 4 miles northwest of Ballsston Spa--26.0 square miles.

DRAINAGE AREA--26.0 square miles.

RECORDS AVAILABLE--Chemical analyses: March 1953 - September 1953.

RECORDS AVAILABLE--Chemical analyses: March 1953 - September 1953.

EXTREMES--Precipitation: Maximum, 148 parts per million Aug. 11, 13-20; minimum, 100 ppm March 21-31.

EXTREMES--Dissolved solids: Maximum, 148 parts per million Aug. 11, 13-20; minimum, 70 ppm Aug. 12.

Hardness: Maximum, 118 ppm Aug. 1-10; minimum, 70 ppm Aug. 12.

Specific Conductance: Maximum, 226 micromhos, July 21-31; minimum, 155 micromhos, March 21-31.

Water temperatures: Maximum, 81°F, July 18; minimum, 34°F, March 1-7.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Albany, N.Y. Records of discharge for year October 1952 to September 1953 given in WSP 1272.

Chemical analyses, in parts per million, March 1953 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Mar. 1-10, 1953	38.4	6.8	0.04	24	7.7	2.2	1.1	94	19	3.6	0.1	0.5	115	92	14	191	7.6	12
Mar. 11-20	91.7	5.9	0.05	20	6.7	2.0	.7	80	13	3.0	.1	.8	107	77	12	167	7.4	10
Mar. 21-31	168	5.4	.04	18	6.0	2.0	.6	73	11	3.5	.1	.6	100	70	10	155	7.5	12
Apr. 1-10	97.0	8.8	.01	22	6.4	2.8	.6	85	14	3.0	.1	.6	115	81	12	178	7.4	15
Apr. 11-13	91.0	--	--	.02	22	7.6	2.3	.6	86	14	3.5	.1	.5	86	16	179	7.6	30
Apr. 22-30	64.7	5.4	.01	24	7.1	2.6	.6	93	16	2.8	.1	.5	120	89	13	184	7.5	15
May 1-10	156	5.0	.03	23	6.0	2.2	.5	86	12	2.5	.1	.5	121	82	12	170	7.4	35
May 11-20	98.9	6.1	.04	26	7.8	2.3	.5	108	16	1.1	.1	.5	128	97	8	197	7.4	30
May 21-31	42.4	5.3	.05	29	8.4	2.3	.4	122	11	2.0	.1	.5	130	107	7	218	7.9	8
June 1-10	16.6	5.3	.05	29	8.9	2.3	.5	122	13	2.5	.0	.3	129	109	9	217	7.9	6
June 11-20	7.79	4.8	.06	29	9.4	2.4	.5	122	13	2.5	.0	.3	123	111	11	217	7.9	5
June 21-30	7.33	6.8	--	27	8.4	2.6	1.1	123	15	2.8	.0	.7	118	102	12	207	7.7	8
July 1-10	12.1	6.4	.00	29	8.9	2.9	1.2	120	13	2.6	.1	.7	131	109	11	214	7.8	12
July 11-20	4.32	6.7	.01	31	8.2	2.9	1.2	124	17	2.4	.0	.7	125	111	9	224	7.8	8
July 21-31	3.27	7.0	.03	30	9.4	2.9	1.2	134	17	2.4	.0	.5	124	116	11	214	7.6	10
Aug. 1-10	5.16	6.2	.00	26	11.4	2.9	1.1	130	13	2.8	.0	.5	122	111	11	214	7.6	10
Aug. 11-20	6.30	6.6	.01	30	10	2.8	.7	121	16	3.5	.2	1.1	146	117	18	219	7.6	12
Aug. 21-31	1.48	8.6	.00	30	9.8	1.5	.6	123	14	1.6	.2	.5	144	116	15	215	7.5	8
Sept. 1-10	2.26	10	.03	30	9.9	2.6	.9	126	13	1.9	.1	.5	145	116	13	219	7.7	5
Sept. 11-20	4.24	12	.02	29	9.1	2.0	1.2	116	16	2.3	.2	.3	141	110	15	215	7.6	5
Sept. 21-24, 26-30	3.09	7.8	.03	29	9.9	2.0	.8	119	15	1.6	.2	.3	136	113	16	219	7.8	8
Average	43.9	6.8	0.02	27	8.4	2.4	0.8	109	14	2.6	0.1	0.5	128	101	12	202	--	12

## HUDSON RIVER BASIN.--Continued

## GLOWEGEE CREEK AT WEST MILTON, N.Y.--Continued

Temperature (°F) of water, water year October 1952 to September 1953  
(Temperature measurements at approximately 2 p.m.)

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

## HUDSON RIVER BASIN--Continued

KAYADEROSERAS CREEK NEAR WEST MILTON, N. Y.

LOCATION --Temperature recorder at gage on left bank 500 feet downstream from Glowegee Creek and 1 mile east of West Milton. Sediment sampler 1,500 feet downstream from gaging station on Lewis Road, 1 mile east of West Milton, Saratoga County.

DRAINAGE AREA --40 square miles.

RECORDS AVAILABLE --Water temperatures from approximately June 1950 to September 1953.

Sediment records: February to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 78°F June 27 and July 18; minimum, 33°F many days in January, February and March.

Sediment concentrations: Maximum, 164 ppm March 26; minimum, Aug. 4, Aug. 18, and many days in September.

Sediment loads: Maximum daily, 453 tons April 7; minimum daily, 0.1 ton June 27 and many days in August and September.

EXTREMES, 1950-53.--Water temperatures: Maximum 78°F July 9, 1950, July 18, 1950, June 27, 1953 and July 18, 1953; minimum, freezing point many days in December 1953, January and February 1954.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1272.

Temperature (°F) of water, water year October 1952 to September 1953																								
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	
1.....	58	53	46	42	35	34	34	34	33	33	34	33	46	44	54	49	60	53	73	70	63	74	67	
2.....	58	57	46	43	34	34	34	34	33	33	33	33	47	46	49	47	63	56	74	70	67	77	70	
3.....	57	54	47	45	35	34	34	34	33	33	33	33	49	45	47	46	63	55	75	69	69	60	72	
4.....	54	50	46	43	35	34	34	33	33	33	33	33	48	45	53	47	60	57	74	65	65	62	76	
5.....	52	50	43	40	35	34	33	33	33	33	34	33	49	45	56	53	65	57	74	64	63	61	86	
6.....	53	52	44	41	35	34	33	33	33	33	34	33	47	44	59	55	70	62	70	68	68	59	73	
7.....	52	50	43	42	36	35	33	33	33	33	34	33	46	44	60	58	68	64	74	67	69	61	67	
8.....	51	48	42	40	36	35	33	33	33	33	34	33	46	44	62	59	68	60	72	67	70	64	66	
9.....	50	46	39	38	33	33	33	33	33	33	34	33	48	45	64	59	70	63	70	66	68	64	58	
10.....	51	47	40	38	41	38	33	33	33	33	34	33	48	46	65	61	68	62	68	63	67	66	64	
11.....	49	45	40	42	40	33	33	33	33	33	34	33	48	45	66	59	67	60	60	67	65	64	57	
12.....	50	45	41	38	42	38	33	33	33	34	33	33	47	45	67	62	66	58	71	62	70	64	62	
13.....	50	46	39	37	38	37	33	33	33	33	36	34	46	44	66	63	62	59	67	64	71	66	61	
14.....	53	48	38	36	37	35	34	33	35	34	35	34	44	42	64	60	65	58	70	61	70	67	60	
15.....	53	50	40	37	35	34	33	34	33	35	34	35	44	41	60	58	68	59	72	65	73	67	59	
16.....	54	51	44	40	35	34	34	33	34	34	34	34	43	40	60	57	72	61	73	67	71	66	60	
17.....	51	48	44	44	36	35	33	33	35	34	36	35	46	42	60	58	73	64	76	68	70	65	62	
18.....	50	47	44	44	36	35	33	33	33	34	37	34	45	44	61	58	70	65	78	70	67	61	60	
19.....	49	47	44	43	35	34	33	33	35	34	37	34	44	43	62	60	74	66	75	73	66	61	60	
20.....	47	43	45	44	34	34	34	34	33	35	34	38	44	42	64	60	78	67	75	72	68	61	60	
21.....	44	40	47	45	34	34	33	33	34	34	39	36	44	42	66	61	76	72	76	70	69	59	63	
22.....	46	42	46	46	36	34	34	33	33	33	40	37	47	41	69	61	77	71	74	71	69	60	57	
23.....	42	42	46	45	32	32	34	34	33	33	42	36	50	44	62	72	63	72	73	69	69	61	59	
24.....	49	44	46	43	38	36	34	33	35	34	40	38	50	45	64	74	64	71	66	70	63	57	50	
25.....	48	45	45	43	36	33	33	36	33	33	36	35	52	52	62	57	73	63	71	63	73	64	58	
26.....	45	41	44	42	36	36	33	33	33	33	35	42	57	53	61	57	75	67	71	62	70	66	60	
27.....	46	42	44	43	36	34	33	33	33	36	35	43	56	52	57	55	78	69	73	68	72	65	62	
28.....	46	43	43	39	34	34	33	33	33	36	34	43	52	49	56	55	76	66	73	67	73	67	62	
29.....	43	42	39	36	34	34	33	33	--	--	--	42	41	50	47	59	53	73	67	69	65	74	66	
30.....	43	41	36	34	34	34	33	33	--	--	--	42	42	55	50	57	53	74	67	73	66	74	67	
31.....	43	40	--	--	34	34	33	33	--	--	--	42	42	55	50	57	53	74	67	73	66	74	67	
Average.....	50	46	43	41	36	35	33	33	34	34	34	37	36	49	45	60	56	72	63	72	67	70	64	
										</														



## HUDSON RIVER BASIN--Continued

KAYADEROSSERAS CREEK NEAR WEST MILTON, N. Y.

Suspended sediment, February to September 1953

Day	January			February			March		
	Mean dis-charge (cfs)	Mean concen-tration (ppm)	Tons per day	Mean dis-charge (cfs)	Mean concen-tration (ppm)	Tons per day	Mean dis-charge (cfs)	Mean concen-tration (ppm)	Tons per day
1.....				--	--	--	140	5	1.9
2.....				--	--	--	122	6	2.0
3.....				--	--	--	114	3	.9
4.....				--	--	--	293	30	s 31
5.....				--	--	--	289	15	12
6.....				--	--	--	196	9	4.8
7.....				--	--	--	150	5	2.0
8.....				--	--	--	125	10	3.4
9.....				--	--	--	110	4	1.2
10.....				--	--	--	100	2	.5
11.....				--	--	--	94	2	.5
12.....				--	--	--	95	4	1.0
13.....				--	--	--	212	19	s 15
14.....				--	--	--	310	21	18
15.....				--	--	--	329	18	s 19
16.....				--	--	--	754	152	s 330
17.....				--	--	--	477	55	s 75
18.....				--	--	--	313	19	16
19.....				--	--	--	316	8	6.8
20.....				--	--	--	382	12	s 14
21.....				--	--	--	407	42	s 48
22.....				--	--	--	360	14	14
23.....				--	--	--	357	19	18
24.....				217	10	5.8	598	140	s 303
25.....				219	9	5.3	774	112	234
26.....				200	4	2.2	730	101	199
27.....				187	7	3.5	988	164	437
28.....				187	5	2.5	624	56	124
29.....				--	--	--	463	15	20
30.....				--	--	--	394	16	15
31.....				--	--	--	397	16	17
Total.				1,010	--	19.3	11,233	--	1,984.0
Day	April			May			June		
	Mean dis-charge (cfs)	Mean concen-tration (ppm)	Tons per day	Mean dis-charge (cfs)	Mean concen-tration (ppm)	Tons per day	Mean dis-charge (cfs)	Mean concen-tration (ppm)	Tons per day
1.....	316	8	6.8	737	132	s 321	126	4	1.4
2.....	284	7	5.4	906	83	203	108	4	1.2
3.....	244	7	4.6	774	78	s 174	96	3	.8
4.....	214	7	4.0	479	14	18	88	4	1.0
5.....	212	5	2.9	410	9	10	102	4	1.1
6.....	187	10	5.0	333	7	6.3	94	6	1.5
7.....	613	135	s 453	265	8	5.7	85	6	1.4
8.....	539	39	s 61	404	23	25	82	5	1.1
9.....	330	8	7.1	348	10	9.4	75	2	.4
10.....	376	39	48	252	7	4.8	67	2	.4
11.....	439	23	s 29	217	6	3.5	63	5	.8
12.....	304	3	2.5	187	6	3.0	63	5	.8
13.....	273	4	2.9	174	7	3.3	60	3	.5
14.....	287	--	s 5	196	6	3.2	64	4	.7
15.....	224	4	2.4	251	14	s 11	60	4	.6
16.....	255	7	s 6.5	284	10	7.7	58	2	.3
17.....	351	10	9.5	744	113	s 262	55	4	.6
18.....	249	3	2.0	723	37	72	54	4	.6
19.....	212	2	1.1	432	15	17	54	2	.3
20.....	257	4	2.8	284	12	9.2	51	2	.3
21.....	262	5	3.5	213	6	3.4	50	2	.3
22.....	214	3	1.7	181	6	2.9	48	3	.4
23.....	205	6	3.3	163	5	2.2	45	2	.2
24.....	180	5	2.4	143	4	1.5	41	2	.2
25.....	163	6	2.6	128	4	1.4	41	2	.2
26.....	204	6	3.3	150	9	s 5.0	42	2	.2
27.....	520	40	s 58	318	15	13	49	1	.1
28.....	341	9	8.3	249	7	4.7	74	10	s 4.9
29.....	236	3	1.9	172	4	1.9	219	22	s 16
30.....	196	4	2.1	145	5	2.0	82	5	1.1
31.....	--	--	--	143	4	1.5	--	--	--
Total.	8,687	--	748.6	10,405	--	1,208.6	2,197	--	39.4

s Computed by subdividing day.

a Computed from estimated concentration graph.

## HUDSON RIVER BASIN--Continued

## KAYADEROSSERAS CREEK NEAR WEST MILTON, N. Y.--Continued

## Suspended sediment, February to September 1953--Continued

Day	July			August			September		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	60	2	0.3	26	4	0.3	20	2	0.1
2.....	96	58	s 24	27	4	.3	20	3	.2
3.....	79	11	2.3	29	2	.2	20	2	.1
4.....	54	4	.6	30	1	.1	20	2	.1
5.....	48	2	.3	70	8	1.5	22	2	.1
6.....	47	5	.6	48	3	.4	32	2	.2
7.....	70	6	1.1	32	2	.2	39	1	.1
8.....	56	4	.6	33	2	.2	39	2	.2
9.....	48	6	.8	34	3	.3	31	1	.1
10.....	44	4	.5	122	37	s 13	27	1	.1
11.....	43	3	.3	136	19	7.0	26	1	.1
12.....	41	4	.4	66	4	.7	27	1	.1
13.....	41	4	.4	51	2	.3	76	2	.4
14.....	45	11	1.3	46	2	.2	44	2	.2
15.....	41	6	.7	49	2	.3	34	1	.1
16.....	39	5	.5	40	2	.2	33	2	.2
17.....	36	3	.3	36	2	.2	30	1	.1
18.....	34	7	.6	34	1	.1	29	1	.1
19.....	33	4	.4	36	2	.2	28	1	.1
20.....	39	6	.6	31	2	.2	31	1	.1
21.....	38	5	.5	29	2	.2	42	2	.2
22.....	34	3	.3	29	2	.2	36	2	.2
23.....	39	6	.6	28	2	.2	30	2	.2
24.....	47	6	.8	27	2	.1	29	2	.2
25.....	37	7	.7	27	3	.2	28	2	.2
26.....	33	4	.4	26	2	.1	28	1	.1
27.....	34	4	.4	27	2	.1	27	1	.1
28.....	37	4	.4	27	2	.1	27	2	.1
29.....	31	3	.3	24	2	.1	27	1	.1
30.....	32	4	.3	23	3	.2	26	1	.1
31.....	29	4	.3	22	2	.1	--	--	--
Total.	1,385	--	41.6	1,265	--	27.5	928	--	4.3

s Computed by subdividing day.

## HUDSON RIVER BASIN--Continued

## MOHAWK RIVER AT VISCHER FERRY DAM, N. Y.

LOCATION.--At bridge crossing headrace of Vischer Ferry Power Plant operated by N. Y. State Department of Public Works.

DRAINAGE AREA.--3,385 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1953.

Water temperatures: October 1951 to September 1953.

EXTREMES, 1951-53.--Dissolved solids: Maximum observed, 183 ppm Sept. 2, 1953; minimum, 82 ppm Apr. 21-30, 1952.

Hardness: Maximum, 125 ppm Sept. 1-10, 1953; minimum, 53 ppm Apr. 21-30, 1952.

Specific conductance: Maximum daily, 305 micromhos June 4, 1953; minimum daily, 140 micromhos May 3, 1952.

Water temperatures: Maximum, 84°F July 17, 1952; minimum, freezing point on many days in December, January, and February.

EXTREMES, 1951-53.--Dissolved solids: Maximum observed, 183 ppm Sept. 2, 1953; minimum, 82 ppm Apr. 21-30, 1952.

Hardness: Maximum, 125 ppm Sept. 1-10, 1953; minimum, 53 ppm Apr. 21-30, 1952.

Specific conductance: Maximum daily, 305 micromhos June 4, 1953; minimum daily, 140 micromhos May 3, 1952.

Water temperatures: Maximum, 84°F July 17, 1952; minimum, freezing point on many days in December, January, and February.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Albany, N. Y.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>	Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
Oct. 1-10, 1952	1,295		3.7				38	4.5	12	2.1	108	33	12	0.2	3.4	165	113	95	278	7.6	5
Oct. 11-20	1,102		2.8				38	5.1	11	2.1	108	33	13	2	3.2	165	116	27	283	7.5	5
Oct. 21-31	1,197		4.2				39	3.6	10	2.1	113	22	14	1	1.9	162	112	20	283	7.3	8
Nov. 1-10	1,175		4.8				40	4.0	12	2.0	107	36	14	1	1.8	176	116	29	287	7.3	12
Nov. 11-20	1,292		5.4				37	4.2	11	1.9	99	34	14	1	2.6	164	110	28	275	7.2	13
Nov. 21-30	1,837		6.0				36	3.8	10	1.8	93	33	12	1	2.1	159	105	29	265	7.4	14
Dec. 1-10	2,295		4.9				38	3.7	7.7	2.0	102	31	10	1	2.6	161	110	26	261	7.3	14
Dec. 11-20	8,959		5.6				32	3.3	4.0	2.1	83	28	5.0	2	1.8	134	93	25	215	7.3	14
Dec. 21-31	2,647		4.5				35	3.6	5.8	1.6	88	33	7.0	1	2.0	150	102	30	241	7.2	17
Jan. 13, 1953	2,648		4.8				30	3.2	11	1.3	77	27	15	1	.9	143	88	25	235	7.1	28
Feb. 20	2,900		4.4	0.1	.16		30	4.7	6.5	1.3	84	30	8.0	1	1.1	130	94	25	217	7.2	13
Mar. 4	5,191		4.6	.1	.09	0.01	27	3.6	4.0	1.0	73	27	5.7	1	.8	117	82	22	185	7.5	18
Mar. 11-20	6,627						26	4.2	6.9		76	25	5.2		1.9		70	20	200	7.3	--
Mar. 21-31	19,043						22	3.7	3.0		66	18	1.8		1.6		70	16	159	7.5	--
Apr. 1	9,322		4.4	.2	.13	.00	21	2.9	2.4	1.0	61	17	3.0	.2	1.8	97	64	14	147	7.5	15
Apr. 1-10	8,585						23	2.8	3.1		63	19	2.2	--	1.5	--	69	17	196	7.2	16
Apr. 11-20	7,200						25	3.3	4.6		71	21	3.2	--	1.6	--	76	18	172	7.4	25
Apr. 21-30	8,731						27	3.0	3.2		74	20	3.5	--	1.8	--	81	20	184	7.4	15
May 1-10	18,269						24	3.0	2.4		67	19	2.5	--	1.3	--	72	19	164	7.3	30
May 11-20	6,411		3.5	.0	.01	.00	26	2.6	2.2	.5	80	17	2.9	.0	1.2	--	73	18	182	7.4	16
May 21-30	5,369		3.6	.0	.01	.01	25	2.4	22.9	.4	94	22	2.8	.0	.7	--	93	16	195	7.5	27
May 21-31	4,580		--	--	--	--	30	5.0	4.3		91	23	3.5	--	1.5	--	95	21	204	7.4	7

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

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub> Calcium, Non-carbonate	Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
June 1-3, 5-10, 1953	3,153		--	--	--	--	35	7.2	--	--	106	27	5.5	--	1.9	--	117	30	242	7.4	7
June 3	2,536		3.3	0.01	0.00	0.00	34	6.1	4.8	1.3	111	24	4.6	0.0	2.1	144	110	19	242	7.7	17
June 4 a	2,019		--	--	--	--	--	--	31	92	92	24	59	--	.6	--	116	41	384	7.3	45
June 11-14, 16-20	1,610		--	--	--	--	38	5.1	11	114	114	30	9.0	--	1.7	--	116	22	270	7.6	8
June 15	1,989		--	--	--	--	38	5.1	12	115	115	30	10	--	2.1	--	116	22	277	7.3	35
June 21-30	1,637		3.5	--	.21	--	40	5.6	12	116	116	34	12	.0	2.1	--	123	28	288	7.4	15
July 1	1,917		1.0	.0	.00	.00	37	5.8	11	2.2	109	33	12	.0	1.4	173	116	27	279	7.5	12
July 1-10	1,321		--	--	.01	--	39	6.6	12	110	110	33	13	--	2.5	--	124	29	286	7.2	2
July 11-20	1,020		--	--	.00	--	40	4.5	11	110	110	36	9.6	--	2.5	--	116	26	284	7.3	2
July 15	1,438		.4	.1	.01	.00	39	3.8	9.9	1.4	111	33	10	.2	1.6	187	122	31	285	7.3	12
July 21-31	1,462		--	--	.00	--	39	4.8	13	112	112	34	11	--	2.4	--	117	25	282	7.2	6
Aug. 1-10	1,353		--	--	.01	--	37	5.0	13	106	106	33	13	--	2.6	--	113	26	279	7.2	8
Aug. 10	1,633		2.2	.0	.01	.00	35	5.0	13	2.3	102	34	14	.1	2.7	158	108	24	270	7.3	8
Aug. 11-20	1,902		7.6	--	.02	--	38	5.9	12	102	102	37	14	.2	2.8	--	119	36	271	7.2	7
Aug. 21-31	882		5.4	--	.01	--	39	5.8	11	108	108	37	12	.1	2.4	--	121	33	278	7.2	8
Sept. 1-10	1,040		4.2	--	.03	--	40	6.2	13	107	107	39	16	.1	2.7	--	125	38	304	7.1	12
Sept. 2	911		2.5	.1	.02	.00	38	6.6	14	1.1	107	44	13	.1	1.9	183	123	35	297	7.0	16
Sept. 11-20	1,090		2.1	--	.02	--	40	5.6	12	102	102	39	16	.1	2.9	--	123	39	305	7.0	10
Average	3,914		4.0	0.1	0.02	0.01	33	4.6	8.3	1.6	95	29	8.9	0.1	2.0	153	103	25	242	--	15

a Sample known to be polluted. Analyses not considered representative of stream and not included in averages.

## HUDSON RIVER BASIN--Continued

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

Temperature (°F) of water, water year October 1952 to September 1953

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

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

## DELAWARE RIVER BASIN

## 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 June 1953.

TEMPERATURES.--Maximum, 30 ppm May 21-31; minimum, 16 ppm Apr. 21-30.  
EXTREMES 1952-53.--Hardness: Maximum, 117 micromhos May 23; minimum, 41.1 micromhos Mar. 17.

Specific conductance: Maximum, 33°F on maximum days during winter months.  
Water temperatures: Minimum, 33°F on maximum days during winter months.

EXTREMES 1950-53.--Dissolved solids: Maximum, 53 ppm Oct. 1-10, 1952; minimum, 31 ppm Mar. 21-31, Apr. 1-10.  
Hardness: Maximum, 34 ppm Oct. 24, 1950; minimum, 15 ppm Apr. 1-10, 1951.

Specific conductance: Maximum, 117 micromhos May 23, 1953; minimum, 38.5 micromhos Apr. 1, 1951; July 23, 1952; minimum, freezing point on many days during winter months.

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

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium, magnesium	Non-carbonate			
Oct. 1-10, 1952.....			6.7	0.01	7.0	1.7	4.5		20	11	4.0	0.0	0.9	53	24	8	71.0	6.9	5
Oct. 11-20.....							1.9		18	9.1	5.0		1.0		28	13	68.8	6.8	7
Oct. 21-31.....							3.4		18	9.6	5.5		1.1		26	11	70.3	7.2	5
Nov. 1-10.....							2.6		20	10	5.0		1.4		29	13	73.8	7.4	7
Nov. 11-20.....							2.7		18	10	5.0		.6		24	9	66.3	7.4	5
Nov. 21-30.....							.6		9	10	2.0		.9		20	13	54.3	6.8	10
Dec. 1-10.....							1.5		10	9.9	3.0		1.9		21	13	53.0	6.9	7
Dec. 11-20.....							1.5		9	9.5	3.0		2.3		20	13	51.5	6.7	7
Dec. 21-31.....							1.5		11	10	3.0		2.0		22	13	57.5	6.8	7
Jan. 1-10, 1953.....							3.2		18	10	3.0		1.9		24	9	59.8	6.7	4
Jan. 11-20.....							2.9		9	9.1	3.5		2.0		20	13	54.5	6.8	5
Jan. 21-31.....							2.9		10	10	4.0		1.4		24	11	51.6	6.7	4
Feb. 1-10.....							1.4		9	9.8	3.0		1.6		20	13	60.7	6.5	5
Feb. 11-20.....							--		8	10	5.0		1.3		--	--	60.9	6.3	5
Feb. 21-28.....							1.6		8	9.2	2.5		.9		17	10	45.0	7.1	5
Mar. 1-10.....							1.6		11	9.8	2.5		.9		20	11	51.8	6.6	7
Mar. 11-20.....							1.3		8	9.4	2.5		1.1		18	11	46.4	6.4	15
Mar. 21-31.....							.9		8	9.7	1.0		1.1		17	10	44.3	6.2	8

Apr. 1-10, 1953 .....	1.2	8	9.2	2.0	0.9	17	10	46.8	6.5	--
Apr. 11-20 .....	1.2	2	11	4.0	1.2	17	15	47.3	6.0	6
Apr. 21-30 .....	2.3	8	9.7	2.5	1.2	16	9	47.9	6.3	7
May 1-10 .....	3.2	11	10.0	3.0	1.2	17	10	48.0	6.3	4
May 11-20 .....	2.6	12	8.4	5.0	1.3	20	10	48.0	6.3	5
May 21-31 .....	2.6	19	12	5.0	.6	30	14	81.9	7.0	9
June 1-10 .....	3.8	13	11	4.0	.7	20	9	69.7	6.8	7
June 11-20 .....	2.9	19	12	3.5	1.0	28	12	76.7	6.9	6
June 21-30 .....	3.4	16	12	3.5	1.0	24	11	73.1	6.9	4
Average .....	2.1	12	11	3.3	1.2	22	11	58.7	--	6

## NORTH ATLANTIC SLOPE BASINS, MAINE TO CONNECTICUT

## DELAWARE RIVER BASIN--Continued

## DELAWARE RIVER AT DINGMANS FERRY, PA.--Continued

Temperature (°F) of water, water year October 1952 to September 1953  
 /Once-daily temperature measurement at approximately 3 p. m./

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



DELAWARE RIVER BASIN--Continued  
LEHIGH RIVER AT CATASAUQUA, PA.

LOCATION --At Race Street Bridge at Catasauqua, Northampton County.

DRAINAGE AREA --1,012 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1944 to June 1953.

Water temperatures: October 1944 to June 1953.

EXTREMES 1952-53 --Hardness: Maximum, 69 ppm Nov. 1-10; minimum, 65.7 micromhos Feb. 22.

Specific conductance: Maximum, 191 micromhos Oct. 29; 30.

Water temperatures: Minimum, freezing point Dec. 29; 30.

EXTREMES 1944-53 --Dissolved solids (1944-47) (1949-53): Maximum, 169 ppm Oct. 1-10, 1944; minimum, 45 ppm Apr. 1-10, 1950.

Hardness (1944-47) (1949-53): Maximum, 106 ppm Oct. 1-10, 1944; minimum, 24 ppm Apr. 1-10, 1950.

Specific conductance: Maximum, 277 micromhos Nov. 2, 1947; minimum, 62.2 micromhos April 1, 1951.

Water temperatures: Maximum, 77°F July 2, 1945; June 28, 29, 1952; 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 1952 to September 1953 based on records for Lehigh River at Bethlehem, which are given in WSP 1272.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium, magnesium	Non-carbonate				
Oct. 1-10, 1952...	1,380	--	--	--	--	--	--	--	3.8	22	44	4.5	--	--	3.9	--	65	47	--	160	7.6	5
Oct. 11-20.....	1,070	--	--	--	0.02	--	16	5.0	3.6	17	46	5.0	--	--	4.8	--	65	51	--	172	7.4	5
Oct. 21-31.....	974	3.3	--	--	--	--	16	5.0	8.9	20	50	6.0	0.1	0.1	3.4	107	60	44	--	175	7.3	5
Nov. 1-10.....	890	--	--	--	--	--	--	--	5.5	22	49	6.0	--	--	4.2	--	69	51	--	178	7.2	3
Nov. 11-20.....	973	--	--	--	--	--	--	--	4.7	20	45	6.5	--	--	6.0	--	67	51	--	172	7.0	5
Nov. 21-30.....	11,115	--	--	--	--	--	--	--	5.0	9	27	5.0	--	--	2.9	--	34	27	--	102	6.6	10
Dec. 1-10.....	5,391	--	--	--	--	--	--	--	3.8	8	24	6.0	--	--	2.7	--	34	27	--	95.3	6.8	5
Dec. 11.....	20,600	--	--	--	--	--	--	--	--	37	--	--	--	--	--	--	--	--	--	140	6.9	5
Dec. 12-20.....	8,882	--	--	--	--	--	--	--	3.2	8	25	2.0	--	--	2.0	--	30	23	--	85.5	7.2	5
Dec. 21-31.....	3,150	--	--	--	--	--	--	--	4	10	26	2.5	--	--	2.6	--	40	33	--	102	6.9	2
Jan. 1-10, 1953...	2,353	--	--	--	--	--	--	--	1.3	13	28	3.5	--	--	2.5	--	44	33	--	112	6.9	3
Jan. 11-20.....	3,990	--	--	--	--	--	--	--	1.3	14	27	3.0	--	--	3.7	--	33	23	--	110	7.0	4
Jan. 21-31.....	5,956	--	--	--	--	--	--	--	3.5	12	24	3.0	--	--	2.0	--	33	23	--	88.5	7.1	4
Feb. 1-10.....	3,609	--	--	--	--	--	--	--	1.9	10	28	5.0	--	--	2.2	--	42	34	--	110	7.1	3
Feb. 11-20.....	2,526	--	--	--	--	--	--	--	6	15	24	3.0	--	--	3.3	--	43	31	--	110	7.1	3
Feb. 21-28.....	5,340	--	--	--	--	--	--	--	8	9	22	2.0	--	--	9	--	32	25	--	84.8	6.7	4
Mar. 1-10.....	3,738	--	--	--	--	--	--	--	8	13	24	2.0	--	--	2.8	--	39	28	--	99.4	7.0	4
Mar. 11-20.....	4,189	--	--	--	--	--	--	--	6	14	23	2.5	--	--	1.8	--	39	28	--	99.4	6.6	3
Mar. 21-31.....	6,221	--	--	--	--	--	--	--	9	8	21	2.0	--	--	3.3	--	32	25	--	81.2	6.8	4
Apr. 1-10.....	4,625	--	--	--	--	--	--	--	5	10	24	2.0	--	--	3.5	--	36	29	--	92.8	6.4	4
Apr. 11-20.....	5,357	3.1	--	--	0.04	--	87	2.3	2.1	10	21	3.0	--	--	1.5	49	31	23	--	81.8	6.4	3
Apr. 21-30.....	4,550	--	--	--	--	--	--	--	3.1	11	24	3.0	--	--	1.8	--	33	24	--	88.7	6.6	3

## DELAWARE RIVER BASIN--Continued

## LEHIGH RIVER AT CATASAUQUA, PA. --Continued

Chemical analyses, in parts per million, water year October 1932 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO <sub>3</sub>		Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25° C)	pH	Color
																	Calcium, magnesium	Non-carbonate				
May 1-10, 1953 ..	3,784		--		--		--	--	2.5		13	26	1.0	--	1.7	--	35	24		92.4	7.2	3 1/1
May 11-20 .....	3,580		--		--		--	--	3.2		9	28	2.0	--	2.0	--	34	27		95.4	7.2	5
May 21-31 .....	4,543		--		--		--	--	3.0		13	27	3.0	--	2.0	--	38	27		104	7.3	4
June 1-10 .....	3,039		--		--		--	--	1.9		14	26	3.0	--	1.8	--	40	29		107	7.2	5
June 11-20 .....	1,765		--		--		--	--	2.3		13	35	3.0	--	2.1	--	48	37		127	7.3	3
June 21-30 .....	1,223		--		--		--	--	2.5		18	38	3.5	--	2.5	--	58	43		152	7.5	2
Average .....	4,473 a 3,172		--		--		--	--	2.6		14	30	3.5	--	2.7	--	43	32		115	--	4

a Average for complete water year.

## DELAWARE RIVER BASIN--Continued

## LEHIGH RIVER AT CATASAUQUA, PA.--Continued

Temperature (°F) of water, water year October 1952 to September 1953  
 /Once-daily temperature measurement at approximately 7:30 a. m./

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

## DELAWARE RIVER BASIN--Continued

## LEHIGH RIVER AT WALNUTPORT, PA.

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

DRAINAGE AREA.--889 square miles.

RECORDS AVAILABLE.--Sediment records: May 1948 to March 1953.

EXTREMES, October 1952-March 1953.--Sediment concentrations: Maximum daily, 675 ppm Nov. 22; minimum daily, 2 ppm on several days during October and March.

Sediment loads: Maximum daily, 54,400 tons Nov. 22; minimum daily, 3 tons Oct. 13 and 19. EXTREMES, 1948-March 1953.--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. Station discontinued March 31, 1953. Records of discharge for water year October 1952 to September 1953 given in WSP 1272.

## Suspended sediment, October 1952 to March 1953

Day	October			November			December		
	Suspended sediment			Suspended sediment			Suspended sediment		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	697	6	11	454	7	9	2,240	9	54
2.....	720	6	12	446	7	8	2,080	9	51
3.....	976	7	18	428	7	8	2,040	8	44
4.....	892	5	12	420	5	6	1,850	9	45
5.....	772	2	4	420	4	5	3,640	57	s 984
6.....	733	6	12	420	5	6	8,500	136	s 3,300
7.....	686	7	13	406			5,800	26	407
8.....	662	3	5	399			4,520	7	85
9.....	640	3	5	399	7	8	3,770	10	102
10.....	616	4	7	406			3,530	15	143
11.....	605	4	7	406			21,200	493	s 35,400
12.....	605	3	5	309			18,600	280	13,100
13.....	575	2	3	392	6	6	9,000	100	2,070
14.....	555	4	7	392			6,750	40	729
15.....	535	5	7	420			5,060	15	205
16.....	515	6	8	535			4,260	12	138
17.....	488	5	7	480	5	7	3,650	9	89
18.....	488	3	4	471			3,290	5	44
19.....	488	2	3	471			2,910	4	31
20.....	480	3	4	1,510	192	s 1,530	2,580	4	28
21.....	488	6	8	8,150	275	s 5,180	2,520	3	20
22.....	480	7	9	27,100	675	s 54,400	3,060	7	58
23.....	480	6	8	18,200	333	s 17,700	2,730	6	44
24.....	471	7	9	9,500	120	3,080	2,480	3	20
25.....	462	6	7	6,250	65	1,100	2,280	5	31
26.....	454	6	7	4,780	40	516	2,150	6	35
27.....	446	8	10	4,020	30	326	2,000	8	43
28.....	471	6	8	3,290	19	169	1,650	5	22
29.....	505	6	8	2,840	20	153	1,550	4	17
30.....	471	7	9	2,560	14	97	1,650	3	13
31.....	454	6	7	--	--	--	1,630	9	40
Total.	17,910	--	244	96,364	--	84,385	139,850	--	57,992

s Computed by subdividing day.

## DELAWARE RIVER BASIN

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## DELAWARE RIVER BASIN--Continued

## LEHIGH RIVER AT WALNUTPORT, PA.--Continued

## Suspended sediment, October 1952 to March 1953--Continued

Day	January			February			March		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	1,550	11	46	2,880	8	62	2,300	9	56
2.....	1,480	10	40	2,500	7	47	2,080	9	51
3.....	1,510	10	41	2,340	7	44	2,000	8	43
4.....	1,480	11	44	2,190	6	35	3,370	35	s 309
5.....	1,350	10	36	1,950	6	32	3,410	7	64
6.....	1,260	10	34	1,920	5	26	2,880	3	23
7.....	1,220	10	33	2,860	15	116	2,620	2	14
8.....	1,240	11	37	3,060	10	83	2,420	4	26
9.....	1,590	12	52	2,650	6	43	2,190	2	12
10.....	2,010	19	s 110	2,340	5	32	2,060	2	11
11.....	2,840	25	192	2,090	5	28	1,860	6	30
12.....	2,460	12	80	2,130	7	40	1,530	8	40
13.....	2,130	8	46	2,020	6	33	1,890	10	54
14.....	1,970	12	64	1,880	6	30	2,040	10	55
15.....	1,880	12	61	2,140	16	92	2,140	14	81
16.....	2,000	13	70	2,560	10	69	4,330	46	538
17.....	2,220	15	90	2,260	7	43	3,890	10	105
18.....	2,780	27	203	1,990	7	38	3,290	6	53
19.....	3,290	17	151	1,880	8	41	3,650	9	89
20.....	3,060	13	107	1,930	7	36	3,530	9	86
21.....	2,840	6	46	4,970	85	s 1,460	3,060	6	50
22.....	2,690	8	58	6,250	33	557	2,840	6	46
23.....	2,440	4	26	4,650	10	126	2,650	6	43
24.....	7,720	209	s 7,140	3,890	9	95	4,700	46	s 755
25.....	9,780	105	2,770	3,410	8	74	6,250	25	422
26.....	7,280	19	373	3,060	7	58	6,920	30	561
27.....	5,200	14	197	2,840	8	61	6,250	14	236
28.....	4,650	12	151	2,560	8	55	5,200	12	168
29.....	4,140	12	134	--	--	--	4,390	9	107
30.....	3,410	7	84	--	--	--	3,770	4	41
31.....	3,180	6	52	--	--	--	3,290	5	44
Total.	92,650	--	12,548	77,200	--	3,456	103,200	--	4,213

Total discharge for period October 1952 to March 1953 (cfs-days) ..... 527,174

Total load for period October 1952 to March 1953 (tons) ..... 162,838

s Computed by subdividing day.

## DELAWARE RIVER BASIN--Continued

## DELAWARE RIVER AT TRENTON, N. J.

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

DRAINAGE AREA.--6,780 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1953.

Water temperatures: October 1944 to September 1953.

Sediment records: September 1949 to September 1953.

EXTREMES, 1952-53.--Hardness: Maximum, 102 ppm Aug. 21-31; minimum daily, 68.9 microhms Aug. 31; minimum daily, 68.9 microhms Jan. 26.

Specific conductance: Maximum daily, 280 microhms Aug. 31, 1953; minimum daily, 58.2 microhms Apr. 1, 1951.

Water temperatures: Maximum, 82°F July 3, 19, 20 and 30; minimum, 37°F Jan. 17.

Sediment concentrations: Maximum daily, 785 ppm Dec. 12; minimum daily, 0 ppm Oct. 21.

Sediment loads: Maximum daily, 256,000 tons Dec. 12; minimum daily, 0 ton Oct. 21.

EXTREMES, 1944-53.--Dissolved solids (1944-47) (1950-51): Maximum, 119 ppm Oct. 11-20, 1950; minimum, 44 ppm March 21-31, 1945.

Hardness (1944-47) (1949-53): Maximum, 102 ppm Aug. 21-31, 1953; minimum, 25 ppm Apr. 1-10, 1950.

Specific conductance: Maximum daily, 280 microhms Aug. 31, 1953; minimum daily, 58.2 microhms Apr. 1, 1951.

Water temperatures: Maximum, 86°F July 30, 1949; Aug. 30, 1946; minimum, 33°F on many days during winter months.

Sediment concentrations (1949-53): Maximum daily, 1,720 ppm Nov. 26, 1950; minimum daily, 0 ppm Oct. 21, 1952.

Sediment loads (1949-53): Maximum daily, 274,000 tons Nov. 26, 1950; minimum daily, 0 ton Oct. 21, 1952.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1952 to September 1953 based on records for Delaware River at Trenton, N. J., given in WSP 1272.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (microhms at 25°C)	pH	Color
																	Calcium	Non-carbonate				
Oct. 1-10, 1952..	4,529	--	--	--	--	--	--	--	6.3	56	27	7.5	--	--	4.8	--	75	29	--	190	7.8	5
Oct. 11-20 .....	3,425	--	--	--	--	--	--	--	5.5	60	28	8.5	--	--	4.5	--	82	33	--	201	7.8	5
Oct. 21-31 .....	3,027	1.9	--	--	0.03	--	23	8.0	7.1	65	36	8.5	--	0.1	3.5	120	90	37	--	221	7.6	5
Nov. 1-10 .....	3,074	--	--	--	--	--	--	--	3.4	60	28	10	--	--	3.8	--	88	39	--	213	7.8	5
Nov. 11-20 .....	3,073	--	--	--	--	--	--	--	4.0	58	28	11	--	--	3.2	--	86	38	--	208	7.4	8
Nov. 21-30 .....	3,245	--	--	--	--	--	--	--	3.3	22	20	7.5	--	--	4.6	--	46	28	--	117	7.5	10
Dec. 1-10 .....	17,450	--	--	--	--	--	--	--	1.3	25	20	3.5	--	--	4.4	--	47	26	--	115	7.1	5
Dec. 11-20 .....	47,460	--	--	--	--	--	--	--	1.3	20	17	2.0	--	--	2.5	--	36	20	--	93	7.1	5
Dec. 21-31 .....	14,827	--	--	--	--	--	--	--	2.5	30	21	4.0	--	--	4.0	--	50	28	--	122	7.3	5
Jan. 1-10, 1953 ..	10,898	--	--	--	--	--	--	--	1.2	34	22	5.0	--	--	2.3	--	57	29	--	136	7.1	3
Jan. 11-20 .....	15,800	--	--	--	--	--	--	--	3.1	32	23	6.0	--	--	5.1	--	56	30	--	135	7.8	7
Jan. 21-31 .....	38,182	--	--	--	--	--	--	--	5.1	24	18	5.0	--	--	4.5	--	38	18	--	97.1	6.9	7
Feb. 1-10 .....	18,700	--	--	--	--	--	--	--	2.0	30	19	3.5	--	--	3.6	--	48	23	--	114	7.3	5
Feb. 11-20 .....	15,460	--	--	--	--	--	--	--	2.5	32	21	3.0	--	--	3.9	--	50	24	--	112	7.3	7
Feb. 21-28 .....	25,750	--	--	--	--	--	--	--	1.4	22	16	3.0	--	--	5.1	--	40	22	--	95.4	6.6	15

Mar. 1-10, 1953	18,510	--	--	--	0.6	26	17	3.5	--	3.0	--	45	24	104	6.7	15
Mar. 11-20	24,100	--	--	--	.6	26	18	3.5	--	1.6	--	45	25	105	6.6	8
Mar. 21-31	33,673	--	--	--	.5	21	15	2.5	--	3.5	--	38	22	90.1	6.2	--
Apr. 1-10	26,960	--	--	--	3.3	22	17	5.0	--	3.0	--	38	20	95.8	6.2	5
Apr. 11-20	23,820	--	--	--	3.0	22	19	3.0	--	3.0	--	38	20	95.8	6.7	6
Apr. 21-30	24,090	--	--	--	3.2	25	20	4.0	--	2.6	--	42	22	104	6.6	7
May 1-10	26,300	9.2	9.8	3.2	4.6	24	18	5.0	0.0	2.7	72	38	18	92.8	6.8	5
May 11-20	18,840	--	--	--	1.1	26	19	2.0	--	3.0	--	44	23	106	7.0	5
May 21-31	15,482	--	--	--	1.4	31	21	2.5	--	2.9	--	50	25	130	7.0	3
June 1-10	10,252	--	--	--	2.5	36	22	4.5	--	3.2	--	56	26	140	7.2	3
June 11-20	6,779	--	--	--	2.5	43	22	6.0	--	3.6	--	64	29	159	7.5	3
June 21-30	4,642	--	--	--	2.7	55	25	6.5	--	4.5	--	78	33	189	7.8	3
July 1-10	4,248	--	--	--	1.8	53	26	5.5	--	4.6	--	78	35	189	7.8	5
July 11-20	3,125	--	--	--	3.5	60	30	8.5	--	4.0	--	88	39	216	7.8	8
July 21-31	3,958	--	--	--	6.2	40	30	22	--	3.1	--	84	51	219	6.9	7
Aug. 1-10	2,687	--	--	--	7.3	30	30	3.5	--	3.3	--	92	67	248	6.7	--
Aug. 11-20	2,640	--	--	--	5.7	33	32	35	--	3.2	--	100	73	261	6.8	7
Aug. 21-31	2,001	--	--	--	7.1	41	34	33	--	2.4	--	102	68	266	6.9	6
Sept. 1-10	3,003	--	--	--	4.8	52	28	9.0	--	3.6	--	77	34	190	7.5	--
Sept. 11-20	2,058	--	--	--	5.0	62	32	11	--	4.0	--	92	41	227	7.6	6
Average	14,380	--	--	--	3.4	37	23	7.5	--	3.6	--	62	32	154	--	6

## DELAWARE RIVER BASIN--Continued

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

Temperature (°F) of water, water year October 1952 to September 1953  
 [Once-daily temperature measurement at approximately 9:30 a. m.]

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



## DELAWARE RIVER BASIN--Continued

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

Suspended sediment, water year October 1952 to September 1953

Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	3,880	8	84	3,340	5	45	12,400	4	134
2.....	4,490	5	61	3,250	5	44	11,300	2	61
3.....	4,880	6	79	3,130	8	68	10,800	2	58
4.....	5,420	6	88	2,760	11	82	10,300	2	56
5.....	5,290	7	100	2,570	7	49	12,600	7	s 318
6.....	4,800	8	104	3,130	6	51	25,800	91	s 6,730
7.....	4,120	8	89	2,820			28,300	70	5,350
8.....	3,950	7	75	2,960			24,700	31	2,070
9.....	4,300	2	23	3,160			20,500	17	941
10.....	4,160	3	34	3,220	13	105	17,800	17	817
11.....	3,850	2	21	2,760			37,500	299	s 35,700
12.....	4,050	1	11	2,550			118,000	785	s 256,000
13.....	3,590	1	10	3,040			104,000	380	s 115,000
14.....	3,340	2	18	2,740	1	8	57,600	145	22,600
15.....	3,190	2	17	3,160			39,600	93	9,940
16.....	3,400	3	28	3,400			31,100	38	3,190
17.....	3,340	3	27	3,340			26,000	22	1,540
18.....	3,400	4	37	3,160	2	18	22,600	13	793
19.....	3,160	7	60	2,960			20,100	8	434
20.....	2,930	2	16	3,620			18,000	10	486
21.....	3,040	0	0	10,300	114	s 4,110	16,500	12	535
22.....	3,070	1	8	52,100	430	s 60,100	18,900	16	818
23.....	3,310	1	9	75,400	315	64,100	17,900	12	580
24.....	3,370	1	9	54,700	160	23,600	17,200	11	511
25.....	3,020	3	24	37,200	75	7,530	16,100	8	348
26.....	2,820	9	69	26,500	35	2,500	15,000	4	162
27.....	2,840	9	69	21,200	19	1,090	13,900	12	480
28.....	2,680	9	65	17,900	14	677	13,000	22	772
29.....	2,630	10	71	15,400	8	333	11,400	19	585
30.....	2,930	7	55	13,800	6	224	10,200	8	220
31.....	3,590	6	59	--	--	--	10,800	6	175
Total.	112,840	--	1,412	385,570	--	165,240	809,900	--	467,422
	January			February			March		
1.....	10,900	12	343	22,200	54	2,920	17,700	6	256
2.....	10,300			20,500			15,800		
3.....	10,200			19,500			13,900		
4.....	10,900			18,000			20,000	109	s 6,530
5.....	10,000	11	293	16,400	23	1,110	24,500	100	6,620
6.....	9,250			15,400			24,400	20	1,320
7.....	8,870			14,800			20,900	10	564
8.....	8,560			19,000			17,900	3	125
9.....	12,600	82	3,900	21,500	17	724	15,700		
10.....	17,400			19,700			14,300		
11.....	17,800			17,000			13,900	7	315
12.....	16,500			15,400			13,100		
13.....	15,600	30	1,210	15,300			17,900		
14.....	14,600			14,400			17,200		
15.....	13,200			14,600			18,500		
16.....	12,600	7	249	18,000	8	322	28,100	122	s 9,320
17.....	12,700			16,500			38,600	108	s 11,600
18.....	14,200			16,000			35,100	40	3,790
19.....	19,400	46	2,410	14,300			29,700	25	2,000
20.....	21,400	54	3,120	13,100	13	774	28,900	19	1,480
21.....	21,500	20	1,160	14,600			28,100	11	835
22.....	20,800	10	562	29,100	149	s 13,100	24,600	15	996
23.....	19,100	8	413	42,600	75	8,630	21,200	15	859
24.....	28,300	229	s 22,300	31,500	47	4,000	21,400	20	1,160
25.....	65,200	328	s 44,200	25,600	32,800	58	5,140		
26.....	83,100	177	s 40,000	22,800	13	774	45,300	118	14,400
27.....	54,300	117	17,200	20,800			48,100	95	12,300
28.....	38,500	46	4,780	19,000			46,700	112	14,100
29.....	34,000	24	2,200	--			--	--	40,600
30.....	30,100	12	975	--	--	--	33,400	35	3,160
31.....	25,100	11	745	--	--	--	28,200	20	1,520
Total.	686,980	--	156,292	547,600	--	53,120	796,500	--	104,932

s Computed by subdividing day.

NORTH ATLANTIC SLOPE BASINS, MAINE TO CONNECTICUT  
 DELAWARE RIVER BASIN--Continued

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

Suspended sediment, water year October 1952 to September 1953--Continued

Day	April			May			June		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	25,800	16	1,110	24,300	11	722	13,200	20	713
2.....	24,200			26,600	49	3,520	12,800	11	380
3.....	23,000			30,700	65	5,390	11,500	10	310
4.....	21,800	22	1,260	27,900	20	1,510	10,000	7	189
5.....	19,500			25,500	25	1,720	9,190		
6.....	17,500			24,900	35	2,350	8,720	16	389
7.....	26,000	84	s 7,160	27,600	15	1,120	8,510		
8.....	37,800	75	7,650	26,000	11	772	9,570		
9.....	39,600	68	7,270	25,200	40	2,720	9,680		
10.....	34,400	40	3,720	24,300	30	1,970	9,350	6	139
11.....	31,100	25	2,100	21,800	11	647	8,210		
12.....	28,600	20	1,540	19,800	15	802	7,140		
13.....	27,600	20	1,490	17,900	12	580	6,960	15	282
14.....	31,000	22	1,840	17,800	19	913	7,520	31	629
15.....	30,400	10	821	17,100	42	1,940	6,960	8	150
16.....	29,100	16	1,260	17,300	15	701	6,870	7	130
17.....	28,800	10	778	17,000	30	1,380	6,770	10	183
18.....	27,300	10	737	18,700	50	2,520	6,230	2	34
19.....	27,700	6	449	21,400	35	2,020	5,710		
20.....	26,600	11	790	19,600	22	1,160	5,420		
21.....	24,800	21	1,410	17,200	14	650	5,080	2	29
22.....	23,200			15,400	8	333	5,150		
23.....	21,300			20,000	274	s 17,300	5,300	153	s 2,390
24.....	19,600			20,100	268	s 15,300	4,490	40	485
25.....	18,100	6	323	16,500	55	2,450	4,490	8	97
26.....	17,600			14,700	22	873	4,380	9	106
27.....	20,900	11	621	15,300	20	826	4,230	5	57
28.....	35,100	97	s 9,580	14,200	20	767	4,570	5	62
29.....	33,000	40	3,560	12,600	15	510	4,680	5	63
30.....	27,300	19	1,400	11,800	20	637	4,050	6	66
31.....	--	--	--	12,500	12	405	--	--	--
Total.	798,700	--	63,201	621,700	--	74,508	216,730	--	8,554
Day	July			August			September		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	4,190	25	283	2,990			1,930	10	52
2.....	5,170	50	698	3,100	6	49	1,720	9	42
3.....	5,840	7	110	2,900					
4.....	5,170	8	112	2,680	3	22	2,840	11	69
5.....	4,380	3	35	2,470	4	27	2,520	18	122
6.....	3,850	2	21	2,340	5	32	3,040	14	115
7.....	3,430	3	28	2,320	9	56	4,160	42	472
8.....	3,430	5	46	2,470	11	73	4,960	48	643
9.....	3,560	5	48	2,500	12	81	3,680	19	189
10.....	3,460	3	28	3,100	22	184	3,880	17	178
11.....	3,280	17	151	3,340	25	225	4,270	20	231
12.....	3,190	26	224	2,870	17	132	3,340	14	126
13.....	2,990	32	258	2,600	16	112	2,840	12	92
14.....	2,930	24	190	2,470	15	100	2,710	6	44
15.....	2,840	42	322	2,550	18	124	2,710	4	29
16.....	3,280	55	487	2,420	14	91	2,930	9	71
17.....	3,280	47	416	2,500	17	115	3,250	8	70
18.....	2,990	13	105	2,500	15	101	2,960	4	32
19.....	3,220	7	61	2,520	12	82	2,600	4	28
20.....	3,250	18	158	2,680	10	71	2,420	5	33
21.....	3,560	18	173	2,370	3	19	2,290	2	12
22.....	3,400	10	92	2,150	5	29	2,220	2	12
23.....	4,530	55	s 712	1,990	3	16	2,100	2	11
24.....	6,870	52	s 945	1,930	8	42	2,240	4	24
25.....	5,460	17	251	1,830	10	49	2,200	9	53
26.....	4,090	8	88	1,810	9	44	2,030	11	60
27.....	3,370			1,830	11	54	1,830	12	63
28.....	3,160			2,060	10	56	1,910	8	41
29.....	3,040	3	25	1,990	8	43	1,910	5	26
30.....	3,040			2,030	9	49	1,890	5	26
31.....	3,020			2,200	10	59	--	--	--
Total.	117,270	--	6,108	75,480	--	2,235	80,850	--	3,016
Total discharge for year (cfs-days) .....									
Total load for year (tons) .....									
								5,250,120	
								1,108,047	

s Computed by subdividing day.

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

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1953.  
REMARKS.--Data obtained from analyses of river samples taken at center of stream approximately 3 feet from bottom. For additional data refer to WSP 1262, chemical characteristics of Delaware River water, Trenton, N.J., to Marcus Hook, Pa.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180° C)	Hardness a	Specific conductance (micro-mhos at 25° C)	pH	Color	Dissolved oxygen	Biochemical oxygen demand a
Oct. 6, 1952.....	4,800	64	3.0	--	0.00	--	20	7.4	6.3	52	29	33	10	0.1	7.7	122	80	203	7.7	5	3.2	8.7
Nov. 6.....	3,130	49	2.8	--	.03	--	21	8.9	7.5	56	33	33	10	--	11	143	89	227	7.6	8	2.6	9.1
Dec. 4.....	10,300	39	4.3	--	.12	--	12	4.8	3.2	24	22	22	5.5	.1	5.8	78	50	125	6.9	6	3.0	12.2
Jan. 7, 1953.....	8,870	36	5.4	--	.04	--	13	5.6	3.2	29	22	22	6.0	.1	6.2	103	56	141	8.0	3	1.7	11.6
Feb. 9.....	21,500	39	4.2	--	.01	--	12	4.3	2.9	28	20	4.5	.1	.1	4.7	88	43	125	7.7	5	2.4	12.0
Mar. 10.....	14,300	38	4.6	--	.09	--	11	4.0	2.0	24	19	4.5	.1	.1	2.4	77	44	109	7.9	10	0.0	9.0
Apr. 6.....	17,500	52	4.4	--	.08	--	8.7	3.0	2.9	23	15	4.5	.1	.1	2.9	70	34	102	7.8	5	1.7	10.4
May 5.....	25,500	56	3.2	--	.05	--	7.1	2.3	2.4	18	13	3.0	.1	.1	2.3	96	27	83.6	7.5	8	1.5	10.0
June 4.....	10,000	65	4.5	--	.03	--	12	4.3	3.9	32	22	5.0	.1	.1	3.4	74	48	131	7.5	5	1.7	8.4
July 2.....	5,170	83	4.0	--	.22	--	17	7.1	6.5	52	28	10	.1	.1	5.0	115	72	188	7.4	5	0.0	3.4
Aug. 5.....	2,470	80	3.5	--	.03	--	20	6.8	7.3	45	38	12	.1	.1	5.2	138	78	208	7.9	2	2.2	4.6
Sept. 2.....	1,660	83	3.0	--	.06	--	22	8.8	9.3	56	36	14	.1	.1	4.4	155	91	244	7.9	2	2.9	6.4

a Values for biochemical oxygen demand and dissolved oxygen obtained from surface samples.

NORTH ATLANTIC SLOPE BASINS, MAINE TO CONNECTICUT  
DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT TORRESDALE INTAKE, PHILADELPHIA, PA.

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1953.

REMARKS.--Data obtained from analyses of river samples taken at center of stream approximately 3 feet from bottom. For additional data refer to WSP 1262, Chemical characteristics of Delaware River water, Trenton, N. J., to Marcus Hook, Pa.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date	Discharge (cfs)	Temperature (°F)	Chloride (Cl)	Specific conductance (micro- mhos at 25°C)	pH	Biochemical oxygen demand <sup>a</sup>	Dissolved oxygen <sup>a</sup>
Oct. 6, 1952 .....	4,800	67	8.5	201	6.4	2.0	8.1
Nov. 6 .....	3,130	51	11	226	6.4	2.4	9.6
Dec. 4 .....	10,300	41	5.0	119	6.4	3.3	11.9
Jan. 7, 1953 .....	8,870	37	6.0	137	6.6	2.0	11.5
Feb. 9 .....	21,500	39	5.0	130	6.7	1.8	11.5
Mar. 10 .....	14,300	38	4.0	107	6.7	1.5	7.0
Apr. 6 .....	17,500	52	4.0	115	7.1	1.9	10.4
May 5 .....	25,500	56	4.0	86.3	6.5	0.7	9.8
June 4 .....	10,000	66	4.0	130	6.8	1.2	7.6
July 2 .....	5,170	85	7.0	180	6.7	0.0	3.2
Aug. 5 .....	2,470	79	12	212	7.5	5.9	3.9
Sept. 2 .....	1,660	85	18	275	7.0	3.2	3.7

<sup>a</sup> Values for biochemical oxygen demand and dissolved oxygen obtained from surface samples.

DELAWARE RIVER AT LEHIGH AVENUE, PHILADELPHIA, PA.

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1953.

REMARKS.--Data obtained from analyses of river samples taken at center of stream approximately 3 feet from bottom. For additional data refer to WSP 1262, Chemical characteristics of Delaware River water, Trenton, N. J., to Marcus Hook, Pa.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date	Discharge (cfs)	Temperature (°F)	Chloride (Cl)	Specific conductance (micro- mhos at 25°C)	pH	Biochemical oxygen demand <sup>a</sup>	Dissolved oxygen <sup>a</sup>
Oct. 6, 1952 .....	4,800	67	9.5	195	6.6	1.9	4.9
Nov. 6 .....	3,130	53	18	278	6.6	6.5	3.5
Dec. 4 .....	10,300	41	6.0	121	6.6	2.6	10.6
Jan. 7, 1953 .....	8,870	36	8.0	160	6.7	2.7	12.3
Feb. 9 .....	21,500	39	6.0	144	6.7	2.0	11.3
Mar. 10 .....	14,800	39	5.0	115	6.6	1.2	9.9
Apr. 6 .....	17,500	52	6.0	110	6.6	2.1	9.2
May 5 .....	25,500	56	4.0	106	6.5	3.5	8.7
June 4 .....	10,000	67	10	149	6.5	2.5	2.0
July 2 .....	5,170	85	16	239	7.0	0.5	0.6
Aug. 5 .....	2,470	80	18	281	7.0	8.1	1.6
Sept. 2 .....	1,660	85	5	373	6.9	8.1	1.7

<sup>a</sup> Values for biochemical oxygen demand and dissolved oxygen obtained from surface samples.

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

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1953.

REMARKS.--Data obtained from analyses of river samples taken at center of stream approximately 3 feet from bottom. For additional data, refer to WSP 1262, Chemical characteristics of Delaware River water, Trenton, N. J., to Marcus Hook, Pa.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO <sub>3</sub>	Specific conductance (micro-mhos at 25° C)	pH	Color	Biochemical oxygen demand a	Dissolved oxygen a
Oct. 6, 1952	4,800	66	3.8		0.03		17	6.8	9.6		42	32	11	0.1	17	124	70	204	7.7	8	1.8	3.6
Nov. 6	3,130	53	2.2		.03		22	8.9	19		48	54	20		18	189	92	301	7.0	6	8.2	1.6
Dec. 4	10,300	42	4.7		.09		11	4.3	4.4		21	29	6.0	.1	6.5	82	45	124	6.9	8	3.1	10.5
Jan. 7, 1953	8,870	36	5.2		.02		13	5.5	6.9		26	27	9.0	.1	9.6	113	55	161	7.8	10	6.7	9.4
Feb. 9	21,500	39	5.8		.14		13	4.7	4.6		20	26	8.0	.1	8.0	97	52	139	7.9	10	3.8	10.1
Mar. 10	14,300	39	5.4		.09		11	4.1	4.2		20	22	6.5	.1	4.5	83	42	120	7.8	10	2.7	10.2
Apr. 6	17,500	52	4.4		.07		9.1	2.8	4.7		20	19	6.0	.1	4.5	73	34	114	7.5	5	2.5	7.6
May 5	25,500	57	4.0		.04		9.1	3.2	4.0		22	16	5.0	.1	3.7	70	36	110	7.2	10	4.2	7.4
June 4	10,000	66	4.2		.03		12	5.3	6.8		26	27	8.0	.1	5.4	100	52	153	7.5	10	1.5	3.0
July 2	5,170	82	4.7		.02		17	6.8	11		35	42	14	.1	9.9	136	70	234	6.7	10	.0	.3
Aug. 5	2,470	80	1.6		.06		21	8.3	17		46	47	19	.1	8.5	175	87	275	7.7	4	10.5	2.2
Sept. 2	1,660	83	1.4		.04		23	11	24		44	63	30	.2	9.2	223	103	348	7.5	7	3.9	.5

a Values for biochemical oxygen demand and dissolved oxygen obtained from surface samples.

## DELAWARE RIVER BASIN--Continued

## DELAWARE RIVER AT WHARTON STREET, PHILADELPHIA, PA.

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1953.

REMARKS.--Data obtained from analyses of river samples taken at center of stream, approximately 3 feet from bottom. For additional data refer to WSP 1262, Chemical characteristics of Delaware River water, Trenton, N. J., to Marcus Hook, Pa.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date	Discharge (cfs)	Temperature (cfs)	Chloride (Cl)	Specific conductance (micromhos at 25°C)	pH	Biochemical oxygen demand <sup>a</sup>	Dissolved oxygen <sup>a</sup>
Oct. 7, 1952 .....	4,120	68	16	255	6.9	5.8	1.0
Nov. 7 .....	2,550	53	22	311	6.4	7.5	2.2
Dec. 5 .....	12,600	47	9.0	162	6.2	6.2	6.3
Jan. 6, 1953 .....	14,600	37	9.0	161	6.6	7.8	9.0
Feb. 10 .....	19,700	38	6.0	135	6.6	2.4	10.4
Mar. 9 .....	15,700	39	6.0	118	6.5	1.3	10.0
Apr. 7 .....	26,000	52	4.0	124	6.3	3.5	6.6
May 4 .....	27,900	57	4.0	102	6.6	2.5	9.6
June 3 .....	11,500	66	8.0	162	6.4	3.6	1.8
July 1 .....	4,190	82	12	234	6.7	1.1	0.6
Aug. 4 .....	2,680	79	15	282	6.8	5.7	2.5
Sept. 1 .....	1,910	83	34	386	6.7	3.3	0.9

<sup>a</sup> Values for biochemical oxygen demand and dissolved oxygen obtained from surface samples.

## DELAWARE RIVER AT LEAGUE ISLAND, PHILADELPHIA, PA.

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1953.

REMARKS.--Data obtained from analyses of river samples taken at center of stream 3 feet from bottom, excepting January 14 sample, taken approximately 3 feet from surface. For additional data refer to WSP 1262, Chemical characteristics of Delaware River water, Trenton, N. J., to Marcus Hook, Pa.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date	Discharge (cfs)	Temperature (°F)	Chloride (Cl)	Specific conductance (micromhos at 25°C)	pH	Biochemical oxygen demand <sup>a</sup>	Dissolved oxygen <sup>a</sup>
Oct. 7, 1952 .....	4,120	68	16	283	6.7	6.7	1.5
Nov. 7 .....	2,550	51	27	353	6.4	6.9	2.0
Dec. 5 .....	12,600	47	8.5	173	6.2	5.3	5.7
Jan. 14, 1953 b .....	14,600	37	8.0	152	7.3	--	--
Feb. 10 .....	19,700	39	8.0	160	6.4	4.4	9.3
Mar. 9 .....	15,700	40	7.0	144	6.2	4.1	7.5
Apr. 7 .....	26,000	53	6.0	137	6.3	3.5	7.2
May 4 .....	27,900	58	4.0	106	6.4	3.5	8.4
June 3 .....	11,500	65	7.0	166	6.4	2.0	2.7
July 1 .....	4,190	82	14	247	6.8	0.0	1.0
Aug. 4 .....	2,680	80	18	303	6.8	4.9	0.8
Sept. 1 .....	1,910	83	55	471	6.6	3.6	1.8

<sup>a</sup> Values for biochemical oxygen demand and dissolved oxygen obtained from surface samples.<sup>b</sup> Surface samples taken from League Island ferry.

## DELAWARE RIVER BASIN--Continued

## 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.--Sediment records: September 1947 to March 1953.

EXTREMES, October 1952-March 1953.--Sediment concentrations: Maximum daily, 1,530 ppm Jan. 24; minimum daily, 18 ppm Jan. 1

Sediment loads: Maximum daily, 10,700 tons Nov. 22; minimum daily, 13 tons Nov. 3 and Jan. 1.

EXTREMES, 1947-March 1953.--Sediment concentrations: Maximum daily, 9,740 ppm Feb. 15, 1948; minimum daily, 11 ppm Mar. 10, 1952.

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

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Station discontinued March 31, 1953. Records of discharge for period October 1952 to March 1953 given in WSP 1272.

## Suspended sediment, October 1952 to March 1953

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.....	147	345	137	77	69	14	417	72	81
2.....	162	395	173	91	67	16	389	210	221
3.....	160	478	206	75	62	13	385	242	252
4.....	145	160	63	72	85	17	341	320	295
5.....	153	258	107	73	116	23	840	392	s 1,090
6.....	143	358	138	68	132	24	1,170	360	1,140
7.....	141	545	207	75	180	36	920	280	696
8.....	139	420	158	89	168	40	745	185	372
9.....	143	458	177	94	95	24	645	122	212
10.....	141	109	41	87	76	18	681	200	368
11.....	151	90	37	83	75	17	2,600	1,370	s 9,740
12.....	129	93	32	78	108	23	1,820	230	1,130
13.....	124	510	171	76	200	41	1,260	250	851
14.....	124	820	275	75	298	60	945	68	174
15.....	126	639	217	94	272	69	745	82	165
16.....	129	540	188	105	110	31	622	266	447
17.....	127	270	93	83	80	18	546	115	170
18.....	137	76	28	89	348	84	483	110	143
19.....	115	260	81	87	150	35	437	200	236
20.....	115	235	73	676	775	s 1,420	409	100	110
21.....	105	210	60	1,370	855	s 3,420	425	64	73
22.....	110	149	44	4,100	923	s 10,700	496	72	96
23.....	113	182	56	2,050	720	3,980	429	80	93
24.....	113	155	47	1,310	350	1,240	389	60	63
25.....	120	152	49	995	68	183	365	28	28
26.....	124	163	55	820	68	151	341	28	26
27.....	118	120	38	695	70	131	321	43	37
28.....	117	115	36	573	160	248	268	48	37
29.....	107	118	34	501	185	250	258	81	56
30.....	72	195	38	465	85	107	255	33	a 23
31.....	76	80	16	--	--	--	255	30	21
Total.	3,926	--	3,075	15,126	--	22,433	20,222	--	18,446

s Computed by subdividing day.

a Computed from estimated concentration graph.

## NORTH ATLANTIC SLOPE BASINS, MAINE TO CONNECTICUT

## DELAWARE RIVER BASIN--Continued

## SCHUYLKILL RIVER AT LANDINGVILLE, PA.--Continued

## Suspended sediment, October 1952 to March 1953--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.....	267	18	13	524	55	78	298	170	137
2.....	252	60	41	445	70	84	255	180	124
3.....	249	70	47	405	65	71	232	215	135
4.....	243	118	77	385	63	65	544	297	436
5.....	216	232	135	357	65	63	445	275	330
6.....	199	128	69	349	52	49	389	220	231
7.....	199	76	41	528	45	64	381	115	118
8.....	210	150	85	433	71	83	377	128	130
9.....	352	115	109	377	100	102	325	195	171
10.....	439	90	107	333	95	85	298	203	163
11.....	528	80	114	309	100	83	261	143	101
12.....	441	65	77	333	74	67	261	140	99
13.....	405	117	128	317	83	71	288	139	108
14.....	385	172	179	302	70	57	270	130	95
15.....	381	255	262	431	75	87	378	149	152
16.....	389	222	233	413	66	74	550	85	126
17.....	401	177	192	357	72	69	474	60	77
18.....	637	230	396	317	65	56	478	137	177
19.....	564	70	106	294	48	38	582	172	270
20.....	578	56	87	291	72	57	506	60	82
21.....	564	80	122	736	228	a 453	474	38	49
22.....	542	103	151	695	100	a 188	453	63	77
23.....	483	160	209	800	78	126	409	48	53
24.....	2,120	1,530	s 9,720	514	66	92	1,050	95	269
25.....	1,870	150	757	449	68	82	948	91	s 292
26.....	1,280	90	306	405	75	82	1,040	116	326
27.....	945	90	230	369	80	80	858	123	285
28.....	845	80	183	329	165	147	768	85	176
29.....	695	68	128	--	--	--	661	40	71
30.....	591	40	64	--	--	--	559	67	101
31.....	555	32	48	--	--	--	499	48	65
Total.	17,805	--	14,416	11,597	--	2,653	15,311	--	5,026

Total discharge for period October 1952 to March 1953 (cfs-days) ..... 83,987

Total load for period October 1952 to March 1953 (tons) ..... 66,049

s Computed by subdividing day.

a Computed from estimated concentration graph.



## DELAWARE RIVER BASIN--Continued

## LITTLE SCHUYLKILL RIVER AT SOUTH TAMAUQUA, PA.

LOCATION.--At State Rt. 443 Highway Bridge,  $3\frac{1}{2}$  miles downstream from Panther Creek.  
DRAINAGE AREA.--69.6 square miles.

RECORDS AVAILABLE.--Sediment records: April 1950 to April 1953.

EXTREMES, October 1952-April 1953.--Sediment concentrations: Maximum daily, 2,950 ppm Nov. 20; minimum daily, 28 ppm Apr. 5.

Sediment loads: Maximum daily, 31,100 tons Nov. 22; minimum daily, 14 tons Oct. 5.

EXTREMES, April 1950 to April 1953.--Sediment concentrations: Maximum daily, 6,400 ppm July 28, 1951; minimum daily, 20 ppm Mar. 18, 1951 and Mar. 16, 1952.

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

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. This station discontinued Apr. 30, 1953. Records of discharge computed on the basis of the discharge records for the Little Schuylkill River at Tamauqua, Pa., which for the water year October 1952 to September 1953 are given in WSP 1272.

## Suspended sediment, October 1952 to April 1953

Day	October			November			December		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	78	100	21	58	280	44	166	530	238
2.....	82	189	42	54	126	18	152	270	111
3.....	91	174	43	58	270	42	152	200	82
4.....	77	272	57	57	395	61	136	90	33
5.....	77	68	14	60	450	73	601	747	s 1,450
6.....	78	176	37	60	380	62	725	180	352
7.....	80	258	56	58	390	61	476	55	71
8.....	80	331	72	56	280	42	369	160	159
9.....	78	330	69	54	130	19	306	170	140
10.....	78	660	139	58	600	94	387	427	s 644
11.....	77	680	141	58	350	55	3,620	1,230	s 11,900
12.....	77	82	17	60	290	47	1,840	200	994
13.....	77	220	46	57	420	65	996	80	215
14.....	75	288	58	57	430	66	665	64	115
15.....	73	335	66	75	1,400	s 376	483	102	133
16.....	71	328	63	60	202	33	375	112	113
17.....	68	320	59	60	264	43	306	144	119
18.....	63	232	39	63	428	73	272	133	98
19.....	63	96	16	61	460	76	244	150	99
20.....	66	192	34	450	2,950	s 3,580	223	110	66
21.....	64	310	54	1,160	2,300	s 7,510	249	78	52
22.....	64	295	51	5,630	1,790	s 31,100	317	236	202
23.....	66	345	61	2,060	250	1,390	301	232	189
24.....	61	302	50	834	78	176	227	188	115
25.....	58	135	21	514	62	86	206	65	35
26.....	58	118	19	369	88	88	202	108	59
27.....	60	270	44	296	50	40	198	106	57
28.....	66	450	80	227	88	54	180	50	24
29.....	64	290	50	187	92	46	184	250	124
30.....	61	307	51	184	48	24	176	234	111
31.....	63	420	71	--	--	--	169	222	101
Total.	2,194	--	1,641	13,035	--	45,444	14,903	--	18,202

s Computed by subdividing day.

## DELAWARE RIVER BASIN--Continued

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

Suspended sediment, October 1952 to April 1953--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.....	169	86	30	244	40	26	215	42	24
2.....	159	98	42	215	160	93	194	92	48
3.....	173	122	57	187	155	78	180	138	67
4.....	166	50	22	176	150	71	338	420	383
5.....	162	208	91	156	125	53	236	184	117
6.....	162	135	59	149	150	60	202	135	74
7.....	156	158	67	254	500	343	191	70	36
8.....	152	222	91	198	50	27	191	51	26
9.....	202	296	161	173	200	93	180	188	91
10.....	244	460	303	173	150	70	162	160	70
11.....	272	155	114	152	135	55	146	175	69
12.....	219	138	82	162	102	45	143	220	85
13.....	194	172	75	152	78	32	156	258	109
14.....	180	156	76	146	82	32	149	110	44
15.....	219	112	66	206	118	66	211	335	191
16.....	317	100	86	215	500	290	369	500	498
17.....	322	93	81	176	143	68	312	285	240
18.....	483	500	652	162	189	83	296	252	201
19.....	407	148	163	156	252	106	350	335	317
20.....	381	109	121	159	243	104	290	200	157
21.....	357	76	73	718	1,630	s 3,680	262	100	71
22.....	327	78	69	581	100	157	258	54	38
23.....	285	72	55	468	140	177	240	60	39
24.....	2,081	1,450	s 9,100	394	145	154	834	710	s 2,260
25.....	1,300	120	421	344	150	139	695	140	263
26.....	685	400	740	296	215	172	790	152	324
27.....	461	112	139	272	270	198	655	98	173
28.....	434	156	185	236	110	70	537	75	109
29.....	350	129	122	--	--	--	441	62	74
30.....	285	110	85	--	--	--	375	111	112
31.....	254	60	41	--	--	--	317	72	62
Total.	11,558	--	13,469	6,920	--	6,542	9,915	--	6,372
Day	April			May			June		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	280	100	76						
2.....	272	115	84						
3.....	227	43	26						
4.....	219	75	44						
5.....	211	28	16						
6.....	219	35	21						
7.....	499	254	s 365						
8.....	394	112	119						
9.....	357	62	60						
10.....	363	79	77						
11.....	306	60	50						
12.....	306	60	50						
13.....	322	59	51						
14.....	312	52	44						
15.....	258	41	29						
16.....	350	135	128						
17.....	306	70	58						
18.....	306	85	70						
19.....	338	35	32						
20.....	306	56	46						
21.....	290	51	40						
22.....	258	60	42						
23.....	244	62	41						
24.....	211	150	85						
25.....	191	110	57						
26.....	285	50	38						
27.....	537	395	573						
28.....	388	282	295						
29.....	327	220	194						
30.....	290	180	141						
31.....	--	--	--						
Total.	9,172	--	2,952						

Total discharge for period October 1952 to April 1953 (cfs-days) ..... 67,697  
 Total load for period October 1952 to April 1953 (tons) ..... 94,622

s Computed by subdividing day.

## DELAWARE RIVER BASIN--Continued

## 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 February 1953.

Water temperatures: February 1948 to February 1953.

Sediment records: October 1947 to September 1953.

EXTREMES, 1952-53.--Sediment concentrations: Maximum daily, 1,300 ppm Nov. 22; minimum daily, 0.3 ton on several days during August and September.

Sediment loads: Maximum daily, 47,100 tons Nov. 22; minimum daily, 0.3 ton on several days during August and September.

EXTREMES, 1947-53.--Dissolved solids: Maximum, 755 ppm Sept. 11-20, 1948; minimum, 155 ppm Dec. 11-14, 1952.

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

Specific conductance (1948-53): Maximum daily, 1,040 micromhos Oct. 23, 1951; minimum daily, 189 micromhos Dec. 4, 1950.

Water temperatures (1948-53): Maximum, 86.0 ppm June 26, 1952; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum, 8,630 ppm Nov. 22, 1947; minimum daily, 0 ppm on many days during 1952 water year.

Sediment loads: Maximum daily, 90,100 tons Nov. 22, 1947; minimum daily, 0 ton on many days during 1952 water year.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1952 to September 1953 given in WSP 1272.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub> Calcium magnesium	Non-carbonate	Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
Oct. 1-10, 1952..	290		13	10	0.07	5.1	66	41	18		0	418	6.0	0.1	2.5	631	333	333	248	840	3.80	5
Oct. 11-20.....	222		14	10	0.08	5.5	70	44	14		0	430	6.0	0	2.5	662	356	356	214	870	3.90	5
Oct. 21-31.....	171		14	10	0.05	5.5	70	43	19		0	435	7.5	1	2.7	660	351	351	222	886	3.83	3
Nov. 1-10.....	149		9	13	0.16	6.2	72	43	20	2.3		420	7.0	0	3.1	658	350	350	232	893	3.80	3
Nov. 11-20.....	170		12	9	0.13	5.7	68	39	19	2.7	0	404	3.0	0	4.1	658	350	350	232	893	3.80	3
Nov. 21-30.....	6,270		12	9.5	0.1	5.7	68	39	19	2.7	0	404	3.0	0	4.1	658	350	350	232	893	3.80	3
Nov. 26-30.....	1,418		8.4	6.4	0.06	2.7	32	22	9.2	1.5	0	208	3.0	0	2.6	313	170	170	132	455	4.25	2
Dec. 1-5.....	1,089		9.6	7.3	0.05	3.0	38	26	11	1.9	0	227	3.5	0	2.5	352	197	197	140	493	4.45	3
Dec. 6-10.....	2,292		8.3	3.0	0.02	1.5	21	13	5.5	1.3	0	124	3.0	1	3.4	194	106	106	106	293	4.5	1
Dec. 11-14.....	5,840		7.4	1.9	0.02	1.2	17	11	9.8	0.8	2	98	2.0	0	3.1	155	88	88	84	242	4.6	2
Dec. 15-20.....	1,398		8.9	5.0	0.05	2.6	34	23	9.0	1.3	0	202	3.0	0	2.5	304	179	179	130	440	4.05	3
Dec. 21-31.....	837		11	7.2	0.07	3.3	40	26	10	1.4	0	252	3.0	0	2.5	381	207	207	174	529	4.15	1
Jan. 1-10, 1953..	558		7.9	7.6	0.06	3.5	44	27	11	1.5	0	263	4.0	0	2.5	398	221	221	190	554	4.40	3
Jan. 11-20.....	1,242		7.1	2.8	0.03	2.0	26	15	7.2	1.4	0	156	4.0	0	3.4	225	127	127	133	344	4.5	2
Jan. 21-31.....	2,341		7.0	3.0	0.01	2.2	26	15	6.6	1.2	0	160	3.0	0	2.7	232	127	127	144	351	4.45	3
Feb. 1-10.....	983		8.0	7.9	0.03	2.8	38	27	11	1.4	0	238	4.0	0	2.5	360	206	206	162	513	4.20	3
Feb. 11-20.....	973		7.6	4.9	0.03	2.5	33	23	8.9	1.4	0	204	4.0	0	2.9	304	177	142	142	439	4.35	2
Feb. 21-28.....	1,605		6.5	2.9	0.02	1.8	24	17	6.3	1.3	0	142	2.5	0	2.6	214	130	130	104	322	4.5	3

## NORTH ATLANTIC SLOPE BASINS, MAINE TO CONNECTICUT

## DELAWARE RIVER BASIN--Continued

## SCHUYLKILL RIVER AT BERNE, PA.--Continued

Temperature (°F) of water, water year October 1952 to September 1953  
 [Once-daily temperature measurement at approximately 5 p.m.]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	87	50	43	36	42	40	50					
2	83	49	42	37	37	37	51					
3	57	48	--	40	39	37	52					
4	60	48	46	38	38	44	50					
5	63	48	45	36	37	40	50					
6	61	47	44	37	40	37	49					
7	58	42	43	35	40	38	48					
8	56	43	44	35	40	38	51					
9	54	43	44	37	40	38	50					
10	54	44	50	38	38	40	50					
11	55	41	47	39	39	40	51					
12	56	43	44	34	38	42	49					
13	--	43	43	38	38	59	45					
14	58	44	41	42	39	55	49					
15	54	44	40	42	39	53	50					
16	56	51	39	41	39	49	46					
17	57	49	39	40	37	43	46					
18	59	48	41	38	36	45	50					
19	58	48	39	41	38	48	50					
20	50	51	47	42	40	45	--					
21	50	55	39	41	47	52	--					
22	48	52	40	41	44	50	--					
23	54	50	41	40	40	48	--					
24	48	50	42	45	43	63	--					
25	49	49	40	42	43	49	--					
26	56	50	39	39	44	46	--					
27	50	48	37	39	43	45	--					
28	46	46	32	40	40	49	--					
29	--	40	33	38	--	50	--					
30	48	45	31	39	--	38	--					
31	48	--	36	41	--	53	--					
Average	55	47	41	39	40	46	--					

## DELAWARE RIVER BASIN--Continued

## SCHUYLKILL RIVER AT BERNE, PA.--Continued

Suspended sediment, water year October 1952 to September 1953

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.....	300	2	1.6	147	5	2.0	960		
2.....	307	5	4.1	141	6	2.3	882	10	24
3.....	382	6	6.2	141	10	3.8	864		
4.....	307	10	8.3	134			799	10	22
5.....	285	9	6.9	141			1,940	43	s 384
6.....	292	4	3.2	147	4	1.6	3,840	55	570
7.....	270	3	2.3	147			2,530	23	157
8.....	263	2	1.4	167			1,970	18	96
9.....	256	2	1.4	167			1,600	14	60
10.....	242	4	2.6	167			1,520	20	82
11.....	307	293	243	160	6	2.6	8,190	254	s 6,090
12.....	263	18	13	160			6,700	62	1,120
13.....	235	4	2.5	154			3,900	20	211
14.....	221	2	1.2	154			2,600	10	70
15.....	207	2	1.1	193			1,970	7	37
16.....	207	5	2.8	263	8	4.5	1,660	8	36
17.....	200	12	6.5	193			1,430	10	39
18.....	207	6	3.4	193			1,240	9	30
19.....	193	5	2.6	193	6	3.1	1,100	9	27
20.....	187	7	3.5	1,140	379	s 2,190	990	12	32
21.....	154	13	5.4	3,920	220	2,330	980	8	21
22.....	180	6	2.9	14,100	1,300	s 47,100	1,230	10	33
23.....	180	10	4.9	7,120	100	1,920	1,010	5	14
24.....	167	11	5.0	3,600	52	505	920		
25.....	174	9	4.2	2,460	23	153	854		
26.....	174	6	2.8	1,900	16	82	817	6	14
27.....	174	11	5.2	1,660	10	45	771		
28.....	180	12	5.8	1,340	9	33	700		
29.....	200	9	4.9	1,140	10	31	660	8	14
30.....	160	10	4.3	1,050	9	26	648		
31.....	141	9	3.4				622		
Total.	7,015	--	366.4	42,592	--	54,466.8	55,897	--	9,315
	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.....	614	2	3.3	1,150			882	2	4.8
2.....	596	2	3.2	1,000	6	16	808	7	15
3.....	605	3	4.9	920			735	10	20
4.....	605	3	4.9	864			1,530	27	s 118
5.....	555	3	4.5	790			1,330	18	65
6.....	505	4	5.5	744	6	16	1,140	14	43
7.....	481	6	7.8	1,260			1,030	8	22
8.....	497	11	15	1,170			990	9	24
9.....	1,010	11	30	1,030			911	12	30
10.....	1,310	14	50	902			835	11	25
11.....	1,720	13	60	844	7	17	762	8	16
12.....	1,380	8	30	854			726	8	16
13.....	1,080	7	20	826			790	6	13
14.....	950	13	33	762			744	7	14
15.....	920	7	17	1,030	10	27	889	14	34
16.....	920	6	15	1,440			1,840	26	129
17.....	930	22	55	1,200			1,600	11	48
18.....	1,460	72	s 283	1,010	8	21	1,420	10	38
19.....	1,560	15	63	911			1,560	13	55
20.....	1,500	8	32	854			1,370	8	30
21.....	1,380	16	60	2,270	112	s 779	1,240	5	17
22.....	1,350	9	33	2,380			1,170	6	19
23.....	1,180	9	s 29	1,900	12	64	1,070	5	14
24.....	5,020	269	s 5,050	1,600			2,520	134	s 2,350
25.....	5,250	85	s 1,320	1,380			2,940	35	278
26.....	3,040	29	238	1,230	7	22	3,210	31	269
27.....	2,240	27	163	1,100			2,610	13	92
28.....	2,040	21	116	980			2,170	5	29
29.....	1,660	19	85	--	--	--	1,840	4	20
30.....	1,380	15	58	--	--	--	1,560	6	25
31.....	1,220	15	49	--	--	--	1,340	6	22
Total.	44,958	--	7,936.1	32,401	--	1,447	43,562	--	3,882

s Computed by subdividing day.

## DELAWARE RIVER BASIN--Continued

## SCHUYLKILL RIVER AT BERNE, PA.--Continued

Suspended sediment, water year October 1952 to September 1953--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.....	1,190								
2.....	1,180								
3.....	1,020	4	11						
4.....	920								
5.....	864								
6.....	790								
7.....	1,750	18	s 96						
8.....	1,780	9	43						
9.....	1,560	5	21						
10.....	1,540	5	21						
11.....	1,380	4	15						
12.....	1,290	5	17						
13.....	1,430	5	19						
14.....	1,360	5	18						
15.....	1,230	4	13						
16.....	1,500	16	65						
17.....	1,420	21	81						
18.....	1,340	8	29						
19.....	1,550	4	17						
20.....	1,340								
21.....	1,260								
22.....	1,160								
23.....	1,070								
24.....	980	--	e 18						
25.....	911								
26.....	970								
27.....	1,660								
28.....	1,340								
29.....	1,230								
30.....	1,150								
31.....	---	--	--						
Total..	38,165	--	719						
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.....	292			165			112		
2.....	380			178			112		
3.....	327			183	1	0.5	110	1	0.3
4.....	264	4	3.3	155			158		
5.....	246			170			159		
6.....	321			190			837	17	s 40
7.....	474			160			1,720	27	s 132
8.....	278			150	2	.9	780	4	8.4
9.....	252			170			481	2	2.6
10.....	216	4	3.0	210			357		
11.....	216			161			299		
12.....	210			150			258	1	.7
13.....	222			147	2	.8	230		
14.....	246			140			210		
15.....	210			154			188		
16.....	188			147			178		
17.....	178			147			165	1	.5
18.....	178			143	1	.4	157		
19.....	178			137			157		
20.....	174			128			165		
21.....	174	2	1.0						
22.....	174			125			178		
23.....	627			128			157	1	.4
24.....	448	20	s 52	131	10	3.4	150		
25.....	258			128			147		
26.....	210			122			147		
27.....	183	3	2.0	125			150		
28.....	178			122			154	1	.4
29.....	174			125	1	.3	143		
30.....	183			120			134		
31.....	178	2	1.0	115			134		
				115			---	--	--
Total..	7,837	--	114.3	4,541	--	31.8	8,327	--	196.7

Total discharge for period October 1952 to April 1953, July to September 1953 (cfs-days) ..... 285,295

Total load for period October 1952 to April 1953, July to September 1953 (tons)..... 78,475.1

e Estimated.

s Computed by subdividing day.

## DELAWARE RIVER BASIN

## PERKIOMEN CREEK AT GRATERFORD, PA.

LOCATION.--At highway bridge at Graterford, Montgomery County, 1,650 feet downstream from gaging station, which is half mile upstream from Landis Brook, and 2½ miles north of Collegeville.

DRAINAGE AREA.--279 square miles.

RECORDS AVAILABLE.--Sediment records: April 1948 to March 1953.

EXTREMES, October 1952-March 1953.--Sediment concentrations: Maximum daily, 501 ppm Mar. 4; minimum daily, 1 ppm on several days during October and December.

Sediment loads: Maximum daily, 11,800 tons Jan. 24; minimum daily, less than 0.50 ton during October and November.

EXTREMES, 1948-53.--Sediment concentrations: Maximum daily, 551 ppm Jan. 24, 1951; minimum daily, 0 ppm Sept. 24, 1950.

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

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1952 to September 1953 given in WSP 1272. This station discontinued Mar. 31, 1953.

## Suspended sediment, October 1952 to March 1953

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.....	71	2	(t)	58	2	(t)	193	2	1
2.....	78	10	2	55	2	(t)	174		
3.....	269	70	s 54	62			205	2	1
4.....	134	48	17	58			214	2	1
5.....	101	39	11	56	3	1	2,340	87	s 1,110
6.....	86	20	5	55			2,580	116	s 697
7.....	79	26	6	56			782	20	42
8.....	79	16	3	50			498		
9.....	77	9	2	50			406	11	13
10.....	68	7	1	62	3	1	366		
11.....	64	9	2	66			10,200	292	s 11,000
12.....	75	7	1	64			1,870	77	389
13.....	73	5	1	62			906	58	142
14.....	64	4	1	60			618		
15.....	62	8	1	60	2	(t)	466	17	23
16.....	58	7	1	108			389		
17.....	53	5	1	101			345		
18.....	50	9	1	84			309	4	3
19.....	48	8	1	91	4		275		
20.....	50	7	1	261			244		
21.....	46	2	(t)	2,496	165	s 963	541	12	sa 25
22.....	46	2	(t)	12,200	106	s 5,210	2,100	34	s 217
23.....	50	5	1	1,870	14	71	820		
24.....	51	2	(t)	786	10	21	552	4	6
25.....	53	1	(t)	492			435		
26.....	50	2	(t)	377			372		
27.....	55	2	(t)	319	4	3	314	4	3
28.....	58	1	(t)	257			225		
29.....	62	1	(t)	214			260		
30.....	68	4	(t)	205			240	1	1
31.....	64			--	--	--	218		
Total.	2,242	--	114	20,727	--	6,362	29,457	--	13,775

s Computed by subdividing day.

t Less than 0.50 ton.

a Computed from estimated concentration graph.

## NORTH ATLANTIC SLOPE BASINS, MAINE TO CONNECTICUT

## DELAWARE RIVER BASIN--Continued

## PERKIOMEN CREEK AT GRATERFORD, PA.--Continued

Suspended sediment, October 1952 to March 1953--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.....	220	4	3	485	2	3	252	8	5
2.....	215			340			230		
3.....	322			309			226		
4.....	511			304			3,270		
5.....	314	3	2	257	6	5	1,070	501	s 5,350 s 1,120
6.....	248			248			581		
7.....	222			895			466		
8.....	232			763			406		
9.....	4,490	189	s 2,690	460	13	25	377	17	21
10.....	5,050			345			389		
11.....	2,660	7	50	304	6	5	372	3	3
12.....	1,460	5	20	340			377		
13.....	783	3	5	394			2,260		
14.....	596			304			998		
15.....	588			1,790	100	s 909	2,710	90	s 1,170
16.....	566			1,320			3,620		
17.....	466	11	14	625			987		
18.....	1,320			423	12	14	664	26	47
19.....	909	20	49	366			1,380		
20.....	596	22	35	356			848		
21.....	734	43	85	1,730	126	s 830	559	25	a 38
22.....	1,440	32	124	881			466		
23.....	747	14	28	512			418		
24.....	6,860	494	s 11,800	429			2,390	177	s 1,680
25.....	2,420	249	s 3,000	394	5	5	1,830		
26.....	918	11	18	356			2,470	52	347
27.....	603			324			1,020		
28.....	696			290			756		
29.....	603			--			630		
30.....	429	4	6	--	--	--	539	4	6
31.....	400			--			532		
Total.	37,618	--	19,800	15,544	--	2,421	33,093	--	13,412
Total discharge for period October 1952 to March 1953 (cfs-days) .....									138,681
Total load for period October 1952 to March 1953 (tons) .....									55,884

s Computed by subdividing day.

a Computed from estimated concentration graph.



## 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 (at Fairmount Dam).

RECORDS AVAILABLE.--Sediment records: November 1947 to September 1953.

EXTREMES, 1952-53.--Sediment concentrations: Maximum daily, 2,900 ppm Nov. 22; minimum daily, 2 ppm on several days.

Sediment loads: Maximum daily, 367,000 tons Nov. 22; minimum daily, 4 tons on several days.

EXTREMES, 1947-53.--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 1952 to September 1953 based on records for Schuylkill River at Philadelphia (Fairmount Dam) which are given in WSP 1272, and include water diverted by the City of Philadelphia for municipal water supply.

## Suspended sediment, water year October 1952 to September 1953

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	1,110	8	24	775	6	13	3,250	12	105
2.....	1,150	9	28	771	5	10	2,960	9	72
3.....	2,020	15	82	791	7	15	3,010	15	122
4.....	2,030	7	38	752	12	24	2,890	12	94
5.....	1,410	8	30	753	5	10	4,040	116	s1,690
6.....	1,220	8	26	760	7	14	14,200	301	s11,500
7.....	1,180	13	41	729	3	6	9,710	135	s3,510
8.....	1,100	9	27	708	3	6	6,920	50	934
9.....	1,080	10	29	700	2	4	5,550	32	480
10.....	1,040	10	28	754	2	4	4,810	38	494
11.....	1,010	6	16	797	4	9	27,300	1,320	s120,000
12.....	1,050	5	14	782	4	8	23,000	557	s35,100
13.....	1,120	5	15	760	2	4	12,500	175	5,910
14.....	1,050	6	17	736	6	12	8,700	67	1,570
15.....	978	5	13	864	3	7	6,810	44	809
16.....	955	4	10	907	2	5	5,640	35	533
17.....	886	6	14	985	5	13	4,990	24	323
18.....	866	6	14	959	2	5	4,490	23	279
19.....	857	5	12	854	3	7	4,030	22	239
20.....	830	4	9	1,150	17	53	3,570	21	202
21.....	798	2	4	7,410	240	s6,950	3,680	30	298
22.....	818	5	11	43,500	2,900	s367,000	7,520	86	s1,700
23.....	775	6	13	30,800	1,220	s109,000	5,640	44	670
24.....	790	5	11	13,200	255	s9,340	4,320	27	315
25.....	800	4	9	8,520	95	2,180	3,850	22	229
26.....	761	4	8	6,450	54	940	3,500	15	142
27.....	789	5	11	5,420	40	585	3,280	11	97
28.....	805	5	11	4,600	29	360	2,880	7	54
29.....	832	12	27	3,820	20	206	2,580	8	56
30.....	857	9	21	3,470	13	122	2,560	8	55
31.....	833	8	18	--	--	--	2,600	8	56
Total.	31,800	--	631	143,477	--	496,912	200,780	--	187,638

s Computed by subdividing day.

## NORTH ATLANTIC SLOPE BASINS, MAINE TO CONNECTICUT

## DELAWARE RIVER BASIN--Continued

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

Suspended sediment, water year October 1952 to September 1953--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.....	2,620	15	103	4,990	26	350	3,560	13	125
2.....	2,460			4,520	20	244	3,310	13	116
3.....	2,740	11	91	3,980	17	183	3,110	12	101
4.....	3,420			3,790	17	174	8,630	194	s 6,270
5.....	2,900			3,560	13	125	8,650	182	s 4,470
6.....	2,530	8	59	3,330	9	81	5,900	45	717
7.....	2,260	8	50	4,020	20	s 299	4,980	23	309
8.....	2,330			7,030	95	s 1,780	4,520	21	256
9.....	12,300	290	s 12,500	5,170	46	642	4,260	21	242
10.....	16,200	260	11,400	4,440	28	336	3,990	13	140
11.....	14,100	250	9,520	3,990	21	226	3,760	15	152
12.....	9,970	110	2,960	3,880	18	189	3,540	7	87
13.....	7,320	40	791	4,140	19	212	6,820	81	s 1,930
14.....	6,040	25	408	3,810	18	185	5,960	58	918
15.....	5,500	25	371	5,500	75	s 1,690	7,070	112	s 3,380
16.....	5,160	25	348	8,620	137	s 3,300	16,000	750	s 35,100
17.....	4,880	20	264	6,070	52	852	9,000	140	3,400
18.....	5,700	52	800	5,090	30	412	7,260	59	1,160
19.....	7,490	68	1,380	4,460	18	217	7,730	47	981
20.....	6,150	40	664	4,120	10	111	7,740	38	794
21.....	5,790	25	391	5,870	46	729	6,120	20	330
22.....	7,780	60	1,260	9,000	134	s 3,300	5,520	17	253
23.....	6,020	38	618	6,890	76	1,410	5,110	12	166
24.....	11,300	544	s 27,000	5,790	37	578	7,900	124	s 4,150
25.....	21,300	612	s 35,700	5,200	15	211	11,700	200	6,320
26.....	12,800	200	6,910	4,710	16	203	16,600	440	s 20,300
27.....	8,700	76	1,790	4,310	12	140	12,100	136	4,440
28.....	7,500	54	1,090	3,920	8	85	9,330	70	1,760
29.....	7,170	40	774	--	--	--	7,840	45	853
30.....	5,830	30	472	--	--	--	6,840	37	663
31.....	5,120	29	401	--	--	--	5,760	30	467
Total.	221,380	--	118,418	140,200	--	18,264	220,310	--	100,430
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.....	5,260	17	241	4,470	9	109	13,100	115	4,070
2.....	5,120	20	276	4,480	5	60	11,100	70	2,100
3.....	4,830	14	183	4,140	4	45	7,970	42	904
4.....	4,400	11	132	3,710	5	50	6,690	20	361
5.....	4,160	15	168	3,520	6	57	5,790	13	203
6.....	3,840	16	166	3,820	8	83	5,120	10	138
7.....	10,600	150	s 6,430	3,830	8	83	4,970	16	215
8.....	11,000	122	s 3,850	3,630	18	176	6,180	52	868
9.....	7,190	43	835	3,720	11	110	4,700	20	254
10.....	6,770	30	548	3,590	9	87	4,000	16	173
11.....	6,800	32	588	3,260	15	132	3,530	15	143
12.....	5,470	22	325	2,990	8	65	3,210	10	87
13.....	6,480	26	455	2,810	10	76	4,100	45	498
14.....	7,180	55	1,070	3,240	10	87	6,730	126	s 2,270
15.....	6,280	29	492	3,020	10	82	4,050	42	459
16.....	6,890	30	558	2,850	9	69	3,360	28	254
17.....	7,380	36	717	3,250	9	79	2,990	19	153
18.....	6,200	20	335	8,160	109	s 2,600	2,730	14	103
19.....	6,970	21	395	5,140	73	s 1,020	2,580	13	91
20.....	6,670	25	450	3,800	40	410	2,430	10	66
21.....	5,590	20	302	3,360	18	163	2,260	12	73
22.....	5,080	20	274	4,400	32	380	2,150	12	70
23.....	4,580	15	185	13,600	417	s 18,600	3,710	28	280
24.....	4,270	12	138	11,100	342	s 10,700	2,300	27	168
25.....	3,970	10	107	7,110	70	1,340	1,910	35	180
26.....	4,020	15	163	15,400	580	s 37,300	1,790	18	87
27.....	6,530	25	441	16,600	549	s 22,900	1,690	12	55
28.....	6,390	25	431	9,660	100	2,610	1,660	12	54
29.....	5,080	15	206	7,140	32	617	1,770	12	57
30.....	4,540	11	135	6,830	39	719	2,300	15	93
31.....	--	--	--	13,400	188	s 6,760	--	--	--
Total.	179,540	--	20,596	186,030	--	107,569	126,870	--	14,527

s Computed by subdividing day.

## DELAWARE RIVER BASIN--Continued

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

## Suspended sediment, water year October 1952 to September 1953--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.....	2,000	15	81	882	17	40	579	9	14
2.....	1,710	12	55	915	16	40	572	4	6
3.....	2,510	19	129	885	13	31	558	10	15
4.....	2,000	16	86	943	13	33	550	42	62
5.....	1,590	17	73	994	12	32	648	38	66
6.....	1,600	22	95	1,010	11	30	1,470	48	s 183
7.....	1,700	22	101	936	9	23	2,040	48	264
8.....	1,810	18	89	846	12	27	2,990	35	s 290
9.....	1,610	14	61	1,080	14	41	1,740	7	33
10.....	1,410	17	65	1,760	24	114	1,160	6	19
11.....	1,300	12	42	1,380	18	67	962	6	16
12.....	1,220	11	36	983	10	27	862	5	12
13.....	1,170	13	41	866	8	19	991	14	37
14.....	1,180	12	38	851	12	28	760	15	31
15.....	1,240	16	54	817	9	20	755	9	18
16.....	1,170	17	54	796	3	6	718	7	14
17.....	1,060	13	37	796	7	15	729	7	14
18.....	976	9	24	783	5	11	678	7	13
19.....	953	9	23	761	8	16	636	5	9
20.....	1,170	11	35	721	12	23	628	7	12
21.....	1,270	16	55	697	7	13	682	10	18
22.....	1,030	50	139	683	9	17	676	11	20
23.....	2,520	52	354	665	5	9	647	19	33
24.....	2,760	20	149	658	4	7	612	11	18
25.....	1,980	29	155	657	13	23	599	9	15
26.....	1,340	23	83	648	15	26	596	7	11
27.....	1,150	18	56	625	12	20	608	6	10
28.....	1,050	19	54	583	11	17	606	5	8
29.....	935	18	45	601	15	24	604	8	13
30.....	954	17	44	587	12	19	578	7	11
31.....	908	17	42	570	8	12	--	--	--
Total.	45,276	--	2,394	25,979	--	830	26,234	--	1,285
Total discharge for year (cfs-days) .....									1,547,876
Total load for year (tons) .....									1,069,494

s Computed by subdividing day.

## 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 --October 1945 to September 1953.

WATER TEMPERATURES --Chemical analyses: October 1945 to September 1953.

EXTREMES 1942-53 --Dissolved solids: Maximum, 308 ppm Oct. 21-31; minimum, 132 ppm Jan. 21-31.

Specific conductance: Maximum, 199 ppm Oct. 21-31; minimum, 86 ppm Mar. 21-31.

Water temperatures: Maximum, 84°F July 4, 1951; minimum, 36°F Dec. 30, 1951.

EXTREMES 1944-53 --Dissolved solids: Maximum, 358 ppm Oct. 11-20, 1947; minimum, 94 ppm Feb. 1-10, and Feb. 21-28, 1951.

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

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

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

REMARKS --Samples collected at raw-water intake on west side of river at Belmont 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 1952 to September 1953 based on records for Schuylkill River at Philadelphia, which are given in WSP 1272.

## Chemical analyses, in parts per million, October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
																Calcium, mg/l.	Non-carbonate				
Oct. 1-10, 1952..	1,030		8.0		0.03		38	17	18		68	117	14	0.1	8.3	254	165	109	406	7.0	7
Oct. 11-20 .....	659		7.5		.03		44	19	20		78	132	16	.1	8.6	290	188	124	457	7.0	7
Oct. 21-31 .....	505		7.1		.02		45	21	20		86	134	18	.2	8.5	309	199	128	485	7.2	10
Nov. 1-10 .....	455		4.9		.01		0.00	45	20		82	131	18	.2	9.6	307	195	127	478	6.9	10
Nov. 11-21 .....	1,182		5.9		.01		0.00	45	19	14	82	116	17	.2	9.9	294	190	123	437	7.0	5
Nov. 22-30 .....	13,043		8.5		.00		.00	23	8.8	4.8	30	64	4.5	1	7.7	132	94	69	236	6.9	5
Dec. 1-10 .....	5,443		9.6		.00		.00	26	11	8.4	36	80	6.0	.2	8.2	179	110	81	273	6.5	3
Dec. 11-20 .....	3,869		9.0		.01		18	22	13	6.3	32	87	6.0	.2	7.9	148	91	64	227	6.7	5
Dec. 21-31 .....	2,863		9.3		.01		.24	22	13	1.1	46	86	9.0	.0	8.1	186	119	83	269	6.7	5
Jan. 1-10, 1953 .....	6,941		8.7		.00		32	17	9.3	1	46	56	6.0	.1	8.6	198	129	90	303	7.2	5
Jan. 11-20 .....	8,941		8.7		.00		22	7.9	6.2		38	54	5.0	.0	7.4	140	87	54	219	7.1	3
Jan. 21-31 .....	8,755		8.5		.01		22	7.8	6.2		38	54	5.0	.0	7.4	132	87	56	209	7.1	10
Feb. 1-10 .....	4,194		9.5		.01		27	12	10		42	84	7.0	.0	8.3	189	117	82	288	6.8	5
Feb. 11-20 .....	4,678		9.2		.01		23	11	8.1		44	72	7.0	.0	8.6	168	110	74	266	6.8	5
Feb. 21-28 .....	5,430		8.5		.02		23	9.7	7.1		41	62	6.0	.0	7.5	162	97	64	237	7.0	5
Mar. 1-10 .....	4,812								4.0		36	55	8.0		8.3		96	66	245	6.7	3
Mar. 11-20 .....	7,194								3.7		36	48	7.5		7.5		88	58	221	6.7	3
Mar. 21-31 .....	8,321								1.9		32	43	6.0		7.0		81	55	205	6.8	3
Apr. 1-10 .....	6,032								5.6		36	58	8.0		7.3		95	66	245	6.8	1
Apr. 11-20 .....	6,350								3.8		37	47	7.0		6.5		86	56	217	7.0	3
Apr. 21-30 .....	4,717								5.9		40	57	8.0		6.7		96	63	245	7.0	2

May 1-10, 1953 ..	3,606	--	--	--	--	--	4.2	47	61	8.0	--	6.1	--	109	70	270	7.3	3
May 11-20 .....	3,563	--	--	--	--	--	2.9	50	62	5.5	--	6.3	--	112	71	279	7.6	5
May 21-31 .....	9,602	--	--	--	--	--	5.5	40	50	7.0	--	6.6	--	88	55	220	7.2	3
June 1-10 .....	6,677	--	--	--	--	--	4.6	43	54	6.5	--	6.6	--	96	61	240	7.6	3
June 11-20 .....	3,277	--	--	--	--	--	3.4	52	63	8.5	--	6.6	--	118	75	290	7.4	3
June 21-30 .....	1,828	--	--	--	--	--	6.6	59	74	11	--	6.7	--	132	84	342	7.8	3
July 1-10 .....	1,467	--	--	--	--	--	10	78	84	13	--	7.5	--	154	90	364	7.6	3
July 11-20 .....	817	--	--	--	--	--	1.5	75	92	12	--	6.5	--	174	113	408	7.2	4
July 21-31 .....	1,120	--	--	--	--	--	5.1	72	93	14	--	6.8	--	170	111	406	7.3	3
Aug. 1-10 .....	720	--	--	--	--	--	9.9	79	100	16	--	7.5	--	176	111	429	7.4	4
Aug. 11-20 .....	566	--	--	--	--	--	8.4	73	87	16	--	7.0	--	162	101	401	7.1	3
Aug. 21-31 .....	317	--	--	--	--	--	22	86	108	20	--	6.1	297	170	99	464	7.4	7
Average.....	a 4,283	--	--	--	--	--	8.5	53	78	9.9	--	7.7	--	127	83	308	--	5

a For period of sampling only; mean discharge for water year was 4,240 cfs.

## NORTH ATLANTIC SLOPE BASINS, MAINE TO CONNECTICUT

## DELAWARE RIVER BASIN--Continued

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

Temperature (°F) of water, water year October 1952 to September 1953  
 /Once-daily temperature measurement at approximately 8:30 a. m./

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

## DELAWARE RIVER BASIN--Continued

## DELAWARE RIVER AT EDDYSTONE, PA.

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1953.

REMARKS.--Data obtained from analyses of center river samples taken approximately 3 feet from surface and 3 feet from bottom. For additional data refer to WSP 1262, Chemical characteristics of Delaware River water, Trenton, N.J., to Marcus Hook, Pa.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date	Dis-charge (cfs)	Sampling station	Tem- pera- ture (°F.)	Chlo- ride (Cl)	Specific conduct- ance (microm- hos at 25°C.)	pH	Bio- chemical oxygen demand <sup>a</sup>	Dis- solved <sup>a</sup> oxygen
Oct. 7, 1952 .....	4,120	Top	68	18	288	6.6	2.3	1.3
		Bottom	68	18	290	6.5		
Nov. 12 .....	2,550	Top	49	202	946	6.4	7.6	4.2
		Bottom	50	215	971	6.2		
Dec. 5 .....	12,600	Top	48	8.5	166	6.2	4.4	7.3
		Bottom	47	8.5	165	6.2		
Jan. 14, 1953 <sup>b</sup> .....	14,600	Top	38	10	186	6.4		
		Bottom						
Feb. 10 .....	19,700	Top	40	10	201	6.3	5.6	7.4
		Bottom	40	9.0	194	6.4		
Mar. 9 .....	15,700	Top	40	7.0	154	6.3	3.2	8.0
		Bottom	40	8.0	157	6.3		
Apr. 7 .....	26,000	Top	53	6.0	146	6.5	3.1	6.2
		Bottom	53	7.0	146	6.3		
May 4 .....	27,900	Top	59	6.0	140	6.5	4.3	5.0
		Bottom	60	6.0	139	6.5		
June 3 .....	11,500	Top	65	6.0	178	6.5	2.0	3.1
		Bottom	66	7.0	179	6.4		
July 1 .....	4,190	Top	82	12	246	6.6	0.0	1.5
		Bottom	82	13	265	6.7		
Aug. 4 .....	2,680	Top	79	43	390	6.8	5.1	2.5
		Bottom	78	42	395	6.8		
Sept. 1 .....	1,910	Top	83	265	1,160	6.6	3.9	1.8
		Bottom	83	300	1,310	6.4		

<sup>a</sup> Values for biochemical demand and dissolved oxygen obtained from surface samples.<sup>b</sup> Samples taken from Chester Ferry.

## DELAWARE RIVER BASIN--Continued

## DELAWARE RIVER AT MARCUS HOOK, PA.

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1953.

REMARKS.--Data obtained from analyses of river samples taken at center of stream approximately 3 feet from surface and 3 feet from bottom. For additional data refer to WSP 1262, Chemical characteristics of Delaware River water, Trenton, N. J., to Marcus Hook, Pa.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Sampling station	Temperature (° F)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO <sub>3</sub>	Dissolved oxygen	Biochemical oxygen demand	Specific conductance (micro-mhos at 25° C)	pH	Color	
Oct. 7, 1952.....	4,120	Top	69	--	--	--	21	8.2	19	--	32	58	28	--	--	--	191	87	1.9	1.1	306	6.3	--
Nov. 12.....	2,550	Bottom	51	4.4	0.04	--	37	40	--	--	26	153	435	0.3	16	--	1,050	257	4.8	10.0	1,750	6.3	5
Dec. 5.....	12,600	Top	48	3.5	.04	--	13	6.0	245	--	14	37	10	0.5	12	--	111	57	7.6	3.1	1,810	7.1	3
Feb. 10, 1953...	19,700	Bottom	47	5.0	.06	--	15	5.8	--	--	15	43	10	0.1	6.3	--	126	61	6.3	5.5	1,687	6.6	10
Mar. 9.....	15,700	Top	39	6.7	.08	--	12	4.5	7.9	--	20	31	8.0	0.2	10	--	96	48	7.2	3.0	1,886	6.3	5
Apr. 7.....	26,000	Bottom	40	5.1	.18	--	11	3.5	7.2	--	18	30	8.0	0.2	8.1	--	87	42	5.7	2.9	1,555	7.6	8
May 4.....	27,900	Top	53	5.0	.01	--	11	3.5	6.7	--	18	30	7.5	.1	5.8	--	87	42	--	--	1,411	7.5	10
June 3.....	11,500	Bottom	60	--	--	--	12	3.9	6.2	--	26	29	7.0	.1	4.6	--	91	46	3.7	63.7	165	6.5	5
July 1.....	4,190	Top	65	4.4	.02	--	14	5.7	7.0	--	25	37	7.0	--	--	--	108	58	--	2.0	149	7.8	10
Aug. 4.....	2,680	Bottom	82	6.3	.02	--	20	7.6	13	--	33	50	15	.2	8.2	--	132	81	3.1	2.0	182	6.5	--
Sept. 1.....	1,910	Top	81	4.3	.04	--	35	36	234	--	24	172	415	.3	7.5	--	1,010	235	1.3	.4	285	6.4	10
		Bottom	80	--	--	--	35	36	--	--	24	172	415	.5	5.2	--	1,010	235	1.3	.5	249	6.4	3
		Top	86	2.1	.06	--	35	36	--	--	24	172	415	--	--	--	1,010	235	2.4	--	1,240	7.4	4
		Bottom	78	2.1	--	--	35	36	--	--	24	172	415	--	--	--	1,010	235	2.4	--	1,700	7.4	4
		Top	86	--	--	--	35	45	--	--	28	162	530	--	--	--	1,280	272	1.9	--	1,880	6.4	4
		Bottom	85	2.5	.14	--	35	45	--	--	28	162	530	.7	4.2	--	1,280	272	--	--	2,080	7.3	5



## DELAWARE RIVER BASIN--Continued

## RED CLAY CREEK AT WOODDALE, DEL.

LOCATION.--Temperature recorder at gaging station 12 feet upstream from bridge on State Highway 48, 0.3 mile south of Wooddale, New Castle County, and 2.3 miles north of Marshallton.  
DRAINAGE AREA.--47.0 square miles.

RECORDS AVAILABLE.--Water temperatures: April to September 1953.

EXTREMES, 1953.--Water temperatures: Maximum 84°F Sept. 3, 4; minimum, not determined.

REMARKS.--Records of discharge for water year 1952-53 given in WSP 1272.

Temperature (°F) of water, April to September 1953  
/Recorder with temperature attachment/

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.....													--	--	63	58	56	55	78	74	78	74	81	76
2.....													--	--	62	57	62	55	80	76	74	73	83	77
3.....													--	--	63	56	66	60	80	76	73	68	84	79
4.....													--	--	65	61	66	61	78	72	71	70	84	81
5.....													--	--	64	62	70	64	74	71	76	71	83	79
6.....													--	--	64	63	73	66	73	72	74	72	79	74
7.....													--	--	64	62	72	67	75	71	74	71	74	72
8.....													--	--	67	62	68	66	74	72	74	72	73	70
9.....													52	50	65	62	72	67	74	70	74	72	71	66
10.....													53	52	69	62	72	68	72	68	72	69	71	65
11.....													57	52	70	63	70	66	71	67	75	70	70	65
12.....													55	51	72	65	68	64	70	67	76	72	69	66
13.....													51	49	73	68	64	60	72	68	76	73	69	64
14.....													50	46	72	67	61	60	73	70	75	73	64	60
15.....													54	48	69	67	64	58	75	70	76	71	67	61
16.....													54	51	68	66	68	61	77	73	77	74	71	65
17.....													55	51	68	64	70	64	78	74	75	73	70	65
18.....													54	53	71	67	69	66	80	76	74	71	68	63
19.....													53	51	70	66	71	67	80	76	73	69	69	64
20.....													52	49	69	64	75	69	80	77	73	69	71	67
21.....													51	47	69	66	78	72	81	76	73	70	71	69
22.....													55	47	67	64	77	73	80	78	74	69	69	65
23.....													57	53	71	65	75	70	78	74	75	71	64	57
24.....													54	52	67	63	73	69	76	72	75	71	62	58
25.....													64	53	65	61	72	68	75	70	77	71	62	58
26.....													65	62	63	61	75	69	74	69	79	73	66	62
27.....													63	56	63	61	77	73	74	71	80	75	66	65
28.....													54	53	59	57	73	73	78	74	81	76	66	63
29.....													56	54	64	58	74	71	76	73	82	76	66	60
30.....													58	53	67	63	77	72	78	76	81	75	69	63
31.....													56	55	58	54	--	--	--	--	76	71	63	57
Average.....													--	--	66	62	70	66	76	77	76	72	71	--

## DELAWARE RIVER BASIN

## BRANDYWINE CREEK AT WILMINGTON, DEL.

LOCATION.---At Henry Clay Bridge in Wilmington, New Castly 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 1952 to July 1953.

Sediment records: December 1946 to September 1953.

EXTREMES, 1952-53.---Sediment concentrations: Maximum daily, 804 ppm Nov. 22; minimum daily, 2 ppm on several days.

Sediment loads: Maximum daily, 9,510 tons Nov. 22; minimum daily, 1 ton on many days.

EXTREMES, 1946-53.---Sediment concentrations: Maximum daily, 1,420 ppm July 9, 1952; minimum daily, 1 ppm on several days.

Sediment loads: Maximum daily, 17,300 tons Nov. 23, 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 1952 to September 1953 given in WSP 1272.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
																Calcium, mg-medium	Non-carbonate				
Oct. 2, 1952.....	220	60	8.8		0.01		15	5.6	10		52	22	8.5	0.1	99	60	18		170	7.3	10
Dec. 4.....	385	41	15		.00		14	6.2	12		42	32	9.0	.1	109	60	26		167	6.5	5
Dec. 28.....	385	--	--		--	--	--	--	7.5		38	25	6.0	--	--	56	25		149	7.2	10
Feb. 2, 1953.....	683	--	12		.00		12	4.4	3.5		34	14	5.0	.1	86	48	20		129	7.2	10
Mar. 3.....	550	--	--		--	--	--	--	5.9		36	17	6.0	.0	--	49	20		136	7.0	10
Apr. 1.....	866	47	--		--	--	--	--	--		27	--	--	--	--	--	--		162	6.8	--
Apr. 30.....	634	53	--		--	--	--	--	--		31	--	--	--	--	--	--		131	6.7	--
July 3.....	388	--	--		--	--	--	--	--		37	--	--	--	--	--	--		141	6.7	--
July 31.....	212	80	--		--	--	--	--	--		43	--	--	--	--	--	--		163	6.8	--

## DELAWARE RIVER BASIN--Continued

## BRANDYWINE CREEK AT WILMINGTON, DEL.--Continued

Suspended sediment, water year October 1952 to September 1953

Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	220	4	2	180	2	1	331		
2.....	220	5	3	180	2	1	325	7	7
3.....	319	10	9	180	2	1	397		
4.....	253	6	4	176	3	1	385	10	10
5.....	225	6	4	171			608	45	s 122
6.....	215	6	4	171	3	1	1,400	117	s 499
7.....	215	5	3	166			564	27	41
8.....	210	6	3	162			448		
9.....	205	5	3	162			409	8	9
10.....	210	6	3	190			403		
11.....	205	9	5	220	4	2	3,370	592	s 3,580
12.....	230	10	6	200			1,780	245	1,180
13.....	225	8	5	180			770		
14.....	215	8	5	176			620		
15.....	210	7	4	205			564		
16.....	205	5	3	271	6	4	522	8	13
17.....	195	6	3	220			494		
18.....	190	5	3	205			474		
19.....	190	4	2	205			454		
20.....	185	5	2	368	23	23	434	4	5
21.....	180	4	2	1,460	258	s 1,200	595		
22.....	180	5	2	4,390	804	s 9,510	1,040	15	42
23.....	180	4	2	1,300	78	274	613		
24.....	185	5	2	599	12	19	515		
25.....	185	3	1	474	7	9	487	2	3
26.....	180	7	3	422	6	7	460		
27.....	176	5	2	397			434		
28.....	190	3	2	367	12	12	397		
29.....	200	2	1	337			385	2	2
30.....	190	3	2	337			409		
31.....	180	3	1	--	--	--	415		
Total.	6,368	--	96	14,071	--	11,129	20,502	--	5,630
Day	January			February			March		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	428			762	10	21	557		
2.....	415	2	3	683	10	18	548	4	6
3.....	508			655			550		
4.....	564			655			1,900	164	s 1,040
5.....	460			620	3	5	1,110	72	216
6.....	422	2	2	606			762		
7.....	415			942			698	8	15
8.....	445			1,000	11	26	670		
9.....	3,050	264	s 2,730	683			650		
10.....	2,700	225	1,640	606			660		
11.....	1,990	80	430	578	4	7	720	4	8
12.....	1,230			641			850		
13.....	906			698			1,600	60	259
14.....	802	12	30	620			1,000	68	184
15.....	786			1,330	61	s 308	1,750	108	467
16.....	778			1,280	57	197	2,900	345	2,700
17.....	764	7	16	802			1,300	105	369
18.....	898			669	4	7	1,150	15	47
19.....	890			634			1,550	42	176
20.....	690			627			1,150	23	71
21.....	663	12	25	1,240	110	s 402	950	16	41
22.....	1,030			1,010	54	147	900	12	29
23.....	754			738			880	11	26
24.....	2,710	218	s 2,070	669			1,750	55	260
25.....	2,990	190	1,530	655			1,500	75	304
26.....	1,110	55	165	634	4	7	2,650	170	1,220
27.....	914			613			1,400	140	529
28.....	922			578			1,150	35	109
29.....	882	16	36	--	--	--	1,100	17	50
30.....	770			--	--	--	990	15	40
31.....	730			--	--	--	930	11	28
Total.	32,616	--	9,049	21,228	--	1,296	36,270	--	8,280

s Computed by subdividing day.

## NORTH ATLANTIC SLOPE BASINS, MAINE TO CONNECTICUT

## DELAWARE RIVER BASIN--Continued

## BRANDYWINE CREEK AT WILMINGTON, DEL.--Continued

## Suspended sediment, water year October 1952 to September 1953--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.....	866			682			1,700	160	734
2.....	914			642			1,190	100	821
3.....	834	12	27	618	7	12	794	30	64
4.....	794			582			674	16	29
5.....	802			603			626	15	25
6.....	714	35	67	634			589	16	25
7.....	1,730	102	s 536	874	13	26	802	42	91
8.....	1,200	82	266	738			722	36	70
9.....	882	26	62	898	20	48	610	22	36
10.....	1,010	20	55	690	12	22	618	23	38
11.....	994			582	6	9	540	17	25
12.....	866	10	25	547	10	15	526	15	21
13.....	1,420	47	180	591	12	19	825	53	s 181
14.....	1,580	86	s 418	772	23	48	1,090	210	s 692
15.....	970	28	73	626	17	29	618	20	33
16.....	1,490	61	s 275	589	10	16	554	19	28
17.....	1,100	65	193	658	21	37	526	19	27
18.....	954	26	67	1,230	36	s 138	512	19	26
19.....	1,160	22	69	650	13	23	498	19	26
20.....	938	18	46	554	7	10	484	11	14
21.....	866			519	10	14	463	9	11
22.....	810			862	47	109	449	9	11
23.....	770	5	10	802	60	130	1,020	87	s 293
24.....	730			582	30	47	505	28	38
25.....	706			526	17	24	435	20	23
26.....	826	13	29	2,460	426	s 3,580	414	12	13
27.....	900	11	27	1,200	103	334	394	22	23
28.....	722	13	25	698	38	72	394	11	12
29.....	658	10	18	589	20	32	414	10	11
30.....	634	7	12	740	35	70	407	14	15
31.....	--	--	--	1,520	140	575	--	--	--
Total..	28,840	--	2,653	24,258	--	5,539	19,393	--	3,456
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.....	382	15	15	200	19	10	123	7	2
2.....	358	7	7	216	26	15	117	7	2
3.....	388	11	12	228	20	12	117	10	3
4.....	352	18	17	208	14	8	114	8	2
5.....	330	21	19	212	16	9	164	41	s 32
6.....	409	22	24	216	11	6	238	112	72
7.....	679	52	95	196	10	5	182	60	29
8.....	392	34	36	189	9	5	160	20	9
9.....	516	68	95	250	9	6	128	20	7
10.....	370	78	78	270	16	12	120	19	6
11.....	330	43	38	232	17	11	114	15	5
12.....	310	25	21	196	9	5	123	32	11
13.....	310	28	23	185	15	7	185	30	15
14.....	300	27	22	185	28	14	123	21	7
15.....	290	25	20	185	15	7	117	22	7
16.....	280	18	14	170	10	5	117	20	6
17.....	270	15	11	174	10	5	120	17	6
18.....	260	16	11	174	11	5	109	24	7
19.....	271	15	11	160	12	5	109	20	6
20.....	285	47	36	153	9	4	109	10	3
21.....	265	15	11	153	6	2	123	6	2
22.....	240	16	10	150	5	2	134	8	3
23.....	769	70	s 160	147	5	2	123	12	4
24.....	390	34	36	141	5	2	114	11	3
25.....	270	18	13	137	4	1	111	11	3
26.....	245	15	10	134	8	3	114	10	3
27.....	232	20	13	131	3	1	114	7	2
28.....	228	19	12	131	3	1	114	7	2
29.....	216	19	11	128	4	1	109	8	2
30.....	212	12	7	125	5	2	103	11	3
31.....	212	10	6	123	6	2	--	--	--
Total..	10,361	--	894	5,499	--	175	3,948	--	264

Total discharge for year (cfs-days) ..... 223,254

Total load for year (tons) ..... 48,461

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Total as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
																		Calcium, Non-carbonate				
PERKIONEN CREEK AT GRATERFORD, PA.																						
Feb. 2, 1953 .....	340	45	11		0.01		16	5.9	9.2	40	38	5.0	0.0	6.0	103	64	31		160	7.3	7	
Apr. 1 .....	492								36										131	6.5		

## SUSQUEHANNA RIVER BASIN

## SUSQUEHANNA RIVER AT TOWANDA, PA.

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

DRAINAGE AREA.--7,797 square miles.

RECORDS AVAILABLE.--Sediment records: January 1951 to September 1953.

EXTREMES, 1952-53.--Sediment concentrations: Maximum daily, 613 ppm May 27; minimum daily, 1 ppm on several days during October, December and January.

Sediment loads: Maximum daily, 297,000 tons Mar. 24; minimum daily, 3 tons Oct. 22.

EXTREMES, 1951-53.--Sediment concentrations: Maximum daily, 1,670 ppm Mar. 31, 1951; minimum daily, 1 ppm on several days.

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

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1952 to September 1953 given in WSP 1272.

Suspended sediment, water year October 1952 to September 1953

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.....	818	3	7	804			4,150	3	31
2.....	860	10	23	790			3,600		
3.....	874	8	19	804	2	4	3,320		
4.....	874	5	12	832			3,060	1	9
5.....	902	6	15	776			3,190		
6.....	1,060	5	14	762			10,200	47	s 1,400
7.....	1,300	3	11	790			13,000	22	772
8.....	1,460	4	16	804	2	5	12,100	19	621
9.....	1,560	6	25	888			9,750	9	237
10.....	1,850	4	20	944			8,750	8	189
11.....	1,700	2	9	972			42,500	436	s 58,800
12.....	1,530	3	12	972			82,100	376	s 85,300
13.....	1,400	3	12	986	3	8	53,000	110	1,570
14.....	1,300	3	11	1,020			37,600	35	3,550
15.....	1,180	3	10	1,040			24,200	31	2,030
16.....	1,080	4	12	1,030			17,800	20	961
17.....	1,080	3	9	1,000			13,900	20	751
18.....	1,060	2	6	1,040	2	6	11,600	8	251
19.....	1,030	2	6	1,080			10,200	4	a 110
20.....	972	2	5	1,210	5	16	8,950	3	a 72
21.....	916	2	5	2,400	51	s 330	7,950	2	a 43
22.....	930	1	3	7,700	85	s 2,070	7,550	2	a 41
23.....	916	3	7	17,800	102	4,900	8,150	1	22
24.....	902	3	7	14,800	74	2,960	8,550	1	23
25.....	860	2	5	10,200	35	964	8,750	1	24
26.....	860	3	7	7,950	24	515	9,150	1	25
27.....	860	2	5	6,500			8,750	1	24
28.....	832	2	4	5,800			7,380	2	40
29.....	804	3	7	5,350	6	91	5,800	2	31
30.....	804	2	4	4,750			5,350	1	14
31.....	790	3	6	--	--	--	5,650	2	31
Total.	33,364	--	314	101,794	--	12,228	456,000	--	157,021

s Computed by subdividing day.

a Computed from estimated concentration graph.

## SUSQUEHANNA RIVER BASIN--Continued

## SUSQUEHANNA RIVER AT TOWANDA, PA.--Continued

Suspended sediment, water year October 1952 to September 1953--Continued

Day	January			February			March			
	Mean discharge (cfs)	Suspended sediment Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Suspended sediment Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Suspended sediment Mean concentration (ppm)	Tons per day	
1.....	5,800	1	15	15,800	8	347	13,000	4	119	
2.....	5,500			16,300			10,800			
3.....	5,350			14,400			9,350			
4.....	5,200			12,600			10,200			
5.....	5,050			11,000			18,600			
6.....	4,600	1	11	9,950	4	123	17,300	31	1,450	
7.....	4,150			9,350			13,900			
8.....	3,880			11,400			11,600			
9.....	3,860			13,900			9,950			
10.....	4,000			12,100			9,150			
11.....	6,150	3	64	9,750	3	75	8,550	2	48	
12.....	8,550			8,750			7,950			
13.....	8,750			8,350			7,950			
14.....	7,950			8,150			10,200			
15.....	8,150			8,150			13,000			
16.....	14,300	26	s 1,070	7,750	2	39	16,800	17	771	
17.....	19,300	53	2,760	7,750			17,800	17	817	
18.....	17,300	40	1,870	7,020			15,800	8	341	
19.....	21,300	29	1,670	6,680			13,900	4	150	
20.....	20,300	17	932	6,500			14,800	5	200	
21.....	16,800	7	318	14,700	57	s 2,780	16,300	12	528	
22.....	14,400	16	622	41,800	62	7,000	14,800	10	400	
23.....	13,000	8	281	37,600	45	4,570	13,000	6	211	
24.....	18,500	12	s 717	27,800	37	2,780	22,300	341	s 297,000	
25.....	54,000	100	s 15,200	19,800	14	748	64,000	492	s 88,400	
26.....	51,600	74	10,300	17,300	9	381	54,400	140	20,600	
27.....	36,200	64	6,260	15,300			53,700	102	14,800	
28.....	25,400	13	892	14,400			53,000	87	9,590	
29.....	23,600	10	533	--			--	46,000	56	6,960
30.....	19,800			--			--	34,400	49	4,550
31.....	15,800			--			--	26,600	25	1,800
Total.	466,520	--	44,963	394,350	--	21,215	649,100	--	452,366	
April			May			June				
1.....	23,600	22	1,400	17,300	16	747	14,800	124	s 5,100	
2.....	22,400	25	1,510	25,400	72	s 5,240	12,100	50	1,630	
3.....	21,800	25	1,470	31,400	56	4,750	9,300	17	427	
4.....	17,800	23	1,100	26,000	40	2,810	7,300	12	215	
5.....	15,800	17	725	26,000	73	s 5,710	6,320			
6.....	14,800	20	799	30,800	90	7,480	6,320	200	3,940	
7.....	17,000	17	780	25,400	46	3,150	7,300			
8.....	25,400	40	2,740	23,000	41	2,540	6,900	180	3,350	
9.....	23,000	33	2,050	18,800	29	1,470	5,390	45	655	
10.....	20,300	23	1,260	16,300	22	968	4,520	15	183	
11.....	21,300	28	1,610	13,900	19	713	3,760	12	122	
12.....	19,800	22	1,180	11,600	15	470	3,340	10	90	
13.....	17,800	19	913	10,200	15	413	3,240	7	61	
14.....	16,300	15	660	9,350	16	404	4,520	9	110	
15.....	15,300	12	451	10,200	34	936	4,860	16	210	
16.....	13,900			13,900	52	1,950	4,050	15	184	
17.....	12,600			13,400	34	1,230	3,360	4	36	
18.....	12,100			16,800	33	1,500	2,990	6	48	
19.....	11,600			18,300	24	1,190	2,690	10	73	
20.....	12,100	8	255	15,300	28	1,160	2,530	6	41	
21.....	12,100			12,600	18	612	2,490	9	61	
22.....	11,400			10,600	19	544	2,520	10	71	
23.....	10,600			10,200	27	744	2,360	7	45	
24.....	9,950			10,600	20	572	2,070	4	22	
25.....	9,350	9	242	8,750	15	354	1,900	5	26	
26.....	9,750	65	1,710	8,750	35	827	1,730	8	37	
27.....	21,400	87	s 5,340	17,900	613	s 31,800	1,640	15	66	
28.....	27,200	57	4,190	12,600	155	5,270	1,800	18	87	
29.....	22,400	32	1,940	10,300	38	1,060	1,840	17	84	
30.....	17,800	16	769	8,900	18	433	1,780	19	91	
31.....	--	--	--	11,600	65	s 2,290	--	--	--	
Total.	506,650	--	35,634	496,150	--	89,330	135,820	--	17,475	

s Computed by subdividing day.

## SUSQUEHANNA RIVER BASIN--Continued

## SUSQUEHANNA RIVER AT TOWANDA, PA.--Continued

Suspended sediment, water year October 1952 to September 1953--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.....	2,110			942			551	8	12
2.....	2,920			916			551	8	12
3.....	3,640			878			497	8	11
4.....	3,090			842			479	7	9
5.....	2,270			854			479	12	16
6.....	1,860			842	8	a19	533	12	17
7.....	1,680			818			600	12	19
8.....	1,500			818			650	11	19
9.....	1,440			878			748	13	26
10.....	1,390			1,160	7	22	1,000	16	43
11.....	1,360			1,810	15	s74	1,490	19	76
12.....	1,260			1,690	5	23	1,220	14	46
13.....	1,200			1,470	6	24	1,180	14	45
14.....	1,180			1,330	5	18	1,030	10	28
15.....	1,120			1,330	7	25	878	12	28
16.....	1,060	--	e33	1,260	10	34	854	9	21
17.....	1,050			1,130	9	27	842	8	18
18.....	1,020			1,030	8	22	806	7	15
19.....	994			981	8	21	770	7	15
20.....	1,030			890	12	29	782	8	17
21.....	981			818	11	24	748	12	24
22.....	968			782	9	19	737	11	22
23.....	1,020			737	13	26	726	8	16
24.....	1,840			693	11	20	748	7	14
25.....	1,820			660	12	21	737	8	16
26.....	1,470			660	11	20	726	7	14
27.....	1,370			640	10	17	693	5	9
28.....	1,220			610	9	15	660	6	11
29.....	1,090			580	8	13	610	12	20
30.....	1,020			560	8	12	580	13	20
31.....	955			560	5	8	--	--	--
Total.	46,928	--	1,023	28,169	--	685	22,905	--	659
Total discharge for year (cfs-days) .....									3,340,750
Total load for year (tons) .....									832,913

e Estimated.

s Computed by subdividing day.

a Computed from estimated concentration graph.



SUSQUEHANNA RIVER BASIN--Continued  
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 June 1953.

Water temperatures: October 1944 to June 1953.

EXTREMES, 1932-33.--Hardness: Maximum, 302 micromhos Nov. 14, 15, 19; minimum daily, 83.1 micromhos Jan. 27.

Specific conductance: Maximum, 302 micromhos Nov. 14, 15, 19; minimum daily, 83.1 micromhos Jan. 27.

Water temperatures: Minimum, 42.1° F. during October and November; maximum, 58° F. during December and January.

EXTREMES, 1944-53.--Dissolved solids (18.4-47): Maximum, 36 ppm Oct. 1-10, 1951; minimum, 58 ppm May 21-31, 1946.

Hardness: Maximum, 117 ppm Nov. 11-20, 1952; minimum, 36 ppm May 21-31, 1946.

Specific conductance: Maximum, 302 micromhos Nov. 14, 15, 19, 1952; minimum daily, 80.0 micromhos Dec. 6, 1950.

Water temperatures (1944-49) (1950-53): Maximum, 86° F. June 22, 1953; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of water discharge for water year October 1952 to September 1953 based on records for Susquehanna River at Wilkes-Barre, which are given in WSP 1272.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Tem- pera- ture (°F)	Silica (SiO <sub>2</sub> )	Alum- inum (Al)	Iron (Fe)	Man- ga- nese (Mn)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO <sub>3</sub> )	Sul- fate (SO <sub>4</sub> )	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO <sub>3</sub> )	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO <sub>3</sub>		Total acid- ity as H <sub>2</sub> SO <sub>4</sub>	Specific conduct- ance (micro- mhos at 25°C)	pH	Color
																	Calcium, mg- nesium	Non- carbon- ate				
Oct. 1-10, 1952 ...	1,702	--	--	--	--	--	--	--	4.9	84	19	15	--	--	2.4	--	101	32	--	246	7.4	7
Oct. 11-20 .....	1,923	2.7	--	33	0.02	--	33	6.6	4.0	90	22	14	0.1	0.1	1.9	156	110	36	--	275	7.6	3
Oct. 21-31 .....	1,442	--	--	--	--	--	--	--	5.2	88	22	17	--	--	3.0	--	110	38	--	270	7.5	5
Nov. 1-10 .....	1,360	--	--	--	--	--	--	--	5.5	91	20	18	--	--	2.8	--	111	36	--	280	7.7	3
Nov. 11-20 .....	1,525	--	--	--	--	--	--	--	8.1	98	21	21	--	--	3.5	--	117	38	--	299	7.7	10
Nov. 21-30 .....	12,871	--	--	--	--	--	--	--	3.4	48	18	8.0	--	--	5.1	--	66	27	--	164	7.2	7
Dec. 1-10 .....	11,048	--	--	--	--	--	--	--	2.1	28	15	6.0	--	--	4.4	--	46	23	--	113	7.3	20
Dec. 11-20 .....	39,370	--	--	--	--	--	--	--	2.3	43	17	8	--	--	3.5	--	62	27	--	153	7.3	8
Dec. 21-31 .....	11,091	--	--	--	--	--	--	--	1.8	45	16	6.0	--	--	3.7	--	61	24	--	151	7.4	5
Jan. 1-10, 1953 ...	6,570	--	--	--	--	--	--	--	1.1	58	21	7.0	--	--	2.8	--	79	31	--	182	7.4	5
Jan. 11-20 .....	17,526	--	--	--	--	--	--	--	4.7	46	21	6.5	--	--	2.0	--	60	22	--	141	7.5	7
Jan. 21-31 .....	31,825	--	--	--	--	--	--	--	3.8	34	17	5.0	--	--	2.1	--	46	18	--	108	7.1	5
Feb. 1-10 .....	16,730	--	--	--	--	--	--	--	1.8	42	18	5.0	--	--	2.1	--	58	24	--	140	7.4	4
Feb. 11-20 .....	11,037	--	--	--	--	--	--	--	2.6	46	16	7.5	--	--	3.3	--	62	24	--	154	6.6	8
Feb. 21-28 .....	3,118	--	--	--	--	--	--	--	.6	29	12	5.5	--	--	2.7	--	45	21	--	110	6.8	10
Mar. 1-10 .....	17,360	--	--	--	--	--	--	--	2.7	38	18	6.0	--	--	1.8	--	54	23	--	131	6.8	10
Mar. 11-20 .....	15,940	--	--	--	--	--	--	--	2.0	42	17	7.0	--	--	1.7	--	59	25	--	140	6.5	7
Mar. 21-31 .....	45,464	--	--	--	--	--	--	--	1.0	26	17	3.5	--	--	1.5	--	43	22	--	106	6.3	10

## SUSQUEHANNA RIVER BASIN--Continued

## SUSQUEHANNA RIVER AT FALLS, PA.--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium, mg-nestum	Non-carbonate				
Apr. 1-10, 1953.....	28,570		--	--	--	--	--	--	1.3	32	19	5.5	--	--	1.3	--	52	26		127	6.8	8
Apr. 11-20.....	22,240		--	--	--	--	--	--	2.8	37	16	7.0	--	--	1.6	--	52	22		128	6.4	9
Apr. 21-30.....	20,880		--	--	--	--	--	--	1.9	38	16	6.0	--	--	1.1	--	53	22		130	6.9	5
May 1-10.....	32,280		4.2		0.02		13	2.0	1.7	31	14	2.0	0.2	0.2	1.2	70	41	15		112	7.2	5
May 11-20.....	18,030		--	--	--	--	--	--	2.2	46	16	6.0	--	--	1.3	--	59	21		142	7.5	6
May 21-31.....	15,045		--	--	--	--	--	--	2.1	48	16	6.0	--	--	1.4	--	61	22		150	7.0	8
June 1-10.....	12,031		--	--	--	--	--	--	3.0	52	18	7.0	--	--	1.6	--	66	23		164	7.1	6
June 11-20.....	5,572		--	--	--	--	--	--	1.7	64	18	6.5	--	--	1.7	--	78	26		191	7.2	5
June 21-30.....	3,168		--	--	--	--	--	--	3.4	76	20	11	--	--	1.1	--	92	30		221	7.3	7
Average.....	15,027		--	--	--	--	--	--	2.9	52	18	8.3	--	--	2.3	--	68	26		168	--	7

a For period of record only; mean discharge for water year was 12,530 cfs.

## SUSQUEHANNA RIVER BASIN--Continued

## SUSQUEHANNA RIVER AT FALLS, PA.--Continued

Temperature (°F) of water, water year October 1952 to September 1953  
 /Once-daily temperature measurement at approximately 5 p.m./

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

## SUSQUEHANNA RIVER BASIN--Continued

## SUSQUEHANNA RIVER AT DANVILLE, PA.

LOCATION.--At gaging station at highway bridge at Danville, Montour County, 0.8 mile upstream from Mahoning Creek. DRAINAGE AREA.--11,220 square miles.

RECORDS AVAILABLE.--Chemical analyses: September 1906 to September 1907, October 1945 to June 1953.

Water temperatures: October 1945 to June 1953.

EXTREMES, 1952-53.--Hardness: Maximum, 232 ppm Nov. 1-10; minimum, 51 ppm Mar. 21-31.

Specific conductance: Maximum daily, 535 micromhos, 232 ppm Nov. 1-10, 1952; minimum, 42 ppm Apr. 1-10, 1950.

Water temperatures: Minimum, freezing point on several days during winter months.

EXTREMES, 1945-53.--Dissolved solids (1945-47): Maximum, 334 ppm Sept. 11-20, 1946; minimum, 68 ppm May 21-31, 1946.

Hardness (1945-47) (1949-53): Maximum, 232 ppm Nov. 1-10, 1948; minimum daily, 93.6 micromhos, Dec. 6, 1950.

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

Water temperatures: Maximum, 87°F Aug. 9, 10, 1948; 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 1945-53. Due to cross-sectional differences in con-

centration of dissolved solids, water samples also collected three times a month at points 120, 850, 880 and 1,180 feet from north end of bridge (1945-50).

Cross-sectional studies made on monthly samples during part of 1950-51 and 1952. Records of specific conductance of daily samples from October 1945 to

June 1953 available in district office at Philadelphia, Pa. Records of discharge for water year October 1952 to September 1953, given in WSP 1272.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Tem- pera- ture (°F)	Silica (SiO <sub>2</sub> )	Alum- inum (Al)	Iron (Fe)	Man- gan- ese (Mn)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO <sub>3</sub> )	Sul- fate (SO <sub>4</sub> )	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO <sub>3</sub> )	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO <sub>3</sub>		Total acid- ity as H <sub>2</sub> SO <sub>4</sub>	Specific conduct- ance (micro- mhos at 25°C)	pH	Color
																	Calcium, mag- nesium	Non- carbon- ate				
Oct. 1-10, 1952...	1,874	--	--	--	--	--	--	--	12	9.7	8	206	13	--	5.5	--	218	211	--	487	6.6	2
Oct. 11-20 .....	2,101	--	--	--	--	--	46	23	20	12	24	179	14	0.2	4.9	--	208	188	--	472	7.4	2
Oct. 21-31 .....	1,540	4.7	--	--	0.02	--	46	23	20	12	22	208	14	--	7.8	338	214	198	--	501	7.3	2
Nov. 1-10 .....	1,358	--	--	--	--	--	--	--	12	12	16	210	14	--	3.1	--	232	219	--	522	7.0	3
Nov. 11-20 .....	1,494	--	--	--	--	--	--	--	16	16	22	200	16	--	3.1	--	216	198	--	516	7.1	2
Nov. 21 .....	5,160	--	--	--	--	--	--	--	12	12	26	185	18	--	3.2	--	196	175	--	469	6.6	7
Nov. 22-30 .....	19,704	--	--	--	--	--	--	--	5.6	5.6	30	48	10	--	2.0	--	78	53	--	201	7.1	23
Dec. 1-10 .....	13,472	--	--	--	--	--	--	--	4.3	4.3	28	52	9.0	--	1.8	--	82	59	--	204	7.3	5
Dec. 11-20 .....	45,480	--	--	--	--	--	--	--	1.1	1.1	19	31	5.0	--	1.9	--	54	88	--	132	6.9	20
Dec. 21-31 .....	12,856	--	--	--	--	--	--	--	2.9	2.9	28	50	7.0	--	1.9	--	80	57	--	198	7.4	10
Jan. 1-10, 1953 ..	7,953	--	--	--	--	--	--	--	2.8	2.8	33	66	7.0	--	3.0	--	102	75	--	242	7.3	3
Jan. 11-20 .....	19,390	--	--	--	--	--	--	--	6.8	6.8	32	48	7.5	--	2.5	--	74	48	--	194	7.7	4
Jan. 21-31 .....	41,355	--	--	--	--	--	--	--	2.3	2.3	26	29	5.0	--	1.7	--	55	34	--	129	6.8	5
Feb. 1-10 .....	19,190	--	--	--	--	--	--	--	2.1	2.1	31	43	6.0	--	2.5	--	76	51	--	177	7.5	4
Feb. 11-20 .....	13,470	--	--	--	--	--	--	--	2.3	2.3	33	40	6.0	--	1.9	--	84	57	--	199	7.2	4
Feb. 21-28 .....	33,013	--	--	--	--	--	--	--	5	5	25	34	5.5	--	1.7	--	64	44	--	148	7.3	6
Mar. 1-10 .....	19,720	--	--	--	--	--	--	--	1.7	1.7	27	40	6.0	--	1.9	--	70	48	--	170	6.8	10
Mar. 11-20 .....	17,730	--	--	--	--	--	--	--	4.0	4.0	31	46	7.0	--	1.9	--	76	51	--	183	6.5	4
Mar. 21-31 .....	46,036	6.0	--	--	.02	--	14	3.8	2.6	2.6	23	29	4.0	.1	1.7	83	51	32	--	128	6.2	6

Apr. 1-10, 1953 ..	31,320	--	--	--	--	3.2	26	34	5.5	--	1.9	--	59	38	146	6.6	5
Apr. 11-20 .....	25,590	--	--	--	--	4.4	28	37	7.0	--	1.7	--	63	48	154	6.6	--
Apr. 21-30 .....	23,090	--	--	--	--	3.8	28	43	7.0	--	1.0	--	70	47	176	6.8	--
May 1-10 .....	34,140	--	--	--	--	4.6	26	31	6.0	--	1.2	--	53	32	138	6.7	--
May 11-20 .....	20,260	--	--	--	--	2.4	37	41	5.0	--	1.4	--	76	46	184	7.5	5
May 21-31 .....	19,591	--	--	--	--	4.0	40	40	6.5	--	1.5	--	76	43	195	6.9	5
June 1-10 .....	15,350	--	--	--	--	2.6	36	48	6.0	--	2.1	--	87	58	206	6.8	4
June 11-20 .....	6,739	--	--	--	--	4.9	42	74	8.5	--	1.4	--	114	80	282	7.0	4
June 21-30 .....	3,798	--	--	--	--	4.4	37	110	10	--	.9	--	150	120	362	6.9	7
Average .....	a 18,023	--	--	--	--	5.5	28	78	8.4	--	2.4	--	106	84	254	--	6

a For period of record only; mean discharge for water year was 14,300 cfs.

## SUSQUEHANNA RIVER BASIN--Continued

## SUSQUEHANNA RIVER AT DANVILLE, PA.--Continued

Chemical analyses of cross-section samples, October 1952 to May 1953

Date	Discharge (cfs)	Station	Time	Tem- pera- ture (°F)	Specific conductance (micromhos at 25°C)
Oct. 15, 1952.....	2,220	120	7:00 a.m.	57	386
		465	7:00 a.m.	56	437
		650	7:00 a.m.	56	452
		880	7:00 a.m.	55	425
		1180	7:00 a.m.	55	403
Nov. 15.....	1,480	120	--	43	477
		465	--	43	526
		650	--	41	511
		880	--	41	482
		1180	--	43	376
Dec. 15.....	51,200	120	--	37	104
		465	--	37	116
		650	--	37	148
		880	--	37	119
		1180	--	37	118
Jan. 15, 1953.....	14,600	120	9:00 a.m.	35	163
		465	9:00 a.m.	34	199
		650	9:00 a.m.	34	202
		880	9:00 a.m.	35	198
		1180	9:00 a.m.	36	182
Feb. 15.....	12,600	120	2:00 p.m.	35	175
		465	2:00 p.m.	35	192
		650	2:00 p.m.	35	201
		880	2:00 p.m.	35	211
		1180	2:00 p.m.	36	192
Mar. 15.....	13,000	120	9:00 a.m.	45	181
		465	9:00 a.m.	39	208
		650	9:00 a.m.	38	209
		880	9:00 a.m.	45	215
		1180	9:00 a.m.	46	202
Apr. 15.....	25,500	120	8:30 a.m.	50	133
		465	8:30 a.m.	50	148
		650	8:30 a.m.	49	150
		880	8:30 a.m.	49	153
		1180	8:30 a.m.	49	147
May 15.....	15,900	120	8:00 a.m.	62	159
		465	8:00 a.m.	62	178
		650	8:00 a.m.	62	178
		880	8:00 a.m.	62	178
		1180	8:00 a.m.	62	178

## SUSQUEHANNA RIVER BASIN--Continued

## SUSQUEHANNA RIVER AT DANVILLE, PA.--Continued

Temperature (°F) of water, water year October 1952 to September 1953  
 /Once-daily temperature measurement at approximately 7 a. m. /

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

## 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 June 1953.

Water temperatures: October 1944 to June 1953.

EXTREMES, 1952-53.--Maximum, 150 ppm Nov. 11-20; minimum, 29 ppm Mar. 21-31.

Specific conductance: Maximum daily, 384 micromhos Nov. 17; minimum daily, 73.6 micromhos May 25.

Water temperature: Minimum, freezing point reached on Dec. 28, 30, Jan. 8 and Feb. 5.

EXTREMES, 1944-53.--Dissolved solids (1944-47): Maximum, 219 ppm Oct. 1-10, 1944; minimum, 46 ppm May 1-10, 1945.

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

Specific conductance: Maximum, 408 micromhos Oct. 4, 1951; minimum, 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 1952 to September 1953 based on records for Susquehanna River at Renovo, which are given in WSP 1272.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)		Potassium (K)	Bicarbonate (HCO <sub>3</sub> ) (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
									Sodium (Na)	Calcium							Non-carbonate					
Oct. 1-10, 1952 ..	1,480	--	--	--	--	--	--	--	9.7	28	99	10	--	1.2	--	120	97	308	7.7	5		
Oct. 11-20 .....	1,121	--	--	--	--	--	--	14	14	28	115	12	--	2.6	--	132	109	347	7.7	5		
Oct. 21-31 .....	834	3.3	--	0.01	--	--	34	12	12	17	120	13	0.2	2.0	239	134	120	353	6.6	3		
Nov. 1-10 .....	781	--	--	--	--	--	--	--	12	30	123	12	--	3.2	--	132	117	370	7.3	8		
Nov. 11-20 .....	874	--	--	--	--	--	--	--	12	34	123	12	--	3.3	--	150	122	377	7.7	5		
Nov. 21-25 .....	23,298	--	--	--	--	--	--	--	9.1	25	85	12	--	4.8	--	110	90	277	6.2	4		
Nov. 26-30 .....	8,838	--	--	--	--	--	--	--	6.5	6	45	7.0	--	3.1	--	50	45	138	6.8	5		
Dec. 1-10 .....	7,208	--	--	--	--	--	--	--	3.4	10	35	5.0	--	2.1	--	46	38	122	7.4	4		
Dec. 11-20 .....	26,030	--	--	--	--	--	--	--	2.8	7	31	3.0	--	2.2	--	38	32	101	6.7	5		
Dec. 21-31 .....	5,750	--	--	--	--	--	--	--	3.8	9	41	6.0	--	2.2	--	52	45	134	7.0	5		
Jan. 1-10, 1953 ..	4,218	--	--	--	--	--	--	--	5.6	16	50	4.0	--	1.8	--	60	47	160	6.8	5		
Jan. 11-20 .....	12,555	--	--	--	--	--	--	--	3.2	6	43	5.0	--	1.6	--	51	46	131	6.8	12		
Jan. 21-31 .....	27,055	--	--	--	--	--	--	--	3.6	23	31	4.0	--	1.3	--	50	31	99.4	7.7	4		
Feb. 1-10 .....	11,710	--	--	--	--	--	--	--	2.9	5	40	4.5	--	1.4	--	47	43	118	5.7	2		
Feb. 11-20 .....	8,500	--	--	--	--	--	--	--	3.8	6	49	5.0	--	1.7	--	56	51	140	5.9	3		
Feb. 21-28 .....	12,737	--	--	--	--	--	--	--	2.9	5	33	4.0	--	1.4	--	39	35	100	6.9	3		
Mar. 1-10 .....	11,709	--	--	--	--	--	--	--	2.8	4	37	4.0	--	1.8	--	42	39	112	6.4	5		
Mar. 11-20 .....	13,217	--	--	--	--	--	--	--	2.3	4	39	3.0	--	1.0	--	44	41	113	5.5	3		
Mar. 21-31 .....	38,518	4.9	--	.01	--	--	7.8	2.3	4.2	3	30	2.5	.1	.9	60	29	26	91.1	5.3	--		



Apr. 1-10, 1953..	21,910	--	--	--	2.9	4	34	2.5	--	1.0	--	38	35	101	6.4	--
Apr. 11-20 .....	16,810	--	--	--	2.7	4	35	4.0	--	.7	--	40	37	109	6.3	--
Apr. 21-30 .....	18,590	--	--	--	2.3	4	33	4.0	--	.7	--	44	22	117	6.1	--
May 1-10 .....	19,950	--	--	--	2.4	6	32	6.0	--	.7	--	42	37	112	6.3	--
May 11-20 .....	14,388	--	--	--	2.1	7	36	2.5	--	1.0	--	43	37	121	6.9	5
May 21-31 .....	43,118	--	--	--	1.2	6	22	4.0	--	1.4	--	32	27	95.4	6.1	4
June 1-10 .....	33,360	--	--	--	5.0	8	39	4.0	--	1.3	--	43	36	121	6.4	4
June 11-20 .....	7,918	--	--	--	3.0	10	49	5.0	--	1.6	--	61	53	156	6.4	3
June 21-30 .....	3,602	--	--	--	4.6	14	61	5.5	--	1.7	--	74	63	202	6.6	4
Average .....	13,680	--	--	--	5.2	12	54	5.9	--	1.7	--	65	54	169	--	5

a. For period of record only; mean discharge for water year was 14,960 cfs.

## SUSQUEHANNA RIVER BASIN--Continued

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

Temperature (°F) of water, water year October 1952 to September 1953  
 /Once-daily temperature measurement at approximately 7:30 a. m./

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

## 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 June 1953.

Water temperatures: October 1944 to June 1953.

Sediment records: January 1951 to September 1953.

EXTREMES, 1952-53.--Hardness: Maximum, 170 ppm Nov. 1-10; minimum, 54 ppm Mar. 21-31.

Specific conductance: Maximum daily, 449 micromhos Nov. 14; minimum daily, 95.2 micromhos Jan. 24.

Water temperature: Minimum, 35.7 Dec. 28 and Jan. 8.

Sediment concentrations: Maximum daily, 811 ppm May 26; minimum daily, 1 ppm on many days.

Sediment loads: Maximum daily, 37,780 tons Nov. 12; minimum daily, 1 ton Oct. 22.

EXTREMES, 1944-47.--Maximum, 170 ppm Nov. 1-10, 1944; minimum, 74 ppm Feb. 11-20, 1950.

Hardness, 1944-47.--Maximum, 170 ppm Nov. 1-10, 1944; minimum, 54 ppm Mar. 21-31, 1950.

Specific conductance: Maximum daily, 449 micromhos Nov. 14; minimum daily, 95.2 micromhos Jan. 24, 1950.

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

Sediment concentrations (1951-53): Maximum daily, 880 ppm Mar. 12, 1952; minimum daily, 0 ppm on several days.

Sediment loads: Maximum daily, 119,500 tons Mar. 12, 1952; minimum daily, 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 1952 to September 1953 given in WSP 1272.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Tem- perature (°F)	Silica (SiO <sub>2</sub> )	Alum- inum (Al)	Iron (Fe)	Man- ga- nese (Mn)	Cal- cium (Ca)	Mag- nesium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO <sub>3</sub> )	Sul- fate (SO <sub>4</sub> )	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO <sub>3</sub> )	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO <sub>3</sub>		Total acid- ity as H <sub>2</sub> SO <sub>4</sub>	Specific conduct- ance (micro- mhos at 25°C)	pH	Color
																	Calcium	Non-carbon- ate				
Oct. 1-10, 1952..	691	--	--	--	--	--	--	--	14	--	399	66	13	--	3.0	--	144	60	--	366	8.0	2
Oct. 11-20 .....	658	--	--	--	--	--	--	--	12	--	105	63	13	--	4.5	--	152	63	--	368	8.0	2
Oct. 21-31 .....	597	2.8	--	--	0.05	--	41	13	21	12	106	62	14	0.1	2.2	240	156	61	--	433	7.7	5
Nov. 1-10 .....	587	--	--	--	--	--	--	--	16	--	123	73	18	--	3.6	--	170	66	--	435	7.6	5
Nov. 11-20 .....	636	--	--	--	--	--	--	--	17	--	120	72	17	--	4.3	--	164	66	--	426	7.6	5
Nov. 21-30 .....	4,190	--	--	--	--	--	--	--	--	--	42	--	--	--	--	--	--	--	--	278	6.8	--
Nov. 22-30 .....	15,357	--	--	--	--	--	--	--	3.2	--	46	29	6.0	--	4.4	--	73	35	--	175	7.1	7
Dec. 1-10 .....	3,221	--	--	--	--	--	--	--	4.7	--	68	39	7.0	--	6.3	--	101	45	--	241	7.5	4
Dec. 11-20 .....	9,263	--	--	--	--	--	--	--	2.1	--	43	26	4.0	--	3.2	--	66	31	--	162	7.3	5
Dec. 21-31 .....	2,773	--	--	--	--	--	--	--	3.0	--	64	33	7.0	--	4.9	--	94	42	--	231	7.6	4
Jan. 1-10, 1953..	2,657	--	--	--	--	--	--	--	5.5	--	68	44	7.5	--	3.4	--	103	47	--	244	7.4	3
Jan. 11-20 .....	11,234	--	--	--	--	--	--	--	7.0	--	46	26	5.5	--	3.9	--	60	22	--	155	8.1	6
Jan. 21-31 .....	13,285	--	--	--	--	--	--	--	1.6	--	36	23	2.0	--	3.9	--	56	26	--	138	7.3	5
Feb. 1-10 .....	5,218	--	--	--	--	--	--	--	1.4	--	552	27	5.0	--	3.0	--	77	34	--	179	6.8	4
Feb. 11-20 .....	4,479	--	--	--	--	--	--	--	1.1	--	53	28	5.5	--	1.4	--	79	36	--	184	6.9	5
Feb. 21-28 .....	5,699	--	--	--	--	--	--	--	1.6	--	48	25	5.0	--	3.7	--	72	33	--	167	6.8	7
Mar. 1-10 .....	5,464	--	--	--	--	--	--	--	5.6	--	48	29	4.5	--	2.7	--	66	27	--	164	6.9	10
Mar. 11-20 .....	8,983	--	--	--	--	--	--	--	3.2	--	38	28	4.5	--	2.9	--	62	31	--	150	6.4	5
Mar. 21-31 .....	18,576	5.3	--	--	.05	--	15	4.1	1.5	--	33	22	3.5	--	2.9	82	54	27	--	133	6.6	4

a Includes equivalent of 2 parts per million carbonate (CO<sub>3</sub>).

## SUSQUEHANNA RIVER BASIN--Continued

## JUNIATA RIVER AT NEWPORT, PA.--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>	Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
Apr. 1-10, 1953..	7,325		--	--	--	--	--	--	1.0	48	26	4.5	--	--	3.0	--	73	34	169	7.0	4
Apr. 11-20 .....	6,945		--	--	--	--	--	--	4.2	48	27	6.0	--	--	2.7	--	69	30	187	6.9	8
Apr. 21-30 .....	5,858		--	--	--	--	--	--	4.2	48	29	4.0	--	--	2.3	--	68	29	170	7.3	5
May 1-10 .....	4,865		--	--	--	--	--	--	2.4	50	29	6.0	--	--	2.0	--	76	35	186	7.3	5
May 11-20 .....	4,736		--	--	--	--	--	--	4.0	47	30	6.0	--	--	2.0	--	71	33	175	7.2	5
May 21-31 .....	8,478		--	--	--	--	--	--	2.6	46	27	3.5	--	--	2.4	--	67	29	167	7.9	6
June 1-10 .....	13,255		--	--	--	--	--	--	2.6	51	24	3.5	--	--	2.3	--	68	26	163	7.8	6
June 11-20 .....	3,334		--	--	--	--	--	--	2.9	71	35	5.5	--	--	2.5	--	98	40	238	7.9	3
June 21-30 .....	1,909		--	--	--	--	--	--	4.6	73	45	7.5	--	--	.9	--	108	48	261	8.0	5
Average .....	b6,077		--	--	--	--	--	--	5.6	62	37	7.0	--	--	3.0	--	91	39	225	--	5

b For period of record only; mean discharge for water year was 4,912 cfs.

## SUSQUEHANNA RIVER BASIN--Continued

## JUNIATA RIVER AT NEWPORT, PA.--Continued

Temperature (°F) of water, water year October 1952 to September 1953  
 /Once-daily temperature measurement at approximately 4:00 p. m. /

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

## SUSQUEHANNA RIVER BASIN--Continued

## JUNIATA RIVER AT NEWPORT, PA.--Continued

Suspended sediment, water year October 1952 to September 1953

Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment Mean concen- tration (ppm)	Tons per day	Mean dis-charge (cfs)	Suspended sediment Mean concen- tration (ppm)	Tons per day	Mean dis-charge (cfs)	Suspended sediment Mean concen- tration (ppm)	Tons per day
1.....	580	1	2	590			3,140	13	110
2.....	679	2	4	633			2,830	9	69
3.....	679	1	2	644	4	6	2,610		
4.....	633	1	2	492			2,520		
5.....	679	1	2	474			2,860	17	142
6.....	644	1	2	590			4,410		
7.....	610	1	2	692	5	7	4,020		
8.....	668	6	11	530			3,390		
9.....	884	4	10	530			3,040	16	149
10.....	855	3	7	560			3,390		
11.....	790	1	2	483			8,520	220	s 6,770
12.....	738	1	2	520	7	11	22,100	218	s 13,200
13.....	679	5	9	600			16,700	66	2,980
14.....	560	7	11	644			11,200	39	1,180
15.....	656	3	5	679			8,370	38	859
16.....	690	3	6	610			6,580		
17.....	633	3	5	590	7	12	5,600	14	204
18.....	668	3	5	590			4,930		
19.....	600	4	6	580			4,510		
20.....	570	6	9	1,060	53	s 120	4,020		
21.....	590	4	6	4,190	178	s 2,580	3,140	8	73
22.....	530	1	1	34,400	408	s 37,800	3,260		
23.....	570	3	5	51,900	223	31,200	3,260		
24.....	590	2	3	23,300	102	6,420	3,120		
25.....	590	3	5	11,800	57	1,820	3,090		
26.....	580	3	5	8,060	33	718	2,830	9	65
27.....	590	3	5	6,020	22	358	2,710		
28.....	530	4	6	4,930	22	293	2,490		
29.....	520	5	7	4,280	15	173	2,330		
30.....	560	3	5	3,520	11	105	2,240	5	29
31.....	610	3	5	--	--	--	2,030		
Total.	19,755	--	157	164,421	--	81,761	155,240	--	27,896
Day	January			February			March		
	Mean dis-charge (cfs)	Suspended sediment Mean concen- tration (ppm)	Tons per day	Mean dis-charge (cfs)	Suspended sediment Mean concen- tration (ppm)	Tons per day	Mean dis-charge (cfs)	Suspended sediment Mean concen- tration (ppm)	Tons per day
1.....	2,140			6,580	16	284	4,800	10	124
2.....	2,350			6,020	9	146	4,410		
3.....	2,350	6	37	5,470			3,760	6	61
4.....	2,190			5,200			4,510	6	73
5.....	2,330			4,930			5,880	18	286
6.....	2,030			4,510	9	119	7,020	28	531
7.....	2,010	7	43	4,150			7,020	22	417
8.....	1,960			5,060			6,300	13	221
9.....	3,020			5,200			5,600	9	136
10.....	6,190	22	368	5,060			5,340	9	130
11.....	12,200	92	3,030	4,670	9	116	5,200	10	140
12.....	13,200	63	2,240	4,410			5,060	8	109
13.....	10,400	27	758	4,510			5,200	9	126
14.....	8,060	17	370	4,800			6,820	17	313
15.....	7,020	15	284	4,510			9,950	47	1,260
16.....	7,460	15	302	4,510	10	124	11,600	59	1,850
17.....	10,100	23	627	4,670			12,900	86	3,000
18.....	14,200	36	1,380	4,410			10,900	48	1,410
19.....	15,500	33	1,380	4,150			10,600	32	916
20.....	14,200	30	1,150	4,150			11,600	43	1,350
21.....	11,900	26	835	4,670	10	137	10,300	31	862
22.....	10,600	16	458	6,020			8,680	29	680
23.....	9,630	14	364	6,300			7,610	25	514
24.....	14,500	199	s 9,280	6,580			16,000	356	s 16,400
25.....	23,200	198	12,400	6,160	14	216	41,600	303	s 33,700
26.....	21,000	77	4,370	5,600			36,400	130	12,800
27.....	15,500	42	1,760	5,200			27,200	71	5,210
28.....	12,200	30	988	5,060			19,200	35	1,810
29.....	10,600	28	801	--	--	--	15,200	37	1,520
30.....	8,990	20	485	--	--	--	12,200	32	1,050
31.....	7,460	11	222	--	--	--	9,950	27	725
Total.	284,490	--	44,209	142,560	--	4,109	348,810	--	87,848

s Computed by subdividing day.

## SUSQUEHANNA RIVER BASIN--Continued

## JUNIATA RIVER AT NEWPORT, PA.--Continued

Suspended sediment, water year October 1952 to September 1953--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.....	8,680	28	656	4,940	17	227	25,500	202	s 14,300
2.....	8,060	33	718	4,810	13	169	29,300	226	s 18,500
3.....	8,370	35	791	4,420	12	143	18,500	90	4,500
4.....	7,310	32	632	3,310	11	98	12,900	52	1,810
5.....	6,580	28	497	3,310	8	71	9,630	44	1,140
6.....	6,020	20	325	3,800	12	123	8,060	35	762
7.....	6,580	22	391	4,040	11	120	9,310	100	2,510
8.....	7,610	31	637	5,390	71	s 1,210	7,310	42	829
9.....	7,020	30	569	7,760	140	2,930	6,300	39	663
10.....	7,020	30	569	6,870	74	1,370	5,740	36	558
11.....	8,060	40	870	5,740	79	1,220	5,070	32	438
12.....	7,760	43	901	5,200	49	688	4,040	25	273
13.....	7,760	31	650	4,810	41	532	3,190	17	146
14.....	7,610	25	514	4,550	48	590	3,310	15	134
15.....	7,160	25	483	4,170	38	428	3,190	11	95
16.....	6,580	27	480	4,300	28	325	3,310	12	107
17.....	5,880	32	508	4,420	29	346	3,190	22	189
18.....	5,600	26	393	4,550	31	381	2,790	3	21
19.....	6,020	23	374	5,070	39	534	2,650		
20.....	7,020	27	512	4,550	38	467	2,600		
21.....	6,720	21	381	4,040	22	240	2,330	1	5
22.....	6,440	19	330	3,800	14	144	2,280		
23.....	6,020	20	325	4,680	30	379	2,110		
24.....	5,600	15	227	4,940	54	720	1,820		
25.....	5,200	16	225	4,550	47	577	1,760		
26.....	5,200	15	211	15,600	811	s 36,700	1,650	3	14
27.....	6,020	21	341	16,500	208	s 9,310	1,860		
28.....	6,440	30	522	11,100	128	3,840	1,740		
29.....	5,740	19	294	7,310	78	1,540	1,800		
30.....	5,200	18	253	6,440	47	617	1,740		
31.....	--	--	--	16,300	166	s 7,540	--	--	--
Total.	201,280	--	14,579	191,270	--	73,779	184,980	--	47,128
	July			August			September		
1.....	1,890	4	20	946	5	13	547	1	2
2.....	1,390			1,060			525		
3.....	1,530			886			547		
4.....	2,190			802			558		
5.....	2,630			931			660		
6.....	1,760	4	21	1,040	1	3	672	1	2
7.....	2,040			1,280			685		
8.....	2,110			1,370			858		
9.....	2,110			1,430			722		
10.....	1,860			3,030			s 123		
11.....	1,720	2	6	2,330	12	75	672	2	5
12.....	1,590			1,970			660		
13.....	1,350			1,370			970		
14.....	1,080			1,260			885		
15.....	1,160			1,170			613		
16.....	1,140	4	10	1,300	2	5	673	4	8
17.....	1,060			993			788		
18.....	946			844			685		
19.....	946			818			748		
20.....	931			886			722		
21.....	872	11	29	735	2	3	660	3	6
22.....	962			710			830		
23.....	962			660			951		
24.....	1,040			624			774		
25.....	2,550			s 333			760		
26.....	2,130	3	10	602	2	3	748	2	4
27.....	1,760			660			748		
28.....	1,170			648			685		
29.....	1,090			624			660		
30.....	1,040			602			722		
31.....	1,010	5	14	613			--	--	--
Total.	46,019	--	934	32,805	--	418	21,308	--	142

Total discharge for year (cfs-days) ..... 1,792,938

Total load for year (tons) ..... 382,963

s Computed by subdividing day.

a Computed from estimated concentration graph.

SUSQUEHANNA RIVER BASIN--Continued  
SHERMAN CREEK AT SHERMANS DALE, PA.

LOCATION.--Temperature recorder at gaging station at highway bridge on State Route 34 at Shermans Dale, Perry County, 1½ miles upstream from Fishing Run.  
DRAINAGE AREA.--200 square miles.  
RECORDS AVAILABLE.--Water temperatures: June to September 1953.  
EXTREMES, June to September 1953.--Water temperatures: Maximum, 89°F Sept. 2.  
REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1290.

Temperature (°F) of water, June to September 1953

/Recorder with temperature attachment, continuous ethyl alcohol actuated thermometer/

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1.....																			84	77	79	71	87	74
2.....																			84	78	76	71	89	76
3.....																			82	76	75	68	83	78
4.....																			79	72	71	69	85	78
5.....																			81	73	73	69	81	74
6.....																			79	77	76	67	74	68
7.....																			83	75	74	70	75	66
8.....																			80	75	71	67	75	66
9.....																			78	72	68	66	76	63
10.....																			76	70	69	66	75	62
11.....																			78	68	74	66	73	61
12.....																			79	69	78	70	70	65
13.....																			79	71	80	72	67	61
14.....																			84	71	77	73	85	57
15.....																			85	73	78	70	69	59
16.....																			85	73	78	68	71	60
17.....																			88	73	76	70	71	59
18.....																			86	74	77	65	68	58
19.....																			80	76	76	62	65	62
20.....																			83	74	76	63	65	63
21.....																			85	73	77	62	70	63
22.....																			82	74	78	64	67	59
23.....																			80	74	77	65	67	55
24.....																			77	72	78	66	65	53
25.....																			79	69	83	66	61	54
26.....																			81	67	83	68	67	58
27.....																			81	70	89	80	70	60
28.....																			78	72	87	70	71	61
29.....																			84	72	87	72	71	59
30.....																			82	75	77	72	70	60
31.....																			84	76	85	70	73	60
Average.....																			81	73	76	68	72	63



SUSQUEHANNA RIVER BASIN--Continued  
MISCELLANEOUS ANALYSES OF STREAMS IN SUSQUEHANNA RIVER BASIN IN NEW YORK

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium, magnesium	Non-carbonate			
SUSQUEHANNA RIVER AT COLLIERSVILLE																			
Apr. 23, 1953 .....	401		2.0	0.16	31	1.8	2.1	0.6	91	12	1.2	0.0	0.3	108	85	10	175	7.6	8
Aug. 18 .....	29		1.2	.08	37	2.7	2.6	1.1	115	15	2.0	.0	.3	124	104	9	218	7.7	20
UNADILLA RIVER NEAR NEW BERLIN																			
Apr. 23, 1953 .....	300		2.3	0.17	35	2.1	2.2	0.6	103	18	2.1	0.1	0.6	130	96	12	202	7.9	6
Aug. 18 .....	33		2.2	.26	50	3.2	3.8	1.1	137	28	4.0	.1	.6	166	138	26	280	7.7	25
SUSQUEHANNA RIVER AT CONKLIN																			
Apr. 22, 1953 .....	4,440		2.8	0.06	15	1.9	3.1	1.6	44	12	2.3	0.1	1.2	68	45	9	105	7.1	6
Aug. 18 .....	313		1.4	.18	26	2.7	3.7	.7	78	16	3.2	.0	.3	93	76	12	168	7.5	15
CHENANGO RIVER AT GREENE																			
Apr. 23, 1953 .....	895		2.8	0.14	26	3.0	2.2	1.0	83	15	2.6	0.0	1.5	96	77	9	174	7.6	7
Aug. 18 .....	112		1.8	.21	42	7.2	4.1	1.4	141	21	3.6	.0	.3	160	135	26	261	8.4	20
OTSSELIC RIVER NEAR UPPER LISLE																			
Apr. 23, 1953 .....	346		2.6	0.16	12	1.7	1.6	0.8	33	9.6	2.0	0.0	1.2	62	37	10	84.4	6.9	20
Aug. 18 .....	20		1.5	.31	22	2.7	3.4	.7	71	12	3.4	.0	.2	94	66	13	147	8.4	15
TIOUGHENGA RIVER AT ITASKA																			
Apr. 23, 1953 .....	1,230		2.3	0.21	23	2.9	1.9	0.9	69	17	2.1	0.1	1.6	101	69	13	156	7.5	8
Aug. 18 .....	98		2.1	.26	39	5.6	6.6	1.2	128	20	8.8	.1	.4	155	120	15	260	8.6	3

SUSQUEHANNA RIVER BASIN--Continued  
MISCELLANEOUS ANALYSES OF STREAMS IN SUSQUEHANNA RIVER BASIN IN NEW YORK--Continued  
Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium, mg-nesium	Non-carbonate			
SUSQUEHANNA RIVER NEAR WAVERLY																			
Apr. 23, 1953 .....	8,170		2.2	0.23	19	2.2	5.6	0.8	53	15	7.9	0.1	0.6	91	56	13	146	7.4	13
Aug. 18 .....	670		2.4	.26	36	4.6	17	1.6	116	25	18	.1	.8	169	110	15	265	7.7	4
CANISTEO RIVER AT ARKPORT																			
Aug. 19, 1953 .....	2.1		5.8	0.16	52	10	3.6	1.8	186	23	2.4	0.1	0.3	202	171	19	331	8.0	2
CANACADEA CREEK NEAR HORSELL																			
Apr. 22, 1953 .....	58		2.0	0.29	29	5.3	2.9	1.1	96	24	2.4	0.0	0.0	131	94	25	202	8.8	7
Aug. 19 .....	8.6		4.7	.24	53	14	4.9	2.1	198	35	2.6	.1	.5	217	190	28	364	8.2	2
CANISTEO RIVER BELOW CANACADEA CREEK AT HORSELL																			
Apr. 22, 1953 .....	139		2.0	0.08	39	1.9	2.3	1.6	105	26	2.8	0.1	0.7	149	105	19	234	7.2	12
Aug. 19 .....	22		2.7	.46	57	13	8.6	1.8	206	39	6.8	.1	1.1	239	196	27	394	8.3	1
CANISTEO RIVER AT WEST CAMERON																			
Apr. 22, 1953 .....	e 330		2.1	0.19	29	4.6	8.7	1.0	91	32	5.3	0.0	0.0	130	92	18	212	8.1	7
Aug. 19 .....	38		2.4	.37	52	11	19	2.7	184	40	22	.1	.2	244	175	24	405	8.6	3
TIOGA RIVER NEAR ERWINS																			
Apr. 22, 1953 .....	1,190		2.3	0.26	22	3.1	9.0	1.4	57	34	7.4	0.1	0.1	122	48	21	182	7.5	8
Aug. 19 .....	94		2.9	.31	39	7.8	12	2.2	89	69	15	.0	.4	211	130	57	314	7.6	27

e Estimated.

## COHOCTON RIVER AT AVOCA

Apr. 22, 1953 .....	a 170		2.9	0.17	32	4.7	2.7	1.1	90	24	6.0	0.0	1.9	127	141	25	220	7.8	8
Aug. 19 .....	a 44.3		4.8	.20	43	8.1	2.9	1.5	148	24	6.1	.1	.6	176	141	20	286	7.9	22

## CAMPBELL CREEK NEAR KANOWA

Apr. 22, 1953 .....	a 20.8		3.1	0.13	19	2.7	2.6	1.2	55	19	2.5	0.0	0.4	90	58	13	134	7.4	5
Aug. 19 .....	a 1.07		4.6	.12	32	7.0	4.4	1.9	121	20	3.2	.1	.5	136	109	10	230	8.1	12

## COHOCTON RIVER NEAR CAMPBELL

Apr. 22, 1953 .....	424		2.4	0.15	28	5.1	3.2	1.2	82	25	4.9	1.3	1.5	137	93	26	212	7.6	12
Aug. 19 .....	74		2.1	.20	34	14	4.6	1.5	146	30	6.1	.1	1.3	171	143	23	268	8.2	18

## CHEMUNG RIVER AT CHEMUNG

Apr. 22, 1953 .....	2, 180		1.7	0.17	24	4.1	5.0	1.6	68	25	6.5	0.0	1.2	132	77	21	189	7.6	20
Aug. 19 .....	2, 296		1.6	.15	39	9.8	11	2.0	123	45	13	.1	1.8	198	138	37	324	7.8	23

a Discharge at time of sampling.

## SUSQUEHANNA RIVER BASIN--Continued

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

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Tem- per- ature (° F)	Silica (SiO <sub>2</sub> )	Alum- inum (Al)	Iron (Fe)	Man- ga- nese (Mn)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO <sub>3</sub> ) (SO <sub>4</sub> )	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO <sub>3</sub> )	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO <sub>3</sub>		Total acid- ity as H <sub>2</sub> SO <sub>4</sub>	Specific conduct- ance (micro- mhos at 25°C)	pH	Color	
																Calcium	Non- mag- carbonate					
TIOGA RIVER AT TIOGA, PA.																						
Oct. 6, 1952 .....	28			4.3	0.02	3.3	35	15	1.4		0.0	164	7.0	0.3	0.9	245	149	149	104	376	4.5	5
LYCOMING CREEK NEAR TROUT RUN, PA.																						
Nov. 10, 1952 .....	22								1.1		14	13	2.6		0.8		27	16		66.1	7.2	3
Dec. 18 .....	342	37							1.7		7.0	11	2.1		1.8		18	12		48.2	7.2	3
Jan. 21, 1953 .....	367	38							2.3		8.0	11	3.5		1.3		19	12		48.2	7.1	4
Feb. 28 .....	311	38							3.0		8.0	11	2.5		1.2		16	9		47.0	7.1	4
Mar. 31 .....	550	45							1.6		5.0	10	2.7		1.4		16	12		43.5	6.9	4
May 5 .....	294	54							1.3		8.0	11	1.4		1.0		18	11		47.1	7.0	3
July 2 .....	242	70							.7		13	14	1.6		1.3		27	16		67.4	7.2	3
July 14 .....	28	63							1.6		9.0	10	1.8		2.7		19	12		54.1	7.2	7
Aug. 18 .....	21								2.1		13	14	3.2		1.2		26	15		70.0	7.4	3

## LOYALSOCK CREEK AT LOYALSOCK, PA.

Nov. 10, 1952	51								1.4		12	9.4	2.0		0.8		20	10		53.5	7.0	3
Dec. 18	769								1.3		7.0	11	1.7		1.6		18	12		47.3	7.1	3
Jan. 21, 1953	1,240								.3		7.0	10	1.3		.8		18	12		42.6	7.0	3
Feb. 28	750								.4		14	13	1.5		.9		33	22		72.7	6.4	7
Mar. 30	1,760								.9		7.0	9.9	1.4		1.1		17	11		42.0	6.9	7
May 5	901								1.3		7.0	9.6	1.6		1.0		16	10		43.2	7.1	4
June 8	751								1.0		10	9.0	1.2		1.1		18	10		45.5	7.1	7
July 13	63								1.5		13	9.1	1.8		.7		20	9		52.9	7.1	3
Aug. 18	46								1.0		15	8.4	1.9		.5		22	10		56.9	6.9	8

## CONODOGUINET CREEK AT HOGESTOWN, PA.

Nov. 19, 1952	138		9.8		0.07		34	5.9	4.0	2.6	a100	24	5.4	0.1	4.9	154	109	25		239	8.2	7
Dec. 12	2,820		7.9		.04		33	7.0	4.1	1.8	b100	21	5.0	.1	4.8	147	111	24		234	8.4	3

a Includes equivalent of 2 ppm of carbonate (CO<sub>3</sub>).b Includes equivalent of 5.9 ppm of carbonate (CO<sub>3</sub>).

SUSQUEHANNA RIVER BASIN  
SUSQUEHANNA RIVER BASIN--Continued

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MISCELLANEOUS ANALYSES OF SUSQUEHANNA RIVER AT HARRISBURG, PA.

Chemical analyses of cross-section samples, November 1952 to September 1953

Date	Dis-charge (cfs)	Station	Time	Parts per million					Specific conductance (micromhos at 25° C)	pH	Color
				Bicar- bonate (HCO <sub>3</sub> )	Sul- fate (SO <sub>4</sub> )	Chlo- ride (Cl)	Ni- trate (NO <sub>3</sub> )	Hard- ness as CaCO <sub>3</sub>			
Nov. 14, 1952...	3,400	East Channel	120								
			11:45 a. m.	4	290	10	1.3	264	623	4.9	2
			600	15	220	12	4.4	220	526	6.1	3
		1180	11:45 a. m.	60	132	12	2.7	166	415	7.8	3
		West Channel	600	102	96	14	2.9	160	414	7.6	3
			1100	134	54	14	3.5	152	373	7.9	5
			1300	174	28	7.0	9.0	174	358	7.6	3
Jan. 16, 1953...	35,400	East Channel	120								
			11:00 a. m.	16	84	5.0	4.0	90	227	7.0	5
			600	32	45	5.0	4.3	70	178	6.9	5
		1180	11:00 a. m.	11	52	3.0	2.6	58	154	6.4	5
		West Channel	600	28	36	3.0	4.0	60	148	6.9	7
			1100	45	28	3.0	4.9	60	146	7.3	5
			1320	100	19	3.5	11	104	228	8.1	5
Feb. 16, 1953...	30,500	East Channel	120	--	--	--	--	--	255	--	--
			500	--	--	--	--	--	227	--	--
			1180	--	--	--	--	--	150	--	--
		West Channel	600	--	--	--	--	--	149	--	--
			1100	--	--	--	--	--	183	--	--
			1320	--	--	--	--	--	275	--	--
		East Channel	120	--	--	--	--	--	236	--	--
			600	--	--	--	--	--	217	--	--
			1180	--	--	--	--	--	135	--	--
Mar. 16, 1953...	42,000	West Channel	600	--	--	--	--	--	159	--	--
			1100	--	--	--	--	--	147	--	--
			1320	--	--	--	--	--	219	--	--
		East Channel	120	--	--	--	--	--	223	--	--
			600	--	--	--	--	--	175	--	--
			1180	--	--	--	--	--	134	--	--
		West Channel	600	--	--	--	--	--	124	--	--
			1100	--	--	--	--	--	158	--	--
			1320	--	--	--	--	--	240	--	--
May 15, 1953...	34,200	East Channel	120	--	--	--	--	--	223	--	--
			600	--	--	--	--	--	175	--	--
			1180	--	--	--	--	--	134	--	--
		West Channel	600	--	--	--	--	--	124	--	--
			1100	--	--	--	--	--	158	--	--
			1320	--	--	--	--	--	240	--	--
		East Channel	120	--	--	--	--	--	306	--	--
			600	--	--	--	--	--	248	--	--
			1180	--	--	--	--	--	149	--	--
June 16, 1953...	21,100	West Channel	1100	--	--	--	--	--	202	--	--
			1320	--	--	--	--	--	326	--	--
		East Channel	120	--	--	--	--	--	306	--	--
			600	--	--	--	--	--	248	--	--
			1180	--	--	--	--	--	149	--	--
		West Channel	1100	--	--	--	--	--	202	--	--
			1320	--	--	--	--	--	326	--	--
		East Channel	120	--	--	--	--	--	306	--	--
			600	--	--	--	--	--	248	--	--
			1180	--	--	--	--	--	149	--	--
July 15, 1953...	6,280	West Channel	1100	--	--	--	--	--	202	--	--
			1320	--	--	--	--	--	326	--	--
		East Channel	120	--	--	--	--	--	306	--	--
			600	--	--	--	--	--	248	--	--
			1180	--	--	--	--	--	149	--	--
		West Channel	1100	--	--	--	--	--	202	--	--
			1320	--	--	--	--	--	326	--	--
		East Channel	120	--	--	--	--	--	306	--	--
			600	--	--	--	--	--	248	--	--
			1180	--	--	--	--	--	149	--	--
Aug. 18, 1953...	5,920	West Channel	1100	--	--	--	--	--	202	--	--
			1320	--	--	--	--	--	326	--	--
		East Channel	120	--	--	--	--	--	306	--	--
			600	--	--	--	--	--	248	--	--
			1180	--	--	--	--	--	149	--	--
		West Channel	1100	--	--	--	--	--	202	--	--
			1320	--	--	--	--	--	326	--	--
		East Channel	120	--	--	--	--	--	306	--	--
			600	--	--	--	--	--	248	--	--
			1180	--	--	--	--	--	149	--	--
Sept. 15, 1953	3,880	West Channel	1100	--	--	--	--	--	202	--	--
			1320	--	--	--	--	--	326	--	--
		East Channel	120	--	--	--	--	--	306	--	--
			600	--	--	--	--	--	248	--	--
			1180	--	--	--	--	--	149	--	--
		West Channel	1100	--	--	--	--	--	202	--	--
			1320	--	--	--	--	--	326	--	--
		East Channel	120	--	--	--	--	--	306	--	--
			600	--	--	--	--	--	248	--	--
			1180	--	--	--	--	--	149	--	--



## POTOMAC RIVER BASIN--Continued

## SOUTH BRANCH OF POTOMAC RIVER NEAR PETERSBURG, W. VA.

LOCATION.--At the Potomac Edison power plant, 1,000 feet upstream from gaging station, 2½ miles west of Petersburg, Grant County.

DRAINAGE AREA.--642 square miles.

RECORDS AVAILABLE.--Water temperatures: January 1947 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum observed, 83°F Aug. 1; minimum observed, 32°F Dec. 29.

EXTREMES, 1947-53.--Water temperatures: Maximum observed, 84°F June 27, July 23, 1952; minimum observed, 32°F on several days most years.

REMARKS.--Records of discharge for water years, 1950, 1951, 1952, and 1953 given in WSP 1171, 1202, 1232, and 1272, respectively.

Temperature (°F) of water, water year October 1952 to September 1953

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

## POTOMAC RIVER BASIN--Continued

## SOUTH BRANCH OF POTOMAC RIVER NEAR PETERSBURG, W. VA.--Continued

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

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

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



## POTOMAC RIVER BASIN--Continued

## SOUTH BRANCH OF POTOMAC RIVER NEAR PETERSBURG, W. VA.--Continued

Temperature (°F) water, water year October 1949 to September 1950

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

## POTOMAC RIVER BASIN--Continued

## CACAPON RIVER AT GREAT CACAPON, W. VA.

LOCATION.--At the Potomac-Edison hydro-plant, 4 miles downstream from gaging station and 2½ miles upstream from mouth, 1 mile south of Great Cacapon, Morgan County, West Virginia.

DRAINAGE AREA.--681 square miles above power plant; 677 square miles above gaging station.

RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum observed, 81°F July 7-8, Sept. 5; minimum observed, 33°F Jan. 6, 8.

EXTREMES, 1946-53.--Water temperatures: Maximum observed, 96°F July 23, 1952; minimum observed, 32°F many days most years.

REMARKS.--Records of discharge for water year 1950, 1951, 1952, and 1953 given in WSP 1171, 1202, 1232, and 1272 respectively.

Temperature (°F) of water, water year October 1952 to September 1953

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

## POTOMAC RIVER BASIN--Continued

## CACAPON RIVER AT GREAT CACAPON, W. VA.--Continued

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	59	55	36	36	35	37	52	59	67	76	80	76
2	62	50	35	36	36	36	50	58	68	76	81	75
3	64	47	35	36	36	36	48	60	68	76	81	73
4	64	45	42	36	37	34	46	60	69	77	81	70
5	66	44	42	35	38	34	47	62	70	77	80	69
6	66	43	43	35	36	38	46	68	72	76	80	70
7	65	43	44	34	34	36	48	62	75	--	81	70
8	64	42	44	36	38	38	50	62	75	75	78	70
9	60	41	46	38	36	44	50	62	76	76	77	72
10	58	40	44	34	44	48	51	62	77	76	78	72
11	55	44	42	36	40	45	51	62	74	75	79	72
12	55	44	40	39	40	46	50	62	73	76	72	72
13	54	46	38	38	40	46	50	58	72	76	77	72
14	55	46	36	38	41	46	53	56	70	75	77	72
15	56	45	32	40	41	45	52	57	72	80	77	74
16	58	47	34	40	40	45	52	58	74	80	77	76
17	56	48	34	41	40	42	53	58	75	82	78	78
18	56	38	35	41	40	42	53	59	75	83	77	76
19	59	37	35	41	39	42	54	59	75	84	76	78
20	57	38	35	41	38	44	53	59	75	84	76	75
21	55	38	34	42	38	45	54	59	73	95	77	72
22	57	38	34	40	39	46	64	59	72	88	78	70
23	57	38	34	38	39	48	64	60	--	96	76	68
24	57	39	34	37	40	51	63	60	70	94	76	68
25	57	38	34	37	41	48	63	60	78	92	75	67
26	58	38	35	39	41	48	62	59	82	95	75	66
27	58	38	35	42	41	49	60	60	80	90	75	65
28	58	36	35	44	41	49	56	62	79	84	75	64
29	57	35	34	40	40	48	58	60	80	82	75	64
30	57	35	35	36	--	49	56	59	79	80	75	65
31	57	--	35	34	--	50	--	59	--	80	76	--
Average	59	42	37	38	39	44	54	60	72	82	77	71

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

## POTOMAC RIVER BASIN--Continued

## CACAPON RIVER AT GREAT CACAPON, W. VA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

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

## POTOMAC RIVER BASIN--Continued

POTOMAC RIVER AT HANCOCK, MD.

**LOCATION.**—Temperature recorder at gaging station 0.2 mile downstream from Little Tonoloway Creek, half a mile downstream from new highway bridge at Hancock, Washington County, and 1.1 miles upstream from Big Tonoloway Creek (formerly called Great Tonoloway Creek).

**DRAINAGE AREA.--4,073 square miles.**

RECORDS AVAILABLE.--Water temperatures: July 1952 to September 1953.

EXTREMES, 1952-53. --Water temperatures: Maximum 89°F. July 17 18 2

1952-53.	Water temperatures: maximum, 89° F July 17, 18, 28, Sept. 2; minimum, 33° F Dec. 30, Jan. 1.	1950
EXTREMES.	July 1952 to September 1953	1950
	--Water temperatures: Maximum, 92° F, July 17-20	1950
	--Water temperatures: Minimum, 33° F, Dec. 30, Jan. 1	1950

REMARKS --Water temperatures: Maximum, 93° F July 22, 1952; minimum 33° F Dec. 30, 1952; Jan. 1, 1953.  
--Temperatures only for  
LANGMUIRS, July 1952 to September 1953.

Temperature ( $^{\circ}\text{F}$ ) of water, water year October 1952 to September 1953

Recorder with thermograph attachment/

Day		October		November		December		January		February		March		April		May		June		July		August		September	
		min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
Average.....	1.....	72	64	47	45	39	37	34	33	39	38	42	41	49	48	59	62	58	84	98	84	83	80	88	80
	2.....	70	63	47	47	38	37	35	34	39	38	41	39	50	49	62	61	57	86	83	81	77	89	81	
	3.....	64	60	48	47	38	37	35	34	38	38	41	39	52	50	67	65	64	91	87	82	81	77	88	
	4.....	63	57	48	47	38	36	35	34	38	39	37	37	52	52	68	66	68	86	79	80	76	86	81	
	5.....	61	57	47	44	40	37	36	34	38	37	40	38	52	51	68	66	71	67	85	80	85	79	83	
	6.....	64	57	48	44	40	39	35	34	37	37	40	40	52	51	68	66	75	60	84	81	82	79	78	
	7.....	62	57	47	43	40	37	34	34	38	37	40	40	51	51	67	66	78	74	87	82	80	76	78	
	8.....	60	56	45	41	39	36	34	34	39	38	40	40	52	51	67	64	78	76	85	81	82	75	76	
	9.....	58	56	45	43	38	38	36	34	39	39	40	38	53	52	64	62	82	76	83	79	79	75	76	
	10.....	58	56	46	44	41	38	38	36	39	38	39	38	55	53	65	61	82	79	80	76	76	74	76	
	11.....	59	55	45	42	44	41	40	38	39	39	40	39	55	55	67	64	81	77	80	73	80	74	76	
	12.....	59	55	45	40	43	43	40	40	39	38	41	40	55	54	69	66	79	74	80	74	81	77	74	
	13.....	62	58	45	40	43	42	40	39	38	38	45	41	54	52	70	68	74	72	83	74	83	78	72	
	14.....	64	58	45	40	42	40	40	38	38	38	47	45	52	50	70	69	72	71	84	77	85	79	68	
	15.....	64	58	46	42	40	38	40	38	38	38	48	47	50	48	70	69	73	70	87	77	85	78	71	
	16.....	64	60	48	44	38	37	41	40	40	38	48	48	49	48	70	68	75	72	87	79	85	77	72	
	17.....	61	57	50	44	37	37	41	41	40	38	48	48	49	48	68	66	75	73	89	80	82	78	73	
	18.....	60	57	50	48	38	37	41	41	38	37	48	47	50	49	66	64	73	72	89	81	82	74	72	
	19.....	59	55	50	48	38	37	41	41	37	37	47	47	51	50	66	65	77	72	85	83	80	72	70	
	20.....	57	52	51	48	38	37	41	41	38	37	48	47	51	50	69	65	82	77	87	80	80	71	70	
	21.....	52	48	54	49	37	37	41	41	41	38	49	47	50	49	69	67	86	80	88	81	80	71	71	
	22.....	51	47	54	51	38	37	41	41	41	41	49	48	51	49	69	68	84	82	85	79	80	72	69	
	23.....	51	47	53	50	39	38	41	41	41	41	52	49	55	51	70	68	86	81	82	75	79	73	68	
	24.....	53	48	52	49	41	39	42	41	40	39	53	51	56	55	70	68	80	80	83	77	80	74	67	
	25.....	53	50	50	48	41	41	42	41	42	39	53	52	58	56	70	67	84	79	82	79	82	74	65	
	26.....	52	48	49	48	41	41	42	40	40	39	52	48	61	58	71	67	87	81	85	77	82	75	66	
	27.....	51	48	49	47	41	38	40	39	42	40	48	47	51	59	71	67	88	82	87	79	83	78	71	
	28.....	50	50	47	43	38	36	39	39	42	42	47	47	59	58	70	66	86	82	82	82	82	76	72	
	29.....	50	47	43	40	36	34	40	39	---	---	---	---	39	57	70	66	87	83	79	85	78	73	67	
	30.....	48	45	40	39	34	33	39	37	---	---	---	---	47	59	70	67	86	83	86	81	85	78	73	
	31.....	47	43	---	---	34	34	38	37	---	---	---	---	48	---	69	69	---	---	---	81	83	78	---	
Average.....	58	54	48	45	39	38	39	38	39	38	45	44	53	52	68	66	78	74	85	79	82	76	74	---	

## POTOMAC RIVER BASIN--Continued

## SOUTH FORK SHENANDOAH RIVER AT FRONT ROYAL, VA.

LOCATION.--At gaging station at bridge on State Highway 619, 1.0 mile west of Front Royal, Warren County, and 3.5 miles upstream from confluence with North Fork.

DRAINAGE AREA.--1,638 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949, October 1952 to September 1953.

Water temperatures: April 1953 to September 1953.

Sediment records: April 1953 to September 1953.

EXTREMES, 1952-53.--Hardness: 157 ppm Sept. 1-10; 21-30; minimum, 65 ppm Feb. 23-28.

Specific conductance: Maximum daily, 328 micromhos Sept. 30; minimum daily, 111 micromhos Feb. 24.

Water temperature: Maximum daily, 74° July 16, 1953; minimum, freezing point on several days during January and February.

Sediment concentrations: Maximum daily, 51 ppm May 21; minimum daily, 1 ppm on many days during July, August, and September.

Sediment loadings: April 1953 to September 1953: Maximum daily, 419 tons Apr. 4; minimum daily, 1 ton on many days during July, August, and September.

REMARKS.--Records of specific conductance and daily samples available in district office at Charlottesville, Va. Records for water year October 1952 to September 1953 given in WSP 1272.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium, mg/l.	Non-carbonate				
Oct. 1-10, 1952...	564		3.4		0.03		28	15	5.4	1.8	149	13			0.4	145	132	10		258	8.1	2
Oct. 11-20 .....	552		3.7		0.04		30	15	5.5	1.9	154	14			0.4	154	137	10		273	8.1	2
Oct. 21-31 .....	465		1.4		0.02		28	15	5.7	1.9	146	15			0.4	147	132	12		262	7.9	2
Nov. 1-10 .....	466		1.5		0.02		31	17	6.2	1.9	167	16			0.4	166	147	10		295	7.8	2
Nov. 11-20 .....	528		1.2		0.03		31	17	6.2	1.9	166	15			0.4	165	147	11		293	7.8	2
Nov. 21-30 .....	3,774		7.3		0.19		21	6.1	2.4	1.9	80	11			3.3	99	78	12		159	7.2	5
Dec. 1-10 .....	1,174		6.2		0.03		30	9.0	3.4	1.6	123	12			2.9	129	112	11		226	7.7	2
Dec. 11-20 .....	3,070		6.4		0.09		21	6.2	2.6	1.6	84	11			2.0	103	78	9		164	7.4	5
Dec. 21-31 .....	1,417		4.8		0.04		25	11	3.2	1.4	119	12			2.6	127	108	10		218	7.8	2
Jan. 1-10, 1953...	2,068		3.9		0.03		29	8.1	3.2	1.4	115	13			3.0	123	106	11		213	7.6	2
Jan. 11-20 .....	3,876				0.01		21	5.8			80	9.0					76	11		161	7.5	10
Jan. 21-31 .....	3,284				0.01		22	6.2			85	10					80	11		168	7.7	10
Feb. 1-10 .....	1,673				0.01		27	9.2			114	10						105	12	213	7.9	8
Feb. 11-22 .....	1,966				0.01		29	11			145	15						118	0	235	7.9	7
Feb. 23-28 .....	3,842				0.01		18	4.8			48	11						65	25	136	7.3	20
Mar. 1-10 .....	2,382				0.01		25	8.0			100	9.0						95	13	181	7.6	8
Mar. 11-20 .....	3,044				0.02		22	8.0			92	7.0						88	12	180	7.3	10
Mar. 21-31 .....	7,597				0.03		20	5.6			75	8.0						73	12	154	7.3	15
Apr. 1-10 .....	2,514		8.0		0.12		26	8.9	3.1	1.4	110	9.7			3.3	140	101	11		203	7.5	10
Apr. 11-20 .....	2,523				0.01		25	8.7			104	7.0						98	13	200	7.6	5
Apr. 21-30 .....	1,798				0.01		25	9.0			108	8.0						99	11	205	7.6	7

May 1-10, 1953 ..	2,031	0.01	23	8.7	--	--	103	7.0	--	--	--	93	9	192	7.7	7
May 11-20 .....	1,861	.01	22	8.8	--	--	97	8.0	--	--	--	92	12	182	7.4	5
May 21-31 .....	1,867	.01	25	8.2	--	--	103	8.0	--	--	--	96	12	195	7.5	5
June 1-10 .....	949	.01	27	12	--	--	131	14	--	--	--	114	9	239	7.7	5
June 11-20 .....	802	.02	31	12	--	--	144	12	--	--	--	127	9	267	7.7	5
June 21-30 .....	646	.01	30	14	--	--	150	13	--	--	--	132	10	272	8.0	5
July 1-10 .....	653	.01	29	14	6.0	2.1	143	14	6.6	0.0	0.9	149	9	252	7.9	7
July 11-20 .....	475	.01	28	3.6	--	--	134	9.0	--	--	--	84	0	243	8.1	10
July 21-31 .....	464	.03	34	13	--	--	164	12	--	--	--	140	4	291	8.3	10
Aug. 1-10 .....	496	.01	35	14	--	--	a173	19	--	--	--	145	2	295	8.6	15
Aug. 11-20 .....	474	.02	32	16	--	--	b170	15	--	--	--	147	7	289	8.7	8
Aug. 21-31 .....	401	.03	35	16	--	--	c176	10	--	--	--	151	9	297	8.8	9
Sept. 1-10 .....	492	.03	35	17	--	--	182	8.0	--	--	--	157	8	319	8.4	10
Sept. 11-20 .....	389	.03	33	15	--	--	d169	16	--	--	--	146	5	291	8.9	15
Sept. 21-30 .....	375	.01	35	17	--	--	a174	25	--	--	--	157	14	300	8.5	16
Average .....	1,681	0.03	27	11	--	--	127	12	--	--	--	113	10	231	--	7

a Includes equivalent of 8 ppm of carbonate (CO<sub>3</sub>).b Includes equivalent of 15 ppm of carbonate (CO<sub>3</sub>).c Includes equivalent of 12 ppm of carbonate (CO<sub>3</sub>).d Includes equivalent of 16 ppm of carbonate (CO<sub>3</sub>).

## POTOMAC RIVER BASIN--Continued

## SOUTH FORK SHENANDOAH RIVER AT FRONT ROYAL, VA.--Continued

Temperature (°F) of water, water year October 1952 to September 1953

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



## POTOMAC RIVER BASIN--Continued

## SOUTH FORK SHENANDOAH RIVER AT FRONT ROYAL, VA.--Continued

Suspended sediment, April to September, 1953

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.....	--	--	--	1,960	12	64	1,110	11	33
2.....	--	--	--	2,100	11	62	1,050	7	17
3.....	--	--	--	2,030	8	44	902		
4.....	--	--	--	1,820	8	39	835		
5.....	--	--	--	1,710	7	32	835		
6.....	--	--	--	1,660	7	31	802	12	27
7.....	2,170	20	117	1,820	14	69	857		
8.....	2,240	22	134	2,520	19	129	857		
9.....	2,310			2,520	19	129	1,130		
10.....	2,240			2,170	10	52	1,110	11	31
11.....	2,170	20	113	1,890			890		
12.....	2,030			1,710			736		
13.....	2,100			1,550	4	17	835	26	58
14.....	3,300	47	419	1,540			998		
15.....	3,380	43	392	1,720			736		
16.....	2,870	30	232	2,450	26	172	725	10	20
17.....	2,660	24	172	2,450	18	119	725		
18.....	2,450	19	126	2,170	21	123	703		
19.....	2,240	16	97	2,030	18	99	747		
20.....	2,100	16	91	2,100	18	102	926	5	11
21.....	2,030	13	71	2,940	51	405	802		
22.....	1,890	12	61	2,520	46	313	725		
23.....	1,760	13	62	2,170	36	211	650	1	2
24.....	1,630	10	44	1,890	33	168	650		
25.....	1,590	9	39	1,670	25	113	692		
26.....	1,540	7	29	1,420	17	65	630	2	3
27.....	1,820	14	69	1,310	16	57	570		
28.....	2,450	22	146	1,240	15	45	540		
29.....	2,240	14	85	1,060			610		
30.....	2,030	11	60	1,010			590	3	5
31.....	--	--	--	1,110			--	--	--
Total.	53,240	--	3,053	58,260	--	2,933	23,968	--	643
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.....	490	5	7	430	2	2	355	1	a 1
2.....	600	6	10	414			348		
3.....	780	30	63	406			308		
4.....	540	7	10	470			314		
5.....	540	28	41	580	2	3	355	2	2
6.....	660	2	4	398			692		
7.....	780	1	a 2	454			758		
8.....	962	3	8	703			758	2	4
9.....	610	1	a 2	570	2	3	630		
10.....	570	1	a 2	530			406		
11.....	550	1	1	470			438	2	2
12.....	462	1	a 1	438	1	a 1	430		
13.....	454	1	a 1	438			376		
14.....	470	1	1	454			362		
15.....	510	1	a 1	390	1	a 1	376	2	2
16.....	540	1	a 1	438	1	a 1	398		
17.....	398	1	1	454	1	a 1	398		
18.....	414	1	a 1	560	1	2	383		
19.....	430	1	a 1	550	1	a 1	362	1	1
20.....	520	1	a 1	550			369		
21.....	560	2	3	490			369		
22.....	470			422			406		
23.....	590			383			369		
24.....	454			369	2	2	376	1	1
25.....	454	2	2	390			369		
26.....	470			446			390		
27.....	446			376			369		
28.....	414	2	2	376	1	a 1	369	--	--
29.....	414			390			362		
30.....	422			390			369		
31.....	406			383			--		
Total.	16,360	--	187	14,112	--	57	12,564	--	51

Total discharge for period Apr. 7 to Sept. 30 (cfs-days) ..... 178,524

Total load for period Apr. 7 to Sept. 30 (tons) ..... 6,924

a Computed from estimated concentration graph.

## POTOMAC RIVER BASIN--Continued

## LINGANEE CREEK NEAR FREDERICK, MD.

LOCATION --Temperature recorder at gaging station, 2½ miles upstream from mouth, and 4 miles east of Frederick, Frederick County.

DRAINAGE AREA 82.3 square miles.

RECORDS AVAILABLE: October 1951 to September 1953

EXTREMES, 1952-53. --Water temperatures: Maximum, 83°F June 30; minimum, 35°F Dec. 28-31.

EXTREMES, October 1951 to September 1953. --Water temperatures: Maximum, 85°F July 22, 1952; minimum, 33°F on several days during November, December 1951, January 1952.

REMARKS. --Records of discharge for water year 1952-53 given in WSP 1272.

Temperature (°F) of water, water year October 1952 to September 1953

/Recorder with temperature attachment, continuous ethyl alcohol actuated thermometer/

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

## RAPPAHANNOCK RIVER BASIN

## HAZEL RIVER AT RIXEYVILLE, VA.

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

DRAINAGE AREA.--286 square miles.

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

Water temperatures: October 1951 to September 1952.

Sediment records: October 1951 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 78°F on several days during June and July; minimum, freezing point Dec. 9, 19.

Sediment concentrations: Maximum daily, 793 ppm May 15; minimum daily, 1 ppm on several days during February and March.

Sediment loads: Maximum daily, 10,700 tons Nov. 21; minimum daily, less than 0.50 ton on many days during October, November, August, and September.

EXTREMES, 1951-53.--Water temperatures: Maximum, 82°F July 17, 1952; minimum, freezing point on several days during winter months.

Sediment concentrations: Maximum daily, 947 ppm Mar. 11, 1952; minimum daily, 1 ppm on several days during each year.

Sediment loads: Maximum daily, 12,100 tons Mar. 11, 1952; minimum daily, less than 0.50 ton on many days during each year.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1272.

Temperature (°F) of water, water year October 1952 to September 1953

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

## RAPPAHANNOCK RIVER BASIN--Continued

## HAZEL RIVER AT RIXEYVILLE, VA.--Continued

Suspended sediment, water year October 1952 to September 1953

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.....	79	2	(t)	77			348	5	5
2.....	79			77			331		
3.....	79	4	1	79	2	(t)	322	5	4
4.....	75			80			308		
5.....	77			79			368		
6.....	75			77			486	17	22
7.....	75	4	1	77			382	9	9
8.....	82			70	2	(t)	362	4	4
9.....	80			68			339	4	4
10.....	87	5	1	84			336	21	19
11.....	115	6	2	115			1,140	404	s 1,310
12.....	139	5	2	96	4	1	826	82	183
13.....	100			84			659	26	46
14.....	87			80			547	14	21
15.....	82	2	(t)	186	29	15	471	9	11
16.....	80			280	23	21	426	6	7
17.....	77			143	8	3	397		
18.....	75			117	5	2	368		
19.....	74			117	3	1	354	6	6
20.....	70	2	(t)	2,100	535	s 4,040	333		
21.....	67			4,950	571	s 10,700	382		
22.....	70			6,040	269	s 5,410	382		
23.....	75			1,420	121	464	368	6	6
24.....	79			940	59	150	348		
25.....	79	2	(t)	694	36	67	333		
26.....	79			578	24	37	322		
27.....	77			516	12	17	305	2	2
28.....	79			441	8	10	280		
29.....	80			397	6	6	252	6	4
30.....	77	2	(t)	382	4	4	303	6	5
31.....	75			--	--	--	322	17	15
Total.	2,524	--	21	20,444	--	20,955	12,700	--	1,741
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.....	578	40	62	426	4	5	368	1	1
2.....	516	16	22	382	3	3	368	2	2
3.....	532	14	20	368	2	2	382	2	a 2
4.....	471	9	11	362	1	1	532	6	9
5.....	412	5	6	331	1	1	578	9	14
6.....	382	3	3	322	3	3	486	2	3
7.....	368	3	3	382	5	5	441	1	1
8.....	456	11	14	368	4	4	441	2	1
9.....	845	108	246	317	2	2	441	1	2
10.....	1,630	479	s 2,420	291			426	1	1
11.....	1,460	122	481	286	2	2	397	1	1
12.....	1,140	54	166	317			397	1	1
13.....	883	27	64	300	1	1	845	57	130
14.....	731	17	34	269	1	a 1	712	18	35
15.....	659	13	23	562	24	36	769	66	s 207
16.....	610	11	18	659	20	36	1,060	380	s 1,170
17.....	578	8	12	501	8	a 11	769	30	62
18.....	547	7	10	426	4	5	731	29	57
19.....	516	4	6	412	4	a 4	845	45	103
20.....	471	4	5	382	4	a 4	676	13	24
21.....	456	5	6	804	145	s 355	578	8	12
22.....	516	12	17	712	39	75	532	6	9
23.....	441	4	5	578	7	11	516	11	15
24.....	1,410	307	s 1,470	532	7	10	2,700	362	s 3,140
25.....	1,140	95	292	501	6	8	2,670	213	s 1,670
26.....	845	26	59	471	4	5	2,320	155	971
27.....	694	21	39	441	3	4	1,540	91	378
28.....	626	12	20	397	2	2	1,220	62	204
29.....	547	7	10	--	--	--	1,020	33	91
30.....	486	4	7	--	--	--	864	21	49
31.....	456	4	5	--	--	--	750	22	45
Total.	21,402	--	5,556	12,099	--	600	26,374	--	8,410

s Computed by subdividing day.

a Computed from estimated concentration graph.

t Less than 0.50 ton.

## RAPPAHANNOCK RIVER BASIN--Continued

## HAZEL RIVER AT RIXEYVILLE, VA.--Continued

Suspended sediment, water year October 1952 to September 1953--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.....	876	18	33	562	18	27	456	78	96
2.....	626	14	24	441	7	8	365	59	a 58
3.....	578	10	16	397	4	4	303	29	a 24
4.....	532	8	11	426	43	s 73	266	20	a 14
5.....	486	5	7	642	220	381	245	15	a 10
6.....	456	4	5	471	24	31	219	20	a 12
7.....	659	32	57	610	64	105	314	78	a 66
8.....	516	11	15	562	31	47	294	49	a 39
9.....	471	10	13	516	29	40	245	14	9
10.....	547	16	24	471	18	23	217	12	7
11.....	471	12	15	412	10	11	196	7	a 4
12.....	471	157	200	368	10	10	178	8	4
13.....	954	340	876	342	10	9	326	164	s 296
14.....	1,020	69	190	610	290	s 553	382	265	273
15.....	807	24	52	2,280	793	s 6,330	252	22	15
16.....	731	12	24	864	85	198	210	18	10
17.....	642	7	12	807	118	257	200	18	a 10
18.....	578	6	9	642	59	102	261	22	16
19.....	532	4	6	562	67	102	242	22	14
20.....	486	4	5	1,000	174	470	203	12	7
21.....	456	2	2	694	39	a 73	175	12	6
22.....	426	2	2	594	31	a 50	471	532	s 814
23.....	412	5	6	547	22	32	200	55	30
24.....	397	4	4	456	21	a 26	162	20	9
25.....	382	3	a 3	412	21	a 23	147	12	5
26.....	471	14	18	397	20	a 21	143	8	a 3
27.....	547	24	35	348	19	a 18	131	5	a 2
28.....	456	7	9	311	19	a 16	125	12	4
29.....	412	5	6	289	18	a 14	171	24	11
30.....	397	5	5	300	29	a 23	147	14	6
31.....	--	--	--	578	235	387	--	--	--
Total..	16,595	--	1,684	17,911	--	9,444	7,246	--	1,874

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.....	123	6	2	43	8	1	22		
2.....	115	8	3	40	7	a 1	20	4	(t)
3.....	131			56	21	a 3	20		
4.....	125			56	13	a 2	25		
5.....	106			64	9	a 2	36	5	(t)
6.....	111	9	3	52	8	1	53	89	13
7.....	121	10	3	50			62	41	7
8.....	113			45			44	18	2
9.....	102	11	3	40	8	1	32	12	1
10.....	93	8	2	89			27	12	1
11.....	87	8	2	62			24	11	a 1
12.....	82	8	2	44	8	1	24	10	a 1
13.....	77	7	1	40			26	8	1
14.....	74	7	1	37			23	9	1
15.....	68	7	1	35	7	1	22	8	(t)
16.....	65	8	1	32	13	1	22	6	(t)
17.....	62			486	370	486	22		
18.....	54			129	61	21	18		
19.....	52	8	1	74	18	4	16	7	(t)
20.....	59			58	12	2	14		
21.....	64			49	9	1	12		
22.....	59	9	a 1	43	9	1	14	6	(t)
23.....	65	14	2	40	6	1	12		
24.....	58			39	6	1	13		
25.....	44			36			12		
26.....	42	10	1	33	6	(t)	13	6	(t)
27.....	39			31			14		
28.....	37			28			14		
29.....	33	10	1	26	6	(t)	11	6	(t)
30.....	32			24			11		
31.....	39			23			11		
Total..	2,332	--	55	1,904	--	542	678	--	34

Total discharge for year (cfs-days) ..... 142,209

Total load for year (tons) ..... 50,916

s Computed by subdividing day.

a Computed from estimated concentration graph.

t Less than 0.50 ton.



## RAPPAHANNOCK RIVER BASIN--Continued

## RAPPAHANNOCK RIVER AT REMINGTON, VA.

LOCATION --At gaging station at bridge on U.S. Highway 29 at Remington, Fauquier County, 0.3 mile upstream from Tinpot Run, 0.4 mile downstream from Ruffans Run, 2.5 miles downstream from Hazel River, and at mile 36.2.

DRAINAGE AREA --616 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1951 to September 1953.

Water temperatures: May 1951 to September 1953.

Sediment records: April 1951 to September 1953.

EXTREMES, 1952-53.--Hardness: Maximum, 25 ppm Oct. 11-20; minimum, 15 ppm Feb. 21-28.

Specific conductance: Maximum daily, 72.4 micromhos Oct. 13; minimum daily, 41.8 micromhos Mar. 27.

Water temperatures: Maximum, 82° F July 30; minimum, freezing point on Dec. 16.

Sediment concentrations: Maximum daily, 1,080 ppm May 15; minimum daily, 1 ppm several days during October, November, July, August, and September.

Sediment loads: Maximum daily, 13,400 tons May 15; minimum daily, less than 0.50 ton on many days during October, November, July, August, and September.

EXTREMES, 1951-53: Dissolved solids (October 1951 to September 1952): Maximum, 51 ppm July 1-10, 1952; minimum, 39 ppm Feb. 21-29.

Hardness: (October 1951 to September 1953): Maximum, 25 ppm Oct. 11-20, 1952; minimum, 15 ppm Feb. 21-28, 1953.

Water temperatures (May 1951 to September 1953): Maximum, 82° F July 30, 1953; minimum, freezing point on many days during winter months.

Sediment concentrations (April 1951 to September 1953): Maximum daily, 1,240 ppm June 10, 1951; minimum daily, 1 ppm on several days during each year.

Sediment loads (April 1951 to September 1953): Maximum daily, 23,400 tons June 10, 1951; minimum daily, less than 0.50 ton on many days during each year.

REMARKS.--Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year October 1952 to September 1953 given in WSP 1272.

## Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sodium (K)	Bicar- bonate (HCO <sub>3</sub> )	Sul- fate (SO <sub>4</sub> )	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO <sub>3</sub> )	Bo- ron (B)	Dissolved solids				Hardness as CaCO <sub>3</sub>	Per cent ad- sorp- tion ratio	Specific conduct- ance (micro- mhos at 25°C)	pH	Color
														Parts per million		Tons per acre- foot	Tons per day					
														Residue at 180°C	Sum							
Oct. 1-10, 1952	142	12	0.01	4.2	2.4	3.5	1.7	29	2.9	2.9	0.2	0.5		43			20	0	56.5	7.1	5	
Oct. 11-20	181	--	.03	7.0	1.8	--	--	29	3.0	--	--	--	--	--			25	1	56.8	7.3	5	
Oct. 21-31	143	--	.04	6.0	1.2	--	--	29	2.0	--	--	--	--	--			20	0	55.0	7.2	5	
Nov. 1-10	152	--	.03	6.4	.8	--	--	29	2.0	--	--	--	--	--			19	0	53.6	7.2	5	
Nov. 11-20	546	--	.04	6.4	.7	--	--	26	4.0	--	--	--	--	--			19	0	55.5	7.3	15	
Nov. 21-30	3,403	--	.09	5.4	.9	--	--	17	7.0	--	--	--	--	--			17	3	50.8	7.0	25	
Dec. 1-10	706	--	.08	4.4	1.5	--	--	18	4.0	--	--	1.7	--	--			17	2	50.6	6.9	10	
Dec. 11-20	1,175	--	.08	4.0	1.6	--	--	18	5.0	--	--	2.1	--	--			17	2	48.2	6.8	25	
Dec. 21-31	605	--	.07	3.9	1.5	--	--	18	3.0	--	--	1.8	--	--			16	1	47.9	7.0	5	
Jan. 1-10, 1953	1,274	13	.06	4.2	2.0	3.0	1.2	17	6.4	3.0	.2	2.1	--	46			19	5	53.4	7.2	25	
Jan. 11-20	1,470	--	.06	4.1	1.6	--	--	17	5.0	--	--	2.0	--	--			17	3	50.4	7.1	15	
Jan. 21-31	1,323	--	.06	4.0	1.6	--	--	17	4.0	--	--	2.0	--	--			17	3	48.9	7.1	20	

## RAPPAHANNOCK RIVER BASIN--Continued

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

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boron (B)	Dissolved solids			Hardness as CaCO <sub>3</sub>	Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Color	
														Parts per million	Tons per acre-foot	Tons per day						
																						Residue at 180°C
Feb. 1-10, 1953	706	--	0.08	3.9	1.4	--	--	18	3.0	--	--	--	--	--	--	--	16	1	--	46.6	7.0	7
Feb. 11-20	830	--	.05	4.3	1.6	--	--	20	5.0	--	--	--	--	--	--	--	17	1	--	50.4	7.0	10
Feb. 21-28	1,001	--	.08	4.9	.8	--	--	18	4.0	--	--	--	--	--	--	--	15	1	--	46.8	7.0	10
Mar. 1-10	1,807	--	.05	4.2	1.3	--	--	18	1.0	--	--	--	--	--	--	--	16	1	--	45.8	7.1	6
Mar. 11-20	1,527	--	.13	4.2	1.6	--	--	18	4.0	--	--	--	--	--	--	--	17	2	--	48.3	7.0	35
Mar. 21-31	2,487	--	.07	3.6	1.7	--	--	15	2.0	--	--	--	--	--	--	--	16	4	--	47.6	7.6	10
Apr. 1-10	1,086	13	.02	4.0	1.6	2.8	0.8	17	5.0	2.1	0.1	1.3	--	40	--	--	16	3	--	45.8	6.8	10
Apr. 11-20	1,304	--	.06	4.0	1.6	--	--	18	2.0	--	--	--	--	--	--	--	16	2	--	49.2	7.6	14
Apr. 21-30	820	--	.06	3.6	1.8	--	--	19	3.0	--	--	--	--	--	--	--	16	1	--	48.4	7.7	5
May 1-10	986	--	.07	4.6	1.6	--	--	20	3.0	--	--	--	--	--	--	--	18	2	--	51.2	7.6	20
May 11-20	1,541	--	.04	3.7	2.0	--	--	20	2.0	--	--	--	--	--	--	--	17	1	--	51.1	7.0	35
May 21-31	1,875	--	.05	4.2	1.6	--	--	18	3.0	--	--	--	--	--	--	--	17	2	--	51.4	7.1	7
June 1-10	650	--	.05	4.6	1.6	--	--	22	3.0	--	--	--	--	--	--	--	18	0	--	52.4	7.0	10
June 11-20	598	--	.06	4.8	1.7	--	--	24	3.0	--	--	--	--	--	--	--	19	0	--	54.7	7.0	30
June 21-30	349	--	.08	4.7	1.7	--	--	24	2.0	--	--	--	--	--	--	--	21	0	--	55.3	7.0	30
July 1-10	223	12	.05	5.1	1.9	3.4	1.8	28	3.3	2.3	.1	1.0	--	55	--	--	19	0	--	58.2	6.9	18
July 11-20	121	--	.06	5.3	1.7	--	--	18	2.0	--	--	--	--	--	--	--	20	5	--	58.4	7.0	15
July 21-31	97.6	--	.03	5.6	2.1	--	--	31	2.0	--	--	--	--	--	--	--	23	0	--	62.4	6.9	9
Aug. 1-10	101	--	.03	5.4	2.0	--	--	30	3.0	--	--	--	--	--	--	--	22	0	--	60.7	6.9	10
Aug. 11-20	138	--	.07	5.3	1.7	--	--	27	3.0	--	--	--	--	--	--	--	20	0	--	58.5	6.8	25
Aug. 21-31	57.9	--	.05	5.1	1.8	--	--	29	2.0	--	--	--	--	--	--	--	22	0	--	57.7	6.8	15
Sept. 1-10	71.0	--	.02	6.5	1.5	--	--	32	3.0	--	--	--	--	--	--	--	23	0	--	62.0	7.1	10
Sept. 11-20	39.4	--	.01	6.2	1.7	--	--	34	2.0	--	--	--	--	--	--	--	22	0	--	62.8	7.2	6
Sept. 21-30	34.1	--	.01	6.5	1.4	--	--	33	1.0	--	--	--	--	--	--	--	22	0	--	60.9	7.1	8
Average	765	--	0.05	4.8	1.6	--	--	23	3.2	--	--	--	--	--	--	--	19	1	--	53.2	--	14



## RAPPAHANNOCK RIVER BASIN--Continued

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

Temperature (°F) of water, water year October 1952 to September 1953

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

## RAPPAHANNOCK RIVER BASIN--Continued

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

Suspended sediment, water year October 1952 to September 1953

Day	October			November			December		
	Suspended sediment			Suspended sediment			Suspended sediment		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	147	2	1	147	1	a(t)	645	6	10
2.....	144			150			586	6	9
3.....	166			150			568	6	9
4.....	140			174			538	7	10
5.....	134	2	1	154	1	(t)	659	19	34
6.....	134			150			1,170	65	205
7.....	131			147			862	21	49
8.....	134			144			743	13	26
9.....	140			144			666	9	16
10.....	150			158	3	1	624	21	35
11.....	238	6	3	226			2,780	691	s 4,840
12.....	282			222			1,940	122	639
13.....	218			178	2	1	1,380	48	179
14.....	178			162	1	(t)	1,140	23	71
15.....	162			272	31	23	960	18	47
16.....	154	2	1	550	100	148	848	12	27
17.....	150			306	15	12	764	11	23
18.....	144			234	6	4	694	10	a 19
19.....	144			222	8	5	645	9	16
20.....	140			3,090	473	s 5,170	598	7	11
21.....	131	2	1	7,650	463	s 10,400	708	10	19
22.....	134			15,000	175	7,090	785	16	34
23.....	140			3,700	116	1,160	694	10	19
24.....	147			1,940	62	325	645	8	14
25.....	150			1,380	43	160	598	7	11
26.....	147			1,140	26	80	568	6	9
27.....	144	1	(t)	995	19	51	538	5	7
28.....	147			834	12	27	508	3	4
29.....	150			715	9	17	460	5	6
30.....	144	1	a(t)	680	5	9	560	10	15
31.....	144	1	a(t)	--	--	--	586	13	21
Total.	4,808	--	37	41,014	--	24,690	25,460	--	6,434
January			February			March			
1.....	1,170	43	136	841	11	25	652	5	9
2.....	1,100	38	113	764	8	17	645	4	7
3.....	1,100	26	77	715	6	12	659	4	7
4.....	1,030	20	56	701	6	11	925	9	22
5.....	855	10	23	652	5	9	1,140	20	62
6.....	743	9	18	624	7	12	890	8	19
7.....	708	8	15	736	12	24	806	5	11
8.....	890	20	48	799	13	28	785	4	8
9.....	2,010	161	874	645	8	14	813	4	9
10.....	3,130	269	s 2,490	586	5	8	757	3	6
11.....	3,130	200	1,690	568	3	5	715	3	6
12.....	2,290	91	563	638	4	7	715	8	15
13.....	1,620	53	232	617	5	8	1,940	136	s 749
14.....	1,380	37	133	550	4	6	1,520	53	218
15.....	1,240	30	100	995	36	97	1,700	75	s 504
16.....	1,140	22	68	1,480	96	384	2,640	409	s 3,190
17.....	1,080	20	57	1,060	23	66	1,520	82	337
18.....	995	18	48	862	8	19	1,420	39	150
19.....	960	17	44	785	6	13	1,760	68	323
20.....	890	14	34	743	5	10	1,340	33	119
21.....	841	12	27	1,380	110	s 498	1,170	20	63
22.....	960	18	47	1,380	59	220	1,060	12	34
23.....	841	17	39	1,060	15	43	995	8	21
24.....	2,360	200	s 1,810	960	8	21	4,050	388	s 5,930
25.....	2,570	202	1,400	890	8	19	5,180	303	s 4,520
26.....	1,560	50	211	841	5	11	5,020	215	2,910
27.....	1,310	31	110	785	6	13	2,920	85	670
28.....	1,200	18	58	715	5	10	2,220	58	348
29.....	1,060	15	43	--	--	--	1,800	45	219
30.....	960	12	31	--	--	--	1,560	27	114
31.....	890	11	26	--	--	--	1,380	27	101
Total.	41,993	--	10,626	23,372	--	1,610	50,697	--	20,701

s Computed by subdividing day.

t Less than 0.50 ton.

a Computed from estimated concentration graph.

## RAPPAHANNOCK RIVER BASIN--Continued

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

Suspended sediment, water year October 1952 to September 1953--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.....	1,280	27	93	1,060	18	52	1,100	158	469
2.....	1,200	27	87	890	14	34	778	32	67
3.....	1,100	13	35	792	9	19	631	17	29
4.....	1,030			722	7	14	556	13	20
5.....	960			1,280	361	s 1,360	508	10	14
6.....	925	18	60	890	38	91	472	8	10
7.....	1,240			1,030	32	89	631	39	66
8.....	1,100			1,100	61	181	750	65	132
9.....	960			1,140	121	372	550	18	27
10.....	1,060	20	56	960	43	111	526	13	18
11.....	995	20	a 54	841	27	61	472	12	15
12.....	925	21	a 52	743	17	34	414	12	13
13.....	1,940	90	a 471	680	18	33	502	108	s 284
14.....	2,150	102	a 592	1,280	290	s 1,200	1,380	917	s 3,840
15.....	1,480	31	124	4,020	1,080	s 13,400	659	122	217
16.....	1,340	17	62	1,870	252	1,270	526	41	58
17.....	1,200	14	45	1,520	150	616	472	33	42
18.....	1,060	12	34	1,380	135	503	538	31	45
19.....	1,030	12	33	1,140	84	259	550	27	40
20.....	925	8	20	1,940	149	780	466	17	21
21.....	869	7	16	1,380	62	231	414	16	18
22.....	806	5	11	1,140	35	108	722	363	s 819
23.....	764	3	6	1,060	28	80	380	97	100
24.....	722	7	14	890	21	50	310	21	18
25.....	687	6	11	820	18	40	272	11	8
26.....	855	11	25	771	17	35	264	6	4
27.....	1,060	23	66	694	15	28	247	6	4
28.....	890	24	58	610	11	18	234	7	4
29.....	792	9	19	562	10	15	331	89	80
30.....	750	8	16	556	13	20	315	22	19
31.....	--	--	--	1,140	173	532	--	--	--
Total.	32,095	--	2,277	34,901	--	21,636	15,970	--	6,501
Day	July			August			September		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	247	9	6	83	2	(t)	37		
2.....	218	6	4	77	2	(t)	32	2	(t)
3.....	238	5	3	112	10	3	31		
4.....	264	9	6	110	7	2	28		
5.....	206	6	3	118			68	48	9
6.....	206	6	3	115			186	115	58
7.....	218	4	2	96	4	1	121	26	8
8.....	206	3	2	90			90		
9.....	234	12	8	90			64		
10.....	194	13	7	121			53	9	1
11.....	166	6	3	147			44		
12.....	150	3	1	93	2	1	44		
13.....	140	2	1	75			44		
14.....	131	1	(t)	68			44		
15.....	121	2	1	64	2	(t)	43	6	1
16.....	115	2	a 1	64	6	1	40		
17.....	107	2	a 1	378	259	s 346	38		
18.....	98	2	a 1	255	117	81	34		
19.....	90	2	a(t)	137	12	4	31		
20.....	90	2	(t)	96	6	2	32	6	1
21.....	104	2	1	81	4	1	36		
22.....	96			72	3	1	38		
23.....	156			68	2	(t)	37		
24.....	160	5	2	64	4	1	37		
25.....	104			61	2	(t)	37	4	(t)
26.....	88			57	3	(t)	34		
27.....	83			53			32		
28.....	79			50			32		(t)
29.....	70	2	(t)	46	3	(t)	31	6	1
30.....	66			43			28	1	(t)
31.....	68			42			--	--	--
Total.	4,513	--	67	3,026	--	456	1,445	--	94

Total discharge for year (cfs-days)..... 279,294

Total load for year (tons)..... 95,129

a Computed by subdividing day.

t Less than 0.50 ton.

a Computed from estimated concentration graph.

## NORTH ATLANTIC SLOPE BASINS, MAINE TO CONNECTICUT

## RAPPAHANNOCK RIVER BASIN--Continued

## RAPIDAN RIVER NEAR CULPEPER, VA.

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

DRAINAGE AREA.--465 square miles.

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

Water temperatures: October 1945 to September 1946, May 1951 to September 1953.

Sediment records: April 1951 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 88°F Sept. 2; minimum, 34°F Jan. 5.

Sediment concentrations: Maximum daily, 1,380 ppm Mar. 16; minimum daily, 1 ppm Oct. 2.

Sediment loads: Maximum daily, 15,400 tons Mar. 16; minimum daily, less than 0.50 ton

on many days during August, September and October.

EXTREMES, 1945-46, 1951-53.--Dissolved solids (1945-46): Maximum, 47 ppm Sept. 21-30,

1946; minimum, 34 ppm Mar. 1-10, 1946.

Hardness (1945-46): Maximum, 19° ppm July 21-31, Sept. 11-20, 1946; minimum, 13° ppm

Jan. 11-20, 1946.

Water temperatures (1945-46, May 1951 to September 1953): Maximum, 91°F Aug. 9, 1951;

minimum, freezing point on several days during winter of 1951-52.

Sediment concentrations (April 1951 to September 1953): Maximum daily, 1,380 ppm

Mar. 16, 1953; minimum daily, 1 ppm Oct. 2, 1952.

Sediment loads (April 1951 to September 1953): Maximum daily, 16,500 tons June 10,

1951; minimum daily, less than 0.50 ton on many days during each year.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in

WSP 1272.

Temperature (°F) of water, water year October 1952 to September 1953

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

## RAPPAHANNOCK RIVER BASIN--Continued

## RAPIDAN RIVER NEAR CULPEPER, VA.--Continued

Suspended sediment, water year October 1952 to September 1953

Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	156	2	1	132			536	6	9
2.....	156	1	(t)	126			506	5	a7
3.....	228	7	4	150			483	5	7
4.....	166	10	4	156	3	1	454	5	6
5.....	150			147			512	11	15
6.....	166	4	2	140			700	31	59
7.....	147			134			572	18	28
8.....	143			126	2	1	524	11	15
9.....	153			118			489	6	8
10.....	170			150			489	10	13
11.....	203	3	1	184	2	1	1,780	527	s 2,690
12.....	236			170			1,220	167	550
13.....	207	2	1	150			970	57	149
14.....	173			140	19	7	814	30	66
15.....	156			636	232	637	706	18	34
16.....	153	3	1	637	137	236	635	12	21
17.....	147			318	23	20	585	10	16
18.....	143			240	10	6	548	9	13
19.....	129			211	8	5	512	9	12
20.....	147			4,350	625	s 10,300	477	9	12
21.....	134			5,620	410	s 6,870	530	9	13
22.....	129			6,220	350	s 6,410	536	10	14
23.....	140	4	1	2,070	121	676	489	8	11
24.....	143			1,380	42	156	471	8	10
25.....	137			1,060	50	143	448	6	7
26.....	134			902	30	73	432	4	5
27.....	147			786	21	45	416	4	4
28.....	140			687	16	30	389	5	5
29.....	137	2	1	604	12	20	352	5	5
30.....	137			578	9	a 14	378	5	5
31.....	134			--	--	--	432	9	10
Total.	4,841	--	40	28,322	--	25,661	18,385	--	3,820
January			February			March			
1.....	835	38	86	661	13	23	597		
2.....	694	24	45	604			604	6	10
3.....	713	18	35	572	9	14	604		
4.....	654	14	25	560			910	22	54
5.....	560	9	14	524	7	a 10	1,060	40	114
6.....	512	3	4	500	5	a 7	793	20	43
7.....	500	6	a 8	629	12	a 20	706		
8.....	642	11	19	629	16	27	687		
9.....	1,560	217	914	530	10	14	680		
10.....	2,910	576	s 5,190	483			635	8	14
11.....	2,220	222	1,330	471	6	8	597		
12.....	1,420	88	337	512			597	6	10
13.....	1,060	44	126	489			1,740	287	1,350
14.....	895	28	68	443	5	6	1,229	75	247
15.....	786	25	53	837	34	77	1,470	270	1,070
16.....	713	20	39	1,020	66	182	3,460	1,380	s 15,400
17.....	648	16	28	752	21	43	1,520	120	492
18.....	610	13	21	642	10	17	1,340	65	235
19.....	572	10	15	578	7	11	1,520	100	410
20.....	524	8	11	560	6	9	1,140	42	129
21.....	554	12	18	1,560	202	s 1,320	985	28	74
22.....	880	25	46	1,650	160	713	888	23	55
23.....	554	16	24	1,140	47	145	835	20	45
24.....	2,170	315	s 2,750	970	27	71	3,510	583	s 6,930
25.....	1,830	177	875	865	17	40	4,800	471	6,100
26.....	1,260	52	177	786	16	34	4,720	296	3,770
27.....	1,060	29	83	720	13	25	2,410	138	898
28.....	948	23	59	654	8	14	1,830	91	450
29.....	835	18	41	--	--	--	1,520	72	295
30.....	746	19	38	--	--	--	1,300	63	221
31.....	694	15	28	--	--	--	1,140	48	148
Total.	30,359	--	12,507	20,341	--	2,882	45,818	--	38,640

s Computed by subdividing day.

a Computed from estimated concentration graph.

t Less than 0.50 ton.

## RAPPAHANNOCK RIVER BASIN--Continued

## RAPIDAN RIVER NEAR CULPEPER, VA.--Continued

Suspended sediment, water year October 1952 to September 1953--Continued

Day	April			May			June		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	1,020	39	107	828	11	25	483	38	50
2.....	948	26	67	700	9	17	421	20	23
3.....	865	23	54	635	8	14	357	9	9
4.....	800	21	45	604	6	10	337	7	6
5.....	746	15	30	865	204	476	322	6	5
6.....	720	13	25	700	32	60	308	5	4
7.....	1,060	70	200	713	25	a 48	347	12	11
8.....	880	35	83	700	15	28	865	217	507
9.....	772	30	63	668	10	18	471	172	219
10.....	765	22	45	629	10	17	542	187	274
11.....	700	14	26	591	9	14	616	236	393
12.....	687	13	24	548	8	12	389	77	81
13.....	2,650	385	s 3,780	518	7	10	410	27	30
14.....	1,830	242	1,200	524	8	11	399	125	135
15.....	1,260	82	279	591	18	29	368	36	36
16.....	1,180	48	153	680	18	33	318	27	23
17.....	1,020	31	85	700	53	100	327	57	50
18.....	902	20	49	674	43	78	352	30	29
19.....	902	22	54	591	37	59	368	23	23
20.....	800	15	32	1,700	299	s 1,490	332	18	16
21.....	746	13	26	985	68	181	289	13	10
22.....	694	6	11	779	28	59	347	114	107
23.....	661	7	12	706	21	40	289	22	17
24.....	635	7	12	610	15	25	276	16	12
25.....	629	7	12	578	13	20	236		
26.....	800	30	65	542	13	19	224	8	5
27.....	814	29	64	483	12	16	207		
28.....	726	16	31	432	10	12	200		
29.....	674	8	15	399	8	9	196	4	2
30.....	654	7	12	383	12	12	224		
31.....	--	--	--	572	13	20	--	--	--
Total.	27,540	--	6,661	20,628	--	2,962	10,820	--	2,091
Day	July			August			September		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	192	4	a 2	54			42		
2.....	173			46			34	5	1
3.....	166	4	2	97	4	1	39		
4.....	153			96			24		
5.....	143			98			34		
6.....	147	5	2	120	6	2	13	5	(t)
7.....	240			88	19	5	43		
8.....	188			80	11	2	49		
9.....	177	6	3	84			46	4	(t)
10.....	156			100			42		
11.....	143			89	6	1	34		
12.....	129	3	1	86			35	4	(t)
13.....	132			76	4	1	17		
14.....	118			62			50		
15.....	107	3	1	61			34	4	(t)
16.....	109			38	4	(t)	42		
17.....	99			758	603	s 1,490	28		
18.....	87			262	120	85	31		
19.....	75	3	1	134	27	10	26	3	(t)
20.....	164			107	17	5	23		
21.....	134			82	14	3	44		
22.....	110			62	10	2	39	3	(t)
23.....	107	10	3	60	8	1	36		
24.....	96			75	7	1	26		
25.....	90			56			33	2	(t)
26.....	69	5	1	52	5	1	37		
27.....	90			51			24		
28.....	76			49			42		
29.....	66			40			32	3	(t)
30.....	64	4	1	30	5	1	29		
31.....	60			49			--	--	--
Total.	3,860	--	52	3,142	--	1,625	1,028	--	12
Total discharge for year (cfs-days) .....									215,084
Total load for year (tons) .....									96,953

s Computed by subdividing day.

a Computed from estimated concentration graph.

t Less than 0.50 ton.

RAPIDAN RIVER NEAR CULPEPER, VA.--Continued

Particle-size analyses of suspended sediment, water year October 1952 to September 1953  
(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	Water discharge (cfs)	Water temperature (° F)	Suspended sediment												Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	
Mar. 16, 1953 . . .	12:32 p. m.	2,750		1,340	3,980	50	64	78	87	94	97	98		100	BWMC	
Aug. 17, . . . . .	1:52 p. m.	918		912	2,060	46	63	85	96	99	100	--		--	BWMC	

## YORK RIVER BASIN

## HUDSON CREEK NEAR BOSWELLS TAVERN, VA.

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

DRAINAGE AREA.--4.1 square miles, approximately.

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

Sediment records: Periodic determinations of suspended sediment discharge, September 1951 to September 1953.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1272.

## Periodic determinations of suspended sediment discharge, water year October 1952 to September 1953

Date	Water discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (pounds per day)
Oct. 1, 1952 .....	0.09	5	2
Oct. 8 .....	.66	3	11
Oct. 15 .....	.83	2	9
Oct. 18 .....	.78	2	8
Oct. 24 .....	.72	3	12
Nov. 1 .....	.78	2	8
Nov. 7 .....	.83	13	58
Nov. 15 .....	17	298	27,300
Nov. 20 .....	315	278	472,000
Nov. 26 .....	3.2	7	121
Dec. 4 .....	2.5	3	40
Dec. 11 .....	24	47	6,080
Dec. 17 .....	2.7	4	58
Dec. 25 .....	2.5	2	27
Dec. 31 .....	11	74	4,390
Jan. 5, 1953 .....	3.4	5	92
Jan. 9 .....	11	15	890
Jan. 10 .....	28	60	9,060
Jan. 16 .....	3.7	5	100
Jan. 21 .....	12	44	2,850
Jan. 24 .....	58	160	50,000
Jan. 27 .....	4.5	8	194
Feb. 2 .....	3.2	8	138
Feb. 10 .....	3.6	14	272
Feb. 17 .....	5.0	5	135
Feb. 24 .....	4.8	2	52
Mar. 4 .....	17	45	4,120
Mar. 10 .....	5.0	17	458
Mar. 15 .....	26	856	120,000
Mar. 16 .....	11	16	949
Mar. 23 .....	4.5	7	170
Mar. 25 .....	81	1,960	856,000
Apr. 1 .....	4.8	5	129
Apr. 8 .....	7.3	12	472
Apr. 14 .....	11	16	949
Apr. 21 .....	4.3	5	116
Apr. 28 .....	3.2	2	34
May 4 .....	2.8	6	91
May 12 .....	2.2	5	59
May 19 .....	2.7	9	131
May 20 .....	22	583	69,200
May 20 .....	29	359	56,100
May 20 .....	53	473	135,000
May 20 .....	16	64	5,520
May 27 .....	1.5	6	49
June 2 .....	2.5	19	258
June 10 .....	1.8	6	58
June 10 .....	30	670	108,000
June 13 .....	2.0	6	65
June 22 .....	1.3	5	35
June 22 .....	5.4	174	5,070
June 29 .....	.94	5	25
July 6 .....	.89	5	24
July 15 .....	.66	6	21
July 20 .....	.55	6	18
July 27 .....	.39	3	6
Aug. 3 .....	.44	a 13	--
Aug. 10 .....	.50	6	16
Aug. 17 .....	.22	11	13
Aug. 24 .....	.25	13	18
Aug. 31 .....	.03	a 36	--
Sept. 7 .....	.00	--	0
Sept. 14 .....	.00	--	0
Sept. 21 .....	.00	--	0
Sept. 28 .....	.00	--	0

a Cattle in creek stirred up sediment.



## JAMES RIVER BASIN

## JAMES RIVER AT BUCHANAN, VA.

LOCATION.--At bridge on U. S. Highway 11, 300 feet downstream from gaging station at Buchanan, Botetourt County, 700 feet upstream from Purgatory Creek,  $1\frac{1}{2}$  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 September 1948, October 1951 to September 1952.

Water temperatures: October 1947 to September 1948, May 1951 to September 1953.

Sediment records: May 1951 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum 82°F July 29, Aug. 1; minimum, 34°F Dec. 29.

Sediment concentrations: Maximum daily, 618 ppm Mar. 24; minimum daily, 1 ppm on several days during October, November, December, April, May, and June.

Sediment loads: Maximum daily, 53,300 tons Feb. 22; minimum daily, 1 ton Oct. 26-31, Nov. 5-9.

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

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

Water temperatures (1947-48, May 1951 to September 1953): Maximum, 86°F July 26, Aug. 12, 1951; minimum, freezing point Dec. 20, 1951.

Sediment concentrations (May 1951 to September 1953): Maximum daily, 740 ppm Aug. 7, 1952; minimum daily, 1 ppm on several days during each year.

Sediment loads (May 1951 to September 1953): Maximum daily, 59,500 tons Mar. 12, 1952; minimum daily, 1 ton Oct. 26-31, Nov. 5-9, 1952.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1273.

Temperature (°F) of water, water year October 1952 to September 1953

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

## SOUTH ATLANTIC SLOPE BASINS, JAMES RIVER TO SAVANNAH RIVER

## JAMES RIVER BASIN--Continued

## JAMES RIVER AT BUCHANAN, VA.--Continued

Suspended sediment, water year October 1952 to September 1953

Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	528			450			884	4	a 10
2.....	522	6	8	460	2	3	844	4	a 9
3.....	510			480			812		
4.....	480			500			788		
5.....	468			520			812		
6.....	474	6	8	500	1	1	988	4	11
7.....	516			480			1,120		
8.....	582			460			1,200		
9.....	588			440			1,120		
10.....	642			450			1,120	34	103
11.....	635	5	8	460	2	3	10,200	538	14,800
12.....	635			480			11,200	260	s 9,050
13.....	614			492			5,090	43	591
14.....	582			486			3,270	19	168
15.....	552			528			2,460	5	33
16.....	528	4	5	534	4	6	2,060	5	28
17.....	510			516			1,730		
18.....	490			504	3	4	1,530		
19.....	480			510	12	17	1,380		
20.....	470			3,200	246	s 1,910	1,260	7	28
21.....	470	2	3	3,530	75	715	1,330	6	29
22.....	460			3,800	56	575	1,630		
23.....	460			3,440	24	223	2,000		
24.....	460			2,280	20	123	1,950		
25.....	470			1,730	18	84	1,840		
26.....	470	1	1	1,430	7	24	1,680	1	4
27.....	460			1,230			1,530		
28.....	460			1,090			1,380	1	4
29.....	460			996	4	a 11	1,260	1	3
30.....	450			940	4	a 10	1,140	1	a 3
31.....	450			--	--	--	1,280	5	17
Total.	15,876	--	166	32,916	--	3,797	66,888	--	25,209
Day	January			February			March		
	Mean dis-charge (cfs)	Mean concen-tration (ppm)	Tons per day	Mean dis-charge (cfs)	Mean concen-tration (ppm)	Tons per day	Mean dis-charge (cfs)	Mean concen-tration (ppm)	Tons per day
1.....	2,120	18	103	2,220	2	12	2,790	2	15
2.....	2,280	11	68	2,060	2	11	2,580	4	28
3.....	2,460	10	66	1,900	2	10	2,400	5	32
4.....	2,650	10	72	1,730	2	9	2,740	32	237
5.....	2,400	7	45	1,680	3	14	11,000	68	2,020
6.....	2,120	4	23	1,530	3	12	10,500	32	907
7.....	1,900	4	21	2,220	8	48	6,820	11	203
8.....	1,900	13	67	3,020	9	73	5,290	4	57
9.....	5,020	65	881	3,530	7	67	4,430	5	60
10.....	9,000	112	2,720	2,860	6	46	3,800	5	51
11.....	10,000	64	1,730	2,460	3	a 20	3,270	3	26
12.....	7,000	33	624	2,340	4	25	3,020	3	24
13.....	5,000	15	203	2,790	5	38	3,270	7	62
14.....	3,500	8	76	2,860	8	62	3,800	9	92
15.....	3,000	7	57	3,270	30	265	4,340	20	234
16.....	2,500	7	47	5,290	29	414	8,000	29	626
17.....	2,300	8	50	4,710	15	191	7,280	17	334
18.....	2,200	6	36	4,250	13	149	5,700	10	154
19.....	2,000	6	32	3,440	20	186	6,140	8	133
20.....	1,800	6	29	3,020	49	400	5,920	7	112
21.....	2,500	19	128	20,200	483	s 37,700	4,800	7	91
22.....	3,500	27	255	39,300	459	s 53,300	3,980	2	21
23.....	3,200	16	138	14,600	85	s 3,590	3,530	148	1,410
24.....	5,000	24	324	8,750	39	921	28,500	618	s 43,300
25.....	8,000	39	842	6,140	17	282	29,900	195	15,700
26.....	6,000	23	373	4,800	13	168	13,500	51	1,860
27.....	4,500	10	122	3,890	6	63	9,000	29	705
28.....	3,620	4	39	3,270	2	18	6,590	10	178
29.....	3,100	4	33	--	--	--	5,290	2	29
30.....	2,720	3	22	--	--	--	4,250	4	46
31.....	2,400	2	13	--	--	--	3,530	4	38
Total.	115,690	--	9,239	158,130	--	98,094	215,960	--	68,785

s Computed by subdividing day.

a Computed from estimated concentration graph.

## JAMES RIVER BASIN --Continued

## JAMES RIVER AT BUCHANAN, VA.--Continued

Suspended sediment, water year October 1952 to September 1953--Continued

Day	Mean discharge (cfs)	April		Mean discharge (cfs)	May		Mean discharge (cfs)	June	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	3,100	2	17	2,060	2	11	956	1	3
2.....	2,790	3	23	2,120			900		
3.....	2,520	2	14	2,000	2	10	852	2	5
4.....	2,340	2	13	1,840			804		
5.....	2,170	1	6	1,780			764		
6.....	2,060	1	a 6	2,060	99		740	4	9
7.....	2,520			3,270	137	1,210	924		
8.....	4,620	8	79	4,430	34	407	1,040		
9.....	4,070			3,710	18	180	1,180		
10.....	3,440			3,100	11	92	1,030	4	11
11.....	3,100			2,650	8	57	964		
12.....	2,790	2	16	2,280	5	31	924	3	7
13.....	2,790			2,060	3	17	852		
14.....	3,710			1,840			772		
15.....	3,620	4	37	1,680			772	3	6
16.....	3,270			1,630	3	13	764		
17.....	3,100			1,580			972	35	92
18.....	2,790			1,480			2,280	49	302
19.....	2,790			1,630	13	57	2,340	30	180
20.....	2,940	2	15	5,290	141	2,010	1,580	13	55
21.....	2,790			4,900	46	609	1,190	12	39
22.....	2,580	2	a 14	3,270	14	124	1,080	30	87
23.....	2,460			2,580	9	63	948	6	15
24.....	2,340			2,170			852		
25.....	2,220	2	12	1,900			764		
26.....	2,170			1,680	4	21	698		
27.....	2,170			1,480			684	8	16
28.....	2,060	2	11	1,290			740		
29.....	1,950			1,150	2	7	772		
30.....	1,840			1,070			764		
31.....	--	--	--	1,010	1	3	--	--	--
Total.	83,110	--	757	70,990	--	5,618	29,902	--	1,012
July				August			September		
1.....	796			370			326	5	4
2.....	796	6	12	550	8	12	321		
3.....	788			650			315	4	3
4.....	663			700			315		
5.....	656	9	16	621			332		
6.....	1,840	104	517	607	8	13	570	9	14
7.....	1,380	54	201	528			868	12	28
8.....	1,320	26	93	588	26	41	663	11	20
9.....	1,180	26	83	552	41	61	528	11	16
10.....	916			504	14	19	462	8	10
11.....	796	16	35	486			409		
12.....	698			468			386		
13.....	635			444	10	12	386	6	6
14.....	594			420			381		
15.....	570			398			375		
16.....	540	10	15	386	8	8	370		
17.....	522			375			370		
18.....	504			398	8	a 9	364	5	5
19.....	498			474	8	a 10	370		
20.....	504			409	8	a 9	375		
21.....	498	10	14	392	8	a 8	381		
22.....	474			375	8	a 8	381		
23.....	528			364			375	4	4
24.....	516			364	8	8	370		
25.....	480			353			364		
26.....	474	10	13	353			364		
27.....	444			342			370		
28.....	420			337			375	4	4
29.....	414			337	5	5	364		
30.....	409	10	11	332			359		
31.....	350			332			--	--	--
Total.	21,203	--	1,321	13,809	--	378	12,189	--	199

Total discharge for year (cfs-days) ..... 836,663

Total load for year (tons) ..... 214,575

a Computed from estimated concentration graph.

## JAMES RIVER BASIN--Continued

## JAMES RIVER AT BUCHANAN, VA.--Continued

Particle-size analyses of suspended sediment, water year October 1952 to September 1953

(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	Water discharge (cfs)	Water temperature (° F)	Suspended sediment										Methods of analysis		
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500
Feb. 21, 1953 .....	3:20 p. m.	28,500		649	1,940	26	39	50	65	83	94	100				BWCM
Mar. 24 .....	1:55 p. m.	33,440		289	758	--	15	45	73	87	91	97		100		BWCM
May 20 .....	12:23 p. m.	5,490		233	619	65	78	88	96	98	99	100				BWCM

## 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, October 1951 to September 1952.

Water temperatures: May 1951 to September 1953.

Sediment records: December 1950 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 90°F July 29, 30; minimum, 37°F Dec. 30.

Sediment concentrations: Maximum daily, 849 ppm Feb. 23; minimum daily, 2 ppm on several days in July, August, and September.

Sediment loads: Maximum daily, 126,000 tons Feb. 23; minimum daily, 3 tons Sept. 1-5.

EXTREMES, 1930-31, 1951-53.--Dissolved solids (1930-31, 1951-52): Maximum, 235 ppm Sept. 21-30, 1930; minimum, 63 ppm Mar. 21-31, 1952.

Hardness (1930-31, 1951-52): Maximum, 128 ppm Oct. 1-10, 1930; minimum, 39 ppm Mar. 11-31, 1952.

Specific conductance (1951-52): Maximum daily, 306 micromhos Oct. 7, 1951; minimum daily, 70.6 micromhos Mar. 11, 1952.

Water temperatures (May 1951 to September 1953): Maximum, 93°F June 26-28, July 21, 1952; minimum, 35°F Dec. 19, 1951.

Sediment concentrations (December 1950 to September 1953): Maximum daily, 915 ppm Mar. 12, 1952; minimum daily, 2 ppm on several days during each year.

Sediment loads (December 1950 to September 1953): Maximum daily, 126,000 tons Feb. 23, 1953; minimum daily, 3 tons Sept. 1-5, 1953.

REMARKS.--Records of specific conductance of daily samples from October 1951 to September 1952 available in district office at Charlottesville, Va. Records of discharge for water year October 1952 to September 1953 given in WSP 1273.

Temperature (°F) of water, water year October 1952 to September 1953

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

## JAMES RIVER BASIN--Continued

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

Suspended sediment, water year October 1952 to September 1953

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	1,890	6	27	1,290			2,780	24	180
2.....	1,530	5	21	1,190	7	24	2,860	9	69
3.....	1,540			1,340			2,530	8	55
4.....	1,440	4	16	1,420	8	31	2,860	11	85
5.....	1,420			1,140	8	25	2,420	8	52
6.....	1,410			1,320			2,690	7	51
7.....	1,400	5	19	1,310	9	32	2,860	9	69
8.....	1,440			1,320			2,860	6	46
9.....	1,410			1,180	6	19	3,120	5	42
10.....	1,690	4	19	1,360	6	22	2,860	4	31
11.....	2,060			1,240	7	23	7,620	104	2,140
12.....	2,450	8	53	1,540			18,100	247	12,100
13.....	1,890	6	27	1,340	8	30	16,700	242	10,900
14.....	1,840	4	20	2,350			10,100	111	3,030
15.....	1,560	8	34	2,420	39	255	7,940	64	1,370
16.....	1,620	7	31	3,810	71	730	6,220	37	621
17.....	1,450	3	12	2,210	28	187	5,210	27	380
18.....	1,440	3	12	1,980	21	112	4,170	20	225
19.....	1,440	4	16	1,690	24	110	4,080	14	154
20.....	1,520			7,250	191	3,740	4,070	12	132
21.....	1,340			15,000	277	11,200	3,630	9	88
22.....	1,180	9	32	13,300	134	4,810	3,540	12	115
23.....	1,240			10,400	80	2,250	3,630	11	108
24.....	1,320			8,400	61	1,380	3,990	10	108
25.....	1,320			6,430	38	660	4,260	10	115
26.....	1,190	7	25	5,010	28	379	3,720	10	100
27.....	1,390			4,260	21	242	3,720	8	80
28.....	1,370			3,460	14	131	3,540	6	57
29.....	1,450	9	32	3,120	14	118	3,120	6	51
30.....	1,200			3,120	10	84	3,280	8	71
31.....	1,250			--	--	--	3,370	10	91
Total.	46,290	--	778	110,200	--	26,746	151,850	--	32,716
Day	January			February			March		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	5,410	39	570	6,010	18	292	7,940	28	600
2.....	5,010	52	703	5,210	13	183	6,850	23	425
3.....	5,810	46	722	5,010	16	216	6,850	23	425
4.....	5,610	21	318	4,820	14	182	7,280	80	1,570
5.....	5,610	21	318	4,350	14	164	10,100	109	2,970
6.....	5,610	15	227	4,170	11	124	17,800	114	5,480
7.....	5,210	13	183	4,260	16	184	16,400	89	3,940
8.....	4,440	14	168	5,010	14	189	12,100	49	1,600
9.....	5,210	15	211	5,010	12	162	10,400	28	786
10.....	12,200	113	3,720	6,850	14	259	8,870	23	551
11.....	17,800	157	7,550	5,810	19	298	8,170	20	441
12.....	16,700	96	4,330	5,410	19	278	7,720	18	375
13.....	12,400	61	2,040	5,210	19	267	10,100	63	1,720
14.....	9,350	37	934	5,210	16	225	9,850	39	1,040
15.....	8,170	24	529	6,640	60	1,080	9,350	33	833
16.....	6,640	20	359	8,630	61	1,420	11,200	79	2,390
17.....	6,220	30	504	9,600	39	1,010	16,400	84	3,720
18.....	5,610	18	273	8,870	29	695	14,000	66	2,490
19.....	5,410	33	482	8,170	22	485	12,700	39	1,340
20.....	5,010	22	298	7,280	15	295	12,100	24	784
21.....	5,010	14	189	11,100	125	3,750	11,500	18	559
22.....	6,430	34	590	42,300	826	s 108,000	9,850	18	479
23.....	6,850	31	573	50,900	849	s 126,000	8,870	16	383
24.....	10,500	78	2,210	22,700	227	13,900	19,000	238	12,200
25.....	16,400	153	6,770	15,300	104	4,300	56,400	595	90,600
26.....	15,700	70	2,970	12,100	62	2,030	45,700	317	39,100
27.....	12,400	53	1,770	9,850	56	1,490	25,100	132	8,950
28.....	9,600	33	855	8,870	45	1,080	18,100	71	3,470
29.....	8,170	37	816	--	--	--	14,000	43	1,630
30.....	7,280	22	432	--	--	--	11,500	30	932
31.....	6,850	13	240	--	--	--	9,850	22	585
Total.	258,620	--	41,854	294,650	--	268,558	446,050	--	192,368

s Load computed by subdividing day.

## JAMES RIVER BASIN--Continued

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

Suspended sediment, water year October 1952 to September 1953--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.....	9,110	16	394	6,640	34	610	2,940	9	71
2.....	8,170	19	419	6,430	28	486	2,780	6	45
3.....	7,500	20	405	6,430	21	365	2,690	4	29
4.....	6,850	19	351	5,810	17	267	2,450	4	26
5.....	6,430	12	208	5,610	18	273	2,290	5	31
6.....	6,010	14	227	5,410	19	278	2,140	4	23
7.....	8,630	77	1,790	6,220	25	420	2,610	8	56
8.....	8,870	58	1,390	7,280	21	413	3,120	17	143
9.....	8,630	34	792	7,720	27	563	2,780	9	68
10.....	9,110	23	566	7,940	39	836	3,000	9	73
11.....	8,630	20	466	7,060	27	515	2,800	12	91
12.....	7,280	16	314	5,810	19	298	2,600		
13.....	9,350	40	1,010	5,410	14	204	2,800	5	36
14.....	9,350	70	1,770	5,010	14	189	2,700		
15.....	8,630	35	816	4,350	12	141	2,400	6	39
16.....	8,630	23	536	4,260	9	104	1,980	4	21
17.....	8,400	16	363	4,260	9	104	2,530	4	27
18.....	7,500	12	243	4,080	12	132	5,610	198	3,000
19.....	7,500	13	263	4,170	10	113	4,820	65	846
20.....	6,640	11	197	7,500	86	1,740	5,010	53	717
21.....	7,060	9	172	10,400	169	4,750	3,720	32	321
22.....	6,640	9	161	9,350	84	2,120	3,200	12	104
23.....	6,430	8	139	7,720	45	938	3,540	18	172
24.....	6,220	12	202	5,610	30	454	2,530	22	150
25.....	5,610	11	167	5,210	21	295	2,610	15	106
26.....	6,010	11	178	4,630	19	238	2,210	12	72
27.....	5,810	15	235	4,170	15	169	2,060	7	39
28.....	6,010	12	195	3,720	9	90	2,940	35	278
29.....	5,810	9	141	3,370	10	91	2,140	12	69
30.....	5,810	11	173	3,200	7	60	2,210	6	36
31.....	--	--	--	3,120	9	76	--	--	--
Total.	222,630	--	14,283	177,900	--	17,332	87,210	--	6,761
	July			August			September		
1.....	1,840	4	20	1,050	3	9	650		
2.....	2,060	8	44	1,140	4	12	635		
3.....	2,290	7	43	1,540	10	42	642	2	3
4.....	2,370	4	26	1,240	9	30	612		
5.....	1,910	4	21	2,060	55	s322	612		
6.....	2,290	7	43	1,540	27	112	742		
7.....	4,080	37	408	1,530	10	41	838	4	9
8.....	3,280	24	213	1,460	4	a16	916		
9.....	2,860	13	100	1,690	7	32	1,280	19	66
10.....	2,500	12	81	1,610	16	70	1,180	10	32
11.....	2,000	4	22	1,690	9	41	1,000	6	16
12.....	1,800	3	15	1,170	4	13	958	7	18
13.....	1,700	6	28	1,180	4	13	968	7	18
14.....	1,560	7	29	1,120	4	12	1,320	10	36
15.....	1,570	6	25	1,010			926	8	20
16.....	1,480	4	16	1,010			810	8	17
17.....	1,290	4	14	905	4	10	742		
18.....	1,390			905			793	5	10
19.....	1,100	2	7	926			742		
20.....	1,190			829			759		
21.....	1,570			848			759	4	8
22.....	1,220	2	7	886	4	9	776		
23.....	947			905			759		
24.....	1,140			886			750		
25.....	1,240			702			688	4	8
26.....	1,200	4	12	725			742		
27.....	1,030			784	2	4	742		
28.....	1,060			680			702		
29.....	947			658			710	4	8
30.....	867	4	10	702			710		
31.....	886			718	4	8	--	--	--
Total.	52,667	--	1,280	34,099	--	892	24,463	--	383

Total discharge for year (cfs-days) ..... 1,906,629

Total load for year (tons) ..... 603,951

s Load 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, October 1952 to September 1953.

Water temperatures: October 1947 to September 1951, October 1952 to September 1953.

EXTREMES, 1952-53.--Hardness: Maximum, 296 micromhos, 36 ppm Jan. 6, 1953; minimum, 36 ppm Jan. 6, 1953.

Specific conductance: Maximum, 296 micromhos, 36 ppm Jan. 6, 1953; minimum, 36 ppm Jan. 6, 1953.

EXTREMES, 1947-51.--Discharge: Maximum, 2,637 cfs, Nov. 21, 1948; minimum, 14,310 cfs, Nov. 21, 1948.

Hardness: Maximum, 296 micromhos, 36 ppm Jan. 6, 1953; minimum, 36 ppm Jan. 6, 1953.

Specific conductance (1948-51, 1952-53): Maximum daily, 296 micromhos, 36 ppm Jan. 6, 1953; minimum, 36 ppm Jan. 6, 1953.

Water temperatures: Maximum, 85°F Aug. 28, 1948; minimum, freezing point Feb. 8, 9, 1951.

REMARKS.--These analyses are considered to be comparable with analyses of James River collected at the gaging station near Richmond October 1951 to September 1952. There is no appreciable inflow between the two sampling points. Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for gaging station near Richmond for water year October 1952 to September 1953 given in WSP 1273.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO <sub>3</sub>		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH or Col.	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, mg./l.				Non-carbonate
Oct. 1-10, 1952 ..	1,208	8.8	0.04	17	5.8	7.6	1.9	66	26	3.5	0.1	0.7		107		66	12		166	7.5	10
Oct. 11-20 .....	1,706	---	.12	18	3.8	---	---	64	26	3.6	---	---	---	---	---	60	8		155	7.4	20
Oct. 21-31 .....	1,222	---	.07	18	5.3	---	---	62	30	3.6	---	---	---	---	---	67	16		159	7.3	10
Nov. 1-10 .....	1,451	---	.11	18	4.7	---	---	58	34	3.7	---	---	---	---	---	64	17		162	7.3	20
Nov. 11-20 .....	2,637	---	.24	19	2.6	---	---	53	32	3.6	---	---	---	---	---	58	15		152	7.2	25
Nov. 21-30 .....	14,310	---	.28	13	1.6	---	---	37	12	3.2	---	---	---	---	---	39	9		95.3	7.3	55
Dec. 1-10 .....	3,430	---	.34	12	2.9	---	---	35	16	4.0	---	---	---	---	---	42	13		113	7.1	25
Dec. 11-20 .....	10,050	---	.18	13	3.1	---	---	43	22	4.4	---	---	---	---	---	45	10		115	6.9	35
Dec. 21-31 .....	7,183	---	.26	14	3.1	---	---	45	20	4.4	---	---	---	---	---	48	11		122	7.1	15
Jan. 1-10, 1953 ..	7,373	10	.23	12	3.5	5.5	1.5	44	16	4.7	.2	1.3	80	80	---	44	8		116	7.2	30
Jan. 11-20 .....	12,820	---	.19	11	2.1	---	---	34	19	3.6	---	---	---	---	---	36	6		93.6	6.9	30
Jan. 21-31 .....	12,350	---	.19	10	2.8	---	---	34	13	3.4	---	---	---	---	---	36	9		92.0	6.9	35
Feb. 1-10 .....	6,480	---	.21	12	2.2	---	---	38	16	3.4	---	---	---	---	---	39	8		96.8	7.3	20
Feb. 11-20 .....	9,249	---	.21	13	2.8	---	---	42	18	5.0	---	---	---	---	---	44	10		113	7.7	30
Feb. 21-28 .....	19,200	---	.14	12	2.1	---	---	37	14	2.0	---	---	---	---	---	39	8		94.1	7.0	30
Mar. 1-10 .....	13,440	---	.15	12	2.4	---	---	40	20	3.0	---	---	---	---	---	40	7		97.3	7.2	25
Mar. 11-20 .....	14,800	---	.16	11	2.0	---	---	37	18	3.6	---	---	---	---	---	36	5		90.2	7.1	40
Mar. 21-31 .....	26,580	---	.10	10	2.9	---	---	36	7.0	2.7	---	---	---	---	---	37	7		88.8	7.1	30
Apr. 1-10 .....	10,100	11	.06	12	2.8	4.1	1.2	43	8.0	4.1	.0	1.3	71	71	---	41	6		97.3	7.1	15
Apr. 11-20 .....	12,650	---	.08	11	3.1	---	---	39	7.0	3.0	---	---	---	---	---	40	8		98.8	7.1	25
Apr. 21-30 .....	7,748	---	.10	12	3.4	---	---	23	6.0	3.6	---	---	---	---	---	44	25		107	7.6	15

## JAMES RIVER BASIN--Continued

JAMES RIVER AT RICHMOND, VA.--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO <sub>3</sub>		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate				
May 1-10, 1953 ..	8,072	--	0.11	11	3.8	--	--	60	11	3.7	--	--	--	--	--	--	43	0		108	7.7	20
May 11-20 .....	6,065	--	.07	13	4.2	--	--	49	11	4.0	--	--	--	--	--	--	50	10		120	7.7	7
May 21-31 .....	7,202	--	.03	15	2.7	--	--	56	14	3.3	--	--	--	--	--	--	48	1		121	7.3	15
June 1-10 .....	2,889	--	.01	15	3.2	--	--	48	11	3.8	--	--	--	--	--	--	50	11		132	7.2	7
June 11-20 .....	3,556	--	.01	19	3.6	--	--	53	15	6.1	--	--	--	--	--	--	55	11		146	7.3	20
June 21-30 .....	2,054	--	.02	17	4.4	--	--	61	22	6.1	--	--	--	--	--	--	64	13		163	7.4	10
July 1-10 .....	2,532	10	.03	17	4.7	7.4	1.8	59	22	6.8	0.1	0.7	--	101	--	--	61	19		166	7.6	10
July 11-20 .....	1,350	--	.03	24	5.1	--	--	70	19	9.0	--	--	--	--	--	--	80	24		196	7.8	8
July 21-31 .....	755	--	.02	22	4.1	--	--	54	22	7.6	--	--	--	--	--	--	71	28		184	6.9	10
Aug. 1-10 .....	963	--	.02	18	6.7	--	--	59	18	7.8	--	--	--	--	--	--	72	24		191	7.2	14
Aug. 11-20 .....	716	--	.02	20	5.5	--	--	61	13	11	--	--	--	--	--	--	72	22		201	7.1	16
Aug. 21-31 .....	193	--	.03	21	6.7	--	--	69	14	8.8	--	--	--	--	--	--	81	23		228	7.2	11
Sept. 1-10 .....	99.2	--	.05	23	7.2	--	--	68	36	15	--	--	--	--	--	--	88	31		242	7.1	10
Sept. 11-20 .....	432	--	.02	27	6.0	--	--	79	48	16	--	--	--	--	--	--	93	27		279	7.9	20
Sept. 21-30 .....	166	--	.02	27	7.6	--	--	74	48	17	--	--	--	--	--	--	99	38		286	7.7	15
Average .....	6,484	--	0.11	16	3.9	--	--	51	20	5.5	--	--	--	--	--	--	55	14		144	--	20

## JAMES RIVER BASIN--Continued

## JAMES RIVER AT RICHMOND, VA.--Continued

Temperature (°F) of water, water year October 1952 to September 1953

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

## ROANOKE RIVER BASIN

## ROANOKE RIVER AT ALTAVISTA, VA.

LOCATION.--At gaging station at bridge on U.S. Highway 29, 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, February to September 1953.

Sediment records: February to September 1953.

EXTREMES, February to September 1953.--Water temperatures: Maximum, 80° F July 22, 31.

Sediment concentrations: Maximum daily, 1,257 ppm Feb. 22; minimum daily, 6 ppm Sept.

1-4.

Sediment loads: Maximum daily, 59,000 tons Mar. 24; minimum daily, 5 tons Sept. 1-4.

EXTREMES, 1950-51, February to September 1953.--Dissolved solids (1950-51): Maximum, 150

ppm Sept. 21-30; minimum, 70 ppm Apr. 1-10.

Hardness (1950-51): Maximum, 70 ppm Sept. 10-20, 21-30; minimum, 44 ppm Dec. 1-10,

Apr. 1-10.

Specific conductance (1950-51): Maximum daily, 288 micromhos Sept. 18, 1951; minimum

daily, 58.2 micromhos Apr. 3, 1951.

Water temperatures: Maximum, 86° F Aug. 10, 1951; minimum, freezing point on several days during winter months.

REMARKS.--Records of specific conductance of daily samples from October 1950 to September 1951 available in district office at Charlottesville, Va. Records of discharge for water year October 1952 to September 1953 given in WSP 1273.

Temperature (°F) of water, February to September 1953

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

## ROANOKE RIVER BASIN--Continued

## ROANOKE RIVER AT ALTAVISTA, VA.--Continued

Suspended sediment, February to September 1953

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.....				--	--	--	2,220	44	264
2.....				--	--	--	2,220	46	276
3.....				--	--	--	2,380	52	334
4.....				1,600	44	190	3,180	110	944
5.....				1,530	42	174	8,100	457	9,990
6.....				1,480	33	130	5,900	414	6,600
7.....				1,670	59	266	4,140	199	2,220
8.....				2,460	121	804	3,420	110	1,020
9.....				2,220	105	629	3,020	95	775
10.....				1,940	82	430	2,700	91	663
11.....				1,740	50	235	2,460	64	425
12.....				1,740	52	244	2,620	71	502
13.....				1,780	40	192	4,320	196	2,290
14.....				1,670	42	189	4,230	166	1,900
15.....				2,540	96	658	3,960	163	1,740
16.....				5,200	402	5,640	6,340	647	11,100
17.....				3,690	208	2,070	4,140	363	4,060
18.....				2,940	135	1,070	3,510	151	1,430
19.....				2,540	115	769	3,690	131	1,310
20.....				2,300	76	472	3,510	139	1,320
21.....				7,800	758	s 27,400	3,100	101	845
22.....				12,200	1,257	s 44,500	2,860	80	618
23.....				5,700	467	7,190	2,700	45	328
24.....				4,050	224	2,450	15,600	1,173	s 59,000
25.....				3,420	104	960	15,500	1,036	43,400
26.....				3,020	82	669	6,890	388	7,220
27.....				2,700	70	510	4,900	221	2,920
28.....				2,460	53	352	4,050	155	1,690
29.....				--	--	--	3,510	134	1,270
30.....				--	--	--	3,180	105	902
31.....				--	--	--	2,940	90	714
Total.				80,370	--	98,213	141,290	--	168,070
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.....	2,700	91	663	1,980			1,080	33	96
2.....	2,540	89	610	1,940			1,110	31	93
3.....	2,380	83	533	1,700	67	338	1,040	31	87
4.....	2,300	63	391	1,600			1,000	27	73
5.....	2,140	60	347	1,560	36	155	900	27	66
6.....	2,140	65	376	1,600			900	30	73
7.....	2,460	88	584	2,380	105	675	1,000	51	138
8.....	2,940	124	984	3,020	173	1,410	1,200	97	314
9.....	2,620	96	679	2,540	134	919	1,100	53	157
10.....	2,380	90	578	2,140	77	445	1,080	49	143
11.....	2,220	60	360	1,900	52	267	1,180	65	207
12.....	2,140	55	318	1,740	50	235	1,140	108	332
13.....	2,300	92	571	1,560	45	190	1,000	98	265
14.....	2,540	117	802	1,460			1,000	67	181
15.....	2,140	82	474	1,420	40	156	1,080	81	236
16.....	2,060	43	239	1,390			1,110	70	210
17.....	2,060	50	278	1,500			1,250	90	304
18.....	1,980	35	187	1,420	116	445	1,980	187	1,000
19.....	1,900	40	205	2,460	413	2,740	2,140	247	1,430
20.....	1,900	41	210	3,780	595	6,070	1,280	133	460
21.....	1,820	49	241	3,870	419	4,380	1,040	100	281
22.....	1,740	34	160	2,540	199	1,360	1,320	191	s 764
23.....	1,700			2,060	117	651	1,780	697	3,350
24.....	1,670		127	1,820	80	393	1,320	505	1,800
25.....	1,670	28		1,670	66	298	970	185	485
26.....	1,670			1,600	61	264	865	75	175
27.....	1,700			1,460	59	233	830	61	137
28.....	1,700	46	201	1,320	52	185	1,460	535	2,110
29.....	1,560			1,220	48	158	1,000	370	999
30.....	1,530			1,180	45	143	970	110	288
31.....	--	--	--	1,110	38	114	--	--	--
Total.	62,600	--	11,102	58,940	--	23,678	35,125	--	16,254

s Computed by subdividing day.

## ROANOKE RIVER BASIN--Continued

## ROANOKE RIVER AT ALTAVISTA, VA.--Continued

Suspended sediment, February to September, 1953--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.....	830	56	125	481	198	257	307		
2.....	760	66	135	830	848	s 2,080	304	6	5
3.....	795	105	225	760	231	474	301		
4.....	760	44	90	592	307	491	304		
5.....	700	41	77	530	107	153	328	9	8
6.....	1,080	122	356	555	77	115	358	14	14
7.....	1,640	572	2,530	530	57	82	445	22	26
8.....	1,040	148	416	516	47	65	445	25	30
9.....	1,000	111	300	604	88	144	410	17	19
10.....	1,110	132	396	1,000	160	432	378	12	12
11.....	795	94	202	700	76	144	361	11	11
12.....	622	61	102	570	43	66	354	11	11
13.....	530	52	74	503	32	43	538	106	s 179
14.....	748	53	107	473	28	36	555	117	175
15.....	688	64	119	442	22	26	375	42	43
16.....	586	50	79	431	18	21	347	25	23
17.....	565	31	47	400	16	17	340	17	16
18.....	555	28	42	438	16	19	325		
19.....	530	25	36	457	33	41	322	16	14
20.....	526	27	38	410	64	71	325		
21.....	508	23	32	406	27	30	337	15	14
22.....	494	22	29	396	22	24	361	14	14
23.....	565	30	46	389	16	17	358		
24.....	718	56	109	382			344	8	7
25.....	575	40	62	364	12	12	344		
26.....	498			361			337		
27.....	465	28	38	350			358		
28.....	453			340			389	14	14
29.....	442	20	24	331	8	7	396		
30.....	428			319			378		
31.....	424			313			--	--	--
Total.	21,430	--	5,932	15,173	--	4,919	11,014	--	741

Total discharge for period (cfs-days) ..... 425,942

Total load for period (tons) ..... 328,909

s Computed by subdividing day.

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

Particle-size analyses of suspended sediment, February to September 1953  
(Methods of analysis: B, bottom withdrawal tube; D, decantation; F, pipette; S, sieve; N, in native water;  
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Water discharge (cfs)	Water temperature (° F)	Suspended sediment												Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500		1.000
Feb. 21, 1953 . . . . .	3:13 p. m.	10, 100		1, 150	3, 300		16	24	32	40	53	74	95		100	--	BWCM
Mar. 16 . . . . .	12:32 p. m.	6, 670		1, 872	2, 040		41	51	61	67	76	82	86		90	100	BWCM
Mar. 24 . . . . .	5:09 p. m.	22, 900		1, 550	3, 650		30	39	50	60	72	84	97		100	--	BWCM
May 20 . . . . .	4:01 p. m.	4, 030		926	2, 770		38	50	67	77	90	94	97		99	100	BWCM
July 7 . . . . .	2:33 p. m.	1, 420		443	1, 300		52	69	80	90	95	97	99		100	--	BWCM

## ROANOKE RIVER BASIN--Continued

## ROANOKE RIVER AT RANDOLPH, VA.

LOCATION.--At gaging station at bridge on State Highway 746 (old 26), 2.8 miles northwest of Randolph, Charlotte County, 3.6 miles upstream from Roanoke Creek, and at mile 227.3.

DRAINAGE AREA.--3,000 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: April 1929 to March 1930, October 1950 to September 1953.

Water temperatures: October 1950 to September 1953.

EXTREMES, 1952-53.--Hardness: Maximum, 64 ppm Sept. 11-20; minimum, 34 ppm Mar. 7, 12-20.

Specific conductance:--Maximum daily, 208 micromhos Sept. 5, 10; minimum daily, 65.2 micromhos Mar. 25.

Water temperature: Maximum, 72°F May 18, 27, June 10, 11; minimum, 33°F Dec. 29.

EXTREMES, 1929-30, 1950-53.--Dissolved solids: Maximum, 116 ppm Oct. 1-10, 1951; minimum, 59 ppm Feb. 1-10, 1952.

Hardness: Maximum, 64 ppm Sept. 11-20, 1953; minimum, 30 ppm Dec. 1-10, 1950; Mar. 21-31, 1952.

Specific conductance (1950-53): Maximum daily, 209 micromhos Oct. 1, 1951; minimum daily, 48.4 micromhos Dec. 23, 1951.

Specific temperatures (1950-53): Maximum, 81°F Aug. 11, 16, 1951; Aug. 20, 1952; minimum, freezing point on several days during some winter months.

REMARKS.--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 1952 to September 1953 given in WSP 1273.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO <sub>3</sub>		Percent sodium chloride ratio	Specific conductance micro-mhos at 25°C	Color or pH
														Parts per million	Tons per foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 1-10, 1952 ..	1,344	12	0.00	11	4.2	9.0	1.7	56	14	5.5	0.1	0.3		87		45	0		134	7.2
Oct. 11-20 .....	1,501	14	.01	11	4.5	11	1.9	55	18	5.8	.2	.2		93		46	1		142	7.2
Oct. 21-31 .....	1,322	14	.14	11	4.5	11	1.8	56	20	6.2	.2	.3		97		46	0		151	7.3
Nov. 1-10 .....	1,332	14	.03	11	4.4	13	1.7	55	22	6.8	.2	.5		98		45	0		151	7.2
Nov. 11-20 .....	2,123	13	.21	9.9	3.8	11	1.9	48	20	5.7	.2	.6		91		40	1		135	7.2
Nov. 21-30 .....	4,094	14	.12	9.9	3.3	7.4	2.1	43	16	4.8	.2	1.0		84		38	3		114	7.1
Dec. 1-10 .....	1,872	15	.09	11	3.3	9.0	1.6	48	17	4.6	.1	.9		87		41	2		127	7.4
Dec. 11-20 .....	3,544	14	.16	9.9	3.9	6.9	1.7	44	17	4.1	.2	1.6		88		41	5		116	7.1
Dec. 21-31 .....	2,028	15	.12	11	4.0	7.7	1.4	50	15	4.4	.1	1.1		87		44	3		126	7.1
Jan. 1-10, 1953 ..	3,901	14	.20	9.8	3.0	5.0	1.4	41	12	3.5	.2	1.1		80		37	3		98.1	7.2
Jan. 11-20 .....	4,309	--	.11	9.8	2.9	--	--	41	9.0	--	--	1.7		--		36	3		100	7.1
Jan. 21-31 .....	5,500	--	.16	9.0	3.0	--	--	38	14	--	--	1.7		--		35	4		73	7.3
Feb. 1-10 .....	3,071	--	.09	10	3.5	--	--	44	13	--	--	1.7		--		39	3		108	7.2
Feb. 11-20 .....	4,286	--	.14	9.8	3.0	--	--	42	8.0	--	--	1.5		--		37	2		96.6	7.2
Feb. 21-28 .....	7,449	--	.19	8.9	3.2	--	--	40	9.0	--	--	1.6		--		35	3		88.0	7.1
Mar. 1-6, 1950 .....	3,318	--	.06	9.1	3.5	--	--	42	11	--	--	--		--		37	3		96.0	7.4
Mar. 7, 12-20 .....	6,304	--	.06	9.1	2.9	--	--	39	17	--	--	--		--		34	2		90.3	7.2
Mar. 21-31 .....	8,046	--	.11	9.5	2.8	--	--	40	11	--	--	--		--		35	2		91.1	7.2
Apr. 1-10 .....	4,010	14	.04	10	4.0	4.7	1.3	47	9.6	3.6	.1	1.2		80		42	3		106	7.2
Apr. 11-20 .....	4,041	--	.11	9.0	3.4	--	--	44	10	--	--	--		--		36	0		97.7	7.2
Apr. 21-30 .....	2,825	--	.01	10	3.6	--	--	50	10	--	--	--		--		41	0		114	7.2



May 1-10, 1953 ..	3,229	--	0.01	10	4.1	--	--	50	10	--	--	--	--	43	1	119	7.1	5
May 11-20 .....	2,736	--	.01	11	3.9	--	--	52	7.0	--	--	--	--	45	1	115	7.1	5
May 21-31 .....	3,496	--	.01	11	4.6	--	--	53	15	--	--	--	--	48	3	119	7.1	15
June 1-10 .....	1,608	--	.01	12	4.8	--	--	57	9.0	--	--	--	--	49	3	128	7.2	5
June 11-20 .....	1,925	--	.05	12	4.9	--	--	56	11	--	--	--	--	49	4	127	7.4	10
June 21-30 .....	1,874	--	.10	11	4.7	--	--	50	10	--	--	--	--	48	6	117	7.2	40
July 1-10 .....	1,573	13	.07	11	4.4	6.7	2.0	52	11	5.9	0.1	1.1	94	44	3	123	7.2	40
July 11-20 .....	1,104	--	.03	12	4.7	--	--	57	14	--	--	--	--	50	3	135	7.4	20
July 21-31 .....	865	--	.01	13	4.7	--	--	61	12	--	--	--	--	52	2	151	7.4	8
Aug. 1-10 .....	1,257	--	.11	11	7.8	--	--	53	12	--	--	--	--	60	--	133	7.2	--
Aug. 11-20 .....	982	--	.07	12	5.0	--	--	58	20	--	--	--	--	52	3	145	7.1	28
Aug. 21-31 .....	665	--	.03	14	5.6	--	--	70	14	--	--	--	--	57	1	170	7.6	18
Sept. 1-10 .....	656	--	.06	14	6.1	--	--	70	22	--	--	--	--	59	3	184	7.4	32
Sept. 11-20 .....	693	--	.02	13	7.4	--	--	69	14	--	--	--	--	64	6	157	7.3	25
Sept. 21-30 .....	592	--	.02	13	7.5	--	--	71	14	--	--	--	--	62	5	161	7.2	5
Average .....	2,783	--	0.08	11	4.3	--	--	51	14	--	--	--	--	45	2	124	--	28

## ROANOKE RIVER BASIN--Continued

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

Temperature (°F) of water, water year October 1952 to September 1953

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

# ROANOKE RIVER BASIN--Continued

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

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Aug. 11, 1953	20.6							36	2	2.8				22	0	68.4	7.1	
Sept. 10	20.6							34	5	2.0				24	0	69.4	7.0	

### TOWN FORK CREEK AT WALNUT COVE

### HYCO RIVER NEAR ROXBORO

Oct. 29, 1952	3.93							70	4	6.8				53	0	139	7.1	
Apr. 24, 1953	26.2							60	5	5.8				42	0	126	7.0	

### READY BRANCH NEAR WILLIAMSTON

Oct. 30, 1952	1.96							28	5	9.2				28	5	87.7	6.4	
June 4, 1953	1.21							19	5	8.2				20	4	74.0	6.5	

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

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
SHELTON CREEK NEAR OXFORD																		
Oct. 29, 1952.....	1.68							4.7	2	3.8				36	2	92.1	7.0	
Apr. 24, 1953.....	10.2							32	2	3.5				24	0	68.4	6.8	
Aug. 29.....	.11							48	1	4.0				22	0	92.2	6.8	
TABBS CREEK NEAR KITTRELL																		
Oct. 29, 1952.....	11.0							49	2	6.2				38	0	103	6.8	
Apr. 24, 1953.....	46.3							38	5	5.5				26	0	85.1	6.9	
Aug. 29.....	1.82							45	1	4.8				28	0	86.0	7.2	
SWIFT CREEK NEAR RED OAK																		
Oct. 28, 1952.....	48.0							31	2	4.2				22	0	67.9	6.5	
Aug. 31, 1953.....	23.7							30	3	4.5				19	0	70.5	6.8	
FISHING CREEK NEAR WARRENTON																		
Oct. 28, 1952.....	19.1							29	1	3.2				21	0	558.8	6.6	
Apr. 28, 1953.....	30.1							30	2	2.5				18	0	63.6	6.6	
Aug. 29.....	3.41							28	2	4.0				19	0	66.1	7.1	
TOWN CREEK NEAR PINETOPS																		
Oct. 30, 1952.....	5.11							22	7	9.2				20	2	84.4	7.4	
Apr. 27, 1953.....	34.2							21	3	8.0				14	0	77.2	7.4	
June 4.....	3.55							20	4	7.8				18	2	80.9	6.5	
Aug. 31.....	2.73							18	8	9.8				19	4	96.1	6.4	
GRINDLE CREEK NEAR PACTOLUS																		
June 4, 1953.....	5.82							21	24	11				38	21	141	6.4	
July 29.....	2.37							22	21	10				34	16	139	6.5	
Sept. 2.....	1.37							23	16	10				34	15	138	6.1	



## NEUSE RIVER BASIN

## TRENT RIVER NEAR TRENTON, N. C.

LOCATION --At gaging station at Free Bridge on first road crossing Trent River upstream from N. C. Highway 12, about 800 feet downstream from Little Chinquapin Branch, 1½ miles southwest of Phillips Crossroads, and 6 miles west of Trenton, Jones County.

RECORDS AVAILABLE --168 square miles.

REMARKS --Chemical analyses: October 1951 to September 1953.

Water temperatures: October 1951 to September 1953.

EXTREMES, 1952-53 --Dissolved solids: Maximum, 145 ppm Oct. 11-20; minimum, 69 ppm Sept. 21-24, 27-30.

Hardness: Maximum, 142 ppm Nov. 9, 10, 13, 31; minimum, 40°F Jan. 5, 6.

Water temperatures: Maximum, 81°F July 9, 10, 13, 31; minimum, 40°F Jan. 5, 6.

EXTREMES, 1951-52 --Dissolved solids: Maximum, 143 ppm Oct. 11-20, Nov. 11-20, 1952; minimum, 59 ppm Mar. 1-10, 1952.

Hardness: Maximum, 112 ppm Nov. 9-10, 1952; minimum, 23 ppm Mar. 1-10, 1952.

Water temperatures: Maximum, 85°F July 27, 1952; minimum, 38°F Feb. 1, 1952.

REMARKS --Records of suspended matter of composite samples available in district office at Raleigh, N. C. Records of discharge for water year October 1952 to September 1953 given in WSP 1273.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		pH	Color	Oxygen consumed	
														Calcium	Non-carbonate			Unfiltered	Filtered
Oct. 1-10, 1952.....	15	9.0	0.11	35	2.2	5.1	0.9	89	33	6.9	0.1	1.5	138	96	24	212	7.0	29	9.1
Oct. 11-20.....	16	9.1	.06	38	2.1	3.5		102	16	7.0	.1	.9	143	103	20	223	7.0	23	7.5
Oct. 21-31.....	7.5	7.2	.05	39	2.1	4.6		110	14	7.2	.1	.9	139	106	16	231	7.1	20	5.1
Nov. 1-10.....	6.1	6.9	.03	41	2.3	5.4		122	13	6.5	.1	.8	141	112	12	245	7.1	14	3.5
Nov. 11-20.....	16	6.3	.03	40	2.5	6.1		121	13	7.0	.0	1.0	143	110	11	245	7.2	18	5.9
Nov. 21-30.....	58	8.7	.16	25	2.0	5.4		63	17	9.0	.0	.5	118	71	19	172	7.0	65	14
Dec. 1-10.....	38	8.9	.12	26	1.7	4.5		62	17	9.0	.0	.6	116	72	21	167	7.0	50	12
Dec. 11-20.....	51	8.9	.11	22	1.7	5.0		51	17	9.2	.0	.5	108	62	20	148	7.1	50	13
Dec. 21-31.....	37	7.8	.13	21	1.8	5.4		55	13	9.0	.0	.4	101	60	15	150	7.1	65	11
Jan. 1-10, 1953.....	128	7.9	.10	16	1.4	4.7	1.0	35	15	9.5	.0	.5	94	46	17	119	7.0	80	18
Jan. 11-20.....	91	8.7	.12	18	1.5	4.0		38	14	9.5	.1	.5	95	51	20	122	6.9	80	17
Jan. 21-31.....	93	7.3	.15	17	1.7	4.4		11	11	9.5	.1	.4	95	49	16	140	6.9	80	19
Feb. 1-10.....	328	6.3	.14	12	1.3	3.7		25	9.5	9.0	.0	.3	77	35	15	96.2	7.0	80	19
Feb. 11-18.....	423	6.1	.09	12	1.4	1.2		20	9.6	8.2	.0	.3	76	36	19	87.9	6.4	90	21
Feb. 20-28.....	307	6.3	.10	11	1.1	3.4		21	9.6	8.5	.0	.3	76	32	15	87.3	6.6	90	17
Mar. 1-10.....	360	5.0	.14	10	1.3	4.1		20	8.7	8.5	.0	.4	78	30	14	80.6	6.5	100	19
Mar. 11-20.....	305	4.8	.11	11	1.4	1.7		23	7.2	8.0	.0	.5	77	23	14	86.1	6.5	80	16
Mar. 21-31.....	131	4.9	.22	14	1.4	2.4		33	6.7	8.0	.1	.5	83	14	14	101	6.5	80	17
Apr. 1-10.....	63	4.4	.30	18	1.4	4.7	1.6	48	7.2	8.0	.0	.6	93	51	11	124	6.8	70	14
Apr. 11-20.....	44	7.0	.11	21	1.1	4.4		55	7.5	9.0	.1	.8	97	57	12	158	6.5	55	11
Apr. 21-30.....	20	7.8	.09	24	1.2	3.3		64	6.7	8.2	.1	.9	101	65	12	159	7.1	50	11
May 1-9.....	63	6.0	.06	23	1.8	4.9		63	7.4	8.0	.0	.8	95	61	9	159	7.0	50	15
May 10.....	245	--	--	--	--	--	--	39	6.8	8.0	--	--	--	35	0	96.6	6.6	--	--
May 11-20.....	70	8.0	.13	17	.8	2.0		39	5.6	8.2	.1	.6	92	46	14	115	6.5	90	19
May 21-31.....	10	8.7	.06	39	1.5	3.1		78	7.8	8.8	.0	1.0	118	78	15	184	7.0	45	19

June 1-10, 1953.....	6.5	8.0	0.08	35	1.7	5.2	101	9.9	8.0	0.0	0.8	130	94	12	217	7.1	22	12	6.3
June 11-20.....	144	8.0	.0	17	1.1	3.8	34	15	7.8	.1	.6	94	47	13	124	6.7	55	12	17
June 21-30.....	104	8.9	.08	15	2.0	1.8	36	12	8.8	.0	.1	97	46	21	113	6.7	80	18	12
July 1-10.....	36	9.4	.07	21	2.4	4.5	56	18.6	8.5	.0	2.0	111	62	16	153	7.0	100	19	14
July 11-20.....	69	7.8	.07	33	1.3	4.9	90	11	8.0	.1	1.0	139	88	14	201	7.2	40	14	9.1
July 21-31.....	5.0	5.0	.08	38	2.1	3.7	109	12	6.5	.0	.6	135	103	14	230	7.4	24	--	--
Aug. 1-9.....	34	5.0	.05	34	2.2	2.3	92	14	6.0	.0	.6	126	94	18	210	7.4	23	--	--
Aug. 10.....	61	--	--	--	--	--	53	17	6.0	--	--	--	60	17	146	6.6	--	--	--
Aug. 11-20.....	86	6.4	.10	23	1.2	2.0	49	16	6.5	.0	.9	118	62	22	148	7.0	100	22	12
Aug. 21-31.....	28	7.4	.08	29	1.7	3.8	75	15	7.0	.0	1.0	130	79	18	186	7.3	70	16	15
Sept. 1-10.....	110	6.4	.04	38	1.7	6.6	105	16	8.5	.0	1.7	142	102	18	227	7.4	18	5.8	5.4
Sept. 11-20.....	7.1	5.6	.03	35	1.2	6.1	98	14	7.2	.0	.8	127	92	12	209	7.4	23	6.0	5.8
Sept. 21-24, 27-30...	610	4.5	.02	8.8	.3	2.2	18	6.6	6.6	.0	.4	a 69	23	8	49.1	6.4	120	--	--
Sept. 25-26.....	28	6.0	--	19	.7	11	43	28	6.5	.0	.8	93	50	15	135	7.0	35	--	--
Average.....	b --	7.0	0.10	24	1.5	4.3	61	13	7.9	0.0	0.7	108	65	15	155	--	60	14	11

a Large proportion of organic matter present; sum of mineral constituents 36 ppm.

b Average discharge for year 97.5. No record of analyses for period June 11-13.

## NEUSE RIVER BASIN--Continued

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

Temperature (°F) of water, water year October 1952 to September 1953.  
 /Once-daily temperature measurement at 7 a. m./

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



NEUSE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN NEUSE RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1952 to September 1953

Chemical analyses, in parts per million, water year October 1952 to September 1953																		
Date of collection	Discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Cal- cium (Ca)	Mag- nesium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conduct- ance (micro- mhos at 25°C)	pH	Color
														Calcium	Non-carbon- ate			
LOWER BARTON CREEK NEAR BAYLEAF																		
Oct. 28, 1952.....	4.21							35	1	3.0				24	0	66.9	6.8	
Apr. 23, 1953.....	11.5							28	1	3.0				18	0	63.2	7.2	
July 31.....	3.74							32	1	3.8				22	0	71.5	6.9	
Aug. 28.....	2.91							32	1	7.5				20	0	68.5	7.0	
HORSE CREEK NEAR WAKE FOREST																		
Oct. 28, 1952.....	8.18							34	1	3.0				21	0	64.3	6.8	
Apr. 23, 1953.....	20.2							32	1	3.5				20	0	62.3	6.9	
July 31.....	7.24							33	1	2.8				18	0	65.3	6.6	
Aug. 28.....	5.98							31	1	3.2				19	0	64.0	6.7	
CRABTREE CREEK NEAR RALEIGH																		
Oct. 28, 1952.....	9.57							32	1	4.2				26	0	71.1	6.7	
Aug. 28, 1953.....	3.07							--	1	4.0				18	0	62.2	6.7	
MINE CREEK NEAR MILLBROOK																		
Oct. 28, 1952.....	3.01							26	1	3.0				18	0	62.1	6.7	
Apr. 23, 1953.....	7.70							23	2	3.5				14	0	51.1	6.5	
July 31.....	2.50							23	1	3.5				13	0	53.0	6.8	
Aug. 28.....	1.95							24	2	3.5				13	0	51.4	6.8	
BIG BRANCH NEAR MILLBROOK																		
Oct. 28, 1952.....	1.10							33	1	2.8				20	0	70.7	6.8	
Apr. 23, 1953.....	3.43							30	2	3.5				16	0	64.2	6.6	
July 31.....	1.03							33	5	3.2				30	3	72.9	6.8	
Aug. 28.....	.86							31	1	3.2				16	0	62.6	6.7	

NEUSE RIVER BASIN--Continued  
MISCELLANEOUS ANALYSES OF STREAMS IN NEUSE RIVER BASIN IN NORTH CAROLINA--Continued  
Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Cal- cium (Ca)	Mag- nesium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conduct- ance (micro- mhos at 25°C)	pH	Color
														Calcium, mg.	Non- carbon- ate			
MIDDLE CREEK NEAR SMITHFIELD																		
Oct. 27, 1952.....	29.4							21	2	4.8				14	0	54.0	7.1	
Apr. 20, 1953.....	235							14	3	4.0				10	0	48.0	6.2	
July 28.....	6.82							24	2	4.0				20	0	62.6	6.5	
Sept. 1.....	3.75							22	1	3.8				13	0	52.5	6.8	
BLACK CREEK NEAR FOUR OAKS																		
Oct. 27, 1952.....	11.4							9	3	6.5				19	12	44.9	6.5	
Apr. 20, 1953.....	112							12	1	5.8				17	7	71.1	6.3	
BUCK SWAMP NEAR DUDLEY																		
Oct. 28, 1952.....	1.67							19	4	5.8				19	3	61.3	6.5	
Apr. 20, 1953.....	7.38							17	3	7.2				18	4	60.5	6.2	
June 3.....	.89							16	2	7.0				15	2	57.3	6.0	
Sept. 1.....	.21							16	4	6.2				15	2	61.7	6.5	
STONY CREEK AT GOLDSBORO																		
Oct. 28, 1952.....	3.06							14	7	8.0				17	6	66.2	6.2	
Apr. 20, 1953.....	10.5							12	7	8.0				14	4	70.6	6.0	
June 3.....	2.28							9	7	7.8				21	14	77.6	6.0	
Sept. 1.....	.68							8	13	6.0				13	6	66.2	6.0	
FALLING CREEK AT FALLING CREEK																		
Oct. 28, 1952.....	6.56							10	6	6.0				14	6	57.8	6.8	
Apr. 20, 1953.....	19.1							15	5	6.8				6	0	59.5	6.0	
June 3.....	3.50							12	2	6.5				12	2	60.9	5.9	
Sept. 1.....	3.67							12	6	9.5				9	0	58.5	6.9	

## DEEP RUN AT DEEP RUN

Oct. 28, 1952.....	1.17					8	2	6.5				8	1	45.5	6.1
Apr. 23, 1953.....	2.79					6	4	6.5				18	13	48.9	5.8
June 3.....	.64					6	3	6.5				17	12	44.7	6.1
Sept. 1.....	2.20					9	2	5.8				8	1	48.4	6.0

## MOCCASIN CREEK NEAR MIDDLESEX

Oct. 30, 1952.....	3.78					24	1	4.0				11	0	56.2	6.5
Apr. 27, 1953.....	12.8					25	2	3.8				10	0	52.2	6.8
June 5.....	1.84					22	1	4.5				12	0	54.4	6.5
Aug. 31.....	.79					23	1	4.0				14	0	59.1	6.6

## NAHUNTA SWAMP NEAR SNOW HILL

Oct. 28, 1952.....	14.1					15	5	8.0				17	5	64.1	6.3
Apr. 23, 1953.....	40.1					12	7	7.5				18	8	74.4	6.2
Apr. 27.....	27.3					12	5	7.8				15	5	70.1	6.3
June 3.....	10.9					9	6	16				15	8	71.3	6.2
Sept. 2.....	5.41					11	3	8.5				12	3	62.2	6.2

## CORE CREEK NEAR FORT BARNWELL

Oct. 29, 1952.....	2.16					135	7	6.8				117	6	250	7.1
Apr. 28, 1953.....	5.81					86	4	6.8				81	11	181	6.8
June 4.....	1.83					118	4	6.3				100	3	224	7.1
Sept. 2.....	2.05					113	16	2.0				97	4	227	6.9

## WHITE OAK RIVER AT BELGRADE

Oct. 29, 1952.....	2.56					144	7	7.5				127	9	267	6.9
Apr. 28, 1953.....	8.00					48	1	7.2				47	8	111	6.5

## CAPE FEAR RIVER BASIN

## HAW RIVER NEAR BENAJA, N. C.

LOCATION.--At bridge on county road, 500 feet downstream from gaging station, half a mile upstream from county line, 6 miles downstream from Troublesome Creek, and 6 miles east of Benaja, Rockingham County.

DRAINAGE AREA.--168 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1953.

Water temperatures: October 1952 to September 1953. Maximum, 79 ppm Oct. 21-31; minimum, 41 ppm Feb. 20-28.

EXTREMES, 1952-53.--Dissolved solids: Maximum, 79 ppm Oct. 21-31; minimum, 41 ppm Feb. 20-28.

Hardness: Maximum, 32 ppm Oct. 21-31; minimum, 14 ppm Feb. 20-28.

Water temperatures: Maximum, 84 F Aug. 2; minimum, 35 F Dec. 15.

REMARKS.--Records of suspended matter of composite samples available in district office at Raleigh, N.C. Records of discharge for water year October 1952 to September 1953 given in WSP 1273.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		pH	Color	Oxygen consumed	
														Calcium	Non-carbonate			Unfiltered	Filtered
Oct. 1-10, 1952	48	22	0.23	5.8	2.5	5.7	1.0	36	2.4	3.0	0.2	0.8	68	25	0	78.5	7.1	27	3.9
Oct. 11-20	56	21	0.04	5.8	2.2	6.9		35	4.4	3.1	1	1.6	63	24	0	75.8	6.7	20	3.2
Oct. 21-31	47	24	0.09	8.7	2.6	6.3		39	6.0	4.4	2	1.3	79	32	0	97.8	6.9	17	3.1
Nov. 1-10	50	24	0.03	6.5	2.5	6.1		37	3.3	3.2	2	1.1	67	26	0	83.0	6.8	16	3.2
Nov. 11-20	101	19	0.04	5.7	2.3	6.4		32	4.9	3.9	1	1.1	64	24	0	77.7	6.6	16	4.9
Nov. 21-30	183	18	0.15	5.1	2.0	5.8		26	6.2	3.9	0	1.4	62	21	0	65.4	6.3	16	5.8
Dec. 1-10	93	19	0.29	6.2	1.8	6.1		31	4.6	3.4	2	1.8	62	23	0	69.7	7.0	13	4.2
Dec. 11-20	316	16	0.10	4.0	1.7	5.2		21	5.6	3.1	1	1.7	52	17	0	56.8	6.6	20	6.8
Dec. 21-31	112	18	0.26	4.8	1.9	5.4		27	4.2	3.1	1	1.7	55	20	0	67.8	6.8	10	4.6
Jan. 1-10, 1953	237	15	0.09	3.9	1.6	4.1	1.7	21	5.5	3.2	2	1.6	49	16	0	56.3	6.7	8	5.4
Jan. 11-20	281	15	0.13	4.0	1.8	4.1		20	4.9	3.1	1	1.5	48	17	1	55.8	6.6	6	5.6
Jan. 21-31	319	13	0.04	4.1	1.7	4.3		20	5.0	3.2	1	1.4	46	17	1	54.6	6.5	9	6.8
Feb. 1-10	202	15	0.05	4.2	1.9	5.5		24	4.6	3.2	2	1.9	51	18	0	59.2	6.5	10	5.0
Feb. 11-19	434	13	0.07	3.7	1.5	4.1		18	4.6	2.8	1	1.7	42	15	1	48.8	6.6	10	5.2
Feb. 20-28	442	12	0.04	3.5	1.4	4.2		16	5.3	2.8	2	1.7	41	14	1	48.7	7.0	10	6.7
Mar. 1-10	270	14	0.06	3.9	1.6	4.1		19	4.7	2.8	1	1.8	48	16	1	54.8	6.4	8	5.1
Mar. 11-20	246	15	0.05	4.4	1.9	3.9		23	3.9	2.5	1	1.6	48	19	0	59.3	6.5	11	4.5
Mar. 21-31	327	14	0.05	4.3	1.2	4.4		22	3.6	2.2	1	1.6	48	16	0	56.0	6.5	15	4.9

163	Apr. 1-10, 1953	17	0.04	4.8	2.1	3.1	2.6	30	3.2	2.9	0.1	0.4	54	21	0	65.2	6.7	6	6.0	3.2
240	Apr. 11-20	16	.08	4.2	1.8	6.7		29	3.2	3.0	.2	.8	54	18	0	62.3	6.7	4	5.4	4.6
109	Apr. 21-30	19	.08	5.2	2.2	5.9		33	2.6	2.8	.2	.8	62	22	0	68.8	6.9	8	3.9	3.8
108	May 1-10	19	.01	6.2	2.5	6.1		38	2.6	2.8	.2	.8	87	26	0	75.6	6.9	17	5.0	4.2
69	May 11-20	24	.06	7.8	2.4	5.0		37	4.3	2.9	.2	1.0	71	29	0	74.3	6.9	12	3.2	3.1
56	May 21-31	24	.02	6.4	2.6	6.5		39	2.7	3.0	.2	1.6	69	27	0	87.4	6.9	10	4.0	3.0
59	June 1-10	21	.11	5.7	1.9	7.6		33	4.1	3.5	.2	2.2	69	22	0	76.8	6.8	28	3.8	3.4
127	June 11-20	18	.05	6.3	1.5	6.3		28	4.1	4.5	.2	1.8	63	22	0	69.9	6.8	12	6.0	4.1
94	June 21-30	17	.05	5.2	2.2	5.7		30	3.6	3.0	.2	1.6	60	22	0	76.0	6.9	10	5.8	3.4
45	July 1-10	22	.06	6.5	3.2	5.3	2.7	38	4.0	3.8	.1	1.6	75	29	0	93.1	7.2	17	4.2	3.6
22	July 11-20	21	.07	5.9	2.2	6.6		36	2.5	3.0	.2	1.6	67	24	0	80.8	7.1	11	3.5	2.8
21	July 21-31	23	.04	6.5	2.3	7.1		39	2.6	3.5	.2	1.1	69	26	0	89.1	7.0	26	4.0	3.9
18	Aug. 1-10	20	.06	6.5	2.6	7.8		39	4.3	3.8	.2	1.9	72	27	0	108	7.2	17	3.8	2.9
22	Aug. 11-20	19	.07	6.5	2.0	8.4		36	5.2	4.0	.1	2.4	72	24	0	128	7.0	24	4.6	4.0
18	Aug. 21-31	18	.01	6.2	1.8	9.9		36	6.8	3.8	.3	2.0	73	23	0	98.7	6.9	17	3.9	2.8
20	Sept. 1-10	21	.02	6.1	2.2	9.9		38	5.1	4.5	.3	2.6	75	24	0	96.1	6.9	17	4.4	3.6
13	Sept. 11-20	18	.04	6.2	1.5	8.1		32	4.4	4.5	.2	1.8	69	22	0	93.5	6.8	12	2.9	2.4
21	Sept. 21-30	18	.03	6.0	2.6	4.4	1.1	23	6.3	4.9	.2	2.2	74	26	5	94.4	6.7	12	4.2	3.4
137	Average	18	0.08	5.5	2.0	6.2		30	4.3	3.4	0.2	1.1	61	22	0	75.1	--	14	4.7	3.5

## SOUTH ATLANTIC SLOPE BASINS, JAMES RIVER TO SAVANNAH RIVER

## CAPE FEAR RIVER BASIN--Continued

## HAW RIVER NEAR BENAJA, N. C.--Continued

Temperature (°F) of water, water year October 1952 to September 1953  
 /Once-daily temperature measurement at 4 p. m./

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

## CAPE FEAR RIVER BASIN--Continued

## LITTLE COHARIE CREEK NEAR ROSEBORO, N. C.

LOCATION.--At gaging station at bridge on State Highway 24, 1½ miles east of Roseboro, Sampson County, and 1½ miles upstream from Bearskin Swamp.  
 DRAINAGE AREA.--96.4 square miles.  
 RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1953.  
 REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1273.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na) (meq/l)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mag-	Non-carbonate			
Oct. 15, 1952	23	12	0.23	6.4	0.6	1.2	0.8	4	4.8	8.6	0.0	0.6	80	18	15	45.5	5.4	70
Nov. 17	42	14	.12	1.2	.5	7.1		4	5.1	8.4	.0	.1	58	5	2	49.7	6.1	64
Dec. 16	39	11	.09	1.6	.4	6.4	1.4	4	4.4	8.0	.1	.1	52	6	2	45.4	5.5	64
Jan. 15, 1953	92	8.8	.16	2.9	.3	3.8		2	4.9	7.4	.0	.2	51	8	7	42.5	5.3	80
Feb. 17	128	6.2	.15	.8	.5	5.9		3	3.5	7.2	.1	.4	46	4	2	48.0	5.0	80
Mar. 16	237	3.5	.33	.9	.7	4.4	.8	3	3.3	6.2	.0	.1	49	5	3	38.8	5.2	90
Apr. 16	94	6.2	.27	1.8	.8	3.3		2	2.9	7.1	.0	.3	53	8	6	41.0	5.1	70
May 18	34	5.8	.10	2.4	.5	3.1		3	1.3	7.2	.0	1.0	97	8	6	65.7	5.2	110
June 15	52	9.6	.20	2.6	.5	3.9		3	4.9	6.2	.0	.9	58	9	6	47.5	5.4	100
July 15	5.8	8.8	.18	1.2	.6	5.4	2.1	6	1.3	8.0	.0	.9	53	5	1	58.2	5.4	100
Aug. 15	3.9	8.8	.18	1.2	.6	9.4		14	2.2	8.5	.0	.4	49	6	0	67.3	6.1	90
Sept. 15	12	10	.15	1.6	.9	9.9	1.7	3	12	8.8	.0	.6	72	8	5	80.5	5.4	50

a Large proportion of organic matter present; sum of mineral constituents 24 ppm.

## CAPE FEAR RIVER BASIN--Continued

## BLACK RIVER NEAR TOMAHAWK, N. C.

LOCATION.--At gaging station at bridge on State Highway 41, at Clear Run Swamp, and 3½ miles northeast of Tomahawk, Sampson County.  
DRAINAGE AREA.--680 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1953.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1273.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 15, 1952.....	132	11	0.17	4.0	1.0	4.3	0.7	12	4.9	6.6	0.0	0.3	52	14	4	55.4	6.1	55
Nov. 15 .....	273	12	.14	3.7	.9	6.1		11	5.2	7.2	.1	.0	53	13	2	58.8	6.4	50
Dec. 17 .....	272	13	.07	3.8	.9	5.6		10	6.8	7.2	.1	.0	53	13	5	58.0	6.4	50
Jan. 15, 1953 .....	483	8.7	.13	3.2	1.0	2.7	1.2	6	7.1	7.2	.0	.2	52	12	7	52.2	6.0	50
Feb. 16 .....	960	7.3	.19	2.8	.9	5.1		6	6.6	7.0	.0	.3	52	11	6	55.1	5.6	70
Mar. 16 .....	1,490	4.7	.37	2.6	.8	4.4		5	5.8	6.5	.0	.2	54	10	6	52.6	5.6	80
Apr. 15 .....	1,600	6.8	.25	3.1	1.1	3.5	1.0	7	4.2	6.8	.0	.3	51	12	6	47.3	5.8	60
May 15 .....	765	6.6	.14	2.4	.5	3.9		5	2.5	6.8	.0	.4	57	8	4	44.1	5.4	90
June 16 .....	612	3.4	.18	5.2	1.0	2.9		6	9.2	5.8	.0	.8	61	17	12	81.3	5.4	60
July 15 .....	66	4.4	.29	3.8	1.0	4.1	2.2	12	4.7	6.2	.0	.4	54	14	4	60.4	6.2	75
Aug. 24 .....	52	8.8	.08	4.8	1.0	6.6		12	9.7	7.2	.1	.2	44	16	6	67.5	6.1	40
Sept. 15 .....	39	7.9	.07	4.8	1.5	8.2	1.6	14	14	7.1	.1	.3	68	18	0	85.0	7.0	45

a Large proportion of organic matter present; sum of mineral constituents 30 ppm.

b Large proportion of organic matter present; sum of mineral constituents 31 ppm.



CAPE FEAR RIVER BASIN--Continued  
 MISCELLANEOUS ANALYSES OF STREAMS IN CAPE FEAR RIVER BASIN IN NORTH CAROLINA  
 Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Cal- cium (Ca)	Mag- nesium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evap- oration at 180° C)	Hardness as CaCO <sub>3</sub>		Specific conduct- ance (micro- mhos at 25° C)	pH	Color	
														Calcium, mag- nesium	Non- carbon- ate				
HAW RIVER NEAR SUMMERFIELD																			
Aug. 11, 1953	2.74							36	1	2.8					19	0	70.2	7.5	
Sept. 9	4.93							29	3	2.5					18	0	61.1	6.7	
TROUBLESOME CREEK NEAR REIDSVILLE																			
Aug. 11, 1953	4.61							33	2	2.0					22	0	64.6	7.2	
Sept. 10	4.23							29	3	2.0					10	0	61.5	6.5	
LITTLE ALAMANCE CREEK NEAR WHITSETT																			
Apr. 28, 1953	14.0							47	2	5.0					34	0	100	6.4	
Aug. 26	1.58							53	4	8.2					47	0	138	7.4	
NEW HOPE CREEK NEAR DURHAM																			
Oct. 29, 1952	3.09							56	7	14					50	4	202	6.6	
Apr. 24, 1953	24.6							37	6	6.8					30	0	104	6.8	
Aug. 28	1.30							94	28	28					68	0	357	7.0	
RICHLAND CREEK NEAR ASHEBORO																			
Apr. 24, 1953	22.3							32	1	3.8					19	0	63.3	6.9	
Aug. 13	2.42							38	10	5.2					31	0	95.9	6.9	
MCLENDONS CREEK NEAR CARTHAGE																			
Oct. 28, 1952	10.0							99	1	2.2					10	3	24.6	6.3	
Apr. 29, 1953	24.7							88	1	2.5					10	3	24.1	6.3	
Aug. 27	.22							88	2	2.8					5	0	25.7	6.0	
BEAR CREEK NEAR GOLDSTON																			
Apr. 24, 1953	7.32							27	33	6.5					18	0	65.3	6.8	
Aug. 27	.49							16	5	3.0					3	0	44.7	6.3	
Sept. 24	.009							26	4	4.0					22	1	68.3	6.3	

CAPE FEAR RIVER BASIN--Continued  
 MISCELLANEOUS ANALYSES OF STREAMS IN CAPE FEAR RIVER BASIN IN NORTH CAROLINA--Continued  
 Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953—Continued

Date of collection	Discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Cal- cium (Ca)	Mag- nesium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evap- oration at 180° C)	Hardness as CaCO <sub>3</sub>		Specific conduct- ance (micro- mhos at 25° C)	pH	Color	
														Calcium, mhos	Non- carbon- ate				
UPPER LITTLE RIVER NEAR LILLINGTON																			
Oct. 26, 1952	29.9							12	2	4.0					9	0	39.8	4.3	
Apr. 29, 1953	82.1							11	1	3.9					8	0	33.1	6.1	
Aug. 31	1.44							12	2	3.2					8	0	33.6	6.2	
CRANE CREEK NEAR VASS																			
Oct. 30, 1952	3.58							16	2	4.0					15	2	43.4	6.6	
Apr. 30, 1953	16.2							12	1	4.0					36	26	84.7	6.2	
ROCKFISH CREEK NEAR RAEFORD																			
Oct. 28, 1952	64.3							4	2	2.0					4	1	13.5	5.8	
Apr. 29, 1953	87.0							4	1	2.2					2	0	13.3	5.7	
Aug. 31	41.1							4	1	2.2					3	0	15.9	5.7	
TURNBULL CREEK NEAR ELIZABETHTOWN																			
May 31, 1953	2.67							1	1	5.0					7	6	45.5	4.6	
Aug. 26	.46							7	1	4.2					8	2	51.7	6.0	
LIVINGSTON CREEK NEAR ACME																			
Oct. 29, 1952	25.1							34	7	8.5					39	11	107	6.6	
May 31, 1953	.49							81	10	9.0					88	22	196	7.0	
HOOD CREEK NEAR LELAND																			
Oct. 29, 1952	6.79							20	2	7.5					24	8	68.0	6.5	
May 30, 1953	.050							66	2	7.0					5	0	139	6.8	
SIX RUNS NEAR CLINTON																			
Oct. 30, 1952	3.27							22	4	6.5					22	4	71.2	6.7	
Apr. 21, 1953	39.0							14	3	7.0					16	5	59.2	6.1	
Aug. 26	.28							35	10	5.0					33	4	117	6.9	

LOCKWOODS FOLLY BASIN  
MISCELLANEOUS ANALYSES OF STREAMS IN LOCKWOODS FOLLY BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Cal- cium (Ca)	Mag- nesium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitr- ate (NO <sub>3</sub> )	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conduct- ance (micro- mhos at 25°C)	pH	Color	
														Calcium, meq- l <sup>-1</sup>	Non- carbon- ate				
PINCH GUT CREEK NEAR BOLIVIA																			
Oct. 29, 1952.....								97	2	9.0					86	6	188	7.1	
May 30, 1953.....								189	2	10					160	0	340	7.2	

## PEE DEE RIVER BASIN

## YADKIN RIVER AT YADKIN COLLEGE, N. C.

LOCATION.--At bridge on U. S. Highway 64, 80 feet upstream from gaging station, 1½ miles south of Yadkin College, Davidson County, and 6¼ 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 1951 to September 1953.

EXTREMES, 1952-53.--Sediment concentrations: Maximum, 2,090 ppm June 18; minimum, 2 ppm Nov. 15.

Sediment loads: Maximum daily, 89,900 tons Feb. 22; minimum daily, 6 tons Nov. 15.

EXTREMES, 1943-44, 1950-53.--Dissolved solids: Maximum, 85 ppm Nov. 1-10, 1950; minimum, 32 ppm Mar. 21-31, 1944.

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

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

Sediment concentrations: Maximum, 2,970 ppm May 26, 1952; minimum, 2 ppm Nov. 15, 1952.

Sediment loads: Maximum daily, 89,900 tons Feb. 22, 1953; minimum daily, 6 tons Nov. 15, 1952.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1273.

Suspended sediment, water year October 1952 to September 1953

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	1,070	22	64	1,030	8	22	1,480	12	48
2.....	1,070	22	64	1,110			1,390	9	34
3.....	1,110	78	234	1,150			1,430	6	23
4.....	910	26	64	1,070			1,430	7	27
5.....	992	18	48	1,070	6	18	1,430	20	77
6.....	1,150	32	99	1,070			1,520	18	74
7.....	1,000	20	54	1,070			1,610	58	252
8.....	1,010	17	46	1,030			1,520	18	74
9.....	1,110	18	54	1,070			1,430	14	54
10.....	1,270	22	75	1,150	5	15	1,480	28	112
11.....	1,520	31	127	1,190			3,300	470	s4,390
12.....	1,430	34	131	1,310			4,550	403	4,950
13.....	1,270	32	110	1,310	7	24	2,750	390	2,890
14.....	1,190	28	90	1,230			2,150	132	766
15.....	1,150	24	75	1,190	2	6	1,880	74	376
16.....	1,150	20	62	1,310	8	28	1,740	32	150
17.....	1,110	16	48	1,310	11	39	1,610	27	117
18.....	1,070	12	35	1,190	10	32	1,560	19	80
19.....	1,070	15	43	1,150	8	25	1,560	20	84
20.....	1,110	18	54	1,310	17	60	1,480	22	88
21.....	1,110	11	33	3,830	316	s3,630	1,610	19	83
22.....	1,070	12	35	7,010	757	s14,200	1,660	16	72
23.....	1,030	14	39	4,180	616	s7,180	1,610	22	96
24.....	1,070	25	72	2,400	266	1,720	1,560	22	93
25.....	1,070	14	40	1,880	111	563	1,520	18	74
26.....	1,070	15	43	1,660	41	184	1,430	20	77
27.....	1,110	10	30	1,610	49	213	1,430	10	39
28.....	1,110			1,610	32	139	1,430	10	39
29.....	1,110			1,560	23	97	1,430	16	62
30.....	1,070	8	24	1,480	13	52	1,390	10	38
31.....	1,070			1	--	--	2,280	106	653
Total.	34,652	--	1,965	50,540	--	28,427	54,650	---	15,992

s Computed by subdividing day.

## PEE DEE RIVER BASIN--Continued

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

## Suspended sediment, water year October 1952 to September 1953--Continued

Day	January			February			March		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	3,250	202	1,770	2,100	42	238	2,950	88	700
2.....	2,850	153	1,180	2,060	48	267	3,150	112	953
3.....	2,200	80	475	1,920	56	290	3,950	162	1,730
4.....	2,060	52	289	1,880	30	152	5,190	198	2,770
5.....	1,920	46	238	1,790	44	213	7,400	403	8,050
6.....	1,740	20	94	1,740	40	188	5,300	268	3,830
7.....	1,700	14	64	3,050	250	s 2,300	4,050	147	1,610
8.....	1,700	24	110	3,950	254	s 2,750	3,550	98	939
9.....	3,450	428	s 3,910	3,150	183	1,560	3,250	104	913
10.....	3,550	304	2,910	2,500	118	796	2,950	91	725
11.....	3,450	194	1,810	2,250	62	377	2,850	56	431
12.....	3,550	243	2,330	2,750	50	371	3,150	108	919
13.....	2,550	266	1,830	3,050	130	1,070	3,750	125	1,270
14.....	2,150	80	464	2,500	84	567	4,250	138	1,580
15.....	1,970	48	255	5,760	505	s 9,080	4,780	195	s 2,820
16.....	1,880	37	188	7,400	452	s 9,290	10,300	1,010	s 27,800
17.....	1,740	29	137	4,970	238	3,190	6,380	578	s 10,200
18.....	1,840	31	154	3,550	211	2,020	4,550	240	2,950
19.....	2,150	64	372	2,950	90	717	4,150	154	1,730
20.....	2,060	63	350	2,650	51	365	3,850	131	1,360
21.....	3,050	303	s 3,100	11,100	1,040	s 37,800	3,350	104	941
22.....	5,900	679	s 11,000	26,400	1,280	s 89,900	3,150	76	646
23.....	4,050	419	4,580	15,600	479	s 21,300	4,380	299	s 4,370
24.....	6,190	500	s 8,710	5,900	330	s 5,270	24,000	1,190	s 76,100
25.....	6,880	530	s 9,960	4,650	287	3,600	32,200	458	s 40,700
26.....	4,550	364	4,470	4,050	218	2,380	12,100	336	s 10,600
27.....	3,350	182	1,650	3,550	172	1,650	6,380	289	4,980
28.....	2,950	100	796	3,150	114	970	5,190	258	3,620
29.....	3,050	149	1,230	--	--	--	4,550	140	1,720
30.....	2,500	54	364	--	--	--	4,150	114	1,280
31.....	2,200	45	267	--	--	--	3,850	106	1,100
Total.	92,430	--	65,057	136,370	--	198,671	193,050	--	219,337
Day	April			May			June		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	3,650	76	749	3,350	104	941	1,480	30	120
2.....	3,950	108	1,150	3,450	190	1,770	1,350	26	95
3.....	3,350	77	697	2,950	110	876	1,350	25	91
4.....	3,150	65	553	2,650	122	873	1,310	21	74
5.....	3,150	55	468	2,450	83	549	1,310	21	74
6.....	3,050	107	881	2,550	62	427	1,230	12	40
7.....	3,350	107	968	3,150	101	859	2,850	645	s 5,740
8.....	3,650	73	719	3,950	266	2,840	4,150	514	s 5,770
9.....	3,250	58	509	3,250	276	2,420	3,150	440	s 3,920
10.....	3,050	50	412	2,750	160	1,190	3,950	546	s 6,210
11.....	2,850	47	362	2,550	92	653	5,160	1,220	s 17,200
12.....	2,950	73	582	2,350	73	463	3,050	1,130	s 9,860
13.....	3,950	632	6,740	2,250	56	340	2,300	526	3,270
14.....	3,950	321	3,420	2,150	52	302	2,650	287	2,050
15.....	3,050	268	2,210	2,100	45	255	2,650	312	2,230
16.....	2,850	76	585	2,020	42	229	2,200	248	1,470
17.....	2,750	70	520	2,150	42	244	2,760	960	s 8,520
18.....	2,550	68	468	2,100	45	255	3,050	2,090	s 16,800
19.....	2,650	67	480	2,060	45	250	2,650	724	5,180
20.....	2,650	62	444	2,300	169	1,050	2,020	288	1,570
21.....	2,500	63	425	2,300	68	422	1,840	201	998
22.....	2,450	38	251	2,060	54	300	3,220	645	s 6,180
23.....	2,400	40	259	1,880	40	203	2,950	680	s 5,580
24.....	2,400	30	194	1,880	45	228	2,550	341	2,350
25.....	2,350	34	216	1,840	--	e 500	2,020	e 250	1,360
26.....	2,500	34	230	1,740	38	179	1,740	e 140	658
27.....	2,550	36	248	1,660	32	143	1,610	106	461
28.....	2,450	31	205	1,560	30	126	3,970	949	s 11,400
29.....	2,250	24	146	1,480	30	120	3,550	1,080	s 10,600
30.....	2,350	28	178	1,480	28	112	3,550	800	s 7,730
31.....	--	--	--	1,480	26	104	--	--	--
Total.	88,000	--	25,269	71,890	--	19,203	77,620	--	137,601

e Estimated.

s Computed by subdividing day.

## SOUTH ATLANTIC SLOPE BASINS, JAMES RIVER TO SAVANNAH RIVER

## PEE DEE RIVER BASIN--Continued

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

Suspended sediment, water year October 1952 to September 1953--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.....	2,300	778	4,830	895			665		
2.....	1,740	318	1,490	955	28	75	640	12	21
3.....	1,970	327	1,740	1,190			635		
4.....	2,290	626	s 4,320	1,570			620		
5.....	2,950	1,300	s 10,400	1,920	226	991	680	50	92
6.....	3,350	819	7,410	1,390			3,400		
7.....	2,300	604	3,750	1,190			4,920	606	s 5,920
8.....	1,970	386	2,050	1,110	170	546	1,790	635	s 9,260
9.....	1,740	206	968	1,430			1,230	176	850
10.....	1,560	138	581	1,270			1,020		
11.....	1,390	88	330	1,190	92	296	888	65	184
12.....	1,350	66	241	1,030			852		
13.....	1,350	50	182	910			859		
14.....	1,270	40	137	873	35	78	873	30	68
15.....	1,230	36	120	782			789		
16.....	1,190	24	77	789			789		
17.....	1,190	30	96	789	76	211	747	21	43
18.....	1,110	28	78	1,030			747		
19.....	1,150	40	124	1,190			739		
20.....	1,560	70	295	1,610	454	s 1,990	740		
21.....	1,310	65	230	1,520	270	1,110	838	32	86
22.....	1,150	60	186	1,150			1,230		
23.....	1,190	55	177	1,030			1,150		
24.....	1,390	53	199	985	68	184	932	36	108
25.....	1,480	50	200	955			810		
26.....	1,190	35	112	895			796		
27.....	1,070	35	101	817	24	49	1,150	36	108
28.....	1,010	33	90	796			1,190		
29.....	1,000	25	68	698			1,150		
30.....	895	27	65	716			970		
31.....	859	28	65	734			--		
Total.	47,504	--	40,712	33,409	--	10,829	33,755	--	16,632

Total discharge for year (cfs-days) ..... 913,870

Total load for year (tons) ..... 779,632

s Computed by subdividing day.

## PEE DEE RIVER BASIN--Continued

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

Particle-size analyses of suspended sediment, water year October 1952 to September 1953  
 (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	Water discharge (cfs)	Water temperature (° F)	Suspended sediment												Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500		1.000
Jan. 22, 1953	11:30 a. m.	6,140		742	564		32	53	64	74	82	86	88		89		BN
Jan. 24	4:25 p. m.	7,790		503	342		26	44	58	68	78	85	96		99		BN
Feb. 15	6:20 p. m.	8,700		764	627		16	26	37	46	55	64	98		69		BN
Feb. 21	3:30 p. m.	14,600		1,130	940		21	30	48	60	72	81	97		86		BN
Feb. 22	2:35 p. m.	27,500		959	673		32	41	56	76	87	94	97		98		BN
Feb. 23	2:10 p. m.	11,700		462	372		25	36	52	66	78	88	92		95		BN
Mar. 25	9:50 a. m.	35,000		413	327		39	53	71	78	83	88	--		--		BN
Mar. 25	8:45 p. m.	27,500		282	218		44	57	68	80	84	92	96		99		BN
June 11	5:30 p. m.	5,940		1,820	1,050		46	61	80	92	96	99	--		--		BN
June 18	7:00 a. m.	7,980		2,620	1,510		42	61	76	91	95	98	--		--		BN
June 19	7:00 a. m.	2,880		1,139	845		9	16	46	87	96	97	98		--		BN
June 19	6:30 p. m.	2,370		641	433		13	32	64	90	92	94	96		--		BN

PEE DEE RIVER BASIN--Continued  
HUNTING CREEK NEAR HARMONY, N. C.

LOCATION--At gaging station at bridge on county road, three-quarters of a mile downstream from Kennedy Creek, 1 mile east of Houstonville, Iredell County, 2 miles downstream from U. S. Highway 21, and 3 miles northeast of Harmony.

DRAINAGE AREA--153 square miles.

RECORDS AVAILABLE--Chemical analyses: October 1952 to September 1953.

REMARKS--Records of discharge for water year October 1952 to September 1953 given in WSP 1273.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 15, 1952	74	13	0.06	3.5	0.9	2.1	1.2	17	1.5	2.5	0.1	0.2	36	12	0	31.9	6.3	7
Nov. 17	81	13	.03	2.2	.7	3.3		14	1.6	1.6	.1	.0	30	8	0	31.9	7.3	9
Dec. 16	104	13	.08	2.4	.7	3.4		14	2.2	1.5	.1	.3	30	9	0	28.4	7.8	13
Jan. 15, 1953	94	11	.17	2.3	.9	2.2	1.1	13	2.1	1.8	.1	.4	31	9	0	29.1	7.1	3
Feb. 15	496	7.3	.13	2.0	.9	3.1		10	2.6	2.4	.1	1.0	26	9	1	29.6	6.1	14
Mar. 17	346	9.1	.05	2.3	1.0	2.9		11	3.3	2.2	.1	1.5	28	10	1	26.7	6.7	7
Apr. 16	181	11	.09	2.4	1.1	2.3	1.1	14	1.5	2.0	.0	.3	28	10	0	28.9	6.7	4
May 15	108	12	.06	2.4	.3	5.3		15	1.4	2.5	.1	1.6	35	7	0	40.8	6.8	11
June 15	160	8.8	.05	2.6	.6	4.5		14	2.1	2.5	.1	1.6	33	9	0	30.0	6.0	40
July 15	85	8.8	.04	2.3	.6	2.7	1.1	14	1.2	2.0	.1	1.2	31	8	0	32.9	6.2	18
Aug. 16	61	12	.05	2.4	.8	4.7		17	2.1	2.0	.1	.4	32	9	0	34.8	7.0	6
Sept. 20	58	10	.05	2.5	.9	3.5	1.3	15	2.1	1.9	.0	.3	32	10	0	33.2	6.7	7



## PEE DEE RIVER BASIN--Continued

LITTLE PEE DEE RIVER NEAR DILLON, S. C.

LOCATION.--At gaging station at bridge on State Highway 9, 1.1 miles east of Dillon, Dillon County, and 3 miles upstream from Maple Swamp.  
 DRAINAGE AREA.--324 square miles.  
 RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1953.  
 REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1273.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on rapid filtration at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
														Calcium, mg./l.	Non-carbonate, mg./l.				Unfiltered	Filtered
Oct. 16, 1952	262	9.7	0.18	1.9	0.8	3.3	0.6	4	2.5	6.8	0.0	0.2	49	8	5	38.4	5.4	110	14	11
Nov. 15	262	8.6	0.16	1.6	0.7	5.5		7	3.1	6.8	0.0	0.2	46	7	1	40.0	6.6	85	15	11
Dec. 15	371	8.8	0.12	2.0	0.8	4.5		5	3.3	7.4	0.0	0.2	a 50	8	4	40.4	5.6	100	19	12
Jan. 15, 1953	443	5.2	0.19	1.6	0.7	3.3	0.8	4	3.4	6.6	0.0	0.1	45	7	4	41.3	5.5	120	22	15
Feb. 16	645	2.8	0.20	1.4	0.7	4.5		4	2.7	7.1	0.0	0.2	44	6	3	53.1	5.4	100	16	13
Mar. 15	1,920	2.4	0.09	2.4	1.0	3.4		4	4.7	6.5	0.0	0.3	b 42	10	7	43.0	5.3	80	14	13
Apr. 15	432	2.8	0.19	2.2	0.8	3.1	1.0	6	1.9	6.4	0.0	0.4	c 45	9	4	37.4	5.7	90	17	16
May 15	785	4.7	0.14	1.6	0.7	3.7		5	1.5	6.2	0.0	0.6	60	7	3	37.9	5.5	135	--	--
June 15	818	7.7	0.10	1.8	0.7	4.1		5	3.6	5.8	0.0	0.3	d 57	7	3	43.0	5.2	140	--	--
Aug. 14	210	11	0.10	2.0	1.1	3.1	1.0	5	7.3	5.5	0.0	0.2	56	10	5	46.8	5.2	65	16	13
Sept. 15	218	7.9	0.10	1.4	0.7	3.7	1.3	4	4.4	5.8	0.0	0.1	55	6	3	53.4	5.6	70	19	13

a Large proportion of organic matter present; sum of mineral constituents 30 ppm.

b Large proportion of organic matter present; sum of mineral constituents 23 ppm.

c Large proportion of organic matter present; sum of mineral constituents 22 ppm.

d Large proportion of organic matter present; sum of mineral constituents 27 ppm.

## PEE DEE RIVER BASIN--Continued

## MISCELLANEOUS ANALYSES OF STREAMS IN PEE DEE RIVER BASIN IN NORTH CAROLINA AND SOUTH CAROLINA

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro- mhos at 25°C)	pH	Color
														Calcium, mg- nesium	Non- carbon- ate			
ELK CREEK AT ELKVILLE, N. C.																		
Nov. 7, 1952	18.4							16	1	1.5				10	0	32.1	6.6	
Apr. 10, 1953	77.4							15	1	2.0				9	0	28.7	6.5	
July 12	25.6							16	1	1.5				10	0	33.2	6.7	
MIDDLE FORK REDDIES RIVER AT WILBAR N. C.																		
Nov. 3, 1952	10.6							14	1	1.2				11	0	25.3	6.6	
Apr. 9, 1953	38.3							11	1	1.5				8	0	25.0	6.7	
July 20	14.4							12	1	1.0				5	0	24.3	6.3	
Sept. 3	10.7							12	2	1.2				6	0	27.7	6.3	
ROARING RIVER NEAR ROARING RIVER, N. C.																		
Nov. 4, 1952	65.5							14	1	1.2				8	0	29.4	6.8	
Apr. 15, 1953	184							13	2	1.5				9	0	31.4	6.4	
July 20	76.0							16	1	1.0				7	0	29.5	6.7	
Sept. 3	44.7							18	4	2.8				11	0	41.4	7.3	
MITCHELL RIVER NEAR MOUNTAIN PARK, N. C.																		
Nov. 4, 1952	20.6							14	1	1.0				10	0	28.1	6.2	
Apr. 15, 1953	67.4							10	2	1.2				8	0	21.7	6.4	
July 28	23.0							12	1	1.8				11	1	24.2	6.1	
STEWART CREEK NEAR MOUNT AIRY, N. C.																		
Nov. 4, 1952	49.3							16	1	1.2				10	0	31.6	6.7	
Jan. 6, 1953	81.5							17	1	1.2				10	0	29.6	7.2	
Apr. 15	145							10	5	1.8				11	3	28.6	6.7	
July 28	55.4							14	1	2.0				10	0	30.9	6.5	
MUDDY CREEK NEAR CLEMMONS, N. C.																		
Dec. 17, 1952	45.9							39	4	3.0				33	1	83.0	6.7	
Apr. 16, 1953	91.6							34	5	2.5				23	0	76.3	6.7	
July 14	36.2							47	4	2.8				32	0	95.4	7.2	



## PEE DEE RIVER BASIN--Continued

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

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Cal- cium (Ca)	Mag- nesium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conduct- ance (micro- mhos at 25°C)	pH	Color
														Calcium,	Non- carbon- ate			
CIDDLE CREEK NEAR CONCORD, N. C.																		
Oct. 29, 1952 .....	12.9							50	3	2.8				33	0	93.2	7.2	
Sept. 1, 1953 .....	8.05							38	4	2.5				24	0	78.9	6.8	
ROCKY RIVER NEAR CONCORD, N. C.																		
Oct. 30, 1952 .....	--							294	6	56				49	0	666	7.3	
Sept. 2, 1953 .....	45.6							356	28	78				52	0	820	7.4	
LITTLE RIVER NEAR STAR, N. C.																		
Oct. 28, 1952 .....	26.4							35	2	2.8				22	0	68.3	7.1	
Apr. 29, 1953 .....	76.6							30	2	2.5				18	0	57.6	6.9	
Aug. 27 .....	7.18							24	5	3.8				16	0	62.0	6.4	
CARTEDGE CREEK NEAR ROCKINGHAM, N. C.																		
Oct. 30, 1952 .....	4.03							21	2	5.0				15	0	56.4	6.6	
Apr. 29, 1953 .....	14.3							16	2	4.0				12	0	44.2	6.6	
Aug. 28 .....	1.38							28	2	5.2				20	0	69.9	7.0	
FALLING CREEK NEAR ROCKINGHAM, N. C.																		
Oct. 30, 1952 .....	4.22							4	1	2.0				4	1	19.9	6.0	
Apr. 30, 1953 .....	5.40							4	2	4.2				6	3	25.1	5.5	
Aug. 28 .....	2.67							3	1	2.8				4	2	18.3	5.9	
SOUTH FORK JONES CREEK NEAR MORVEN, N. C.																		
Oct. 29, 1952 .....	8.07							21	1	5.8				15	0	64.2	6.7	
Aug. 28, 1953 .....	.58							30	1	5.8				6	0	72.1	6.8	

## CEDAR CREEK AT SOCIETY HILL, S. C.

Apr. 24, 1953 .....	63.7	2.8	0.07	1.6	0.4	1.5	3	1.6	3.2	0.0	0.5	23	6	3	17.6	5.5	19
June 23 .....	40.9	5.4	.03	1.0	.5	8.3	19	1.2	3.5	.0	.8	27	4	0	24.3	5.2	40

## PEE DEE RIVER NEAR SOCIETY HILL, S. C.

Apr. 24, 1953 .....	5,420	9.0	0.03	3.4	0.8	7.8	16	8.7	3.8	0.0	1.4	45	12	0	83.7	6.5	27
June 12 .....	6,040	8.0	.02	3.6	1.1	5.9	19	4.0	4.2	.0	1.0	54	14	0	59.0	6.5	20

## LITTLE LYNCHES RIVER NEAR BETHUNE, S. C.

Mar. 18, 1953 .....	253	9.5	0.15	2.8	1.2	5.0	5	13	3.6	0.0	0.2	45	12	8	51.7	5.8	17
June 23 .....	98.0	8.7	.02	1.9	.4	3.4	3	5.3	3.5	.0	1.0	34	6	4	36.2	5.3	33

## LYNCHES RIVER NEAR BISHOPVILLE, S. C.

Apr. 24, 1953 .....	a 510	7.9	0.02	1.8	0.5	5.0	10	3.0	4.0	0.0	0.7	33	7	0	39.3	6.0	29
June 12 .....	a 350	11	.03	3.0	.9	1.6	7	2.9	3.8	.0	.8	34	11	5	34.6	6.0	12

## LYNCHES RIVER AT EFFINGHAM, S. C.

Dec. 31, 1952 .....	a 685	9.2	0.07	2.6	0.9	4.6	8	5.0	5.8	0.0	0.4	39	10	4	42.3	6.3	20
Mar. 31, 1953 .....	a 1,420	6.2	.47	2.8	1.0	4.8	10	3.8	6.4	.0	.3	46	11	3	49.9	6.1	60
Apr. 30 .....	a 487	7.0	.02	3.2	.6	4.2	11	3.0	4.8	.1	.5	36	10	1	41.3	6.1	22
June 1 .....	a 295	9.8	.08	3.8	.8	1.8	7	3.1	4.8	.0	.9	47	13	7	49.6	5.8	38

## GUN SWAMP CREEK NEAR LAURINBURG, N. C.

Oct. 31, 1952 .....	31.3					3.2	4	2	2.5		0.1	18	4	1	15.3	5.9	
Apr. 29, 1953 .....	46.4	3.0	0.07	1.0	0.3		5	2.4	2.5				4	0	16.1	6.3	45
Aug. 28 .....	28.6						5	1	2.2				3	0	16.4	5.9	

a Mean discharge.



## SANTEE RIVER BASIN

INDIAN CREEK NEAR LABORATORY, N. C.

LOCATION.--Temperature recorder at gaging station on left bank 250 feet upstream from remain of Rudisill Mill dam,  $\frac{1}{2}$  mile upstream from county highway bridge  $1\frac{1}{2}$  miles upstream from mouth,  $1\frac{1}{2}$  miles south of Laboratory, Lincoln County, and  $3\frac{1}{2}$  miles south of Lincolnton.

**DRAINAGE AREA.**--68.4 square miles.

WATER TEMPERATURES: January 15 to September 30, 1953.

EXTREMES.--Water temperatures: Maximum 84°F Aug 1, 2, 5.

REMARKS. --Records of discharge for water year October 1952 to September 1953 given in WSP 1273.

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.....									50	46	49	45	64	55	69	62	78	72	82	75	84	76	80	71
2.....									49	46	47	44	64	58	69	66	74	67	84	75	84	76	81	74
3.....									47	44	44	43	62	56	68	66	72	64	82	75	80	75	79	74
4.....									49	47	49	43	62	56	69	66	74	66	79	74	80	77	78	74
5.....									49	42	49	46	61	56	72	67	76	67	80	75	84	76	74	73
6.....									44	43	50	45	60	56	71	68	76	72	82	76	82	76	73	68
7.....									48	44	50	46	63	56	68	65	76	72	83	75	79	76	71	65
8.....									48	46	52	48	63	56	67	64	77	74	80	74	80	74	72	64
9.....									47	43	51	46	66	57	66	62	77	74	80	74	79	73	71	64
10.....									47	44	48	45	68	63	69	61	78	73	78	73	78	70	69	62
11.....									47	46	48	47	67	60	70	63	74	71	74	68	78	70	70	62
12.....									50	47	49	47	64	60	71	64	76	71	74	67	78	70	73	65
13.....									49	44	56	49	61	59	72	66	76	73	73	66	78	71	70	67
14.....									45	42	57	51	59	53	73	67	75	71	74	67	80	70	67	59
15.....								46	43	45	44	59	57	58	74	68	73	69	73	70	80	71	69	60
16.....								49	45	45	42	59	54	60	55	73	68	70	68	78	71	79	72	73
17.....								49	48	47	45	57	51	59	52	71	68	77	70	78	71	75	73	72
18.....								53	49	--	--	54	59	57	72	69	76	73	75	72	75	72	67	65
19.....								52	46	--	--	61	56	61	57	71	68	77	71	79	72	74	70	68
20.....								48	44	47	46	58	51	59	52	70	65	78	73	81	74	72	69	67
21.....								50	48	52	48	56	52	56	49	72	66	80	74	81	74	74	68	72
22.....								50	46	52	50	52	59	51	75	69	77	71	78	75	74	69	70	65
23.....								49	47	--	--	46	55	52	66	57	78	71	79	73	80	74	75	69
24.....								49	48	47	46	61	54	69	61	79	74	78	73	79	71	76	68	63
25.....								48	44	48	46	60	53	68	64	80	74	78	72	77	72	75	69	62
26.....								44	41	52	48	53	49	67	64	90	73	79	73	78	71	76	68	63
27.....								45	42	51	46	54	47	65	59	78	73	80	75	78	71	77	69	66
28.....								48	43	50	48	53	50	62	55	75	67	80	75	81	73	77	69	63
29.....								47	43	--	--	54	49	66	58	71	64	79	75	81	73	79	68	62
30.....								44	41	--	--	56	48	66	63	77	69	81	74	83	76	78	70	67
31.....								46	43	--	--	56	54	--	--	78	71	--	--	82	75	78	71	--
Average.....								--	--	48	45	54	49	63	57	72	67	77	72	79	72	78	71	70

SANTEE RIVER BASIN--Continued  
BUFFALO CREEK NEAR BLACKSBURG, S. C.

LOCATION.--At bridge on State Highway 5, 1½ miles northeast of Blacksburg, Cherokee County, and 1½ miles above mouth.  
DRAINAGE AREA.--176 square miles.  
RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1953.  
REMARKS.--Records of discharge for water year October 1952 to September 1953 available in district office at Columbia, S. C.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		pH	Color	Oxygen consumed	
														Calcium, mg-nestum	Non-carbonate			Unfiltered	Filtered
Oct. 15, 1952	91.1	16	0.13	4.3	1.5	6.2	1.2	24	2.8	6.8	0.1	0.6	53	17	0	68.9	6	2.5	1.8
Nov. 17	94.2	16	.06	3.9	1.4	8.6	8.6	26	3.0	6.5	.1	.6	52	16	0	70.1	5	2.2	1.5
Dec. 15	97.8	16	.08	4.2	1.5	7.0	7.0	23	3.3	6.2	.1	.6	52	17	0	68.1	16	3.4	2.0
Jan. 15, 1953	186	14	.27	4.0	1.4	5.1	2.7	20	4.0	5.5	.1	1.1	50	16	0	63.0	4	4.8	2.6
Feb. 17	312	13	.07	4.0	1.6	5.5	5.5	18	5.1	5.1	.1	1.2	46	17	2	58.8	5	8.4	2.5
Mar. 13	255	13	.07	3.8	1.4	5.0	5.0	19	4.5	4.9	.1	1.1	44	15	0	61.1	6.4	7	2.6
Apr. 16	171	14	.03	3.5	1.5	4.9	1.0	21	3.4	5.6	.1	.4	44	15	0	61.3	6.5	4	2.0
May 15	125	15	.06	3.2	1.7	8.0	8.0	24	2.7	6.0	.1	1.6	54	15	0	77.7	6.8	18	1.9
June 12	206	12	.04	3.2	.9	6.8	6.8	17	4.8	4.2	.1	1.6	42	12	0	70.1	6.2	18	--
July 16	70.2	15	.07	4.5	1.5	7.5	7.5	25	4.3	5.2	.1	1.4	52	17	0	75.0	6.5	8	--
Aug. 14	43.3	15	.02	3.6	1.1	10	10	25	2.4	8.2	.2	.5	53	14	0	86.6	6.9	6	5.4
Sept. 16	50.8	12	.03	3.6	1.4	7.9	2.2	24	3.0	7.4	.1	.5	50	15	0	76.5	6.9	3.0	2.6



SANTÉE RIVER BASIN--Continued  
PACOLET RIVER NEAR FINGERVILLE, S. C.

LOCATION.--At bridge on State Highway 55, 100 feet downstream from gaging station, a quarter of a mile downstream from confluence of North Pacolet and Rivers and 2½ miles southeast of Fingerville, Spartanburg County.

DRAINAGE AREA.--12 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1953.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
													Calcium	Non-carbonate				Unfiltered	Filtered
Oct. 18, 1952	129	13	0.03	2.6	1.0	8.0	0.9	27	2.8	2.5	0.1	0.5	42	11	54.7	7.3	26	2.7	2.2
Nov. 22	187	14	.09	2.6	1.0	7.1		24	2.7	2.2	.1	.4	44	11	54.4	7.0	19	3.2	1.8
Dec. 17	194	12	.08	2.6	1.0	5.5		19	3.1	2.2	.1	.6	37	11	44.0	6.9	7	3.8	2.1
Jan. 22, 1953	322	12	.08	2.0	.8	3.8	2.0	17	2.9	2.2	.1	.6	34	8	57.2	6.6	5	3.7	1.9
Feb. 17	800	12	.09	2.6	1.0	5.6		18	3.4	2.4	.1	.9	36	11	43.2	6.4	4	2.4	2.4
Mar. 18	328	13	.03	3.0	1.3	5.8		22	3.4	2.2	.1	.5	38	13	59.6	6.5	19	4.0	2.1
Apr. 15	245	13	.17	2.6	1.1	5.0	.9	23	2.8	2.1	.1	.5	39	11	49.9	6.9	9	4.8	2.4
May 25	198	12	.08	2.4	1.0	6.3		21	2.0	2.5	.1	1.0	36	10	41.4	6.6	25	--	--
June 16	545	10	.03	2.6	.9	4.5		16	3.7	1.8	.0	.7	34	10	39.3	6.1	4	15	2.9
July 13	141	14	.02	2.9	1.0	9.8		36	3.0	3.0	.0	.6	52	11	69.8	6.7	7	--	--
Aug. 13	96	14	.02	2.7	1.3	7.9		27	2.8	2.5	.0	.8	51	12	78.1	6.7	16	--	--
Sept. 16	69	11	.06	2.4	1.0	9.5	1.3	30	4.0	2.8	.0	.4	50	10	66.4	7.1	8	4.9	3.8

SANTÉE RIVER BASIN

SANTEE RIVER BASIN--Continued  
SOUTH TYGER RIVER NEAR WOODRUFF, S. C.

LOCATION.--At gaging station at Chesnee Shoals, 0.5 mile upstream from confluence with North Tyger River and 5½ miles east of Woodruff, Spartanburg County.  
DRAINAGE AREA.--174 square miles.  
RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1953.  
REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1273.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO <sub>3</sub>		pH	Color	Oxygen consumed	
														Calcium	Non-carbonate			Unfiltered	Filtered
Oct. 15, 1952	96	14	0.10	2.4	1.0	4.8	1.3	20	2.1	3.2	0.1	0.9	39	10	0	6.5	8	2.7	2.5
Nov. 15	107	17	.08	3.8	1.4	5.4		24	2.3	2.9	.1	.7	45	15	0	53.3	5	2.3	1.5
Dec. 15	98	15	.04	3.2	1.2	5.2		21	2.3	2.5	.1	1.2	41	13	0	47.6	6	2.7	2.0
Jan. 15, 1953	170	12	.05	3.0	1.1	2.8	1.6	15	3.6	2.5	.1	1.2	38	12	0	42.5	4	3.9	2.5
Feb. 15	754	6.3	.04	2.4	1.0	2.6		9	3.5	2.1	.2	1.7	30	10	3	35.7	6	9.7	3.4
Mar. 15	234	12	.03	3.7	1.4	3.4		17	3.2	2.4	.1	1.9	37	15	1	45.3	5	8.8	3.6
Apr. 27	81	15	.09	3.8	1.7	3.9	1.4	24	2.3	2.9	.1	.8	42	16	0	51.3	4	2.2	1.8
May 15	133	13	.13	2.4	1.2	6.3		20	1.7	3.5	.1	1.7	41	11	0	47.0	6	--	--
June 15	224	12	.04	2.5	1.2	5.3		16	4.8	2.5	.1	1.0	37	11	0	39.4	6	8.8	1.5
July 15	79	12	.11	2.9	1.2	3.7	1.4	19	1.7	3.2	.1	1.0	40	12	0	55.1	8	2.6	1.6
Aug. 15	46	14	.02	3.7	.6	7.5		24	1.9	4.0	.0	.8	50	12	0	58.5	6	3.4	1.7
Sept. 15	65	6.0	.01	3.2	1.2	5.3	1.9	19	3.0	3.0	.0	1.2	36	13	0	50.3	5	4.6	2.2

SANTÉE RIVER BASIN--Continued  
MISCELLANEOUS ANALYSES OF STREAMS IN SANTÉE RIVER BASIN IN NORTH CAROLINA AND SOUTH CAROLINA

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
CURTIS CREEK NEAR OLD FORT, N. C.																		
Nov. 4, 1952	7.07							16	3	0.8				14	1	33.7	7.0	
Feb. 3, 1953	25.1							8	5	1.2				7	0	24.8	5.8	
May 4	19.8							10	2	.8				11	3	23.3	6.3	
June 2	10.6							21	2	1.2				7	0	25.3	6.5	
Aug. 10	6.21							11	2	.5				6	0	25.2	6.6	
NORTH FORK CATAWBA RIVER AT PITTS, N. C.																		
May 4, 1953	42.7							23	3	1.2				22	4	47.0	6.7	
June 2	12.0							36	1	1.0				30	0	68.5	6.9	
MUDDY CREEK AT BRIDGEWATER, N. C.																		
Nov. 14, 1952	64.0							44	3	10				22	0	112	7.2	
Apr. 10, 1953	121							21	3	5.0				14	0	58.7	7.1	
July 20	53.9							23	1	3.2				11	0	53.0	6.4	
SILVER CREEK NEAR GLEN ALPINE, N. C.																		
Nov. 14, 1952	15.1							23	3	1.2				13	0	45.5	6.8	
Apr. 10, 1953	27.5							21	2	1.2				14	0	41.4	6.6	
July 20	15.1							24	1	1.8				12	0	46.2	7.0	
JOHNS RIVER AT COLLETTSVILLE, N. C.																		
Nov. 7, 1952	19.9							16	2	0.8				11	0	31.4	6.8	
Apr. 10, 1953	104							12	2	1.5				7	0	30.6	6.4	
July 16	32.7							15	2	1.2				9	0	33.5	6.6	

## SANTÉE RIVER BASIN--Continued

## MISCELLANEOUS ANALYSES OF STREAMS IN SANTÉE RIVER BASIN IN NORTH CAROLINA AND SOUTH CAROLINA--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
LOWER CREEK AT LENOIR, N. C.																		
Nov. 7, 1952.....	5.36							33	1	2.2				22	0	63.3		6.7
Apr. 10, 1953.....	12.3							29	4	3.2				20	0	61.3		6.6
July 16.....	4.89							33	2	1.5				21	0	63.9		6.7
Sept. 18.....	3.99							33	3	2.2				20	0	63.0		7.2
LOWER LITTLE RIVER NEAR ALL HEALING SPRINGS, N. C.																		
Oct. 30, 1952.....	11.3	13	0.08	2.6	1.0	3.1		16	2.0	1.4	0.0	0.1	31	11	0	35.0	6.5	8
Apr. 26, 1953.....	23.1							16	1	1.5				12	0	33.3	6.5	
LOWER LITTLE RIVER NEAR TAYLORSVILLE, N. C.																		
Nov. 24, 1952.....	34.7							16	2	1.8				12	0	31.8	7.4	
Mar. 19, 1953.....	89.0							14	2	2.0				12	1	39.5	6.5	
LYLE CREEK AT CATAWBA, N. C.																		
Dec. 18, 1952.....	35.6							34	2	2.8				28	0	69.4	6.6	
May 27, 1953.....	46.7							34	1	3.2				23	0	82.7	6.1	
DAVIDSON CREEK NEAR CORNELIUS, N. C.																		
Oct. 2, 1952.....	6.97							47	4	2.5				33	0	91.4	6.9	
Apr. 9, 1953.....	25.3							42	5	2.8				31	0	86.7	6.9	
July 17.....	6.02							48	5	3.5				33	0	97.0	7.1	
Sept. 3.....	3.30							49	3	3.0				32	0	94.9	7.2	

## DUTCHEMANS CREEK NEAR STANLEY, N. C.

Oct. 1, 1952 .....	33.1					35	1	1.5				24	0	66.9	7.0
Apr. 9, 1953 .....	84.6					34	3	2.5				22	0	84.1	6.8
July 17 .....	27.3					34	3	2.0				22	0	66.3	6.7
Sept. 3 .....	27.3					32	2	1.8				19	0	63.4	7.0

## JACOB FORK NEAR STARTOWN, N. C.

Nov. 18, 1952 .....	58.4					13	3	1.8				9	0	29.5	7.4
Apr. 10, 1953 .....	130					13	1	1.5				9	0	27.3	6.7
July 20 .....	51.9					13	2	1.2				9	0	30.9	6.5

## CLARK CREEK AT LINCOLNTON, N. C.

Oct. 20, 1952 .....	36.8					37	4	6.8				24	0	93.0	6.8
Apr. 10, 1953 .....	75.8					28	4	9.8				26	3	102	6.5
July 22 .....	30.7					50	3	37				28	0	215	6.9
Sept. 2 .....	24.7					42	1	41				27	0	231	7.0

## CROWDERS CREEK NEAR GASTONIA, N. C.

Dec. 18, 1952 .....	31.7					42	8	8.8				26	0	124	6.8
Apr. 10, 1953 .....	26.6					31	5	7.8				23	0	114	6.5
July 22 .....	29.2					60	21	14				26	0	174	7.1

## MCALPINE CREEK NEAR PINEVILLE, N. C.

Oct. 2, 1952 .....	11.6					61	5	4.8				52	2	118	6.8
Apr. 10, 1953 .....	34.1					63	3	5.2				50	0	129	6.8
July 17 .....	2.22					84	4	3.0				60	0	160	7.4
Sept. 3 .....	1.05					67	5	4.5				48	0	134	7.1

SANTÉE RIVER BASIN--Continued  
MISCELLANEOUS ANALYSES OF STREAMS IN SANTÉE RIVER BASIN IN NORTH CAROLINA AND SOUTH CAROLINA--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953—Continued

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Cal- cium (Ca)	Mag- nesium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conduct- ance (micro- mhos at 25°C)	pH	Color	
														Calcium	Non- carbon- ates				
TWELFEMILE CREEK NEAR WAXHAW, N. C.																			
Oct. 2, 1952	3.30							47	4	5.0					34	0	99.5	7.0	
Apr. 9, 1953	24.4							45	5	5.5					34	0	96.7	7.0	
July 17, 1953	.95							43	3	4.0					23	0	91.1	6.5	
Sept. 3	1.22							30	4	3.2					23	0	66.9	6.6	
COVE CREEK NEAR LAKE LURE, N. C.																			
Nov. 5, 1952	43.9							22	1	1.2					12	0	37.5	6.7	
Feb. 4, 1953	70.1							18	1	1.0					14	0	35.0	6.7	
May 5	197							13	6	1.0					11	0	33.0	6.1	
June 3	50.1							18	1	1.5					10	0	35.9	6.5	
MOUNTAIN CREEK NEAR RUTHERFORDTON, N. C.																			
Nov. 5, 1952	28.6							28	1	1.5					18	0	48.6	7.0	
Feb. 4, 1953	44.7							26	1	2.2					25	4	53.5	7.0	
June 3	26.6							25	1	1.5					16	0	48.4	6.7	
SECOND BROAD RIVER AT BOSTIC, N. C.																			
Nov. 17, 1952	112							32	5	12					16	0	108	6.9	
July 14, 1953	60.4							35	10	16					16	0	130	6.8	
Sept. 2	40.4							38	5	9.8					16	0	112	6.8	
FIRST BROAD RIVER NEAR CASAR, N. C.																			
Nov. 17, 1952	35.5							19	2	1.8					14	0	38.1	6.7	
May 5, 1953	56.2							20	4	1.8					13	0	42.2	6.1	
July 14	21.2							19	1	4.2					13	0	40.0	6.8	

## BUFFALO CREEK NEAR WACO, N. C.

Dec. 17, 1952.....	24.0					19	1	1.8			17	1	43.2	6.9
Apr. 10, 1953.....	43.2					27	2	3.0			15	0	56.9	6.3
July 22.....	11.3					23	5	4.0			19	0	62.7	7.2

## BROAD RIVER NEAR GAFFNEY, S. C.

Jan. 15, 1953.....	a2,140	13	0.12	3.0	1.0	4.5	13	3.3	2.9	0.0	0.9	38	12	0	44.1	6.6	4
Apr. 16.....	a1,920	7.9	.02	2.8	1.1	6.1	17	2.1	5.5	.0	1.0	44	11	0	42.4	6.2	8
June 23.....	a1,380	14	.04	3.5	.9	5.8	18	3.3	4.0	.0	1.6	46	13	0	58.5	6.9	8

## BULLOCK CREEK NEAR SHARON, S. C.

Oct. 15, 1952.....	12.5	24	0.04	6.8	2.4	7.1	40	3.7	3.5	0.1	0.5	68	27	0	86.0	6.5	8
Apr. 16, 1953.....	49.8	16	.04	6.5	2.5	7.6	40	4.1	3.8	.1	.4	67	26	0	83.9	6.6	7
June 12.....	40.5	20	.03	6.0	1.7	6.4	34	3.2	2.8	.1	.7	50	22	0	76.7	6.5	13

## NORTH PACOLET RIVER NEAR TRYON, N. C.

Nov. 5, 1952.....	33.6						b86	6	2.5			18	0	154	9.7	
Feb. 4, 1953.....	52.8						c84	5	2.5			15	0	132	9.2	
June 3.....	42.2						d76	6	3.0			12	0	150	9.5	

## NORTH TYGER RIVER NEAR MOORE, S. C.

Jan. 14, 1953.....	a229	11	0.09	2.4	0.9	40	80	17	7.2	0.1	2.7	123	10	0	193	7.1	11
Apr. 16.....	a188	15	.16	3.6	.9	55	120	20	9.0	.0	.6	180	13	0	266	7.0	25
June 25.....	a104	13	.02	3.0	.6	68	142	24	10	.0	2.8	201	10	0	323	7.0	7

a Mean discharge.

b Includes equivalent of 38 parts per million of carbonate (CO<sub>3</sub>).c Includes equivalent of 18 parts per million of carbonate (CO<sub>3</sub>).d Includes equivalent of 30 parts per million of carbonate (CO<sub>3</sub>).

SANTEE RIVER BASIN--Continued  
MISCELLANEOUS ANALYSES OF STREAMS IN SANTEE RIVER BASIN IN NORTH CAROLINA AND SOUTH CAROLINA--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
ENOREE RIVER NEAR ENOREE, S. C.																		
Jan. 14, 1953.....	a 373	12	0.04	2.6	1.0	6.6		14	4.2	3.0	0.0	1.2	42	11	0	50.8	7.5	6
June 25.....	a 162	16	.08	3.5	1.0	11		29	5.1	4.0	.1	1.8	68	13	0	80.3	6.6	9
SALUDA RIVER AT CHAPPELLE, S. C.																		
May 4, 1953.....	a 3,580	11	0.02	2.6	0.7	9.3		23	4.4	3.8	0.1	1.0	46	10	0	85.0	6.4	7
June 3.....	a 1,380	8.6	.04	3.6	1.6	7.9		27	3.9	4.2	.1	.6	50	10	0	68.6	6.6	17
CONGAREE RIVER AT COLUMBIA, S. C.																		
Mar. 30, 1953.....	a 7,840	11	0.03	4.0	1.5	7.9		25	5.4	4.0	0.4	0.6	46	16	0	114	7.1	6
May 13.....	a 5,500	14	.02	4.0	1.8	8.3		27	4.9	4.0	.6	1.2	55	17	0	79.0	6.5	16
June 17.....	a 5,390	12	.03	4.8	.5	7.2		19	5.7	3.5	.9	1.0	52	14	0	66.4	6.4	7
CONGAREE CREEK NEAR CAYCE, S. C.																		
Apr. 2, 1953.....	a 142	3.9	0.10	1.4	0.3	1.9		4	1.9	2.2	0.1	0.3	17	5	1	18.5	5.4	20
June 17.....	a 147	4.4	.03	1.0	.3	1.7		3	.9	2.5	.0	.6	22	4	1	16.8	5.6	9
Aug. 20.....	a 179	9.7	.08	1.4	.9	18		12	2.7	23	.0	.4	65	7	0	105	6.5	20
Sept. 24.....	a 129	5.3	.15	.9	.2	1.4		3	.4	2.2	.0	.2	15	3	1	20.7	5.7	10
GILLS CREEK NEAR COLUMBIA, S. C.																		
Apr. 2, 1953.....	30.8	5.6	0.15	4.2	1.6	5.5		22	7.9	10	00.1	6.0	63	17	15	88.3	5.0	20
June 17.....	44.3	3.2	.02	4.6	2.2	17		29	7.9	18	.1	.2	76	21	0	144	6.1	15

Mean discharge.

a Mean discharge.



SAVANNAH RIVER BASIN  
MISCELLANEOUS ANALYSES OF STREAMS IN SAVANNAH RIVER BASIN IN SOUTH CAROLINA  
Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Cal- cium (Ca)	Mag- nesium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conduct- ance (micro- mhos at 25°C)	pH	Color
														Calcium mag- nesium	Non- carbon- ate			
SENECA RIVER AT CLEMSON																		
Nov. 5, 1952 .....	462	14	0.04	2.4	1.0	3.3		17	1.0	1.5	0.0	0.2	32	10	0	40.7	6.3	4
June 3, 1953 .....	756	12	.03	1.6	1.2	3.8		15	.9	2.0	.1	1.1	31	9	0	30.8	6.5	2

## PART 2B. SOUTH ATLANTIC SLOPE AND EASTERN GULF OF MEXICO BASINS, OGEECHEE RIVER TO PEARL RIVER

## ST. JOHNS RIVER BASIN

## MISCELLANEOUS ANALYSES OF STREAMS IN ST. JOHNS RIVER BASIN IN FLORIDA

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO <sub>3</sub> )	Bo- ron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO <sub>3</sub>		Per- cent sod- ium	So- ad- sorp- tion ratio	Specific conduct- ance (micro- mhos at 25°C)	Col- or pH	
														Parts per mil- lion	Tons per acre- foot	Calcium, magnesium	Non- carbon- ate					
ST. JOHNS RIVER NEAR MELBOURNE																						
Dec. 18, 1952 ...	950	2.4	0.13	7.9	1.3	9.5	0.6	19	4.0	21	0.0	0.2		109			25	10		104	6.2	110
Mar. 27, 1953 ...	138	3.7	.14	8.3	1.8	12	.6	22	29	26	.2	.2		118			28	10		131	6.8	100
June 23 .....	a 55	2.4	.11	8.7	2.0	12	.5	25	1.0	25	.1	.1		114			30	9		127	6.6	100
ST. JOHNS RIVER NEAR CHRISTMAS																						
Dec. 18, 1952 ...	1,700	0.9	0.22	13	2.7	23	0.6	22	2.0	52	0.0	0.1		189			44	26		230	6.6	120
Mar. 27, 1953 ...	726	4.2	.20	37	19	150	3.1	26	74	282	.1	.6		739			170	149		1,120	7.0	110
June 23 .....	202	.7	.07	27	9.9	78	1.5	33	33	150	.1	.5		481			108	81		637	6.9	80

a Estimated.

## LAKE OKEECHOBEE AND THE EVERGLADES

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

Chemical analyses in parts per million, water year October 1952 to September 1953

Date of collection	Discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (Sum)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro- mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			

## KISSIMMEE RIVER BELOW LAKE KISSIMMEE

Dec. 22, 1952.....	1,230	1.7	0.12	5.2	1.2	4.8	0.4	14	6.2	9.8	0.0	0.3	874	18	6	63.8	6.6	80
Mar. 24, 1953.....	973	3.0	.12	4.6	1.6	5.7	.3	15	5.8	10	.1	.2	872	18	6	71.9	6.7	90
June 15.....	836	.9	.09	4.8	1.9	6.5	.3	16	7.2	12	.1	.0	877	20	7	77.4	7.1	65

## KISSIMMEE RIVER NEAR OKEECHOBEE

Dec. 22, 1952.....	2,220	1.9	0.12	4.4	1.8	5.1	0.4	10	6.2	11	0.1	0.1	877	18	10	66.1	6.0	90
Mar. 24, 1953.....	1,590	2.8	.17	6.0	1.1	6.3	.3	15	5.8	10	.1	.3	879	19	7	71.3	6.6	110
June 15.....	1,440	2.2	.10	4.8	1.7	5.7	.2	15	7.0	10	.2	.3	871	19	7	70.5	7.1	90

## WEST PALM BEACH CANAL AT CANAL POINT

Oct. 17, 1952.....	438	130		57	8.3	216		512	202	280		6.5	1,140	559	140	1,860	7.6	420
May 28, 1953.....	522	36				23		122	28	32		.7	188	124	24	328	7.6	45

## BIG MOUND CANAL AT WEST PALM BEACH NEAR CANAL POINT

Oct. 17, 1952.....		31		5.4	23	236		102	14	36		0.1	180	100	16	310	7.2	440
June 11, 1953.....		76		24				314	94	350		.6	957	286	30	1,660	7.9	90

## LATERAL FROM NORTH AT WEST PALM BEACH CANAL, ABOVE CONTROL, LOXAHATCHEE

Oct. 17, 1952.....		93		4.7	35	288		288	22	48		0.4	345	282	16	604	7.3	55
May 28, 1953.....		46		10	43	156		156	35	60		.4	271	156	28	472	7.6	45

## RANGELINE CANAL AT WEST PALM BEACH CANAL, ABOVE CONTROL, NEAR WEST PALM BEACH

Oct. 17, 1952.....		56		2.7	14	166		166	10	24		0.4	189	151	15	337	7.5	80
May 28, 1953.....		76		5.0	24	230		230	25	34		.3	277	210	22	476	7.5	55

a Residue on evaporation at 180° C

LAKE OKEECHEE AND THE EVERGLADES--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN LAKE OKEECHEE AND THE EVERGLADES IN FLORIDA--Continued

Chemical analyses in parts per million, water year October 1952 to September 1953--Continued

Chemical analyses in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Cal- cium (Ca)	Mag- nesium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (Sum)	Hardness as CaCO <sub>3</sub>		Specific conduct- ance (micro- mhos at 25° C)	pH	Color
														Calcium	Non- carbon- ate			
WEST PALM BEACH CANAL, ABOVE CONTROL, AT WEST PALM BEACH																		
Oct. 17, 1952.....	2,000			46	8.7	48		160	26	68		1.4	277	150	19	510	7.4	220
May 19, 1953.....	320			49	11	50		170	35	70		.8	300	167	28	523	7.4	45
LAKE OKEECHOBEE AT HURRICANE GATE STRUCTURE 4, NEAR BELLE GLADE																		
Oct. 17, 1952.....				146	60	150		526	240	178		6.5	1,040	611	180	1,670	7.6	220
May 28, 1953.....				36	9.3	25		124	30	34		.8	196	128	26	350	7.6	23
HILLSBORO CANAL AT BELLE GLADE																		
Oct. 17, 1952.....				142	51	95		448	200	132		12	852	564	197	1,400	7.5	260
June 11, 1953.....				36	11	33		130	39	42		.7	226	135	28	381	7.6	33
CROSS CANAL AT BEND NEAR BELLE GLADE																		
Oct. 17, 1952.....				133	53	126		504	175	160		4.0	899	550	137	1,480	7.5	260
June 11, 1953.....				40	11	36		152	38	41		.5	242	145	20	391	7.4	38
BOLLES CANAL AT HILLSBORO CANAL, NEAR BELLE GLADE																		
Oct. 17, 1952.....				115	33	59		450	72	74		2.5	576	422	54	949	7.5	240
June 11, 1953.....				37	11	32		128	40	43		.9	226	136	33	380	7.4	34
INDIAN RUN AT HILLSBORO CANAL NEAR DEERFIELD BEACH																		
Oct. 17, 1952.....				8.3	1.5	12		25	4.2	19		0.3	57	27	6	106	6.5	220
May 27, 1953.....				36	8.8	64		160	13	85		.2	286	126	0	519	6.7	150
RANGELINE CANAL AT HILLSBORO CANAL, NEAR DEERFIELD BEACH, ABOVE CONTROL																		
Oct. 17, 1952.....				95	5.7	31		276	38	44		0.2	350	260	34	605	7.7	75
May 19, 1953.....				94	12	80		302	30	127		.6	492	284	36	857	7.5	60

## HILLSBORO CANAL NEAR DEERFIELD BEACH, ABOVE CONTROL

Oct. 17, 1952.....			45	11	35	174	20	50		248	158	15	442	7.5	200
May 28, 1953.....	1,080 b-60		75	12	67	260	33	95		410	236	24	711	7.6	55

## NORTH NEW RIVER CANAL AT SOUTH BAY

Oct. 17, 1952.....	91		161	57	75	502	242	94		880	636	224	1,380	7.5	180
June 11, 1953.....	521		40	11	38	140	42	48		249	145	30	426	7.6	40

## NORTH NEW RIVER CANAL AT BEND 4 MILES SOUTH OF OKEELANTA

Oct. 17, 1952.....			141	52	83	486	195	112		816	566	184	1,350	7.5	300
June 11, 1953.....			38	12	31	134	40	42		230	144	34	399	7.8	37

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

Oct. 17, 1952.....			101	34	83	352	113	116		622	392	104	914	7.7	320
June 11, 1953.....			86	30	57	324	46	104		464	338	72	836	6.9	300

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

Oct. 17, 1952.....			84	27	96	308	76	140		575	320	68	745	7.6	220
June 11, 1953.....			42	10	27	142	35	36		221	146	30	365	7.7	55

## DIKE E BORROW PIT AT NORTH NEW RIVER CANAL NEAR FORT LAUDERDALE

Oct. 17, 1952.....			76	23	42	272	71	54		402	284	61	682	7.7	220
June 11, 1953.....			47	12	30	158	39	43		250	167	37	438	7.4	45

## HOLLOWAY LATERAL AT NORTH NEW RIVER CANAL NEAR FORT LAUDERDALE

Oct. 17, 1952.....			72	6.2	13	208	29	22		247	205	35	436	7.7	180
June 12, 1953.....			50	12	31	176	34	44		259	174	30	449	7.6	50

b Estimated

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 1952 to September 1953--Continued

Date of collection	Discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Mag- nesium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (Sum)	Hardness as CaCO <sub>3</sub>		Specific conduct- ance (micro- mhos at 25°C)	pH	Color
														Calcium, mg- nesium	Non- carbon- ate			
SNAKE CREEK CANAL AT SOUTH NEW RIVER CANAL NEAR DAVIE																		
Oct. 17, 1952.....				56	4.1	8.1		162	20	14			183	157	24	319	7.6	220
June 12, 1953.....				80	13	22		292	27	24			311	253	14	526	7.3	65
SOUTH NEW RIVER CANAL AT DAVIE, ABOVE CONTROL																		
Oct. 17, 1952.....				85	8.8	11		246	33	24			284	248	46	504	7.7	140
June 12, 1953.....				75	9.0	22		244	26	31			284	224	24	483	7.4	70
MIAMI CANAL AT LAKE HARBOR																		
Oct. 17, 1952.....				31	6.0	19		104	10	34			151	102	17	228	7.1	300
June 11, 1953.....				37	13	35		140	38	46			241	146	31	419	7.5	35
MIAMI CANAL AT JUNCTION WITH SOUTH NEW RIVER CANAL																		
Oct. 17, 1953.....				52	5.7	12		176	10	18			185	153	9	330	7.6	130
MIAMI CANAL AT L-30, WEST OF MIAMI																		
June 12, 1953.....				80	5.9	17		272	10	19			287	224	1	453	7.2	70
PENNSUCO LATERAL AT PENNSUCO																		
Oct. 17, 1952.....				94	5.2	13		304	9.5	18			289	256	7	513	7.7	100
June 12, 1953.....				89	7.3	12		300	8.5	16			281	252	6	496	7.1	90
MIAMI CANAL AT WATER PLANT, HIALEAH																		
Oct. 17, 1952.....	918			82	5.0	12		260	9.0	20			256	225	12	452	7.8	100
June 12, 1953.....	b 70			85	4.8	20		284	9.5	23			283	232	0	482	7.5	80

b Estimated

b Estimated

MIAMI CANAL NEAR CORAL GABLES (FOOTBRIDGE)

[illegible]

**TAMIAMI CANAL AT BRIDGE 45, 27 MILES WEST OF MIAMI**

[illegible]

TAMIAMI CANAL AT BRIDGE 115, 46 MILES WEST OF MIAMI

[illegible]

TAMIAMI CANAL AT BRIDGE 96, MONROE

[illegible]





ESCAMBIA RIVER BASIN

PINE BAREN CREEK NEAR BARTH, FLA.

LOCATION.--At gaging station, near right bank, 10 feet downstream from Wiggins Bridge on private road, 0.3 mile upstream from Blue Water Creek, 2.2 miles northeast of Mount Calvary Camp Grounds, and 4.0 miles northwest of Barth, Escambia County, Fla.  
DRAINAGE AREA.--76.4 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1953.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1274.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO <sub>3</sub>		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Col- or
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate				
Oct. 23, 1952 ....	74	7.2	0.04	0.4	0.4	2.9	0.1	5	0.2	2.8	0.1	0.4		19		3	0		15.9	6.3	4
Nov. 21 .....	86	7.3	0.12	1.0	1	2.9	.4	5	.5	3.6	.1	.2		20		3	0		16.6	5.9	13
Jan. 14, 1953 .....	98	6.9	.13	.4	.5	1.7	.2	4	.2	3.2	.1	.6		50		3	0		17.3	5.9	7
Feb. 11 .....	93	7.0	.17	.4	.4	1.7	.2	4	1.8	2.6	.1	.4		22		3	0		16.1	6.0	22
Mar. 27 .....	100	5.6	.19	.4	.4	1.8	.1	4	.2	2.6	.1	.5		20		3	0		17.1	6.1	23
May 6 .....	575	4.1	.34	.4	.5	1.3	.2	4	1.2	2.2	.0	.3		36		3	0		16.2	5.4	26
June 14 .....	98	6.3	.15	.4	.6	2.6	.1	5	.5	3.2	.1	.3		24		3	0		16.3	6.1	16
July 30 .....	81	7.2	.16	.4	.5	1.8	.2	5	1.5	2.6	.1	.3		18		3	0		16.2	6.2	18
Sept. 11 .....	70	6.7	.11	.4	.4	2.0	.2	4	.8	2.6	.0	.2		24		3	0		17.2	5.9	13

## ESCAMBIA RIVER BASIN--Continued

## ESCAMBIA RIVER NEAR CENTURY, FLA.--Continued

LOCATION.--At gaging station, on left bank, 16 feet downstream from bridge on State Highway 4, 1.2 miles downstream from Escambia Creek, and 1½ miles east of Century Escambia County, Florida, approximately.

DRAINAGE AREA, square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses January 1952 to December 1953.

EXTREMES.--Maximum, 53°; dissolved solids, Maximum, 101 parts per million Sept. 11-20; minimum 51 parts per million Dec. 21-30.

Hardness: Maximum, 43 parts per million Aug. 3, 6-10, 11-14; minimum, 6 parts per million Feb. 15.

Specific conductance: Maximum daily, 178 micromhos Aug. 27; minimum 39° F Dec. 30.

Water temperatures: Maximum, 90° F June 15; minimum 39° F Dec. 30.

EXTREMES, January 1952 to December 1953.--Dissolved solids: Maximum, 101 parts per million Sept. 11-20, 1953; minimum, 51 parts per million Apr. 1-6, 9-10, 1952, Dec. 21-30, 1953.

Hardness: Maximum, 43 parts per million Aug. 3, 6-10, 11-14, 1953; minimum, 6 parts per million Feb. 15, 1953.

Specific conductance: Maximum daily, 178 micromhos Aug. 27, 1953; minimum daily, 22.4 micromhos Feb. 15, 1953.

Water temperatures: Maximum, 98° F July 1, 1952; minimum, 39° F Dec. 30, 1953.

REMARKS.--Records of specific conductance of daily samples available in district office, Ocala, Fla. Values reported for dissolved solids are residues on evaporation at 180°C, except for period Aug. 1-2, which is sum of determined constituents. Records of discharge for water year 1952-53 given in WSP 1274.

Chemical analyses, in parts per million, water year October 1952 to December 1953

Date of collection	Mean discharge (cfs)	Temperature (° F)	Silica (SiO <sub>2</sub> )	Alum-inium (Al)	Iron (Fe)	Man-gan-ese (Mn)	Cal-cium (Ca)	Mag-ne-sium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO <sub>3</sub> )	Sul-fate (SO <sub>4</sub> )	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO <sub>3</sub> )	Dissolved solids (residue on evap-oration at 180°C)	Hardness as CaCO <sub>3</sub>		Total acid-ity as H <sub>2</sub> SO <sub>4</sub>	Specific conduct-ance (micro-mhos at 25°C)	pH	Color
																	Calcium	Non-carbon-ate				
Oct. 1-4, 1952.....	1,232		12		0.05		10	1.0	2.5	0.6	34	3.2	3.4	0.1	0.2	65	29	1		71.0	7.2	7
Oct. 13-20 .....	1,081		8.7		.06		10	.9	2.3	.5	34	3.2	3.2	.1	.3	59	29	1		71.8	7.0	10
Oct. 21-27 .....	1,023		9.2		.07		10	.9	2.2	.5	34	3.5	3.5	.1	.4	71	29	1		71.6	7.2	7
Nov. 1-8 .....	999		7.9		.05		11	1.0	2.2	.5	39	3.5	3.1	.1	.2	60	32	0		76.0	7.2	7
Nov. 18-20 .....	1,147		8.1		.10		9.8	.9	2.3	.6	34	4.0	3.5	.0	.3	53	28	0		68.6	7.3	10
Nov. 21-30 .....	1,329		11		.10		10	1.0	2.4	.6	37	4.0	3.5	.1	.4	63	29	0		74.0	7.2	15
Dec. 1-10 .....	1,835		10		.18		10	1.5	2.9	.6	34	4.8	4.4	.1	.2	59	31	3		77.1	7.4	18
Dec. 11-20 .....	2,582		9.2		.26		8.7	.8	2.5	.6	28	4.8	3.8	.2	.3	57	25	2		63.8	6.9	39
Dec. 21-24, 26-31.	3,425		9.5		.29		8.1	1.2	2.5	.6	28	4.8	3.9	.1	.1	60	25	2		65.2	7.1	55

Jan. 1-10, 1953 ...	3,918	10	0.36	7.7	1.4	2.8	0.6	25	6.5	4.4	0.1	0.1	60	25	4	4	65.6	7.2	55
Jan. 11-20 .....	5,635	10	.47	7.1	1.0	2.7	.6	22	3.0	4.0	.1	.2	69	22	4	4	60.0	7.1	110
Jan. 21-30 .....	6,571	10	.44	6.6	1.1	2.5	.6	22	5.8	3.6	.1	.2	67	22	3	3	57.4	7.0	110
Feb. 1-10 .....	5,193	11	.43	7.5	.6	2.7	.5	24	4.5	3.6	.1	.2	64	21	2	2	57.7	7.1	95
Feb. 11-14 .....	4,205	9.2	.49	6.3	.6	2.7	.5	27	5.5	3.4	.2	.4	58	24	0	0	63.4	7.2	65
Feb. 15 .....	6,310	--	--	5.2	.7	3.6	--	18	3.8	2.8	--	.4	--	6	0	--	22.4	6.4	--
Feb. 16-20 .....	13,388	7.9	.61	5.4	.6	2.1	.5	17	3.8	2.5	.1	.1	60	16	2	2	43.3	7.0	110-
Feb. 21-28 .....	12,180	7.0	.43	4.6	.7	2.1	.7	15	4.5	3.2	.2	.7	61	15	3	3	42.9	6.6	17
Mar. 1-9 .....	1,003	7.4	.44	6.2	.6	2.2	.7	20	4.8	3.4	.1	.5	61	18	2	2	49.6	6.8	22
Mar. 11-20 .....	6,905	9.2	.57	7.1	1.4	2.6	.6	24	5.2	4.8	.2	.6	64	23	4	4	62.6	7.0	23
Mar. 21-31 .....	5,537	9.5	.72	7.9	1.7	2.6	.7	28	5.0	4.4	.2	.5	66	27	4	4	65.1	7.1	33
Apr. 1-10 .....	5,561	9.0	.54	7.5	1.3	2.6	.6	27	3.0	4.5	.1	.4	65	24	2	2	63.0	7.0	16
Apr. 11-17, 19-20 .....	12,440	7.4	.54	4.8	1.0	1.8	.6	18	2.2	2.8	.1	.4	63	16	1	1	42.8	6.7	25
Apr. 21-30 .....	7,566	8.3	.54	6.4	1.0	2.2	.6	23	3.2	3.2	.1	.4	62	20	1	1	51.8	6.8	27
May 1-10 .....	16,040	9.0	.41	5.0	.9	2.2	.6	18	3.2	3.5	.2	.6	64	16	1	1	41.2	6.7	22
May 11-20 .....	13,150	11	.56	7.5	2.3	2.8	.6	27	5.2	5.6	.3	.7	78	28	6	6	68.5	7.2	16
May 21-27, 29-31 .....	3,820	11	.51	10	1.1	2.6	.4	34	3.5	4.4	.2	.6	68	29	2	2	71.4	7.3	8
June 1-10 .....	1,900	11	.34	12	1.2	3.8	.3	41	.2	5.9	.2	.5	70	35	1	1	84.0	7.3	4
June 11-20 .....	2,612	8.8	.57	11	1.1	3.1	.5	36	3.0	5.8	.1	.8	72	32	2	2	82.2	7.2	7
June 22-30 .....	2,794	11	.66	11	1.0	3.2	.6	36	3.8	5.5	.2	.7	76	32	2	2	81.8	7.3	11

ESCAMBIA RIVER BASIN--Continued

ESCAMBIA RIVER NEAR CENTURY, FLA.--Continued

Chemical analyses, in parts per million, water year October 1952 to December 1953.--Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>	Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
July 1-10, 1953 ..	2,091		13		0.59		11	1.6	3.6	0.6	38	5.0	5.9	0.1	0.6	78	34	3	88.2	7.5	14
July 11-20 .....	2,461		8.8		.41		8.3	1.0	2.7	.6	28	3.2	5.1	.1	.5	64	25	2	87.1	7.1	19
July 21-26, 28-31.	5,466		9.9		.27		7.6	1.3	2.6	.8	24	4.8	4.9	.1	.3	74	24	5	69.8	6.7	22
Aug. 1-2 .....	2,545		11		.14		9.2	2.4	3.6	.9	28	5.5	5.7	.1	2.9	b55	33	10	86.4	6.8	--
Aug. 3, 6-10 .....	1,765		18		.39		12	3.2	5.8	.8	48	7.0	9.0	.2	.3	87	43	4	119	6.8	40
Aug. 11-14 .....	1,400		19		.29		13	2.6	6.1	.6	50	5.5	9.0	.2	.4	94	43	2	122	7.1	28
Aug. 15-20 .....	1,420		11		.14		11	1.3	4.1	.6	38	4.2	6.5	.1	.2	68	33	2	89.6	7.1	8
Aug. 21-31 .....	1,879		11		.14		11	1.2	6.3	.6	41	4.5	7.1	.1	.3	82	32	0	96.9	7.5	7
Sept. 1-10 .....	1,400		12		.16		11	1.3	5.1	.7	38	4.5	8.0	.1	.3	71	33	2	94.5	7.2	9
Sept. 11-20 .....	1,122		21		.10		13	2.3	9.1	.8	51	6.2	12	.1	.3	101	42	0	131	8.0	7
Sept. 21-27 .....	1,814		14		.13		11	2.0	8.2	.7	37	5.8	14	.1	.2	90	36	5	121	7.4	9
Oct. 5-10, 1953 ..	4,968		9.1		.34		6.9	1.4	3.2	1.1	25	5.0	4.6	.3	.2	83	23	2	84.3	7.0	29
Oct. 11-19 .....	2,079		9.5		.41		10	2.1	5.2	.7	37	5.5	8.3	.1	.2	75	24	3	86.4	7.2	50
Oct. 23-31 .....	1,481		8.8		.41		12	1.6	4.4	.7	40	4.5	9.8	.1	.3	77	37	4	104	7.3	39
Nov. 1-10 .....	1,795		9.1		.32		9.9	1.8	5.6	.7	34	3.8	9.5	.1	.2	72	32	4	96.2	7.0	34
Nov. 11-20 .....	1,566		9.5		.26		11	1.9	6.4	.7	33	3.0	12	.2	.9	74	32	3	96.7	7.1	35
Nov. 21-30 .....	3,996		13		.27		8.6	2.1	4.9	1.0	31	6.2	8.5	.1	1.2	79	30	5	92.6	6.7	38
Dec. 1-10 .....	24,900		9.3		.35		6.3	1.5	3.2	.8	23	4.2	5.8	.1	.4	68	22	3	85.9	6.6	100
Dec. 11-20 .....	31,930		7.1		.38		4.8	1.0	2.4	.8	16	4.2	4.8	.2	.2	67	16	3	47.1	6.5	110
Dec. 21-30 .....	17,800		6.9		.38		5.7	.7	2.6	.7	17	4.5	5.0	.1	.4	51	17	3	51.6	6.5	90
Weighted Average January to December 1953	6,674		9.0		0.43		6.7	1.2	2.8	0.7	23	4.2	4.9	0.2	0.4	66	22	3	80.0	6.8	57

b Sum of determined constituents.

## 201

ESCAMBIA RIVER NEAR CENTURY, FLA.

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

[illegible]

## PEARL RIVER BASIN

## MISCELLANEOUS ANALYSES OF STREAMS IN THE PEARL RIVER BASIN IN LOUISIANA

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boron (B)	Dissolved solids		Hardness as CaCO <sub>3</sub>		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Color	
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate					
PEARL RIVER NEAR BOGALUSA																						
Oct. 7, 1952.....	1,200	13	0.06	2.2	1.4	8.0	--	12	5.2	9.5		0.4		46	0.06	149	11	1	61	62.6	6.4	
Nov. 25.....	1,460	11	.17	2.2	1.2	7.2	--	14	2.7	8.5		.4		40	.05	158	10	0	60	58.0	6.6	
Jan. 6, 1953.....	3,060	12	.63	2.7	1.1	6.5	--	12	4.2	8.0		.8		42	.06	347	11	1	56	58.7	6.5	
Feb. 10.....	11,500	8.0	.45	2.4	1.2	3.3	--	7	6.3	3.8		1.0		29	.04	900	11	5	40	43.1	5.8	
Mar. 10.....	24,800	7.8	.28	3.2	1.6	3.1	--	4	14	2.8		.2		35	.05	2,340	15	11	32	54.8	5.3	
Apr. 21.....	6,300	11	.63	3.4	1.3	4.3	1.6	14	6.1	6.0		1.5		43	.06	731	15	4	35	60.3	6.5	
June 24.....	3,080	14	.05	4.2	1.5	5.2	1.1	16	7.7	6.2	0.1	1.0		49	.07	407	17	4	38	67.7	6.3	
July 21.....	3,320	12	.12	3.2	1.2	5.4	1.3	14	5.8	7.2		.5		44	.06	394	13	2	44	66.2	7.0	

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

ALLEGHENY RIVER BASIN

MISCELLANEOUS ANALYSES OF STREAMS IN ALLEGHENY RIVER BASIN IN NEW YORK

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium, magnesium	Non-carbonate			
ALLEGHENY RIVER AT MILL GROVE																			
Apr. 15, 1953	a1.310		3.8	0.23	8.2	2.1	0.11	0.7	17	13	22	0.1	0.5	78	29	15	134	6.9	8
Aug. 20, 1953	a96.3		3.3	.52	23	4.6	48	1.3	36	18	99	.1	.8	246	76	47	411	7.1	10
TUNUNGWANT CREEK AT LIMESTONE																			
Apr. 15, 1953	a293		4.0	0.42	32	6.1	73	1.4	41	26	152	0.2	0.3	319	105	72	641	6.8	9
Aug. 20, 1953	a31.5		2.5	.77	146	37	425	2.4	125	93	908	.0	1.0	1,800	518	415	3,110	7.5	22
ALLEGHENY RIVER AT RED HOUSE																			
Apr. 15, 1953	3.220		6.1	0.27	15	2.4	16	0.7	30	15	35	0.1	0.5	114	47	23	204	7.1	8
Aug. 20, 1953	274		.9	.30	38	9.1	64	1.6	70	28	139	.0	.3	365	132	75	607	7.7	7
ALLEGHENY RIVER AT ONOVILLE																			
Apr. 15, 1953	a3,670		2.7	0.23	15	2.5	15	0.7	30	18	30	0.1	0.4	108	48	23	190	7.0	7
Aug. 20, 1953	a335		.9	.19	38	5.9	54	1.6	72	26	110	.1	.2	312	119	60	515	7.6	15
CONEWANGO CREEK AT WATERBORO																			
Apr. 16, 1953	357		2.4	0.40	27	3.7	2.1	1.3	81	22	1.8	0.0	1.0	129	83	16	178	7.4	20
Aug. 21, 1953	57		4.7	.38	45	6.9	4.0	1.1	136	36	2.8	.1	.6	175	141	30	280	7.7	30
CHADAKOIN RIVER AT FALCONER																			
Apr. 16, 1953	305		2.3	0.10	19	3.3	3.9	1.6	53	20	4.5	0.1	1.4	90	61	18	143	7.0	6
Aug. 21, 1953	17		5.2	.76	31	5.4	22	4.3	115	20	22	.5	.5	187	100	6	307	7.6	35
CONEWANGO CREEK AT FRENDSBURG																			
Aug. 21, 1953	--		5.6	0.34	38	6.1	7.1	2.5	113	30	8.0	0.0	3.4	171	120	27	280	7.0	30

a Discharge at time of sampling.

## CLARION RIVER BASIN

## CLARION RIVER NEAR PINEY, PA.

LOCATION --At hydroelectric plant of Pennsylvania Electric Company, 2.5 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 June 1953.

Water temperatures: October 1949 to June 1953.

EXTREMES 1952-53.--Hardness: Maximum, 194 ppm Nov. 11-20; minimum, 36 ppm Mar. 21-31.

Specific conductance: Maximum daily, 613 micromhos Nov. 20; minimum daily, 84.6 micromhos May 27.

Water temperatures: Minimum, freezing point on several days during winter months.

EXTREMES 1946-53.--Dissolved solids (1946-47) (1952-53): Maximum, 348 ppm Oct. 21-31, 1952; minimum, 59 ppm Apr. 1-10, 1947.

Hardness (1946-47) (1949-53): Maximum, 220 ppm Nov. 21-30, 1949; minimum, 28 ppm Apr. 1-10, 1947.

Specific conductance: Maximum daily, 674 micromhos Nov. 26, 1949; minimum daily, 80.0 micromhos Mar. 7, 1951.

Water temperatures: Maximum, 77°F Aug. 8, 1952; minimum, freezing point reached Feb. 7, 1953.

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 1952 to September 1953 given in WSP 1275.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Tem- per- ature (°F)	Silica (SiO <sub>2</sub> )	Alum- inum (Al)	Iron (Fe)	Man- gan- ese (Mn)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO <sub>3</sub> )	Sul- fate (SO <sub>4</sub> )	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO <sub>3</sub> )	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO <sub>3</sub>		Total acid- ity as H <sub>2</sub> SO <sub>4</sub>	Specific conduct- ance (micro- mhos at 25°C)	pH	Color
																	Calcium, mag- nesium	Non- carbon- ate				
Oct. 1-10, 1952..	123	--	--	--	--	--	--	--	28	41	93	62	62	--	5.5	--	162	128	482	7.3	30	
Oct. 11-20 .....	109	--	--	--	--	--	50	7.3	23	24	78	43	43	--	5.8	--	116	96	372	6.8	60	
Oct. 21-31 .....	91	3.8	--	0.21	--	--	50	7.3	40	46	104	87	87	0.2	1.6	346	155	117	504	7.5	70	
Nov. 1-10 .....	91	--	--	--	--	--	--	--	37	40	113	76	76	--	2.5	--	180	147	563	7.3	60	
Nov. 11-20 .....	116	--	--	--	--	--	--	--	32	47	111	76	76	--	3.1	--	194	156	576	7.2	45	
Nov. 21-30 .....	171	--	--	--	--	--	--	--	33	46	111	76	76	--	2.4	--	190	152	574	7.2	40	
Dec. 1-10 .....	465	--	--	--	--	--	--	--	31	36	108	68	68	--	3.2	--	172	142	522	7.1	45	
Dec. 11-13 .....	3,147	--	--	--	--	--	--	--	20	16	87	46	46	--	2.3	--	128	113	387	6.9	20	
Dec. 14-20 .....	928	--	--	--	--	--	--	--	11	8	57	20	20	--	1.7	--	72	65	216	6.4	27	
Dec. 21-31 .....	568	--	--	--	--	--	--	--	5.1	6	48	12	12	--	1.8	--	62	57	176	6.1	15	
Jan. 1-10, 1953 ..	488	--	--	--	--	--	--	--	10	8	57	20	20	--	2.8	--	74	67	221	6.5	14	
Jan. 11-20 .....	1,566	--	--	--	--	--	--	--	8.9	26	56	24	24	--	1.0	--	95	74	248	6.5	25	
Jan. 21-31 .....	2,061	--	--	--	--	--	--	--	7.5	6	44	14	14	--	1.1	--	55	50	165	6.3	5	
Feb. 1-10 .....	2,205	--	--	--	--	--	--	--	4.4	4	41	9.0	9.0	--	1.0	--	50	47	152	6.3	4	
Feb. 11-20 .....	1,484	--	--	--	--	--	--	--	7.2	5	39	11	11	--	1.8	--	46	52	136	5.6	6	
Feb. 21-28 .....	1,861	--	--	--	--	--	--	--	6.8	4	45	14	14	--	1.2	--	56	43	161	6.4	7	
Mar. 1-10 .....	1,715	--	--	--	--	--	--	--	3.2	4	44	8.0	8.0	--	.8	--	54	51	163	6.5	18	
Mar. 11-20 .....	2,225	--	--	--	--	--	--	--	4.9	5	37	11	11	--	.8	--	48	44	148	6.0	12	
Mar. 21-31 .....	4,031	4.4	--	--	.15	--	11	2.2	9.6	3	40	9.0	9.0	.0	.8	87	36	34	129	5.0	15	



Apr. 1-10, 1953 ..	2,654	--	--	--	4.7	2	39	8.0	--	0.8	--	44	42	130	6.1	7
Apr. 11-20 .....	2,175	--	--	--	4.5	3	43	12	--	.8	--	55	53	156	5.8	4
Apr. 21-30 .....	3,142	--	--	--	9.2	4	46	10	--	.9	--	46	43	138	5.8	3
May 1-10 .....	1,858	--	--	--	8.5	6	39	10	--	1.0	--	42	37	132	6.0	4
May 11-20 .....	2,217	--	--	--	4.3	4	46	8.0	--	.9	--	54	51	158	6.4	7
May 21 .....	2,600	--	--	--	8.6	10	41	16	--	.9	--	66	58	183	6.3	3
May 22-31 .....	8,283	--	--	--	6.5	3	34	9.0	--	.7	--	37	35	112	6.0	4
June 1-10 .....	4,414	--	--	--	5.6	2	37	6.0	--	3.1	--	39	37	113	5.6	3
June 11-20 .....	1,176	--	--	--	8.8	3	50	10	--	.6	--	50	48	146	5.6	4
June 21-30 .....	459	--	--	--	9.1	5	53	15	--	.5	--	61	47	164	6.6	3
Average .....	a 2,943	--	--	--	14	14	60	27	--	1.8	--	84	72	253	--	19

. a For period of record only; mean discharge for water year was 1,564 cfs.

## CLARION RIVER BASIN--Continued

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

Temperature (°F) of water, water year October 1952 to September 1953  
 /Once-daily temperature measurement at approximately 10:30 a. m./

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

## OHIO RIVER MAIN STEM

## ALLEGHENY RIVER AT KITTANNING, PA.

LOCATION.--At city raw-water intake, about 1,000 feet upstream from bridge on U. S. Highway 422 at Kittanning, Armstrong County, and about 1,500 feet downstream from gaging station.

DRAINAGE AREA.--8,973 square miles (above gaging station).

RECORDS AVAILABLE.--Chemical analyses: September 1906 to September 1907; October 1944 to June 1953.

Water temperatures: October 1944 to June 1953.

EXTREMES, 1952-53.--Hardness: Maximum, 136 ppm Nov. 1-10; minimum, 44 ppm Mar. 21-31.

Specific conductance: Maximum daily, 503 micromhos Nov. 6; minimum daily, 104 micromhos May 28.

Water temperature: Minimum, 33°F Jan. 7.

EXTREMES, 1906-07, 1944-53.--Dissolved solids (1906-07) (1944-47): Maximum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.

Hardness (1906-07) (1944-53): Maximum, 136 ppm Nov. 1-10, 1952; minimum, 29 ppm Jan. 7-15, 1907.

Specific conductance (1944-53): Maximum daily, 580 micromhos Oct. 18, 1946; minimum daily, 91.6 micromhos Mar. 15, 1952.

Water temperatures (1944-53): Maximum, 81°F July 24, 1952; minimum, freezing point Dec. 17, 1951.

REMARKS.--Records of specific conductance and temperature of daily samples available in district office at Philadelphia, Pa. Temperature records not published because temperature at water plant may be influenced by travel distance in pipe line to plant. Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium	Non-carbonates				
Oct. 1-10, 1952..	1,698		--		--	--	--	--	23		56	43	70	--	1.4	--	130	84		421	7.1	5
Oct. 11-20 .....	1,762		--		--	--	--	--	32		54	57	62	--	1.1	--	122	78		425	7.4	5
Oct. 21-31 .....	1,426		3.8		0.02	8.2	36		34		60	58	62	0.2	1.2	259	124	74		441	7.4	5
Nov. 1-10 .....	1,615		--		--	--	--	--	48		62	54	73	--	1.0	--	136	56		479	7.6	5
Nov. 11-20 .....	2,895		--		--	--	--	--	36		68	53	68	--	1.2	--	130	74		458	7.4	7
Nov. 21-30 .....	10,337		--		--	--	--	--	23		43	45	46	--	1.1	--	97	62		341	7.3	5
Dec. 1-10 .....	6,869		--		--	--	--	--	18		30	41	35	--	3.0	--	80	55		262	7.0	23
Dec. 11-20 .....	22,750		--		--	--	--	--	9.6		18	33	20	--	1.9	--	58	43		187	7.0	5
Dec. 21-31 .....	9,018		--		--	--	--	--	10		28	32	20	--	2.4	--	64	41		201	6.9	5
Jan. 1-10, 1953..	6,387		--		--	--	--	--	11		31	38	25	--	1.0	--	77	47		239	7.0	5
Jan. 11-20 .....	19,120		--		--	--	--	--	15		24	44	22	--	1.3	--	64	44		206	7.7	8
Jan. 21-31 .....	22,509		--		--	--	--	--	11		22	34	16	--	1.1	--	54	36		169	6.8	4
Feb. 1-10 .....	21,160		--		--	--	--	--	7.5		14	38	16	--	.9	--	558	47		172	7.2	12
Feb. 11-20 .....	13,136		--		--	--	--	--	7.7		18	37	17	--	1.9	--	62	47		174	7.0	6
Feb. 21-26 .....	20,550		--		--	--	--	--	7.0		18	33	16	--	1.9	--	58	43		168	7.1	4
Mar. 1-10 .....	19,670		--		--	--	--	--	6.9		18	30	16	--	2.1	--	54	39		161	6.8	9
Mar. 11-20 .....	22,160		--		--	--	--	--	7.5		17	29	15	--	2.1	--	32	38		135	6.7	13
Mar. 21-31 .....	36,118		6.9		.02	3.3	12		9.7		15	33	12	.1	1.0	91	44	31		140	6.1	9

OHIO RIVER MAIN STEM--Continued  
ALLEGHENY RIVER AT KITTANNING, PA.--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Tem- perature (° F)	Silica (SiO <sub>2</sub> )	Alum- inum (Al)	Iron (Fe)	Man- ga- nese (Mn)	Cal- cium (Ca)	Mag- nesium (Mg)	Sod- ium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO <sub>3</sub> )	Sul- fate (SO <sub>4</sub> )	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO <sub>3</sub> )	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO <sub>3</sub>	Total acid- as H <sub>2</sub> SO <sub>4</sub>	Specific conduct- ance (micro- mhos at 25°C)	pH	Color	
Apr. 1-10, 1953..	26,020	--	--	--	--	--	--	--	7.5	14	34	12	12	--	0.8	--	48	37	--	142	6.7	6
Apr. 11-20 .....	19,710	--	--	--	--	--	--	--	9.5	18	39	14	14	--	.6	--	55	40	--	161	6.3	5
Apr. 21-30 .....	22,410	--	--	--	--	--	--	--	7.2	16	35	14	14	--	.5	--	54	41	--	161	6.5	6
May 1-10 .....	20,860	--	--	--	--	--	--	--	6.8	20	29	14	14	--	.5	--	52	36	--	156	6.6	5
May 11-20 .....	23,770	--	--	--	--	--	--	--	6.4	22	26	13	13	--	.6	--	50	32	--	154	7.1	5
May 21-31 .....	52,036	--	--	--	--	--	--	--	3.8	17	26	9.0	9.0	--	.8	--	46	32	--	129	7.1	8
June 1-10 .....	43,500	--	--	--	--	--	--	--	5.2	16	30	8.0	8.0	--	.8	--	45	32	--	129	7.5	6
June 11-20 .....	10,128	--	--	--	--	--	--	--	7.2	24	38	15	15	--	.5	--	65	45	--	188	7.6	4
June 21-30 .....	5,171	--	--	--	--	--	--	--	10	33	38	22	22	--	.2	--	76	49	--	232	7.7	3
Average .....	a 17,199	--	--	--	--	--	--	--	14	29	38	27	27	--	1.2	--	72	48	--	232	--	7

a For period of sampling only; mean discharge for water year was 13,710 cfs.

## OHIO RIVER MAIN STEM--Continued

## ALLEGHENY RIVER AT KITTANNING, PA.--Continued

Temperature (°F) of water, water year October 1952 to September 1953  
 /Once-daily temperature measurement at approximately 8:00 a. m./

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

KISKIMINETAS RIVER BASIN  
CONEMAUGH RIVER AT TUNNELTON, PA.

LOCATION -- At gaging station on right bank at single span steel highway bridge at Tunnelton, Indiana County, 0.9 mile downstream from Bostyard Run, 2 1/2 miles downstream from Conemaugh River Dam, 3 3/4 miles southeast of Saltsburg, and 5.5 miles upstream from confluence with Loyalhanna Creek.

DRAINAGE AREA, 358 square miles. RECORDS AVAILABLE -- Chemical analyses: October 1952 to June 1953.

Water temperatures: October 1952 to June 1953. Maximum 91.8 ppm Oct. 1-10; minimum, 177 ppm Mar. 21-31.

EXTREMES 1952-53 -- Dissolved solids: Maximum 37 ppm Mar. 21-31.

Hardness: Maximum 540 ppm Nov. 11-20; minimum, 193 micromhos June 2.

Specific conductance: Maximum 1,650 micromhos Nov. 12; minimum, 193 micromhos June 2.

Water temperatures: Minimum freezing point on Dec. 19.

REMARKS -- Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium	Non-carbonate				
Oct. 1-10, 1952..	334		15		0.88	0.02	11	12			0	505	43	0.4	0.6	918	--	460	124	1,440	3.40	7
Oct. 11-20.....	330		--		--	--	--	--	53	--	0	565	19	--	1.0	--	500	500	92	1,260	3.40	5
Oct. 21-30.....	180		--		--	--	--	--	87	--	0	637	25	--	--	--	530	530	88	1,360	3.40	2
Nov. 1-10.....	249		--		--	--	--	--	106	--	0	665	34	--	--	--	514	514	96	1,450	3.30	4
Nov. 11-20.....	371		--		--	--	--	--	77	--	0	652	28	--	--	--	540	540	111	1,460	3.30	3
Nov. 21-30.....	2,564		--		--	--	--	--	24	--	0	277	16	--	2.1	--	260	260	61	686	3.60	4
Dec. 1-10.....	925		--		--	--	--	--	41	--	0	292	18	--	3	--	240	240	61	737	3.60	2
Dec. 11-15.....	3,489		--		--	--	--	--	21	--	0	176	9.5	--	1.2	--	130	130	47	485	3.70	3
Dec. 16-20.....	1,105		--		--	--	--	--	1.9	--	0	90	5.5	--	3.3	--	100	100	26	267	4.20	3
Dec. 21-31.....	1,332		--		--	--	--	--	22	--	0	235	9.0	--	5.5	--	200	200	51	573	3.80	0
Jan. 1-10, 1953..	4,589		--		--	--	--	--	--	--	0	238	10	--	2.1	--	280	--	60	717	3.45	4
Jan. 11-20.....	4,687		--		--	--	--	--	--	--	0	108	7.0	--	3.6	--	130	--	30	330	4.00	4
Jan. 21-31.....			--		--	--	--	--	--	--	0	108	6.0	--	2.1	--	110	--	32	323	3.80	3
Feb. 1-10.....	3,250		--		--	--	--	--	--	--	0	136	9.0	--	1.6	--	150	--	42	426	3.50	2
Feb. 11-20.....	3,001		--		--	--	--	--	15	--	0	155	7.5	--	5	--	140	140	48	450	3.35	2
Feb. 21-28.....	3,444		--		--	--	--	--	14	--	0	144	4.5	--	3	--	125	125	40	391	3.65	3
Mar. 1-10.....	2,542		--		--	--	--	--	18	--	0	171	7.0	--	4	--	150	150	42	453	3.50	2
Mar. 11-12.....	--		--		--	--	--	--	--	--	0	159	8.0	--	2.4	--	155	--	52	441	3.25	5
Mar. 13-20.....	6,899		--		--	--	--	--	36	--	0	97	5.0	--	1.4	--	100	--	34	273	3.60	7
Mar. 21-31.....			7.5		.03	--	12	1.8	--	--	0	102	6.0	--	1.4	177	37	37	28	312	3.55	3
Apr. 1-10.....	4,947		--		--	--	--	--	--	--	0	121	7.0	--	1.0	--	120	--	36	379	3.50	4
Apr. 11-20.....	4,188		--		--	--	--	--	--	--	0	121	8.5	--	1.0	--	120	--	38	373	3.65	4
Apr. 21-30.....	3,595		--		--	--	--	--	--	--	0	134	6.0	--	1.2	--	115	--	37	389	3.75	3
May 1-10.....	3,340		--		--	--	--	--	--	--	0	152	8.0	--	.9	--	145	--	51	471	3.55	5
May 11-20.....	2,991		--		--	--	--	--	--	--	0	142	4.0	--	1.1	--	140	--	42	448	3.65	3
May 21-31.....	3,143		--		--	--	--	--	19	--	0	152	6.5	--	1.6	--	128	128	20	446	3.65	4
June 1-10.....	6,609		--		--	--	--	--	19	--	0	125	5.5	--	.4	--	96	96	17	387	3.70	4
June 11-20.....	1,371		--		--	--	--	--	21	--	0	230	8.5	--	.4	--	206	206	31	685	3.35	4
June 21-30.....	632		--		--	--	--	--	--	--	0	330	17	--	.6	--	305	--	41	845	3.35	5
Average .....	2,813		--		--	--	--	--	--	--	--	244	12	--	1.2	--	206	--	53	634	--	4

## KISKIMINETAS RIVER BASIN--Continued

CONEMAUGH RIVER AT TUNNELTON, PA.--Continued

Temperature (°F) of water, October 1952 to June 1953

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

## MONONGAHELA RIVER BASIN

## TYGART RIVER AT ELKINS, W. VA.

LOCATION.--At city water plant, at Elkins, Randolph County, 2½ miles upstream from gaging station.

DRAINAGE AREA.--268 square miles above water plant. 272 square miles above gaging station. RECORDS AVAILABLE.--January 1947 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum observed, 82°F July 29-31, Aug. 1, Sept. 1; minimum observed, 36°F Dec. 15, Jan. 4.

EXTREMES, 1947-53.--Water temperatures: Maximum observed, 92°F July 22, 1952; minimum, freezing point on many days during winter months.

REMARKS.--No appreciable inflow between water plant and gaging station except during periods of heavy local rains. During flood periods part of the flow is diverted around the water plant in a flood by-pass channel. Records of discharge for water years 1950, 1951, 1952, and 1953 given in WSP 1173, 1205, 1235, and 1275, respectively.

Temperature (°F) of water, water year October 1952 to September 1953

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



## MONONGAHELA RIVER BASIN--Continued

## TYGART RIVER AT ELKINS, W. VA.--Continued

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	67	49	38	48	34	41	52	64	72	84	80	80
2	72	48	39	48	35	40	53	65	73	83	81	79
3	73	45	40	47	35	42	53	66	75	84	84	77
4	74	42	41	42	45	43	50	66	75	83	80	75
5	71	43	44	42	43	42	46	67	76	82	78	74
6	73	40	46	36	42	41	41	69	79	76	78	75
7	60	42	48	38	39	41	42	69	79	84	78	74
8	62	38	50	38	40	40	44	66	78	79	81	74
9	65	43	40	40	39	40	50	65	79	77	80	76
10	64	38	45	39	43	40	54	65	77	81	78	77
11	58	42	42	39	39	42	52	50	75	78	82	74
12	58	42	39	39	41	47	52	56	71	81	77	75
13	60	46	36	40	41	45	54	52	81	--	80	74
14	60	49	34	43	39	42	53	58	76	87	80	74
15	63	49	34	47	42	44	47	58	81	82	81	71
16	63	47	32	48	40	40	51	60	85	82	78	74
17	61	45	32	44	38	39	53	64	85	85	77	70
18	62	46	32	45	42	40	56	58	86	84	78	74
19	60	37	32	42	41	40	59	60	85	82	82	69
20	59	39	32	42	40	46	58	64	84	85	84	72
21	60	36	35	44	40	52	67	61	78	87	80	68
22	61	34	38	41	40	50	67	68	83	92	78	65
23	63	38	37	39	40	52	66	67	80	88	75	68
24	60	36	37	38	40	49	61	69	82	86	74	70
25	62	38	38	34	42	48	50	68	83	88	80	69
26	57	43	38	41	42	49	--	67	84	88	75	71
27	57	44	37	42	39	48	50	69	88	87	77	70
28	50	40	32	44	42	46	--	72	87	85	75	70
29	56	39	34	43	45	45	--	63	67	60	77	68
30	53	41	43	32	--	52	60	68	83	85	78	70
31	53	--	45	32	--	50	--	70	--	85	76	--
Average	62	42	38	41	40	44	53	64	80	89	79	73

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

## MONONGAHELA RIVER BASIN--Continued

## TYGART RIVER AT ELKINS, W. VA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

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

SHIVERS FORK AT PARSONS, W. VA.

REMARKS.--Water temperatures observed at intake pipe of Armour Leather Company. Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Temperature (°F) of water, water year October 1952 to September 1953

[illegible]

## MONONGAHELA RIVER BASIN--Continued

## SHAVERS FORK AT PARSONS, W. VA.--Continued

Temperature (°F) of water, January to September 1950

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

## MONONGAHELA RIVER BASIN--Continued

## CHEAT RIVER AT LAKE LYNN, PENN.

LOCATION.--At the Lake Lynn hydro-electric plant of the West Penn Power Company at Lake Lynn, Fayette County, 3 miles upstream from mouth, and 13.8 miles downstream from gaging station near Pisgah, Preston County, W. Va.

DRAINAGE AREA.--1,411 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1948 to September 30, 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 84°F July 2, 3; minimum, 35°F Jan. 5-7.

EXTREMES, 1948-53.--Water temperatures: Maximum, 85°F July 30, 1949 and July 28, 1952;

minimum, 33°F many days during winter months.

REMARKS.--Water temperatures observed on water passing through hydro-electric plant.

(Records furnished by the West Penn Power Company). Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Temperature (°F) of water, water year October 1952 to 1953

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

## MONONGAHELA RIVER BASIN--Continued

## CHEAT RIVER AT LAKE LYNN, PENN.--Continued

Temperature (°F) of water, water year October 1, 1951 to September 30, 1952

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

Temperature (°F) of water, water year October 1, 1950 to September 1951

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

## MONONGAHELA RIVER BASIN--Continued

## CHEAT RIVER AT LAKE LYNN, PENN.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

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

Temperature (°F) of water, water year October 1948 to September 1949

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

## MONONGAHELA RIVER BASIN--Continued

## MONONGAHELA RIVER AT CHARLEROI, PA.

LOCATION.--At Mercantile Bridge Company toll bridge approximately 1½ miles downstream from gaging station at Charleroi, Washington County, and 1 mile downstream from lock 4.

DRAINAGE AREA.--5,213 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1944 to June 1953.

Water temperatures: October 1944 to June 1953.

EXTREMES, 1952-53.--Hardness: Maximum, 310 ppm Nov. 11-20; minimum, 57 ppm Mar. 11-20.

Specific conductance: Maximum daily, 1,190 micromhos Oct. 10; minimum daily, 169 micromhos Feb. 22.

Water temperature: Minimum, 36°F Jan. 5.

EXTREMES, 1944-53.--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, 210 micromhos Sept. 11-20, 1946; minimum, 149 micromhos Dec. 1-10, 1949.

Water temperatures: Maximum, 86°F Sept. 1, 1948; June 29, 1952; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for gaging station at Charleroi for water year October 1952 to September 1953 given in WSP 1275.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium, magnesium	Non-carbonate				
Oct. 1-10, 1952 ...	871	--	--	--	--	--	--	92	--	--	0	444	23	--	7.6	--	300	300	110	1,050	3.50	2
Oct. 11-20.....	823	11	--	0.46	--	--	72	8	115	--	0	410	22	0.3	4.0	693	213	213	84	1,080	3.40	0
Oct. 21-31.....	835	--	--	--	--	--	--	--	96	--	0	417	21	--	6.0	--	260	260	108	991	3.50	0
Nov. 1-10.....	694	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 11-20.....	2,585	--	--	--	--	--	--	--	97	--	0	460	24	--	8.9	--	310	310	119	1,040	3.80	1
Nov. 21-30.....	2,049	--	--	--	--	--	--	--	78	--	0	390	20	--	1.3	--	265	265	122	988	3.50	1
Dec. 1-10.....	10,930	--	--	--	--	--	--	--	51	--	0	227	15	--	4.5	--	150	150	71	606	3.70	5
Dec. 11-20.....	4,209	--	--	--	--	--	--	--	19	--	0	129	11	--	3.1	--	110	110	33	346	4.30	0
Dec. 21-31.....	11,960	--	--	--	--	--	--	--	7.9	--	0	84	6.0	--	1.5	--	80	80	26	254	4.20	5
Jan. 1-10, 1953 ...	17,550	--	--	--	--	--	--	--	15	--	0	105	8.0	--	3.7	--	92	92	20	327	4.25	4
Jan. 11-20.....	20,491	--	--	--	--	--	--	--	3.5	--	0	62	5.0	--	2.6	--	66	66	20	203	4.40	4
Jan. 21-31.....	10,443	--	--	--	--	--	--	--	6.2	--	0	70	5.0	--	1.9	--	68	68	21	195	4.6	1
Feb. 1-10.....	17,085	--	--	--	--	--	--	--	5.8	--	0	81	4.0	--	.8	--	78	78	29	227	3.80	2
Feb. 11-20.....	14,229	--	--	--	--	--	--	--	6.1	--	0	80	5.0	--	1.2	--	78	78	25	224	4.40	3
Feb. 21-28.....	12,434	--	--	--	--	--	--	--	6.1	--	0	82	5.0	--	1.0	--	80	80	26	227	4.15	3
Mar. 1-10.....	14,590	--	--	--	--	--	--	--	9.3	--	0	91	6.0	--	1.3	--	84	84	28	246	4.20	4
Mar. 11-20.....	16,644	5.3	--	.01	--	--	17	3.5	13	--	a18	77	4.5	.0	1.3	139	57	57	215	3.90	4	
Mar. 21-31.....	16,644	--	--	--	--	--	--	--	6.8	--	0	84	5.5	--	1.9	--	82	82	14	281	4.8	--

a Includes equivalent of 2 parts per million of carbonate (CO<sub>3</sub>).



Apr. 1-10, 1953 . . . . .	16,860						4.5	0	70	4.0	--	1.6	--	70	70	14	225	4.40	4
Apr. 11-20 . . . . .	16,230						2.7	0	73	6.0	--	1.7	--	80	80	12	224	4.30	--
Apr. 21-30 . . . . .	10,316						7.3	0	90	5.0	--	1.5	--	86	86	16	260	4.20	--
May 1-10 . . . . .	15,600						14	0	100	6.0	--	1.8	--	84	84	16	281	4.20	--
May 11-20 . . . . .	10,797						8.2	0	98	3.5	--	1.0	--	90	90	18	286	4.40	4
May 21-31 . . . . .	7,929						19	0	118	5.5	--	2.8	--	92	92	20	319	4.20	2
June 1-10 . . . . .	1,825						25	0	154	7.5	--	.5	--	116	116	26	398	4.20	2
June 11-20 . . . . .	1,607						46	0	230	10	--	3.4	--	156	156	44	575	3.80	3
June 21-30 . . . . .	1,302						49	0	244	11	--	3.5	--	165	165	29	678	3.50	3
Average . . . . .	b9,650						31	--	172	9.6	--	2.7	--	127	127	42	450	--	3

b For period of record only; mean discharge for water year was 7,022 cfs.

## MONONGAHELA RIVER BASIN--Continued

## MONONGAHELA RIVER AT CHARLEROI, PA.--Continued

Temperature (°F) of water, water year October 1952 to September 1953  
 /Once-daily temperature measurement at approximately 7:30 p.m./

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

## OHIO RIVER MAIN STEM--Continued

## OHIO RIVER AT AMBRIDGE, PA.

LOCATION.--At bridge on State Highway 930 at Ambridge, Beaver County, 1.2 miles downstream from Sewickley Creek, and approximately 5 miles below gaging station at Sewickley, Allegheny County.

DRAINAGE AREA --19,560 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1945 to June 1953.

Water temperatures: October 1945 to June 1953.

EXTREMES, 1952-53.--Hardness: Maximum, 256 ppm Oct. 21-31; minimum, 57 ppm May 21-31.

Specific conductance: Maximum daily, 885 micromhos Nov. 12; minimum daily, 127 micromhos May 29.

Water temperature: Minimum, 36°F Mar. 8.

EXTREMES, 1945-53.--Dissolved solids (1945-47): Maximum, 600 ppm Oct. 1-10, 1946; minimum, 79 ppm Apr. 1-10, 1947.

Hardness (1945-47)(1949-53): Maximum, 302 ppm Oct. 1-10, 1946; minimum, 43 ppm Apr. 1-10, 1947.

Specific conductance: Maximum daily, 994 micromhos Sept. 25, 1952; minimum daily, 107 micromhos Mar. 24, 1948.

Water temperatures: Maximum, 86°F Aug. 20, 21, 1947; July 22, 23, 1952; 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 water discharge for water year October 1952 to September 1953 based on records for Ohio River at Sewickley, which are given in WSP 1275.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium	Non-carbonate				
Oct. 1-10, 1952..	4,051								58		8	246	43		18		212	205		701	6.7	5
Oct. 11-20.....	3,950							63		5	265	52			18		230	226		746	6.0	2
Oct. 21-31.....	3,415							--	--	4	--	54			--		256	--		761	5.9	5
Nov. 1-10.....	3,178							72		6	275	58			23		236	231		798	5.9	3
Nov. 11-20.....	4,744							76		5	296	53			24		240	236		815	6.3	3
Nov. 21-30.....	17,454							47		14	189	48			13		184	173		596	6.7	4
Dec. 1-10.....	11,954							40		7	187	34			13		140	134		492	5.7	10
Dec. 11, 12.....	60,850							36		16	139	29			9.6		141	128		459	6.3	3
Dec. 13-20.....	37,988							12		10	64	18			7.0		80	72		235	6.5	3
Dec. 21-31.....	16,555							16		8	82	18			10		90	83		277	6.1	5
Jan. 1-10, 1953..	22,220							8.0		10	88	18			5.2		110	102		314	6.1	3
Jan. 11-20.....	51,480							10		11	67	15			4.7		82	73		250	6.2	5
Jan. 21-31.....	56,060							8.6		8	58	13					70	63		204	6.2	5
Feb. 1-10.....	43,590							5.8		8	57	12			4.2		72	67		202	5.9	3
Feb. 11-20.....	41,116							12		6	71	14			7.2		72	72		225	6.7	3
Feb. 21-29.....	45,813							12		10	61	16			6.7		76	68		226	6.9	3
Mar. 1-10.....	46,190							11		8	60	14			2.8		68	61		215	6.3	6
Mar. 11-20.....																						
Mar. 21-31.....	54,020		5.1		0.01		20	4.8	4.7	8	54	12		0.1	2.8	120	70	63		185	6.4	3

## OHIO RIVER MAIN STEM--Continued

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

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Total acidity as H <sub>2</sub> PO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium, mg./mesium	Non-carbonate				
Apr. 1-10, 1953..	58,950									8.8	6	59	10		1.0		62	57		189	5.9	4
Apr. 11-20 .....	50,320								7.5	8	8	62	12		2.8		74	67		218	5.8	2
Apr. 21-30 .....	45,900								9.9	8	8	67	13		2.4		75	68		222	6.0	3
May 1-10 .....	49,660								10	7	7	72	12		2.9		78	72		240	6.0	2
May 11-20 .....	45,960								5.8	8	8	66	8.0		2.4		76	69		223	6.8	4
May 21-31 .....	66,564								10	9	9	55	9.0		1.9		57	50		169	6.9	3
June 1-10 .....	64,100								8.0	9	9	51	9.5		2.0		58	51		168	6.6	4
June 11-20 .....	15,910								16	8	8	99	14		3.8		97	90		289	6.5	3
June 21-30 .....	8,479								26	6	6	148	19		4.7		132	127		393	6.8	2
Average .....	a 34,318								23	8	8	112	23		7.6		116	104		364	--	4

a For period of sampling only; mean discharge for water year was 27,940 cfs.

## OHIO RIVER MAIN STEM--Continued

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

Chemical analyses of cross-section samples, October 1952 to May 1953

Date	Discharge (cfs)	Station	Time	Temperature (°F)	Specific conductance (micromhos at 25°C)
Oct. 20, 1952 .....	3,830	340	2:55 p. m.	61	838
		625	2:45 p. m.	61	778
		870	2:35 p. m.	61	780
		1090	2:25 p. m.	62	774
		1380	2:15 p. m.	62	776
Nov. 18 .....	3,890	340	11:20 a. m.	57	763
		625	11:15 a. m.	56	765
		870	11:10 a. m.	56	763
		1090	11:05 a. m.	56	765
		1380	11:00 a. m.	57	767
Dec. 10 .....	18,000	340	11:05 a. m.	45	434
		625	11:00 a. m.	47	424
		870	10:57 a. m.	44	437
		1090	10:53 a. m.	45	450
		1380	10:48 a. m.	46	452
Jan. 13, 1953 .....	57,300	340	4:00 p. m.	38	263
		625	3:55 p. m.	39	257
		870	3:50 p. m.	39	247
		1090	3:45 p. m.	39	245
		1380	3:35 p. m.	41	242
Feb. 24 .....	59,400	340	10:50 a. m.	41	223
		625	10:45 a. m.	40	219
		870	10:40 a. m.	39	223
		1090	10:35 a. m.	37	231
		1380	10:30 a. m.	37	238
Mar. 18 .....	59,400	340	10:40 a. m.	45	251
		625	10:35 a. m.	45	241
		870	10:30 a. m.	46	251
		1090	10:25 a. m.	46	256
		1380	10:20 a. m.	48	258
Apr. 8 .....	47,000	340	1:55 p. m.	50	192
		625	1:45 p. m.	50	209
		870	1:35 p. m.	51	218
		1090	1:30 p. m.	51	231
		1380	1:20 p. m.	53	241
May 13 .....	37,300	340	10:15 a. m.	64	202
		625	10:10 a. m.	64	214
		870	10:05 a. m.	64	228
		1090	10:00 a. m.	65	240
		1380	9:55 a. m.	65	249

## OHIO RIVER MAIN STEM--Continued

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

Temperature (°F) of water, water year October 1952 to September 1953  
 /Once-daily temperature measurements at approximately 4 p. m./

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

## OHIO RIVER MAIN STEM --Continued

## OHIO RIVER AT CINCINNATI, OHIO

LOCATION.--At gaging station at Covington and Cincinnati Suspension Bridge, Cincinnati, Hamilton County, 0.2 mile downstream from Licking River and 1.9 miles upstream from Mill Creek.

DRAINAGE AREA.--76,380 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1953.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 13, 1952	7,500	0.7	0.03	68	18	52	4.2	57	199	70	0.5	2.9	458	244	197	732	7.2	2
Nov. 14	9,000	4.5	0.04	76	17	48	4.0	53	205	79	0.4	6.0	483	258	216	782	6.8	4
Dec. 15	111,000	5.5	0.05	47	11	39	3.8	45	117	61	0.4	5.1	304	164	126	533	6.8	3
Jan. 15, 1953	144,000	6.1	0.11	25	6.6	12	2.4	32	65	14	0.2	4.8	154	90	63	260	6.6	6
Feb. 16	127,000	3.2	0.10	26	7.0	12	1.4	37	64	16	0.2	3.8	148	93	63	257	6.6	2
Mar. 16	129,000	5.6	0.01	28	7.0	11	1.7	44	65	17	0.1	1.9	159	98	63	270	6.6	3
Apr. 15	155,000	6.2	0.06	22	6.1	11	1.5	34	56	14	0.1	2.6	135	81	52	230	6.7	5
May 15	120,000	6.4	0.24	28	9.0	12	1.4	33	84	13	0.2	2.0	181	107	80	294	6.9	7
June 15	41,900	6.2	0.05	26	6.8	12	2.1	42	62	13	0.2	3.7	157	94	58	268	6.9	1
July 15	16,600	5.2	0.02	32	8.0	18	2.8	50	78	24	0.2	3.5	200	113	72	331	7.4	4
Aug. 14	21,800	0.4	0.05	51	11	40	3.3	50	127	56	0.2	4.5	347	172	132	568	7.1	3
Sept. 15	8,500	1.1	0.08	60	14	46	4.8	54	188	48	0.4	6.4	398	210	163	682	7.2	5

OHIO RIVER MAIN STEM

## OHIO RIVER MAIN STEM --Continued

## OHIO RIVER AT LOUISVILLE, KY.

LOCATION.--At bridge on U.S. Highway 31E at Louisville, Jefferson County, 2.2 miles upstream from lock and gage, and 2.8 miles downstream from Beargrass Creek. DRAINAGE AREA.--91,170 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1953.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 15, 1952	11,300	0.7	0.02	57	15	36	3.2	80	140	49	0.5	3.6	355	205	138	593	7.2	4
Nov. 14	17,500	2.4	.04	74	17	49	3.8	82	196	68	.4	5.4	457	256	187	762	7.1	6
Dec. 15	134,000	5.6	.05	56	12	31	5.1	63	147	39	.5	8.1	338	189	137	555	6.7	5
Jan. 15, 1953	181,000	6.1	.26	26	6.8	11	2.2	46	49	17	.2	5.1	132	94	55	261	6.8	8
Feb. 16	142,000	3.6	.10	32	8.3	12	1.6	61	62	16	.1	4.4	172	113	84	295	7.0	2
Mar. 16	132,000	6.8	.01	27	6.8	6.4	1.4	71	38	7.5	.2	3.4	142	166	27	288	6.8	7
Apr. 15	163,000	3.8	.10	27	6.3	10	1.5	41	52	16	.1	3.1	145	93	56	292	6.9	5
May 15	181,000	6.3	.12	25	7.3	9.3	1.5	43	58	8.5	.2	1.4	149	92	57	244	6.8	15
June 15	49,000	5.6	.05	29	6.8	8.8	1.9	53	58	11	.2	4.0	157	100	57	260	7.0	1
July 15	18,300	6.4	.10	38	9.2	16	2.8	64	76	22	.1	4.3	220	133	80	354	6.8	7
Aug. 14	29,400	5	.02	48	11	24	3.4	73	104	34	.3	5.2	275	167	105	470	7.2	7
Sept. 15	10,400	1.7	.05	60	14	43	4.1	67	154	59	.5	7.3	380	208	152	628	7.1	5



## OHIO RIVER MAIN STEM--Continued

## OHIO RIVER AT METROPOLIS, ILL.

LOCATION.--At gaging station at Paducah and Illinois Railroad Bridge at Metropolis, Massac County, 9½ miles downstream from Tennessee River, and 37 miles upstream from mouth.

DRAINAGE AREA.--203,000 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1953.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO <sub>3</sub>		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate			
Oct. 15, 1952.....	58,600	2.1	0.05	30	7.5	12	2.0	85	38	15	0.2	1.0		155		107	36		278	7.4	3
Nov. 14.....	42,100	3.8	.04	34	8.0	13	.6	94	40	18	.2	.8		166		117	41		298	7.4	3
Dec. 15.....	176,000	3.5	.03	30	8.0	21	2.3	84	63	34	.3	2.2		216		133	64		380	6.8	4
Jan. 15, 1953 a...	385,000	--	--	37	6.6	41	2.4	82	49	64	--	8.9		--		119	52		451	6.9	--
Jan. 15 b.....	385,000	4.1	.08	34	6.3	11	1.7	81	38	18	.2	4.3		163		111	44		285	7.3	5
Jan. 15 c.....	385,000	--	--	41	8.5	17	2.6	92	63	25	--	8.2		--		138	62		359	7.0	--
Feb. 16 a.....	405,000	--	--	20	3.9	5.8	1.4	64	28	8.0	--	3.1		--		66	14		157	7.3	--
Feb. 16 b.....	405,000	3.3	.44	28	4.6	5.6	.5	71	27	8.0	.1	3.3		124		85	26		203	6.9	25
Feb. 16 c.....	405,000	--	--	34	7.8	9.2	1.4	76	68	13	--	6.0		--		116	55		275	7.3	--
Mar. 16.....	432,000	6.1	.01	32	7.5	11	1.7	61	64	14	.1	2.4		169		110	61		231	6.8	3
Apr. 15 a.....	306,000	5.3	.02	28	6.6	7.2	1.1	70	40	9.5	.2	3.4		132		98	40		237	6.6	5
Apr. 15 c.....	306,000	6.4	.02	35	9.7	10	1.3	78	55	14	.2	4.4		192		127	63		301	7.1	5
May 15 a.....	326,000	3.2	.05	23	4.9	4.7	1.1	70	24	5.0	.1	2.0		107		78	20		185	7.4	1
May 15 b.....	326,000	5.1	.05	34	8.5	11	2.1	80	61	12	.1	3.6		181		120	54		306	7.4	1
June 15 a.....	148,000	4.1	.05	24	4.6	5.5	1.1	66	28	6.5	.1	2.1		114		80	25		196	7.1	3
June 15 b.....	148,000	5.5	.02	31	7.5	8.8	1.5	71	50	14	.2	2.9		164		108	50		271	7.4	2
July 15.....	81,900	2.3	.02	32	6.1	7.7	1.6	90	32	12	.2	3.5		134		105	31		250	7.6	5
Aug. 14.....	84,600	2.3	.02	34	8.9	12	2.1	89	46	1.6	.2	2.1		171		122	46		304	7.7	4
Sept. 15.....	45,300	1.5	.01	22	8.5	7.7	1.0	79	24	12	.2	1.1		112		90	25		213	7.4	3

a Collected at left quarter point.

b Collected at midsection.

c Collected at right quarter point.

## BEAVER RIVER BASIN

## MAHONING RIVER AT LEAVITTSTOWN, OHIO.

LOCATION.--At gaging station in Leavittsburg, Trumbull County, 300 feet downstream from Duck Creek and 1½ miles downstream from Eagle Creek. DRAINAGE AREA.--580 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1953.

Water temperatures: April 1943 to December 1945, October 1946 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 78°F Sept. 3; minimum, freezing point on several days during December, January, February, and March.

EXTREMES, 1948-53.--Water temperatures: Maximum, 86°F July 2, 1948; minimum, freezing point on several days during winter months.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boiron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO <sub>3</sub>		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH or
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 11, 1952.....	276	2.9	0.03	43	14	12	3.0	86	100	14	0.3	0.6		241		164	94			389	7.6
Dec. 1.....	155	3.5	.02	53	15	18	3.5	91	118	25	.2	2.9		296		194	119			469	7.4
Dec. 12.....	295	3.9	.02	51	16	16	3.6	90	119	21	.2	4.1		288		192	119			460	7.3
Jan. 23, 1953.....	281	5.7	.02	46	14	14	3.2	70	112	21	.2	4.9		284		173	115			418	7.0
Feb. 13.....	450	5.0	.05	51	15	17	2.7	83	122	24	.2	3.0		293		190	121			465	7.2
Mar. 7.....	310	6.5	.01	31	8.7	7.6	2.5	42	80	9.2	.2	4.0		176		113	79			280	6.7
Apr. 18.....	318	6.7	.11	43	13	11	2.1	82	100	12	.2	2.4		241		160	94			373	6.0
May 16.....	438	4.8	.05	47	14	13	2.4	92	101	17	.2	3.5		250		176	99			414	7.1
June 12.....	238	3.4	.01	48	14	10	2.2	87	108	16	.1	2.2		255		178	106			431	6.9
July 2.....	274	5.1	.01	47	14	12	2.1	87	104	16	.2	2.6		256		174	104			410	7.4
Aug. 14.....	252	4.1	.05	46	13	13	2.9	80	101	14	.2	2.1		252		167	103			395	7.3
Sept. 26.....	246	2.6	.05	47	13	12	3.2	85	100	15	.2	1.0		243		171	101			404	7.6

## BEAVER RIVER BASIN--Continued

## MAHONING RIVER AT LEAVITTSBURG, OHIO--Continued

Temperature (°F) of water, water year October 1952 to September 1953  
 (Once-daily temperature measurement at approximately 8 a.m.)

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



BEAVER RIVER BASIN--Continued  
MAHONING RIVER AT YOUNGSTOWN, OHIO

LOCATION.--At Bridge Street Bridge in Youngstown, Mahoning County, 400 feet downstream from gaging station, and 0.7 mile upstream from Mill Creek.

DRAINAGE AREA.--899 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1953.

Water temperatures: October 1952 to September 1953.

EXTREMES, 1952-53.--Dissolved solids: Maximum, 518 ppm Jan. 1-10; minimum, 260 ppm June 21-30, July 11-31.

Hardness: Maximum, 288 ppm Dec. 21-31; minimum, 143 ppm Aug. 1-10.

Specific conductance: Maximum daily, 855 microhos Jan. 4; minimum daily, 217 microhos June 13.

Water temperatures: Maximum, 95°F June 6; minimum, 42°F Jan. 19-20, 29 Feb. 22.

REMARKS.--Records of specific conductance of daily samples from October 1952 to September 1953 available in district office at Columbus, Ohio. Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium, nesium	Non-carbonate				
Oct. 1-10, 1952 ..	379		11	0.1	1.2	0.90	53	12	25	6.9	50	162	26	1.6	1.2	336	180	141		514	6.6	25
Oct. 11-20 .....	392		18	1	.24	.80	60	14	23	7.4	53	177	24	1.6	1.0	370	207	164		543	6.6	8
Oct. 21-31 .....	340		13	1	1.0	1.0	57	14	25	7.6	51	181	28	1.3	1.5	372	201	158		543	6.4	3
Nov. 1-10 .....	273		11	1	1.1	1.3	65	17	30	8.9	57	218	32	2.2	2.2	420	236	188		633	6.4	3
Nov. 11-20 .....	305		8.6	1	.35	1.4	65	16	33	9.2	43	220	36	2.2	2.4	429	228	193		653	6.4	10
Nov. 21-30 .....	276		13	0	.02	.90	74	18	35	10	73	228	37	1.6	1.7	464	260	199		716	6.8	5
Dec. 1-10 .....	342		15	0	.15	1.5	72	19	36	9.2	71	227	42	1.6	1.4	470	260	200		721	6.6	7
Dec. 11-20 .....	304		12	0	.02	1.1	76	20	31	10	77	227	39	2.0	1.0	462	270	209		722	6.8	7
Dec. 21-31 .....	234		11	--	.02	1.7	79	22	34	12	79	250	44	2.0	1.4	504	288	223		799	6.8	5
Jan. 1-10, 1953 ..	241		9.0	--	.02	1.6	80	21	38	10	64	264	47	1.6	1.4	518	286	234		811	6.7	5
Jan. 11-20 .....	844		13	--	.05	.90	64	16	25	6.6	80	168	30	1.6	2.7	370	224	160		598	6.8	5
Jan. 21-31 .....	970		9.6	--	.02	.25	49	13	17	6.0	32	148	23	1.6	3.9	302	174	150		461	6.2	4
Feb. 1-10 .....	473		9.6	0	.02	.3	63	16	25	7.8	38	191	34	1.2	3.5	382	222	192		588	6.3	2
Feb. 11-20 .....	440		7.5	0	.02	1.3	67	19	30	7.0	63	204	38	1.0	2.1	127	246	194		650	6.7	3
Feb. 21-28 .....	628		8.9	0	.02	1.2	62	17	26	6.7	54	181	36	1.7	2.8	392	223	180		593	6.7	3
Mar. 1-10 .....	695		9.8	0	.01	.90	57	15	23	7.4	40	175	30	1.0	2.9	362	202	171		547	6.1	3
Mar. 11-20 .....	437		11	0	.02	1.1	63	16	27	7.6	38	207	33	1.0	3.9	412	222	192		509	6.1	3
Mar. 21-31 .....	533		9.8	0	.02	1.0	54	13	20	5.8	26	177	24	1.0	4.7	344	188	167		506	5.9	2
Apr. 1-10 .....	567		9.4	0	.02	.70	54	14	21	5.6	20	181	24	1.0	4.4	346	192	176		509	5.3	2
Apr. 11-20 .....	710		10	0	.02	.70	46	12	19	5.8	23	186	25	1.0	4.6	367	188	146		452	6.2	2
Apr. 21-30 .....	456		7.7	0	.02	1.1	54	14	22	6.4	42	183	26	1.0	4.4	350	194	158		523	6.3	2
May 1-10 .....	425		8.7	0	.02	.84	56	17	27	8.0	49	200	34	1.0	4.1	400	236	194		621	6.6	2
May 11-20 .....	816		9.8	2	.03	.08	56	14	22	6.4	46	169	26	1.7	6.3	358	196	160		546	6.6	3
May 21-31 .....	1,391		12	4	.06	.05	50	14	14	4.3	76	126	17	1.6	3.2	289	182	120		468	6.9	10

BEAVER RIVER BASIN--Continued  
MARONING RIVER AT YOUNGSTOWN, OHIO--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium, as CaCO <sub>3</sub>	Non-carbonate				
June 1-10, 1953 ..	635		6.4	0.2	0.07	0.12	59	14	20	6.3	49	168	18	1.4	6.3	345	204	165		561	6.8	2
June 11-20 .....	489		7.5	.1	.02	.50	52	12	18	6.5	47	149	22	.8	3.0	300	180	141		473	7.0	2
June 21-30 .....	623		6.9	.2	.02	.60	46	9.7	16	5.8	28	140	19	1.4	2.8	260	155	132		423	6.6	5
July 1-10 .....	590		8.9	.1	.04	.20	46	12	17	5.8	38	137	20	1.2	3.7	272	165	133		445	6.7	5
July 11-20 .....	587		6.3	.1	.02	.50	44	9.7	17	4.6	39	131	21	.8	1.0	280	130	118		419	6.8	7
July 21-31 .....	597		4.5	.0	.05	.30	43	9.9	16	5.3	26	129	17	.6	3.3	260	147	127		401	6.6	15
Aug. 1-10 .....	623		4.0	.0	.02	.00	43	8.7	16	5.5	16	128	20	.8	2.3	264	143	128		398	6.3	15
Aug. 11-20 .....	469		5.6	.4	.02	.40	49	10	13	6.1	15	151	22	1.2	6.0	298	183	156		421	6.5	5
Aug. 21-31 .....	510		4.4	.3	.02	.40	43	10	13	6.1	18	141	26	1.1	7.9	304	193	158		421	6.5	5
Sept. 1-10 .....	541		8.4	.2	.06	.80	46	13.0	17	5.4	19	142	19	.8	7.3	274	153	138		415	5.9	4
Sept. 11-20 .....	354		7.5	.2	.10	.70	46	13	24	7.4	24	186	29	1.2	1.0	369	206	186		552	6.1	4
Sept. 21-30 .....	315		8.2	.4	.14	1.2	67	15	29	7.6	13	223	33	.6	12	420	229	218		620	3.7	5
Average .....	554		9.4	0.1	0.09	0.77	58	14	24	7.0	44	179	28	1.2	3.8	361	202	166		556	--	--

## BEAVER RIVER BASIN--Continued

## MAHONING RIVER AT YOUNGSTOWN, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, November 1952 to September 1953

Date of collection	Time	Mean discharge (cfs)	Temperature		Dissolved oxygen		Cyanide	Phenolic material as C <sub>6</sub> H <sub>5</sub> OH
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Nov. 21, 1952 ..	6:15 p. m.	346	78	25.6	4.6	55	0.0	0.013
Dec. 12.....	6:30 p. m.	438	72	22.2	3.8	44	.1	.173
Dec. 23.....	9:00 a. m.	253	82	27.8	4.6	58	.0	.221
Jan. 24, 1953...	7:30 a. m.	491	68	20.0	4.8	52	.1	.114
Feb. 13.....	5:45 p. m.	432	60	15.6	5.9	59	.0	.302
Mar. 6.....	4:30 p. m.	1,110	49	9.4	6.4	56	.0	.106
Mar. 28.....	10:30 a. m.	990	57	13.9	5.9	57	.0	.074
Apr. 18.....	2:00 p. m.	451	68	20.0	4.8	52	.3	.040
May 16.....	12:00 m.	557	84	28.9	5.2	67	.1	.039
June 12.....	--	502	90	32.2	5.2	71	.0	.022
July 2.....	--	778	85	29.4	5.6	72	.0	.023
July 23.....	--	665	90	32.2	5.0	68	.3	.008
Aug. 14.....	--	508	95	35.0	5.4	77	.2	.064
Sept. 3.....	--	626	89	31.7	5.0	67	.1	.008
Sept. 26.....	--	302	94	34.4	1.4	20	.2	.032

Temperature (°F) of water, water year October 1952 to September 1953  
(Once-daily temperature measurement at approximately 7 a. m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	85	85	83	79	53	61	64	83	74	86	90	88
2	86	84	83	81	47	64	60	87	75	90	90	90
3	82	79	84	80	58	69	57	85	76	80	88	90
4	83	80	65	81	60	55	61	88	78	85	89	90
5	87	80	75	82	63	45	65	91	91	85	89	86
6	83	85	69	80	65	46	70	90	95	85	86	80
7	83	86	64	82	66	51	75	89	89	90	88	85
8	81	83	70	80	62	58	75	81	83	90	90	83
9	86	85	75	71	60	58	68	74	90	90	90	85
10	85	89	79	68	63	64	65	78	92	85	80	88
11	87	85	73	58	67	62	58	83	91	90	80	89
12	82	87	71	47	61	65	58	89	89	90	90	88
13	78	88	73	52	60	70	55	89	90	90	92	85
14	82	89	70	58	58	70	55	88	87	92	93	83
15	80	85	71	65	59	72	65	80	86	91	91	84
16	78	81	72	74	60	66	71	82	89	91	88	89
17	79	77	76	69	55	63	72	75	85	92	90	88
18	82	76	79	50	60	71	69	70	89	93	87	85
19	80	86	81	42	61	74	62	71	90	90	87	84
20	79	81	82	42	64	79	56	72	92	89	88	82
21	80	86	83	51	63	82	55	78	91	90	89	89
22	82	81	82	55	42	83	68	80	91	92	90	90
23	85	78	80	63	51	88	62	65	88	91	85	87
24	81	77	81	69	52	71	71	62	86	91	88	89
25	79	83	78	62	62	59	74	66	85	89	88	90
26	78	85	75	43	65	53	78	74	89	90	89	91
27	80	84	80	53	64	52	71	75	88	91	89	95
28	80	81	76	50	63	53	70	68	85	90	90	90
29	80	84	76	42	--	53	75	66	80	92	89	85
30	81	82	79	48	--	54	80	67	90	92	88	88
31	85	---	81	50	--	60	--	73	--	91	88	--
Average	82	83	76	62	59	64	66	78	87	89	88	87

BEAVER RIVER BASIN--Continued  
MAHONING RIVER AT LOWELLVILLE, OHIO

LOCATION.--At gaging station 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.--Chemical analyses: October 1951 to September 1953.

Water temperatures: October 1943 to November 1944, incomplete, October 1949 to September 1953.

EXTREMES, 1952-53.--Dissolved solids: Maximum, 629 ppm Jan. 1-10; minimum, 258 ppm May 22-25.

Hardness: Maximum, 328 ppm Jan. 1-10; minimum, 170 ppm May 22-25.

Specific conductance: Maximum daily, 1,120 micromhos Dec. 27; minimum daily, 344 micromhos May 24.

Water temperatures: Maximum, 107°F Aug. 14, 27-28; minimum, 43°F Jan. 29-30.

EXTREMES, 1951-53.--Dissolved solids: Maximum, 629 ppm Jan. 1-10, 1953; minimum, 182 ppm Feb. 1-10, 1952.

Hardness: Maximum, 328 ppm Jan. 1-10, 1953; minimum, 107 ppm Feb. 1-10, 1952.

Specific conductance: Maximum daily, 1,160 micromhos May 30, 1952; minimum daily, 186 micromhos Jan. 28, 1952.

Water temperatures: Maximum, 107°F Aug. 14, 27-28, 1953; minimum, 35°F Jan. 2, 1952.

EXTREMES, 1949-53.--Water temperatures: Maximum, 111°F Aug. 6, 1944; minimum, freezing point Dec. 5, 1950.

REMARKS.--Water temperature affected by cooling water from steel mills. Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium, magnesium	Non-carbonate				
Oct. 1-10, 1952..	486		14	0.3	12	1.7	66	16	32	12	10	275	34	1.4	0.3	464	230	222		709	5.5	3
Oct. 11-20 .....	476		9.5	.1	.90	.80	67	16	30	11	13	251	36	1.4	.3	447	235	222		673	5.8	30
Oct. 21-31 .....	424		12	.1	1.4	1.2	70	17	33	12	46	237	40	1.5	.3	463	244	207		708	6.3	8
Nov. 1-10 .....	346		11	.1	.86	1.2	78	17	40	14	39	277	44	1.9	.2	517	267	233		788	6.3	20
Nov. 11-20 .....	378		9.9	.1	1.2	1.6	82	18	43	15	39	285	48	1.8	.3	432	276	247		823	6.4	23
Nov. 21-30 .....	375		16	.1	.01	1.1	86	19	42	14			46	1.6	2.5	560	294	247		837	6.6	4
Dec. 1-10 .....	440		11	.2	.24	1.2	87	22	44	13	27	311	54	1.6	.2	576	308	285		857	6.1	6
Dec. 11-20 .....	408		14	--	.08	.90	86	22	40	14	66	290	44	1.8	.2	567	308	251		879	6.3	5
Dec. 21-31 .....	305		10	--	.98	1.8	92	23	47	17	62	320	58	2.0	.2	612	324	273		995	6.5	30
Jan. 1-10, 1953..	337		12	--	3.5	1.7	98	23	49	16	59	328	64	1.6	.2	629	328	278		955	6.3	15
Jan. 11-20 .....	1,016		16	.1	1.2	1.0	71	17	29	9.6	73	312	36	1.2	1.0	436	248	187		853	6.6	30
Jan. 21-31 .....	1,166		11	.0	.02	1.0	56	14	21	7.5	30	187	26	.6	1.6	352	198	173		551	6.3	4
Feb. 1-10 .....	603		9.1	.0	.53	1.1	70	17	30	11	17	249	40	1.2	2.6	452	244	231		695	6.2	6
Feb. 11-20 .....	582		8.4	.0	3.0	1.3	73	19	35	11	44	254	45	.4	.9	484	260	224		745	6.4	10
Feb. 21-28 .....	719		9.0	.0	.12	1.1	69	18	31	10	30	235	39	.7	.9	448	248	222		675	6.3	5
Mar. 1-10 .....	773		8.8	.0	.15	1.2	66	14	30	10	55	193	36	.8	.3	421	223	177		646	6.6	5
Mar. 11-20 .....	574		8.9	.0	.92	1.6	72	15	29	11	38	247	35	1.0	.5	455	242	218		687	6.4	7
Mar. 21-24 .....			8.6	.0	.10	1.4	76	19	36	13	30	258	47	1.1	.1	514	266	243		796	6.5	3
Mar. 25-31 .....	1,481		10	.0	.02	.50	54	13	19	6.0	43	161	23	.7	1.8	318	188	153		488	5.9	3





## OHIO RIVER BASIN EXCEPT CUMBERLAND AND TENNESSEE RIVER BASINS

## BEAVER RIVER BASIN--Continued

## MAHONING RIVER AT LOWELLVILLE, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, November 1952 to September 1953

Date of collection	Time	Mean discharge (cfs)	Temperature		Dissolved oxygen		Cyanide	Phenolic material as $C_6H_5OH$
			°F	°C	Parts per million	Percent saturation		Parts per million
Nov. 21, 1952.	5:15 p. m.	516	87	30.6	4.2	56	0.0	0.007
Dec. 12. ....	5:45 p. m.	605	74	23.3	4.5	52	.2	.014
Dec. 23. ....	8:00 a. m.	340	83	28.3	4.7	60	.2	.272
Jan. 24, 1953..	8:30 a. m.	650	74	23.3	3.9	45	.3	.335
Feb. 13. ....	4:45 p. m.	697	65	18.3	5.1	54	.0	.183
Mar. 6. ....	3:45 p. m.	1,190	54	12.2	7.8	72	.0	.276
Mar. 28. ....	9:30 a. m.	1,250	58	14.4	6.6	64	.1	.148
Apr. 18. ....	1:00 p. m.	724	70	21.1	5.8	64	.3	.019
May 16. ....	--	986	79	26.1	6.2	76	.0	.008
June 12. ....	--	624	95	35.0	5.4	77	.0	.066
July 2. ....	--	987	95	35.0	4.3	61	.1	.030
July 23. ....	--	788	94	34.4	5.0	70	.3	.010
Aug. 14. ....	--	592	94	34.4	5.0	70	.6	.043
Sept. 3. ....	--	690	96	35.6	4.4	62	.6	.000
Sept. 26. ....	--	358	97	36.1	4.0	58	1.0	.000

BEAVER RIVER BASIN--Continued  
 MAHONING RIVER AT LOWELLVILLE, OHIO--Continued

Temperature (°F) of water, water year October 1952 to September 1953

Seven-day gas-activated thermograph

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1.....	98	88	97	88	85	80	87	85	61	54	74	67	69	63	94	85	83	76	104	92	102	94	103	91
2.....	95	86	95	81	85	82	80	86	61	53	72	68	64	59	93	87	87	77	98	86	102	94	106	95
3.....	89	85	92	81	88	80	92	88	68	61	75	70	66	57	92	83	83	78	97	87	102	91	106	96
4.....	95	85	87	81	80	66	88	79	72	65	74	55	71	64	99	85	83	80	96	85	102	91	105	98
5.....	93	84	92	84	79	71	83	79	75	67	55	46	74	68	96	92	103	90	87	100	89	101	101	90
6.....	90	87	91	84	75	72	81	76	76	71	53	46	76	71	100	92	105	96	99	91	99	88	96	89
7.....	95	87	86	82	74	67	83	78	78	72	62	53	83	76	95	80	96	85	103	91	103	92	96	89
8.....	98	89	90	84	82	70	82	79	73	68	63	58	92	77	81	77	84	82	101	95	102	95	100	89
9.....	99	89	90	85	87	81	85	77	71	65	70	60	96	84	73	97	84	98	92	95	89	100	89	89
10.....	95	89	89	84	88	81	82	73	76	67	76	68	89	83	90	74	86	89	97	91	93	86	103	91
11.....	95	91	92	84	82	73	73	59	76	72	78	69	64	59	95	82	99	88	100	89	99	85	103	93
12.....	93	87	89	85	75	73	60	55	76	68	83	72	62	60	100	88	96	90	98	88	104	90	101	92
13.....	93	85	94	86	76	72	66	57	70	66	82	77	66	61	89	78	96	90	99	91	104	93	92	86
14.....	90	85	94	86	75	72	73	64	70	64	83	77	73	64	84	77	92	87	101	92	107	93	95	86
15.....	86	82	96	89	79	72	79	71	67	62	83	76	77	68	82	68	97	85	103	92	102	96	101	89
16.....	88	81	92	87	85	77	80	73	67	61	76	70	76	75	82	76	99	88	104	92	98	91	101	93
17.....	88	81	92	86	88	78	74	65	67	63	79	70	80	75	78	72	95	83	103	93	101	91	104	92
18.....	89	84	87	83	88	81	65	51	72	63	79	73	77	67	73	69	84	85	100	95	97	88	98	91
19.....	88	81	86	83	87	79	51	47	77	70	81	77	70	64	78	68	103	90	98	91	95	88	97	91
20.....	83	79	84	79	84	80	55	48	78	73	89	68	64	59	88	73	106	95	100	90	100	88	97	83
21.....	86	79	86	76	87	81	83	55	77	58	93	82	86	58	93	82	103	95	100	90	102	91	97	91
22.....	82	73	84	74	89	85	70	63	56	51	88	53	72	63	88	65	103	92	96	89	102	91	99	89
23.....	84	73	81	77	82	73	66	62	51	82	93	78	67	67	92	89	91	100	95	99	91	98	88	86
24.....	82	86	85	77	89	85	77	69	68	61	87	87	84	72	97	90	93	86	99	102	90	100	86	86
25.....	90	82	88	83	85	77	68	52	74	67	67	53	90	82	75	94	100	99	86	100	90	102	92	92
26.....	82	75	87	84	79	74	54	48	76	73	53	50	83	76	82	72	97	90	101	90	102	91	103	96
27.....	85	78	85	82	79	74	67	53	75	70	53	50	76	73	81	74	98	87	101	94	107	95	100	94
28.....	81	76	84	81	80	75	66	46	74	69	57	52	79	72	75	68	99	90	106	94	107	96	102	91
29.....	78	77	86	80	84	77	48	43	--	--	54	53	87	76	73	65	96	85	103	95	106	94	106	92
30.....	86	78	85	82	89	84	55	43	--	--	61	52	88	79	77	69	101	91	104	98	102	94	105	96
31.....	90	83	--	--	88	84	61	55	--	--	72	57	--	--	79	72	--	--	105	96	102	89	--	--
Average.....	90	83	89	83	83	77	72	64	71	64	73	65	76	68	85	75	87	87	100	91	101	91	101	91

## BEAVER RIVER BASIN--Continued

## 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 June 1953.

Water temperatures: October 1945 to June 1953.

EXTREMES, 1952-53.--Hardness: Maximum, 248 ppm Nov. 11-20; minimum, 118 ppm Apr. 1-10, May 11-20.

Specific conductance: Maximum daily, 710 micromhos Nov. 19; minimum daily, 248 micromhos June 2.

Water temperatures: Minimum, 34° F on several days during winter months.

EXTREMES, 1945-53.--Dissolved solids (1945-47): Maximum, 453 ppm Oct. 21-31, 1952; minimum, 136 ppm Apr. 1-10, 1947.

Hardness: Maximum, 248 ppm Nov. 11-20, 1952; minimum, 80 ppm Jan. 21-31, 1952.

Specific conductance: Maximum daily, 710 micromhos Nov. 19, 1952; minimum daily, 161 micromhos Jan. 29, 1952.

Water temperatures: Maximum, 68° F July 6, 1949; minimum, freezing point on several days during winter months.

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 1952 to September 1953 based on records for Beaver River at Beaver Falls, which are given in WSP 1275.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boron (B)	Dissolved solids (residue at 180° C)		Hardness as CaCO <sub>3</sub>	Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos/cm at 25°C)	Color or pH
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate			
Oct. 1-10, 1952...	--	--	--	--	--	--	23	38	159	26	--	20	--	--	--	200	169	--	510	7.9
Oct. 11-20.....	--	--	--	--	--	24	24	32	182	33	--	23	--	--	--	238	212	--	598	7.4
Oct. 21-31.....	--	6.0	0.05	66	13	2.9	2.9	14	200	34	0.5	14	453	--	--	218	207	--	601	7.0
Nov. 1-10.....	--	--	--	--	--	29	28	188	34	--	--	26	--	--	--	235	212	--	620	7.3
Nov. 11-20.....	--	--	--	--	--	35	28	207	44	--	--	29	--	--	--	248	225	--	635	7.2
Nov. 21-30.....	--	--	--	--	--	22	36	134	27	--	--	16	--	--	--	162	132	--	444	6.9
Dec. 1-10.....	--	--	--	--	--	24	30	153	29	--	--	18	--	--	--	188	163	--	513	7.5
Dec. 11-20.....	--	--	--	--	--	16	26	104	20	--	--	8.6	--	--	--	128	196	--	343	7.4
Dec. 21-31.....	--	--	--	--	--	25	32	183	30	--	--	20	--	--	--	186	150	--	485	7.4
Jan. 1-10, 1953...	5,933	--	--	--	--	26	30	159	27	--	--	18	--	--	--	130	103	--	524	7.1
Jan. 11-20.....	5,820	--	--	--	--	8.9	31	85	27	--	--	5.5	--	--	--	122	97	--	340	7.9
Jan. 21-31.....	--	--	--	--	--	8.6	31	82	18	--	--	5.5	--	--	--	122	97	--	316	7.0
Feb. 1-10.....	3,391	--	--	--	--	11	26	96	20	--	--	5.9	--	--	--	130	109	--	340	6.2
Feb. 11-20.....	2,752	--	--	--	--	18	29	117	22	--	--	16	--	--	--	150	126	--	403	6.2
Feb. 21-28.....	3,130	--	--	--	--	17	36	108	22	--	--	15	--	--	--	148	118	--	384	7.2
Mar. 1-10.....	3,331	--	--	--	--	8.1	30	95	19	--	--	5.3	--	--	--	137	112	--	371	7.2
Mar. 11-20.....	3,843	--	--	--	--	6.7	32	85	18	--	--	4.7	--	--	--	125	99	--	338	7.2
Mar. 21-31.....	7,395	7.5	.04	36	8.2	6.6	30	86	14	--	3	3.9	--	203	--	124	99	--	298	6.3
Apr. 1-10.....	5,167	--	--	--	--	9.1	30	87	14	--	--	3.5	--	--	--	118	93	--	309	7.1
Apr. 11-20.....	5,020	--	--	--	--	7.3	35	84	14	--	--	2.4	--	--	--	122	93	--	311	6.6
Apr. 21-30.....	4,530	--	--	--	--	7.7	33	84	14	--	--	3.1	--	--	--	120	93	--	309	6.9

May 1-10, 1953.....	3,911	--	--	--	--	--	--	--	13	39	95	16	--	4.5	--	--	--	129	97	349	7.6	4
May 11-20.....	6,117	--	--	--	--	--	--	--	5.5	44	77	8	--	2.9	--	--	--	118	82	302	7.3	8
May 21-31.....	7,873	--	--	--	--	--	--	--	5.8	57	78	12	--	4.6	--	--	--	136	89	321	7.3	7
June 1-10.....	5,014	--	--	--	--	--	--	--	6.1	43	70	14	--	6.7	--	--	--	120	85	311	7.2	8
June 11-20.....	2,449	--	--	--	--	--	--	--	11	45	102	16	--	7.7	--	--	--	148	111	391	7.3	4
June 21-30.....	2,472	--	--	--	--	--	--	--	12	44	105	17	--	8.5	--	--	--	150	114	404	7.0	4
Average.....	--	--	--	--	--	--	--	--	14.5	34	117	22	--	11.1	--	--	--	156	128	411	--	7

## BEAVER RIVER BASIN--Continued

## BEAVER RIVER AT NEW BRIGHTON, PA.--Continued

Temperature (°F) of water, water year October 1952 to September 1953

/Once-daily temperature measurement at approximately 8:30 a. m./

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

BEAVER RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN BEAVER RIVER BASIN IN PENNSYLVANIA

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO <sub>3</sub>		Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25° C)	pH	Color
																	Calcium	Non-carbonate				
SHENANGO RIVER AT NEW CASTLE, PA.																						
Oct. 20, 1952 .....									9.5	45	78	12			7.1		120	83		316	7.5	3
Nov. 14 .....									9.0	48	76	12			6.8		122	83		307	7.5	4
Dec. 22 .....									6.5	46	72	10			4.1		116	78		288	7.6	9
Jan. 20, 1953 .....									5.0	22	47	6.0			6.8		70	52		182	7.2	6
Feb. 25 .....									2.8	36	56	7.5			4.8		100	69		239	7.3	8
Mar. 19 .....									3.4	36	59	6.0			3.9		95	66		232	7.5	5
Apr. 10 .....									3.4	44	57	6.0			4.4		100	64		242	7.7	7
May 14 .....									2.0	48	53	4.5			3.1		99	60		232	7.6	8
June 9 .....									3.4	44	41	5.5			4.8		83	47		204	7.6	7
July 14 .....									5.7	56	57	8.0			4.9		108	62		266	7.5	4

## MUSKINGUM RIVER BASIN

## MUSKINGUM RIVER AT DRESDEN, OHIO

LOCATION.--At gaging station at bridge on State Highway 208, 0.5 mile east of Dresden, Muskingum County, and 0.5 mile downstream from Wakatomika Creek.

DRAINAGE AREA.--5,982 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1952 to September 1953.

Sediment records: October 1952 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 82°F Aug. 1, Sept. 3; minimum, freezing point Dec. 28, Jan. 5, 7.

Sediment concentrations: Maximum daily, 490 ppm Jan. 19; minimum daily, 1 ppm Dec. 26-27.

Sediment loads: Maximum daily, 17,300 tons Jan. 19; minimum daily, 3 tons Dec. 26-27.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Temperature (°F) of water, water year October 1952 to September 1953

[Once-daily temperature measurement at approximately 10 a.m.]

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



## MUSKINGUM RIVER BASIN--Continued

## MUSKINGUM RIVER AT DRESDEN, OHIO--Continued

Suspended sediment, water year October 1952 to September 1953

Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	790	--		780	5	10	890	5	12
2.....	780	--		790	5	11	880	3	7
3.....	770	--		800	7	15	880	5	12
4.....	780	--		810	13	28	880	5	12
5.....	770	--		830	12	27	1,040	8	22
6.....	820	--		890	8	19	1,510	16	65
7.....	870	--		900	6	14	2,220	39	234
8.....	950	--		900	10	24	2,350	31	197
9.....	960	--		960	8	21	1,920	19	98
10.....	900	--		990	7	19	1,740	19	89
11.....	870	--		1,020	8	22	1,800	21	102
12.....	870	--		1,040	4	11	2,220	28	168
13.....	860	--		1,050	4	11	2,220	19	114
14.....	840	--		990	7	19	2,040	7	38
15.....	800	--		880	11	26	1,740	5	23
16.....	800	--		850	10	23	1,620	5	22
17.....	800	15	32	840	9	20	1,400	5	19
18.....	800	13	a 30	840	10	23	1,360	4	15
19.....	790	9	a 19	850	12	28	1,270	5	17
20.....	770	4	8	970	13	34	1,240	5	17
21.....	770	2	4	1,120	11	33	1,200	5	16
22.....	770	2	4	1,180	15	48	1,200	5	16
23.....	780	2	4	1,310	17	60	1,240	5	17
24.....	800	2	4	1,510	20	82	1,220	7	23
25.....	800	5	11	1,400	17	64	1,210	3	10
26.....	800	5	11	1,220	17	56	1,200	1	3
27.....	800	5	11	1,080	14	41	1,170	1	3
28.....	780	12	25	1,000	10	27	1,090	2	6
29.....	761	10	20	960	6	16	1,000	3	8
30.....	750	7	14	930	5	12	1,020	3	8
31.....	750	5	10	--	--	--	1,030	2	6
Total.	25,151	--	463	29,690	--	844	43,800	--	1,399
Day	January			February			March		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	1,050	4	11	11,000	82	2,440	3,900	17	179
2.....	1,060	5	14	10,400	62	1,740	3,600	11	107
3.....	1,100	6	18	8,600	47	1,090	3,800	10	89
4.....	1,170	7	22	6,940	32	600	3,750	27	s 299
5.....	1,250	5	17	5,840	25	394	7,740	168	3,510
6.....	1,330	6	a 20	4,830	23	300	7,940	125	2,680
7.....	1,320	7	25	4,350	21	247	6,740	55	1,000
8.....	1,310	8	28	4,200	18	204	5,840	32	505
9.....	1,560	10	42	3,900	17	179	5,150	20	278
10.....	2,810	50	s 403	3,520	15	142	4,830	15	196
11.....	5,490	183	2,710	3,300	14	125	4,830	12	156
12.....	8,160	304	6,700	3,750	16	162	4,990	17	229
13.....	7,140	140	2,700	4,830	28	365	5,150	20	278
14.....	5,490	72	1,070	5,490	27	400	5,150	22	306
15.....	4,510	43	524	5,150	22	306	5,150	24	334
16.....	3,900	32	337	4,830	22	287	5,840	41	646
17.....	3,680	27	268	4,510	20	244	6,200	53	887
18.....	8,700	392	s 10,600	4,050	18	197	5,660	42	642
19.....	13,100	490	17,300	3,900	17	179	5,150	34	473
20.....	11,900	331	10,600	3,750	15	152	4,830	32	417
21.....	9,040	163	3,980	4,510	31	377	4,510	29	353
22.....	6,940	80	1,500	7,740	115	s 2,550	4,200	27	306
23.....	5,660	54	825	8,160	130	2,860	3,900	24	253
24.....	5,840	78	1,230	6,560	65	1,150	4,350	28	329
25.....	7,540	92	1,870	5,490	45	667	6,560	59	s 1,120
26.....	8,820	89	2,120	5,150	30	417	9,920	137	3,670
27.....	8,160	79	1,740	4,670	29	366	10,800	136	3,960
28.....	8,820	100	2,380	4,350	23	270	9,920	90	2,410
29.....	12,700	204	7,000	--	--	--	8,820	60	1,430
30.....	13,600	198	7,270	--	--	--	7,540	42	855
31.....	11,700	116	3,660	--	--	--	6,380	38	654
Total.	184,850	--	86,984	153,770	--	18,410	182,640	--	28,551

e Estimated.

s Computed by subdividing day.

a Computed from estimated concentration graph.

## OHIO RIVER BASIN EXCEPT CUMBERLAND AND TENNESSEE RIVER BASINS

## MUSKINGUM RIVER BASIN--Continued

## MUSKINGUM RIVER AT DRESDEN, OHIO--Continued

Suspended sediment, water year October 1952 to September 1953--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.....	5,490	34	504	4,990	28	377	4,990	71	956
2.....	6,380	46	792	4,510	25	304	4,670	69	870
3.....	8,160	94	2,070	4,050	20	219	4,510	62	755
4.....	7,940	98	2,100	3,680	18	179	3,900	54	569
5.....	7,140	67	1,290	3,450	18	168	3,230	43	375
6.....	6,380	48	827	3,450	18	168	2,810	38	288
7.....	5,660	40	611	3,900	21	221	3,380	116	1,060
8.....	5,150	26	362	8,600	280	s 7,250	3,750	98	992
9.....	5,150	23	320	12,700	231	7,920	3,520	62	589
10.....	5,490	37	548	11,000	117	3,470	3,300	37	330
11.....	8,600	106	s 2,580	8,600	83	1,930	4,510	85	1,040
12.....	10,800	178	5,160	6,740	61	1,110	4,050	116	1,270
13.....	9,480	133	3,530	5,840	58	914	3,180	83	708
14.....	7,940	74	1,590	6,380	66	1,140	2,540	47	322
15.....	6,940	46	862	6,740	67	1,220	2,220	32	192
16.....	6,200	37	619	6,940	75	1,400	2,040	27	149
17.....	6,200	30	502	7,340	81	1,600	1,980	29	155
18.....	6,200	28	469	9,920	116	3,110	2,350	34	216
19.....	6,200	24	402	11,200	134	4,050	3,680	63	626
20.....	7,540	30	611	10,600	121	3,460	3,520	62	589
21.....	9,260	44	1,100	8,600	98	2,280	2,880	49	381
22.....	9,700	54	1,410	8,160	96	2,120	2,540	41	281
23.....	8,820	49	1,170	12,900	308	s 11,400	2,350	35	222
24.....	7,540	44	896	14,600	379	14,900	2,100	24	136
25.....	6,560	35	620	14,600	302	11,900	1,860	21	105
26.....	6,020	32	520	14,100	216	8,220	1,740	19	89
27.....	5,840	28	442	12,700	185	6,340	1,620	17	74
28.....	6,020	25	406	10,400	164	4,600	1,740	21	99
29.....	5,660	26	397	8,160	138	3,040	2,160	97	566
30.....	5,320	27	388	6,560	102	1,810	1,920	52	270
31.....	--	--	--	5,660	85	1,300	--	--	--
Total.	209,780	--	33,098	257,070	--	108,120	89,020	--	14,274
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.....	1,800	26	126	1,160	29	91	599	19	31
2.....	2,280	35	215	1,180	25	80	644	21	36
3.....	3,900	136	s 1,550	1,310	26	92	1,080	34	99
4.....	4,670	203	2,560	1,180	19	60	850	27	62
5.....	4,050	152	1,660	1,160	15	47	761	25	51
6.....	3,020	93	758	1,270	14	48	698	29	55
7.....	2,540	58	398	1,510	23	94	716	23	44
8.....	2,350	42	266	1,380	23	86	707	32	61
9.....	2,220	41	246	1,270	22	75	671	23	42
10.....	2,420	42	274	1,620	25	109	617	18	30
11.....	2,100	32	181	1,980	37	198	608	16	26
12.....	1,860	28	141	1,740	25	117	608	20	33
13.....	1,620	25	109	1,400	40	151	608	20	33
14.....	1,400	22	83	1,200	39	126	617	20	33
15.....	1,290	20	70	1,080	16	47	653	21	36
16.....	1,210	21	69	1,000	12	32	635	20	34
17.....	1,160	22	69	960	10	26	626	23	39
18.....	1,180	25	80	880	10	24	644	24	42
19.....	1,320	27	96	840	14	32	653	26	46
20.....	1,680	34	154	790	15	32	680	27	50
21.....	1,510	26	106	770	22	46	680	23	42
22.....	1,680	30	136	770	20	42	689	22	41
23.....	1,860	26	130	752	28	57	689	28	52
24.....	2,810	86	652	716	21	40	671	30	54
25.....	2,610	110	775	698	20	38	635	29	50
26.....	1,980	63	337	680	20	37	599	28	45
27.....	1,620	41	179	662	21	38	590	19	30
28.....	1,510	33	134	653	22	39	590	23	37
29.....	1,400	26	98	653	22	39	572	25	39
30.....	1,300	25	88	635	17	29	545	26	38
31.....	1,200	28	91	608	22	36	--	--	--
Total.	63,550	--	11,831	32,507	--	2,008	19,935	--	1,311

Total discharge for year (cfs-days) ..... 1,291,763

Total load for year (tons) ..... 307,293

s Computed by subdividing day.

## MUSKINGUM RIVER BASIN--Continued

## MUSKINGUM RIVER AT DRESDEN, OHIO--Continued

Particle-size analyses of suspended sediment, water year October 1952 to September 1953

(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	Water discharge (cfs)	Water temperature (° F)	Suspended sediment											Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	
Jan. 19, 1953 ...	10:00 a. m.	13,400		505	683	42	54	66	79	87	92	95	97		BSWCM
Jan. 29, .....	4:30 p. m.	13,400		192	565	47	58	69	81	90	94	96	98	100	BSWCM
Jan. 29, .....	4:30 p. m.	13,400		192	610	7	18	27	49	90	91	95	98	100	BSN
May 8, .....	2:30 p. m.	9,480		397	1,270	50	61	70	83	92	93	95	96	98	BSWCM
May 8, .....	2:30 p. m.	9,480		397	1,180	9	15	26	46	87	93	95	96	99	BSN
May 8, .....	11:00 p. m.	11,500		413	498	47	53	63	81	90	95	97	--	--	BSWCM
May 9, .....	9:30 a. m.	12,700		232	641	37	56	65	78	86	91	94	97	--	BSWCM
May 23, .....	8:35 p. m.	14,100		559	803	35	51	67	85	92	96	97	--	--	BSWCM

## LITTLE KANAWHA RIVER BASIN

## LITTLE KANAWHA RIVER AT GLENVILLE, W. VA.

LOCATION.--At water plant, at Glenville, Gilmer County,  $\frac{1}{2}$  mile upstream from gaging station.

DRAINAGE AREA.--386 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum observed, 84°F June 27, 28, Aug. 3, 4; minimum observed, 35°F Dec. 29, Jan. 7.

EXTREMES, 1946-53.--Water temperatures: Maximum observed, 86°F Aug. 22, 1947; minimum observed, freezing point many days during winter months.

REMARKS.--Record furnished by West Virginia Power Co. Records of discharge for water years 1950, 1951, 1952, and 1953 given in WSP 1173, 1205, 1235, and 1275 respectively.

Temperature (°F) of water, water year October 1952 to September 1953

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

## LITTLE KANAWHA RIVER BASIN--Continued

## LITTLE KANAWHA RIVER AT GLENNVILLE, W. VA.--Continued

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

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

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

## LITTLE KANAWHA RIVER BASIN--Continued

## LITTLE KANAWHA RIVER AT GLENVILLE, W. VA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

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

## KANAWHA RIVER BASIN

## NEW RIVER AT EGGLESTON, VA.

LOCATION.--At gaging station at highway bridge at Eggleston, Giles County, 1.9 miles downstream from Spruce Run, and 7.8 miles upstream from Walker Creek. DRAINAGE AREA.--2,941 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950, December 1952 to September 1953.

Water temperatures: December 1952 to September 1953.

EXTREMES, 1952-53.--Hardness: Maximum, 114 ppm Aug. 21-31; minimum, 43 ppm Feb. 21-28.

Specific conductance: Maximum, 262 micromhos Aug. 24; minimum daily, 83.8 micromhos Mar. 14.

Water temperatures: Maximum, 80°F on several days during June, July, and August; minimum, 34°F Dec. 29, Jan. 12.

REMARKS.--Records of specific conductance of daily samples from December 1952 to September 1953 available in district office at Charlottesville, Va. Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

## Chemical analyses, in parts per million, December 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> ) (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO <sub>3</sub>		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Color
													Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate				
Dec. 5-10, 1952..	2,605	8.8	0.04	13	4.8	3.5	1.7	45	16	3.7	0.2	6.2	79			52	15		124	7.4	10
Dec. 11-20.....	2,261	8.5	.05	12	4.7	3.2	1.7	41	16	3.8	.1	6.6	75			46	16		116	7.3	10
Dec. 21-31.....	2,581	8.9	.04	15	5.2	3.2	1.6	46	20	2.8	.1	8.4	86			59	21		135	7.4	13
Jan. 1-10, 1953..	2,880	8.5	.05	13	5.1	3.0	1.6	47	15	3.0	.2	5.8	77			53	15		123	7.4	13
Jan. 11-20.....	3,750	--	.07	12	4.3	--	--	41	20	--	--	--	--			48	14		112	7.3	5
Jan. 21-31.....	6,529	--	.07	12	3.5	--	--	44	3.0	--	--	--	--			44	8		102	7.6	6
Feb. 1-10.....	3,663	--	.04	13	3.8	--	--	40	3.0	--	--	--	--			48	15		110	7.3	5
Feb. 11-20.....	4,200	--	.04	12	3.8	--	--	40	1.0	--	--	--	--			46	13		105	7.3	5
Feb. 21-28.....	12,370	--	.08	11	3.8	--	--	43	3.0	--	--	--	--			43	8		97.3	7.4	15
Mar. 1-10.....	8,137	--	.01	11	4.7	--	--	46	7.0	--	--	--	--			47	9		115	7.5	25
Mar. 11-20.....	6,424	--	.01	11	4.3	--	--	44	8.0	--	--	--	--			45	9		99.9	7.4	7
Mar. 21-31.....	11,980	--	.01	11	4.5	--	--	45	7.0	--	--	--	--			46	9		100	7.3	15
Apr. 1-10.....	5,111	7.8	.03	12	4.6	2.0	1.1	48	9.8	1.8	.0	3.5	70			50	10		112	7.2	5
Apr. 11-20.....	4,150	--	.01	13	4.9	--	--	47	6.0	--	--	--	--			52	14		117	7.7	7
Apr. 21-30.....	3,265	--	.02	13	4.9	--	--	51	5.0	--	--	--	--			52	11		114	7.7	5
May 1-10.....	5,415	--	.02	13	5.4	--	--	50	7.0	--	--	--	--			54	14		113	7.7	7
May 11-20.....	4,116	--	.02	13	5.0	--	--	52	7.0	--	--	--	--			53	10		116	7.6	8
May 21-31.....	3,067	--	.01	14	5.5	--	--	57	7.0	--	--	--	--			58	11		125	7.7	6
June 1-10.....	2,124	--	.01	17	7.1	--	--	53	24	--	--	--	--			71	28		159	7.5	5
June 11-20.....	4,371	--	.02	14	5.5	--	--	53	12	--	--	--	--			58	14		128	7.4	5
June 21-30.....	2,512	--	.03	15	5.3	--	--	53	14	--	--	--	--			60	16		137	7.5	5
July 1-10.....	3,945	8.4	.02	13	4.9	2.4	1.4	52	9.5	1.8	.1	3.3	80			54	10		118	7.4	10
July 11-20.....	2,066	--	.01	17	5.4	--	--	53	21	--	--	--	--			65	21		145	7.2	7
July 21-31.....	1,808	--	.01	21	6.0	--	--	51	17	--	--	--	--			77	35		169	7.0	8

## KANAWHA RIVER BASIN--Continued

## NEW RIVER AT EGGLESTON, VA.--Continued

Chemical analyses, in parts per million, December 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> ) (B)	Dissolved solids (residue at 180°C)	Hardness as CaCO <sub>3</sub>		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate				
Aug. 1-10, 1953..	1,736	--	0.01	26	5.5	--	--	56	20	--	--	--	--	--	87	42	190	7.1	6
Aug. 11-20 .....	1,468	--	.01	29	6.8	--	--	60	22	--	--	--	--	--	102	51	214	7.3	6
Aug. 21-31 .....	1,195	--	.01	32	8.7	--	--	63	48	--	--	--	--	--	114	64	237	7.1	5
Sept. 1-10 .....	1,270	--	.03	28	7.1	--	--	70	9.0	--	--	--	--	--	100	22	224	7.6	20
Sept. 11-20 .....	1,170	--	.13	29	6.7	--	--	71	28	--	--	--	--	--	101	42	222	7.5	5
Sept. 21-30 .....	1,163	--	.10	28	7.0	--	--	71	30	--	--	--	--	--	100	40	220	7.8	5
Average .....	3,936	--	0.03	16	5.3	--	--	51	14	--	--	--	--	--	63	20	140	--	8



## KANAWHA RIVER BASIN--Continued

## NEW RIVER AT EGGLESTON, VA.--Continued

Temperature (°F) of water, December 1952 to September 1953

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

## KANAWHA RIVER BASIN--Continued

## NEW RIVER AT GLENLYN, VA.

LOCATION.--At the Glenlyn steam electric plant of the Appalachian Electric Power Co. on the right bank of New River, across the river from the stream gaging station, at Glenlyn Giles County, Virginia.

DRAINAGE AREA.--3,768 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1953.

EXTREMES.--1952-53 Water temperatures: Maximum observed, 82°F Aug. 5, 6; minimum observed, 32°F Mar. 10.

EXTREMES, 1951-53--Water temperatures: Maximum observed, 84°F June 28, 1952; minimum temperature observed, 32°F Dec. 16, 1951, Mar. 10, 1953.

REMARKS.--Records of discharge for water year, 1951, 1952, and 1953 given in WSP 1205, 1235, and 1275 respectively.

Temperature (°F) of water, water year October 1952 to September 1953

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

a Estimated.

KANAWHA RIVER BASIN--Continued  
NEW RIVER AT GLENLYN, VIRGINIA--Continued

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

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

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

## KANAWHA RIVER BASIN--Continued

NEW RIVER AT BLUESTONE DAM STILLING BASIN NEAR HINTON, W. VA.

LOCATION --At Bluestone Dam Stilling Basin 0.9 mile upstream from mouth of Greenbrier River, near Hinton, Summers County, 1,000 feet above gaging station.  
 DRAINAGE AREA 7,604 square miles.

RECORDS AVAILABLE --Water temperatures: May to September 1953.

EXTREMES --Water temperatures: Maximum observed during period, 83°F Aug. 5;

Temperature (°F) of water, May to September 1953

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.....																	71	69	79	77	82	80	78	77
2.....																	70	68	81	79	82	81	78	77
3.....																	69	69	81	79	82	81	79	77
4.....																	71	69	81	80	82	80	79	77
5.....																	72	69	82	80	83	83	79	77
6.....																	72	71	82	80	82	81	77	76
7.....																	72	71	81	80	81	81	76	76
8.....																	75	71	80	76	81	81	76	75
9.....																	76	74	76	74	81	80	75	74
10.....																	76	74	75	74	80	79	74	73
11.....																	75	75	74	74	79	77	74	73
12.....																	76	74	74	74	78	76	73	72
13.....																	76	74	74	74	78	77	73	72
14.....																	75	74	73	77	76	76	72	71
15.....																	74	73	75	74	78	76	71	70
16.....																	75	74	75	74	78	77	71	70
17.....																	74	73	76	75	78	77	70	69
18.....																	73	70	77	76	78	77	70	69
19.....																	70	70	77	76	78	77	70	70
20.....																	72	70	78	76	77	76	70	70
21.....																	75	73	77	77	77	76	70	69
22.....																	76	73	79	77	76	76	69	68
23.....																	76	75	79	78	77	76	68	68
24.....																	72	70	78	79	78	77	69	68
25.....																	74	72	78	78	76	75	69	68
26.....																	73	71	80	78	76	76	68	68
27.....																	73	72	79	78	76	76	68	67
28.....																	71	80	78	79	77	76	68	67
29.....																	71	70	79	79	78	78	68	67
30.....																	71	69	80	78	79	78	67	67
31.....																	71	69	--	80	78	77	--	--
Average.....																	75	73	78	77	79	78	72	72

## KANAWHA RIVER BASIN--Continued

## KNAPP CREEK AT MARLINTON, W. VA.

LOCATION.--At city water plant, at Marlinton, Pocahontas County, 1 mile upstream from mouth and 2 miles downstream from gaging station.

DRAINAGE AREA.--108 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum observed 79°F July 2, 4; minimum, freezing point on many days December to March.

EXTREMES, 1946-53.--Water temperatures: Maximum observed, 82°F July 24, 1952; minimum freezing point on many days during winter months.

REMARKS.--Records of discharge for water years 1950, 1951, 1952, and 1953 given in WSP 1173, 1205, 1235, and 1275, respectively.

Temperature (°F) of water, water year October 1952 to September 1953

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

## KANAWHA RIVER BASIN--Continued

## KNAPP CREEK AT MARLINTON, W. VA.--Continued

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

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

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

## KANAWHA RIVER BASIN--Continued

## KNAPP CREEK AT MARLINTON, W. VA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

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

## KANAWHA RIVER BASIN--Continued

## GREENBRIER RIVER AT ALDERSON, W. VA.

LOCATION.--At city water plant, 500 feet upstream from gaging station, and 900 feet upstream from highway bridge at Alderson, Monroe County.

DRAINAGE AREA.--1,357 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1946 to March 1949; October 1949 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum observed, 84°F July 2-6; minimum observed, 32°F Dec. 18-20.

EXTREMES, 1946-53.--Water temperatures: Maximum observed, 84°F July 2-6, 1953; minimum observed, 32°F Jan. 9, 10, Feb. 9, 10, 1951, Dec. 18-20, 1952.

REMARKS.--Records of discharge for water years, 1950, 1951, 1952, and 1953 given in WSP 1173, 1205, 1235, and 1275 respectively.

Temperature (°F) of water, water year October 1952 to September 1953

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



## KANAWHA RIVER BASIN--Continued

## GREENBRIER RIVER AT ALDERSON, W. VA.--Continued

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

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

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	33	33	36	45	--	60	67	--	75	74
2	62	58	33	33	37	46	45	63	67	73	75	--
3	64	58	--	35	35	46	46	63	--	72	74	75
4	64	58	36	37	--	--	44	64	74	73	72	75
5	62	--	38	37	34	48	44	64	74	73	72	75
6	62	50	38	37	34	48	44	--	74	70	--	71
7	61	48	38	35	34	50	44	57	74	70	74	71
8	--	48	38	33	33	50	--	56	74	--	76	72
9	61	50	40	32	32	50	47	58	74	75	73	70
10	61	50	--	32	32	45	47	66	--	75	78	70
11	60	48	36	33	--	--	47	62	65	76	81	71
12	60	--	36	33	35	44	--	60	65	78	--	71
13	59	42	36	--	35	44	47	--	64	79	77	70
14	60	41	36	34	38	41	47	60	64	80	77	70
15	--	41	35	34	40	41	--	62	60	--	76	70
16	58	41	35	34	40	43	47	65	61	80	74	--
17	58	41	--	35	40	44	46	66	62	78	76	70
18	58	40	35	35	--	--	45	67	62	78	76	70
19	60	--	33	37	44	41	45	67	65	78	--	68
20	60	40	33	40	44	41	45	--	65	78	75	68
21	60	41	33	--	45	41	48	67	66	75	75	68
22	--	40	33	38	42	42	--	67	70	--	75	65
23	60	40	33	36	42	42	50	65	72	76	72	--
24	60	38	34	36	42	43	50	65	--	75	72	65
25	60	35	--	35	--	--	50	65	74	--	72	65
26	58	33	33	34	43	43	55	65	75	--	71	65
27	55	33	33	33	44	43	57	--	77	--	70	66
28	55	33	33	--	45	43	58	64	77	--	70	64
29	--	33	34	37	--	43	--	61	75	--	72	63
30	56	33	34	37	--	44	58	62	74	75	72	--
31	58	--	34	37	--	44	--	65	--	75	74	--
Average	60	43	35	35	39	44	--	63	69	--	74	71

## KANAWHA RIVER BASIN--Continued

## GREENBRIER RIVER AT ALDERSON, W. VA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

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

## KANAWHA RIVER BASIN--Continued

## NEW RIVER AT HINTON, W. VA.

LOCATION.--At water plant, at Hinton, Summers County, 500 feet upstream from gaging station.  
DRAINAGE AREA.--6,257 square miles.

RECORDS AVAILABLE.--October 1946 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum observed, 80°F July 2, 3; minimum observed, 34°F Jan. 6.

EXTREMES, 1946-53.--Water temperatures: Maximum observed, 85°F June 29, 1952; minimum observed, 33°F many days most years.

REMARKS.--Records furnished by West Virginia Water Service Company. Records of discharge for water years 1950, 1951, 1952 and 1953 given in WSP 1173, 1205, 1235 and 1275 respectively.

Temperature (°F) of water, water year October 1952 to September 1953

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

## KANAWHA RIVER BASIN--Continued

## NEW RIVER AT HINTON, W. VA.--Continued

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

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

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

KANAWHA RIVER BASIN--Continued  
NEW RIVER AT HINTON, W. VA.--Continued

Temperature (° F) of water, water year October 1949 to September 1950

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

## KANAWHA RIVER BASIN--Continued

## KANAWHA RIVER AT CABIN CREEK, W. VA.

LOCATION.--At the Cabin Creek thermoelectric plant of the Appalachian Electric Power Company at Cabin Creek, Kanawha County, W. Va.

DRAINAGE AREA.--8,661 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 88°F Aug. 6; minimum, 37°F Jan. 3-8.

EXTREMES, 1950-53.--Water temperatures: Maximum, 89°F July 24, 1952; minimum, 32°F Feb. 10, 1951.

REMARKS.--Water temperatures observed at cooling water intake. Records furnished by the Appalachian Electric Power Company. No records of discharge available for this station.

Temperature (°F) of water, water year October 1952 to September 1953

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

## KANAWHA RIVER BASIN--Continued

## KANAWHA RIVER AT CABIN CREEK, W. VA.--Continued

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

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

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	62	35	35	38	46	51	65	64	79	84	81
2	67	62	38	36	39	46	50	66	69	79	84	78
3	67	62	42	37	35	47	48	67	69	81	84	79
4	67	62	42	38	34	48	47	66	73	78	83	80
5	66	58	39	38	35	50	48	64	74	78	82	81
6	66	60	41	40	35	50	47	62	73	78	82	78
7	66	53	41	39	36	50	48	61	62	76	83	79
8	66	--	42	38	35	51	51	64	68	77	83	77
9	66	--	41	36	34	51	52	64	70	77	83	76
10	67	--	43	35	32	51	51	63	69	78	81	76
11	65	--	41	35	34	50	50	64	66	79	82	76
12	64	--	40	36	36	48	50	63	66	81	82	76
13	62	--	39	36	36	47	50	63	60	82	84	77
14	62	--	39	36	38	45	49	63	66	82	83	74
15	63	49	38	38	39	43	49	64	65	82	82	75
16	62	48	38	38	49	42	50	64	66	84	94	76
17	61	47	38	38	42	43	50	68	67	84	94	73
18	61	46	36	37	44	44	51	70	65	84	86	75
19	61	46	35	39	45	44	52	69	70	85	85	76
20	63	47	34	41	45	44	53	71	71	82	84	75
21	62	47	34	43	46	42	54	71	73	82	85	75
22	63	46	34	41	46	44	55	70	75	83	82	75
23	64	44	36	39	44	44	57	72	76	83	82	74
24	64	44	36	40	44	46	57	70	78	83	81	74
25	64	41	36	38	43	45	59	68	79	82	82	74
26	64	38	37	38	43	44	60	62	80	82	81	74
27	64	36	36	38	44	46	60	66	80	84	78	75
28	62	35	35	37	45	47	62	66	79	83	80	73
29	62	35	34	37	--	49	63	64	79	82	81	72
30	62	34	35	37	--	50	64	62	80	85	79	72
31	62	--	36	37	--	51	--	63	--	80	79	--
Average	64	--	38	38	40	47	53	66	71	81	82	76





## KANAWHA RIVER BASIN--Continued

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

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO <sub>3</sub> )	Bo- ron (B)	Dissolved solids (residue at 180° C)		Hardness as CaCO <sub>3</sub>		Per- cent so- adso- rption ratio	Specific conduct- ance (micro- mhos at 25° C)	Col- or pH	
														Parts per mil- lion	Tons per acre- foot	Calcium, mag- nesium	Non-carbon- ate				
MIDDLE FORK OF SOUTH FORK NEW RIVER NEAR BLOWING ROCK																					
Oct. 6, 1952.....	5.05							12	1	1.0							11	1		29.9	6.6
Apr. 9, 1953.....	26.8							9	2	1.2							11	4		26.5	6.3
July 21.....	8.67							15	2	2.0							10	0		35.6	6.5
Sept. 18.....	3.73							12	2	2.8							9	0		35.3	6.7
NORTH FORK NEW RIVER AT CRESTON																					
Oct. 6, 1952.....	26.4							23	1	0.8							17	0		45.6	7.0
Apr. 9, 1953.....	104							16	1	1.0							14	0		40.0	6.4
July 20.....	49.0							23	3	1.5							16	0		49.2	6.5
Sept. 18.....	23.5							25	2	1.8							9	0		49.0	6.7
LITTLE RIVER NEAR SPARTA																					
Nov. 4, 1952.....	11.9							12	1	1.0							10	0		25.9	6.7
Apr. 15, 1953.....	53.1							12	1	1.5							10	0		35.3	6.4
July 21.....	19.1							11	1	1.0							8	0		23.6	7.2
Sept. 17.....	11.5							11	1	.8							6	0		22.1	6.5

## RACCOON CREEK BASIN

## RACCOON CREEK AT ADAMSVILLE, OHIO

LOCATION.--At gaging station at bridge on U.S. Highway 35 at Adamsville, Gallia County, 1.3 miles downstream from Indian Creek.

DRAINAGE AREA.--587 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1953.

Water temperatures: October 1951 to September 1953.

EXTREMES 1952-53.--Dissolved solids: Maximum, 582 ppm Oct. 11-20; minimum, 128 ppm May 1-10.

Hardness: Maximum, 223 ppm Dec. 11-20; minimum, 70 ppm July 3-7.

Specific conductance: Maximum daily 1,250 micromhos Oct. 15; minimum daily 136 micromhos Mar. 4.

Water temperatures: Maximum, 79°F Aug. 19; minimum, 33°F Jan. 6.

EXTREMES 1951-52.--Dissolved solids: Maximum, 582 ppm Oct. 11-20, 1952; minimum, 116 ppm Feb. 1-10 and Mar. 11-20, 1952.

Hardness: Maximum, 223 ppm Dec. 11-20, 1952; minimum, 63 ppm Jan. 1-10, 1952.

Specific conductance: Maximum daily 1,300 micromhos Nov. 7, 1951; minimum daily 115 micromhos Mar. 23, 1952.

Water temperatures: Maximum, 84°F June 16, 1952; minimum, freezing point Dec. 19, 1951.

REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium	Non-carbonate				
Oct. 1-10, 1952	5.16		18	0.0	0.02	0.00	38	13	113	4.9	57	92	180	0.2	0.9	499	150	102		885	6.8	5
Oct. 11-20	4.98		7.5				41	14	141	5.4	43	95	240		1.0	562	183	129		1,070	6.6	5
Oct. 21-31	6.88		5.7				38	12	120	4.4	48	95	201		2.5	521	152	113		938	6.5	13
Nov. 1-10	7.82		6.9				38	13	108	6.0	43	86	185		2.5	476	143	108		888	6.5	22
Nov. 11-20	9.82		10				40	11	124	7.1	45	101	215		2.5	548	182	127		988	6.7	25
Nov. 21-30	17.5		11				35	13	92	4.7	45	99	148		1.0	431	141	104		768	6.8	3
Dec. 1-10	52.2		17	2	0.1	1.7	35	13	50	3.9	23	137	71		1.0	355	141	122		574	6.4	2
Dec. 11-20	127		15	3	0.2	5.0	45	27	28	3.7	3	230	40		2.1	4	223	221		600	4.6	0
Dec. 21-31	39.1		12	3	0.3	4.9	47	25	21	4.2	0	242	26		3.1	397	220	220		587	4.30	2
Jan. 1-10, 1953	288		13	9	0.1	4.0	39	16	20	3.1	0	191	24		3.6	327	184	184		484	4.30	1
Jan. 11-20	807		10	4	0.1	1.8	23	11	7.3	3.3	0	112	11		2.1	188	105	105		289	4.30	1
Jan. 21-31	1,128		14	0	0.1	1.4	22	9.7	7.8	1.7	2	96	9.0		1.6	168	94	93		247	4.8	1
Feb. 1-10	52		12	3	0.1	1.7	23	11	10	2.0	0	112	12		2.2	189	102	102		285	4.6	1
Feb. 11-20	478		9.8	5	0.2	1.8	22	10	9.2	2.4	0	105	12		1.4	186	99	99		295	4.5	1
Feb. 21-28	423		9.5	5	0.2	1.7	22	11	8.9	1.8	1	106	12		1.6	186	100	99		297	4.6	1
Mar. 1-10	1,746		8.7	0	0.5	1.3	18	7.8	6.1	2.2	3	82	7.0		1.6	138	77	74		217	4.8	1
Mar. 11-20	998		11	1.2	0.5	1.1	19	7.8	5.9	1.4	0	88	5.0		1.4	156	80	80		231	4.5	2
Mar. 21-31	758		9.6	0.2	0.8	1.2	18	8.5	6.8	1.6	4	80	6.5		1.6	147	81	77		239	5.0	2

Apr. 1-10, 1953	741	9.4	0.0	0.10	1.0	19	7.3	6.8	1.9	3	80	6.0	0.0	0.4	158	78	75	72	233	4.9	1
Apr. 11-20	924	9.5	.3	.08	1.0	18	7.5	5.9	1.6	4	77	5.0	.1	.1	136	75	72	216	216	5.0	2
Apr. 21-30	896	12	.0	.02	1.2	18	9.2	6.3	1.4	3	87	7.0	.2	.6	150	83	80	224	224	4.8	0
May 1-10	1,501	11	.0	.02	.90	16	7.5	5.5	1.6	3	71	6.5	.1	1.0	128	71	68	192	192	4.9	0
May 11-20	956	12	.0	.02	1.1	17	8.0	5.9	1.6	3	80	6.0	.1	.6	136	75	73	209	209	5.0	0
May 21-31	1,117	11	.3	.04	1.2	21	6.8	10	1.5	4	85	9.5	.1	.7	151	80	77	252	252	5.7	3
June 1-10	126	12	.3	.02	1.6	26	11	22	2.5	14	114	22	.2	1.0	220	104	99	375	375	6.3	2
June 11-20	85.1	12	.3	.03	1.7	30	12	26	2.5	10	132	30	.2	.7	256	124	116	432	432	6.4	2
June 21-30	134	10	.1	.02	1.3	28	9.5	23	3.1	14	111	28	.2	1.6	230	110	97	368	368	6.5	2
July 1-10	561	10	.2	.10	.20	19	5.7	7.2	2.7	15	70	6.8	.2	2.4	195	170	59	206	206	6.5	7
July 11-20	112	11	.7	.08	2.2	28	11	19	2.9	4	122	24	.2	.6	232	113	112	360	360	5.1	3
July 21-28	103	9.6	1.2	.06	2.5	35	12	20	3.4	4	146	23	.2	2.1	270	138	133	473	473	5.0	2
July 29-Aug. 4	84.7	9.6	.6	.04	2.5	34	15	34	3.5	4	153	46	.2	1.0	315	146	143	493	493	5.2	2
Aug. 5-11	122.4	7.8	.4	.07	.82	28	9.9	22	3.2	12	110	28	.2	1.4	223	111	101	338	338	6.3	5
Aug. 12-20	83.4	10	1.9	.06	3.3	35	14	21	3.7	0	134	28	.2	1.3	268	143	145	476	476	4.2	0
Aug. 21-31	19.6	10	.4	.02	2.1	33	14	34	3.6	5	145	46	.2	1.0	280	143	137	477	477	4.2	1
Sept. 1-10	10.6	8.6	.4	.02	2.2	34	14	75	3.2	5	145	58	.2	.6	316	144	136	531	531	5.3	1
Sept. 11-20	7.15	7.1	.2	.02	1.4	35	13	75	3.4	18	139	108	.2	2.0	358	141	136	680	680	5.7	1
Sept. 21-30	7.18	7.0	.2	.04	1.3	34	14	90	1.4	27	114	142	.2	1.5	442	143	120	773	773	6.4	1
Average	408	11	0.4	0.08	1.6	29	12	37	3.1	13	115	55	0.2	1.6	282	122	111	466	--	--	3

## RACCOON CREEK BASIN--Continued

## RACCOON CREEK AT ADAMSVILLE, OHIO--Continued

Temperature (°F) of water, water year October 1952 to September 1953  
 /Once-daily temperature measurement at approximately 9 a. m./

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

## BIG SANDY RIVER BASIN

## LEVISA FORK AT PAINTSVILLE, KY.

LOCATION.--At gaging station at bridge on State Highway 40 at Paintsville, Johnson County, 700 feet downstream from Paint Creek.

DRAINAGE AREA.--2,143 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1949 to March 1953.

Water temperatures: October 1949 to March 1953.

Sediment records: October 1952 to April 1953.

EXTREMES, 1952-53.--Dissolved solids: Maximum, 367 ppm Nov. 11-20; minimum, 77 ppm Feb. 21-28.

Hardness: Maximum, 153 ppm Nov. 11-20; minimum, 45 ppm Feb. 21-28.

Specific conductance: Maximum daily, 683 micromhos Nov. 16; minimum daily, 95.4 micromhos Feb. 23.

Water temperatures: Minimum, 36°F Dec. 17; Jan. 5-6.

Sediment concentrations: Maximum daily, 960 ppm Dec. 12; minimum daily, 2 ppm Feb. 6.

Sediment loads: Maximum daily, 34,800 tons Feb. 23; minimum daily, 1 ton on many days during October and November.

EXTREMES, 1949-53.--Dissolved solids: Maximum, 367 ppm Nov. 11-20, 1952; minimum, 75 ppm Dec. 11-20, 1951.

Hardness: Maximum, 155 ppm Nov. 11-20, 1952; minimum, 40 ppm Dec. 11-20, 1951.

Specific conductance: Maximum daily, 768 micromhos Oct. 16, 1949; minimum daily, 79.9 micromhos Mar. 26, 1952.

Water temperatures: Maximum, 89°F July 21, 23, 1952; minimum, freezing point Nov. 26-28, 1950.

REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for October 1952 to April 1953 given in WSP 12/75.

## BIG SANDY RIVER BASIN

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Chemical analyses, in parts per million, October 1952 to March 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> ) (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO <sub>3</sub>		Percent sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
													Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate				
Oct. 1-10, 1952..	56.9	9.0	0.05	35	16	45	4.4	76	135	38	0.1	0.9	330		153	91		541	7.3	3
Oct. 11-20.....	91.5	14	.03	35	15	51	4.4	88	121	42	.1	.8	332		149	77		549	7.2	3
Oct. 21-31.....	54.2	6.1	.02	32	14	48	4.0	82	106	46	.2	.9	296		138	70		513	6.9	5
Nov. 1-10.....	54.9	10	.03	35	15	58	4.8	97	113	62	.2	1.6	349		147	70		592	7.0	4
Nov. 11-20.....	112	11	.02	36	16	63	4.8	93	126	63	.2	1.0	367		155	79		620	7.0	5
Nov. 21-30.....	1,069	9.1	.04	26	12	26	4.1	54	94	24	.2	2.8	231		116	70		372	6.5	3
Dec. 1-10.....	608	13	.04	18	8.5	15	2.5	36	62	11	.1	3.2	151		79	50		238	6.5	2
Dec. 11-20.....	2,913	12	.07	14	7.3	9.6	2.4	29	48	6.5	.1	3.9	117		66	41		187	6.3	2
Dec. 21-31.....	3,461	10	.03	17	8.7	14	2.1	36	60	11	.1	3.1	144		79	49		236	6.6	1
Jan. 1-10, 1953..	3,359	13	.09	16	7.3	13	2.4	37	52	8.5	.1	2.8	140		70	40		218	6.6	3
Jan. 11-20.....	2,896	16	.02	12	6.3	9.1	2.0	31	42	5.2	.2	1.9	103		57	30		161	6.7	1
Jan. 21-31.....	4,344	19	.01	11	5.6	7.9	1.6	32	35	3.8	.1	1.4	103		51	24		147	6.8	2
Feb. 1-10.....	1,592	11	.09	11	7.8	8.4	1.9	30	45	4.5	.1	1.4	101		60	35		157	6.6	2
Feb. 11-20.....	3,682	9.2	.12	11	7.0	7.3	1.6	27	41	4.0	.2	1.0	96		56	34		149	6.7	4
Feb. 21-28.....	7,105	9.3	.14	8.4	4.8	4.8	1.4	23	31	2.5	.1	2.0	77		45	26		116	6.6	5
Mar. 1-10.....	7,136	11	.04	11	4.6	6.5	1.5	21	40	3.5	.1	1.0	95		47	29		143	6.9	3
Mar. 11-20.....	2,811	8.8	.02	14	6.1	9.7	1.7	25	56	4.0	.1	1.4	122		61	40		187	7.1	1
Mar. 21-31.....	3,995	9.6	.08	11	4.9	6.2	1.4	21	36	5.8	.1	1.5	89		48	30		140	7.4	3

BIG SANDY RIVER BASIN--Continued

Temperature (°F) of water, October 1952 to March 1953

Twice-daily temperature measurements at approximately 7 a. m. and 5 p. m.

[illegible]

## BIG SANDY RIVER BASIN--Continued

## LEVISA FORK AT PAINTSVILLE, KY.--Continued

Suspended sediment, October 1952 to April 1953

Day	October			November			December		
	Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment	
		Mean con- centration (ppm)	Tons per day		Mean con- centration (ppm)	Tons per day		Mean con- centration (ppm)	Tons per day
1.....	--	--	--	47	6	1	432	39	45
2.....	--	--	--	48	6	1	368	14	14
3.....	--	--	--	50	5	1	327	7	6
4.....	--	--	--	52	7	1	297	8	6
5.....	--	--	--	54	5	1	346	11	10
6.....	--	--	--	54	5	1	554	12	18
7.....	--	--	--	57	5	1	738	11	22
8.....	--	--	--	59	5	1	975	10	26
9.....	--	--	--	59	5	1	840	8	18
10.....	--	--	--	69	5	1	1,200	182	s 816
11.....	--	--	--	72	5	1	5,830	692	s 12,000
12.....	--	--	--	80	7	2	10,700	960	27,700
13.....	--	--	--	88	7	2	4,920	610	8,100
14.....	--	--	--	95	5	1	2,340	211	s 1,400
15.....	--	--	--	110	4	1	1,510	43	175
16.....	--	--	--	138	8	3	1,080	38	111
17.....	--	--	--	152	8	3	860	28	65
18.....	--	--	--	138	7	3	720	13	25
19.....	--	--	--	124	5	2	612	16	26
20.....	--	--	--	118	7	2	558	17	26
21.....	--	--	--	135	7	3	534	12	17
22.....	61	4	1	660	18	s 49	518	4	6
23.....	57	9	1	2,750	301	2,230	518	3	4
24.....	59	8	1	1,800	290	1,410	514	3	4
25.....	56	8	1	1,290	157	547	498	13	17
26.....	54	12	2	1,060	92	263	474	12	15
27.....	52	9	1	845	64	146	452	11	13
28.....	50	8	1	870	62	146	424	17	19
29.....	47	9	1	734	35	69	396	15	16
30.....	47	8	1	542	33	48	368	19	19
31.....	48	7	1	--	--	--	372	9	9
Total.	531	--	11	12,350	--	4,941	40,275	--	50,748
Day	January			February			March		
	Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment	
		Mean con- centration (ppm)	Tons per day		Mean con- centration (ppm)	Tons per day		Mean con- centration (ppm)	Tons per day
1.....	470	9	11	3,030	55	450	1,820	37	182
2.....	658	14	25	2,280	61	376	3,570	90	s 914
3.....	1,040	8	22	1,840	44	218	8,750	167	s 4,200
4.....	1,420	3	12	1,470	25	99	13,600	179	6,570
5.....	1,610	4	17	1,290	8	28	15,400	210	8,730
6.....	1,420	5	19	1,160	2	6	11,800	165	s 5,610
7.....	3,330	213	s 2,720	1,080	12	35	6,310	136	2,320
8.....	8,870	302	7,230	1,100	22	65	4,240	74	847
9.....	9,380	190	4,810	1,330	15	54	3,290	64	568
10.....	5,390	117	1,700	1,340	13	47	2,580	33	230
11.....	4,270	96	1,110	1,320	7	25	2,060	23	128
12.....	3,980	114	1,220	1,690	20	91	1,820	16	79
13.....	3,010	98	796	2,260	29	177	1,660	12	54
14.....	2,340	50	316	3,680	85	844	1,520	7	29
15.....	1,980	32	171	3,850	132	1,370	2,040	34	187
16.....	1,830	44	217	4,760	99	1,270	2,750	89	661
17.....	1,710	18	83	5,200	114	1,600	2,990	89	718
18.....	3,140	152	1,290	5,620	82	1,240	3,350	62	561
19.....	3,490	145	1,370	4,770	100	1,290	4,340	78	914
20.....	3,210	110	953	3,670	55	545	5,580	94	1,420
21.....	3,370	61	555	5,530	134	s 2,290	4,420	46	549
22.....	4,750	95	1,220	15,000	656	s 30,000	3,370	18	164
23.....	5,230	87	1,230	16,500	740	s 34,800	2,700	60	437
24.....	4,560	98	985	7,450	452	s 10,400	3,140	37	314
25.....	4,610	75	934	4,260	128	1,470	6,740	86	s 1,660
26.....	4,260	106	1,220	3,320	72	645	7,360	88	1,750
27.....	3,410	38	350	2,630	72	511	4,960	64	857
28.....	3,090	39	325	2,150	52	302	3,760	38	386
29.....	4,440	95	1,140	--	--	--	3,030	48	393
30.....	5,820	115	1,810	--	--	--	2,450	33	218
31.....	4,240	112	1,280	--	--	--	2,020	17	93
Total.	110,328	--	35,141	109,580	--	90,248	143,420	--	41,743

s Computed by subdividing day.

## BIG SANDY RIVER BASIN--Continued

## LEVISA FORK AT PAINTSVILLE, KY.--Continued

Suspended sediment, October 1952 to April 1953--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.....	1,790	16	77						
2.....	1,720	15	70						
3.....	1,650	17	76						
4.....	1,460	7	28						
5.....	1,310	23	81						
6.....	1,220	8	26						
7.....	1,310	18	64						
8.....	1,880	10	51						
9.....	--	--	--						
10.....	--	--	--						
11.....	--	--	--						
12.....	--	--	--						
13.....	--	--	--						
14.....	--	--	--						
15.....	--	--	--						
16.....	--	--	--						
17.....	--	--	--						
18.....	--	--	--						
19.....	--	--	--						
20.....	--	--	--						
21.....	--	--	--						
22.....	--	--	--						
23.....	--	--	--						
24.....	--	--	--						
25.....	--	--	--						
26.....	--	--	--						
27.....	--	--	--						
28.....	--	--	--						
29.....	--	--	--						
30.....	--	--	--						
31.....	--	--	--						
Total.	12,340	--	473						

Total discharge for period (cfs-days) ..... a 428,824

Total load for period (tons) ..... 223,305

a Represents 61 percent of runoff for water year October 1952 to September 1953.



## BIG SANDY RIVER BASIN--Continued

## LEVISA FORK AT PAINTSVILLE, KY.--Continued

Particle-size analyses of suspended sediment, December 1952 to February 1953  
 (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	Water discharge (cfs)	Water temperature (° F)	Suspended sediment											Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters								1.000		
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500
Dec. 11, 1952 ..	11:00 a.m.	5,060		699	762	42	57	73	86	93	96	--			BSWCM	
Dec. 11, .....	5:00 p.m.	6,390		782	873	31	44	63	78	89	94	--			BSWCM	
Dec. 12, .....	9:00 a.m.	11,800		1,070	1,150	33	48	68	84	92	95	97	99		BSWCM	
Dec. 13, .....	7:00 a.m.	5,740		711	843	39	56	74	89	95	97	98			BSWCM	
Feb. 22, 1953 ..	4:00 p.m.	17,400		838	736	29	45	61	78	89	95	98			BSWCM	
Feb. 23, .....	7:00 a.m.	18,500		1,070	560	43	48	68	86	94	96	--			BSWCM	
Feb. 23, .....	7:00 a.m.	18,500		1,070	546	10	18	41	72	95	96	--			BSN	
Feb. 23, .....	12:05 p.m.	16,900		441	443	37	50	68	86	94	97	99			BSWCM	
Feb. 24, .....	7:00 a.m.	8,530		988	1,070	38	47	65	84	95	97	--			BSWCM	

## BIG SANDY RIVER BASIN--Continued

TUG FORK AT KERMIT, W. VA.

LOCATION.--At city water plant, at Kermit, Mingo County,  $\frac{1}{2}$  of a mile downstream from Wolf Creek, and 3 miles downstream from gaging station.

DRAINAGE AREA.--1,274 square miles at water plant, 1,185 square miles at gaging station.

RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1953.

EXTREMES, 1952-53.--Water temperatures, Maximum observed, 85°F July 28, 31, Aug. 1; minimum observed, 36°F Dec. 29.

EXTREMES, 1946-53, Water temperature.--Maximum observed, 90°F July 29, 1949; minimum freezing point Feb. 5, 1947, Nov. 26, 1950, Jan. 10, Feb. 8, 9, 1951.

REMARKS.--Records of discharge for water year 1950, 1951, 1952 and 1953 given in WSP 1173, 1205, 1235, and 1275 respectively.

Temperature (°F) of water, water year October 1952 to September 1953

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

## BIG SANDY RIVER BASIN--Continued

## TUG FORK AT KERMIT, W. VA.--Continued

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

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

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

## BIG SANDY RIVER BASIN--Continued

## TUG FORK AT KERMIT, W. VA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

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

## SCIOTO RIVER BASIN

## SCIOTO RIVER NEAR PROSPECT, OHIO

LOCATION -- At gaging station at Hoskins Bridge,  $1\frac{1}{2}$  miles upstream from Ottawa Creek, 2 miles south of Prospect, Marion County, and  $2\frac{1}{4}$  miles downstream from Patton Run.  
DRAINAGE AREA -- 571 square miles.

RECORDS AVAILABLE -- Water temperatures: October 1952 to September 1953.

Sediment records: April 1951 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Minimum, freezing point Jan. 6.

Sediment concentrations: Maximum daily, 336 ppm Jan. 19; minimum daily, 1 ppm on several days during June.

Sediment loads: Maximum daily, 2,810 tons May 24; minimum daily, less than 0.05 ton Sept. 13-14.

EXTREMES, 1951-53.--Sediment concentrations: Maximum daily, 758 ppm June 9, 1951; minimum daily, 1 ppm on several days during October 1951 and June 1953.

Sediment loads: Maximum daily, 7,860 tons Jan. 28, 1952; minimum daily, less than 0.05 ton Oct. 27-28, 1951, Aug. 25, 1952, Sept. 13-14, 1953.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Temperature (°F) of water, water year October 1952 to September 1953  
/Once-daily temperature measurement at varying hours/

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

## SCIOTO RIVER BASIN--Continued

## SCIOTO RIVER NEAR PROSPECT, OHIO--Continued

Suspended sediment, water year October 1952 to September 1953

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.....	13	8	0.3	16	6	0.3	12	10	a0.3
2.....	16	12	.5	17	6	a.3	14	9	.3
3.....	13	7	.2	21	6	.3	14	8	.3
4.....	11	7	.2	17	7	.3	14	7	.3
5.....	13	6	a.2	17	7	.3	38	14	1.4
6.....	14	6	.2	20	6	.3	26	8	.6
7.....	14	8	.3	21	8	.4	24	8	a.5
8.....	12	6	.2	16	13	.6	32	12	1.0
9.....	13	7	.2	17	13	a.6	46	17	2.1
10.....	12	8	.2	17	13	.6	101	42	11
11.....	12	6	.2	15	12	.5	62	30	a5
12.....	11	6	a.2	16	7	.3	127	50	a17
13.....	12	5	.2	16	6	.3	98	18	4.8
14.....	13	4	.1	16	8	.3	60	15	2.4
15.....	13	3	.1	16	8	.3	38	13	1.3
16.....	12	2	.1	16	8	a.3	30	11	.9
17.....	12	2	.1	15	8	.3	28	11	.8
18.....	13	2	.1	15	8	.3	27	8	.6
19.....	13	7	.2	24	12	.8	24	5	.3
20.....	13	7	.2	22	10	.6	24	5	.3
21.....	12	6	.2	20	6	.3	27	5	a.4
22.....	13	6	.2	20	5	.3	25	5	.3
23.....	15	7	.3	19	5	a.3	36	5	.5
24.....	16	11	.5	16	5	.2	60	4	.6
25.....	15	12	.5	15	5	.2	48	4	a.5
26.....	16	8	a.3	15	3	.1	38	4	.4
27.....	21	7	.4	16	3	.1	33	5	.4
28.....	16	8	.3	13	3	.1	23	5	a.3
29.....	15	8	.3	12	3	.1	21	5	.3
30.....	13	7	.2	13	6	a.2	24	4	.3
31.....	14	7	.3	--	--	--	27	4	.3
Total.	421	--	7.5	509	--	9.9	1,201	--	55.5
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.....	22	3	0.2	257	9	a6	139	5	1.9
2.....	22	2	.1	260	10	7.0	113	3	.9
3.....	24	2	.1	205	10	5.5	118	7	s2.5
4.....	20	2	a.1	160	7	3.0	716	116	s250
5.....	20	2	a.1	132	5	1.8	1,330	287	1,030
6.....	24	2	.1	128	7	2.4	1,410	284	1,000
7.....	21	3	.2	120	6	1.9	861	107	249
8.....	30	3	.2	104	5	a1	498	40	a55
9.....	49	4	.5	90	4	1.0	364	22	22
10.....	86	10	s3.2	81	4	.9	337	16	14
11.....	470	104	s144	93	4	1.0	460	16	20
12.....	819	180	398	190	12	6.2	655	28	50
13.....	695	129	242	346	50	a45	675	34	62
14.....	364	44	43	349	35	33	556	28	42
15.....	331	19	17	255	17	a12	537	25	a35
16.....	428	14	16	214	15	8.7	635	50	86
17.....	410	32	s44	152	12	4.9	655	60	106
18.....	990	165	441	109	10	2.9	483	42	55
19.....	1,330	336	1,210	147	8	3.2	635	39	67
20.....	1,300	200	702	145	8	3.1	777	92	193
21.....	777	68	143	385	55	s67	556	59	88
22.....	428	30	35	715	123	237	380	37	38
23.....	306	22	18	487	88	116	311	33	28
24.....	255	13	9.0	303	53	43	263	28	20
25.....	240	13	a8	242	25	16	225	25	a15
26.....	221	13	7.8	208	12	6.7	193	18	9.4
27.....	184	10	5.0	195	15	7.9	166	15	6.7
28.....	219	18	11	168	7	3.2	154	14	5.8
29.....	212	11	6.3	--	--	--	143	13	a5
30.....	162	9	3.9	--	--	--	128	13	4.5
31.....	199	8	4.3	--	--	--	116	10	3.1
Total.	10,658	--	3,513.1	6,240	--	647.3	14,589	--	3,564.8

a Computed from estimated concentration graph.

s Computed by subdividing day.

## SCIOTO RIVER BASIN--Continued

## SCIOTO RIVER NEAR PROSPECT, OHIO--Continued

## Suspended sediment, water year October 1952 to September 1953--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.....	158	8	3.4	132	8	2.8	188	11	5.6
2.....	337	25	s27	128	7	2.4	149	9	3.6
3.....	377	57	58	123	6	a2	121	6	a2
4.....	263	38	27	113	6	1.8	103	3	a.8
5.....	205	20	a11	118	6	1.9	86	4	.9
6.....	180	15	7.3	116	7	2.2	78	8	1.7
7.....	154	13	5.4	149	10	4.0	72	7	al
8.....	141	11	4.2	371	34	s44	61	5	.8
9.....	136	12	4.4	1,160	253	792	60	5	a.8
10.....	306	42	s39	1,080	110	a320	56	5	.8
11.....	695	105	197	518	47	66	52	3	.4
12.....	518	85	a120	322	27	23	61	3	.5
13.....	334	47	42	320	22	19	57	2	.3
14.....	270	21	15	328	25	22	38	1	a.1
15.....	228	13	8.0	675	40	73	32	1	.1
16.....	250	15	10	861	59	137	31	1	.1
17.....	257	18	12	1,300	129	s496	30	1	.1
18.....	252	12	8.2	2,280	235	1,450	30	1	.1
19.....	221	8	a5	2,950	272	2,170	34	1	.1
20.....	210	7	4.0	2,950	109	868	42	1	.1
21.....	219	8	4.7	1,560	51	215	54	1	a.1
22.....	180	8	3.9	1,160	73	s277	54	1	a.1
23.....	172	7	3.2	2,340	315	1,990	69	1	.2
24.....	152	8	a3	3,580	291	2,810	67	1	a.2
25.....	141	9	3.4	3,720	181	1,820	72	1	.2
26.....	147	10	a4	2,400	80	518	80	2	.4
27.....	150	10	4.0	1,080	53	154	78	2	.4
28.....	137	10	3.7	576	32	50	74	2	a.4
29.....	130	10	3.5	364	22	23	116	3	.9
30.....	127	9	3.1	297	18	14	176	6	2.8
31.....	--	--	--	240	17	a11	--	--	--
Total.	7,047	--	644.4	33,331	--	14,379.1	2,221	--	25.6
Day	July			August			September		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	228	6	3.7	27	3	0.2	9.4	6	0.2
2.....	100	20	5.4	30	7	.6	9.4	4	.1
3.....	64	17	2.9	22	7	a.4	9.1	3	.1
4.....	57	7	1.1	16	8	a.3	9.8	6	.2
5.....	48	7	a.9	35	9	.8	12	7	.2
6.....	42	8	.9	39	4	.4	8.8	7	a.2
7.....	36	15	1.4	39	3	.3	6.1	7	.1
8.....	26	27	1.9	72	3	.6	7.7	3	.1
9.....	20	28	1.5	84	3	a.7	9.1	3	.1
10.....	19	26	1.3	104	3	.8	9.4	3	a.1
11.....	17	33	1.5	58	2	.3	10	4	.1
12.....	17	45	a2	44	3	.4	14	4	.2
13.....	15	45	1.8	32	8	.7	6.1	3	(t)
14.....	18	19	.9	25	8	.5	4.5	3	(t)
15.....	16	8	a.3	22	4	a.2	8.8	3	a.1
16.....	16	7	a.3	17	4	a.2	11	3	a.1
17.....	15	7	a.3	16	4	.2	10	3	.1
18.....	25	7	.5	15	5	a.2	10	3	.1
19.....	31	7	a.6	17	6	.3	10	5	.1
20.....	19	7	.4	15	6	a.2	17	3	a.1
21.....	15	8	.3	15	6	.2	12	3	.1
22.....	25	20	1.3	16	6	.2	8.8	3	.1
23.....	229	45	sa35	15	5	a.2	12	5	.2
24.....	400	75	a80	14	5	.2	14	6	.2
25.....	193	26	14	15	7	.3	14	5	a.2
26.....	81	12	2.6	17	7	.3	14	5	a.2
27.....	48	7	.9	16	7	.3	15	5	a.2
28.....	38	5	.5	15	8	.3	10	5	a.1
29.....	32	4	.3	15	7	.3	11	5	a.1
30.....	30	5	.4	15	7	a.3	15	5	a.2
31.....	27	2	.1	14	7	.3	--	--	--
Total.	1,947	--	165.0	896	--	11.2	318.0	--	4.0

Total discharge for year (cfs-days) ..... 79,378.0

Total load for year (tons) ..... 23,027.4

a Computed from estimated concentration graph.

t Less than 0.05

s Computed by subdividing day.

SCIOTO RIVER BASIN--Continued  
SCIOTO RIVER NEAR PROSPECT, OHIO--Continued

Particle size analyses of suspended sediment. January to May 1953  
(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	Water discharge (cfs)	Water temperature (° F)	Suspended sediment											Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500
Jan. 19, 1953.....	2:40 p. m.	1,330		325	438	81	90	96	98	99	100					BSWCM
Mar. 5.....	12:20 p. m.	1,330		303	279	74	81	91	95	97	100					BSWCM
Mar. 5.....	12:20 p. m.	1,330		303	201	13	40	82	95	97	98					BSN
May 9.....	8:55 a. m.	1,160		281	401	--	84	95	98	99	100					BSWCM
May 19.....	12:05 p. m.	3,020		303	463	75	80	90	98	99	99					BSWCM
May 23.....	7:50 a. m.	2,280		369	537	83	88	93	96	97	100					BSWCM
May 24.....	6:10 p. m.	3,930		357	578	75	81	89	97	98	100					BSWCM
May 25.....	2:00 p. m.	3,650		170	457	58	71	89	95	97	98	100				BSN



SCIOTO RIVER BASIN--Continued  
 OLENTANGY RIVER NEAR DELAWARE, OHIO

LOCATION.--At gaging station 500 feet upstream from highway bridge, 1,000 feet downstream from Delaware Dam, 1,300 feet upstream from Pennsylvania railroad bridge and 4 miles north of Delaware, Delaware County.

DRAINAGE AREA.--387 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1953.

EXTREMES, 1946-53.--Water temperatures: Maximum, 76°F, July 27-28; minimum, 34°F, on several days during February.

EXTREMES, 1946-53.--Water temperatures: Maximum, 93°F, June 29, 1952; minimum, freezing point on several days during most winter months.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Temperatures (°F) of water, water year October 1952 to September 1953

/Continuous ethyl alcohol actuated thermograph. Prior to October 1, 1952, once-daily measurement at approximately 5 p. m. /

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

SCIOTO RIVER BASIN--Continued  
BIG WALNUT CREEK AT CENTRAL COLLEGE, OHIO

LOCATION.--At gaging station a quarter of a mile east of Central College, Franklin County, 3 miles southeast of Westerville, and 3½ miles downstream from Duncan Run.

Drainage Area.--191 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1953.

Water temperatures: October 1951 to September 1953.

Sediment records: October 1951 to September 1953.

EXTREMES, 1952-53.--Dissolved solids: Maximum, 765 ppm Dec. 1-10; minimum, 225 ppm May 8-20.

Hardness: Maximum, 585 ppm Dec. 1-10; minimum, 175 ppm July 1-10.

Specific conductance: Maximum daily, 1,110 microhmhos Dec. 1-2; minimum daily, 187 microhmhos July 19.

Water temperatures: Maximum, 88° F Aug. 30; minimum, freezing point Dec. 27, Jan. 6-7, Mar. 8.

Sediment concentrations: Maximum daily, less than 0.50 ppm on several days during October and November.

Sediment loads: Minimum daily, less than 0.05 ton on many days during October, November, December, January, August, and September.

EXTREMES, 1951-53.--Dissolved solids: Maximum, 765 ppm Dec. 1-10, 1952; minimum, 158 ppm Jan. 21-31, 1952.

Hardness: Maximum, 585 ppm Dec. 1-10, 1952; minimum, 122 ppm Jan. 21-Feb. 10, 1952.

Specific conductance: Maximum daily, 1,110 microhmhos Dec. 1-2, 1952; minimum daily, 139 microhmhos Jan. 27, 1952.

Water temperatures: Maximum, 88° F June 28, 1952; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 664 ppm Jan. 28, 1952; minimum daily, less than 0.50 ppm on several days during October and November 1952.

Sediment loads: Maximum daily 10.7 tons Jan. 27, 1952; minimum daily, less than 0.05 ton on many days.

REMARKS.--Flow affected by ice Feb. 17-19. Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (microhmhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 1-10, 1952	0.63	11	0.02	102	45	15	5.3	210	284	10	0.4	1.1	612	440	267	841	7.7	5
Oct. 11-20	1.17	8.1	0.02	104	45	15	5.4	220	281	11	0.4	0.2	615	444	264	848	7.8	7
Oct. 21-31	1.10	12	0.02	118	51	15	5.3	262	303	10	0.4	0.4	665	505	289	933	7.2	10
Nov. 1-5, 7-10	1.28	16	0.02	129	54	15	6.3	284	342	10	0.4	0.1	729	545	311	984	7.4	10
Nov. 11-20	1.46	14	0.05	131	56	16	6.2	300	327	9.5	0.4	0.1	730	560	311	1,010	7.5	10
Nov. 21-25, 27-30	1.75	19	0.05	136	53	17	6.3	a 320	321	11	0.4	0.1	740	560	295	1,010	8.3	10
Dec. 1-10	4.97	13	0.05	145	54	17	6.2	b 334	335	19	0.4	0.1	765	585	310	1,050	8.2	10
Dec. 11-20	15.1	13	0.02	82	30	14	4.6	209	159	12	0.4	3.6	434	328	137	675	7.2	15
Dec. 21-31	6.85	10	0.02	90	30	13	4.0	216	179	13	0.3	3.0	462	348	171	702	7.4	15
Jan. 1-10, 1953	13.5	7.4	0.02	97	36	13	3.3	244	197	12	0.3	1.0	505	392	190	757	7.6	7
Jan. 11-20	283	8.1	0.02	48	15	5.6	2.8	92	87	9.5	0.3	16	241	182	106	389	7.0	15
Jan. 21-27, 29-31	168	9.2	0.04	53	17	5.7	1.7	106	96	8.5	0.3	17	268	201	115	434	7.3	15
Feb. 2-10	65.8	18	0.02	60	18	8.2	1.6	132	108	8.5	0.2	5.4	312	224	66	455	7.6	7
Feb. 11-20	118	9.2	0.02	55	18	6.5	1.4	125	99	8.2	0.2	6.4	262	210	109	437	7.4	5
Feb. 21-28	126	8.3	0.02	51	18	5.7	1.8	115	94	8.0	0.2	8.2	256	201	107	403	7.3	10
Mar. 1-10	288	7.0	0.02	49	17	5.3	1.7	109	89	8.8	0.2	7.6	244	193	103	389	7.3	10
Mar. 11-20	168	5.3	0.01	50	17	5.5	1.6	124	88	8.5	0.2	7.4	246	196	103	396	7.6	12
Mar. 22-31	48.9	8.6	0.05	61	22	6.7	1.3	160	111	9.5	0.2	3.4	314	244	112	491	7.2	5

a. Includes equivalent of 18 parts per million of carbonate (CO<sub>3</sub>).

b. Includes equivalent of 12 parts per million of carbonate (CO<sub>3</sub>).

Apr. 1-10, 1953	62.6	7.0	0.02	64	24	7.9	1.6	176	119	9.0	0.2	1.7	332	258	114	520	7.4	5
Apr. 11-20	139	7.5	.04	49	17	5.6	1.4	136	81	7.0	.2	3.5	287	192	81	396	7.6	5
Apr. 21-30	99.9	4.1	.02	53	19	5.8	1.2	146	91	9.0	.2	3.7	268	210	91	430	7.6	7
May 1-7	41.7	5.1	.04	60	22	7.7	1.6	174	102	8.0	.2	1.0	307	242	96	482	7.6	7
May 8-20	237	7.8	.05	46	16	5.7	1.5	134	65	6.5	.2	4.8	223	180	71	388	7.2	25
May 21-31	99.2	7.9	.10	51	16	5.5	2.0	161	72	6.5	.2	3.9	253	204	69	457	7.3	20
June 1-10	12.1	4.9	.02	66	24	6.3	2.3	206	104	7.5	.2	.9	329	264	95	556	7.4	5
June 11-20	16.2	11	.01	60	22	7.8	2.4	184	82	8.0	.3	2.5	310	240	89	467	7.4	10
June 21-30	18.2	12	.01	62	22	6.4	2.1	194	86	8.0	.3	1.6	312	246	96	504	7.6	10
July 1-10	124	11	.03	46	13	5.0	2.7	120	90	7.0	.1	13.4	231	175	80	368	7.4	30
July 11-20	213	11	.04	54	11	7.7	2.4	150	82	8.0	.1	3.4	272	205	92	428	7.7	25
July 21-31	45.0	10	.02	50	13	6.4	3.2	138	64	5.5	.1	3.2	246	180	65	375	7.5	23
Aug. 1-3-10	17.8	8.8	.05	64	19	7.8	2.9	184	85	5.5	.1	1.0	301	238	87	469	7.8	20
Aug. 11-20	7.10	12	.03	64	23	11	3.2	202	99	7.4	.3	.1	335	258	89	513	7.4	10
Aug. 21-31	1.26	10	.05	62	24	15	4.1	184	115	10	.3	.8	339	254	103	539	7.7	10
Sept. 1-10	.59	9.4	.02	68	24	29	5.8	183	149	15	.4	2.4	402	270	118	635	7.0	8
Sept. 11-20	.62	9.0	.02	61	22	32	6.4	182	136	17	.4	2.3	386	244	94	616	7.1	9
Sept. 21-30	.63	7.6	.02	62	21	31	7.0	188	122	18	.4	1.6	367	242	87	597	7.1	10
Average	71.9	9.8	0.03	72	27	11	3.4	184	145	9.7	0.3	3.7	386	291	140	576	--	12

## SCIOTO RIVER BASIN--Continued

## BIG WALNUT CREEK AT CENTRAL COLLEGE, OHIO--Continued

Temperature (°F) of water, water year October 1952 to September 1953

/Once-daily temperature measurement at approximately 5:30 p. m./

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

## SCIOTO RIVER BASIN--Continued

## BIG WALNUT CREEK AT CENTRAL COLLEGE, OHIO--Continued

Suspended sediment, water year October 1952 to September 1953

Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	0.5	4		1.1	6		1.7	46	0.2
2.....	.5	3		1.2	2		1.8	46	.2
3.....	.4	3		1.3	2		1.8	24	.1
4.....	.4	12		1.3	1		2.0	17	.1
5.....	.4	5		1.3		(t)	4.6	16	.2
6.....	.8	2		1.4		a	5.2	12	.2
7.....	1.0	2		1.3			5.4	10	.1
8.....	.7	3		1.3			5.6	11	.2
9.....	.6	3		1.3	1		5.6	8	.1
10.....	1.0	4		1.3	23	0.1	16	18	.8
11.....	1.1	4		1.3	24	.1	53	34	4.9
12.....	1.2	4		1.3	3		25	22	1.5
13.....	1.3	4		1.4	1		16	12	.5
14.....	1.3	2		1.4	1		12	7	.2
15.....	1.3			1.4	1		10	4	.1
16.....	1.1		(t)	1.4	1	(t)	8.2	2	(t)
17.....	1.1			1.4	4		7.4	3	.1
18.....	1.1			1.4	4		6.9	3	.1
19.....	1.1	a		1.8	6		6.4	12	.2
20.....	1.1			1.8	4		6.4	18	.3
21.....	1.1			1.8	3		6.4	7	.1
22.....	1.1			2.1	11	.1	6.6	5	.1
23.....	1.1			2.3	12	.1	6.9	5	.1
24.....	1.1			2.1	17	.1	9.1	4	.1
25.....	1.1	1		2.0	23	.1	8.8	3	.1
26.....	1.1	6		2.0	52	.3	8.2	3	.1
27.....	1.1	10		1.8	52	.2	7.2	3	.1
28.....	1.1	10		1.7	64	.3	6.2	3	.1
29.....	1.1	10		1.7	47	.2	5.9	3	(t)
30.....	1.1	7		1.7	38	.2	5.0	3	(t)
31.....	1.1	15		--	--	--	5.0	3	(t)
Total.	30.1	--	0.3	46.6	--	2.0	276.3	--	11.1
Day	January			February			March		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	5.0	3	(t)	427	30	sb 40	42	10	1.1
2.....	5.0	3	(t)	144	8	3.1	36	5	.5
3.....	5.0	3	(t)	101	8	2.2	40	7	.8
4.....	5.2	5	0.1	65	7	1.2	1,330	235	s1,070
5.....	5.2	7	.1	59	7	1.1	588	119	s 226
6.....	5.4	10	.1	50	7	.9	219	32	19
7.....	5.2	8	.1	49	7	.9	224	26	16
8.....	6.4	4	.1	46	5	.6	140	14	5.3
9.....	9.4	5	.1	42	6	.7	114	8	2.5
10.....	83	30	s 8.7	36	4	.4	144	7	2.7
11.....	331	96	s 92	57	19	s 4.3	193	4	2.1
12.....	179	64	s 34	331	--	e 75	208	6	3.4
13.....	89	33	7.9	254	30	20	180	10	4.9
14.....	56	19	2.9	142	22	8.4	160	7	3.0
15.....	46	13	1.6	109	13	3.8	193	--	e 17
16.....	36	8	.8	89	15	3.6	240	--	e 30
17.....	148	126	s 101	60	7	1.1	134	13	4.7
18.....	1,500	300	sb 1,400	45	5	.6	105	8	2.3
19.....	372	46	46	45	5	.6	134	7	2.5
20.....	176	28	13	48	5	.6	130	4	1.4
21.....	128	19	6.6	248	--	e 75	89	3	.7
22.....	91	15	3.7	310	130	sb 120	71	2	.4
23.....	69	13	2.4	122	55	18	60	2	.3
24.....	101	12	3.3	86	30	7.0	56	5	.8
25.....	162	12	5.2	71	19	3.6	52	4	.6
26.....	88	10	2.4	66	13	2.3	52	3	.4
27.....	71	19	3.6	59	11	1.8	46	2	.2
28.....	681	100	sb 225	49	12	1.6	43	2	.2
29.....	394	48	s 54	--	--	--	39	1	.1
30.....	164	27	12	--	--	--	36	2	.2
31.....	416	--	e 50	--	--	--	34	2	.2
Total.	5,432.8	--	2,076.8	3,210	--	398.4	5,132	--	1,419.3

e Estimated.

s Computed by subdividing day.

t Less than 0.50 ton.

a Less than 0.50 ppm.

b Computed from partly-estimated concentration graph.

## SCIOTO RIVER BASIN--Continued

## BIG WALNUT CREEK AT CENTRAL COLLEGE, OHIO--Continued

Suspended sediment, water year October 1952 to September 1953--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.....	39	3	0.3	62	12	2.0	12	10	0.3
2.....	60	4	.6	52	7	1.0	10	12	.3
3.....	60	3	.5	40	7	.8	8.8	13	.3
4.....	52	5	.7	33	7	.6	7.4	17	.3
5.....	46	7	.9	34	8	.7	6.4	17	.3
6.....	43	4	.5	35	10	.9	5.6	16	.2
7.....	43	2	.2	36	9	.9	12	21	.7
8.....	42	2	.2	533	190	sb340	25	26	1.8
9.....	59	15	2.4	490	110	sb190	14	17	.6
10.....	182	42	s35	160	26	11	20	18	1.0
11.....	220	84	50	86	16	3.7	52	28	3.9
12.....	118	36	11	60	12	1.9	44	21	2.5
13.....	100	17	4.6	52	12	1.7	18	18	.9
14.....	74	5	1.0	52	9	1.3	11	17	.5
15.....	60	3	.5	146	21	s9.9	8.2	17	.4
16.....	118	--	e10	200	28	15	6.9	17	.3
17.....	157	14	b6	444	40	s51	6.2	15	.2
18.....	112	10	3.0	529	49	70	5.4	13	.2
19.....	160	25	11	216	22	13	5.0	23	.3
20.....	275	25	b18	114	36	11	4.8	25	.3
21.....	232	2	1.2	76	31	6.4	4.4	18	.2
22.....	160	4	1.7	310	192	s256	3.6	18	.2
23.....	109	8	2.4	299	69	56	3.4	15	.1
24.....	77	7	1.4	138	43	16	3.1	14	.1
25.....	63	7	1.2	84	28	6.4	2.8	14	.1
26.....	66	7	1.2	60	17	2.8	2.6	14	.1
27.....	76	7	1.4	40	12	1.3	2.4	13	.1
28.....	74	10	2.0	29	11	.9	2.4	13	.1
29.....	68	10	1.8	22	10	.6	83	193	s80
30.....	74	15	3.0	18	8	.4	74	258	52
31.....	--	--	--	15	9	.4	--	--	--
Total.	3,019	--	173.7	4,465	--	1,073.6	464.6	--	148.3
Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	33	254	23	85	24	0.6	0.6	8	
2.....	852	--	e1,800	24	36	2.3	.6	9	
3.....	196	220	s128	34	37	3.4	.5	10	
4.....	81	94	20	25	27	1.8	.5	13	
5.....	32	59	5.1	15	21	.8	.6	10	
6.....	17	39	1.8	11	29	.9	.6	5	
7.....	11	43	1.3	8.8	29	.7	.6	5	
8.....	85	37	.8	7.9	17	.4	.6	3	
9.....	72	33	.6	12	18	.6	.6	2	
10.....	59	30	.5	32	28	2.4	.6	7	
11.....	52	28	.4	19	18	.9	.6	15	
12.....	46	23	.3	12	19	.6	.6	9	
13.....	42	22	.2	8.8	27	.6	.6	21	
14.....	38	28	.3	7.2	23	.4	.6	38	0.1
15.....	36	24	.2	5.9	28	.4	.8	43	.1
16.....	32	37	.3	4.8	16	.2	.6	44	.1
17.....	29	29	.2	4.2	32	.4	.6	44	.1
18.....	804	--	e2,400	3.6	37	.4	.5	43	.1
19.....	1,130	--	e2,600	2.9	32	.2	.5	43	.1
20.....	173	59	s30	2.6	14	.1	.8	42	.1
21.....	74	33	6.6	24	12	.1	1.0	26	.1
22.....	36	50	4.9	2.0	12	.1	.7	20	
23.....	112	65	b20	1.4	10	(t)	.7	15	
24.....	81	33	7.2	1.6	12	.1	.7	14	
25.....	29	32	2.5	1.7	56	.2	.6	27	
26.....	16	28	1.2	1.2	65	.2	.5	19	
27.....	11	23	.7	1.0	53	.1	.6	23	
28.....	69	40	b8	.8	26	.1	.6	37	.1
29.....	39	31	3.3	.6	10	(t)	.5	18	(t)
30.....	17	32	1.5	.6	7	(t)	.4	13	(t)
31.....	11	29	.9	.6	7	(t)	--	--	--
Total.	3,873.1	--	7,069.8	263.1	--	19.1	18.3	--	1.3
Total discharge for year (cfs-days)									26,230.9
Total load for year (tons)									12,403.7

e Estimated.

s Computed by subdividing day.

t Less than 0.050 ton.

a Less than 0.50 ppm.

b Computed from partly-estimated concentration graph.

## SCIOTO RIVER BASIN--Continued

## BIG WALNUT CREEK AT CENTRAL COLLEGE, OHIO--Continued

Particle-size analyses of suspended sediment, water year October 1952 to September 1953

(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	Water discharge (cfs)	Water temperature (°F)	Suspended sediment												Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500		1.000
May 8, 1953.....	6:00 p. m.	728		214	287	70	87	94	96	99	100						BSWCM
May 22.....	3:40 p. m.	521		498	705	64	77	90	97	99	99						BSWCM
May 22.....	3:40 p. m.	521		498	871	35	54	76	96	99	100						BSN
May 22.....	8:00 p. m.	538		184	479	62	74	82	89	93	99						BSWCM
May 22.....	8:00 p. m.	538		184	582	34	46	70	93	98	99						BSN
May 22.....	8:00 p. m.	538		221	380	78	93	97	100	--	--						BSWCM
July 3.....	10:30 a. m.	208		221	475	54	73	93	99	100	--						BSN

## NORTH FORK LITTLE MIAMI RIVER NEAR PITCHIN, OHIO

DRAINAGE AREA.--29.1 square miles

RECORDS AVAILABLE.--Water temperatures: August 1952 to September 1953.

Sediment records: August 1952 to September 1953.

EXTREMES, August 1952 to September 1953.--Water temperatures: Maximum, 87°F Sept. 1, 1953; minimum, freezing point on many days during November, December, January and February.

Sediment concentrations: Maximum daily, 669 ppm June 10; minimum daily, 1 ppm Feb. 9-10.

Sediment loads: Maximum daily, 49 tons March 4; minimum daily, less than 0.05 ton on many days during October, November, December 1952, February and September 1953.

REMARKS. --Records of discharge for August and September given in WSP 1235; records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Temperature (°F) of water, August 1952 to September 1953

[illegible]



## LITTLE MIAMI RIVER BASIN--Continued

## NORTH FORK LITTLE MIAMI RIVER NEAR PITCHIN, OHIO--Continued

Temperature (°F) of water, August 1952 to September 1953--Continued  
 /Once-daily temperature measurement at approximately 9 a. m./

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

## LITTLE MIAMI RIVER BASIN--Continued

## NORTH FORK LITTLE MIAMI RIVER NEAR PITCHIN, OHIO--Continued

Suspended sediment, August 1951 to September 1953

Day	Mean dis-charge (cfs)	Suspended sediment		August			September		
		Mean concen-tration (ppm)	Tons per day	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
					Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....				3.6	28	0.3	1.6	62	0.3
2.....				3.5	27	.3	6.6	78	1.4
3.....				3.3	47	.4	3.1	38	.3
4.....				3.3	74	.7	2.2	45	.3
5.....				3.3	82	.7	1.7	47	.2
6.....				3.1	89	.7	1.4	37	.1
7.....				3.1	59	.5	1.3	41	.1
8.....				2.9	59	.5	1.3	25	.1
9.....				2.9	35	.3	1.3	24	.1
10.....				3.5	57	.5	1.3	20	.1
11.....				3.1	50	.4	1.1	26	.1
12.....				3.1	60	.5	1.0	28	.1
13.....				2.9	46	.4	.8	27	.1
14.....				2.6	41	.3	1.3	63	.2
15.....				2.7	68	.5	2.8	62	.5
16.....				3.3	93	.8	1.4	25	.1
17.....				2.6	67	.5	1.3	28	.1
18.....				2.0	70	.4	1.3	38	.1
19.....				2.0	60	.3	2.6	34	.2
20.....				1.9	70	.4	1.9	49	.3
21.....				1.7	35	.2	1.6	37	.2
22.....				1.9	38	.2	1.6	34	.1
23.....				1.7	38	.2	1.6	24	.1
24.....				1.7	56	.3	1.4	32	.1
25.....				1.6	73	.3	1.3	29	.1
26.....				1.6	66	.3	1.3	33	.1
27.....				1.4	40	.2	1.3	29	.1
28.....				1.4	53	.2	1.3	26	.1
29.....				1.4	65	.2	1.1	33	.1
30.....				1.4	77	.3	1.1	22	.1
31.....				1.4	81	.3	--	--	--
Total.				75.9	--	12.1	50.9	--	5.9
Day	Mean dis-charge (cfs)	October		November			December		
		Mean concen-tration (ppm)	Tons per day	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
					Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	1.1	15	(t)	2.6	8	0.1	1.7	9	(t)
2.....	1.1	14	(t)	2.6	8	.1	1.9	12	0.1
3.....	1.1	13	(t)	2.6	4	(t)	1.9	12	.1
4.....	1.1	14	(t)	2.4	3	(t)	2.4	8	.1
5.....	1.4	23	0.1	2.4	4	(t)	10	15	.4
6.....	2.0	12	.1	2.2	5	(t)	7.7	6	.1
7.....	1.7	20	.1	2.0	5	(t)	5.2	5	.1
8.....	1.3	45	.2	1.9	9	(t)	4.2	5	a.1
9.....	1.7	40	.2	2.2	7	(t)	4.4	12	b.1
10.....	1.9	41	.2	2.2	7	(t)	17	45	b.2
11.....	2.0	30	.2	2.0	7	(t)	12	21	.7
12.....	2.2	26	.2	2.0	8	(t)	8.1	17	.4
13.....	2.0	30	.2	1.9	7	(t)	6.6	8	.1
14.....	2.2	23	.1	1.7	7	(t)	5.4	8	.1
15.....	2.2	27	.2	1.7	6	(t)	4.8	8	.1
16.....	2.2	29	.2	1.9	8	(t)	4.6	35	b.4
17.....	2.2	26	.2	1.9	8	(t)	4.2	20	.2
18.....	2.2	27	.2	2.1	8		3.8	9	.1
19.....	2.4	22	.1	2.7	10	.1	3.5	12	.1
20.....	2.9	8	.1	2.4	11	.1	3.6	32	.3
21.....	3.1	7	.1	2.0	13	.1	4.8	23	.3
22.....	3.5	12	.1	2.4	18	.1	5.2	30	.4
23.....	3.5	14	.1	2.4	27	.2	5.0	58	.8
24.....	3.6	13	.1	2.2	18	.1	4.4	21	.2
25.....	3.5	10	.1	2.2	11	.1	4.0	29	.3
26.....	3.3	12	.1	2.6	29	.2	3.5	26	.2
27.....	2.9	11	.1	2.0	18	.1	3.3	19	.2
28.....	2.7	10	.1	1.7	13	.1	3.1	14	.1
29.....	2.7	9	.1	1.7	22	.1	3.1	36	.3
30.....	3.1	9	.1	1.9	8	(t)	3.1	28	.2
31.....	2.9	14	.1	--	--	--	2.9	15	.1
Total.	71.7	--	3.9	64.5	--	2.1	155.4	--	8.7

t Less than 0.050 ton.

a Computed from estimated concentration graph.

b Computed from partly-estimated concentration graph.

## LITTLE MIAMI RIVER BASIN--Continued

## NORTH FORK LITTLE MIAMI RIVER NEAR PITCHIN, OHIO--Continued

## Suspended sediment, August 1951 to September 1953--Continued

Day	January			February			March		
	Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment	
		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day
1.....	2.7	14	0.1	32	9	0.8	13	18	0.6
2.....	2.6	17	.1	24	7	.5	13	23	.8
3.....	2.7	12	.1	21	5	.3	18	32	1.6
4.....	2.6	9	.1	17	6	.3	89	184	s 49
5.....	2.6	10	.1	16	8	.3	54	43	6.3
6.....	2.2	16	.1	16	10	.4	38	22	2.3
7.....	2.4	17	.1	14	12	.5	30	23	1.9
8.....	6.3	18	.3	13	2	.1	27	30	2.2
9.....	16	29	1.3	11	1	(t)	24	19	1.2
10.....	21	24	1.4	11	1	(t)	23	18	1.1
11.....	41	79	8.7	31	62	s 10	22	21	1.2
12.....	25	17	1.1	73	89	s 19	21	35	2.0
13.....	18	12	.6	43	18	2.1	24	31	2.0
14.....	15	10	.4	31	12	1.0	24	12	.8
15.....	13	10	.4	28	8	.6	26	10	.7
16.....	12	12	.4	24	4	.3	24	8	a .5
17.....	25	75	s 8.3	20	12	.6	21	7	.4
18.....	98	140	b 40	18	2	.1	29	7	.5
19.....	49	28	3.7	17	6	.3	46	27	3.4
20.....	34	21	1.9	17	7	.3	33	12	1.1
21.....	28	21	1.6	29	40	b 3	28	14	1.1
22.....	22	12	.7	24	18	1.2	24	15	1.0
23.....	20	14	.8	21	3	.2	23	12	.7
24.....	20	36	1.9	19	9	.5	21	12	.7
25.....	17	19	.9	18	10	.5	19	13	.7
26.....	15	28	1.1	17	23	1.0	18	13	a .6
27.....	15	48	1.9	16	27	1.1	17	13	.6
28.....	40	37	4.0	15	28	1.1	16	9	.4
29.....	37	14	1.4	--	--	--	16	8	.3
30.....	27	11	.8	--	--	--	15	8	.3
31.....	41	17	1.9	--	--	--	14	8	.3
Total.	673.1	--	86.2	636	--	46.2	810	--	86.3
Day	April			May			June		
	Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment	
		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day
1.....	15	7	0.3	14	27	1.0	9.0	49	1.2
2.....	14	7	.3	13	34	1.2	8.8	30	.7
3.....	13	7	.2	12	23	.7	8.1	32	.7
4.....	13	7	.2	11	18	.5	7.9	28	.6
5.....	12	7	.2	12	31	1.0	7.5	23	.5
6.....	13	7	.2	11	32	1.0	7.5	25	.5
7.....	13	7	.2	11	32	1.0	8.3	25	.6
8.....	12	15	.5	11	38	1.1	8.1	13	.3
9.....	13	16	.6	11	31	.9	7.7	10	.2
10.....	15	17	.7	9.9	21	.6	19	669	s 45
11.....	14	22	.8	9.7	19	.5	19	286	s 16
12.....	14	12	.5	9.5	20	.5	12	115	3.7
13.....	13	9	.3	9.7	18	.5	9.9	100	2.7
14.....	12	7	.2	9.7	9	.2	8.8	113	2.7
15.....	13	8	.3	9.7	16	.4	8.1	99	2.2
16.....	18	20	1.0	13	23	.8	7.5	58	1.2
17.....	16	10	.4	34	36	s 3.5	7.5	57	1.2
18.....	16	9	.4	39	38	s 5.3	6.8	86	1.6
19.....	19	14	.7	30	42	3.4	6.4	66	1.1
20.....	34	20	1.8	22	19	1.1	6.0	73	1.2
21.....	31	3	.3	18	43	2.0	5.6	100	1.5
22.....	25	3	.2	17	57	2.6	5.2	75	1.1
23.....	21	8	.5	33	90	b 8	5.0	94	1.3
24.....	18	7	.3	26	77	5.4	4.8	63	.8
25.....	17	7	.3	23	61	3.8	4.6	48	.6
26.....	17	12	.6	19	68	3.5	4.6	70	.9
27.....	17	13	.6	15	78	3.2	4.6	36	.4
28.....	16	17	.7	13	63	2.2	4.4	28	.3
29.....	15	20	.8	12	76	2.5	5.6	58	.9
30.....	15	23	.9	11	59	1.8	4.6	67	.8
31.....	--	--	--	9.9	49	1.3	--	--	--
Total.	494	--	15.0	509.1	--	61.5	232.9	--	92.5

s Computed by subdividing day.  
t Less than 0.050 ton.

a Computed from estimated concentration graph  
b Computed from partly-estimated concentration graph.

## LITTLE MIAMI RIVER BASIN--Continued

## NORTH FORK LITTLE MIAMI RIVER NEAR PITCHIN, OHIO--Continued

Suspended sediment, August 1951 to September 1953--Continued

Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	4.6	92	1.1	2.6	67	0.5	1.7	50	0.2
2.....	5.4	102	1.5	24	170	b11	1.6	56	.2
3.....	4.8	101	1.3	13	72	s 2.8	1.4	60	.2
4.....	4.4	97	1.2	10	453	s 19	1.4	28	.1
5.....	4.4	58	.7	45	251	30	1.6	30	.1
6.....	4.4	71	.8	21	45	2.6	1.3	34	.1
7.....	4.0	83	.9	13	88	3.1	1.3	42	.1
8.....	3.6	86	.8	9.2	81	2.0	1.1	34	.1
9.....	3.6	74	.7	7.7	75	1.6	1.0	34	.1
10.....	3.1	68	.6	6.4	68	1.2	.8	27	.1
11.....	3.1	74	.6	5.6	54	.8	.8	33	.1
12.....	2.9	73	.6	5.2	62	.9	.7	19	(t)
13.....	2.9	75	.6	4.8	65	.8	.7	13	(t)
14.....	2.7	42	.3	4.6	58	.7	1.0	9	(t)
15.....	2.7	42	.3	4.4	62	.7	1.0	13	(t)
16.....	2.6	42	.3	4.0	63	.7	1.0	17	(t)
17.....	2.6	66	.5	4.2	60	.7	.8	18	(t)
18.....	8.0	120	b3	3.8	54	.6	.8	20	(t)
19.....	6.6	102	s 1.9	3.6	49	.5	1.0	21	.1
20.....	4.2	79	.9	3.5	48	.4	1.1	35	.1
21.....	3.3	60	.5	3.3	47	.4	1.0	32	.1
22.....	8.3	120	b3	3.1	42	.4	1.0	25	.1
23.....	11	82	2.4	2.9	32	.2	1.1	23	.1
24.....	6.6	92	1.6	2.7	42	.3	1.1	22	.1
25.....	4.6	82	1.0	2.6	37	.2	1.0	25	.1
26.....	3.8	72	.7	2.6	37	.2	1.1	27	.1
27.....	3.5	83	.8	2.4	40	.2	1.0	41	.1
28.....	3.3	82	.7	2.2	27	.2	1.0	37	.1
29.....	2.9	72	.6	2.2	25	.1	1.0	25	.1
30.....	2.6	56	.4	2.0	44	.2	.7	26	(t)
31.....	2.4	69	.4	1.9	48	.2	--	--	--
Total.	132.9	--	30.7	223.5	--	83.2	32.1	--	2.8

Total discharge for October 1952 to September 1953 (cfs-days)..... 4,035.2

Total load for October 1952 to September 1953 (tons)..... 519.1

s Computed by subdividing day.

t Less than 0.050 ton.

b Computed from partly-estimated concentration graph.

## LITTLE MIAMI RIVER BASIN--Continued

## NORTH FORK LITTLE MIAMI RIVER NEAR PITCHIN, OHIO--Continued

Particle-size analyses of suspended sediment, June to August 1953

(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	Water discharge (cfs)	Water temperature (° F)	Suspended sediment												Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0. 002	0. 004	0. 008	0. 016	0. 031	0. 062	0. 125	0. 250	0. 350	0. 500	
June 10, 1953, . . . . .	10:45 a. m.	22		1. 200	1. 610	47	66	85	96	99	100					BSWCM
June 10, . . . . .	10:45 a. m.	22		1. 200	1. 670	13	21	43	77	99	99					BSN
June 11, . . . . .	9:30 a. m.	21		283	378	78	83	85	89	91	100					BSWCM
Aug. 4, . . . . .	6:00 p. m.	14		1. 820	1. 060	46	62	78	89	92	100					BSWCM

## LITTLE MIAMI RIVER BASIN--Continued

## LITTLE MIAMI RIVER NEAR SELMA, OHIO

LOCATION.--At gaging station at bridge on Selma Pike, 2.3 miles northwest of Selma, Clark County, and 3.1 miles upstream from North Fork.

DRAINAGE AREA.--50.6 square miles.

RECORDS AVAILABLE.--Chemical analyses: September 1952 to September 1953.

Water temperatures: September 1952 to September 1953.

Sediment records: September 1952 to September 1953.

EXTREMES, September 1952 to September 1953.--Dissolved solids: Maximum, 434 ppm Nov. 11-20; minimum, 300 ppm Aug. 1-10.

Hardness: Maximum, 380 ppm Nov. 1-20; minimum, 267 ppm Aug. 1-10.

Specific conductance: Maximum daily, 733 micromhos Nov. 8; minimum daily, 257 micromhos Aug. 2.

Water temperatures: Maximum, 80° F. June 30-July 1; minimum, 35° F. Dec. 27, Mar. 2, 5.

Sediment concentrations: Maximum daily, 364 ppm Aug. 2; minimum daily, 1 ppm May 13.

Sediment loads: Maximum daily, 180 tons Mar. 4; minimum daily, less than 0.05 ton Oct. 21, Jan. 2, May 13.

REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for September 1952 given in WSP 1235; records of discharge for water year October 1952 to September 1953 given in WSP 1275.

## Chemical analyses, in parts per million, September 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Phosphate (PO <sub>4</sub> )	Dissolved solids (residue at 180° C)		Hardness as CaCO <sub>3</sub>		Percent sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH	Color
														Parts per million	Tons per acre-foot	Calcium magnesium	Non-carbonate				
Sept. 1-10, 1952 <sup>a</sup>	2.29	26	0.06	64	29	10	2.3	283	60	6.0	0.2	2.6	0.02	338		280	47		542	7.9	5
Sept. 11-20 <sup>a</sup>	2.17	17	.01	59	30	6.7	1.3	270	57	5.5	.2	2.3	.03	314		272	49		520	7.8	5
Sept. 21-30 <sup>a</sup>	1.30	15	.01	69	32	7.0	1.4	302	63	6.0	.3	2.0	.04	346		304	56		574	7.9	5
Oct. 1-10	1.76	13	0.01	70	32	6.7	1.4	305	64	6.0	.2	1.6	.02	346		308	56		573	8.0	5
Oct. 11-20	2.58	13	.02	78	31	7.3	1.4	327	67	6.5	.2	1.4	.06	365		324	54		604	8.1	5
Oct. 21-31	3.77	18	.02	87	33	7.4	1.2	346	77	5.0	.3	1.0	.01	399		352	69		635	7.6	2
Nov. 1-10	3.43	14	.02	92	36	6.9	1.7	336	102	5.5	.3	1.0	.01	415		380	102		672	7.6	2
Nov. 11-20	4.54	14	.04	94	35	6.9	1.7	330	112	5.5	.3	1.0	.01	434		380	108		679	7.7	3
Nov. 21-30	5.15	11	.02	93	34	6.4	1.5	340	98	5.5	.3	.9	.01	424		370	93		666	7.7	2
Dec. 1-10	9.64	13	.02	87	34	7.6	1.3	314	96	8.0	.4	3.6	.07	415		356	100		652	7.6	5
Dec. 11-20	9.23	9.3	.02	88	35	5.8	1.5	319	92	10	.4	4.0	.03	411		362	102		659	7.7	3
Dec. 21-31	7.19	7.6	.05	90	34	6.9	1.3	337	90	9.0	.4	2.1	.03	412		362	88		672	7.9	4
Jan. 1-10, 1953	18.6	8.9	.05	78	32	6.6	1.1	297	83	8.0	.4	4.6	.05	374		326	83		605	7.7	5
Jan. 11-20	72.4	9.0	.01	66	27	4.2	1.1	236	68	8.0	.5	14	.01	314		276	82		520	7.7	5
Jan. 21-31	47.5	9.7	.02	70	28	4.2	1.2	256	69	7.5	.4	12	.01	328		292	80		542	7.7	5

<sup>a</sup> Not included in average.

Feb. 1-10, 1953...	32.7	9.8	0.02	74	30	4.2	1.0	274	74	9.0	0.3	9.2	0.02	348	310	84	576	7.9	2
Feb. 11-20 .....	61.8	7.3	.02	69	29	4.1	.9	256	69	6.5	.3	12	.02	322	290	82	544	7.8	2
Feb. 21-28 .....	33.5	11	.02	73	31	4.4	1.1	276	72	8.5	.3	8.3	.03	347	308	83	572	7.9	2
Mar. 1-10 .....	59.0	8.7	.02	66	30	4.2	.7	253	65	6.8	.3	10	.01	327	288	81	532	7.8	17
Mar. 11-20 .....	47.6	11	.05	70	30	4.9	.4	b284	64	7.0	.3	9.2	.01	338	298	82	541	8.0	4
Mar. 21-31 .....	29.5	5.7	.15	74	33	4.6	1.0	c282	73	7.0	.3	7.9	.01	348	320	89	575	8.0	1
Apr. 1-10 .....	18.7	8.2	.10	76	34	4.8	.8	c290	78	6.0	.3	3.8	.00	367	330	92	591	8.0	6
Apr. 11-20 .....	30.5	7.3	.10	74	34	4.3	.9	280	80	7.0	.2	4.9	.04	352	324	95	563	8.0	6
Apr. 21-30 .....	36.4	12	.04	73	30	4.5	1.1	289	72	8.0	.3	5.9	.02	369	304	69	539	7.8	5
May 1-10 .....	19.1	8.0	.08	70	32	4.9	.9	284	81	8.0	.4	1.5	.00	361	306	74	560	7.6	5
May 11-20 .....	42.8	9.3	.03	72	31	4.6	1.4	282	71	8.0	.4	5.6	.02	363	308	76	558	7.3	5
May 21-31 .....	22.6	8.0	.04	77	32	4.8	1.4	300	79	8.0	.4	4.0	.04	363	324	78	585	7.6	5
June 1-10 .....	15.5	9.3	.08	77	32	5.7	1.4	304	82	8.0	.4	2.0	.01	396	324	75	600	7.6	5
June 11-20 .....	16.3	4.7	.01	76	33	5.7	1.3	305	77	4.8	.3	5.9	.02	380	324	75	608	7.7	2
June 21-30 .....	7.36	6.1	.01	72	35	6.8	1.1	282	86	4.8	.2	1.2	.02	376	322	84	607	7.7	1
July 1-10 .....	3.37	10	.10	75	32	5.4	2.0	288	92	5.0	.3	5.1	.00	383	326	83	606	7.8	5
July 11-20 .....	9.24	10	.02	70	30	5.7	.8	256	97	6.1	.3	5.0	.01	340	298	88	585	7.8	6
July 21-31 .....	11.4	11	.02	75	29	5.7	1.5	274	72	7.2	.2	6.4	.00	350	306	82	588	7.7	6
Aug. 1-10 .....	37.2	10	.02	64	26	4.0	1.5	247	54	5.8	.3	5.2	.02	300	287	64	498	7.3	15
Aug. 11-20 .....	6.14	7.9	.02	78	36	6.0	1.1	304	83	7.7	.3	2.7	.01	374	327	89	607	7.6	5
Aug. 21-31 .....	2.93	12	.04	77	37	6.7	1.3	298	92	6.0	.3	2.0	.01	393	344	100	632	7.6	5
Sept. 1-10 .....	2.27	13	.05	73	37	6.2	2.1	280	98	6.0	.3	1.4	.05	384	333	105	613	7.7	5
Sept. 11-20 .....	2.35	14	.02	83	36	6.3	1.9	298	107	5.2	.2	1.0	.02	412	356	111	644	7.4	2
Sept. 21-30 .....	1.94	11	.01	83	38	5.6	1.7	287	116	5.8	.2	.6	.01	415	357	120	649	7.5	1
Average .....	20.4	10	0.04	77	32	5.6	1.3	292	82	6.8	0.3	4.6	0.02	371	324	84	595	--	5

a Not included in average.

b Includes equivalent of 6 parts per million of carbonate (CO<sub>3</sub>).c Includes equivalent of 4 parts per million of carbonate (CO<sub>3</sub>).





## LITTLE MIAMI RIVER BASIN--Continued

## LITTLE MIAMI RIVER NEAR SELMA, OHIO--Continued

Suspended sediment, September 1952 to September 1953

Day	September			October			November		
	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.....	1.6	18	0.1	1.1	22	0.1	3.4	15	0.1
2.....	8.0	44	1.0	1.1	32	.1	3.4	16	.1
3.....	3.0	35	.3	1.1	31	.1	3.4	14	.1
4.....	1.9	25	.1	1.4	36	.1	2.6	14	.1
5.....	1.4	24	.1	1.6	23	.1	3.0	12	.1
6.....	1.4	29	.1	3.0	25	.2	3.4	18	.2
7.....	1.4	34	.1	2.4	19	.1	3.4	11	.1
8.....	1.4	41	.2	1.9	12	.1	3.9	11	.1
9.....	1.4	27	.1	1.9	45	.2	3.9	14	.1
10.....	1.4	30	.1	2.1	47	.3	3.9	13	.1
11.....	1.1	37	.1	2.6	21	.1	4.3	13	.2
12.....	1.1	43	.1	2.6	30	.2	4.3	14	.2
13.....	.8	45	.1	2.1	53	.3	4.3	11	.1
14.....	1.9	58	.3	2.1	46	.3	4.3	24	.3
15.....	6.8	72	1.3	2.6	41	.3	4.8	36	.5
16.....	2.1	46	.3	2.6	27	.2	4.3	41	.5
17.....	1.6	48	.2	2.6	25	.2	3.9	34	.4
18.....	1.4	52	.2	3.0	12	.1	4.1	26	.3
19.....	3.0	40	.3	3.0	8	.1	5.8	21	.3
20.....	1.9	32	.2	2.6	13	.1	5.3	13	.2
21.....	1.4	47	.2	3.0	4	(t)	4.3	17	.2
22.....	1.4	53	.2	3.4	8	.1	5.8	12	.2
23.....	1.6	50	.2	3.9	9	.1	5.8	47	.7
24.....	1.4	41	.2	3.9	12	.1	5.3	12	.2
25.....	1.4	47	.2	3.9	26	.3	5.3	18	.3
26.....	1.1	43	.1	3.9	29	.3	4.8	58	.8
27.....	1.4	26	.1	3.9	25	.3	4.8	17	.2
28.....	1.1	30	.1	3.9	17	.2	4.8	10	.1
29.....	1.1	31	.1	3.9	12	.1	5.3	61	.9
30.....	1.1	23	1.1	3.9	18	.2	5.3	45	a.6
31.....	--	--	--	3.9	17	.2	--	--	--
Total.	57.6	--	6.8	84.9	--	5.2	131.2	--	8.3
Day	December			January			February		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	5.3	14	0.2	5.3	7	0.1	61	14	2.3
2.....	5.8	37	.6	5.3	3	(t)	46	8	1.0
3.....	5.3	38	.5	5.8	12	.2	40	5	.5
4.....	6.3	19	a.3	5.3	9	.1	33	2	.2
5.....	14	10	.4	4.8	12	.2	30	2	.2
6.....	11	8	.2	4.3	13	a.2	28	7	.5
7.....	8.0	7	.2	5.3	13	.2	25	2	.1
8.....	6.3	8	a.1	30	35	sb5	23	5	.3
9.....	7.4	9	.2	59	54	8.6	22	4	.2
10.....	27	38	2.8	61	30	b5	19	3	.2
11.....	18	16	.8	94	95	b25	98	175	s90
12.....	14	10	.4	55	17	2.5	147	88	s40
13.....	11	8	.2	42	5	.6	84	22	5.0
14.....	9.3	8	.2	36	6	.6	62	14	2.3
15.....	8.0	9	.2	31	4	.3	55	8	1.2
16.....	6.8	5	.1	28	4	.3	45	7	.8
17.....	6.8	17	.3	90	90	sa55	36	5	.5
18.....	6.3	21	.4	195	150	sb95	31	5	.4
19.....	5.8	11	.2	89	37	8.9	30	5	.4
20.....	6.3	32	.5	64	21	3.6	30	8	.6
21.....	8.0	18	.4	51	13	1.8	49	25	3.3
22.....	8.7	11	.2	41	12	1.3	41	10	1.1
23.....	8.7	14	a.3	36	7	.7	36	7	.7
24.....	8.0	15	.3	36	12	1.2	32	7	.6
25.....	7.4	12	.2	32	5	.4	31	7	.6
26.....	6.8	12	.2	27	4	.3	29	8	.6
27.....	9.3	10	.2	27	7	.5	27	12	.9
28.....	5.8	16	.2	77	65	b13	23	7	.4
29.....	5.3	25	a.4	63	17	2.9	--	--	--
30.....	5.3	33	.5	54	7	1.0	--	--	--
31.....	5.8	21	.3	78	12	2.5	--	--	--
Total.	267.8	--	12.0	1,432.1	--	237.0	1,213	--	154.9

s Computed by subdividing day.

a Computed from estimated concentration graph.

t Less than 0.05 ton.

b Computed from partly-estimated concentration graph.

## LITTLE MIAMI RIVER BASIN--Continued

## LITTLE MIAMI RIVER NEAR SELMA, OHIO--Continued

Suspended sediment, September 1952 to September 1953--Continued

Day	March			April			May		
	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.....	22	13	0.8	21	9	0.5	23	13	0.8
2.....	20	17	.9	19	7	.4	21	17	1.0
3.....	34	35	sb 5	17	4	.2	19	12	.6
4.....	196	300	sb 180	18	4	.2	18	12	.6
5.....	88	46	11	17	5	.2	20	9	.5
6.....	63	18	3.1	18	6	.3	19	11	.6
7.....	50	12	1.6	17	8	.4	18	9	.4
8.....	43	7	.8	16	13	.6	19	12	.6
9.....	38	10	1.0	17	8	.4	18	5	.2
10.....	36	10	1.0	27	25	1.8	16	3	.1
11.....	35	10	.9	23	10	.6	16	2	.1
12.....	33	10	.9	23	7	.4	15	4	.2
13.....	41	10	1.1	21	5	.3	16	1	(t)
14.....	41	9	1.0	18	5	.2	16	2	.1
15.....	44	10	1.2	19	4	.2	18	2	.1
16.....	41	4	.4	33	10	.9	25	8	.5
17.....	36	7	.7	27	7	.5	106	120	sb 50
18.....	62	40	sb 9	27	5	.4	108	52	s 17
19.....	84	37	8.4	38	16	b 2	63	17	2.9
20.....	59	9	1.4	76	22	4.5	45	9	1.1
21.....	48	10	1.3	68	10	1.8	36	18	a 2
22.....	41	7	.8	50	4	.5	32	36	3.1
23.....	36	12	1.2	41	9	1.0	31	39	2.3
24.....	33	8	.7	34	7	.6	27	32	2.3
25.....	30	10	.8	33	10	.9	25	28	1.9
26.....	27	7	.5	31	9	.8	21	23	1.3
27.....	25	4	.3	29	8	.6	18	17	.8
28.....	24	5	.3	27	6	.4	16	25	1.1
29.....	22	4	.2	26	9	.6	15	41	1.7
30.....	20	4	.2	25	16	1.1	15	33	1.3
31.....	19	7	.4	--	--	--	15	36	1.3
Total.	1,391	--	236.9	856	--	23.3	868	--	97.5
	June			July			August		
1.....	12	23	0.7	5.7	45	0.7	4.5	48	0.6
2.....	12	20	.6	6.4	55	1.0	66	364	s 80
3.....	11	23	.7	5.7	42	.6	34	111	10
4.....	11	22	.7	5.3	40	.6	42	120	sc 30
5.....	10	11	.3	5.7	38	.6	106	200	sc 70
6.....	12	8	.3	5.7	48	.7	44	87	10
7.....	15	13	.5	5.3	37	.5	27	82	6.0
8.....	13	4	.1	5.0	40	.5	21	86	4.9
9.....	12	2	.1	4.6	31	.4	16	80	3.4
10.....	47	--	e 70	4.3	37	.4	12	82	2.6
11.....	38	150	sb 16	4.0	34	.4	10	77	2.1
12.....	22	92	5.5	4.0	27	.3	8.1	72	1.6
13.....	17	80	3.7	4.0	34	.4	6.8	67	1.2
14.....	15	79	3.2	3.7	40	.4	6.4	54	.9
15.....	13	81	2.8	3.7	33	.3	6.0	38	.6
16.....	12	75	2.5	3.5	37	.3	5.3	54	.8
17.....	12	73	2.4	3.5	45	.4	5.3	67	1.0
18.....	11	67	2.0	20	90	sc 14	4.6	55	.7
19.....	10	53	1.4	32	190	sc 19	4.6	52	.6
20.....	9.7	34	.9	14	72	2.7	4.3	53	.6
21.....	8.6	35	.8	8.6	56	1.3	3.7	58	.6
22.....	8.1	29	.6	35	130	sc 19	3.5	44	.4
23.....	7.7	30	.6	28	125	9.4	3.5	34	.3
24.....	7.7	34	.7	14	79	3.0	3.5	37	.3
25.....	7.3	44	.9	8.6	63	1.5	3.2	37	.3
26.....	7.3	18	.4	6.8	72	1.3	2.9	56	.4
27.....	7.3	27	.5	5.7	52	.8	2.6	49	.3
28.....	6.4	28	.5	5.0	47	.6	2.6	49	.3
29.....	6.8	20	.4	5.0	45	.6	2.4	48	.3
30.....	6.4	23	.4	4.3	38	.4	2.4	46	.3
31.....	--	--	--	4.3	33	.4	2.1	40	.2
Total.	388.3	--	120.2	271.4	--	82.5	466.3	--	231.3

e Estimated.

s Computed by subdividing day.

t Less than 0.05 ton.

a Computed from estimated concentration graph.

b Computed from partly-estimated concentration graph.

c Computed partly from water-sediment discharge curve.

## LITTLE MIAMI RIVER BASIN--Continued

## LITTLE MIAMI RIVER NEAR SELMA, OHIO--Continued

Suspended sediment, September 1952 to September 1953--Continued

Day	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.....	2.1	36	0.2						
2.....	2.1	26	.1						
3.....	2.1	33	.2						
4.....	2.1	40	.2						
5.....	2.6	33	.2						
6.....	2.4	37	.2						
7.....	2.4	27	.2						
8.....	2.4	27	.2						
9.....	2.4	42	.3						
10.....	2.1	40	.2						
11.....	2.1	45	.2						
12.....	2.1	38	.2						
13.....	2.1	32	.2						
14.....	2.4	33	.2						
15.....	2.6	30	.2						
16.....	2.6	27	.2						
17.....	2.4	23	.1						
18.....	2.4	23	.1						
19.....	2.4	33	.2						
20.....	2.4	40	.2						
21.....	2.1	37	.2						
22.....	2.1	26	.1						
23.....	2.1	23	.1						
24.....	2.1	33	.2						
25.....	2.1	35	.2						
26.....	2.1	41	.2						
27.....	2.1	37	.2						
28.....	1.8	42	.2						
29.....	1.6	35	.2						
30.....	1.3	30	a. 1						
31.....	--	--	--						
Total.	65.6	--	5.5						

Total discharge for October 1952 to September 1953 (cfs-days) ..... 7,435.6

Total load for October 1952 to September 1953 (tons) ..... 1,214.6

a Computed from estimated concentration graph.

LITTLE MIAMI RIVER BASIN--Continued  
LITTLE MIAMI RIVER NEAR SELMA, OHIO--Continued

Particle-size analyses of suspended sediment, water year October 1952 to September 1953  
(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	Water discharge (cfs)	Water temperature (° F)	Suspended sediment											Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500
Feb. 11, 1953	4:15 p.m.	122		320	504	55	58	70	83	95	99					BSWCM
Feb. 11	8:00 p.m.	256		501	478	64	69	79	92	97	99					BSWCM
Mar. 4	9:15 a.m.	238		393	253	66	75	85	94	96	98					BSWCM
Mar. 4	9:15 a.m.	238		393	306	42	56	72	85	92	98					ESN
May 18	1:50 a.m.	153		99	212	62	69	80	89	96	99					BSWCM
June 11	8:30 a.m.	38		154	236	76	86	90	95	96	100					BSWCM
Aug. 2	8:45 a.m.	122		583	790	76	86	93	98	99	100					BSWCM
Aug. 5	8:00 a.m.	107		187	281	73	77	88	95	96	100					BSWCM

## LITTLE MIAMI RIVER BASIN--Continued

## MASSIE CREEK AT WILBERFORCE, OHIO

LOCATION.--At gaging station at bridge on Wilberforce-Clifton Road, 0.5 mile northwest of Wilberforce, Greene County, 1.7 miles upstream from Clark Run, and 3.5 miles northeast of Xenia.

DRAINAGE AREA--64.5 square miles.

RECORDS AVAILABLE.--Chemical analyses: September 1952 to September 1953.

Water temperature records: September 1952 to September 1953.

EXTREMES: September 1952 to September 1953.--Dissolved solids: Maximum, 387 ppm Dec. 21-31; minimum, 292 ppm Jan. 11-20.

Hardness: Maximum, 346 ppm Dec. 21-31; minimum, 260 ppm Jan. 11-20.

Specific conductance: Maximum, 411, 658 micromhos Sept. 30, 1953; minimum daily, 295 micromhos Sept. 2, 1952.

Water temperature: Maximum, 79.3 F., 68.8 micromhos Sept. 30, 1953; minimum daily, 60.5 micromhos Sept. 2, 1952.

Water temperature: Maximum, 79.3 F., 68.8 micromhos Sept. 30, 1953; minimum daily, 60.5 micromhos Sept. 2, 1952.

Sediment loads: Maximum, daily 329 tons Jan. 17, 1953; minimum daily, 100 tons Oct. 21, Apr. 30, 1953.

REMARKS.--Records of specific conductance of daily samples available at district offices at Columbus Ohio. Records of discharge for September 1952 given in WSP 1235; records of discharge for water year October 1952 to September 1953 given in WSP 1275. Flow affected by ice Dec. 28-30.

## Chemical analyses, in parts per million, September 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Phosphate	Dissolved solids (residue at 180°C)		Hardness as CaCO <sub>3</sub>	Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	Col- or pH
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate		
Sept. 1-10, 1952 a	3.84	14	0.01	66	24	7.2	2.3	273	44	7.5	0.2	3.3	0.03	304		264	40	509	7.7
Sept. 11-20a.....	3.16	11	.01	67	30	7.0	2.7	279	49	8.0	.2	4.5	.06	317		280	49	535	7.9
Sept. 21-30a.....	1.85	9.6	.01	67	31	7.8	2.7	293	52	9.5	.2	5.5	.08	332		296	54	560	7.9
Oct. 1-10.....	3.18	9.2	.02	65	33	9.0	2.7	306	50	9.0	.2	5.1	.09	332		296	47	569	7.9
Oct. 11-20.....	4.18	9.5	.01	69	32	9.2	2.7	315	52	9.5	.2	4.2	.12	342		302	46	579	8.0
Oct. 21-31.....	4.25	13	.01	74	35	9.6	2.7	328	52	12	.1	4.1	.14	364		328	63	610	7.4
Nov. 1-10.....	5.64	12	.01	73	36	10	2.7	324	51	12	.1	2.7	.10	365		330	61	610	7.6
Nov. 11-20.....	5.86	10	.01	72	35	8.6	2.6	314	49	16	.1	2.9	.12	372		324	66	607	7.5
Nov. 21-30.....	5.87	9.0	.01	74	35	12	2.4	326	55	18	.1	3.1	.12	372		332	61	618	7.7
Dec. 1-10.....	17.3	10	.02	82	32	5.9	1.7	317	73	9.0	.4	5.7	.06	378		336	76	627	7.8
Dec. 11-20.....	12.1	12	.02	85	33	7.1	1.5	339	69	10	.3	3.6	.03	387		348	70	639	7.9
Dec. 21-31.....	37.8	16	.02	72	30	6.9	1.5	293	60	9.0	.3	7.0	.06	344		304	63	570	7.8
Jan. 1-10, 1953	118	13	.01	64	24	3.1	1.2	234	55	8.0	.3	15	.02	292		260	67	491	7.7
Jan. 11-20.....	79.5	11	.05	66	27	3.9	1.0	252	59	8.0	.3	12	.02	309		276	69	516	7.7
Jan. 21-31.....	52.9	10	.01	70	28	4.3	1.1	262	60	8.0	.3	13	.03	318		290	75	534	7.9
Feb. 1-10.....	97.3	11	.02	66	27	4.2	1.0	250	55	9.0	.3	14	.03	312		276	71	521	7.9
Feb. 11-20.....	53.4	8.9	.01	67	29	4.3	.8	268	57	9.0	.3	10	.04	328		286	67	535	7.9
Feb. 21-28.....	66.7	11	.08	67	31	4.3	.9	266	75	7.0	.2	10	.04	328		294	85	525	8.0
Mar. 1-10.....	55.1	14	.05	69	32	4.3	.9	266	77	7.5	.1	9.2	.03	336		304	86	536	8.0
Mar. 11-20.....	40.0	9.4	.05	69	36	4.4	.9	278	77	7.0	.1	7.0	.03	323		322	92	548	8.0
Mar. 21-31.....	25.4	5.7	.08	66	33	4.6	1.1	276	63	7.5	.1	3.8	.02	314		300	74	513	8.1
Apr. 1-10.....	34.0	10	.10	68	32	4.6	1.2	284	63	7.5	.1	4.2	.03	316		300	69	545	8.1
Apr. 11-20.....	42.8	6.0	.05	65	29	7.3	1.5	268	53	8.5	.1	9.7	.04	314		282	62	522	7.5

a Not included in average.

LITTLE MIAMI RIVER BASIN--Continued  
 MASSIE CREEK AT WILBERFORCE, OHIO--Continued

Chemical analyses, in parts per million, September 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue at 180° C)			Hardness as CaCO <sub>3</sub>		Per cent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Color
													Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate				
May 1-10, 1953	22.7	8.7	0.08	62	31	5.6	0.9	280	54	9.0	0.1	4.2	0.06	317		284	53		542	7.5	5
May 11-16, 18-20	44.7	11	.08	62	31	5.6	1.7	276	51	10	.1	11	.08	318		284	56		542	7.5	5
May 21-31.....	29.1	6.0	.01	70	31	6.1	1.5	293	57	10	.1	4.1	.02	351		302	62		584	7.7	3
June 1-10.....	15.2	6.6	.02	60	31	6.9	1.9	275	55	7.8	.1	2.6	.07	320		276	52		534	7.7	4
June 11-20.....	19.0	5.9	.02	66	33	5.7	1.3	284	54	8.0	.2	6.0	.03	332		298	68		554	7.8	3
June 21-30.....	6.70	5.8	.01	60	29	6.9	2.0	271	52	7.8	.1	3.5	.03	311		268	47		522	7.9	3
July 1-10.....	3.05	14	.05	61	31	8.3	2.5	292	50	10	.2	4.1	.10	340		280	40		550	7.8	6
July 11-20.....	2.32	12	.02	68	31	9.3	1.9	292	50	12	.2	4.6	.13	334		294	58		588	7.7	3
July 21-31.....	5.15	11	.02	64	27	7.5	2.3	264	54	10	.2	4.4	.06	318		272	54		526	7.8	5
Aug. 1-10.....	2.42	13	.01	61	31	9.7	2.7	280	59	11	.2	4.7	.10	321		281	50		543	7.4	5
Aug. 11-20.....	1.13	9.8	.01	67	33	11	2.7	303	50	20	.2	5.1	.14	338		304	55		585	7.6	8
Aug. 21-31.....	.98	11	.05	66	35	13	2.3	308	50	16	.2	4.6	.13	353		310	56		608	7.6	4
Sept. 1-10.....	1.01	14	.03	64	34	15	2.7	304	47	15	.2	4.4	.18	349		300	50		598	7.6	8
Sept. 11-19.....	1.03	13	.01	73	33	15	3.0	325	51	18	.1	8.1	.24	368		320	52		632	7.1	2
Sept. 21-25, 29-30	1.09	13	.01	70	36	17	3.3	320	49	19	.1	13	.40	376		323	60		643	7.4	2
Average.....	26.0	10	0.03	68	32	7.7	1.8	289	57	11	0.2	6.6	0.08	336		301	64		582	--	4

LITTLE MIAMI RIVER BASIN--Continued  
 MASSIE CREEK AT WILBERFORCE, OHIO--Continued

Temperature (°F) of water, September 1952			
Day	September	Day	September
1	70	16	65
2	69	17	65
3	68	18	66
4	61	19	65
5	63	20	62
6	63	21	60
7	67	22	63
8	63	23	--
9	64	24	55
10	64	25	55
11	66	26	55
12	66	27	--
13	68	28	--
14	71	29	59
15	65	30	61

Temperature (°F) of water, water year October 1952 to September 1953  
 /Once-daily temperature measurement at approximately 7:30 a.m./

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

## LITTLE MIAMI RIVER BASIN--Continued

## MASSIE CREEK AT WILBERFORCE, OHIO--Continued

Suspended sediment, September 1952 to September 1953

Day	September			October			November		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	1.8	35	a 0.2	1.5	20	0.1	4.9	6	0.1
2.....	17	220	a 12	1.9	25	.1	5.6	13	a .2
3.....	5.3	52	.7	1.9	20	.1	6.4	21	.4
4.....	3.0	23	.2	1.9	12	.1	6.0	21	.3
5.....	1.9	23	.1	2.6	13	.1	5.6	14	.2
6.....	1.9	25	.1	5.6	11	.2	5.3	23	.3
7.....	1.9	23	.1	4.5	18	.2	5.3	33	.5
8.....	1.9	28	.1	3.7	46	.5	5.3	44	.6
9.....	1.9	32	.2	3.7	49	.5	6.0	21	.3
10.....	1.8	23	.1	4.5	36	.4	6.0	33	.5
11.....	1.9	22	.1	4.9	17	.2	5.3	50	a .7
12.....	1.5	17	.1	4.9	7	.1	5.3	47	.7
13.....	1.4	21	.1	4.5	5	.1	4.9	20	.3
14.....	1.5	17	.1	4.2	8	.1	4.5	7	.1
15.....	7.7	40	a .9	4.2	11	.1	4.9	11	.1
16.....	3.7	24	.2	3.9	10	.1	4.9	14	.2
17.....	2.6	22	.2	3.9	7	.1	4.5	18	.2
18.....	2.2	22	.1	3.9	4	(t)	4.8	20	.3
19.....	5.6	24	.4	3.7	3	(t)	11	68	2
20.....	3.5	18	.2	3.7	5	(t)	8.5	65	1.5
21.....	1.9	17	.1	3.9	1	(t)	6.0	23	.4
22.....	2.6	14	.1	3.9	2	(t)	8.1	13	.3
23.....	1.9	13	.1	4.2	2	(t)	8.1	28	.6
24.....	1.9	18	.1	4.5	4	(t)	6.0	27	.4
25.....	1.9	18	.1	4.2	6	.1	5.3	27	.4
26.....	1.8	23	.1	4.5	11	.1	5.6	51	.8
27.....	1.7	16	.1	4.2	25	.3	4.9	43	.6
28.....	1.7	28	.1	4.2	42	.5	4.5	35	.4
29.....	1.7	22	.1	4.2	17	a .2	4.9	--	e .4
30.....	1.4	25	.1	4.5	4	(t)	5.3	--	e .5
31.....	--	--	--	4.5	5	.1	--	--	--
Total.	88.5	--	17.2	120.4	--	4.6	173.7	--	14.3
	December			January			February		
1.....	5.3	--	e 0.5	8.9	--	e 1	95	25	a 6
2.....	6.8	--	e .6	8.9	--		76	15	3.1
3.....	6.8	--	e .6	10	--		67	11	2.0
4.....	9.3	--	e 1	8.5	--		56	16	a 2
5.....	34	141	13	8.1	--		49	20	2.6
6.....	26	--	e 6	6.7	--	e 30	47	7	.9
7.....	16	--	e .9	9.4	--		40	--	--
8.....	13	--	e .2	83	--		36	--	--
9.....	14	70	sb 2	121	96		31	33	e .6
10.....	62	602	101	114	68		21	30	--
11.....	38	212	22	142	96	37	139	287	s 160
12.....	25	--	e 4	94	23	5.8	225	156	s 101
13.....	20	--	--	74	15	3.0	136	59	22
14.....	16	--	--	60	13	2.1	100	27	7.3
15.....	14	--	--	51	12	a 2	89	18	4.3
16.....	12	--	--	47	10	1.3	75	8	1.6
17.....	13	--	--	136	469	s 329	60	5	.8
18.....	12	--	e 2	307	277	s 257	53	2	.3
19.....	11	--	--	158	29	12	48	8	1.0
20.....	12	--	--	109	30	a 9	48	10	1.3
21.....	20	--	--	89	50	a 12	78	162	34
22.....	16	--	--	73	62	12	66	38	6.8
23.....	16	--	--	64	55	a 10	57	7	1.1
24.....	14	--	--	66	34	6.0	52	4	.6
25.....	12	--	--	57	6	.9	50	5	.7
26.....	11	--	--	46	3	a .4	46	6	.7
27.....	9.4	--	e 1	47	10	a 1	42	7	.8
28.....	8	--	--	127	93	s 28	36	4	.4
29.....	8	--	--	108	24	7.1	--	--	--
30.....	9	--	--	87	31	7.3	--	--	--
31.....	9.8	--	--	110	45	13	--	--	--
Total.	499.4	--	186.8	2,430.5	--	844.9	1,929	--	363.7

e Estimated.

s Computed by subdividing day.

t Less than 0.05 ton.

a Computed from estimated concentration graph.

b Computed from partly-estimated concentration graph.



## LITTLE MIAMI RIVER BASIN--Continued

## MASSIE CREEK AT WILBERFORCE, OHIO--Continued

## Suspended sediment, September 1952 to September 1953--Continued

Day	March			April			May		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	33	2	a 0.2	30	1	0.1	27	10	0.7
2.....	30	2	.2	28	1	.1	24	4	.3
3.....	55	20	sb 6	26	1	.1	22	4	.2
4.....	148	111	44	25	2	.1	22	4	.2
5.....	99	30	8.1	23	2	.1	25	4	.3
6.....	77	15	3.1	24	2	a .1	23	3	.2
7.....	65	10	1.8	24	2	.1	22	3	.2
8.....	59	6	1.0	22	2	.1	22	3	.2
9.....	51	5	.7	22	3	.2	21	3	.2
10.....	50	5	.7	30	10	.8	19	3	a .2
11.....	46	11	a 1	28	2	.2	19	3	.2
12.....	45	26	3.2	28	2	.2	19	4	.2
13.....	46	16	2.0	26	2	.1	20	5	.3
14.....	46	17	2.1	22	2	.1	20	6	.3
15.....	51	13	1.8	24	6	.4	22	8	.5
16.....	49	10	1.3	35	18	a 2	34	40	sb 4
17.....	45	10	1.2	30	3	.2	101	110	a 30
18.....	68	35	b 6	29	2	.2	125	56	s 20
19.....	87	29	6.8	40	7	a .8	82	21	4.6
20.....	68	12	2.2	78	12	2.5	61	15	2.5
21.....	58	10	a 2	75	6	1.2	49	15	2.0
22.....	52	11	1.5	61	5	.8	43	15	1.7
23.....	48	5	.6	51	5	.7	36	16	a 2
24.....	45	9	1.1	42	5	.6	34	19	a 2
25.....	42	10	1.1	40	5	.5	31	18	1.5
26.....	36	6	.6	38	3	.3	28	11	.8
27.....	35	5	.5	34	3	.3	23	15	.9
28.....	34	5	.5	30	2	.2	21	11	.6
29.....	32	6	.5	29	2	.2	19	9	.5
30.....	29	2	.2	28	4	a .3	19	11	.6
31.....	29	2	.2	--	--	--	17	11	.5
Total.	1,658	--	102.2	1,022	--	13.6	1,050	--	78.4
Day	June			July			August		
	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.....	16	15	0.6	3.5	52	0.5	4.6	100	sb 2
2.....	14	12	.5	3.9	43	.4	3.9	100	b 1
3.....	13	10	.4	3.7	48	.5	2.6	47	.3
4.....	12	11	.4	2.6	45	.3	1.9	40	a .2
5.....	11	12	.4	3.0	37	.3	2.6	33	.2
6.....	12	18	.6	4.2	43	.5	1.9	35	a .2
7.....	15	15	.6	3.5	37	.3	1.8	65	a .3
8.....	12	15	.5	2.4	41	.3	1.9	100	a .5
9.....	12	12	.4	1.9	61	.3	1.6	129	.6
10.....	35	566	s 76	1.8	32	.2	1.4	143	.5
11.....	50	197	27	1.7	21	.1	1.3	163	.6
12.....	28	84	6.4	1.6	38	.2	1.3	170	.6
13.....	21	44	2.5	1.5	33	.1	1.2	151	.5
14.....	18	43	2.1	1.4	22	.1	1.1	117	.3
15.....	15	47	1.9	1.4	16	.1	1.1	126	.4
16.....	13	37	1.3	1.4	12	(t)	1.0	110	.3
17.....	14	39	1.5	1.4	38	.1	1.1	130	.4
18.....	12	31	1.0	2.6	131	.9	1.1	93	.3
19.....	10	32	.9	5.3	123	1.8	1.1	105	.3
20.....	8.5	30	.7	4.9	130	1.7	1.0	85	.2
21.....	7.3	27	.5	5.3	93	1.3	1.0	78	.2
22.....	6.0	27	.4	6.4	100	b 2	1.0	21	.1
23.....	4.9	29	.4	18	130	b 7	1.0	17	(t)
24.....	4.2	32	.4	9.8	88	2.3	1.0	16	(t)
25.....	3.7	30	a .3	4.9	112	1.5	1.0	15	(t)
26.....	3.7	22	.2	3.0	120	a 1	1.0	19	.1
27.....	3.7	13	.1	2.4	116	.8	1.0	34	.1
28.....	14	69	s 12	1.9	114	.6	1.0	36	.1
29.....	15	163	s 8.0	1.9	95	.5	1.0	31	.1
30.....	4.5	75	.9	1.6	63	.3	.9	25	.1
31.....	--	--	--	1.5	52	.2	.9	25	.1
Total.	408.5	--	148.9	110.4	--	26.2	46.3	--	10.7

e Estimated.

s Computed by subdividing day.

t Less than 0.05 ton.

a Computed from estimated concentration graph.

b Computed from partly-estimated concentration graph.

## LITTLE MIAMI RIVER BASIN--Continued

## MASSIE CREEK AT WILBERFORCE, OHIO--Continued

Suspended sediment, September 1952 to September 1953--Continued

Suspended sediment, September 1952 to September 1953 Continued												
Day	September			Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment	
	Mean dis- charge (cfs)	Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day			
1.....	0.9	28	0.1									
2.....	1.0	25	.1									
3.....	1.0	18	(t)									
4.....	1.1	20	a.1									
5.....	1.1	23	.1									
6.....	1.0	26	.1									
7.....	1.0	28	.1									
8.....	1.0	30	a.1									
9.....	1.0	32	.1									
10.....	1.0	14	(t)									
11.....	1.0	18	(t)									
12.....	1.1	17	(t)									
13.....	1.0	17	(t)									
14.....	1.1	23	.1									
15.....	1.1	26	.1									
16.....	1.0	17	(t)									
17.....	1.0	23	.1									
18.....	1.0	16	(t)									
19.....	1.0	15	(t)									
20.....	1.1	10	(t)									
21.....	1.1	17	.1									
22.....	1.0	14	(t)									
23.....	1.1	20	.1									
24.....	1.1	13	(t)									
25.....	1.1	13	(t)									
26.....	1.1	13	(t)									
27.....	1.1	13	(t)									
28.....	1.1	14	(t)									
29.....	1.1	14	(t)									
30.....	1.1	13	(t)									
31.....	--	--	--									
Total.	31.4	--	2.0									

Total discharge for October 1952 to September 1953 (cfs-days) ..... 9,479.6

Total load for October 1952 to September 1953 (tons) ..... 1,796.3

t Less than 0.05 ton.

a Computed from estimated concentration graph.

## LITTLE MIAMI RIVER BASIN--Continued

## MASSIE CREEK AT WILBERFORCE, OHIO--Continued

Particle size analyses of suspended sediment, water year October 1952 to September 1953

(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	Water discharge (cfs)	Water temperature (° F)	Suspended sediment												Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	
Feb. 11, 1953...	2:15 p.m.	228		905	663	43	58	74	90	97	100	--				BSWCM
Feb. 11.....	2:15 p.m.	228		905	645	31	47	64	83	97	98	99				BSN
Feb. 11.....	4:00 p.m.	205		538	753	56	68	78	92	97	99	99	99			BSWCM
June 10.....	12:10 p.m.	56		1,980	1,060	56	71	79	85	87	100	--				BSWCM
June 10.....	12:10 p.m.	56		1,980	1,080	16	32	64	96	99	100	--				BSN
June 28.....	8:15 p.m.	16		411	495	70	82	83	84	85	99	--				BSWCM

## LITTLE MIAMI RIVER BASIN--Continued

## LITTLE MIAMI RIVER NEAR OLDTOWN, OHIO

LOCATION --At gaging station at bridge on U. S. Highway 68, 0.9 mile upstream from Massie Creek, 1.3 miles northeast of Oldtown, Greene County, and 4.5 miles north of Xenia.

DRAINAGE AREA --129 square miles.

RECORDS AVAILABLE--Chemical analyses: November 1947 to August 1948, August 1952 to September 1953.

Water temperatures: August 1952 to September 1953.

Sediment records: August 1952 to September 1953.

EXTREMES, August 1952 to September 1953 --Dissolved solids: Maximum, 380 ppm Dec. 11-20; minimum, 294 ppm Aug. 1-10, 1953.

Hardness: Maximum, 340 ppm Dec. 21-31; minimum, 263 ppm Aug. 1-10, 1953.

Specific conductance: Maximum daily, 641 micromhos Aug. 6, 1953.

Water temperatures: Maximum, 78°F Aug. 1, 1953; minimum, freezing point Dec. 15-16, Jan. 6-7, Feb. 18.

Sediment concentrations: Maximum daily, 1,250 ppm June 10; minimum daily, less than 0.50 ppm on several days during October, November and December.

Sediment loads: Maximum daily, 555 tons June 10; minimum daily, less than 0.05 ton on many days during October, November and December.

REMARKS --Records of specific conductance of daily samples from August 1952 to September 1953 available in district office at Columbus, Ohio. Records of discharge for August and September 1952, given in WSP 1235; records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Chemical analyses, in parts per million, August 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Phosphate (PO <sub>4</sub> )	Dissolved solids (residue at 180°C)		Hardness as CaCO <sub>3</sub>		Percent adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate				
Aug. 1-10, 1952 a	16.0	11	0.02	65	34	4.1	1.6	304	48	6.5	0.1	5.1	0.00	324		302	53		557	7.9	4
Aug. 11-20 a	18.2	11	.02	66	32	4.3	1.3	293	48	7.0	.1	5.2	.03	328		295	56		565	7.6	3
Aug. 21-31 a	13.4	13	.02	66	32	4.9	1.4	296	49	8.0	.1	5.2	.03	337		298	54		569	7.8	3
Sept. 1-10 a	18.1	14	.02	62	29	5.5	2.1	278	49	8.2	.2	4.5	.03	319		277	46		542	7.8	3
Sept. 11-20 a	14.4	17	.01	69	33	6.4	2.1	302	49	9.0	.1	4.8	.04	332		306	60		559	7.8	5
Sept. 21-30 a	13.4	24	.01	69	33	9.2	2.1	310	48	9.0	.1	4.8	.04	348		308	54		573	7.8	5
Oct. 1-10	14.2	16	.02	70	33	7.8	2.2	316	47	9.0	.1	4.8	.07	342		310	51		573	7.9	5
Oct. 11-20	16.8	14	.01	73	34	7.4	2.1	317	52	9.5	.1	5.0	.04	346		320	52		583	7.8	3
Oct. 21-31	17.9	16	.02	75	32	8.5	2.2	322	52	9.5	.1	5.4	.03	350		320	55		586	7.8	3
Nov. 1-10	17.3	12	.02	74	34	6.4	1.6	320	56	8.5	.2	5.2	.07	344		324	52		585	7.8	5
Nov. 11-20	16.4	15	.01	78	34	8.2	1.2	322	59	7.5	.2	5.6	.04	335		326	63		585	7.8	5
Nov. 21-30	17.9	15	.01	78	33	7.9	1.7	320	61	8.5	.2	5.5	.04	352		330	66		595	7.9	5
Dec. 1-10	34.1	22	.01	75	30	7.4	2.2	306	62	8.5	.2	4.8	.04	360		312	60		595	7.9	5
Dec. 11-20	35.6	18	.05	82	35	6.2	1.8	312	71	9.0	.2	6.0	.04	380		320	85		625	7.5	2
Dec. 21-31	27.1	8.7	.02	83	32	5.6	1.7	326	65	9.0	.2	4.6	.02	376		340	72		626	7.6	2
Jan. 1-10, 1953	46.8	7.2	.08	77	31	6.3	1.5	310	70	9.5	.2	5.4	.02	352		318	66		593	7.7	2
Jan. 11-20	162	11	.01	69	26	4.4	1.5	244	65	9.0	.3	14	.02	317		280	79		521	7.7	2
Jan. 21-31	117	13	.01	74	29	4.0	1.2	272	67	8.0	.2	9.6	.02	338		302	81		556	7.9	5
Feb. 1-10	87.1	9.6	.01	74	29	4.5	1.0	277	66	7.0	.2	4.6	.00	342		306	77		568	7.8	1
Feb. 11-20	147	9.3	.02	70	27	4.7	1.0	254	61	7.0	.2	5.3	.00	325		286	78		537	7.7	2
Feb. 21-28	93.1	11	.01	72	30	5.1	1.1	282	63	8.0	.2	10	.03	332		302	72		561	7.9	0

a Not included in average.

Mar. 1-10, 1953.	163	8.1	0.01	67	28	4.2	1.1	252	60	6.5	0.3	9.9	0.00	310	284	68	531	7.9	0
Mar. 11-20 .....	128	12	.03	69	32	4.5	.9	278	62	7.0	.2	7.7	.01	346	304	76	553	7.9	1
Mar. 21-31 .....	87.3	8.8	.03	71	32	4.7	.4	b284	61	6.2	.2	6.6	.03	338	310	76	565	8.0	1
Apr. 1-10 .....	61.5	6.9	.02	71	33	4.7	.7	c297	64	6.5	.2	4.2	.04	336	314	69	568	8.1	1
Apr. 11-20 .....	82.8	6.1	.03	70	33	4.7	.8	d292	59	6.5	.2	4.1	.02	330	312	71	560	8.0	3
Apr. 21-30 .....	94.1	11	.06	69	31	4.9	1.2	284	61	6.0	.2	5.4	.01	339	300	87	558	7.6	3
May 1-10 .....	57.5	14	.04	69	32	4.9	1.2	288	61	8.0	.3	2.5	.01	344	302	68	563	7.6	3
May 11-20 .....	98.2	9.6	.06	68	30	4.3	1.4	278	62	8.0	.3	3.3	.03	333	294	65	550	7.5	5
May 21-31 .....	85.9	11	.04	75	30	4.3	1.1	303	63	8.0	.3	5.2	.04	359	312	62	584	7.7	5
June 1-10 .....	45.5	12	.07	73	32	4.9	1.5	300	68	8.0	.3	3.8	.05	356	312	68	581	7.7	5
June 11-20 .....	49.2	6.5	.01	70	32	4.9	1.6	296	59	5.8	.2	6.1	.02	353	306	64	575	7.9	2
June 21-30 .....	26.6	6.8	.02	70	32	5.0	1.7	300	62	5.8	.1	2.7	.02	352	306	60	579	7.9	2
July 1-10 .....	21.5	13	.05	70	31	5.2	1.9	300	60	7.5	.1	4.3	.03	336	305	56	574	7.9	5
July 11-20 .....	21.5	14	.02	76	31	6.3	1.5	300	65	9.8	.2	4.9	.06	354	314	71	588	7.8	2
July 21-31 .....	27.4	13	.02	68	25	5.0	1.9	264	54	8.0	.2	8.5	.05	315	273	56	517	7.7	6
Aug. 1-10 .....	62.7	13	.02	62	26	4.7	2.5	246	51	6.8	.3	6.0	.01	294	263	60	491	7.5	12
Aug. 11-20 .....	21.9	12	.01	73	33	6.1	1.9	308	63	7.4	.3	3.7	.02	353	321	65	590	7.8	10
Aug. 21-31 .....	12.3	13	.19	68	36	7.0	2.0	292	66	8.0	.2	4.0	.05	354	317	78	580	7.7	7
Sept. 1-10 .....	9.75	11	.05	68	36	7.2	2.0	302	61	9.0	.2	4.1	.09	349	317	70	581	7.9	7
Sept. 11-20 .....	9.13	10	.01	72	34	8.0	2.2	305	62	10	.2	4.3	.04	353	319	70	594	7.5	3
Sept. 21-30 .....	8.55	13	.01	75	34	9.3	2.0	315	63	10	.2	4.7	.07	366	326	69	606	7.6	3
Average .....	55.3	12	0.03	72	31	5.8	1.5	284	61	7.9	0.2	5.4	0.03	344	307	66	569	--	4

b Includes equivalent of 10 parts per million of carbonate (CO<sub>3</sub>).c Includes equivalent of 5 parts per million of carbonate (CO<sub>3</sub>).d Includes equivalent of 6 parts per million of carbonate (CO<sub>3</sub>).

## LITTLE MIAMI RIVER BASIN--Continued

## LITTLE MIAMI RIVER NEAR OLDTOWN, OHIO--Continued

Temperature (°F) of water, August to September 1952:

Day	Aug.	Day	Aug.	Day	Sept.	Day	Sept.
1	75	16	71	1	71	16	65
2	69	17	71	2	70	17	65
3	70	18	73	3	64	18	66
4	75	19	67	4	61	19	65
5	71	20	67	5	63	20	60
6	71	21	72	6	64	21	62
7	70	22	70	7	67	22	59
8	70	23	65	8	63	23	58
9	72	24	64	9	65	24	57
10	69	25	64	10	66	25	56
11	68	26	65	11	67	26	57
12	70	27	67	12	68	27	58
13	69	28	69	13	70	28	56
14	71	29	72	14	72	29	59
15	71	30	71	15	70	30	63
		31	73			31	--
Average	69			Average	63		

Temperature (°F) of water, water year October 1952 to September 1953

/Once-daily temperature measurement at approximately 7 a. m. /

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

## LITTLE MIAMI RIVER BASIN--Continued

## LITTLE MIAMI RIVER NEAR OLDTOWN, OHIO--Continued

Suspended sediment, August 1952 to September 1953

Day	July			August			September		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....				17	27	1.2	18	32	1.6
2.....				16	38	1.6	34	74	6.8
3.....				15	41	1.7	28	32	2.4
4.....				15	37	1.5	19	30	1.5
5.....				15	32	1.3	15	25	1.0
6.....				15	35	1.4	14	24	.9
7.....				15	33	1.3	14	22	.8
8.....				15	30	1.2	13	18	.6
9.....				15	29	1.2	13	23	.8
10.....				22	28	1.7	13	23	.8
11.....				21	23	1.3	12	21	.7
12.....				18	23	1.1	12	22	.7
13.....				18	26	1.3	11	20	.6
14.....				17	28	1.3	12	20	.6
15.....				17	25	1.1	18	19	.9
16.....				21	23	1.3	19	17	.9
17.....				21	22	1.2	15	15	.6
18.....				18	20	1.0	14	15	.6
19.....				16	24	1.0	16	14	.6
20.....				15	26	1.1	15	13	.5
21.....				16	22	1.0	14	11	.4
22.....				16	20	.9	14	10	.4
23.....				15	21	.8	14	11	.4
24.....				13	25	.9	14	10	.4
25.....				13	45	1.6	13	10	.4
26.....				13	33	1.2	13	10	.4
27.....				12	28	.9	13	10	.4
28.....				12	26	.8	13	10	.4
29.....				13	23	.8	13	10	.4
30.....				12	27	.9	13	10	.4
31.....				12	28	.9	--	--	--
Total.				489	--	36.5	459	--	27.9
Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	13	10	0.3	19	a	(t)	19	3	0.2
2.....	13	9	.3	18			21	3	.2
3.....	13	7	.2	19			21	5	.3
4.....	13	5	.2	18			22	6	.4
5.....	13	5	.2	16			50	8	1.1
6.....	17	4	.2	16	1	(t)	46	5	.6
7.....	15	4	.2	16			34	6	.6
8.....	15	4	.2	17			29	6	.5
9.....	15	3	.1	17			29	4	.3
10.....	15	2	.1	17			70	20	3.8
11.....	17	1	(t)	15	2	.1	60	10	1.6
12.....	16	1	(t)	15	2	.1	46	8	1.0
13.....	16	3	.1	15	1	(t)	41	5	.6
14.....	16	9	.4	15	2	.1	35	4	.4
15.....	16	7	.3	15	7	.3	31	2	.2
16.....	17	5	.2	15	9	.4	29	a	(t)
17.....	17	4	.2	15	8	.3	30		
18.....	18	3	.1	14	9	.3	28		
19.....	18	2	.1	24	10	.6	27		
20.....	17	2	.1	21	8	.5	29	3	.2
21.....	17	3	.1	17	7	.3	31	2	.2
22.....	17	3	.1	19	7	.4	32	5	.4
23.....	18	2	.1	21	7	.4	32	4	.3
24.....	18	1	(t)	18	6	.3	30	5	.4
25.....	19	a	(t)	16	6	.3	29	4	.3
26.....	18			18	5	.2	27	3	.2
27.....	18			17	5	.2	25	2	.1
28.....	18			17	4	.2	22	1	.1
29.....	18			17	4	.2	25	2	.1
30.....	18			19	3	.2	20	3	.2
31.....	18			--	--	--	25	4	.3
Total.	507	--	4.0	516	--	5.9	995	--	14.7

t Less than 0.05 ton.

a Less than 0.50 ppm.

## OHIO RIVER BASIN EXCEPT CUMBERLAND AND TENNESSEE RIVER BASINS

## LITTLE MIAMI RIVER BASIN--Continued

## LITTLE MIAMI RIVER NEAR OLDTOWN, OHIO--Continued

Suspended sediment, August 1952 to September 1953--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.....	25	5	0.3	151	18	7.3	63	10	1.7
2.....	24	4	.3	116	8	2.5	61	6	1.0
3.....	26	3	.2	104	5	1.4	105	40	sb30
4.....	24	2	.1	89	3	.7	465	340	sb460
5.....	23	1	.1	80	2	.4	273	95	s75
6.....	20	2	.1	76	6	1.2	181	29	14
7.....	24	2	.1	70	33	6.2	142	17	6.5
8.....	58	6	.9	66	40	7.1	123	9	3.0
9.....	121	19	6.2	61	37	6.1	109	13	3.8
10.....	123	17	5.6	58	30	4.9	106	19	5.4
11.....	205	44	24	170	152	s 92	99	19	5.1
12.....	132	38	12	346	156	s 156	94	18	4.6
13.....	96	9	2.3	217	51	30	106	26	7.4
14.....	80	4	.9	155	19	8.0	113	28	8.5
15.....	70	6	1.1	132	12	4.3	118	25	8.0
16.....	66	5	.9	114	8	2.5	111	20	6.0
17.....	132	52	s 35	96	3	.8	97	12	3.1
18.....	437	247	s 307	83	3	.7	134	22	s 8.9
19.....	237	66	42	82	4	.9	223	43	26
20.....	161	24	10	78	12	2.5	167	24	11
21.....	127	14	4.8	130	151	53	127	24	8.2
22.....	104	9	2.5	116	22	6.9	113	28	8.5
23.....	93	7	1.8	101	12	3.3	102	26	7.2
24.....	94	10	2.5	89	7	1.7	94	21	5.3
25.....	88	8	1.9	85	8	1.8	88	17	4.0
26.....	76	6	1.2	82	8	1.8	80	12	2.6
27.....	72	4	.8	74	6	1.2	76	8	1.6
28.....	161	45	20	68	10	1.8	76	13	2.7
29.....	169	30	14	--	--	--	71	14	2.7
30.....	129	13	4.5	--	--	--	67	12	2.2
31.....	171	20	9.2	--	--	--	66	11	2.0
Total.	3,368	--	512.3	3,089	--	406.8	3,850	--	736.0
Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	67	10	1.8	67	13	2.4	42	32	3.6
2.....	65	10	1.8	62	12	2.0	40	33	3.6
3.....	60	9	1.5	58	10	1.6	38	34	3.5
4.....	59	7	1.1	56	10	1.5	38	32	3.3
5.....	56	5	.8	59	10	1.6	35	30	2.8
6.....	58	9	1.4	58	10	1.6	38	32	3.3
7.....	58	7	1.1	55	11	1.6	43	34	3.9
8.....	56	17	2.6	55	9	1.3	39	33	3.5
9.....	58	19	3.0	54	9	1.3	37	27	2.7
10.....	78	27	5.7	51	9	1.2	105	1,250	s 555
11.....	70	20	3.8	49	9	1.2	106	327	s 100
12.....	70	18	3.4	49	8	1.1	62	164	27
13.....	67	15	2.7	50	7	.9	52	107	15
14.....	61	11	1.8	51	8	1.1	45	103	13
15.....	61	16	2.6	55	7	1.0	42	109	12
16.....	83	17	3.8	62	3	.5	40	115	12
17.....	80	15	3.2	149	21	s 11	39	112	12
18.....	82	19	4.2	253	68	46	38	83	8.5
19.....	91	37	9.1	153	36	15	35	83	7.8
20.....	163	48	21	111	29	8.7	33	80	7.1
21.....	157	20	8.5	88	44	10	29	57	4.5
22.....	125	16	5.4	80	38	8.2	28	60	4.5
23.....	106	14	4.0	80	47	10	26	51	3.6
24.....	89	11	2.6	96	47	11	25	48	3.2
25.....	85	8	1.8	76	47	9.6	23	44	2.7
26.....	83	8	1.8	66	45	8.0	22	35	2.1
27.....	80	9	1.9	56	41	6.2	22	35	2.1
28.....	76	8	1.6	52	36	5.1	33	150	sb 30
29.....	72	6	1.2	49	39	5.2	34	174	s 16
30.....	68	13	2.4	47	35	4.4	24	82	5.3
31.....	--	--	--	45	30	3.6	--	--	--
Total.	2,384	--	107.6	2,282	--	183.9	1,213	--	873.6

s Computed by subdividing day.

b Computed partly from water-sediment discharge curve.



## LITTLE MIAMI RIVER BASIN--Continued

## LITTLE MIAMI RIVER NEAR OLDTOWN, OHIO--Continued

## Suspended sediment, August 1952 to September 1953--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.....	22	75	4.4	14	49	1.8	9.7	21	0.5
2.....	24	62	4.0	73	100	sb 25	9.2	22	.5
3.....	24	57	3.7	71	100	19	9.2	22	.5
4.....	22	57	3.4	48	77	10	9.7	23	.6
5.....	21	49	2.8	147	180	sb 85	11	25	.7
6.....	23	60	3.7	91	109	27	11	27	.8
7.....	22	59	3.5	59	68	11	10	25	.7
8.....	21	53	3.0	48	63	8.2	9.7	24	.6
9.....	18	48	2.3	41	64	7.1	9.2	23	.6
10.....	18	50	2.4	35	63	6.0	8.8	23	.5
11.....	17	49	2.2	31	60	5.0	8.8	22	.5
12.....	16	50	2.2	27	52	3.8	9.2	23	.6
13.....	16	52	2.2	25	41	2.8	9.2	25	.6
14.....	15	55	2.2	23	42	2.6	7.8	21	.4
15.....	15	58	2.3	21	42	2.4	9.7	20	.5
16.....	14	52	2.0	20	36	1.9	9.7	20	.5
17.....	14	50	1.9	19	34	1.7	9.2	21	.5
18.....	15	55	2.2	18	36	1.7	8.8	21	.5
19.....	54	82	s 13	18	34	1.6	9.2	19	.5
20.....	39	68	7.2	17	34	1.6	9.7	23	.6
21.....	29	66	5.2	15	32	1.3	9.2	24	.6
22.....	28	60	b 5	15	32	1.3	8.8	27	.6
23.....	60	83	13	14	32	1.2	8.8	22	.5
24.....	41	68	7.5	13	32	1.1	8.3	20	.4
25.....	30	65	5.3	12	32	1.0	8.3	19	.4
26.....	25	55	3.7	12	28	.9	8.8	18	.4
27.....	22	53	3.1	12	25	.8	8.8	18	.4
28.....	19	58	3.0	11	26	.8	8.8	19	.4
29.....	18	59	2.9	11	25	.7	8.3	18	.4
30.....	15	54	2.2	10	24	.6	7.4	15	.3
31.....	14	48	1.8	10	24	.6	--	--	--
Total	731	--	150.3	981	--	235.5	274.3	--	16.6

Total discharge for October 1952 to September 1953 ..... 20,190.3

Total load for October 1952 to September 1953 ..... 3,219.2

s Computed by subdividing day.

b Computed partly from water-sediment discharge curve.

## LITTLE MIAMI RIVER BASIN--Continued

## LITTLE MIAMI RIVER NEAR OLDTOWN, OHIO--Continued

Particle-size analyses of suspended sediment, water year October 1952 to September 1953

(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	Water discharge (cfs)	Water temperature (° F)	Suspended sediment												Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	
Jan. 18, 1953 ...	7:30 a. m.	568		320	373	51	69	77	86	90	94	97				BSWCM
Feb. 11, .....	3:15 p. m.	239		504	568	47	60	75	89	97	99	--				BSWCM
Feb. 11, .....	3:15 p. m.	239		504	473	0	18	47	84	98	98	--				BSN
Feb. 12, .....	1:30 p. m.	346		151	33367	80	83	92	97	98	99	--				BSWCM
Feb. 12, .....	1:30 p. m.	346		151	491	43	59	78	93	94	95	--				BSN
June 10, .....	1:10 p. m.	261		3,100	2,240	16	27	47	76	99	99	100				BSN
June 11, .....	3:50 a. m.	125		380	532	63	73	80	85	92	100	--				BSWCM
June 29, .....	6:10 a. m.	38		200	268	67	79	89	90	92	98	--				BSWCM

## LITTLE MIAMI RIVER BASIN--Continued

## TODD FORK NEAR ROACHESTER, OHIO

LOCATION.--At gaging station at bridge on State Highway 123, 0.3 mile downstream from Lick Run, 1.6 miles southeast of Roacheater, Warren County, 2 3/4 miles southwest of Morrow, and 4 miles upstream from mouth.

DRAINAGE AREA.--234 square miles.

RECORDS AVAILABLE.--Chemical analyses: September 1952 to September 1953.

Sediment records: September 1952 to September 1953.

Water temperatures: September 1952 to September 1953.

EXTREMES, September 1952 to September 1953--Dissolved solids: Maximum, 324 ppm Dec. 21-31; minimum, 221 ppm July 21-31.

Hardness: Maximum, 262 ppm Nov. 21-30; minimum, 185 ppm July 21-31.

Specific conductance: Maximum daily, 580 micromhos Dec. 1; minimum daily, 236 micromhos Jan. 28.

Water temperatures: Maximum, 92° F July 31; minimum, freezing point Jan. 5-6.

Sediment concentrations: Maximum daily, 3,100 ppm June 10; minimum daily, 1 ppm on many days during October, December, January, February, April and May.

Sediment loads: Maximum daily, 10,000 tons June 10; minimum daily, less than 0.05 ton on many days during September, October, November, December, 1952, January, August and September 1953.

REMARKS--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for September 1952 shown in WSP 1235; records of discharge for water year October 1952 to September 1953 given in WSP 1275.

## Chemical analyses, in parts per million, September 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boron (B)	Dissolved solids (residue at 180° C)		Hardness as CaCO <sub>3</sub>		Percent sodium adsorption ratio	Specific conductance (micro-mhos/cm at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate				
Sept. 1-10, 1952 a	8.21	6.4	0.02	44	18	12	2.7	196	37	12	0.2	1.1	0.01	235		186	23		400	7.8	5
Sept. 11-20 a	2.40	18	.02	50	19	12	2.3	222	34	11	.2	.8	.01	262		202	21		428	7.9	5
Sept. 21-30 a	.90	9.0	.02	50	19	10	2.3	218	34	11	.2	.8	.01	253		202	24		426	7.9	5
Oct. 1-10, 1953 ..	.54	7.6	.02	54	20	10	2.9	231	35	12	.2	.5	.01	261		218	28		446	7.9	5
Oct. 11-20 ..	1.41	25	.01	54	19	15	3.7	230	40	12	.3	.8	.04	281		214	24		451	7.6	5
Oct. 21-31 ..	1.50	19	.04	61	21	14	3.6	252	41	12	.3	.8	.01	295		238	32		487	7.6	5
Nov. 1-10 ..	1.59	14	.01	64	21	14	3.8	264	41	12	.2	.8	.02	300		248	30		510	7.7	5
Nov. 11-20 ..	1.97	7.7	.02	66	22	14	3.7	270	45	14	.2	.5	.01	301		258	34		528	7.7	5
Nov. 21-30 ..	3.23	8.4	.02	67	23	18	3.4	270	45	17	.2	.5	.01	317		262	40		549	7.8	5
Dec. 1-10 ..	57.8	7.5	.02	65	21	20	3.7	248	55	17	.3	3.3	.05	315		248	45		534	7.8	5
Dec. 11-20 ..	23.8	7.1	.05	55	16	7.4	3.5	190	51	10	.3	3.7	.01	352		204	47		424	7.4	8
Dec. 21-31 ..	18.2	9.6	.02	70	20	13	2.8	241	63	18	.3	4.0	.07	324		258	59		538	7.7	7
Jan. 1-10 ..	224	9.3	.01	62	17	11	3.1	199	51	20	.3	.06	.06	286		228	62		487	7.7	7
Jan. 11-20 ..	488	10	.02	50	16	4.7	2.2	178	41	9.0	.3	8.6	.03	224		192	45		391	7.5	7
Jan. 21-31 ..	466	7.5	.02	51	17	4.0	2.0	182	41	8.0	.3	7.9	.03	227		196	48		399	7.6	10

a Not included in average.

LITTLE MIAMI RIVER BASIN--Continued  
TODD FORK NEAR ROACHESTER, OHIO--Continued

Chemical analyses, in parts per million, September 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> ) (B)	Dissolved solids (residue at 180° C)		Hardness as CaCO <sub>3</sub>	Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH	Col- or
													Parts per million	Tons per acre-foot					
Feb. 1-10, 1953..	122	9.5	0.02	61	20	5.4	1.4	212	48	8.8	0.2	4.6	0.02	279	234	61	480	7.6	2
Feb. 11-20.....	156	11	.02	57	19	5.7	1.3	200	53	9.0	.1	3.6	.00	264	230	56	434	7.1	4
Feb. 21-28.....	195	8.7	.02	54	18	4.4	1.3	200	43	9.0	.3	7.6	.00	244	212	45	434	7.8	5
Mar. 1-10.....	279	6.2	.02	51	19	4.9	1.5	190	42	8.0	.3	5.9	.03	260	206	50	406	8.0	5
Mar. 11, 18, 20, 22-27, 30.....	197	4.4	.03	54	21	5.7	1.4	207	44	7.8	.2	4.6	.02	251	222	52	429	7.9	4
Apr. 7, 9-17.....	71.8	2.6	.03	58	23	6.9	1.2	b235	49	8.0	.1	1.5	.03	271	240	46	464	8.4	3
Apr. 18-30.....	213	6.1	.05	54	19	5.0	1.1	c209	40	9.5	.1	3.8	.01	257	212	41	429	8.0	5
May 1-10.....	108	6.7	.08	52	21	6.1	1.4	d218	41	8.5	.1	1.2	.02	231	218	39	425	8.0	5
May 11-20.....	635	9.8	.08	50	17	6.1	2.1	e184	36	9.5	.1	6.0	.01	238	196	35	394	8.0	15
May 21-31.....	447	9.4	.05	57	20	4.6	1.4	222	39	8.5	.1	6.0	.01	262	224	43	438	7.9	5
June 1-10.....	210	9.4	.08	51	20	5.1	2.1	c212	35	8.5	.1	4.3	.01	248	210	35	418	8.0	7
June 11-20.....	186	3.6	.01	56	20	5.3	1.5	220	38	6.8	.1	8.7	.02	264	222	42	441	7.8	2
June 21-30.....	21.1	2.5	.10	54	24	7.0	2.0	239	40	7.2	.1	1.4	.00	266	232	38	462	7.8	2
July 1-10.....	15.1	2.9	.05	50	23	8.6	2.5	222	37	9.0	.1	1.9	.01	247	220	37	431	7.7	15
July 11-20.....	20.5	3.8	.05	57	19	9.0	2.1	236	36	10	.1	2.2	.03	256	222	27	446	7.7	5
July 21-31.....	14.6	4.4	.02	48	16	8.8	3.1	198	30	9.6	.2	1.5	.01	221	185	23	386	7.6	6
Aug. 1-10.....	3.04	7.3	.01	44	21	8.0	2.7	202	29	9.0	.2	1.6	.00	222	195	31	390	7.5	10
Aug. 11-20.....	2.37	6.8	.08	45	22	7.6	2.6	212	29	9.0	.2	1.5	.04	229	202	29	410	7.4	5
Aug. 21-31.....	.19	7.6	.04	47	22	8.1	2.7	216	31	10	.2	1.8	.02	237	209	31	421	7.4	5
Sept. 1-10.....	.11	4.9	.04	46	22	8.3	2.8	208	30	10	.2	2.0	.02	236	206	35	418	7.4	4
Sept. 11-20.....	3.69	3.8	.01	55	23	10	3.1	236	40	11	.2	1.6	.02	271	234	38	474	7.4	2
Sept. 21-30.....	.86	1.9	.01	57	26	12	4.0	249	46	14	.2	1.0	.03	288	250	45	504	7.3	3
Average.....	125	7.8	0.03	55	20	8.8	2.5	217	41	11	0.2	3.5	0.02	263	220	42	442	--	6

b. Includes equivalent of 19 parts per million of carbonate.

c. Includes equivalent of 12 parts per million of carbonate.

d. Includes equivalent of 8 parts per million of carbonate.

e. Includes equivalent of 10 parts per million of carbonate.

## LITTLE MIAMI RIVER BASIN--Continued

## TODD FORK NEAR ROACHESTER, OHIO--Continued

Temperature (°F) of water, September 1952

Day	Sept.	Day	Sept.
1	86	16	65
2	74	17	65
3	67	18	67
4	65	19	63
5	64	20	60
6	64	21	63
7	69	22	60
8	64	23	60
9	65	24	60
10	65	25	52
11	68	26	58
12	70	27	56
13	70	28	57
14	74	29	59
15	72	30	60
Average			63

Temperature (°F) of water, September 1952 to September 1953  
/Once-daily temperature measurement at varying hours/

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	45	39	34	39	38	--	68	75	86	87	85
2	60	48	37	37	40	39	--	70	76	87	87	86
3	55	54	40	37	39	42	--	72	74	85	87	85
4	51	47	41	37	38	45	--	87	77	85	85	79
5	52	42	37	32	39	--	--	68	80	82	79	80
6	54	50	38	32	40	40	--	66	78	81	80	75
7	47	48	44	33	41	41	45	66	73	84	80	75
8	44	45	45	34	39	40	--	64	78	83	80	74
9	48	45	48	40	40	42	62	70	80	80	78	77
10	50	47	50	38	41	43	59	72	70	78	79	76
11	50	45	41	34	40	45	60	71	74	80	82	75
12	50	47	40	35	41	--	53	71	77	--	81	70
13	58	46	40	38	41	--	52	66	76	80	84	68
14	54	46	36	40	40	--	55	61	73	82	85	68
15	55	54	35	44	38	--	50	61	76	84	84	71
16	52	47	35	40	39	--	50	61	76	84	82	78
17	46	57	37	40	38	--	50	63	75	82	78	70
18	50	--	36	40	36	52	42	65	78	77	77	71
19	45	50	36	40	37	--	43	66	61	81	74	70
20	49	48	38	40	38	55	45	68	85	85	75	73
21	50	45	37	39	39	--	50	71	86	83	75	68
22	52	45	39	40	40	57	54	70	85	81	79	67
23	49	44	40	40	40	58	63	71	85	85	78	66
24	50	45	40	42	42	45	60	69	86	82	80	69
25	50	48	40	38	42	46	63	75	85	83	80	67
26	50	46	37	41	42	46	57	78	83	84	83	70
27	50	43	--	38	39	47	51	72	85	85	83	70
28	49	--	--	36	40	--	54	71	85	86	80	68
29	44	--	34	40	--	--	61	75	87	87	84	72
30	40	43	36	39	--	48	63	79	90	90	86	74
31	44	--	34	40	--	--	--	80	--	92	86	--
Average	50	47	39	38	40	--	--	69	80	83	81	73

## LITTLE MIAMI RIVER BASIN--Continued

## TODD FORK NEAR ROACHESTER, OHIO--Continued

Suspended sediment, September 1952 to September 1953

Day	September			October			November		
	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.....	0.4	21	(t)	0.2	10	(t)	1.6	2	(t)
2.....	10	53	1.4	.3	10	(t)	1.5	3	(t)
3.....	50	61	8.2	.3	11	(t)	1.5	4	(t)
4.....	11	42	1.2	.2	5	(t)	1.5	3	(t)
5.....	4.1	32	.4	.2	5	(t)	1.5	2	(t)
6.....	1.6	35	.2	.8	8	(t)	1.6	4	(t)
7.....	1.8	30	.1	.4	5	(t)	1.5	3	(t)
8.....	1.6	28	.1	.3	6	(t)	1.5	2	(t)
9.....	.7	25	(t)	.8	8	(t)	1.8	2	(t)
10.....	.9	20	(t)	1.9	6	(t)	1.9	2	(t)
11.....	.8	17	(t)	2.0	3	(t)	1.9	2	(t)
12.....	.4	17	(t)	2.5	5	(t)	1.8	3	(t)
13.....	9.2	22	.5	2.2	5	(t)	1.9	3	(t)
14.....	4.1	33	.4	1.7	5	(t)	1.8	3	(t)
15.....	1.7	20	.1	1.5	4	(t)	1.8	5	(t)
16.....	.8	8	(t)	1.1	3	(t)	1.7	8	(t)
17.....	.8	15	(t)	.8	3	(t)	1.6	15	0.1
18.....	.6	16	(t)	.8	3	(t)	1.6	15	.1
19.....	3.8	20	.2	.7	3	(t)	2.6	12	.1
20.....	1.8	19	.1	.8	3	(t)	3.0	8	.1
21.....	1.0	17	(t)	1.1	1	(t)	6.4	12	.2
22.....	2.3	21	.1	1.2	2	(t)	5.0	10	.1
23.....	1.3	16	.1	1.4	1	(t)	4.0	12	a.1
24.....	1.4	15	.1	1.4	2	(t)	4.3	11	.1
25.....	1.2	12	(t)	1.3	1	(t)	3.5	3	(t)
26.....	.6	10	(t)	1.4	3	(t)	2.5	12	.1
27.....	.5	9	(t)	1.5	2	(t)	1.9	13	a.1
28.....	.3	8	(t)	1.8	3	(t)	1.6	12	a.1
29.....	.2	8	(t)	1.8	2	(t)	1.5	11	(t)
30.....	.2	8	(t)	1.8	2	(t)	1.6	10	(t)
31.....	--	--	--	1.8	2	(t)	--	--	--
Total.	115.1	--	13.6	36.0	--	0.4	67.9	--	1.5
Day	December			January			February		
	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.....	1.6	6	(t)	9.9	1	(t)	222	10	6.0
2.....	2.0	5	(t)	9.9	1	(t)	178	5	2.4
3.....	2.2	7	(t)	10	1	(t)	150	2	.8
4.....	3.3	10	0.1	9.9	1	(t)	130	1	.4
5.....	48	35	sb2	8.9	2	(t)	123	1	.3
6.....	52	10	1.4	7.4	13	0.3	118	1	.3
7.....	21	7	.4	8.4	18	.4	91	1	.2
8.....	12	5	.2	1,150	482	sl, 850	75	1	.2
9.....	43	150	sc 140	578	124	s 246	66	2	.4
10.....	393	700	sc 1,000	445	57	s 72	66	1	.2
11.....	91	155	38	407	23	25	133	35	sc 25
12.....	41	98	11	218	15	8.8	356	85	sb 90
13.....	24	57	3.7	154	8	3.3	239	8	5.2
14.....	17	47	2.2	126	7	2.4	181	5	2.4
15.....	14	36	1.4	103	7	1.9	154	5	2.1
16.....	12	27	.9	93	5	1.3	128	3	1.0
17.....	10	15	.4	1,450	650	sc 6,100	108	3	.9
18.....	9.9	13	.3	1,540	1,100	sc 5,200	86	2	.5
19.....	9.2	10	.2	485	110	sb 170	86	2	.5
20.....	10	10	.3	280	14	11	86	2	a.5
21.....	37	9	.9	197	8	4.3	482	240	sc 360
22.....	38	8	.8	151	8	3.3	288	50	c 45
23.....	26	8	.6	126	6	2.0	184	13	6.4
24.....	22	5	.3	200	20	b 11	151	11	4.5
25.....	16	3	.1	166	10	4.5	131	7	2.5
26.....	14	2	.1	128	9	3.1	123	5	1.7
27.....	12	2	a.1	419	160	sc 800	110	3	.9
28.....	10	2	a.1	2,370	900	sc 7,000	93	3	.8
29.....	8.4	1	(t)	608	63	s 137	--	--	--
30.....	8.4	1	(t)	412	13	14	--	--	--
31.....	8.9	1	(t)	344	13	12	--	--	--
Total.	1,016.9	--	1,205.7	12,214.4	--	21,683.8	4,338	--	561.1

a Computed from estimated concentration graph.

b Computed from partly-estimated concentration graph.

c Computed partly from water-sediment discharge curve.

s Computed by subdividing day.

t Less than 0.05 ton.

## LITTLE MIAMI RIVER BASIN--Continued

## TODD FORK NEAR ROACHESTER, OHIO--Continued

Suspended sediment, September 1952 to September 1953--Continued

Day	March			April			May		
	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.....	81	3	0.7	85	--		86	1	0.2
2.....	86	3	.7	80	--		75	1	.2
3.....	327	190	sc 340	70	--		62	1	.2
4.....	988	380	sc 1,200	65	--	e 0.8	58	1	.2
5.....	407	40	a 45	65	--		123	5	1.7
6.....	264	7	5.0	85	--		110	3	.9
7.....	190	6	3.1	93	4	1.0	103	7	b 2
8.....	166	8	3.6	75	4	a 8	204	25	b 13
9.....	146	8	3.2	68	4	.7	148	5	2.0
10.....	131	8	2.8	73	4	.8	113	2	.6
11.....	123	8	2.7	62	5	.8	93	1	.3
12.....	113	--	e 2	64	4	.7	81	1	.2
13.....	113	--	e 2	70	3	.6	178	50	sb 30
14.....	123	--	e 3	54	3	.4	118	60	19
15.....	290	--	e 140	52	4	.6	128	34	12
16.....	228	--	e 75	98	8	2.1	761	244	s 1,090
17.....	166	--	e 10	61	5	1.1	2,690	785	s 6,270
18.....	725	310	sc 1,100	396	112	s 168	1,420	163	s 736
19.....	618	190	sb 390	547	43	64	552	56	83
20.....	312	34	29	455	27	33	328	30	27
21.....	214	12	a 7	276	13	9.7	232	20	13
22.....	169	6	2.7	194	7	3.7	2,500	1,000	sc 8,000
23.....	146	8	3.2	154	5	2.1	858	174	s 481
24.....	123	6	2.0	123	5	1.7	360	53	52
25.....	118	6	1.9	113	2	.6	250	35	24
26.....	103	6	1.7	113	2	.6	187	25	13
27.....	91	5	1.2	100	1	.3	148	23	9.2
28.....	88	4	a 1	93	1	.3	118	21	6.7
29.....	79	4	a 9	108	1	.3	98	18	4.8
30.....	62	4	.7	95	1	.3	86	17	3.9
31.....	60	--	e 6	--	--	--	79	21	4.5
Total.	6,850	--	3,380.7	4,007	--	299.0	12,347	--	16,900.6
	June			July			August		
1.....	68	25	4.6	92	39	1.0	25	21	0.1
2.....	52	20	2.8	82	43	1.0	21	25	.1
3.....	45	24	2.9	82	38	.8	17	25	.1
4.....	38	28	2.9	74	38	.8	18	24	.1
5.....	32	27	2.3	13	90	sc 4	19	28	.1
6.....	65	140	sc 170	58	370	sc 75	17	23	.1
7.....	318	1,700	sc 1,700	18	170	8.3	16	22	.1
8.....	131	430	152	14	64	2.4	22	19	.1
9.....	193	330	sc 1,100	87	48	1.1	29	20	.2
10.....	1,160	3,100	sc 10,000	61	41	.7	12	43	1.4
11.....	569	872	s 1,560	48	40	.5	84	26	.6
12.....	288	207	161	40	40	.4	48	22	.3
13.....	204	130	72	38	40	.4	29	24	.2
14.....	163	98	43	32	45	.4	21	20	.1
15.....	118	80	25	26	45	.3	16	20	.1
16.....	86	72	17	22	53	.3	12	22	.1
17.....	184	350	sc 230	21	48	.3	.9	23	.1
18.....	116	308	96	25	102	s 13	.7	19	(t)
19.....	77	153	32	112	150	b 44	.6	19	(t)
20.....	56	97	15	45	58	7.0	.5	22	(t)
21.....	43	83	9.6	19	40	2.0	.4	22	(t)
22.....	30	72	5.8	11	28	.8	.4	21	(t)
23.....	23	57	3.5	18	25	b 2	.2	20	(t)
24.....	17	55	2.5	54	45	sc 8	.2	20	(t)
25.....	15	52	2.1	20	28	1.5	.2	20	(t)
26.....	16	38	1.6	12	23	.7	.2	20	(t)
27.....	25	35	2.4	82	23	.5	.1	21	(t)
28.....	18	42	2.0	69	33	.6	.1	25	(t)
29.....	13	34	1.2	52	63	.9	.1	32	(t)
30.....	11	32	1.0	35	50	.5	.1	43	(t)
31.....	--	--	--	29	19	.1	.1	43	(t)
Total.	4,174	--	15,420.2	5162	--	179.3	56.2	--	4.1

e Estimated.

s Computed by subdividing day.

t Less than 0.05 ton.

a Computed from estimated concentration graph.

b Computed from partly-estimated concentration graph.

c Computed partly from water-sediment discharge curve.

## LITTLE MIAMI RIVER BASIN--Continued

## TODD FORK NEAR ROACHESTER, OHIO--Continued

Suspended sediment, September 1952 to September 1953--Continued

Day	September			Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment		Mean dis- charge (cfs)	Suspended sediment	
	Mean dis- charge (cfs)	Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day
1.....	0.1	33	(t)									
2.....	.1	18	(t)									
3.....	.1	18	(t)									
4.....	.1	20	(t)									
5.....	.2	21	(t)									
6.....	.1	19	(t)									
7.....	.1	20	(t)									
8.....	.1	22	(t)									
9.....	.1	21	(t)									
10.....	.1	20	(t)									
11.....	.1	19	(t)									
12.....	.1	20	(t)									
13.....	.1	21	(t)									
14.....	.2	24	(t)									
15.....	.2	26	(t)									
16.....	18	35	c 2									
17.....	8.3	20	.3									
18.....	3.7											
19.....	3.2											
20.....	3.0	20	.1									
21.....	2.2											
22.....	1.6											
23.....	1.1											
24.....	.9											
25.....	.7	19	(t)									
26.....	.6											
27.....	.6											
28.....	.4											
29.....	.3											
30.....	.2	--	--									
31.....	--											
Total.	46.6	--	3.8									

Total discharge for October 1952 to September 1953 (cfs-days) ..... 45,670.2

Total load for October 1952 to September 1953 (tons) ..... 59,640.2

c Computed from water-sediment discharge curve.

t Less than 0.05 ton.



## LICKING RIVER BASIN

## LICKING RIVER AT FARMERS, KY.

LOCATION.--At bridge on U. S. Highway 60, 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 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 84°F July 29, 30, Sept. 1; minimum, freezing point on several days during December and January.

EXTREMES, 1949-53.--Water temperatures: Maximum, 92°F July 19, 1951; minimum, freezing point at times each year.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Temperature (°F) of water, water year October 1952 to September 1953  
Mean of twice-daily measurements at approximately 6 a.m. and 3 p.m. 7

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	46	34	37	42	43	50	62	72	80	80	78
2	68	51	38	34	40	41	50	64	70	81	79	80
3	63	50	38	37	41	42	49	64	71	81	78	77
4	58	47	38	32	41	44	54	65	72	80	79	78
5	58	44	41	32	40	46	54	65	74	80	80	75
6	54	46	40	32	42	46	54	64	72	80	76	72
7	52	43	41	34	42	44	52	60	72	78	78	70
8	51	44	42	38	41	44	52	58	72	78	74	68
9	52	44	44	42	40	43	54	58	74	76	75	68
10	52	44	46	44	42	43	54	59	73	74	74	70
11	63	42	44	43	42	44	56	61	74	73	76	70
12	54	40	44	43	42	45	56	64	74	72	76	72
13	54	39	42	42	42	48	52	64	73	72	78	68
14	56	42	38	40	40	48	52	66	73	74	78	64
15	54	46	32	42	41	51	50	64	72	74	78	64
16	54	48	35	42	39	52	50	62	71	76	79	66
17	54	49	35	42	40	52	48	62	74	77	79	66
18	51	46	38	44	37	52	49	62	73	77	76	68
19	52	50	38	44	39	51	48	61	74	76	74	67
20	49	48	39	44	40	50	46	61	76	80	72	69
21	46	46	39	44	42	50	47	62	78	80	73	68
22	45	44	40	44	42	52	49	66	78	79	71	65
23	42	44	42	44	41	54	54	68	78	78	73	64
24	47	40	42	44	40	54	56	68	80	78	74	62
25	48	40	42	42	40	51	59	70	80	79	74	63
26	46	46	40	40	42	48	58	72	80	78	74	64
27	49	44	37	41	42	48	56	70	79	78	74	62
28	46	38	33	42	43	46	55	69	79	78	75	65
29	45	36	34	42	--	46	58	70	78	80	76	66
30	43	36	37	40	--	46	59	72	80	81	76	66
31	46	--	38	42	--	47	--	75	--	81	77	--
Average	52	44	39.2	40	41	47	53	65	75	78	76	69

## LICKING RIVER BASIN--Continued

## LICKING RIVER AT MCKINNEYSBURG, KY.

LOCATION.--At gaging station at county highway bridge at McKinneysburg, Pendleton County, 6.5 miles southeast of Falmouth, 9.0 miles upstream from Blanket Creek and 12.8 miles upstream from South Fork.

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

RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1953.

Water temperatures: October 1952 to September 1953.

Sediment Records: October 1952 to September 1953.

EXTREMES, 1952-53.--Dissolved solids: Maximum, 165 ppm Jan. 1-10; minimum, 57 ppm Apr. 16-17.

Hardness: Maximum, 122 ppm Jan. 1-10; minimum, 45 ppm Apr. 16-17.

Specific conductance: Maximum, 296 micromhos Jan. 3; minimum daily, 90.2 micromhos Mar. 9.

Water temperatures: Maximum, 87° F. July 3; minimum, freezing point Dec. 28-29.

Sediment concentrations: Maximum daily, 1,620 ppm Mar. 4; minimum daily, less than 0.50, 1.

Sediment loads: Maximum daily, 126,000 tons Mar. 4; minimum daily, less than 0.50, 1.

REMARKS.--Records of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Chemical analyses, in parts per million, October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boron (B)	Dissolved solids (residue at 180° C)		Hardness as CaCO <sub>3</sub>		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH	Color
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate				
Oct. 1-10, 1952	14.6	8.0	0.02	25	5.3	5.9	2.1	99	8.3	6.0	0.1	0.4		112		85	2		193	7.5	2
Oct. 11-20	7.24	5.1	.01	26	5.3	5.3	1.9	101	8.9	6.5	.1	.1		112		87	4		197	7.5	4
Oct. 21-30	15.2	8.1	.03	29	5.6	5.1	2.3	107	9.3	7.5	.1	.3		121		95	8		211	7.5	6
Nov. 1-10	13.3	4.7	.05	31	5.8	4.1	2.5	115	9.9	5.1	.1	.2		124		101	7		217	7.4	13
Nov. 11-21	28.6	14	.02	32	6.3	6.1	2.7	124	12	5.0	.1	.5		144		106	4		237	6.9	8
Nov. 21-30	522	9.0	.07	36	6.3	4.4	3.2	96	16	5.0	.1	1.6		122		92	12		204	7.0	8
Dec. 1-10	1,718	5.3	.05	26	5.3	3.1	2.6	78	20	5.5	.1	3.6		117		86	23		185	6.8	9
Dec. 11-20	2,112	8.6	.05	20	4.6	3.9	1.1	54	23	6.5	.1	4.8		106		69	25		159	6.9	6
Dec. 21-31	449	11	.01	27	5.1	3.7	1.1	74	27	5.4	.0	4.1		129		89	28		197	7.0	6
Jan. 1-10, 1953	3,994	12	.08	38	6.8	3.7	.7	108	27	5.1	.0	4.8		165		122	34		252	7.0	7
Jan. 11-20	6,310	7.5	.02	23	4.6	2.0	1.5	64	19	3.6	.1	4.4		103		76	24		163	6.9	7
Jan. 21-30	6,063	12	.02	25	4.1	3.5	1.7	75	18	2.8	.1	4.6		111		80	18		175	7.2	5
Feb. 1-10	1,685	9.8	.08	23	5.1	2.8	1.3	74	19	3.5	.1	3.5		108		79	18		176	7.3	6
Feb. 11-20	2,165	12	.08	24	5.3	3.4	1.3	75	22	4.0	.1	2.4		114		83	20		184	7.3	5
Feb. 21-28	3,725	11	.08	20	3.6	2.9	1.3	59	19	3.0	.1	2.2		96		65	16		149	7.4	7
Mar. 1-10	14,300	8.2	.05	31	3.6	2.4	1.3	89	18	2.2	.2	5.0		119		92	19		194	7.3	8
Mar. 11-22	6,521	7.0	.01	24	4.4	2.5	1.4	75	16	2.5	.1	3.7		107		77	17		177	6.9	2
Mar. 23-30, Apr. 1-4	2,098	8.6	.01	21	4.6	3.1	1.1	69	19	2.8	.1	1.2		107		72	15		165	6.9	2

Apr. 5-10, 1953	3,370	9.4	0.02	31	6.6	2.3	1.0	103	20	3.2	0.2	2.4	130					218	7.1	15
Apr. 11-15, .....	3,972	8.7	.10	18	5.1	2.4	1.2	61	17	2.6	.2	1.1	89					146	7.0	20
Apr. 16-17, .....	3,085	4.0	--	15	1.7	1.2	1.1	47	7.2	1.0	.3	2.4	57					96.8	6.6	--
Apr. 18-27, .....	4,277	7.7	.20	22	5.3	2.5	1.1	75	17	2.1	.2	1.2	97					164	7.3	10
Apr. 28-May 9, .....	3,076	8.5	.03	23	6.6	3.0	1.7	76	20	4.0	.1	1.5	119					192	7.2	5
May. 10-16, .....	4,216	11	.08	16	4.4	2.7	1.2	54	18	2.2	.2	1.0	90					138	7.3	4
May 17-20	10,050	12	.42	28	6.1	2.6	1.8	96	16	2.8	.2	3.7	129					201	7.3	25
May 21-June 2, .....	3,178	9.9	.10	20	5.3	2.5	1.7	64	16	4.8	.1	1.5	97					150	7.4	9
June 3-15, .....	560	13	.05	24	4.1	3.9	1.9	80	13	6.0	.1	1.0	107					169	7.3	5
June 16-28, .....	401	9.6	.05	23	3.8	3.4	2.2	75	12	4.8	.1	2.7	104					167	7.3	4
June 29-July 10, .....	413	13	.02	29	5.1	4.3	2.6	95	17	4.8	.1	2.2	129					209	7.3	5
July 11-22, .....	312	12	.11	22	4.4	4.1	2.1	80	13	4.9	.1	.3	110					174	7.4	6
July 23-Aug. 4, .....	199	7.9	.04	27	4.0	3.3	2.4	88	15	4.6	.1	2.0	113					190	7.3	6
Aug. 5-17, .....	551	8.4	.04	28	6.1	2.6	3.1	101	16	2.9	.2	4.3	135					204	7.5	12
Aug. 18-30, .....	37.7	7.7	.05	32	5.7	2.8	3.1	108	17	3.2	.2	2.0	133					221	7.8	15
Aug. 31-Sept. 10, .....	20.5	7.6	.01	32	6.5	2.6	3.3	114	16	3.6	.1	.8	130					227	7.0	7
Sept. 11-20, .....	14.5	7.6	.01	35	6.5	3.1	3.0	120	16	4.0	.1	.4	134					236	7.2	10
Sept. 21-30, .....	12.4	4.5	.02	36	6.9	2.5	3.0	129	17	3.4	.1	.3	137					244	7.3	8
Average.....	2,179	9.0	0.06	26	5.2	3.3	1.9	86	17	4.1	0.1	2.2	115					190	--	8

## LICKING RIVER BASIN--Continued

## LICKING RIVER AT MCKINNEYSBURG, KY.--Continued

Temperature ( $^{\circ}$  F) of water, water year October 1952 to September 1953  
 /Once-daily temperature measurement at varying hours/

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

## LICKING RIVER BASIN--Continued

## LICKING RIVER AT McKINNEYSBURG, KY.--Continued

Suspended sediment, water year October 1952 to September 1953

Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	18	20	1	17	1	(t)	220	16	10
2.....	16	23	1	13	3	(t)	220	20	12
3.....	15	18	1	11	4	(t)	190	26	13
4.....	13	16	1	10	4	(t)	330	58	s76
5.....	13	13	(t)	8.3	5	(t)	3,360	414	s3,980
6.....	16	10	(t)	8.3	6	(t)	2,580	300	a2,100
7.....	15	14	1	9.2	7	(t)	2,120	185	1,060
8.....	13	10	(t)	13	6	(t)	1,610	110	a480
9.....	12	10	(t)	21	6	(t)	1,140	90	a280
10.....	15	10	(t)	22	6	(t)	5,410	900	13,100
11.....	13	10	(t)	21	5	(t)	4,600	482	5,990
12.....	12	8	(t)	18	5	(t)	5,050	233	3,180
13.....	10	8	(t)	18	6	(t)	3,330	120	a1,100
14.....	8.3	10	(t)	29	7	1	2,480	74	496
15.....	6.5	11	(t)	35	9	1	1,810	68	332
16.....	5.6	12	(t)	34	9	1	1,170	67	212
17.....	4.7	13	(t)	32	7	1	864	66	154
18.....	3.8	10	(t)	32	8	1	696	63	118
19.....	3.8	10	(t)	35	13	1	588	57	90
20.....	4.7	9	(t)	32	13	1	534	48	69
21.....	6.5	7	(t)	32	12	1	564	33	50
22.....	11	6	(t)	50	14	2	528	32	45
23.....	12	5	(t)	142	13	5	474	17	22
24.....	12	5	(t)	1,250	--	e600	474	18	23
25.....	11	4	(t)	1,280	173	598	480	17	22
26.....	12	5	(t)	828	95	a210	462	7	9
27.....	16	5	(t)	600	64	104	432	6	7
28.....	17	3	(t)	444	55	66	402	7	8
29.....	18	4	(t)	342	22	20	360	8	8
30.....	19	6	(t)	250	19	13	324	10	9
31.....	18	3	(t)	--	--	--	436	--	e45
Total.	370.9	--	11	5,636.8	--	1,628	43,238	--	33,100
Day	January			February			March		
	Mean dis-charge (cfs)	Mean concen-tration (ppm)	Tons per day	Mean dis-charge (cfs)	Mean concen-tration (ppm)	Tons per day	Mean dis-charge (cfs)	Mean concen-tration (ppm)	Tons per day
1.....	960	--	e380	3,010	49	398	1,640	61	270
2.....	684	62	114	2,440	24	158	1,450	54	611
3.....	1,510	60	245	2,060	27	150	12,400	906	s52,900
4.....	2,430	86	564	1,750	23	109	28,800	1,620	126,000
5.....	2,330	86	541	1,510	12	49	26,900	785	57,000
6.....	2,000	82	443	1,340	14	51	22,700	355	s23,100
7.....	1,730	80	a370	1,210	11	36	19,300	112	5,840
8.....	6,000	320	b7,200	1,160	7	22	15,800	101	4,310
9.....	10,000	516	13,900	1,130	7	21	9,940	109	2,920
10.....	12,300	482	16,000	1,040	6	17	4,100	72	797
11.....	12,200	362	11,900	978	7	a18	2,600	45	a315
12.....	10,900	339	9,980	1,240	20	67	2,120	36	206
13.....	8,930	210	a5,100	2,040	--	e270	1,880	33	168
14.....	5,700	88	1,350	3,270	--	e700	2,400	27	s205
15.....	2,770	--	e500	2,610	46	349	11,100	550	sb19,000
16.....	2,010	--	e390	2,530	38	260	13,000	813	28,500
17.....	1,980	--	e750	2,520	18	122	11,900	446	s14,300
18.....	5,830	--	e9,900	2,320	16	100	7,800	128	2,700
19.....	6,170	--	e4,800	2,100	18	102	6,790	118	2,160
20.....	6,610	207	e4,800	1,840	13	64	7,590	116	2,380
21.....	4,960	98	1,310	2,590	190	sb1,500	6,500	116	2,040
22.....	3,850	99	1,030	4,100	197	2,180	4,570	69	851
23.....	2,650	93	665	6,190	185	3,090	3,340	58	523
24.....	5,300	220	sb3,500	5,330	85	a1,200	2,650	42	300
25.....	7,260	174	3,410	4,230	57	651	2,330	35	220
26.....	7,680	172	3,570	3,090	56	467	2,240	23	139
27.....	6,650	--	e1,400	2,340	57	360	2,370	18	115
28.....	7,120	--	e3,300	1,930	55	287	2,400	17	110
29.....	5,710	130	2,000	--	--	--	2,250	18	110
30.....	5,480	75	1,110	--	--	--	1,960	13	69
31.....	3,970	70	a750	--	--	--	1,720	10	46
Total.	163,674	--	110,162	68,098	--	12,798	242,540	--	347,805

e Estimated

s Computed by subdividing day.

t Less than 0.50 ton.

a Computed from estimated concentration graph.

b Computed partly from water-sediment discharge curve.

## LICKING RIVER BASIN--Continued

## LICKING RIVER AT MCKINNEYSBURG, KY.--Continued

Suspended sediment, water year October 1952 to September 1953--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.....	1,620	11	48	1,250	10	34	618	22	37
2.....	1,570	12	51	1,160	5	16	534	15	22
3.....	1,470	11	44	1,080	5	14	468	16	20
4.....	1,350	11	40	1,030	5	14	408	14	15
5.....	1,230	--	e40	5,660	--	e8,200	360	10	10
6.....	1,630	--	e500	6,820	530	9,760	318	10	8
7.....	4,240	--	e2,600	5,590	426	6,430	295	10	8
8.....	4,550	--	e1,100	4,560	113	1,390	275	9	7
9.....	4,970	98	1,320	5,460	102	1,500	295	--	e20
10.....	3,600	50	a500	6,190	135	2,260	732	--	e150
11.....	3,050	42	346	5,710	142	2,190	1,090	--	e310
12.....	3,240	34	297	4,110	106	1,180	870	61	143
13.....	3,840	60	a600	2,880	78	606	876	60	142
14.....	5,410	131	1,910	2,140	86	497	720	61	118
15.....	4,320	133	1,550	2,640	84	599	570	61	94
16.....	3,210	46	399	5,840	200	sb3,700	624	64	108
17.....	2,960	44	352	11,100	420	b13,000	756	75	153
18.....	5,290	--	e2,300	10,600	146	4,180	672	65	118
19.....	7,800	68	1,430	9,030	127	3,100	498	59	79
20.....	7,990	104	2,220	9,470	148	3,780	402	48	52
21.....	6,420	78	1,350	9,100	171	4,200	318	53	46
22.....	4,240	25	a290	7,560	149	3,040	265	66	47
23.....	3,060	23	190	5,720	95	1,470	230	56	35
24.....	2,440	23	152	4,140	92	1,030	200	38	20
25.....	2,040	23	127	2,600	43	302	225	65	39
26.....	1,870	18	91	1,930	49	255	324	158	138
27.....	1,720	17	79	1,810	49	239	432	145	169
28.....	1,560	16	67	1,420	41	157	270	--	e120
29.....	1,430	34	131	1,090	21	62	456	446	549
30.....	1,310	24	85	882	20	48	295	310	a250
31.....	--	--	--	732	25	49	--	--	--
Total.	99,330	--	20,209	139,304	--	73,302	14,396	--	3,627
Day	July			August			September		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	312	173	146	67	33	6	20	23	1
2.....	360	169	164	58	--	e5	20	24	1
3.....	426	137	158	139	--	e90	21	27	2
4.....	384	124	128	1,210	--	e1,500	21	39	2
5.....	324	53	46	1,550	532	2,230	20	37	2
6.....	260	54	38	1,490	428	1,720	21	35	2
7.....	240	50	32	768	240	a500	22	32	2
8.....	396	48	51	564	188	286	22	32	2
9.....	810	85	a190	618	192	320	20	34	2
10.....	696	58	109	654	212	374	19	32	2
11.....	642	50	a85	486	217	285	18	31	2
12.....	528	45	a65	336	190	172	17	28	1
13.....	378	39	40	230	119	74	16	25	1
14.....	275	36	27	162	112	49	16	27	1
15.....	215	39	23	120	108	35	15	33	1
16.....	171	43	20	97	93	24	13	28	1
17.....	142	45	17	82	76	17	12	23	1
18.....	166	50	22	69	65	a12	12	24	1
19.....	210	48	27	60	56	9	13	27	1
20.....	152	30	a13	51	50	a7	13	37	1
21.....	372	210	sb230	46	46	6	13	30	a1
22.....	492	--	e430	38	44	4	13	25	a1
23.....	240	181	117	35	39	4	14	21	1
24.....	176	93	44	33	34	3	14	18	1
25.....	142	63	24	31	31	2	14	17	1
26.....	117	42	13	30	30	2	13	19	1
27.....	97	41	11	26	28	2	12	22	1
28.....	92	40	a10	26	26	2	11	19	1
29.....	88	40	a12	24	25	2	10	14	(t)
30.....	82	36	8	21	26	1	9.6	13	(t)
31.....	77	35	7	19	23	1	--	--	--
Total.	9,062	--	2,307	9,140	--	7,744	474.6	--	38

Total discharge for year (cfs-days).....795,264.3

Total load for year (tons).....612,131

e Estimated

a Computed from estimated concentration graph

s Computed by subdividing day

b Computed partly from water-sediment discharge curve

t Less than 0.50 ton

## LICKING RIVER BASIN--Continued

## LICKING RIVER AT MCKINNEYSBURG, KY.--Continued

Particle size analyses of suspended sediment, December 1952 to June 1953  
 (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	Water discharge (cfs)	Water temperature per- centage (° F)	Suspended sediment												Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500		1.000
Dec. 10, 1952.....	4:00 p.m.	5,550		1,040	600	57	72	81	93	98	99	--					BSWCM
Dec. 10.....	4:00 p.m.	5,550		1,040	556	29	46	68	91	98	99	--					BSN
Jan. 20, 1953.....	8:30 a.m.	7,030		250	283	58	61	78	92	96	99	--					BSWCM
Jan. 25.....	8:30 a.m.	7,370		185	230	59	60	75	91	96	99	--					BSWCM
Mar. 4.....	8:30 a.m.	29,200		1,730	931	45	52	66	81	92	96	99					BSWCM
Mar. 4.....	8:30 a.m.	29,200		1,730	943	21	37	54	72	89	98	99					BSN
May 6.....	7:00 a.m.	7,700		545	709	52	61	74	89	96	100	--					BSWCM
May 17.....	9:220	9,220		598	511	61	61	73	87	96	99	100					BSWCM
June 29.....	9:00 a.m.	450		460	511	85	89	92	92	93	100	--					BSWCM

## LICKING RIVER BASIN--Continued

## SOUTH FORK LICKING RIVER AT CYNTHIANA, KY.

LOCATION.--At bridge on State Highway 32 and 36 at Cynthiana, Harrison County, in pool formed by old mill dam, 0.4 mile downstream from Grays Run, and 48 miles upstream from mouth.

DRAINAGE AREA.--615 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 85°F on several days during July and August; minimum, 33°F Jan. 6.

EXTREMES, 1949-53.--Water temperatures: Maximum, 87°F June 30, 1953; minimum, 33°F at times during 1950, 1951, 1953.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Temperature (°F) of water, water year October 1952 to September 1953

/Mean of twice-daily measurements at approximately 6 a. m. and 5 p. m. 7

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



## MIAMI RIVER BASIN

## MIAMI RIVER AT DAYTON, OHIO

LOCATION.--At Main Street Bridge at Dayton, Montgomery County, 1,000 feet upstream from gaging station, and half a mile downstream from Mad River.

DRAINAGE AREA.--2,513 square miles.

RECORDS AVAILABLE.--Sediment records: October 1951 to September 1953.

EXTREMES, 1952-53.--Sediment concentrations: Maximum daily, 1,800 ppm June 11; minimum daily, 2 ppm Jan. 7.

Sediment loads: Maximum daily, 30,000 tons June 11; minimum daily, 3 tons Jan. 7.

EXTREMES, 1951-53.--Sediment concentrations: Maximum daily, 1,800 ppm June 11, 1953; minimum daily, 2 ppm Jan. 7, 1953.

Sediment loads: Maximum daily, 88,800 tons Jan. 27, 1952; minimum daily, 3 tons Jan. 7, 1953.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

## Suspended sediment, water year October 1952 to September 1953

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.....	286	28	22	359	21	20	409	8	9
2.....	291	32	25	359	23	22	398	12	13
3.....	281	29	22	392	25	26	403	16	17
4.....	272	32	24	376	27	27	426	17	20
5.....	286	38	29	376	23	23	686	40	74
6.....	354	32	30	376	18	18	1,410	45	s 192
7.....	332	25	22	376	18	18	1,440	36	140
8.....	343	25	23	364	21	21	944	35	89
9.....	312	27	23	359	23	22	844	40	91
10.....	322	40	35	359	17	16	1,630	90	a 550
11.....	327	33	29	354	18	17	3,230	222	1,940
12.....	312	26	22	354	17	16	2,070	107	598
13.....	301	28	23	354	16	15	1,410	57	217
14.....	301	32	26	359	20	19	1,110	35	105
15.....	306	34	28	364	18	18	944	23	59
16.....	312	30	25	354	16	15	864	15	35
17.....	312	32	27	348	15	14	779	11	23
18.....	306	28	23	364	19	19	743	9	18
19.....	306	23	19	455	20	24	677	8	15
20.....	312	25	21	438	19	22	632	5	8
21.....	312	25	21	420	18	20	617	7	12
22.....	322	20	17	473	17	22	976	--	e 180
23.....	327	20	18	438	14	16	1,010	32	87
24.....	327	17	15	420	11	12	1,010	15	b 40
25.....	322	18	16	473	16	20	965	10	26
26.....	332	22	20	467	23	29	825	10	22
27.....	343	23	21	449	12	14	727	13	26
28.....	343	22	20	510	7	10	646	12	b 20
29.....	343	24	22	461	5	6	588	4	6
30.....	354	39	37	426	5	6	568	3	5
31.....	359	24	23	--	--	--	575	3	5
Total.	9,858	--	728	11,977	--	547	29,556	--	4,642

e Estimated.

s Computed by subdividing day.

a Computed partly from water-sediment discharge curve.

b Computed from estimated concentration graph.

## MIAMI RIVER BASIN--Continued

## MIAMI RIVER AT DAYTON, OHIO--Continued

Suspended sediment, water year October 1952 to September 1953--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.....	548	3	4	1,660	17	76	1,110	15	45
2.....	535	3	4	1,560	9	38	976	15	40
3.....	542	6	9	1,450	5	20	1,130	30	s 118
4.....	542	6	12	1,340	3	11	7,360	542	s 11,500
5.....	610	18	30	1,260	5	17	9,320	526	13,200
6.....	603	6	10	1,190	9	29	5,470	290	4,280
7.....	529	2	3	1,190	10	32	3,460	154	1,440
8.....	710	6	12	1,130	9	27	2,780	138	1,040
9.....	913	22	s 73	1,060	8	23	2,280	78	480
10.....	2,070	420	2,350	976	7	18	2,000	47	254
11.....	5,610	510	7,720	1,400	14	53	1,930	45	234
12.....	4,950	209	2,790	4,170	102	s 1,360	2,000	42	227
13.....	3,230	90	785	4,030	87	947	2,070	33	184
14.....	2,490	51	343	2,780	82	615	2,490	37	249
15.....	2,490	40	269	2,210	54	322	2,560	74	511
16.....	2,420	40	261	1,860	22	110	4,030	260	a 2,800
17.....	2,350	65	sa 470	1,530	12	50	3,160	168	1,430
18.....	7,940	237	s 5,590	1,160	11	34	2,930	147	1,160
19.....	7,860	242	5,140	1,060	7	20	6,430	330	a 5,700
20.....	4,470	128	1,540	1,190	7	22	4,750	174	2,230
21.....	3,300	70	624	1,630	34	s 174	3,300	126	1,120
22.....	2,560	45	311	3,000	--	e 3,200	2,560	92	636
23.....	2,070	30	168	2,070	264	1,480	2,070	56	313
24.....	2,000	26	140	1,560	157	661	1,790	34	164
25.....	2,210	27	161	1,430	65	251	1,660	24	108
26.....	2,140	34	196	1,410	36	137	1,490	18	72
27.....	1,720	29	135	1,360	26	95	1,390	12	45
28.....	2,350	41	260	1,240	20	67	1,380	12	45
29.....	2,350	35	222	--	--	--	1,250	11	37
30.....	1,860	17	85	--	--	--	1,110	8	24
31.....	1,660	12	54	--	--	--	1,060	13	37
Total.	75,632	--	29,771	47,906	--	9,889	87,296	--	49,723
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.....	1,050	14	40	864	13	30	1,720	41	190
2.....	1,050	13	37	844	15	34	1,600	37	160
3.....	1,060	13	37	770	12	25	1,400	35	132
4.....	1,040	14	39	727	12	24	1,180	49	156
5.....	944	19	48	752	14	28	1,050	57	162
6.....	933	13	33	743	26	52	923	58	144
7.....	965	9	23	825	31	69	965	60	156
8.....	933	8	20	2,070	90	sa 550	966	54	144
9.....	1,020	8	22	3,080	200	1,660	1,060	51	146
10.....	1,190	15	48	2,140	85	491	1,320	150	sa 750
11.....	1,340	15	54	1,620	40	175	6,210	1,800	a 30,000
12.....	1,310	17	60	1,350	29	106	3,160	830	s 7,790
13.....	1,230	15	50	1,290	30	104	1,790	216	1,040
14.....	1,190	13	42	1,930	53	276	1,300	120	420
15.....	1,160	14	44	4,290	156	s 2,030	1,070	90	260
16.....	1,340	16	58	5,150	148	2,060	1,020	81	223
17.....	1,350	13	47	7,860	204	4,330	997	78	210
18.....	1,440	10	39	13,200	252	8,980	874	65	153
19.....	1,380	8	30	11,000	157	4,660	816	61	134
20.....	1,520	10	41	6,050	99	1,620	761	61	125
21.....	1,440	10	39	4,120	100	b 1,100	694	61	114
22.....	1,280	9	31	8,230	429	s 10,000	632	55	94
23.....	1,120	10	30	17,300	263	12,300	581	46	72
24.....	997	11	30	13,500	275	10,000	542	45	66
25.....	923	10	25	13,500	184	6,710	522	58	82
26.....	933	11	28	10,000	130	3,510	516	51	71
27.....	976	10	26	5,150	116	1,610	510	39	54
28.....	944	9	23	3,540	97	927	485	40	52
29.....	923	12	30	2,780	74	555	516	43	60
30.....	903	14	34	2,280	67	412	568	41	63
31.....	--	--	--	1,860	49	246	--	--	--
Total.	33,884	--	1,108	148,815	--	74,674	35,768	--	43,223

e Estimated.

s Computed by subdividing day.

a Computed partly from water-sediment discharge curve.

b Computed from estimated concentration graph.

## MIAMI RIVER BASIN--Continued

## MIAMI RIVER AT DAYTON, OHIO--Continued

Suspended sediment, water year October 1952 to September 1953--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.....	770	50	104	372	40	sa 45	190	--	
2.....	661	28	50	1,040	95	sa 310	176	27	e 13
3.....	677	40	73	903	70	171	171	--	
4.....	588	55	87	844	66	150	213	--	
5.....	562	43	65	997	66	178	213	33	
6.....	575	40	62	694	57	107	190	--	e 18
7.....	535	42	61	568	47	72	180	--	
8.....	535	50	72	522	35	b 50	204	--	
9.....	516	49	68	1,160	110	a 340	213	40	e 23
10.....	479	54	70	1,250	154	520	213	--	
11.....	426	49	56	893	45	108	209	--	
12.....	398	42	45	654	22	39	209	38	
13.....	386	36	38	529	31	44	190	--	
14.....	381	37	38	461	46	57	194	--	
15.....	364	35	34	403	47		213	--	
16.....	343	30	28	359	--		213	36	
17.....	332	23	21	343	--	e 47	233	--	e 21
18.....	354	27	26	332	--		223	--	
19.....	409	29	32	322	--		223	42	
20.....	455	20	24	312	--		204	--	
21.....	461	20	25	276	--	e 29	190	--	
22.....	498	24	32	257	39		185	--	
23.....	617	27	45	237	--		185	39	
24.....	727	25	49	228	--		185	--	
25.....	669	20	36	228	--		180	--	
26.....	522	19	27	223	30	e 17	180	22	e 11
27.....	444	18	22	204	30		176	--	
28.....	403	22	24	204	--		171	--	
29.....	370	24	24	199	23		180	--	e 12
30.....	348	26	24	199	--	e 12	185	24	
31.....	338	26	24	199	--		--	--	
Total.	15,143	---	1,386	15,412	--	2,639	5,891	--	543

Total discharge for year (cfs-days) ..... 517,138

Total load for year (tons)..... 218,873

e Estimated.

s Computed by subdividing day.

a Computed partly from water-sediment discharge curve.

b Computed from estimated concentration graph.

## MIAMI RIVER BASIN--Continued

## MIAMI RIVER AT DAYTON, OHIO.--Continued

Particle-size analyses of suspended sediment, water year October 1952 to September 1953

(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	Water discharge (cfs)	Water temperature (° F)	Suspended sediment												Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500		1.000
Jan. 19, 1953	5:00 p. m.	7,260		228	373	89	90	96	98	99	100	--					BSWCM
Mar. 4	5:00 p. m.	10,700		644	492	77	88	97	99	--	--	--					BSWCM
Mar. 4	5:00 p. m.	10,700		644	610	44	64	82	94	98	99	--					BSN
Mar. 19	5:00 p. m.	6,700		308	509	70	82	90	97	99	100	--					BSWCM
May 9	5:00 p. m.	2,830		184	320	73	84	91	96	98	100	--					BSWCM
May 15	5:00 p. m.	5,700		230	395	61	68	79	89	96	99	--					BSWCM
May 20	1:00 p. m.	5,810		93	308	60	74	85	92	97	99	--					BSWCM
May 22	5:00 p. m.	11,400		1,040	787	72	79	84	94	96	97	97					BSWCM
May 22	5:00 p. m.	11,400		1,040	905	21	30	52	80	98	99	99					BSN
May 23	7:00 p. m.	16,800		2,599	411	85	92	97	98	98	99	--					BSWCM
June 11	5:00 p. m.	6,860		1,580	1,260	71	84	90	93	93	95	--					BSWCM
June 11	8:00 p. m.	5,810		1,610	1,320	39	55	78	96	99	99	--					BSN

## KENTUCKY RIVER BASIN

## NORTH FORK KENTUCKY RIVER AT HAZARD, KY.

LOCATION.--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 1953.

EXTREMES, 1952-1953.--Water temperatures: Maximum, 93°F Aug. 1; minimum, 34°F Dec. 17.

EXTREMES, 1949-1953.--Water temperatures: Maximum, 93°F Aug. 1, 1953; minimum, 33°F Nov. 26, 1950, Feb. 3, 1951.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Temperature (°F) of water, water year October 1952 to September 1953  
/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	74	56	37	40	45	46	56	64	78	81	92	84
2	72	56	39	40	45	46	58	66	77	82	87	85
3	69	56	42	38	46	50	58	68	77	82	86	84
4	66	53	44	36	46	52	58	68	78	81	86	85
5	68	56	44	37	44	46	58	70	76	82	84	82
6	64	60	42	42	45	48	58	64	76	83	83	76
7	62	58	41	40	44	48	56	58	76	84	84	74
8	62	57	42	46	44	48	55	58	80	84	84	76
9	64	54	46	49	44	48	58	59	79	84	78	76
10	64	50	48	48	45	48	62	63	78	80	78	76
11	63	51	46	45	46	49	60	66	81	77	83	80
12	60	56	42	42	46	50	58	68	80	80	87	82
13	62	48	40	42	46	52	56	69	80	80	88	78
14	65	49	38	42	41	54	54	72	80	82	88	72
15	68	50	36	44	42	58	54	71	80	84	88	72
16	70	50	38	45	40	58	51	70	80	85	88	74
17	64	52	36	46	42	56	51	70	80	84	86	75
18	60	55	38	48	40	56	53	69	82	80	85	77
19	58	60	38	46	42	56	50	62	80	79	84	76
20	56	61	40	45	46	55	47	62	83	83	82	76
21	52	56	41	46	47	53	48	66	86	87	82	75
22	50	42	42	47	44	55	52	68	84	84	82	72
23	50	42	44	46	42	58	58	72	85	85	82	70
24	52	42	44	46	42	56	61	73	85	80	76	70
25	50	43	44	42	44	54	63	76	84	80	78	72
26	50	47	43	40	47	46	62	78	84	82	80	74
27	50	46	40	44	48	46	58	77	82	82	84	74
28	48	44	39	47	46	48	56	74	82	84	84	74
29	47	41	38	44	--	48	60	74	82	86	86	74
30	50	39	40	43	--	48	63	76	82	87	86	74
31	52	--	43	42	--	52	--	78	--	90	84	--
Average	59	51	41	43	44	51	56	69	81	83	84	76

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

LOCATION.--At gaging station at combination Broadway Street Highway and Louisville & Nashville Railroad bridge, at Frankfort, Franklin County, 300 feet upstream from Benson Creek, and 0.9 mile upstream from Lock 4. Records include flow of Benson Creek.

DRAINAGE AREA.--5,430 square miles, including that of Benson Creek.

RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1953.

Water temperatures: October 1949 to September 1953.

Sediment records: October 1952 to September 1953.

EXTREMES, 1952-53.--Dissolved solids: Maximum, 191 ppm Dec. 1-2, 4-10; minimum, 71 ppm May 10-13.

Hardness: Maximum, 118 ppm Sept. 22-27, 29-30; minimum, 42 ppm May 10-13.

Specific conductance: Maximum daily, 555 micromhos Dec. 7; minimum daily, 88.2 micromhos May 10.

Water temperature: Maximum, 86°F Aug. 3-4; minimum, 38°F Jan. 8-9.

Sediment concentrations: Maximum daily, 805 ppm Mar. 4; minimum daily, 1 ppm Nov. 16-18.

Sediment loads: Maximum daily, 105,000 tons Mar. 4; minimum daily, 1 ton on several days during November.

EXTREMES, 1949-53.--Dissolved solids: Maximum, 224 ppm Nov. 21-30, 1949; minimum, 71 ppm May 10-13, 1953.

Hardness: Maximum, 121 ppm Nov. 21-30, 1949; minimum, 42 ppm May 10-13, 1953.

Specific conductance: Maximum daily, 555 micromhos Dec. 7, 1952; minimum daily, 79.8 micromhos Feb. 4, 1951.

Water temperatures: Maximum, 86°F Aug. 3-4, 1953; minimum, 34°F Feb. 8, 1951.

REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO <sub>3</sub>		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Coliform or
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate				
Oct. 1-10, 1952...	310	3.7	0.03	27	5.8	5.4	2.1	89	22	7.0	0.1	1.0		126		91	18		221	7.5	4
Oct. 11-20, 1952...	2209	2.9	.04	27	6.1	5.8	2.1	85	25	7.5	.1	.7		130		92	23		225	7.6	3
Oct. 21-31, 1952...	219	24	.02	28	7.3	10	2.4	104	24	8.0	.1	1.0		163		100	15		240	7.3	3
Nov. 1-7, 1952...	243	4.0	.01	28	6.8	6.9	2.3	93	25	8.5	.1	1.1		130		98	22		229	7.0	3
Nov. 8-10, 1952...	270	5.6	.01	29	7.0	8.2	2.4	96	26	10	.2	1.1		138		101	22		238	7.1	2
Nov. 11-20, 1952...	3,798	17	.01	29	7.5	14	2.5	96	32	17	.1	1.6		171		103	25		277	7.1	4
Dec. 1-2, 4-10, 1952...	3,741	10	.02	28	8.0	22	3.0	76	37	38	.1	2.0		191		104	40		329	6.8	6
Dec. 11-20, 1952...	8,683	14	.14	17	5.1	7.4	1.9	53	23	8.0	.1	3.0		110		64	20		329	6.6	8
Dec. 21-31, 1952...	15,727	13	.06	18	4.4	5.1	1.9	57	19	4.0	.1	3.2		97		62	16		158	6.7	7
Jan. 1, 3-10, 1953	11,520	7.8	.10	24	5.3	4.4	1.9	68	24	6.8	.1	4.5		114		83	26		196	6.8	7
Jan. 11-20, 1953	15,800	8.8	.04	18	4.1	2.8	1.6	51	18	4.0	.1	4.0		86		61	20		148	6.9	5
Jan. 21-31, 1953	15,180	7.7	.06	18	4.9	4.6	1.3	60	20	5.2	.1	2.0		97		66	16		160	7.1	5
Feb. 1-10, 1953	5,789	9.3	.07	18	4.9	4.4	1.4	60	20	4.5	.1	2.4		100		66	16		160	7.4	4
Feb. 12, 20, 1953	5,945	11	.12	20	5.0	6.9	1.4	80	23	9.0	.1	1.5		118		70	21		182	7.2	7
Feb. 21-22, 1953	13,290	17.1	.12	17	4.4	5.6	1.4	48	25	6.2	.1	1.3		99		60	21		158	7.3	7
Feb. 23-28, 1953	14,100	7.2	.06	13	3.6	3.6	1.2	40	18	3.5	.1	1.8		77		48	14		119	6.7	10
Mar. 1-7, 9, 1953	25,450	6.3	.15	18	3.1	2.5	1.2	50	18	33.0	.2	2.5		86		57	17		147	7.3	10
Mar. 12, 14, 1953	6,485	13	.18	23	3.8	3.0	1.2	68	18	3.0	.4	3.4		110		74	17		167	7.5	35

Mar. 15-24, 1953.	10,880	12	0.05	26	5.3	4.6	1.8	78	22	5.0	0.1	2.9	123				87	23	195	7.3	5
Mar. 31-Apr. 5..	5,568	9.1	.04	19	4.9	4.5	1.1	56	22	5.5	.1	.8	100				67	22	162	7.1	1
Apr. 11-20 .....	10,100	15	.03	26	6.6	6.9	1.5	89	23	55.0	.1	2.3	136				92	19	210	7.7	4
Apr. 21-22, 24-30	5,674	12	.04	28	6.1	4.8	.8	86	22	5.0	.1	2.2	131				94	24	207	7.2	2
May 1-8 .....	7,676	9.3	.03	26	5.3	4.3	1.1	78	21	5.0	.1	1.2	120				86	23	196	7.3	3
May 10-13 .....	17,060	8.3	.12	12	3.2	2.7	1.6	36	15	3.5	.1	.5	71				42	14	107	6.9	8
May 14-17 .....	11,840	11	.38	21	4.4	2.7	1.5	60	15	5.8	.1	3.6	98				71	21	154	7.2	8
May 18-21 .....	25,220	9.0	.26	32	6.3	2.9	1.5	100	18	5.8	.1	5.1	136				105	24	218	7.4	13
May 22-June 3 ..	9,157	11	.12	22	4.1	3.2	1.5	64	17	4.8	.1	3.6	104				72	19	166	7.3	7
June 4-14 .....	2,112	--	--	26	4.5	--	--	75	--	--	--	--	--				82	22	183	6.2	--
June 15, 18-25, 27	1,858	9.8	.12	25	5.5	5.2	2.1	69	27	8.5	.1	4.0	123				85	28	198	7.5	4
June 28-July 2, 4-6, 9-10 .....	2,166	9.0	.02	35	.5	4.9	2.1	78	28	6.0	.1	4.4	127				90	26	212	7.6	7
July 11-13, 15-20	921	7.7	.04	38	1.0	5.1	2.2	91	27	8.0	.1	3.8	134				100	24	227	7.7	7
July 21-31 .....	677	5.9	.03	30	6.2	4.5	2.4	97	23	6.0	.2	3.8	140				101	21	223	7.2	5
Aug. 1-7 .....	1,021	3.3	.05	31	6.6	5.3	2.4	94	28	6.5	.2	3.0	137				106	27	233	7.4	8
Aug. 16-20, 22-24																					
Aug. 26-28 .....	240	3.8	.02	33	5.3	5.9	2.8	101	24	7.9	.2	3.1	141				105	21	241	7.0	5
Aug. 29-31, Sept.																					
3-10 .....	274	2.9	.01	34	7.0	8.0	2.6	106	29	13	.1	2.7	147				114	27	269	6.6	5
Sept. 11, 13, 15	235	2.0	.01	34	7.1	8.7	2.3	104	29	13	.1	2.3	152				114	29	273	6.9	5
-16, 20 .....	217	3.3	.01	34	7.8	9.3	2.7	108	29	13	.1	1.5	156				118	28	276	6.9	5
Sept. 22-27, 29-30																					
Average .....	5,662	8.8	0.07	25	5.3	6.0	1.9	76	23	7.8	0.1	2.5	123				84	22	205	--	6

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

Temperature (°F) of water, water year October 1952 to September 1953  
Continuous ethyl alcohol actuated thermograph. Prior to November 14, 1952, once-daily measurement at varying hours.<sup>7</sup>

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



## KENTUCKY RIVER BASIN--Continued

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

Suspended sediment, water year October 1952 to September 1953

Suspended sediment, water year October 1952 to September 1953									
Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	316	--	e 10	218	7	4	1,730	21	98
2.....	379	--	e 12	239	4	a 2	1,580	21	90
3.....	379	12	12	178	3	1	1,330	20	72
4.....	340	12	11	253	5	3	1,300	22	77
5.....	253	13	9	225	4	2	3,130	30	254
6.....	246	15	10	225	2	1	3,780	16	163
7.....	284	13	10	308	5	4	4,840	19	248
8.....	260	10	7	292	4	3	5,850	21	332
9.....	308	12	10	300	3	2	5,470	--	--
10.....	340	12	11	190	7	4	8,400	--	--
11.....	292	10	8	268	6	4	9,910	--	--
12.....	225	9	5	280	4	3	17,300	--	--
13.....	178	9	4	280	3	2	22,500	--	--
14.....	125	9	3	280	3	2	14,000	--	--
15.....	125	8	3	260	2	1	7,130	--	--
16.....	268	10	7	239	1	1	5,090	--	--
17.....	268	10	7	197	1	1	3,390	--	--
18.....	260	6	4	300	1	1	2,830	--	--
19.....	204	10	6	332	2	2	2,540	--	--
20.....	148	10	4	268	3	2	2,140	--	--
21.....	160	8	3	239	5	3	1,730	--	--
22.....	218	7	4	572	7	a 11	1,760	--	--
23.....	218	6	4	7,070	34	s 788	2,070	--	--
24.....	239	5	3	9,360	75	1,900	2,100	--	--
25.....	253	5	3	6,250	42	709	1,550	--	--
26.....	239	5	3	4,220	16	182	1,280	--	--
27.....	160	7	3	3,090	15	125	1,330	--	--
28.....	197	6	3	2,510	15	102	1,250	--	--
29.....	276	7	5	2,470	16	107	1,120	--	--
30.....	246	7	5	2,200	18	107	1,470	--	--
31.....	204	8	4	--	--	--	1,640	30	133
Total.	7,608	--	193	43,113	--	4,079	141,540	--	e 30,000
January			February			March			
1.....	1,980	23	123	11,700	30	948	5,090	60	824
2.....	1,790	26	126	8,640	42	980	6,030	70	s 1,220
3.....	2,760	34	253	7,130	16	308	27,800	484	s 42,700
4.....	2,900	35	274	5,940	12	192	48,400	805	105,000
5.....	3,470	31	290	5,090	16	220	44,000	638	75,800
6.....	3,320	27	242	4,420	18	215	39,300	393	41,700
7.....	3,550	33	s 345	3,860	18	188	29,500	288	22,900
8.....	21,400	213	s 13,800	3,390	19	174	17,300	96	s 4,700
9.....	33,100	617	55,100	3,620	20	195	11,600	67	2,100
10.....	40,900	759	83,800	4,100	20	221	9,020	50	1,220
11.....	41,100	583	64,700	4,220	20	a 230	7,000	24	454
12.....	27,400	397	29,400	4,590	20	248	6,070	20	328
13.....	16,200	216	9,450	6,250	20	a 340	5,380	42	610
14.....	11,000	128	3,800	7,170	20	a 390	6,900	90	sb 2,400
15.....	8,310	93	2,090	7,940	21	450	13,900	246	9,230
16.....	6,600	75	1,340	7,660	20	414	13,400	210	a 7,600
17.....	5,940	47	754	7,890	18	383	10,300	195	5,420
18.....	8,590	43	997	8,740	16	378	10,200	168	4,630
19.....	14,700	64	2,540	8,310	17	381	12,200	77	2,540
20.....	18,200	150	b 7,400	7,300	15	296	11,600	77	2,410
21.....	14,000	142	5,370	9,080	18	441	11,600	69	2,160
22.....	10,700	108	3,120	17,500	27	1,280	9,810	55	1,460
23.....	13,200	50	1,780	23,800	70	4,500	8,080	31	676
24.....	19,300	81	4,220	23,000	211	13,100	7,220	23	448
25.....	20,000	112	6,050	14,600	124	s 5,180	6,560	32	567
26.....	17,600	74	3,520	9,610	96	2,490	7,350	30	595
27.....	15,500	62	3,590	7,440	77	1,550	9,260	15	375
28.....	14,200	85	3,260	6,120	62	1,020	8,830	20	477
29.....	13,200	70	2,490	--	--	--	7,390	24	479
30.....	14,300	48	1,850	--	--	--	6,290	21	357
31.....	15,000	20	810	--	--	--	5,590	17	258
Total.	440,210	--	311,884	23,110	--	36,712	422,970	--	341,636

e Estimated.

s Computed by subdividing day.

a Computed from estimated concentration graph.

b Computed from partly-estimated concentration graph.

## KENTUCKY RIVER BASIN--Continued

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

## Suspended sediment, water year October 1952 to September 1953--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.....	5,640	19	289	3,130	30	254	2,010	32	174
2.....	5,980	17	274	2,900	22	172	1,910	28	144
3.....	5,900	17	271	3,130	28	237	1,500	22	89
4.....	5,550	17	255	3,860	22	229	1,360	20	73
5.....	4,750	18	231	8,670	43	1,010	1,220	20	66
6.....	5,280	40	sc 650	9,220	58	1,440	1,030	6	17
7.....	7,570	80	a 1,600	8,500	69	1,580	1,380	7	26
8.....	9,260	42	1,050	22,000	190	s 11,800	2,070	12	67
9.....	8,740	23	543	30,200	395	32,200	2,510	13	88
10.....	9,220	40	996	28,900	475	37,100	2,270	12	74
11.....	10,200	37	1,020	19,400	294	15,400	3,320	5	45
12.....	9,220	34	846	11,800	191	6,080	3,700	16	160
13.....	11,100	65	1,950	8,120	80	1,750	2,610	23	162
14.....	10,500	72	2,040	7,170	57	1,100	1,760	15	71
15.....	9,260	86	2,150	10,400	70	1,960	1,300	19	67
16.....	8,500	53	1,220	11,600	94	s 3,280	1,820	16	79
17.....	7,480	35	707	18,200	400	b 20,000	8,400	140	sc 3,400
18.....	9,460	45	sc 1,400	17,900	420	b 20,000	5,940	117	1,880
19.....	14,200	70	2,680	21,400	361	20,800	3,010	56	455
20.....	11,100	62	1,860	29,100	615	48,300	1,700	57	262
21.....	9,460	69	1,760	32,500	447	39,200	1,050	53	150
22.....	8,400	38	862	34,200	186	17,200	1,300	57	200
23.....	7,300	39	769	28,100	372	s 26,400	1,300	132	463
24.....	6,420	41	711	15,200	260	s 11,500	1,150	104	323
25.....	5,470	36	532	9,510	100	a 2,600	1,220	49	161
26.....	4,750	32	410	7,660	38	786	650	35	a 60
27.....	4,260	21	242	5,640	45	a 700	650	22	39
28.....	3,820	18	186	4,380	52	615	764	20	41
29.....	3,470	27	253	3,620	47	459	1,850	21	105
30.....	3,390	32	293	3,170	66	565	3,200	42	363
31.....	--	--	--	2,140	60	347	--	--	--
Total.	225,630	--	28,050	421,720	--	325,064	63,954	--	9,304
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.....	3,240	52	455	506	34	46	197	95	a 50
2.....	2,400	64	415	470	15	19	276	80	a 60
3.....	1,700	75	344	324	8	a 7	405	60	a 65
4.....	1,410	101	384	3,100	90	sc 950	688	55	b 100
5.....	1,380	102	380	1,180	38	121	431	34	40
6.....	2,010	78	423	882	35	83	232	11	7
7.....	2,940	75	a 600	688	--	e 65	190	17	9
8.....	2,860	100	772	578	--	e 45	218	22	13
9.....	2,370	115	736	353	--	--	211	12	7
10.....	2,040	91	501	332	--	--	225	5	3
11.....	1,550	57	238	418	--	--	225	5	3
12.....	903	58	141	524	--	--	197	8	a 4
13.....	903	44	107	431	--	e 25	300	13	10
14.....	987	35	a 95	418	--	--	239	15	a 10
15.....	882	35	83	418	--	--	284	15	12
16.....	802	34	74	431	--	--	232	15	9
17.....	764	35	72	211	--	--	184	15	7
18.....	882	90	sc 290	204	15	8	211	15	8
19.....	903	69	s 183	324	16	14	232	13	a 8
20.....	632	59	101	300	10	8	246	11	7
21.....	650	47	82	197	5	a 3	160	17	a 7
22.....	614	24	40	239	30	2	148	25	10
23.....	966	56	s 170	190	10	5	190	24	12
24.....	1,080	125	364	142	32	12	232	21	13
25.....	882	51	121	253	45	a 30	292	16	13
26.....	632	50	85	260	40	28	260	12	8
27.....	488	44	58	204	17	9	260	13	9
28.....	431	41	48	166	10	4	225	14	a 8
29.....	405	52	57	197	31	16	218	16	9
30.....	614	34	56	166	44	20	184	16	8
31.....	688	37	69	120	78	25	--	--	--
Total.	39,008	--	7,544	14,226	--	1,728	7,592	--	529

Total discharge for year (cfs-days) ..... 2,066,681

Total load for year (tons) ..... 1,096,723

e Estimated.

s Computed by subdividing day.

a Computed from estimated concentration graph.

b Computed from partly-estimated concentration graph.

c Computed partly from water-sediment discharge curve.

## KENTUCKY RIVER BASIN--Continued

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

Particle-size analyses of suspended sediment, March to May 1953

(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	Water discharge (cfs)	Water temperature per- ature (° F)	Suspended sediment											Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters								1.000		
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500
Mar. 4, 1953.....	3:45 p. m.	48,100		793	716	39	52	64	80	90	97	99			BSWCM	
Mar. 4, 1953.....	3:45 p. m.	48,100		793	646	20	32	49	71	92	97	99			BSN	
May 10.....	6:00 p. m.	27,400		467	566	13	29	40	61	79	91	96	99		BSWCM	
May 17.....	3:05 p. m.	17,200		407	629	33	49	63	82	94	99	--			BSWCM	
May 21.....	5:35 p. m.	33,800		389	627	26	38	49	67	81	93	98			BSWCM	
May 23.....	9:45 a. m.	29,800		228	319	14	31	52	76	90	97	--			BSWCM	

## KENTUCKY RIVER BASIN--Continued

## EAGLE CREEK AT GLENCOE, KY.

LOCATION.--At bridge on State Highway 16 at Glencoe, Gallatin County, 5.7 miles downstream from Tennile Creek and 21 miles upstream from mouth.

DRAINAGE AREA.--438 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1948 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 93°F Sept. 1, 2; minimum, 33°F on several days in November, December, and January.

EXTREMES, 1949-53.--Water temperatures: Maximum, 93°F Sept. 1, 2, 1953; minimum, freezing point at times in 1950, 1951, 1952.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Temperature (°F) of water, water year October 1952 to September 1953

Mean of twice-daily measurements at approximately 8 a.m. and 5 p.m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	56	34	37	42	40	50	68	76	86	82	82
2	64	58	34	38	38	38	50	68	72	84	84	93
3	62	52	36	37	42	39	48	71	74	85	82	88
4	63	46	38	36	40	44	48	66	76	82	82	84
5	58	48	42	33	39	40	48	65	77	85	81	79
6	51	48	43	33	42	45	52	66	78	82	78	90
7	49	42	42	34	40	44	52	64	78	82	77	82
8	50	41	46	34	41	38	52	64	80	82	76	84
9	49	46	47	38	38	42	57	66	83	79	78	88
10	50	42	49	40	42	43	60	69	82	78	78	84
11	54	40	36	40	42	46	58	66	80	78	78	84
12	56	46	39	36	42	46	55	70	78	80	77	--
13	58	46	38	38	41	52	52	68	80	80	80	--
14	58	46	36	39	37	52	52	64	78	79	80	--
15	56	56	35	44	41	54	52	64	78	80	79	--
16	54	58	35	42	38	52	50	61	72	80	81	--
17	55	58	41	40	37	52	50	63	74	77	78	--
18	52	58	36	42	39	54	46	63	76	82	76	--
19	54	51	38	44	40	52	44	64	78	80	75	--
20	48	48	41	44	42	52	44	67	80	83	74	--
21	46	46	40	44	42	54	46	68	82	82	75	--
22	47	45	41	42	41	55	55	74	82	79	74	--
23	50	44	42	42	40	56	58	75	82	78	82	--
24	52	43	42	42	42	54	58	74	80	78	76	--
25	55	44	40	34	42	50	62	75	80	78	86	--
26	54	46	36	36	44	46	58	78	82	80	81	--
27	54	42	34	40	46	48	52	76	80	78	80	--
28	43	38	34	43	42	49	55	72	81	80	89	--
29	50	37	35	42	--	50	61	72	84	82	89	--
30	47	34	36	41	--	48	62	78	85	81	76	--
31	54	--	36	42	--	48	--	76	--	81	91	--
Average	54	47	39	39	41	48	53	69	79	81	80	--

## SALT RIVER BASIN

## FLOYDS FORK AT FISHERVILLE, KY.

LOCATION.--At gaging station at bridge on State Highway 155, at Fishersville, Jefferson County, 0.2 mile downstream from Brush Run and 1.5 miles upstream from Poke Lick.

DRAINAGE AREA.--138 square miles.

RECORDS AVAILABLE.--Chemical analyses: June 1952 to September 1953.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Chemical analyses, in parts per million, December 1952 to August 1953.

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO <sub>3</sub>		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate					
Dec. 24, 1952	106	4.7	0.04	59	16	3.1	2.7	186	41	7.0	0.2	17		239			214	61			533	7.3	7
Jan. 23, 1953	96	5.4	.06	60	15	2.3	1.4	204	33	4.0	.1	17		237			213	44			413	7.7	5
Mar. 10	103	4.1	.02	61	15	3.6	1.3	220	31	4.0	.1	6.0		242			216	34			418	7.5	2
Apr. 10	181	4.1	.04	57	15	2.6	1.3	214	26	4.0	.1	6.0		220			203	29			391	7.8	3
June 5	7.2	3.2	.02	56	22	6.4	2.3	248	27	8.5	.0	2.0		272			230	27			458	7.2	5
July 15	.7	3.1	.02	46	14	3.1	3.2	186	23	3.8	.2	1.5		183			170	20			342	7.5	4
Aug. 4	.2	4.9	.08	51	2.7	2.0	3.3	148	17	3.0	.3	1.7		155			138	17			274	7.6	15

## SALT RIVER BASIN--Continued

## SALT RIVER AT SHEPHERDSVILLE, KY.

LOCATION.--At gaging station at bridge on State Highway 61 at Shepherdsville, Bullitt County, 700 feet downstream from Louisville and Nashville Railroad bridge, and 1 mile downstream from Buffalo Run.

DRAINAGE AREA.--1,230 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950, October 1952 to September 1953.

Water temperatures: October 1952 to September 1953.

Sediment records: October 1952 to September 1953.

EXTREMES, 1952-53.--Dissolved solids: Maximum, 258 ppm Dec. 21-31; minimum, 121 ppm July 19-21.

Hardness: Maximum, 208 ppm Dec. 21-31; minimum, 93 ppm July 19-21.

Specific conductance: Maximum daily, 529 micromhos Dec. 23; minimum daily, 146 micromhos Mar. 5.

Water temperatures: Maximum, 87°F July 9; minimum, 35°F Jan. 6-7.

Sediment concentrations: Maximum daily, 1,940 ppm Dec. 10; minimum daily, no flow Sept. 13-30.

Sediment loads: Maximum daily, 103,000 tons Mar. 4; minimum daily, 0 ton Sept. 13-30.

REMARKS.--Records of specific conductance of daily samples from October 1952 to September 1953 available in district office at Columbus, Ohio. Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boiron (B)	Dissolved solids (residue at 180° C)		Hardness as CaCO <sub>3</sub>		Percent sodium	Specific conductance (micro-mhos at 25° C)	pH	Color	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium					Non-carbonate
Oct. 1-10, 1952..	2.54	3.4	0.13	46	10	4.9	3.5	156	21	7.5	0.2	12		190			156	28		323	7.3	8
Oct. 11-20.....	7.82	3.9	0.05	48	8.5	3.5	3.3	168	17	5.0	.2	1.4		179			154	17		309	7.8	5
Oct. 21-31.....	.83	3.7	0.03	50	9.5	4.0	3.6	174	18	7.5	.2	1.2		190			163	21		328	7.7	4
Nov. 1-10.....	.94	1.4	0.02	51	9.0	5.4	2.6	178	19	9.0	.2	1.5		196			164	18		342	7.5	6
Nov. 11-20.....	12.4	6.8	0.03	50	9.7	6.7	3.5	179	18	8.5	.2	1.4		198			164	18		341	7.1	5
Nov. 21-30.....	86.6	13	0.01	57	11	5.9	3.6	201	26	7.0	.2	2.0		231			188	23		387	7.1	7
Dec. 1-10.....	1,842	13	0.03	45	8.3	5.6	2.7	144	28	4.5	.1	7.8		192			147	28		313	7.2	10
Dec. 11-20.....	.997	9.1	0.10	49	8.5	4.0	2.3	144	30	4.5	.1	14		193			157	39		324	7.1	8
Dec. 21-31.....	.395	17	0.01	64	11	6.2	2.1	190	40	12	.1	13		258			208	49		433	7.2	4
Jan. 1-10, 1953..	2,480	12	0.01	52	9.0	4.6	1.0	158	33	5.0	.2	12		208			166	37		350	7.1	4
Jan. 11-20.....	4,017	8.0	0.02	48	7.8	2.6	1.2	143	25	4.0	.2	15		181			152	35		310	7.2	5
Jan. 21-31.....	2,047	7.2	0.01	51	8.0	2.7	1.5	156	25	3.5	.2	14		189			161	32		325	7.4	4
Feb. 1-10.....	.682	8.2	0.01	62	10	2.9	1.2	195	30	4.2	.2	13		227			199	36		390	7.5	4
Feb. 11-20.....	437	5.0	0.01	64	11	3.9	1.5	205	35	5.0	.2	8.8		237			207	37		408	7.6	3
Feb. 21-28.....	712	3.8	0.03	59	10	3.6	.9	184	36	5.0	.2	4.3		226			190	38		376	7.5	5
Mar. 1-10.....	8,808	8.3	0.06	47	7.1	3.2	1.2	144	24	4.0	.2	8.6		184			146	28		304	7.1	4
Mar. 11-20.....	3,994	6.4	0.02	52	7.6	2.7	1.0	162	23	2.8	.2	7.7		192			162	28		324	7.7	5
Mar. 21-31.....	.840	4.6	0.01	62	10	3.2	1.0	205	27	3.5	.1	5.9		246			199	28		369	7.4	2

Apr. 1-6, 1953...	1,092	3.2	0.01	56	10	4.2	1.2	139	29	3.8	0.1	4.2	222	134	27	367	7.2	3
Apr. 7-14.....	2,389	5.6	.01	50	13.2	3.1	1.2	122	25	3.8	.2	4.7	198	164	22	325	7.7	7
Apr. 15-19, 21-23	2,028	7.1	.02	58	17.8	3.5	1.4	156	27	3.0	.2	5.0	214	182	27	354	7.7	7
Apr. 24-25.....	2,028	4.1	.02	38	7.8	2.6	2.3	138	19	2.0	.2	4.8	164	126	22	254	7.4	30
Apr. 26-May 6....	1,232	6.8	.04	58	9.7	3.9	1.9	135	26	3.5	.1	2.7	205	181	20	374	7.4	8
May 7-16.....	1,368	8.7	.12	54	9.7	3.1	1.7	180	22	4.8	.1	5.3	204	175	27	349	7.3	8
May 17-19.....	16,070	8.1	.66	37	5.1	2.5	2.6	118	13	3.8	.2	6.0	158	114	17	236	7.3	35
May 20-29.....	1,895	10	.10	60	8.7	3.2	1.7	191	20	4.8	.1	8.6	216	185	29	386	7.5	6
May 30-June 7...	1,222	7.3	.02	59	11	4.2	1.5	207	24	6.8	.1	4.0	222	194	23	389	7.5	2
June 8-20.....	201	13	.05	47	6.6	4.2	3.7	160	15	4.8	.2	4.1	182	144	13	286	7.2	8
June 21-30.....	105	6.9	.03	53	8.7	4.5	3.1	133	19	4.2	.1	4	200	168	18	343	7.4	5
July 1-9.....	246	9.0	.03	43	5.8	3.4	2.9	137	18	4.1	.1	4.1	189	131	19	307	7.3	5
July 10-18.....	140	9.7	.03	43	6.6	3.7	2.8	136	19	3.8	.2	5.7	187	135	23	287	7.5	7
July 19-21.....	877	7.7	.03	30	4.3	3.4	2.5	96	14	3.6	.2	5.1	121	93	14	185	7.2	7
July 22-Aug. 2...	202	8.7	.03	41	5.2	2.8	3.0	135	15	3.6	.2	3.4	156	125	13	256	7.5	5
Aug. 3-13.....	272	6.3	.02	32	4.2	2.0	2.8	100	12	2.5	.3	4.1	123	97	14	202	7.2	15
Aug. 14-26.....	12.6	6.3	.02	41	5.9	2.1	3.0	138	12	3.1	.3	2.5	151	127	13	254	7.5	12
Aug. 27-Sept. 8...	51	6.4	.01	42	7.2	2.2	3.4	148	12	4.4	.1	1.7	155	135	13	272	7.0	15
Sept. 9-20.....	.03	3.4	.01	40	8.1	3.3	3.4	139	15	7.5	.1	1.3	158	133	19	276	7.0	15
Sept. 21-30.....	.00	5.5	.01	33	6.9	6.4	3.9	103	17	13	.2	2.3	154	112	22	280	6.9	15
Average.....	1,209	7.3	0.05	49	8.3	3.8	2.3	161	22	5.1	0.2	5.9	191	156	24	321	--	8

## SALT RIVER BASIN--Continued

## SALT RIVER AT SHEPHERDSVILLE, KY.--Continued

Temperature (°F) of water, water year October 1952 to September 1953  
 /Once-daily temperature measurement at approximately 7:30 a. m./

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



## SALT RIVER BASIN--Continued

## SALT RIVER AT SHEPHERDSVILLE, KY.--Continued

Suspended sediment, water year October 1952 to September 1953

Day	October			November			December		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	0.5			0.8	--		48	10	a1
2.....	.3			1.0	9		48	9	1
3.....	.2			.8	--		62	10	2
4.....	.2			.8	--		463	171	s504
5.....	.4			.8	--		4,350	1,090	12,800
6.....	2.5			.8	--		3,070	742	s6,560
7.....	2.1			.8	--		856	152	351
8.....	2.1			.8	--		440	85	101
9.....	3.1			1.0	--		827	409	s2,190
10.....	14			1.8	10	(t)	8,260	1,940	s41,000
11.....	19			1.8	--		5,490	1,050	s17,400
12.....	15			2.1	--		1,310	232	s867
13.....	12			2.1	--		1,120	96	290
14.....	9.6			2.1	--		532	60	86
15.....	6.2			2.1	--		395	44	47
16.....	5.0			2.1	29		308	37	31
17.....	4.0			2.1	--		244	31	20
18.....	3.1			2.1	--		208	24	13
19.....	2.5			18	18	a1	186	20	10
20.....	1.8			90	14	3	178	19	9
21.....	1.5			65	10	a2	240	20	13
22.....	.8			58	8	1	321	20	17
23.....	.7			102	8	2	484	23	30
24.....	.7			124	11	4	641	25	43
25.....	.8			118	10	a3	613	28	46
26.....	.8			113	10	3	478	24	31
27.....	.8			95	10	2	390	18	19
28.....	.7			76	12	2	316	15	13
29.....	.7			62	18	3	258	14	10
30.....	.8			53	12	2	228	14	9
31.....	.8			--	--	--	372	13	13
Total.	112.7		e15	999.9	--	29	32,736	--	82,527
Day	January			February			March		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	1,060	72	206	1,190	37	119	370	18	18
2.....	954	105	270	978	28	74	945	28	s85
3.....	1,190	81	260	826	21	47	12,700	1,400	s61,400
4.....	2,060	148	823	706	17	32	28,000	1,360	103,000
5.....	1,380	80	300	613	10	17	23,800	578	37,300
6.....	954	38	98	578	9	14	11,700	207	6,540
7.....	866	30	70	564	9	14	5,210	76	1,070
8.....	4,070	354	s4,130	514	5	7	2,480	50	335
9.....	5,720	360	5,560	448	6	7	1,680	44	200
10.....	6,540	481	s9,000	400	5	5	1,200	32	104
11.....	6,450	444	7,730	390	8	8	1,030	21	58
12.....	3,280	153	s1,430	484	10	13	914	18	44
13.....	1,840	72	358	578	11	17	1,000	21	57
14.....	1,370	45	166	585	8	13	1,880	441	s4,040
15.....	1,100	37	110	532	7	10	11,700	1,920	60,600
16.....	1,000	34	92	454	9	11	11,400	700	21,500
17.....	3,540	270	sb4,700	400	11	12	3,990	283	s3,200
18.....	12,700	674	23,100	345	10	9	2,900	206	1,610
19.....	6,370	284	s5,390	308	5	4	3,140	203	1,720
20.....	2,520	113	769	298	5	4	1,990	92	494
21.....	1,670	59	266	800	24	s64	1,470	48	190
22.....	1,270	38	130	1,360	119	437	1,220	31	102
23.....	1,060	30	86	898	189	458	1,140	29	89
24.....	1,360	70	257	855	105	186	1,020	22	60
25.....	2,530	500	sc3,900	557	62	93	858	16	37
26.....	2,340	396	s2,700	526	34	48	730	10	20
27.....	1,370	205	758	484	28	36	641	5	9
28.....	3,680	430	sc4,900	420	23	26	578	5	8
29.....	3,760	380	sc4,200	--	--	--	514	7	10
30.....	2,020	104	567	--	--	--	613	26	s58
31.....	1,460	55	217	--	--	--	613	26	s58
Total.	87,494	--	82,543	16,891	--	1,785	137,267	--	303,964

e Estimated.

s Computed by subdividing day.

t Less than 0.50 ton.

a Computed from estimated concentration graph.

b Computed from partly-estimated concentration graph.

c Computed partly from water-sediment discharge curve.

## SALT RIVER BASIN--Continued

## SALT RIVER AT SHEPHERDSVILLE, KY.--Continued

Suspended sediment, water year October 1952 to September 1953--Continued

Day	April			May			June		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	1,350	106	386	1,110	50	150	212	17	10
2.....	1,410	85	324	842	47	107	178	17	8
3.....	1,000	54	146	648	37	65	151	20	a 8
4.....	762	30	62	683	28	52	135	22	8
5.....	648	25	44	2,300	108	671	118	19	6
6.....	1,320	72	s 374	3,080	277	2,300	100	22	6
7.....	4,360	410	c 4,800	2,070	232	1,300	568	150	sc 450
8.....	2,790	153	1,150	1,600	123	531	1,000	335	s 1,010
9.....	2,570	85	590	1,190	72	231	385	117	122
10.....	2,790	550	c 4,100	949	47	120	220	104	62
11.....	2,210	486	2,900	784	63	133	151	110	45
12.....	1,700	178	817	656	70	124	113	70	21
13.....	1,460	72	284	629	34	58	100	51	14
14.....	1,230	54	179	968	41	107	76	34	7
15.....	996	34	91	1,620	90	394	58	34	5
16.....	1,210	45	147	3,210	187	s 2,550	138	58	22
17.....	1,090	49	144	14,800	458	18,300	135	52	19
18.....	2,620	270	sc 2,800	19,400	400	21,000	102	25	7
19.....	7,630	513	10,600	14,000	148	5,590	76	21	4
20.....	4,100	162	1,790	7,030	153	2,900	58	13	2
21.....	2,190	80	473	4,140	240	2,680	60	14	2
22.....	1,580	40	170	2,120	219	1,250	55	20	3
23.....	1,310	27	95	1,380	77	287	41	25	3
24.....	3,620	1,330	s 14,900	1,270	73	250	62	40	b 7
25.....	2,210	804	4,800	954	45	116	58	15	2
26.....	1,260	119	405	738	37	74	31	16	1
27.....	1,020	66	182	564	37	56	18	17	1
28.....	906	36	88	420	56	64	23	24	1
29.....	802	32	69	335	38	34	51	21	3
30.....	898	50	121	290	32	25	654	85	sc 200
31.....	--	--	--	249	24	16	--	--	--
Total.	59,042	--	53,031	90,029	--	61,535	5,127	--	2,059
Day	July			August			September		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	683	266	490	226	85	sb 65	0.5	18	(t)
2.....	254	282	193	285	83	64	.4	19	
3.....	135	168	61	132	265	s 102	.3	--	
4.....	88	62	15	229	112	s 76	.3	--	
5.....	76	53	11	1,310	700	b 2,500	.1	--	
6.....	76	52	11	564	829	1,260	.1	20	(t)
7.....	118	65	sb 25	254	610	418	.1	--	
8.....	420	120	sb 160	132	468	167	.1	--	
9.....	360	208	202	82	391	86	.1	18	
10.....	193	171	89	55	416	62	.1	--	
11.....	113	143	44	82	308	68	.1	--	(t)
12.....	76	93	19	90	216	52	.1	26	
13.....	55	74	11	65	92	16	0	--	
14.....	41	46	5	43	53	6	0	--	
15.....	30	38	3	30	42	3	0	--	
16.....	24	21	1	23	36	2	0	--	0
17.....	85	35	sb 14	17	41	2	0	--	0
18.....	645	70	sc 190	12	51	2	0	--	0
19.....	1,480	120	sc 550	8.8	35	1	0	--	0
20.....	730	320	631	6.8	27	(t)	0	--	0
21.....	420	137	155	6.2	33	1	0	--	0
22.....	370	90	90	5.0	50	1	0	--	0
23.....	532	109	156	4.5	68	1	0	--	0
24.....	430	102	118	3.1	69	1	0	--	0
25.....	193	85	44	2.8	48		0	--	0
26.....	124	69	23	2.1	28		0	--	0
27.....	88	64	15	1.5	24		0	--	0
28.....	60	54	9	1.0	20	(t)	0	--	0
29.....	50	42	6	.8	17		0	--	0
30.....	40	26	3	.7	15		0	--	0
31.....	30	34	3	.7	17		--	--	--
Total.	8,019	--	3,347	3,675.0	--	4,957	2.3	--	(t)
Total discharge for year (cfs-days) .....									441,394.9
Total load for year (tons) .....									595,792

s Computed by subdividing day.

t Less than 0.50 ton.

a Computed from estimated concentration graph.

b Computed from partly-estimated concentration graph.

c Computed partly from water-sediment discharge curve.

## SALT RIVER BASIN--Continued

## SALT RIVER AT SHEPHERDSVILLE, KY. --Continued

Particle-size analyses of suspended sediment, water year October 1952 to September 1953

(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	Water discharge (cfs)	Water temperature (° F)	Suspended sediment													Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Dec. 6, 1952 . . .	7:30 a. m.	3,670		991	757	60	65	80	88	96	100	--					BSWCM
Dec. 10 . . .	3:50 p. m.	9,820		1,510	1,290	55	67	78	90	98	100	--					BSWCM
Jan. 13, 1953 . . .	4:35 p. m.	13,400		693	580	64	74	82	91	98	100	--					BSWCM
Jan. 18 . . .	4:35 p. m.	13,400		693	643	30	44	67	85	100	--	--					BN
Jan. 26 . . .	1:30 p. m.	1,970		274	926	69	75	84	88	90	100	--					BSWCM
Jan. 29 . . .	7:30 a. m.	4,350		437	677	--	72	80	90	95	100	--					BSWCM
Mar. 4 . . .	4:00 p. m.	28,800		1,250	884	50	62	76	90	97	100	--					BSWCM
Mar. 4 . . .	4:00 p. m.	28,800		1,250	893	33	51	69	84	99	99	100					BSN
Mar. 15 . . .	8:30 a. m.	11,000		2,210	1,540	46	54	68	74	79	98	99					BSWCM
Mar. 15 . . .	8:30 a. m.	11,000		2,210	1,750	28	41	59	77	98	99	99					BSN
Apr. 11 . . .	7:40 a. m.	2,380		623	425	65	85	94	97	99	99	--					BSWCM
Apr. 11 . . .	7:40 a. m.	2,380		623	433	36	55	80	94	98	98	--					BSN
Apr. 19 . . .	9:00 a. m.	8,860		624	516	59	68	76	86	99	99	--					BSWCM
Apr. 19 . . .	9:00 a. m.	8,860		624	510	22	34	52	67	69	98	--					BSN
Apr. 24 . . .	4:00 p. m.	4,560		1,570	1,030	40	49	65	78	98	99	99					BSWCM
Apr. 24 . . .	4:00 p. m.	4,560		1,570	1,120	18	28	45	67	99	99	99					BSN
May 17 . . .	9:00 a. m.	14,100		481	803	56	85	75	89	97	100	--					BSWCM
May 18 . . .	11:15 a. m.	19,300		458	628	49	60	73	91	98	100	--					BSWCM
July 9 . . .	10:15 a. m.	375		264	490	88	94	95	96	96	98	--					BSWCM
July 20 . . .	8:00 a. m.	810		613	613	86	92	94	94	95	99	--					BSWCM
Aug. 6 . . .	7:30 a. m.	698		892	587	84	88	90	90	91	99	--					BSWCM

## SALT RIVER BASIN--Continued

## ROLLING FORK NEAR BOSTON, KY.

LOCATION.--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.

RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 86°F June 27, July 1, 3, 5; minimum, freezing point Nov. 29, 30, Dec. 1, Jan. 6, 7.

EXTREMES, 1949-53.--Water temperatures: Maximum, 88°F Sept. 2, 1951; minimum, freezing point on several days during winter months, in 1951, 1952, 1953.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Temperature (°F) of water, water year October 1952 to September 1953  
/Mean of twice-daily measurements at approximately 8 a.m. and 4:30 p.m./

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

## GREEN RIVER BASIN

## GREEN RIVER AT GREENSBURG, KY.

LOCATION.--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 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 87°F July 31; minimum, 39°F Mar. 3, 4.

EXTREMES, 1949-53.--Water temperatures: Maximum, 89°F July 1, 2, 23, Aug. 4, 1952, minimum, freezing point Dec. 18, 1951.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Temperature (°F) of water, water year October 1952 to September 1953  
/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	72	66	50	47	44	42	52	63	58	80	81	79
2	74	62	51	47	46	41	52	62	58	78	83	78
3	72	64	54	45	44	40	52	58	60	78	82	81
4	70	62	51	50	46	40	52	55	60	77	80	77
5	70	64	49	48	44	42	54	56	60	77	80	78
6	70	60	52	50	46	47	50	58	62	77	79	75
7	71	63	50	46	47	45	54	52	60	72	81	74
8	72	62	51	50	42	46	53	53	61	76	80	72
9	72	60	49	46	43	46	53	52	59	74	76	71
10	70	62	52	46	43	48	54	56	60	76	75	73
11	71	64	51	46	40	46	51	58	57	73	76	75
12	66	62	51	50	42	45	52	52	80	76	78	74
13	68	59	48	45	41	44	54	56	56	75	78	74
14	66	61	52	48	44	47	52	54	63	78	79	66
15	67	62	50	46	42	46	50	54	61	80	84	64
16	67	60	51	52	41	46	51	52	77	78	81	64
17	69	58	49	46	43	48	63	55	78	80	81	66
18	67	62	52	47	44	48	52	55	78	77	80	64
19	65	60	50	48	41	46	53	54	81	82	78	71
20	64	60	48	45	42	46	50	58	81	81	76	70
21	66	60	50	46	42	44	52	58	80	79	74	68
22	66	59	50	44	41	45	54	58	80	81	76	65
23	62	55	51	46	42	46	57	59	78	81	76	62
24	66	56	50	42	40	46	57	61	79	80	76	62
25	62	63	50	44	42	45	56	60	80	78	78	66
26	68	56	48	44	42	48	59	61	80	80	78	66
27	65	52	50	45	42	44	54	58	80	81	80	68
28	68	53	49	42	40	48	60	62	80	81	82	66
29	64	50	50	42	--	47	62	64	80	78	80	62
30	65	52	48	41	--	44	62	64	78	82	78	66
31	63	--	50	42	--	48	--	59	--	82	78	--
Average	68	59	50	46	43	45	54	57	70	78	79	70

GREEN RIVER BASIN--Continued  
GREEN RIVER AT MUMFORDVILLE, KY.

LOCATION.--At gaging station at bridge on U. S. Highway 31W, at Mumfordsville, Hart County.

DRAINAGE AREA.--1,790 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1953.

Water temperatures: October 1950 to September 1953.

Water records: April 1951 to September 1953.

EXTREMES, 1952-53.--Dissolved solids: Maximum, 200 ppm Nov. 1-10; minimum, 97 ppm July 9-11.

Specific conductance: Maximum, 161 ppm Sept. 21-30; minimum, 66 ppm July 9-11.

Water temperature: Maximum, 79.3° F., 34.9 micromhos Oct. 30, Nov. 2; minimum, 37° F. Dec. 16.

Sediment concentrations: Maximum daily, 1.140 ppm July 8; minimum daily, 1 ppm Dec. 1, Jan. 5.

Sediment loads: Maximum daily, 29,700 tons Mar. 24; minimum daily, 10 tons on several days during November, December, January, and September.

EXTREMES, 1950-53.--Dissolved solids: Maximum, 200 ppm Nov. 1-10, 1952; minimum, 86 ppm Feb. 1-10, 1951.

Specific conductance: Maximum, 161 ppm Sept. 21-30, 1953; minimum, 66 ppm July 9-11, 1953.

Water temperature: Maximum daily, 34.9° C., 94.8° F., 1952; minimum daily, 58.9 micromhos Mar. 25, 1952.

Sediment concentrations (1951-53): Maximum daily, 3.140 ppm Dec. 1, 1952, Jan. 5, 1953.

Sediment loads (1951-53): Maximum daily, 153,000 tons Mar. 23-24, 1952; minimum daily, 1 ton on several days during November and December 1952, January and September 1953.

REMARKS.--Records of specific conductance of daily samples for October 1950 to September 1953 available in district office at Columbus, Ohio. Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO <sub>3</sub>		Percent adsorption	Specific conductance (micro-mhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate				
Oct. 1-10, 1952..	96.2	14	0.01	47	8.0	7.5	1.3	172	12	10	0.0	1.2		193		150	9		332	7.8	3
Oct. 11-20 .....	133	16	.01	47	8.0	8.1	1.2	170	13	9.5	.1	1.3		183		150	11		321	7.5	2
Oct. 21-31 .....	104	17	.01	48	7.8	8.8	.8	174	13	12	.0	1.3		183		150	9		330	7.5	3
Nov. 1-10 .....	114	18	.01	50	8.0	9.1	.9	180	13	12	.0	1.0		180		150	10		338	7.5	3
Nov. 11-20 .....	165	10	.01	47	7.8	5.3	1.8	168	14	9.0	.1	.7		178		150	12		311	7.5	3
Nov. 21-30 .....	205	11	.14	46	7.5	5.0	1.8	161	14	8.5	.1	.6		175		146	14		300	7.7	5
Dec. 1-10 .....	507	11	.01	39	7.3	5.4	1.9	133	18	7.5	.1	.8		159		127	18		264	7.3	5
Dec. 11-20 .....	651	8.4	.01	32	6.8	3.1	2.0	96	23	5.8	.1	.3		135		107	28		224	7.1	4
Dec. 21-31 .....	260	9.6	.02	38	7.0	4.4	1.1	121	22	7.2	.1	.3		158		124	24		260	7.2	4
Jan. 1-10, 1953 ..	1,286	6.8	.02	36	7.8	3.4	.8	116	21	6.8	.1	.6		147		123	27		247	7.3	3
Jan. 11-20 .....	2,592	7.5	.06	29	7.0	3.0	1.1	81	20	4.2	.1	5.4		120		101	27		205	7.2	5
Jan. 21-31 .....	4,648	10	.01	25	6.1	3.1	.9	86	16	2.5	.1	5.1		109		87	17		177	7.1	5
Feb. 1-10 .....	1,389	8.8	.01	31	7.3	3.5	.5	107	17	3.5	.1	4.2		126		107	20		212	7.2	2
Feb. 11-20 .....	2,339	6.7	.01	30	7.5	3.1	1.0	106	17	3.8	.0	2.8		125		106	19		212	7.2	3
Feb. 21-28 .....	2,800	7.5	.04	27	4.9	2.1	.8	92	15	2.5	.1	2.8		112		88	12		190	7.6	4
Mar. 1-10 .....	3,845	7.0	.04	26	3.9	2.0	.8	87	11	2.5	.1	3.7		106		92	10		173	7.3	2
Mar. 11-20 .....	3,861	7.3	.03	30	4.1	2.4	1.1	101	11	2.8	.1	3.5		115		92	9		194	7.5	2
Mar. 21-31 .....	2,406	6.9	.02	29	5.1	2.5	.5	103	11	3.1	.1	2.4		119		94	9		197	7.2	1

Apr. 1-10, 1953 ..	2,219	7.5	0.03	27	7.8	1.9	0.8	103	13	3.1	0.1	2.3	117		99	15	203	6.9	5
Apr. 11-20 .....	3,521	8.5	.10	26	5.8	2.2	.6	94	12	2.5	.1	2.4	105		89	12	182	7.0	5
Apr. 21-30 .....	2,452	11	.04	30	5.1	3.1	1.0	107	12	2.5	.0	2.4	122		97	8	205	7.2	2
May 1-10 .....	5,487	9.4	.04	28	5.3	2.9	1.2	95	13	2.5	.0	2.5	114		92	14	189	7.1	2
May 11-20 .....	7,033	12	.03	30	5.3	2.9	1.2	105	12	2.5	.0	3.2	119		96	11	200	7.3	2
May 21-25 .....	1,286	11	.07	21	4.9	3.7	1.2	36	13	2.0	.0	3.3	120		83	12	171	7.3	7
May 26-June 7 ...	1,076	13	.04	38	5.8	3.0	1.2	128	11	3.9	.0	3.0	145		118	14	243	7.5	3
June 8-20 .....	799	11	.10	35	4.9	3.4	1.4	119	8.6	6.0	.1	2.6	136		108	10	226	7.4	3
June 21-30 .....	426	11	.02	47	1.0	3.9	1.7	134	11	5.2	.1	3.6	145		122	12	251	7.8	5
July 1-8 .....	610	14	.02	43	1.0	3.3	1.7	119	10	4.5	.1	3.0	138		112	14	224	7.8	5
July 9-11 .....	1,457	7.9	.08	20	4.0	2.6	2.2	69	11	4.2	.1	4.9	97		86	10	147	7.2	10
July 12-24 .....	510	13	.02	34	5.8	5.8	2.1	119	15	6.2	.1	2.4	150		109	11	232	7.5	10
July 25-Aug. 5 ..	497	9.5	.03	34	3.9	3.6	1.7	111	11	5.0	.1	2.4	127		100	10	210	7.5	3
Aug. 6-15 .....	311	11	.10	31	5.7	3.9	1.7	110	11	5.5	.1	2.9	130		102	11	217	7.6	8
Aug. 16-28 .....	184	8.1	.04	39	6.8	4.8	1.8	136	11	7.0	.1	2.2	151		126	14	264	7.7	5
Aug. 29-Sept. 10 ..	57.6	11	.02	45	7.6	6.9	1.6	158	11	9.8	.1	2.1	174		143	14	303	7.3	3
Sept. 11-20 .....	77.6	11	.02	50	7.3	8.1	1.2	172	12	12	.1	1.9	183		136	14	331	7.6	1
Sept. 21-30 .....	73.5	8.8	.04	50	8.8	8.1	1.4	174	16	12	.1	1.5	194		161	13	337	7.6	1
Average .....	1,753	10	0.04	36	6.1	4.3	1.3	121	14	5.8	0.1	2.5	143		115	16	242	--	4

## GREEN RIVER BASIN--Continued

## GREEN RIVER AT MUNFORDVILLE, KY.--Continued

Temperature (°F) of water, water year October 1952 to September 1953  
 [Once-daily temperature measurement at approximately 7 a. m.]

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



## GREEN RIVER BASIN--Continued

## GREEN RIVER AT MUNFORDVILLE, KY.--Continued

Suspended sediment, water year October 1952 to September 1953

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.....	102	13	4	102	9	2	202	1	1
2.....	102	12	3	102	9	2	210	2	1
3.....	92	12	3	109	7	2	215	3	2
4.....	89	11	3	112	6	2	220	4	2
5.....	89	10	2	116	5	2	292	5	4
6.....	92	10	2	112	5	2	536	40	sa 75
7.....	92	10	2	112	7	2	668	37	67
8.....	89	9	2	116	8	2	992	137	367
9.....	95	9	2	120	8	2	794	92	197
10.....	120	9	3	134	7	2	938	177	448
11.....	150	10	4	150	7	3	1,050	203	576
12.....	154	10	4	158	2	1	914	161	397
13.....	166	10	4	170	2	1	1,140	114	351
14.....	162	12	5	202	4	2	860	63	146
15.....	146	12	5	179	3	1	632	37	63
16.....	126	12	4	158	4	2	500	22	30
17.....	116	12	4	146	4	2	422	16	18
18.....	106	11	3	138	5	2	362	12	12
19.....	102	11	3	162	5	2	326	10	9
20.....	106	13	4	184	5	2	304	11	9
21.....	106	11	3	179	5	2	292	10	8
22.....	102	10	3	174	6	3	282	10	8
23.....	102	10	3	184	5	2	276	10	7
24.....	102	10	3	179	4	2	270	10	7
25.....	102	10	3	179	5	2	265	10	7
26.....	102	9	2	179	5	2	260	10	7
27.....	106	9	2	265	5	4	255	8	6
28.....	106	9	2	265	5	4	250	5	3
29.....	109	8	2	235	2	1	240	2	1
30.....	106	8	2	215	2	1	230	2	1
31.....	102	8	2	--	--	--	235	2	1
Total.	3,441	--	93	4,836	--	61	14,432	--	2,831
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.....	245	2	1	2,410	31	202	1,330	11	40
2.....	250	2	1	1,940	28	147	2,320	112	s 891
3.....	276	2	1	1,630	24	106	7,280	587	s 12,600
4.....	320	2	2	1,390	16	60	15,300	719	29,700
5.....	404	1	1	1,210	14	46	18,000	391	19,000
6.....	500	2	3	1,120	13	39	16,400	178	7,880
7.....	800	13	s 35	1,120	12	36	11,000	91	2,700
8.....	1,900	213	s 1,200	1,100	12	36	4,790	63	815
9.....	3,430	506	4,690	1,030	11	30	3,340	41	370
10.....	4,740	495	6,340	938	11	28	2,690	30	b 220
11.....	4,690	288	3,650	878	10	24	2,250	22	134
12.....	3,910	211	2,230	1,210	35	s 127	1,930	19	b 100
13.....	2,770	63	471	2,360	67	427	1,790	17	82
14.....	1,900	33	169	2,870	51	395	1,780	80	s 405
15.....	1,420	23	88	2,470	32	213	4,230	729	8,320
16.....	1,160	23	72	1,980	20	107	4,370	176	2,080
17.....	1,030	17	47	1,720	16	74	3,670	87	882
18.....	1,700	110	s 648	1,490	12	48	3,820	200	sa 2,200
19.....	3,300	228	2,030	1,270	9	31	5,930	260	a 4,200
20.....	4,040	163	1,780	1,140	7	22	5,840	91	1,430
21.....	2,910	81	636	1,870	80	sa 600	4,440	48	575
22.....	2,460	57	378	3,990	170	a 1,800	3,220	42	365
23.....	2,200	45	267	4,770	107	1,380	2,710	34	249
24.....	2,980	410	s 4,640	3,660	68	672	2,520	23	156
25.....	8,280	860	19,200	2,600	27	190	2,520	20	136
26.....	9,480	463	11,800	2,130	20	115	2,550	16	110
27.....	8,010	161	3,480	1,830	23	114	2,200	11	65
28.....	4,200	85	964	1,550	17	71	1,890	10	b 50
29.....	3,830	61	631	--	--	--	1,650	9	40
30.....	3,700	61	609	--	--	--	1,450	8	31
31.....	3,080	45	374	--	--	--	1,320	8	28
Total.	89,915	--	66,438	53,676	--	7,140	144,530	--	95,834

s Computed by subdividing day.

a Computed partly from water-sediment discharge curve.

b Computed from estimated concentration graph.

## GREEN RIVER BASIN--Continued

## GREEN RIVER AT MUNFORDVILLE, KY.--Continued

Suspended sediment, water year October 1952 to September 1953--Continued

Day	Mean discharge (cfs)	April		Mean discharge (cfs)	May		Mean discharge (cfs)	June	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	2,030	291	s 2,340	4,320	310	a 3,600	848	20	46
2.....	3,550	780	7,480	4,820	312	4,060	758	18	33
3.....	2,640	120	855	4,340	275	3,220	692	15	28
4.....	2,170	30	176	3,910	165	1,740	632	15	26
5.....	1,760	22	104	6,080	400	sa 7,100	590	15	24
6.....	1,540	14	58	9,780	358	9,450	830	200	sa 500
7.....	1,550	11	46	7,800	124	2,610	740	126	252
8.....	1,890	19	97	5,520	71	1,060	722	64	125
9.....	2,370	32	205	4,380	96	1,140	668	48	86
10.....	2,690	112	813	3,720	75	753	632	42	72
11.....	3,480	212	1,990	2,960	53	424	668	36	65
12.....	4,230	134	1,530	2,300	44	273	890	57	137
13.....	3,840	97	1,000	1,840	36	179	962	67	174
14.....	3,620	52	508	1,710	298	s 1,640	746	45	91
15.....	3,050	38	313	2,720	830	6,100	788	75	sa 180
16.....	2,580	33	230	3,220	241	s 2,250	1,110	120	a 360
17.....	2,240	47	284	6,780	565	10,300	1,050	130	b 370
18.....	2,540	59	405	11,300	685	20,900	950	180	462
19.....	4,640	230	a 2,900	16,600	430	19,300	680	188	345
20.....	4,990	96	1,290	20,900	254	14,300	524	100	141
21.....	4,270	48	553	23,000	200	12,400	446	68	82
22.....	3,200	27	233	21,500	88	5,110	392	57	60
23.....	2,560	22	152	11,800	45	s 1,360	356	43	41
24.....	2,630	310	sa 2,400	4,120	77	856	320	36	31
25.....	2,930	438	3,460	2,880	58	451	298	32	26
26.....	2,380	100	643	2,280	55	338	298	25	20
27.....	1,840	58	288	1,820	48	236	380	160	sa 200
28.....	1,540	57	237	1,490	35	141	506	244	333
29.....	1,350	26	95	1,250	34	115	488	104	137
30.....	1,820	190	sa 1,200	1,090	38	112	776	140	a 290
31.....	--	--	--	968	23	60	--	--	--
Total.	81,920	--	31,885	197,198	--	131,578	19,740	--	4,737
July				August			September		
1.....	668	128	231	250	21	14	91	15	4
2.....	638	180	310	327	55	sc 70	86	21	5
3.....	530	154	220	632	85	c 140	82	18	4
4.....	410	77	85	590	93	148	82	18	4
5.....	392	36	38	458	50	62	86	16	4
6.....	362	37	36	410	35	39	86	11	2
7.....	326	27	24	542	60	88	82	12	3
8.....	1,550	650	sa 3,300	470	51	65	82	12	3
9.....	2,380	1,110	7,130	356	32	31	82	10	2
10.....	1,270	457	1,570	298	32	26	78	10	2
11.....	722	274	534	250	39	26	74	10	2
12.....	512	104	144	225	27	16	82	10	2
13.....	404	76	83	202	24	13	82	7	2
14.....	332	55	49	184	24	12	78	7	1
15.....	287	40	31	170	20	9	78	7	1
16.....	255	40	28	161	16	7	78	8	2
17.....	304	60	sc 50	148	14	6	78	9	2
18.....	422	170	sa 220	320	13	11	74	8	2
19.....	326	101	89	255	12	8	74	7	1
20.....	362	45	44	179	11	5	78	8	2
21.....	824	108	240	152	10	4	86	8	2
22.....	680	62	114	156	10	4	82	8	2
23.....	872	120	sa 310	143	11	4	74	12	2
24.....	1,050	140	c 400	320	20	c 17	69	9	2
25.....	1,060	132	378	255	14	10	69	10	2
26.....	776	78	163	170	15	7	69	10	2
27.....	536	39	56	138	13	5	74	9	2
28.....	404	28	31	121	11	4	74	11	2
29.....	326	24	21	108	10	3	69	12	2
30.....	276	23	17	99	9	2	69	10	2
31.....	332	50	sc 45	95	13	3	--	--	--
Total.	19,588	--	15,991	8,184	--	859	2,348	--	70

Total discharge for year (cfs-days)..... 639,808  
 Total load for year (tons)..... 357,517

s Computed by subdividing day.

b Computed from estimated concentration graph.

a Computed partly from water-sediment discharge curve. c Computed from partly-estimated concentration graph.

## GREEN RIVER BASIN--Continued

## GREEN RIVER AT MUNFORDVILLE, KY.--Continued

Particle-size analyses of suspended sediment, water year October 1952 to September 1953  
 (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	Water discharge (cfs)	Water temperature (° F)	Suspended sediment											Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500
Jan. 25, 1953 . . .	12:25 p. m.	8,500		709	580	42	50	67	85	93	99	--				BSWCM
Jan. 25 . . .	12:25 p. m.	8,500		709	428	20	32	55	85	97	98	--				BSN
Jan. 26 . . .	7:00 a. m.	9,430		642	961	40	52	71	89	98	99	--				BSWCM
Mar. 4 . . .	12:45 p. m.	15,800		827	709	46	62	74	90	97	99	--				BSWCM
Mar. 4 . . .	12:45 p. m.	15,800		827	513	25	39	62	83	98	99	--				BSN
Apr. 2 . . .	7:00 a. m.	3,880		919	1,310	41	54	71	86	97	100	--				BSWCM
May 2 . . .	1:30 p. m.	4,940		424	566	34	50	66	89	98	99	--				BSWCM
May 6 . . .	7:00 a. m.	10,100		421	570	36	47	55	67	75	89	--				BSWCM
May 15 . . .	7:00 a. m.	2,780		1,110	687	24	40	59	76	88	100	--				BSWCM
May 17 . . .	7:00 a. m.	6,400		520	317	37	41	56	78	95	100	--				BSWCM
May 18 . . .	1:30 p. m.	11,800		644	407	46	65	75	86	94	100	--				BSWCM
May 19 . . .	10:20 a. m.	16,200		437	553	38	54	68	85	94	99	--				BSWCM
May 20 . . .	3:05 p. m.	21,300		243	614	34	44	54	75	88	98	99				BSWCM
May 20 . . .	3:05 p. m.	21,300		243	748	26	40	60	82	94	97	--				BSN
July 9 . . .	7:00 a. m.	2,700		1,300	1,580	46	61	79	92	96	99	100				BSWCM

GREEN RIVER BASIN

GREEN RIVER BASIN--Continued  
BARREN RIVER AT BOWLING GREEN, KY.

LOCATION.--At bridge on U. S. Highways 31W and 68, 400 feet upstream from gaging station and old bridge, at Bowling Green, Warren County, 6 miles downstream from Drakes Creek, and 8.9 miles upstream from Jennings Creek.

DRAINAGE AREA.--1,680 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.

Water temperatures: October 1949 to September 1950, October 1952 to September 1953.

Sediment records: November 1952 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 82°F July 31-Aug. 2, Aug. 17; minimum, 38°F Jan. 6.

Sediment concentrations: Maximum daily, 1,880 ppm June 17; minimum daily, 1 ppm Nov. 21-22, Dec. 25.

Sediment loads: Maximum daily, 34,200 tons June 17; minimum daily, 1 ton on several days during November, December, and September.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Temperature, (°F) of water, water year October 1952 to September 1953

(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.....	66	66	49	49	44	43	40	40	46	46	50	50	54	52	61	60	73	72	80	79	82	81	81	77
2.....	66	66	50	49	43	43	40	40	46	46	50	50	54	53	63	63	81	73	80	79	82	81	81	78
3.....	66	62	51	61	43	43	41	41	47	46	52	50	53	53	64	63	73	72	80	80	79	78	80	79
4.....	64	62	51	51	43	43	40	40	47	47	53	51	53	53	64	64	72	72	81	80	79	79	80	79
5.....	62	62	51	50	43	43	40	40	47	46	53	53	53	53	65	65	72	72	81	80	79	79	79	76
6.....	62	59	50	50	43	42	39	38	46	46	53	52	53	53	64	64	72	72	81	80	79	79	76	74
7.....	59	57	50	49	43	42	39	39	46	46	52	52	53	53	64	64	73	72	81	79	79	79	75	74
8.....	56	55	49	48	44	43	40	39	46	46	53	52	56	56	64	63	74	73	81	79	79	79	74	74
9.....	55	55	48	48	46	44	41	40	46	46	53	52	58	58	63	62	76	74	81	79	79	77	73	72
10.....	55	54	48	48	47	46	42	41	46	46	52	52	60	58	62	62	77	76	80	78	77	76	73	72
11.....	54	54	49	48	47	47	43	42	47	46	52	51	60	59	63	62	78	77	78	77	77	76	74	72
12.....	54	54	49	49	47	47	43	43	48	47	53	52	60	59	63	63	78	77	77	77	77	76	74	74
13.....	54	54	48	48	47	45	43	42	48	47	53	52	59	59	64	63	78	78	77	77	78	76	74	72
14.....	55	54	48	48	45	44	42	42	47	47	55	53	59	59	64	64	76	77	78	78	77	77	73	70
15.....	55	55	48	48	44	42	42	42	48	47	57	54	58	58	64	64	77	76	77	77	79	76	71	70
16.....	55	55	49	48	42	41	44	44	48	47	55	55	58	57	64	64	76	74	78	78	81	78	71	70
17.....	55	54	50	49	41	41	44	43	47	46	56	55	57	57	64	64	75	75	77	77	82	79	71	70
18.....	54	54	52	50	41	41	45	44	47	46	57	56	57	57	65	65	75	75	77	77	79	79	72	70
19.....	54	53	53	52	41	41	45	44	46	46	56	55	57	56	65	65	74	74	77	75	79	77	72	72
20.....	54	52	52	52	42	41	44	44	47	46	56	56	56	56	64	65	74	74	78	76	77	75	72	71
21.....	52	50	52	50	43	42	46	44	49	47	56	56	54	53	64	64	76	75	78	77	75	75	71	70
22.....	51	49	50	50	43	43	46	46	49	48	55	55	55	53	65	64	77	76	78	78	76	75	70	69
23.....	48	48	50	49	43	43	46	46	48	48	55	55	57	55	66	65	77	76	79	78	77	75	69	68
24.....	48	49	49	49	43	43	46	46	48	48	55	55	58	56	67	66	78	77	79	78	77	76	68	68
25.....	50	49	49	49	43	43	46	46	48	47	55	54	80	58	69	67	78	78	80	78	77	75	68	68
26.....	51	50	49	49	44	43	46	44	48	47	54	52	60	60	70	69	78	77	79	78	77	77	68	68
27.....	51	51	49	49	43	42	44	44	48	48	52	51	60	59	70	70	78	78	80	79	78	77	68	68
28.....	52	52	49	47	42	41	48	44	50	49	51	51	60	59	71	70	78	78	80	79	77	76	69	68
29.....	51	50	47	45	41	40	48	46	--	--	51	51	60	60	71	70	79	78	80	79	78	76	69	68
30.....	50	48	45	44	40	40	46	46	--	--	51	51	62	60	71	70	79	78	81	79	79	76	69	--
31.....	49	49	--	--	40	40	48	48	--	--	52	51	--	--	73	71	--	--	82	81	79	77	--	--
Average.....	55	54	50	49	43	43	43	43	47	47	54	53	57	56	66	65	76	75	79	78	78	77	73	72

## GREEN RIVER BASIN--Continued

## BARREN RIVER AT BOWLING GREEN, KY.--Continued

## Suspended sediment, November 1952 to September 1953

Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....				--	--	--	224	8	4
2.....				--	--	--	224	2	1
3.....				--	--	--	220	2	1
4.....				--	--	--	241	2	1
5.....				--	--	--	341	3	3
6.....				--	--	--	665	7	12
7.....				--	--	--	886	12	29
8.....				--	--	--	798	9	19
9.....				--	--	--	627	5	8
10.....				--	--	--	619	10	17
11.....				178	4	2	759	18	37
12.....				304	6	5	669	23	42
13.....				388	6	6	627	20	34
14.....				358	4	4	564	20	30
15.....				299	2	2	480	16	21
16.....				257	3	2	425	11	13
17.....				228	5	3	379	10	10
18.....				207	5	3	346	7	6
19.....				232	6	4	316	7	6
20.....				236	9	6	308	8	7
21.....				287	1	1	304	8	6
22.....				346	1	1	291	7	5
23.....				337	3	3	291	7	5
24.....				304	5	4	295	2	2
25.....				270	9	6	295	1	1
26.....				245	9	6	283	2	2
27.....				220	9	5	270	4	3
28.....				207	8	4	257	3	2
29.....				215	8	5	249	7	5
30.....				228	5	3	241	4	3
31.....				--	--	--	249	5	3
Total.				5,346	--	75	12,743	--	338
Day	January			February			March		
	Mean dis-charge (cfs)	Mean concentration (ppm)	Tons per day	Mean dis-charge (cfs)	Mean concentration (ppm)	Tons per day	Mean dis-charge (cfs)	Mean concentration (ppm)	Tons per day
1.....	245	5	3	2,480	38	254	1,600	16	69
2.....	270	6	4	2,010	31	168	2,360	38	242
3.....	308	6	5	1,710	26	120	5,650	227	s 4,020
4.....	350	9	8	1,480	20	80	13,200	409	14,600
5.....	392	9	10	1,320	18	64	16,600	312	14,000
6.....	438	5	6	1,250	20	68	13,300	128	4,600
7.....	459	7	9	1,380	15	56	7,130	53	1,020
8.....	501	6	8	1,400	15	57	4,560	42	517
9.....	833	6	13	1,350	15	55	3,590	36	349
10.....	1,730	60	s 309	1,210	13	42	2,880	30	233
11.....	3,800	210	2,150	1,140	9	28	2,410	26	169
12.....	3,620	179	1,750	2,500	28	s 244	2,100	20	113
13.....	2,100	78	442	5,370	137	1,990	1,900	19	97
14.....	1,470	34	135	4,900	70	926	1,850	25	125
15.....	1,160	23	72	3,520	33	314	2,320	115	720
16.....	993	28	70	2,780	21	158	2,680	85	b 600
17.....	899	17	41	2,260	15	92	2,200	42	249
18.....	1,190	32	s 112	1,830	12	59	2,850	96	s 849
19.....	3,070	99	821	1,520	10	41	6,910	199	3,710
20.....	3,110	104	873	1,360	10	37	6,200	96	1,610
21.....	2,410	100	651	2,540	42	s 360	4,300	47	546
22.....	4,150	197	2,210	6,850	232	4,290	3,350	37	335
23.....	4,070	107	1,180	7,280	249	4,890	3,610	59	s 642
24.....	3,770	200	sa 2,300	4,270	55	634	5,590	101	1,520
25.....	8,450	628	15,500	3,110	31	260	4,520	47	574
26.....	8,780	255	6,040	2,590	23	161	3,630	32	314
27.....	5,360	96	1,390	2,180	18	106	2,960	20	160
28.....	3,760	60	609	1,840	21	104	2,490	16	108
29.....	4,400	74	879	--	--	--	2,150	21	122
30.....	4,180	73	824	--	--	--	1,870	20	101
31.....	3,170	56	479	--	--	--	1,720	20	93
Total.	79,438	--	38,903	73,430	--	15,658	138,460	--	52,407

s Computed by subdividing day.

a Computed from partly estimated concentration graph.

b Computed from estimated concentration graph.



GREEN RIVER BASIN--Continued  
BARREN RIVER AT BOWLING GREEN, KY.--Continued

Particle-size analyses of suspended sediment, January to July 1953  
(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	Water discharge (cfs)	Water temperature per- ature (° F)	Suspended sediment										Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350
Jan. 25, 1933....	4:30 p. m.	9,500		690	553	34	49	73	93	96	99	--			BSWCM
Jan. 25.....	4:30 p. m.	9,500		690	630	22	38	60	86	97	98	--			BSN
Feb. 23.....	6:30 a. m.	8,040		352	530	30	52	78	84	92	99	--			BSWCM
May 1.....	6:30 a. m.	5,840		210	356	43	50	61	80	97	99	--			BSWCM
May 6.....	6:30 a. m.	5,680		201	349	53	65	79	93	100	--	--			BSWCM
May 18.....	6:30 a. m.	9,920		307	495	30	41	63	83	97	99	--			BSWCM
June 16.....	5:15 p. m.	4,050		1,820	1,660	34	44	64	80	92	99	100			BSWCM
June 16.....	5:15 p. m.	4,050		1,820	1,850	18	29	48	72	99	99	100			BSN
June 17.....	6:30 a. m.	7,760		2,730	2,190	42	56	72	78	81	100	--			BSWCM
June 17.....	6:00 p. m.	4,720		1,110	858	51	62	71	76	79	100	--			BSWCM
June 17.....	6:00 p. m.	4,720		1,110	843	32	49	73	95	99	100	--			BSN
July 20.....	6:30 a. m.	1,460		307	382	69	80	95	98	98	99	--			BSWCM

## GREEN RIVER BASIN--Continued

## ROUGH RIVER AT FALLS OF ROUGH, KY.

LOCATION.--At county bridge at Falls of Rough, Grayson County, 150 feet upstream from gaging station, 50 feet upstream from Mill Dam, 1,850 feet upstream from Pleasant Run, and 3.1 miles downstream from Rock Lick Creek.

DRAINAGE AREA.--500 square miles, approximately.

RECORDS AVAILABLE.--Water temperatures: October 1952 to September 1953.

Sediment records: October 1952 to September 1953.

EXTREMES 1952-53.--Water temperatures: Maximum, 78° F July 3, 8, Aug. 1, 5-6; minimum, 34° F Dec. 28-29, Jan. 6.

Sediment concentrations: Maximum daily, 1,600 ppm Dec. 10; minimum daily 2 ppm Nov. 4-6, 14-15.

Sediment loads: Maximum daily, 18,600 tons Mar. 3; minimum daily, less than 0.50 ton on many days during October, November, December, August, and September.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

Temperature (°F) of water, water year October 1952 to September 1953

[Once-daily temperature measurement at approximately 6:30 a.m.]

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



## GREEN RIVER BASIN--Continued

## ROUGH RIVER AT FALLS OF ROUGH, KY.--Continued

Suspended sediment, water year October 1952 to September 1953

Day	October			November			December		
	Suspended sediment			Suspended sediment			Suspended sediment		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	11	9	(t)	14	10	(t)	24	8	1
2.....	11	9	(t)	14	9	(t)	24	6	(t)
3.....	11	10	(t)	18	4	(t)	25	3	(t)
4.....	11	15	(t)	15	2	(t)	522	191	s 500
5.....	11	14	(t)	18	2	(t)	1,470	423	1,680
6.....	11	10	(t)	19	2	(t)	1,050	243	689
7.....	11	10	(t)	19	4	(t)	506	120	164
8.....	11	9	(t)	19	3	(t)	210	85	48
9.....	11	9	(t)	19	3	(t)	328	550	sa 950
10.....	34	27	2	23	3	(t)	2,310	1,600	a 10,000
11.....	40	27	3	22	5	(t)	1,600	700	3,020
12.....	76	9	2	26	4	(t)	682	403	741
13.....	61	4	1	25	3	(t)	329	198	176
14.....	40	7	1	27	2	(t)	212	131	75
15.....	27	5	(t)	31	2	(t)	158	88	38
16.....	22	4	(t)	19	3	(t)	127	59	20
17.....	18	10	(t)	24	4	(t)	106	44	12
18.....	17	6	(t)	25	4	(t)	93	36	9
19.....	16	7	(t)	121	11	4	84	30	7
20.....	15	6	(t)	107	42	12	81	27	6
21.....	16	8	(t)	84	30	7	95	20	5
22.....	26	6	(t)	76	23	5	101	15	4
23.....	17	5	(t)	53	34	5	104	13	4
24.....	13	3	(t)	38	21	2	104	12	3
25.....	13	3	(t)	31	18	2	97	11	3
26.....	13	5	(t)	23	22	1	89	9	2
27.....	15	5	(t)	20	17	1	81	11	2
28.....	13	8	(t)	21	13	1	74	5	1
29.....	13	7	(t)	23	13	1	69	4	1
30.....	14	5	(t)	24	10	1	66	3	1
31.....	13	5	(t)	--	--	--	126	4	1
Total.	631	--	16	998	--	46	10,947	--	18,164
Day	January			February			March		
	Suspended sediment			Suspended sediment			Suspended sediment		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	234	7	4	450	23	28	219	10	6
2.....	247	32	21	376	20	20	1,230	114	378
3.....	486	32	42	325	16	14	5,120	1,200	s 18,600
4.....	430	33	38	287	12	9	7,460	893	18,000
5.....	361	19	18	257	10	7	7,960	492	10,600
6.....	287	13	10	352	14	13	7,030	198	3,760
7.....	653	50	s 145	358	26	25	5,030	89	1,210
8.....	2,270	390	2,390	326	20	18	3,130	53	448
9.....	1,860	289	1,450	274	11	8	872	49	115
10.....	2,060	210	1,170	238	10	6	641	34	59
11.....	1,760	146	694	258	10	7	545	25	37
12.....	1,050	78	221	589	34	54	497	16	21
13.....	648	33	58	615	38	63	509	14	19
14.....	473	20	26	474	33	42	1,530	402	s 2,740
15.....	379	18	18	376	18	18	3,500	765	7,230
16.....	470	32	41	320	11	10	4,040	620	6,760
17.....	1,620	310	s 2,340	269	10	7	3,330	206	1,850
18.....	2,700	395	2,880	228	8	5	2,240	118	714
19.....	2,330	285	1,790	204	5	3	1,820	159	781
20.....	1,110	97	s 314	198	4	2	1,190	81	260
21.....	687	30	56	480	16	21	827	34	76
22.....	509	20	27	604	50	82	722	26	51
23.....	455	20	24	451	31	38	1,270	90	309
24.....	1,570	328	1,390	338	43	39	1,040	67	188
25.....	1,030	110	306	299	25	20	739	45	90
26.....	703	45	85	276	16	12	577	16	25
27.....	558	26	39	252	12	8	488	11	14
28.....	1,210	103	336	225	10	6	426	9	10
29.....	1,100	100	297	--	--	--	385	7	7
30.....	747	83	167	--	--	--	347	7	7
31.....	553	32	48	--	--	--	353	12	11
Total.	30,550	--	16,445	9,699	--	585	65,067	--	74,376

s Computed by subdividing day.

t Less than 0.50 ton

a Computed from partly-estimated concentration graph.

## GREEN RIVER BASIN--Continued

## ROUGH RIVER AT FALLS OF ROUGH, KY.--Continued

Suspended sediment, water year October 1952 to September 1953--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.....	393	18	19	564	19	29	195	17	9
2.....	379	19	19	509	24	33	182	16	8
3.....	338	9	8	365	13	13	162	22	10
4.....	301	9	7	318	28	24	150	23	9
5.....	272	8	6	1,270	113	s 439	142	27	10
6.....	525	28	s 60	1,130	125	381	134	26	9
7.....	1,130	58	177	834	56	126	125	22	7
8.....	1,070	44	127	641	37	64	120	19	6
9.....	885	55	131	708	47	90	110	15	4
10.....	733	23	46	532	72	103	99	15	4
11.....	570	25	38	585	56	s 100	93	16	4
12.....	509	19	26	947	282	721	87	14	3
13.....	542	16	23	1,350	228	s 933	82	14	3
14.....	463	20	25	2,350	525	3,330	79	19	4
15.....	383	21	22	2,610	290	2,040	77	40	8
16.....	340	10	9	3,200	203	1,750	87	40	9
17.....	314	9	8	5,370	356	5,160	406	45	49
18.....	1,070	107	s 507	7,210	328	6,380	163	67	s 33
19.....	1,840	221	1,100	7,630	118	2,430	89	47	11
20.....	1,290	106	s 395	6,600	57	1,020	71	154	30
21.....	739	30	60	4,980	64	860	65	143	25
22.....	560	19	29	2,210	38	227	60	100	16
23.....	460	11	14	881	32	76	56	68	10
24.....	408	11	12	602	25	41	54	40	6
25.....	389	10	10	487	23	30	53	31	4
26.....	356	10	10	412	20	22	50	23	3
27.....	320	6	5	346	19	18	49	22	3
28.....	282	3	2	295	18	14	50	26	4
29.....	254	5	3	256	16	11	73	27	5
30.....	398	10	11	233	13	8	71	28	5
31.....	--	--	--	217	17	10	--	--	--
Total..	17,513	--	2,909	55,642	--	26,483	3,234	--	311
	July			August			September		
1.....	60	28	4	38	14	1	11	6	(t)
2.....	61	28	5	76	13	3	11	5	(t)
3.....	63	22	4	51	10	1	11	5	(t)
4.....	330	34	30	42	6	1	11	6	(t)
5.....	174	357	168	32	11	1	23	15	1
6.....	115	152	s 51	73	15	3	14	9	(t)
7.....	70	65	12	71	14	3	17	13	1
8.....	95	62	16	45	17	2	14	12	(t)
9.....	84	66	15	33	19	2	14	20	1
10.....	52	69	10	33	18	2	14	15	1
11.....	49	52	7	24	16	1	23	12	1
12.....	32	45	4	25	15	1	17	11	1
13.....	41	32	4	29	15	1	12	16	1
14.....	31	27	2	23	13	1	12	23	1
15.....	36	24	2	25	14	1	12	25	1
16.....	37	17	2	22	14	1	12	19	1
17.....	58	16	2	22	11	1	12	17	1
18.....	158	22	9	25	10	1	11	13	(t)
19.....	171	43	20	21	12	1	11	13	(t)
20.....	192	44	23	19	17	1	11	13	(t)
21.....	99	46	12	30	13	1	11	10	(t)
22.....	73	38	8	27	12	1	11	14	(t)
23.....	114	45	14	14	11	(t)	11	12	(t)
24.....	126	46	16	14	8	(t)	26	16	1
25.....	66	37	7	17	8	(t)	11	13	(t)
26.....	40	35	4	14	9	(t)	11	12	(t)
27.....	40	31	3	14	11	(t)	11	12	(t)
28.....	36	25	2	13	11	(t)	11	14	(t)
29.....	36	24	2	12	9	(t)	19	15	1
30.....	39	24	2	2	8	(t)	21	12	1
31.....	32	22	2	12	7	(t)	--	--	--
Total..	2,610	--	462	908	--	34	416	--	19

Total discharge for year (cfs-days).....198,215

Total load for year (tons).....139,850

s Computed by subdividing day.

t Less than 0.50 ton.

GREEN RIVER BASIN--Continued  
ROUGH RIVER AT FALLS OF ROUGH, KY.--Continued

Particle-size analyses of suspended sediment, December 1952 to July 1953

(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	Water discharge (cfs)	Water temperature (° F)	Suspended sediment												Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters								1.000		
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	
Dec. 5, 1952	1:30 p. m.	1,610		300	362	46	54	70	87	96	98					BSWCM
Dec. 10	8:20 a. m.	2,530		1,400	754	43	59	75	92	98	99					BSWCM
Dec. 10	8:20 a. m.	2,530		1,400	908	22	37	59	80	98	99					BSN
Dec. 10	4:30 p. m.	2,350		1,010	1,390	50	62	74	90	98	100					BSWCM
Mar. 3, 1953	7:30 p. m.	6,510		1,270	1,330	39	53	65	79	85	100					BSWCM
Mar. 14	5:20 p. m.	2,390		1,000	515	30	43	60	83	95	100					BSWCM
Mar. 14	5:20 p. m.	2,390		1,000	612	21	32	53	79	97	99					BSN
Mar. 15	4:30 p. m.	3,650		589	640	56	70	79	88	94	100					BSWCM
Mar. 16	5:20 p. m.	4,140		534	556	52	66	79	90	94	100					BSWCM
May 12	4:50 a. m.	1,010		273	333	55	70	82	97	100	--					BWCM
May 14	8:20 a. m.	2,200		624	660	39	52	66	84	99	100					BSWCM
May 14	6:30 p. m.	2,660		561	614	49	60	68	87	96	99					BSWCM
May 15	6:30 p. m.	2,580		216	243	54	62	71	87	98	100					BSWCM
May 17	6:20 p. m.	6,340		394	454	43	55	69	86	97	99					BSWCM
July 5	6:10 a. m.	173		354	386	73	93	97	98	98	100					BSWCM

## GREEN RIVER BASIN--Continued

## ROUGH RIVER AT DUNDEE, KY.

LOCATION.--At bridge on State Highway 69 at Dundee, Ohio County, and 7.1 miles downstream from Caney Creek.

DRAINAGE AREA.--775 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 85°F Aug. 1, 2, 3; minimum, 33°F Dec. 17, 28, 29, Jan. 16.

EXTREMES, 1949-53.--Water temperatures: Maximum, 88°F Sept. 2, 1951, July 1, 1952; minimum, freezing point on several days during February and December 1951.

REMARKS.--Records of discharge for Rough River near Dundee for water year October 1952 to September 1953 given in WSP 1275.

Temperature (°F) of water, water year October 1952 to September 1953  
/Mean of twice-daily measurements at approximately 7 a.m. and 4 p.m./

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

GREEN RIVER BASIN--Continued  
MUDDY CREEK AT HARTFORD, KY.

LOCATION.--At bridge on U. S. Highway 231 (Old State Highway 71), 1 mile southeast of Hartford, Ohio County, and  $\frac{1}{2}$  mile upstream from mouth.  
DRAINAGE AREA.--65.4 square miles.  
RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1953.  
REMARKS --No records of discharge available for this station.

Chemical analyses, in parts per million, October 1952 to June 1953

Date of collection	Mean discharge (cfs)	Tem- perature (°F)	Silica (SiO <sub>2</sub> )	Alum- inum (Al)	Iron (Fe)	Man- gan- ese (Mn)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO <sub>3</sub> )	Sul- fate (SO <sub>4</sub> )	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO <sub>3</sub> )	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO <sub>3</sub>		Total acid- ility as H <sub>2</sub> SO <sub>4</sub>	Specific conduct- ance (micro- mhos at 25°C)	pH	Color
																	Calcium, mag- nesium	Non- carbon- ate				
Oct. 15, 1952 .....			4.7		0.09	--	20	8.5	55	4.2	165	28	30	0.5	0.3	250	84	0		429	7.2	26
Nov. 19 .....			6.7		.08	--	19	4.9	23	4.9	58	54	11	.0	6.0	166	68	20		277	6.4	35
Dec. 16 .....			14		.21	2.7	25	13	8.5	2.6	0	146	3.2	.3	2.2	224	117	117		350	4.20	2
Feb. 5, 1953			12		.04	1.2	16	8.5	6.3	1.6	0	78	6.8	.1	1.7	143	75	75		224	4.25	1
Mar. 12 .....			11		.01	1.0	12	7.3	5.3	1.4	3	62	2.9	.1	2.0	113	61	58		164	5.2	3
Apr. 23 .....			11		.04	.37	8.4	4.6	3.9	1.1	4	41	2.1	.0	1.0	89	40	37		122	6.2	1
June 3 .....			17		.04	3.6	31	16	14	2.6	1	163	6.5	.1	.6	292	144	142		393	5.2	0

GREEN RIVER BASIN--Continued  
POND RIVER AT JEWEL CITY, KY.

LOCATION.--At Jewel City, Hopkins County, 200 feet upstream from Cypress Creek and  $\frac{1}{4}$  mile upstream from mouth.  
DRAINAGE AREA.--790 square miles (approximate).  
RECORDS AVAILABLE.--Chemical analyses: April 1950 to September 1953.  
REMARKS.--No records of discharge available for this station.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Total acidity as H <sub>2</sub> SO <sub>4</sub>	Specific conductance (micro-mhos at 25°C)	pH	Color
																	Calcium, magnesium	Non-carbonate				
Oct. 15, 1952 ....			4.3		0.90	0.12	46	8.7	8.3	2.0	142	44	6.0	0.2	0.5	189	151	34		338	7.8	2
Nov. 6, .....			3.7		.37	.13	54	13	13	1.5	132	99	7.5	.1	.7	263	196	66		426	7.3	3
Dec. 10, .....			4.9		1.9	b.70	16	6.3	4.6	2.5	27	49	2.4	.1	2.9	103	63	44		152	6.2	15
Jan. 14, 1953 ....			6.8		2.2	.67	24	6.3	4.2	1.8	26	67	2.2	.2	2.5	132	86	64		215	6.4	4
Feb. 18, .....			7.8		a.87	.00	27	5.3	5.4	1.3	42	63	3.2	.1	1.6	135	89	55		216	6.5	4
Mar. 30, .....			7.6		.64	.00	26	8.8	5.3	1.3	39	67	3.9	.2	.9	134	92	60		233	6.5	7
Apr. 20, .....			7.3		.05	.00	28	7.8	5.3	1.4	43	73	2.5	.0	.7	145	102	67		255	6.5	4
June 2, .....			8.8		a.79	b.1.1	28	8.9	5.8	2.0	36	85	1.9	.1	1.4	179	106	77		263	6.5	6
July 2, .....			9.5		a.38	b.4.1	79	29	22	3.0	49	321	5.0	.6	2.6	509	318	276		696	6.9	4
Aug. 5, .....			5.3		.08	.30	39	8.6	8.3	2.1	80	74	5.6	.1	2.4	188	134	87		313	7.4	4
Sept. 4, .....			5.1		.15	.13	38	6.4	3.9	2.2	130	17	7.8	.2	1.9	145	122	15		259	7.8	3

a Includes iron in suspended materials.

b Includes manganese in suspended materials.

## TRADEWATER RIVER BASIN

## TRADEWATER RIVER AT OLNEY, KY.

LOCATION.--At gaging station at highway bridge at Olney, Hopkins County, 1.1 miles upstream from Cave Creek, 5.1 miles downstream from Flynn Creek, and 9.5 miles northeast of Princeton.

DRAINAGE AREA.--255 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1949 to August 1950, October 1951 to September 1953.

Water temperatures: October 1951 to September 1953.

Sediment records: October 1952 to September 1953.

EXTREMES, 1952-53.--Dissolved solids: Maximum, 496 ppm July 25-30; minimum 62 ppm May 18-21.

Hardness: Maximum, 318 ppm Sept. 7-19; minimum, 35 ppm May 18-21.

Specific conductance: Maximum daily, 756 micromhos July 30; minimum daily, 76.5 micromhos May 19, 29.

Water temperatures: Maximum, 84°F June 25, July 2, 6, Aug. 2-3; minimum, freezing point Dec. 15, 29.

Sediment concentrations: Maximum daily, 234 ppm Mar. 3; minimum daily, no flow on many days during October, November, August, and September.

Sediment loads: Maximum daily, 1,370 tons Mar. 6; minimum daily, 0 ton on many days during October, November, August, and September.

EXTREMES, 1951-53.--Dissolved solids: Maximum, 496 ppm July 25-30; minimum, 62 ppm May 18-21, 1953.

Hardness, 1951-53.--Dissolved solids: Maximum, 496 ppm July 25-30; minimum, 62 ppm May 18-21, 1953.

Specific conductance: Maximum daily, 783 micromhos Nov. 9, 1951; minimum daily, 51.4 micromhos Mar. 23, 1952.

Water temperatures: Maximum, 87°F June 26, 29, 1952; minimum, freezing point Dec. 19, 1951, Dec. 15, 29, 1952.

REMARKS.--Records of specific conductance of daily samples from October 1952 to September 1953 available in district office at Columbus, Ohio. Records of discharge for water year October 1952 to September 1953 given in WSP 1275.

## Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO <sub>3</sub>		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	Color or pH
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate				
Oct. 1-10, 1952..	0.00	11	0.07	41	18	9.0	2.6	73	131	3.2	0.4	0.4		264		176	116			396	6.9
Oct. 11-20.....	.00	6.4	.07	40	18	8.8	2.0	71	130	3.5	.3	.2		254		175	116			391	6.9
Oct. 21-31.....	.00	5.3	.08	40	18	9.4	2.7	72	130	3.2	.4	.1		263		174	115			391	6.8
Nov. 1-10.....	.00	5.0	.04	42	19	8.6	2.5	76	132	3.8	.4	.3		283		181	121			393	6.5
Nov. 11-20.....	.09	8.4	.03	41	19	9.0	2.3	77	132	3.8	.3	.5		259		163	117			391	6.7
Nov. 21-30.....	5.04	18	.03	40	18	11	3.0	89	123	4.0	.3	.4		264		176	101			391	6.8
Dec. 1-10.....	121	18	.04	34	15	8.8	3.7	65	105	4.0	.3	1.2		230		144	93			331	6.7
Dec. 11-20.....	127	8.1	.04	30	14	4.8	2.6	3	132	3.5	.2	1.8		211		133	130			302	5.2
Dec. 21-31.....	16.0	9.8	.05	42	18	5.6	2.2	6	176	3.5	.3	1.4		274		179	174			394	5.4
Jan. 1-10, 1953..	258	13	.05	46	21	7.4	2.4	9	198	3.8	.3	1.8		320		201	194			445	5.4
Jan. 11-20.....	539	13	.04	24	11	4.8	1.5	10	96	2.8	.2	3.3		168		103	97			252	6.0
Jan. 21-31.....	416	19	.03	23	10	5.3	1.7	19	88	2.8	.2	2.7		169		99	83			241	6.4
Feb. 1-10.....	140	14	.04	29	14	6.4	1.3	17	119	3.5	.2	2.0		208		128	116			302	6.4
Feb. 11-20.....	323	14	.05	22	10	5.0	1.3	19	86	2.8	.2	1.6		158		98	80			238	6.5
Feb. 21-28.....	330	9.5	.33	22	8.5	5.2	1.3	17	78	4.0	.2	1.7		146		89	76			218	6.8
Mar. 1-2.....	402	8.4	.03	22	8.5	4.9	1.1	20	79	2.5	.2	1.6		152		90	73			234	6.0
Mar. 3-8.....	2,533	6.3	.22	9.6	2.9	3.3	1.5	12	28	1.8	.2	1.7		71		36	26			97.5	6.0
Mar. 9-17.....	958	8.9	.04	18	6.8	3.6	1.3	12	67	2.2	.2	1.5		123		74	63			190	5.8

## TRADEWATER RIVER BASIN--Continued

## TRADEWATER RIVER AT OLNEY, KY.--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953.--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> ) (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO <sub>3</sub>		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Color
													Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate				
Mar. 15-25, 1953	1,211	9.4	0.31	14	6.3	2.9	1.2	16	49	2.2	0.2	2.2	98		62	47		151	6.1	15
Mar. 26-Apr. 2	417	12	.19	21	8.5	4.2	1.1	19	75	2.6	.2	1.4	138		89	72		210	6.2	3
Apr. 3-10	375	11	.02	19	7.8	4.2	1.3	22	68	2.2	.1	.8	134		90	61		201	6.8	3
Apr. 11-18	281	9.7	.05	23	8.5	4.8	1.3	20	84	2.5	.1	.8	156		92	76		225	6.3	3
Apr. 19-20	1,050	6.8	.46	14	5.3	3.2	1.4	22	44	1.6	.2	1.0	89		56	39		138	6.4	22
Apr. 21-30	542	10	.07	18	7.5	4.1	1.1	17	65	2.4	.1	.9	125		77	62		193	6.2	22
May 1-7	1,099	9.4	.12	14	4.9	3.1	1.6	16	45	2.4	.1	1.1	98		55	42		139	6.2	11
May 8-17	625	11	.04	19	7.3	4.4	1.1	21	66	2.5	.1	1.0	130		78	60		192	6.4	5
May 18-21	3,182	9.2	.30	9.2	2.9	3.4	1.3	18	25	1.0	.1	.9	62		35	20		86.6	6.4	6
May 22-25	1,708	11	.12	15	6.1	3.0	1.4	16	53	1.6	.1	.8	112		62	49		157	6.4	6
May 26-June 5	74.9	13	.05	30	10	5.8	1.8	22	105	3.9	.2	1.8	191		118	98		280	7.6	2
June 6-16	21.5	12	.20	33	12	6.6	1.8	31	114	3.8	.2	1.6	206		132	106		306	6.6	2
June 17-25	12.0	11	.02	42	17	9.0	2.3	14	176	3.0	.2	1.0	281		175	163		466	6.3	5
June 26-July 4	4.61	10	.03	40	17	11	2.1	20	171	3.6	.2	.7	276		170	153		409	6.7	0
July 5-14	8.60	7.1	.02	34	13	7.8	2.1	55	108	3.9	.3	.6	208		138	93		328	6.8	2
July 15-24	12.6	6.0	.02	34	14	7.5	3.1	52	114	3.8	.3	.6	218		145	92		338	6.9	3
July 25-30	7.73	9.3	.02	70	31	14	3.6	10	316	5.1	.4	2.4	496		304	284		651	6.7	4
July 31-Aug. 11	1.12	9.5	.02	69	32	11	3.6	11	310	4.0	.4	1.0	480		303	285		633	6.7	3
Aug. 12-24	.00	6.6	.04	74	31	12	4.1	16	309	4.0	.4	.5	480		311	299		642	6.5	3
Aug. 25-Sept. 6	.00	12	.02	75	31	11	3.5	16	311	3.6	.4	.4	476		314	302		655	6.0	4
Sept. 7-19	.00	9.7	.02	76	31	11	3.6	21	306	3.5	.4	.4	476		318	300		654	6.1	3
Sept. 20-30	.00	9.0	.02	76	30	11	3.6	26	303	3.5	.4	.4	478		314	292		658	6.1	3
Average	295	10	0.09	35	15	6.9	2.1	29	131	3.1	0.2	1.2	230		149	125		359	--	4



## TRADEWATER RIVER BASIN--Continued

## TRADEWATER RIVER AT OLNEY, KY.--Continued

Temperature (°F) of water, water year October 1952 to September 1953

Twice-daily temperature measurements at approximately 8 a.m. and 5:30 p.m.

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

## TRADEWATER RIVER BASIN--Continued

## TRADEWATER RIVER AT OLNEY, KY.--Continued

Suspended sediment, water year October 1952 to September 1953

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.....				0	--	0	3.0	1	(t)
2.....				0	--	0	3.0	1	(t)
3.....				0	--	0	2.8	1	(t)
4.....				0	--	0	22	18	s 1.6
5.....				0	--	0	204	120	s 70
6.....				0	--	0	258	56	39
7.....				0	--	0	205	6	3.3
8.....				0	--	0	103	8	2.2
9.....				0	--	0	90	24	s 7.6
10.....				0	--	0	316	169	s 166
11.....				0	--	0	500	62	84
12.....				0	--	0	308	44	s 38
13.....				0	--	0	153	4	1.6
14.....				0	--	0	85	1	.2
15.....				0	--	0	59	2	.3
16.....				0	--	0	44	2	.2
17.....				0	--	0	36	4	.4
18.....				0	--	0	31	1	.1
19.....				.5	7	(t)	27	1	.1
20.....				.4	10	(t)	25	1	.1
21.....				.9	12	(t)	24	2	.1
22.....				7.2	8	.2	21	4	.2
23.....				9.2	7	.2	20	10	.5
24.....				7.5	5	.1	19	7	.4
25.....				6.6	5	.1	17	7	.3
26.....				5.4	5	.1	16	6	.2
27.....				4.0	7	.1	14	6	.2
28.....				3.4	6	.1	13	6	.2
29.....				3.2	5	(t)	11	5	.1
30.....				3.0	2	(t)	9.8	7	.2
31.....				--	--	--	11	8	.2
Total.	0	--	0	51.3	--	1.0	2,650.6	--	417.3
January			February			March			
1.....	13	8	0.3	148	4	1.6	112	2	0.6
2.....	18	5	.2	121	2	.6	691	131	s 302
3.....	29	4	.3	102	3	.8	1,600	234	1,010
4.....	53	3	.4	88	2	.5	2,220	202	1,210
5.....	82	5	1.1	77	2	.4	2,660	130	934
6.....	83	5	1.1	135	44	s 19	3,140	162	1,370
7.....	74	7	1.4	234	74	47	3,070	124	1,030
8.....	398	54	s 84	207	14	7.8	2,510	48	325
9.....	1,020	185	509	162	3	1.3	1,730	17	79
10.....	811	117	256	123	7	2.3	886	15	36
11.....	695	19	36	125	6	2.0	710	9	17
12.....	534	15	22	488	54	s 80	339	7	6.4
13.....	282	8	6.1	792	62	132	205	5	2.8
14.....	192	3	1.6	662	29	52	411	41	s 74
15.....	141	1	.4	398	8	8.6	1,540	222	923
16.....	203	19	s 12	260	2	1.4	1,420	99	380
17.....	515	36	50	172	2	.9	1,360	64	238
18.....	1,080	54	157	128	1	.3	1,410	36	137
19.....	979	44	116	89	1	.3	1,350	52	190
20.....	767	22	46	106	3	.8	1,260	51	174
21.....	556	11	16	534	143	s 230	941	22	56
22.....	340	7	6.4	669	106	191	870	22	52
23.....	328	42	s 43	470	15	19	1,350	103	375
24.....	637	88	151	319	5	4.3	1,280	80	276
25.....	743	32	64	214	2	1.2	1,230	49	163
26.....	561	18	27	172	2	.9	932	22	55
27.....	370	9	9.0	143	2	.8	733	12	24
28.....	301	12	9.8	116	3	.9	385	8	8.3
29.....	293	6	4.7	--	--	--	222	4	2.4
30.....	258	5	3.5	--	--	--	164	2	.9
31.....	188	7	3.5	--	--	--	164	49	22
Total.	12,542	--	1,638.8	7,264	--	807.7	36,915	--	9,473.4

s Computed by subdividing day.

t Less than 0.050.

## TRADEWATER RIVER BASIN--Continued

## TRADEWATER RIVER AT OLNEY, KY.--Continued

Suspended sediment, water year October 1952 to September 1953--Continued

Suspended sediment, water year October 1966 to September 1967—Continued									
Day	Mean discharge (cfs)	April		Mean discharge (cfs)	May		Mean discharge (cfs)	June	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	241	15	9.8	1,130	86	262	32	10	0.9
2.....	497	50	s 78	1,140	57	175	26	10	.7
3.....	528	121	172	1,010	28	76	22	12	.7
4.....	340	21	19	796	19	41	18	11	.5
5.....	226	18	11	1,180	56	178	15	11	.4
6.....	184	7	3.5	1,180	55	175	14	8	.3
7.....	370	11	11	1,260	34	115	13	9	.3
8.....	568	30	46	1,090	23	68	12	8	.2
9.....	452	14	17	796	14	30	11	7	.2
10.....	333	4	3.6	579	7	11	9.2	5	.1
11.....	246	5	3.3	328	6	5.3	8.4	7	.2
12.....	260	14	9.8	202	7	3.8	8.0	8	.2
13.....	348	20	19	162	8	3.5	10	25	.7
14.....	329	11	9.8	162	10	4.4	26	41	2.9
15.....	226	8	4.9	436	32	s 40	61	19	3.1
16.....	176	6	2.8	954	73	188	64	15	2.6
17.....	168	5	2.3	1,540	70	291	39	18	1.9
18.....	336	43	s 49	2,060	72	400	22	19	1.1
19.....	1,080	91	265	3,080	51	424	15	17	.7
20.....	1,020	79	218	3,970	42	450	11	16	.5
21.....	817	29	64	3,620	32	313	7.6	14	.3
22.....	599	15	24	2,880	19	148	5.5	14	.2
23.....	346	11	10	2,110	10	57	4.0	14	.2
24.....	258	12	8.4	1,200	7	23	2.4	12	.1
25.....	533	38	s 59	642	7	12	1.8	11	.1
26.....	777	46	96	378	10	10	1.5	10	(t)
27.....	609	22	36	116	11	3.4	.8	12	(t)
28.....	378	10	10	75	9	1.8	1.2	13	(t)
29.....	271	2	1.5	57	11	1.7	1.2	12	(t)
30.....	837	64	s 178	46	10	1.2	2.8	14	.1
31.....	--	--	--	39	11	1.2	--	--	--
Total.	13,353	--	1,441.7	34,218	--	3,513.3	465.4	--	19.3
Suspended sediment, water year October 1967 to September 1968—Continued									
Day	Mean discharge (cfs)	July		Mean discharge (cfs)	August		Mean discharge (cfs)	September	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	9.2	14	0.3	2.8	58	0.4			
2.....	11	14	.4	1.5	42	.2			
3.....	8.0	12	.2	.9	23	.1			
4.....	5.8	14	.2	.5	45	.1			
5.....	14	14	.5	.2	22	(t)			
6.....	16	20	.9	.1	23	(t)			
7.....	16	18	.8	.1	20	(t)			
8.....	15	19	.8	0	--	0			
9.....	10	24	.6	0	--	0			
10.....	6.1	21	.3	0	--	0			
11.....	3.7	20	.2	0	--	0			
12.....	2.4	22	.1	0	--	0			
13.....	1.6	20	.1	0	--	0			
14.....	1.2	17	.1	0	--	0			
15.....	.9	16	(t)	0	--	0			
16.....	.7	16	(t)	0	--	0			
17.....	.7	17	(t)	0	--	0			
18.....	.6	15	(t)	0	--	0			
19.....	.6	10	(t)	0	--	0			
20.....	4.6	19	.2	0	--	0			
21.....	41	35	3.9	0	--	0			
22.....	21	27	1.5	0	--	0			
23.....	28	46	3.6	0	--	0			
24.....	27	44	3.2	0	--	0			
25.....	17	28	1.3	0	--	0			
26.....	11	27	.8	0	--	0			
27.....	6.1	20	.3	0	--	0			
28.....	4.9	14	.2	0	--	0			
29.....	3.1	10	.1	0	--	0			
30.....	4.3	44	.5	0	--	0			
31.....	7.3	111	2.2	0	--	0			
Total.	299.8	--	23.4	6.1	--	0.8	0	--	0
Total discharge for year (cfs-days) .....									107,765.2
Total load for year (tons) .....									17,336.7

s Computed by subdividing day.

t Less than 0.050.

## CUMBERLAND AND TENNESSEE RIVER BASINS

## PART 3B. CUMBERLAND AND TENNESSEE RIVER BASINS

## CUMBERLAND RIVER BASIN

## CUMBERLAND RIVER AT BARBOURVILLE, KY.

LOCATION.--At bridge on State Highway 11, at Barbourville, Knox County, and 0.2 mile upstream from Richland Creek.

DRAINAGE AREA.--972 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 88°F Aug. 4; minimum, 34°F Jan. 3, 4.

EXTREMES, 1949-53.--Water temperatures: Maximum, 91°F June 28, 1952; minimum, freezing point Nov. 26, Dec. 18, 1950, Feb. 2,3, 1951.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1276.

Temperature (°F) of water, water year October 1952 to September 1953

/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	70	46	40	42	46	45	60	64	78	78	81	79
2	68	50	40	41	44	48	56	66	76	80	82	79
3	64	48	41	36	44	51	55	66	76	80	84	78
4	64	45	41	36	44	50	57	67	77	76	86	80
5	65	46	46	36	44	46	56	66	76	80	84	77
6	61	48	45	38	44	48	56	61	78	79	84	75
7	58	46	44	50	46	48	55	58	76	80	81	74
8	60	46	44	48	44	48	56	58	79	80	81	73
9	60	44	46	45	44	48	59	59	81	80	77	72
10	60	46	49	48	45	50	53	62	78	77	78	73
11	60	44	46	44	46	50	60	65	80	78	78	74
12	60	44	44	42	46	50	60	66	80	78	80	76
13	60	46	40	41	44	54	54	68	80	77	80	72
14	62	50	42	37	42	54	53	72	79	76	80	66
15	63	54	42	42	42	57	53	68	80	78	80	70
16	62	50	37	46	44	56	51	66	78	80	81	72
17	60	52	42	48	42	56	52	68	79	80	80	71
18	58	52	43	48	41	57	53	68	80	79	80	71
19	59	56	46	48	42	56	51	61	80	80	78	72
20	54	50	45	48	44	50	48	61	82	82	76	72
21	52	47	42	52	44	56	49	64	84	82	77	71
22	52	42	45	47	45	55	53	66	80	83	76	69
23	49	42	46	48	42	56	56	71	77	82	75	67
24	51	42	42	46	42	55	61	74	78	81	76	66
25	55	43	40	46	46	53	62	76	82	80	76	62
26	55	48	46	42	46	48	62	78	82	80	76	66
27	50	46	42	46	47	52	58	70	84	81	77	69
28	50	42	42	44	46	48	60	74	84	82	80	66
29	48	42	39	44	--	50	60	74	78	82	78	68
30	46	40	40	44	--	49	66	76	78	84	78	69
31	46	--	42	46	--	51	--	78	--	84	79	--
Average	57	47	43	44	44	51	56	67	79	80	79	72

## CUMBERLAND RIVER BASIN--Continued

## CUMBERLAND RIVER AT WILLIAMSBURG, KY.

LOCATION --At gaging station at bridge on State Highway 92 at Williamsburg, Whitley County, and 2.1 miles downstream from Clear Fork.

DRAINAGE AREA, 673 square miles.

RECORDS AVAILABLE. Chemical analyses: October 1951 to September 1953.

Water temperatures: October 1951 to September 1953.

EXTREMES 1951-53--Dissolved solids: Maximum, 304 ppm Nov. 11-20; minimum, 61 ppm May 20-24.

Hardness: Maximum, 100 ppm Nov. 11-20; minimum, 31 ppm May 6-10; May 20-24, 72.4 microhos Jan. 11.

Specific conductance: Maximum, 100 ppm daily, 513 microhos Nov. 12; minimum, 37 microhos Nov. 17 Jan. 6.

Water temperatures: Maximum, 88°F, 15-16; minimum, 37°F, 11-20, 1951.

EXTREMES 1951-53--Dissolved solids: Maximum, 304 ppm Nov. 11-20, 1952; minimum, 60 ppm Jan. 21-31, 1952.

Hardness: Maximum, 100 ppm Nov. 11-20, 1952; minimum, 29 ppm Dec. 11-20, 1951.

Specific conductance: Maximum daily, 513 microhos Nov. 12, 1952; minimum, 60.3 microhos Mar. 24-25, 1952.

Water temperatures: Maximum, 91°F on several days during June and July 1952; minimum, 37°F Dec. 17, 1952, Jan. 6, 1953.

REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio.

to September 1953 given in WSP 1276.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (microhos at 25°C)	pH	Color
															Calcium, magnesium	Non-carbonate			
Oct. 1-10, 1952	36.3		5.5	0.04	18	7.8	48	3.7	116	73	12	0.1	0.2	231	77	0	397	7.7	4
Oct. 11-20	76.4		5.9	0.1	19	9.5	49	3.4	120	82	10			237	87	0	383	7.3	3
Oct. 21-31	34.9		9.1	0.1	19	9.0	60	3.3	145	79	11		1.5	259	84	0	426	7.4	4
Nov. 1-10	33.6		7.5	0.2	20	10	66	3.7	158	86	15	2	4	286	90	0	471	7.4	5
Nov. 11-20	111		12	0.4	22	11	63	4.0	149	100	13		5	304	100	0	485	7.2	6
Nov. 21-30	2,492		11	14	13	6.1	22	2.5	58	51	5.0	1	2.7	145	58	10	228	6.7	8
Dec. 1, 3-10	2,020		11	22	9.6	4.4	9.0	1.8	30	32	3.0	1	2.7	90	42	17	138	6.5	9
Dec. 11-20	5,381		8.1	12	8.4	3.9	7.5	1.4	24	29	3.0	1	2.8	79	37	17	118	6.4	6
Dec. 21-31	594		13	14	12	5.8	15	1.8	45	44	4.2	1	2.5	118	54	17	188	6.7	3
Jan. 1-10, 1953	4,198		7.0	11	10	5.1	14	1.5	38	40	4.0	0	2.0	101	47	15	167	6.6	5
Jan. 11-20	5,952		6.8	08	7.2	4.4	6.2	1.4	23	26	2.4	1	1.5	66	36	17	103	6.5	4
Jan. 21-31	7,353		7.0	00	7.2	4.6	5.8	1.1	26	25	2.4	1	1.0	63	37	16	102	6.8	3
Feb. 1-10	2,744		14	05	9.6	5.6	11	1.3	38	34	2.4	1	1.0	96	47	16	144	7.1	3
Feb. 11-20	5,839		6.8	03	7.2	4.1	6.9	1.5	29	25	1.9	1	1.9	66	35	11	106	6.8	2
Feb. 21-28	9,254		12	04	8.4	4.4	8.9	2.0	33	28	1.6	1	1.0	84	39	12	119	7.0	3
Mar. 1-10	5,993		8.2	13	8.8	4.1	8.5	1.2	28	31	1.8	1	1.0	84	39	16	125	6.8	5
Mar. 11-20	2,673		7.0	09	11	4.6	13	1.2	37	40	2.5	1	1.0	102	46	16	164	7.1	4
Mar. 21-31	3,077		6.0	06	8.4	3.9	9.3	1.0	30	30	2.5	1	.8	79	37	12	123	6.5	3

CUMBERLAND RIVER BASIN--Continued  
CUMBERLAND RIVER AT WILLIAMSBURG, KY.--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium-magnesium	Non-carbonate			
Apr. 1-13, 1953	2,585		11	0.10	9.2	5.1	11	0.8	40	32	2.5	0.1	0.6	98	44	11	148	7.1	1
May 1-5	2,726		6.1	.06	10	5.8	14	1.1	46	38	3.5	.1	1.0	105	49	11	173	7.0	2
May 6-10	11,790		7.1	.08	7.6	2.9	6.1	.8	25	19	2.5	.1	1.5	62	31	10	102	6.7	4
May 11-19	3,072		7.7	.12	10	4.6	10	1.4	35	30	4.8	.1	1.5	90	45	15	149	6.8	2
May 20-24	13,380		7.5	.22	8.8	2.2	4.7	1.2	22	20	1.8	.1	2.0	61	31	12	91.2	6.9	7
May 25-31	1,555		9.1	.08	14	5.3	15	1.5	45	45	4.8	.1	2.0	113	56	20	188	7.3	3
June 1, 3-6, 8-12	810		9.3	.15	16	7.5	23	2.4	67	61	3.1	.1	1.1	155	70	16	247	7.0	90
June 13-24	1,431		7.3	.23	15	6.1	19	2.3	58	54	4.0	.0	1.7	139	63	15	222	7.1	90
June 25-July 5	1,891		7.8	.10	13	4.9	11	2.2	38	39	2.4	.1	2.1	103	52	21	163	7.3	5
July 6-15	999		10	.08	13	5.2	16	2.1	53	39	3.0	.1	1.2	119	53	10	190	7.5	5
July 16-25	392		7.3	.02	16	7.4	20	2.2	65	52	4.5	.1	1.0	143	69	17	241	7.5	4
July 26-Aug. 7	318		7.0	.04	18	8.1	27	2.5	80	63	5.5	.1	1.1	174	78	13	283	7.3	3
Aug. 8-20	131		6.7	.05	15	7.5	21	2.6	67	52	6.2	.1	1.0	157	69	13	243	7.4	3
Aug. 21-31	66.3		4.0	.02	18	7.0	29	2.6	85	59	6.9	.1	.5	172	75	4	287	6.9	5
Sept. 1-10	34.2		3.9	.03	17	8.4	37	3.1	93	66	8.4	.1	1.1	194	77	0	319	7.0	7
Sept. 11-20	46.9		6.5	.02	20	9.4	47	3.2	115	77	11	.1	.4	228	88	0	360	7.2	4
Sept. 21-30	18.8		3.9	.01	21	10	47	4.3	117	83	11	.2	.2	238	93	0	397	7.0	1
Average	2,414		8.0	0.08	13	6.2	22	2.1	62	48	5.2	0.1	1.2	138	58	7	229	--	7

## CUMBERLAND RIVER BASIN--Continued

## CUMBERLAND RIVER AT WILLIAMSURG, KY. --Continued

Temperature (°F) of water, water year October 1952 to September 1953  
(Twice-daily temperature measurements at approximately 8 a. m. and 530 p. m.)

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

CUMBERLAND RIVER BASIN--Continued  
CUMBERLAND RIVER NEAR BURKESVILLE, KY.

LOCATION.--At Neely's Ferry on State Highway 61, one-half mile downstream from Raft Creek, 3½ miles south of Burkesville, Cumberland County, about 37 miles downstream from the gaging station near Rowena, and about 38 miles downstream from Wolf Creek Dam.

RECORDS AVAILABLE.--6,050 square miles.  
RECORDS AVAILABLE.--Chemical analyses: January 1952 to September 1953.

Water temperatures: January 1952 to September 1953.

EXTREMES, 1952-53.--Dissolved solids: Maximum, 94 ppm May 11-20; minimum, 64 ppm July 29-Aug. 9.

Hardness: Maximum, 64 ppm May 11-20; minimum, 43 ppm Apr. 21-30.

Specific conductance: Maximum daily, 244 microhos Mar. 27; minimum daily, 102 microhos Apr. 28.

Water temperatures: Minimum, 40° F Dec. 15.

EXTREMES, 1952-53.--Dissolved solids: Maximum, 94 ppm May 11-20, 1953; minimum, 62 ppm Mar. 21-31, 1952.

Hardness: Maximum, 64 ppm May 11-20, 1953; minimum, 41 ppm Apr. 1-10, 1952.

Specific conductance: Maximum daily, 244 microhos Mar. 27, 1953; minimum daily, 93.6 microhos Apr. 1, 1952.

Water temperatures: Maximum, 70° F Aug. 18, 1952; minimum, 40° F Dec. 15, 1952.

REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. No records of discharge available for this station.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (microhos at 25°C)	pH	Color
															Calcium, magnesium	Non-carbonate			
Oct. 1-10, 1952.....			6.1	0.04	12	3.6	3.3	0.7	45	13	1.8	0.1	0.8	68	45	8	111	6.9	3
Oct. 11-20.....			8.3	.02	14	3.6	4.1	1.2	51	15	2.4			75	75	8	124	6.9	2
Oct. 21-30.....			8.9	.02	14	3.9	3.3	1.2	50	14	2.8			73	50	10	118	6.9	3
Nov. 1-10.....			8.1	.02	15	3.6	3.7	1.0	55	14	2.6			78	52	7	122	7.1	2
Nov. 11-20.....			8.1	.02	15	3.6	3.7	1.1	53	15	2.9			80	53	10	128	6.8	2
Nov. 21-30.....			7.5	.01	14	3.9	4.5	1.2	49	16	2.6			78	51	11	126	6.7	3
Dec. 1-10.....			7.8	.02	15	3.4	3.7	9	49	16	1.9	0	0.9	77	51	11	121	6.9	2
Dec. 11-20.....			7.9	.01	14	3.9	3.9	1.4	49	17	3.1	0	0.8	79	51	11	128	6.8	1
Dec. 21-31.....			16	.01	15	4.9	5.9	1.0	58	18	3.0			91	58	10	139	7.2	3
Jan. 1-10, 1953.....			16	.01	15	4.9	6.6	1.2	63	18	2.4			92	57	6	138	7.0	2
Jan. 11-20.....			6.7	.01	15	5.6	5.0	1.4	57	20	3.4			84	61	14	141	7.0	2
Jan. 21-31.....																			
Feb. 1-10.....			9.2	.01	16	4.9	6.6	1.3	59	21	2.6	0	0.9	90	59	12	141	6.9	2
Feb. 11-20.....			11	.01	15	5.3	5.6	1.3	55	21	2.6			88	60	14	136	7.1	2
Feb. 21-28.....			7.9	.01	15	4.6	5.2	1.1	53	22	2.5		1.4	82	57	13	131	6.9	2
Mar. 1-10.....			11	.01	14	3.4	4.5	1.1	45	20	2.4		1.0	86	50	12	126	7.2	3
Mar. 11-20.....			11	.01	12	4.1	4.4	1.4	44	19	2.2		1.1	84	48	11	133	6.6	3
Mar. 21-31.....			7.5	.03	13	3.4	5.4	1.5	41	21	3.0		1.2	83	46	13	135	6.4	2



Apr. 1-10, 1953	5.3	0.01	13	3.4	3.9	1.1	40	17	2.4	0.1	1.3	73	46	14	116	6.9	1
Apr. 11-20	5.4	.03	13	3.2	3.6	1.5	43	17	2.1	.1	1.0	74	46	10	109	6.9	4
Apr. 21-30	6.3	.01	12	3.2	4.1	1.3	37	18	3.8	.1	1.0	74	43	13	122	7.1	1
May 1-10	7.5	.05	18	4.4	3.6	.9	59	17	3.8	.1	1.3	90	63	15	145	7.2	3
May 11-20	13	.02	19	3.9	4.7	.9	64	17	4.8	.0	1.2	94	64	11	154	7.3	2
May 21-31	8.5	.08	14	2.9	3.9	1.1	42	16	3.8	.1	1.2	75	48	12	120	7.0	0
June 1-12	9.8	.05	13	3.2	4.7	1.5	45	19	2.9	.0	1.0	76	45	9	120	7.0	4
June 13-24	9.1	.10	12	3.6	4.2	1.2	40	18	3.0	.1	1.2	74	44	12	113	7.2	3
June 25-July 6	9.6	.15	12	3.2	3.9	1.4	39	18	2.8	.0	.9	75	44	11	115	7.3	10
July 7-17	6.8	.05	13	3.1	4.5	1.2	41	17	2.4	.1	1.2	73	45	12	120	7.4	5
July 18-27	7.7	.02	13	3.2	4.8	1.5	41	18	2.5	.1	.8	74	45	12	120	7.5	7
July 28-Aug. 9	8.4	.05	13	3.2	4.7	1.3	41	17	2.5	.1	.9	64	45	12	119	7.4	3
Aug. 10-22	7.8	.05	13	3.5	5.6	1.5	44	20	4.0	.1	1.0	79	47	11	129	7.3	5
Aug. 23-31	7.2	.02	14	3.1	3.8	.9	40	16	3.1	.1	1.1	75	46	15	121	6.4	3
Sept. 1-10	6.3	.02	13	3.1	3.8	1.0	44	15	2.7	.1	.8	75	46	9	118	6.5	2
Sept. 11-20	7.6	.02	13	3.4	3.8	1.2	44	16	2.4	.1	.6	75	47	10	119	6.8	3
Sept. 21-30	7.1	.01	14	3.3	4.4	2.2	47	18	2.5	.1	1.0	75	49	10	123	6.8	2
Average	8.7	0.03	14	3.8	4.5	1.2	48	17	2.7	0.1	1.0	79	51	11	122	--	3

CUMBERLAND RIVER BASIN--Continued  
CUMBERLAND RIVER NEAR BURKESVILLE, KY.--Continued

Temperature (°F) of water, water year October 1952 to September 1953

/Twice-daily temperature measurements at approximately 7 a. m. and 3 p. m./

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.
1.....	59	80	54	52	43	--	47	47	45	46	45	46	49	48	54	54	55	57	60	57	--	--	63	--
2.....	60	59	53	51	50	--	46	47	45	45	47	48	48	48	55	58	53	55	57	58	--	--	61	--
3.....	58	80	59	53	51	--	47	47	47	47	48	48	46	49	55	58	53	54	57	57	62	65	59	--
4.....	58	59	53	45	--	--	46	46	48	48	47	47	48	45	56	59	55	54	58	60	57	59	60	--
5.....	57	56	53	51	--	--	45	46	47	47	45	46	47	49	58	59	53	54	58	66	57	57	59	65
6.....	55	55	49	47	--	--	46	47	46	46	45	47	48	49	59	59	53	54	64	67	56	37	58	64
7.....	55	56	48	49	--	--	47	47	46	47	45	48	48	49	59	62	54	55	58	58	58	58	59	67
8.....	55	55	50	50	50	--	48	48	46	47	45	46	48	50	54	55	56	58	58	58	58	59	60	67
9.....	55	55	49	50	52	--	48	48	47	47	44	48	49	50	55	51	57	56	58	59	58	62	56	61
10.....	56	55	49	50	54	--	48	48	47	47	44	47	50	50	58	61	56	54	57	60	60	59	59	62
11.....	55	56	50	49	50	52	46	45	45	45	46	48	48	50	60	65	54	56	60	63	57	80	60	65
12.....	56	57	49	49	46	--	45	46	46	46	47	50	50	64	66	56	55	55	60	61	58	80	61	65
13.....	57	59	50	49	46	44	46	47	46	46	48	49	49	50	66	67	54	55	--	--	57	80	58	62
14.....	61	59	50	49	42	44	47	47	45	45	48	48	45	48	67	64	54	56	--	--	67	64	58	62
15.....	57	56	51	50	40	44	47	48	45	45	48	49	49	49	54	53	54	56	--	--	--	--	58	62
16.....	54	55	52	51	44	47	48	48	45	45	49	48	45	47	53	54	55	57	--	--	--	--	58	--
17.....	55	55	53	55	48	50	47	47	45	45	45	46	46	50	55	60	56	57	--	--	--	--	58	62
18.....	56	56	55	55	48	46	47	47	45	45	48	50	49	49	62	63	55	58	--	--	--	--	58	63
19.....	55	55	54	53	50	48	47	47	45	45	48	48	48	47	62	59	55	56	--	--	--	--	63	62
20.....	55	55	52	50	49	46	47	47	46	46	45	48	47	48	58	56	--	--	--	--	--	--	60	64
21.....	52	53	50	49	48	48	46	46	47	47	46	48	45	48	56	55	--	--	--	--	--	--	62	65
22.....	52	52	49	48	48	49	47	47	46	46	48	50	48	50	52	55	--	--	--	--	--	--	60	65
23.....	53	52	47	49	47	47	47	47	45	45	48	48	50	52	53	52	--	--	--	--	--	--	57	63
24.....	52	53	46	48	46	47	47	47	45	45	48	48	52	52	53	53	--	--	--	--	--	--	56	60
25.....	55	54	50	53	48	48	45	45	45	46	45	45	52	53	52	55	--	--	--	--	--	--	60	59
26.....	53	52	52	51	47	46	45	45	45	46	45	45	50	50	54	57	--	--	--	--	--	--	59	63
27.....	53	54	50	49	43	44	45	46	45	46	42	47	48	50	53	54	--	--	--	--	--	--	59	64
28.....	54	52	47	47	44	46	46	46	46	46	45	46	47	48	49	53	54	--	--	--	--	--	58	64
29.....	55	53	45	47	45	46	45	45	45	--	45	47	49	51	54	57	--	--	--	--	--	--	69	65
30.....	52	49	46	46	47	45	45	--	--	--	47	48	51	52	54	58	--	--	--	--	--	--	59	65
31.....	52	50	--	--	47	47	46	46	--	--	46	49	--	--	54	55	--	--	--	--	--	--	--	--
Average.....	55	55	50	50	47	--	46	47	46	46	46	46	48	49	56	58	--	--	--	--	--	--	60	63

## CUMBERLAND RIVER BASIN--Continued

## CUMBERLAND RIVER AT SMITHLAND, KY.

LOCATION.--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 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 86°F Aug. 1, 2, 3; minimum, 41°F Jan. 6.

EXTREMES, 1949-53.--Water temperatures: Maximum, 88°F July 27, 1952; 34°F Feb. 3,

4, 5, 7, 1951.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1276.

Temperature (°F) of water, water year October 1952 to September 1953  
/Mean of twice-daily measurements at approximately 8 a. m. and 5 p. m./

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

## TENNESSEE RIVER BASIN

## FRENCH BROOK RIVER AT BLANTYRE, N. C.

LOCATION.--At gaging station at bridge on county road, 700 feet east of Blantyre railroad station, Transylvania County, and 3.4 miles downstream from Little River.

DRAINAGE AREA.--296 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1953.

Water temperatures: October 1952 to September 1953.

EXTREMES, 1952-53.--Dissolved solids: Maximum, 202 ppm Oct. 21-31; minimum, 44 ppm Mar. 22-31.

Hardness: Maximum, 27 ppm Oct. 1-10; minimum, 9 ppm May 2-4, June 7, July 23.

Water temperatures: Maximum, 79°F Sept. 4; minimum, freezing point Dec. 30, 31.

REMARKS.--Records of suspended matter of composite samples available in district office at Raleigh, N. C. Records of discharge for water year October 1952 to September 1953 given in WSP 1276.

## Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		pH	Color	Oxygen consumed	
													Calcium	Non-carbonate			Unfiltered	Filtered
Oct. 1-10, 1952 ....	333 11	0.18	0.18	8.4	1.4 17	16	0.8	48	7.7 11	0.0	0.8	164	27	0	6.4	180	22	12
Oct. 11-20 .....	289 11	.17	8.0	8.0	1.0	16		44	7.9 10		1.0	173	24	0	6.3	180	23	16
Oct. 21-31 .....	235 8.9	.30	8.5	8.5	.8	53		58	73 12		.1	202	24	0	6.5	110	23	2.7
Nov. 1-10 .....	260 10	.19	8.4	1.0	48	41		46	71 12		.2	192	23	0	6.5	120	23	3.5
Nov. 11-20 .....	533 8.7	.11	7.8	1.0	41	20		41	62 9.8		1.0	164	24	0	6.3	100	21	12
Nov. 21-30 .....	685 8.1	.12	4.9	1.0	20	20		23	32 5.2	.1	.6	188	16	0	6.3	50	12	7.6
Dec. 1-10 .....	560 8.4	.08	5.0	5.0	.7	23		27	34 5.5	.0	.1	96	15	0	6.5	50	14	8.7
Dec. 11-20 .....	773 8.0	.05	4.1	.7	16	16		22	23 3.5	.0	.0	73	13	0	6.5	36	9	6.5
Dec. 21-31 .....	487 8.9	.05	5.8	.7	21	21	2.3	22	37 4.6	.0	.0	94	17	0	6.4	40	12	7.9
Jan. 1-10, 1953 .....	980 8.1	.06	4.3	3.9 17				20	28 5.0	.1	.2	80	14	0	6.5	20	14	7.2
Jan. 11-20 .....	1,120 6.7	.02	3.8	1.0	13	13		18	19 4.5	.1	.4	59	14	0	6.3	25	12	6.2
Jan. 21-31 .....	1,440 6.6	.03	3.4	3.4	.7	9.4		14	3.8 1.1		.4	48	11	0	6.3	18	11	8.1
Feb. 1-10 .....	889 8.6	.08	3.0	3.0	.7	13		15	21 3.5	.0	.4	62	10	0	6.3	19	--	--
Feb. 11-19 .....	1,100 8.6	.08	3.0	3.0	.8	11		14	17 3.5	.0	.4	56	11	0	6.3	18	9.2	4.2
Feb. 20-28 .....	3,460 9.1	.11	4.0	1.1	4.9	11		11	11 3.0	.0	.5	44	14	6	6.5	17	4.4	2.8
Mar. 1-10 .....	1,460 9.2	.08	3.2	3.2	.8	9.0		14	3.2 0.0		.4	54	11	0	6.3	16	0	4.8
Mar. 11-20 .....	1,260 9.2	.09	2.6	.7	10	10		13	3.2 0.0		.2	54	10	0	6.3	18	7.6	4.8
Mar. 21-31 .....	1,020 --	--	--	--	--	--	--	20	4.0 --	--	--	--	10	--	6.3	--	--	--
Mar. 22-31 .....	2,520 8.4	.07	2.8	2.8	.8	7.9		13	12 3.0	.0	.2	44	10	0	6.4	14	6.4	4.0
Apr. 1-10 .....	11,100 9.0	.09	3.2	3.2	7 11	1.4		16	17 3.8	.0	.2	59	11	0	6.5	20	6.8	5.0
Apr. 11-20 .....	397 8.2	.05	3.0	3.0	.7	15		17	22 3.6	.0	.2	65	10	0	6.3	30	9.1	5.7
Apr. 21-30 .....	729 10	.10	3.7	3.7	1.1	18		23	26 5.2	.0	.3	84	14	0	6.4	35	12	7.6
Apr. 30-5-10 .....	1,360 --	--	--	--	--	--	--	12	12 3.5		--	--	15	5	5.8	--	--	--
May 1-10 .....	1,850 7.2	.11	2.8	2.8	1.2	7.4		12	13 3.0	.0	.5	50	12	2	6.3	15	11	4.8
May 11-20 .....	1,180 7.2	.08	3.0	3.0	1.1	16		16	16 3.8	.0	--	--	9	0	6.2	25	--	--
May 21-31 .....	1,932 9.3	.05	3.0	3.0	1.1	15		20	20 4.5	.0	.3	72	12	0	6.4	27	9.8	6.2
May 22-31 .....	689 9.6	.04	3.6	3.6	1.2	17		17	29 4.5	.0	.2	81	14	0	6.2	31	8.6	5.6

June 1-6, 1953	496	11	0.10	4.8	0.3	26	24	38	7.2	0.0	0.7	112	13	0	163	6.6	50	--	--
June 7	2,170	--	--	--	--	--	8	7	2.5	--	--	9	9	2	48.8	6.7	--	--	--
June 8-10	1,030	--	--	--	--	--	15	18	3.5	--	--	--	13	1	97.8	6.7	--	--	--
June 11	1,310	--	--	--	--	--	12	14	3.0	--	--	--	10	0	64.3	6.0	--	--	--
June 12-20	737	11	.06	4.5	.7	17	20	26	5.0	.0	.3	78	14	0	120	6.5	50	15	8.1
June 21-30	681	10	.05	4.0	.7	17	19	25	5.0	.0	.6	81	13	0	120	6.4	32	13	6.8
July 1-10	581	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 11-16, 18-20	587	10	.04	4.1	1.5	17	21	32	5.8	.0	.6	88	16	0	133	6.5	32	10	6.2
July 17	613	--	--	4.8	.7	21	24	31	5.2	.0	.4	104	15	0	196	6.5	37	14	6.8
July 21	558	9.4	.04	5.8	.7	21	14	20	3.2	--	--	11	0	0	78.8	6.1	--	--	--
July 22-24, 31	979	--	--	--	--	--	32	32	6.0	.0	.4	103	17	0	184	6.6	45	14	7.7
July 23	--	--	--	--	--	--	12	17	4.0	--	--	9	0	0	80.0	--	--	--	--
Aug 1-10	487	9.8	.05	6.0	.6	24	18	35	5.8	.0	.1	114	17	0	170	8.6	55	14	9.1
Aug 11-20	403	10	.03	6.0	.8	31	28	51	6.2	.0	.2	126	18	0	197	8.6	45	16	9.6
Aug 21-31	334	11	.05	7.4	.5	36	31	58	9.0	.0	.7	150	20	0	223	8.3	43	16	11
Sept. 1-4, 9-10	340	10	.08	7.4	.9	42	42	59	12	.0	1.3	172	22	0	253	6.7	55	--	--
Sept. 5-8	669	8.7	.07	4.2	.7	18	15	34	3.8	.0	.3	177	13	1	127	6.8	16	--	--
Sept. 11-19	299	9.6	.04	8.7	.6	40	37	84	4.5	.1	.2	166	24	0	253	6.6	40	19	13
Sept. 20	749	--	--	--	--	--	17	18	4.0	--	--	11	0	0	93.4	6.2	--	--	--
Sept. 21-25	376	8.4	.12	6.7	.9	34	27	55	11.0	.0	.4	131	20	0	212	7.2	32	--	--
Sept. 26-30	685	8.3	.11	4.0	.4	21	20	33	4.0	.0	.2	81	12	0	126	7.2	32	--	--
Average	846	9.1	0.09	4.9	0.8	21	22	29	5.5	0.0	0.4	98	15	0	133	--	45	13	7.3

## TENNESSEE RIVER BASIN--Continued

## FRENCH BROAD RIVER AT BLANTYRE, N. C.--Continued

Temperature (°F) of water, water year October 1952 to September 1953  
 (Once-daily temperature measurement at 8 a. m.)

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

## TENNESSEE RIVER BASIN--Continued

## IVY RIVER NEAR MARSHALL, N. C.

LOCATION.--At gaging station, 0.2 mile downstream from highway bridge, 1.9 miles upstream from mouth, and 4 miles southeast of Marshall, Madison County.  
 DRAINAGE AREA.--158 square miles.  
 RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1953.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1276.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 15, 1952	19	17	0.18	6.2	2.6	3.2	1.7	37	2.8	2.0	0.2	0.8	56	26	0	71.2	7.1	7
Nov. 15	24	16	.18	5.0	2.3	4.6		30	3.1	2.4	.2	.3	52	22	0	72.3	7.5	8
Dec. 15	58	14	.08	5.0	1.8	1.9		20	3.7	2.0	.1	.9	44	20	4	50.8	7.6	3
Jan. 15, 1953	105	11	.06	3.8	1.4	3.1	1.3	17	4.2	2.0	.1	2.8	39	15	1	47.1	6.8	4
Feb. 15	342	12	.08	5.4	2.1	3.7		16	6.0	3.2	.1	7.6	53	22	9	83.2	6.6	17
Mar. 15	266	13	.15	5.7	2.1	4.8		18	13.7	2.6	.1	3.9	35	23	8	55.1	6.7	12
Apr. 15	135	11	.06	3.6	1.5	3.6	1.5	20	3.7	2.9	.1	.7	38	13	0	46.5	7.0	4
May 15	100	13	.07	4.4	1.0	6.3		24	3.5	2.2	.1	2.0	43	13	0	55.9	6.8	6
June 15	48	11	.08	5.3	1.8	5.5		31	2.9	2.2	.1	1.1	49	21	0	64.3	6.4	6
July 15	19	8.8	.06	5.9	2.0	3.7	2.1	36	2.5	2.5	.1	.5	51	23	0	70.0	6.5	8
Aug. 15	15	9.6	.03	5.9	2.2	6.2		37	2.8	2.5	.1	.2	52	24	0	74.3	7.1	16
Sept. 15	11	15	.03	6.0	2.6	3.4	1.2	37	3.5	2.1	.2	.3	56	26	0	89.5	6.6	7

TENNESSEE RIVER BASIN--Continued  
WATAUGA RIVER NEAR SUGAR GROVE, N. C.

LOCATION.--At gaging station at bridge on county road, 300 feet downstream from Cove Creek and 2.3 miles southwest of Sugar Grove, Watauga County. DRAINAGE AREA.--90.8 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1953.

Water temperatures: October 1952 to September 1953.

EXTREMES, 1952-53.--Dissolved solids: Maximum, 40 ppm June 21-30, July 1-10, Aug. 1-10; minimum, 26 ppm Mar. 11-20.

Hardness: Maximum, 18 ppm Nov. 1-10; minimum, 9 ppm Mar. 11-20.

Water temperatures: Maximum, 86° F July 31; minimum, freezing point Dec. 15, Jan. 5.

REMARKS.--Records of suspended matter of composite samples available in district office at Raleigh, N. C. Records of discharge for water year October 1952 to September 1953 given in WSP 1276.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25° C)	pH	Color	Oxygen consumed	
														Calcium	Non-carbonate				Unfiltered	Filtered
Oct. 1-10, 1952 ...	41	9.5	0.05	3.8	1.1	2.9	1.0	18	4.3	2.1	0.1	0.5	35	14	0	43.7	6.5	8	3.1	2.6
Oct. 11-20 .....	33	9.2	.04	3.5	1.1	3.4	3.4	19	1.9	1.9	.1	.2	32	13	0	43.2	6.7	16	2.6	2.6
Oct. 21-31 .....	25	11	.04	3.8	1.3	3.9	3.9	22	1.9	2.0	.1	.3	34	15	0	43.2	7.3	5	1.8	1.4
Nov. 1-10 .....	24	10	.06	5.6	1.1	1.8	2.9	20	2.0	2.4	.1	.4	38	18	2	43.3	6.9	5	1.8	1.7
Nov. 11-20 .....	86	8.7	.02	4.9	.9	2.9	2.9	19	2.8	2.2	.1	.7	36	16	0	41.7	6.3	11	3.0	2.1
Nov. 21-30 .....	150	9.0	.06	3.7	1.2	2.6	2.6	14	3.4	2.2	.1	2.0	35	14	3	42.5	6.5	13	3.5	2.8
Dec. 1-10 .....	91	9.1	.06	3.4	1.0	3.4	3.4	14	3.1	2.5	.1	1.9	33	13	1	41.6	6.7	8	3.2	2.3
Dec. 11-20 .....	138	9.3	.05	3.2	1.0	3.2	3.2	13	2.8	2.6	.1	2.1	32	12	1	38.7	6.7	5	3.1	2.3
Dec. 21-31 .....	74	10	.04	4.1	1.0	3.4	3.4	15	3.9	2.8	.1	1.5	37	14	2	45.0	6.6	6	3.0	2.2
Jan. 1-10, 1953 ...	208	9.1	.04	3.6	1.0	2.5	1.5	14	2.8	2.5	.1	2.5	33	13	2	41.0	6.7	16	3.0	2.4
Jan. 11-20 .....	205	11	.02	3.6	1.1	4.7	4.7	16	2.7	2.9	.2	3.9	38	14	0	57.0	6.7	3	3.2	3.2
Jan. 21-31 .....	396	7.2	.01	3.6	1.1	2.6	2.6	10	3.3	2.6	.2	4.1	33	14	5	68.6	6.4	7	3.8	2.9
Feb. 1-10 .....	142	8.7	.07	3.2	.9	3.1	3.1	12	2.8	2.6	.1	2.2	30	12	2	45.2	6.5	3	2.6	2.2
Feb. 11-19 .....	195	8.7	.04	3.0	1.0	2.6	2.6	11	2.7	2.2	.1	2.6	29	12	3	36.7	7.1	7	3.2	2.2
Feb. 20-28 .....	573	8.7	.04	3.0	1.1	2.3	2.3	9	3.6	3.1	.1	1.7	37	12	5	35.9	6.5	9	3.1	2.8
Mar. 1-10 .....	247	8.9	.04	2.9	1.0	2.8	2.8	11	3.1	2.6	.1	1.6	31	11	2	37.6	6.5	5	2.7	2.2
Mar. 11-20 .....	291	7.9	.03	2.4	.8	2.7	2.7	10	2.7	1.9	.1	1.6	26	9	1	31.5	6.4	11	3.6	3.4
Mar. 21-31 .....	524	9.1	.04	2.5	.8	2.9	2.9	10	2.3	2.1	.2	2.2	29	10	1	35.0	6.3	10	3.8	3.4
Apr. 1-10 .....	162	8.8	.06	2.9	.9	1.4	.5	12	2.4	1.8	.0	1.5	28	11	1	34.0	6.7	4	2.2	2.1
Apr. 11-20 .....	131	11	.06	2.8	1.0	3.3	3.3	14	2.3	1.9	.2	1.5	33	11	0	36.4	6.7	9	3.3	2.3
Apr. 21-30 .....	130	12	.04	3.0	1.0	3.6	3.6	14	2.5	2.2	.1	2.2	35	12	0	49.8	6.6	11	3.4	3.1
May 1-10 .....	306	9.0	.08	3.1	.9	3.7	3.7	14	3.1	2.1	.1	2.0	34	11	0	38.2	6.5	10	3.4	3.0
May 11-20 .....	134	9.7	.06	3.7	1.1	3.4	3.4	18	2.7	2.0	.1	.8	35	14	0	53.4	6.7	5	3.2	2.4
May 21-31 .....	80	11	.02	3.5	1.1	3.9	3.9	18	3.0	2.0	.1	.6	39	13	0	--	6.7	18	4.0	3.9



June 1-10, 1953....	112	9.3	0.08	3.6	1.2	3.6	18	2.1	2.0	0.2	1.8	36	14	0	41.7	6.7	8	4.2	3.0
June 11-20.....	123	9.2	.06	4.0	.8	3.0	15	2.5	2.5	.1	1.5	37	13	1	45.0	6.4	8	4.9	3.0
June 21-30.....	83	11	.06	3.9	1.4	4.2	19	3.0	3.5	.1	1.0	40	16	0	50.3	6.5	13	4.1	2.8
July 1-10.....	83	8.2	.04	4.6	.7	2.8	17	2.0	2.8	.1	1.2	40	14	0	45.4	6.5	16	3.8	3.2
July 11-20.....	53	10	.06	3.7	.9	4.0	18	2.1	2.5	.1	1.0	36	13	0	52.1	6.5	9	--	2.8
July 21-31.....	61	10	.05	5.7	.5	3.4	20	2.3	2.8	.1	.7	39	16	0	53.0	6.7	13	4.5	2.8
Aug. 1-10.....	38	12	.03	4.4	1.2	4.4	21	3.2	3.0	.1	.7	40	16	0	50.7	7.0	13	4.2	2.2
Aug. 11-20.....	30	6.6	.04	4.2	1.4	3.9	22	2.6	2.5	.1	.3	38	16	0	54.7	7.0	27	2.8	2.5
Aug. 21-31.....	30	6.0	.07	3.9	1.2	4.3	20	2.2	2.8	.3	.8	38	15	0	64.6	6.8	12	3.1	2.8
Sept. 1-10.....	32	11	.04	4.1	1.4	3.5	20	2.2	2.8	.2	.5	39	16	0	50.3	6.8	14	4.6	2.6
Sept. 11-20.....	25	7.8	.02	3.9	1.3	4.9	23	2.0	2.8	.2	.5	37	15	0	51.0	7.0	14	3.4	2.6
Sept. 21-30.....	31	9.0	.06	3.9	.9	4.2	23	2.0	2.8	.2	.4	36	13	0	49.1	7.1	19	3.6	2.8
Average.....	141	9.5	0.05	3.7	1.0	3.5	16	2.7	2.4	0.1	1.4	35	13	1	45.2	--	10	3.4	2.6

## CUMBERLAND AND TENNESSEE RIVER BASINS

## TENNESSEE RIVER BASIN--Continued

## WATAUGA RIVER NEAR SUGAR GROVE, N. C.--Continued

Temperature (°F) of water, water year October 1952 to September 1953  
 /Once-daily temperature measurement at 2:30 p. m./

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

TENNESSEE RIVER BASIN--Continued  
NORTH FORK HOLSTON RIVER AT HOLSTON, VA.

LOCATION.--At gaging station at bridge on U. S. Highway 19, 100 feet downstream from Greendale Creek, 0.4 mile upstream from Garrett Creek, 0.5 mile east of Holston, Washington County, and 0.6 mile upstream from Little Moccasin Creek.

DRAINAGE AREA.--402 square miles.

RECORDS AVAILABLE.--October 1951 to September 1953.

Water temperatures: October 1951 to September 1953.

EXTREMES, 1952-53.--Dissolved solids: Maximum, 8,780 ppm Oct. 11-15, 17-20; minimum, 200 ppm (calculated) Jan. 27.

Hardness: Maximum, 4,870 ppm Oct. 11-15, 17-20; minimum, 109 ppm Jan. 27.

Specific conductance: Maximum daily, 15,400 micromhos Oct. 11, 12; minimum daily, 366 micromhos Jan. 27.

Water temperatures: Maximum observed, 84° F Aug. 15; minimum, freezing point on several days during March and April.

EXTREMES, 1951-53.--Dissolved solids: Maximum, 8,780 ppm Oct. 11-15, 17-20, 1952; minimum, 200 ppm (calculated) Jan. 27, 1953.

Hardness: Maximum, 4,870 ppm Oct. 11-15, 17-20, 1952; minimum, 109 ppm Jan. 27, 1953.

Specific conductance: Maximum daily, 15,400 micromhos Sept. 14, 1951, Oct. 11, 12, 1952; minimum daily, 366 micromhos Jan. 27, 1953.

Water temperatures: Maximum, 88° F June 24, 1952; minimum, freezing point on several days during March and April, 1953.

REMARKS.--Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year October 1952 to September 1953 given in WSP 1276. Values reported for dissolved solids are sums of determined constituents.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boiron (B)	Dissolved solids (Sum)		Hardness as CaCO <sub>3</sub>		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-10, 1952..	50.2	6.6	0.01	1,400	114	1,160	7.7	58	116	4,470		2.4		7,310		3,960	3,910			12,600	6.9	2
Oct. 11-15, 17-20	52.1	9.0	.01	1,760	116	1,340	8.2	46	123	5,400		4.4		8,780		4,870	4,830			15,000	6.8	4
Oct. 16, 23, 25-30	49.5	5.6	.02	1,530	86	1,110	7.7	90	113	4,670		4.4		7,570		4,170	4,100			13,100	7.0	4
Oct. 21, 22, 24, 31	48.0	7.7	.02	379	39	280	3.1	169	31	1,150		2.0		1,970		1,110	967			3,770	7.6	0
Nov. 1, 2, 23-25,																						
Nov. 1, 2, 23-25,	172	7.9	.01	302	23	222	2.9	98	44	888		5.1		1,550		869	788			3,100	7.2	5
Nov. 3-10, .....	53.0	5.8	.01	1,670	98	1,220	8.9	78	123	5,090		2.8		8,260		4,570	4,510			14,200	7.0	0
Nov. 11-18, .....	62.5	4.3	.01	1,540	121	1,130	8.7	64	125	4,710		3.0		7,670		4,340	4,290			13,400	6.9	3
Nov. 19-22, 26, ..																						
Dec. 1-8, .....	130	4.9	.02	876	28	620	5.0	52	71	2,480		3.6		4,110		2,300	2,260			7,550	7.0	5
Dec. 9-11, 15, ..	721	6.3	.02	178	13	99	1.8	72	44	440		4.0		821		2,200	2,160			7,120	6.8	0
Dec. 12-14, .....	628	--	--	71	6	54	1.6	87	28	158		--				498	439			1,620	7.4	4
Dec. 15, .....	238	--	--	203	9	185	2.1	72	44	606		--				196	125			687	7.5	--
Dec. 16, 18, .....	233	--	--	424	18	330	2.4	69	44	1,190		--				546	487			2,070	7.4	--
Dec. 17, .....																1,130	1,080			3,770	7.2	--
Dec. 19-27, 31, ..	192	--	--	660	19	505	3.0	64	48	1,870		--				1,720	1,670			5,760	7.3	--
Dec. 28-30, .....	148	--	--	914	29	700	3.5	57	48	2,620		--				2,400	2,350			7,800	7.4	--
Jan. 1-10, 1953, ..	463	5.6	.01	326	15	251	2.1	72	32	940		.8		1,610		2,878	816			2,990	7.3	5
Jan. 11, 12, 15, ..																						
21-23, 28-31, .....	977	--	--	106	5.2	83	1.4	72	26	276		--				286	227			1,070	7.6	--

TENNESSEE RIVER BASIN--Continued  
NORTH FORK HOLSTON RIVER AT HOLSTON, VA.--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boiron (B)	Dissolved solids (Sum)			Hardness as CaCO <sub>3</sub>		Per-cent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Jan. 13, 14, 16-20, 26, 1953.....	507	--	--	183	6.2	165	1.7	67	32	536	--	--	--	--	--	--	482	427	--	1,840	7.4	--
Jan. 27.....	675	--	--	37	4.1	28	1.4	84	20	60	--	--	--	--	--	--	109	40	--	366	7.7	--
Feb. 1, 5, 8-10, 12, 19, 20, 26, 27.....	661	--	--	158	7.2	119	1.6	72	24	422	--	--	--	--	--	--	424	365	--	1,510	7.5	--
Feb. 2, 6, 7, 11, 28, Feb. 3, 4, 13-18, 22-25.....	447	--	--	203	13	165	1.8	70	26	564	--	--	--	--	--	--	580	503	--	1,950	7.5	--
Feb. 21, Mar. 2-5, 10, 19-22.....	1,375 2,060	--	--	95	8.5	70	1.4	70	14	239	--	--	--	--	--	--	272	215	--	911	7.8	--
Mar. 1, 6, 7, 11, 18, 24, 26-28.....	999	--	--	138	9.4	86	1.5	59	12	343	--	--	--	--	--	--	383	335	--	615	7.6	--
Mar. 8, 9, 12-17, 23, 29-31.....	647	--	--	168	8.3	126	1.7	77	18	490	--	--	--	--	--	--	528	465	--	1,240	7.6	--
Mar. 25.....	1,630	--	--	90	5.7	53	1.2	58	16	205	--	--	--	--	--	--	248	200	--	1,710	7.7	--
Apr. 1-10.....	446	7.6	0.02	214	16	169	1.7	69	23	605	--	1.1	--	1,070	--	--	600	543	--	2,020	7.5	4
Apr. 11, 13-15, 17-21, 23-24.....	641	--	--	220	14	144	1.6	47	20	580	--	--	--	--	--	--	606	568	--	1,930	7.5	--
Apr. 12, 16, 22.....	562	--	--	105	9.2	96	1.4	64	22	302	--	--	--	--	--	--	300	247	--	1,120	7.8	--
Apr. 25-30.....	383	--	--	314	16	186	1.9	61	22	806	--	--	--	--	--	--	849	799	--	2,620	7.1	--
May 1, 5, 12-16, 29-31.....	500	--	.01	284	11	202	2.0	70	26	740	--	--	--	--	--	--	756	696	--	2,660	7.3	--
May 2-4, 6, 10, 11, 22-24, 27, 28.....	882	--	.01	184	8.7	120	1.7	70	28	540	--	--	--	--	--	--	496	438	--	1,710	7.4	--
May 7-9, 17-21, 25, 26.....	2,270	--	.02	103	5.3	59	1.5	84	19	250	--	--	--	--	--	--	280	210	--	891	7.5	--
June 1-6, 10, 27, 28, June 7-9, 21-26, 29, 30.....	225	--	.01	432	32	366	2.9	74	22	1,350	--	--	--	--	--	--	1,210	1,150	--	4,280	7.2	--
June 11-20.....	334	--	.02	288	16	201	2.4	64	30	870	--	--	--	--	--	--	784	732	--	2,730	7.3	--
July 1-10.....	337	--	.01	304	12	237	2.5	72	14	960	--	--	--	--	--	--	808	749	--	2,990	7.2	--
July 11-15, 18-20, 22, 31.....	556	11	.02	330	20	242	2.5	61	38	960	--	.6	--	1,630	--	--	908	856	--	3,040	7.4	6
July 16, 17, 21, 23-30.....	185	--	.02	382	29	306	2.5	71	28	1,200	--	--	--	--	--	--	1,070	1,010	--	3,810	7.4	--
	156	--	.02	552	34	422	3.1	63	32	1,780	--	--	--	--	--	--	1,520	1,470	--	5,260	7.2	--

Aug. 1-10, 1953.	108	--	0.01	676	61	552	3.9	--	52	2,080	--	--	--	--	1,940	--	6,380	7.0	--
Aug. 11-20.	76.0	--	.03	908	134	710	4.6	--	60	2,980	--	--	--	--	2,820	--	8,670	6.8	--
Aug. 21-31.	72.5	--	.01	1,290	151	1,020	5.1	--	68	4,200	--	--	--	--	3,670	--	11,900	6.9	--
Sept. 1-10.	72.	--	.01	1,310	78	995	5.2	--	84	4,050	--	--	--	--	3,590	--	11,500	6.9	--
Sept. 11-20.	57.3	--	.01	1,260	78	995	5.3	--	60	4,030	--	--	--	--	3,540	--	11,500	7.0	--
Sept. 21-30.	56.3	--	.02	1,268	134	1,040	5.6	--	52	4,150	--	--	--	--	3,720	--	11,800	7.0	--
Average	480	--	--	583	44	446	3.4	69	45	1,790	--	--	--	--	1,630	1,260	5,470	--	--

## TENNESSEE RIVER BASIN--Continued

## NORTH FORK HOLSTON RIVER AT HOLSTON, VA.--Continued

Temperature (°F) of water, water year October 1952 to September 1953

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

TENNESSEE RIVER BASIN--Continued  
LITTLE TENNESSEE RIVER AT PRENTISS, N. C.

LOCATION--100 yards upstream from bridge on county road at Prentiss, Macon County, and about 2 miles upstream from gaging station.  
DRAINAGE AREA--140 square miles.

RECORDS AVAILABLE--Chemical analyses: October 1952 to September 1953.

Water temperatures: October 1952 to September 1953.

EXTREMES, 1952-53.--Dissolved solids: Maximum, 33 ppm Mar. 1-10; minimum, 19 ppm Feb. 20-28.  
Hardness: Maximum, 10 ppm Oct. 1-10, Nov. 1-10, Feb. 11-19; minimum, 5 ppm Mar. 1-10, Mar. 21-31, Apr. 1-10, June 1-10, July 11-20.

Water temperatures: Maximum, 78°F July 6, 12, 13, 14; minimum, 37°F Dec. 15.

REMARKS.--Records of suspended matter of composite samples available in district office at Raleigh, N. C. Records of discharge for gaging station near Prentiss, N. C. for water year October 1952 to September 1953 given in WSP 1276. No appreciable inflow between sampling point and gaging station except during periods of heavy local rain.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
														Calcium	Non-carbonate				Unfiltered	Filtered
Oct. 1-10, 1952	113	11	0.03	3.3	0.5	1.6	0.9	12	1.9	1.2	0.0	0.4	28	10	0	26.1	6.4	3	2.3	1.8
Oct. 11-20	106	11	.02	2.0	.7	3.2		12	3.0	1.2	.0	.2	27	8	0	26.6	6.6	6	2.0	2.0
Oct. 21-31	99	11	.03	1.7	.8	3.0		13	1.0	1.5	.0	.3	26	8	0	24.5	6.8	4	2.0	1.5
Nov. 1-10	98	12	.04	2.7	.9	1.7		13	1.2	1.2	.1	.3	30	10	0	27.1	6.8	6	2.1	1.5
Nov. 11-20	184	8.9	.04	2.1	.7	3.5		13	2.0	1.8	.1	.4	26	8	0	27.9	6.4	8	4.4	1.8
Nov. 21-30	199	9.3	.05	2.0	.8	2.9		11	2.4	1.6	.0	1.1	26	8	0	24.9	6.8	7	2.2	1.8
Dec. 1-10	225	8.7	.06	2.0	.7	2.4		10	1.9	1.5	.1	.6	24	8	0	24.5	6.5	3	3.4	1.7
Dec. 11-20	218	10	.05	2.1	.7	3.0		11	2.8	1.5	.1	.5	26	8	0	23.5	6.6	3	2.4	1.4
Dec. 21-31	163	9.1	.07	2.1	.8	1.9		10	1.7	1.5	.1	.4	23	8	0	26.7	6.4	4	2.4	1.5
Jan. 1-10, 1953	439	8.0	.08	2.2	.6	2.1	1.0	12	1.9	1.6	.1	.6	27	9	0	27.5	6.6	4	3.4	1.8
Jan. 11-20	455	8.4	.03	2.0	.7	2.7		11	1.9	2.0	.1	.6	25	8	0	23.8	6.6	2	2.6	2.0
Jan. 21-31	578	6.1	.04	1.6	.7	1.9		8	1.4	1.6	.1	.6	20	7	0	20.4	6.4	3	5.3	1.8
Feb. 1-10	345	8.3	.02	1.8	.5	2.5		9	.9	2.1	.1	.5	21	7	0	19.2	7.0	4	2.4	2.0
Feb. 11-19	562	7.0	.03	2.6	.8	1.8		8	1.9	1.9	.1	1.7	20	10	2	27.8	6.8	10	3.3	2.0
Feb. 20-28	1,320	6.6	.03	2.0	.6	1.6		7	1.6	2.0	.1	1.7	19	7	2	33.4	6.4	15	4.8	1.9
Mar. 1-10	631	7.8	.08	1.6	.3	3.2		8	2.8	1.6	.1	.4	33	5	0	22.6	6.2	19	3.6	2.0
Mar. 11-20	516	7.8	.04	1.4	.6	2.7		9	1.6	1.6	.1	.5	21	6	0	18.5	6.7	5	3.0	1.6
Mar. 21-31	645	7.8	.08	1.3	.5	2.6		8	1.6	1.6	.0	.5	20	5	0	18.5	6.6	6	2.9	2.3
Apr. 1-10	415	8.1	.05	1.1	.6	2.0	.9	9	1.5	1.5	.1	.4	21	5	0	18.2	6.5	4	2.0	1.8
Apr. 11-20	357	8.5	.02	1.4	.4			10	1.3	1.9	.1	.5	23	5	0	23.1	6.5	5	2.9	1.9
Apr. 21-30	324	8.5	.02	1.5	.5	2.8		9	1.2	1.8	.1	.6	22	6	0	21.9	6.4	7	3.6	3.0
May 1-10	361	8.1	.03	1.8	.7	2.2		9	1.7	1.6	.1	.7	25	7	0	24.8	6.6	8	2.2	1.9
May 11-20	360	9.8	.05	1.9	.7	2.2		10	1.3	1.6	.1	.5	22	8	0	20.7	6.6	3	3.6	2.2
May 21-31	255	9.2	.02	1.6	.5	2.5		10	1.2	1.1	.1	.4	23	6	0	25.3	6.6	8	3.0	2.0

TENNESSEE RIVER BASIN--Continued  
LITTLE TENNESSEE RIVER AT PRENTISS, N. C.--Continued  
Chemical analyses, in parts per million, water year October 1953 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color	Oxygen consumed	
														Calcium, mg-nesium	Non-carbonate				Unfiltered	Filtered
June 1-10, 1953.....	211	9.9	0.04	1.5	0.4	2.5		8	1.1	1.8	0.0	0.6	23	5	0	39.5	6.2	9	2.8	2.4
June 11-20.....	212	9.9	.05	1.9	.2	2.6		8	1.2	1.8	.1	.8	23	6	0	24.1	6.1	4	5.9	1.5
June 21-30.....	219	11	.02	2.2	.6	2.5		9	1.7	2.5	.1	.7	27	8	1	46.7	6.1	5	4.7	2.0
July 1-10.....	181	13	.01	2.2	.8	2.2	1.0	11	2.1	3.0	.0	.5	31	9	0	32.2	6.6	13	4.5	2.7
July 11-20.....	180	10	.06	1.5	.4	3.1		9	1.1	2.0	.1	.8	24	5	0	30.1	6.1	12	3.8	2.2
July 21-31.....	221	9.2	.05	2.3	.7	3.0		11	2.0	2.2	.1	.8	29	9	0	35.0	6.3	27	5.2	2.5
Aug. 1-10.....	156	11	.02	2.0	.5	2.2		10	1.4	1.2	.0	.6	28	7	0	30.2	6.6	16	5.6	2.0
Aug. 11-20.....	144	12	.03	2.0	.9	2.0		12	1.2	1.2	.0	.4	26	9	0	25.1	6.8	17	4.2	1.3
Aug. 21-31.....	123	11	.05	1.7	.5	4.1		10	3.6	2.0	.1	.2	30	6	0	25.9	6.6	15	3.2	1.8
Sept. 1-10.....	109	8.6	.04	1.9	.8	3.5		11	3.0	2.2	.1	.4	30	8	0	27.7	6.6	12	5.5	2.1
Sept. 11-20.....	96	11	.02	1.8	.3	2.8	4.3	10	2.1	3.0	.1	.4	28	6	0	25.4	6.6	10	2.8	1.6
Sept. 21-30.....	155	8.8	.07	1.8	.9	2.8	1.5	12	1.9	1.5	.1	.2	28	8	0	27.2	6.7	7	4.5	2.6
Average.....	310	9.3	0.04	1.9	0.6	2.8		10	1.8	1.8	0.1	0.6	25	7	0	26.4	--	8	3.5	1.9



## TENNESSEE RIVER BASIN--Continued

## LITTLE TENNESSEE RIVER AT PRENTISS, N. C.--Continued

Temperature (°F) of water, water year October 1952 to September 1953  
 /Once-daily temperature measurement at 5 p. m. /

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

## TENNESSEE RIVER BASIN--Continued

## VALLEY RIVER AT TOMOTLA, N. C.

LOCATION--At gaging station at bridge on county road at Tomotla, Cherokee County, 0.2 mile upstream from Rodgers Creek, 4.7 miles northeast of Murphy, and 6.6 miles upstream from mouth.

DRAINAGE AREA--104 square miles.

RECORDS AVAILABLE--Chemical analyses: October 1952 to September 1953.

Water temperatures: October 1952 to September 1953.

EXTREMES, 1952-53--Dissolved solids: Maximum, 39 ppm Aug. 1-10, Sept. 11-20, minimum, 20 ppm Feb. 11-19.

Hardness: Maximum, 23 ppm Oct. 21-31; minimum, 9 ppm Feb. 20-28.

Water temperatures: Maximum, 74° F. July 7, Aug. 3, 4, 5, 6; minimum, 37° F. Dec. 16, 29.

REMARKS--Records of suspended matter of composite samples available in district office at Raleigh, N. C. Records of discharge for water year October 1952 to September 1953 given in WSP 1276.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		pH	Color	Oxygen consumed	
														Calcium	Non-carbonate			Unfiltered	Filtered
Oct. 1-10, 1952.....	58	8.1	0.07	6.2	1.5	2.4	0.8	27	1.4	2.1	0.0	0.3	36	22	0	51.3	6.7	2.7	2.5
Oct. 11-20.....	52	8.4	.13	5.7	1.3	3.1		26	2.4	1.5	.1	.2	36	20	0	49.4	6.2	11	3.0
Oct. 21-31.....	48	9.1	.06	7.1	1.4		.8	25	2.5	1.2	.1	.2	38	23	3	50.2	6.9	18	2.4
Nov. 1-10.....	50	8.0	.11	5.8	1.2	2.5		24	2.7	1.4	.1	.2	35	19	0	48.4	6.7	11	2.7
Nov. 11-20.....	80	7.6	.06	5.7	1.3	2.4		24	2.9	1.4	.0	.3	35	20	0	48.5	6.7	11	3.4
Nov. 21-30.....	113	7.3	.06	5.7	1.2	2.6		21	3.4	1.4	.1	.6	33	18	1	41.9	6.5	8	2.4
Dec. 1-10.....	192	7.0	.05	5.6	1.0	2.0		20	2.9	1.6	.1	.6	31	18	2	41.0	6.7	6	3.4
Dec. 11-20.....	201	6.8	.04	4.2	.9	2.3		16	2.8	1.9	.0	.6	27	14	1	35.5	6.7	3	2.5
Dec. 21-31.....	134	6.8	.05	4.8	1.0	2.2		19	2.5	1.4	.1	.7	29	16	1	41.3	6.8	18	2.8
Jan. 1-10, 1953.....	422	6.2	.03	3.5	.8	1.9	.7	14	2.6	1.6	.1	.6	25	12	1	32.6	6.7	4	2.6
Jan. 11-20.....	334	5.7	.03	3.4	.9	2.9		14	2.3	1.8	.1	.7	25	12	1	32.4	6.6	2	3.5
Jan. 21-31.....	427	5.5	.02	3.2	.7	1.8		12	2.1	1.5	.1	.6	22	11		26.5	6.5	2	2.8
Feb. 1-10.....	238	6.9	.03	3.5	1.0	2.4		15	2.4	1.9	.1	.5	25	13	1	30.5	6.6	2	2.0
Feb. 11-19.....	769	5.8	.02	2.8	.7	1.4		10	2.0	1.2	.1	.8	20	10	2	33.2	6.5	2	1.7
Feb. 20-28.....	860	6.3	.05	2.6	.7	1.8		9	2.8	1.3	.1	.8	23	9	2	22.2	6.8	9	5.5
Mar. 1-10.....	450	6.7	.02	2.8	.7	1.5		11	2.1	1.0	.0	.6	22	10	1	22.3	6.5	7	2.4
Mar. 11-20.....	304	6.9	.02	3.0	.9	1.3		12	2.3	1.0	.0	.5	22	11	1	26.3	6.7	5	2.1
Mar. 21-31.....	259	8.5	.02	3.1	.7	1.3		12	2.0	.9	.1	.4	24	11	1	26.9	6.4	25	2.2
Apr. 1-10.....	205	7.9	.04	3.0	1.2	1.4	.3	13	2.3	1.5	.1	.4	24	12	2	28.9	6.6	4	2.1
Apr. 11-20.....	260	8.2	.06	2.6	.8	2.6		13	2.1	1.4	.1	.5	26	10	0	27.6	6.7	4	3.4
Apr. 21-30.....	251	7.7	.04	2.9	.8	2.9		13	2.5	1.0	.1	.4	26	11	0	35.4	6.8	7	2.6

548	6.6	0.03	2.8	0.7	2.5	13	2.2	1.1	0.1	0.6	22	10	0	28.7	6.8	5	3.4	2.0
285	6.9	.02	3.0	.8	2.0	13	2.1	1.1	.1	.5	23	11	0	33.4	6.7	4	2.6	2.4
May 11-20.....																		
May 21-31.....																		
179	8.5	.05	3.2	.7	3.4	16	2.3	1.5	.1	.6	30	11	0	35.2	6.7	2	2.0	1.9
June 1-10.....																		
123	10	.06	4.2	.9	2.8	18	1.8	2.0	.1	.8	29	14	0	36.5	6.7	2	2.3	1.7
June 11-20.....																		
108	9.0	.03	4.8	.4	4.4	21	2.3	2.0	.1	.8	32	14	0	39.2	6.6	3	3.1	2.3
June 21-30.....																		
83	6.8	.03	4.0	.8	3.2	17	2.6	2.0	.1	.7	30	13	0	42.1	6.4	4	2.6	2.3
July 1-10.....																		
75	9.0	.04	4.8	1.0	2.4	19	3.0	2.8	.0	.6	37	16	1	49.0	6.8	7	3.6	2.1
July 11-20.....																		
77	8.0	.02	4.4	.7	2.4	18	2.1	1.2	.0	.6	35	14	0	41.4	6.5	8	3.4	2.4
July 21-31.....																		
85	7.6	.05	5.2	1.3	2.5	21	3.1	2.0	.0	.5	34	18	1	49.4	6.8	8	2.6	2.2
Aug. 1-10.....																		
60	8.2	.02	5.2	1.6	8.4	23	3.7	1.2	.0	.4	39	19	0	55.1	7.0	8	2.8	2.2
Aug. 11-20.....																		
45	7.0	.02	5.4	1.2	2.2	23	2.3	1.2	.0	.4	34	18	0	48.5	7.1	9	2.6	1.6
Aug. 21-31.....																		
36	5.2	.04	4.6	1.2	4.0	24	2.1	1.8	.1	.5	34	16	0	53.5	7.0	8	2.6	2.0
Sept. 1-10.....																		
54	6.0	.02	7.0	.9	3.2	28	2.3	1.5	.1	.5	39	21	0	59.4	7.0	8	4.1	2.2
Sept. 11-20.....																		
40	8.0	.02	6.6	1.1	3.5	29	2.1	1.5	.1	.4	39	21	0	56.3	7.1	8	2.8	2.2
Sept. 21-30.....																		
65	6.0	.04	6.1	.9	2.5	23	2.3	1.8	.1	.4	36	19	0	60.4	7.0	11	3.2	2.4
Average.....																		
207	7.3	0.04	4.4	1.0	2.7	18	2.4	1.5	0.1	0.5	30	15	0	40.2	--	7	2.9	2.1

## TENNESSEE RIVER BASIN--Continued

## VALLEY RIVER AT TOMOTLA, N. C.--Continued

Temperature (° F.) of water, water year October 1952 to September 1953  
 [Once-daily temperature measurement at 7 a.m.]

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

TENNESSEE RIVER BASIN--Continued  
TENNESSEE RIVER AT KENTUCKY DAM, NEAR PADUCAH, KY.

LOCATION.--At tailrace of powerplant at Kentucky Dam at Gilbertsville, Marshall County, 3,500 feet from base gage, 3.0 miles upstream from Shadie Creek, and 16 miles east of Paducah, McCracken County.

DRAINAGE AREA.--40,200 square miles, approximately (at Gilbertsville).

RECORDS AVAILABLE.--Chemical analyses: October 1949 to August 1950, October 1951 to September 1953.

Water temperatures: October 1952 to September 1953.

EXTREMES, 1952-53.--Dissolved solids: Maximum, 124 ppm Jan. 11-20; minimum, 63 ppm May 21-31.

Hardness: Maximum, 82 ppm Jan. 21-31; minimum, 48 ppm Mar. 11-20, Apr. 2-10.

Specific conductance: Maximum daily, 227 micromhos Jan. 24; minimum daily, 107 micromhos Apr. 9-10.

Water temperatures: Maximum, 86°F Aug. 2-4; minimum, 44°F on several days during December and January.

REMARKS.--Records of specific conductance of daily samples from October 1952 to September 1953 available in district office at Columbus, Ohio. Records of discharge for water year October 1952 to September 1953 given in WSP 1276.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> ) (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO <sub>3</sub>		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Color
													Parts per million	Tons per acre-foot	Calcium, mg./l.	Non-carbonate				
Oct. 1-10, 1952 ..	26,830	4.3	0.01	19	4.6	5.0	1.5	68	9.6	8.5	0.1	1.6	89		67	11		158	7.1	1
Oct. 11-20 ..	32,730	6.0	.02	20	4.4	5.4	1.3	70	9.6	10	.1	.5	96		66	11		163	7.4	2
Oct. 21-31 ..	30,490	5.6	.01	20	4.4	5.9	1.1	69	12	9.0	.1	.8	96		69	11		171	6.8	2
Nov. 1-10 ..	25,420	17	.01	21	4.6	8.4	1.3	73	12	10	.1	.8	115		72	7		185	7.1	3
Nov. 11-20 ..	27,170	10	.01	21	4.9	6.2	1.1	68	12	12	.1	.5	104		72	17		177	7.0	2
Nov. 21-30 ..	29,080	6.1	.01	21	4.6	6.9	1.1	68	13	11	.1	.7	99		71	16		175	7.0	3
Dec. 1-10 ..	49,860	8.2	.02	21	4.4	7.0	1.5	68	12	13	.0	.4	105		71	15		178	6.8	2
Dec. 11-20 ..	56,690	13	.02	22	3.6	6.5	1.9	71	12	12	.0	.4	117		71	12		166	7.1	2
Dec. 21-31 ..	36,530	10	.01	23	3.9	8.6	1.9	72	14	15	.0	.6	114		74	14		193	7.0	4
Jan. 1-10, 1953 ..	54,260	3.3	.01	23	4.6	8.5	2.3	71	15	17	.0	.4	114		77	18		195	7.0	3
Jan. 11-20 ..	93,270	5.8	.02	25	4.6	9.2	1.9	74	16	17	.0	.6	121		81	21		210	7.1	2
Jan. 21-31 ..	100,600	5.1	.02	27	3.6	9.7	1.3	76	15	17	.1	1.8	123		82	20		213	7.2	5
Feb. 1-10 ..	71,850	7.8	.02	23	3.6	8.7	1.1	72	14	12	.1	2.2	114		73	13		189	7.4	5
Feb. 11-20 ..	191,300	9.0	.10	21	2.7	6.3	1.3	65	11	9.5	.1	2.1	100		64	10		160	7.3	8
Feb. 21-28 ..	203,500	7.5	.08	19	2.7	4.7	1.1	57	9.1	9.8	.1	2.0	88		59	12		147	7.3	6
Mar. 1-10 ..	168,900	5.5	.08	17	2.2	4.0	.8	54	7.8	6.2	.1	1.7	77		51	8		123	7.3	7
Mar. 11-20 ..	84,390	11	.11	15	2.4	3.2	.7	49	7.5	4.5	.2	1.5	78		48	7		116	7.3	7
Mar. 21-Apr. 1 ..	67,220	12	.04	16	2.7	4.1	1.0	54	8.8	5.0	.1	1.8	82		51	7		129	7.1	5
Apr. 2-10 ..	49,790	8.5	.53	15	2.7	2.7	.9	49	7.5	4.1	.2	1.8	73		48	8		115	6.8	20
Apr. 11-20 ..	45,420	6.8	.24	16	2.9	2.9	.6	53	7.0	3.9	.2	1.6	69		51	8		115	6.8	10
Apr. 21-30 ..	53,680	3.5	.04	14	4.6	2.5	1.0	56	7.0	5.5	.1	1.0	67		55	8		124	7.1	5
May 1-10 ..	119,500	3.3	.04	16	3.4	2.9	1.2	58	5.6	4.5	.1	.7	68		55	6		122	7.1	4
May 11-20 ..	98,740	3.7	.04	17	2.4	2.9	1.0	59	5.4	3.5	.1	.7	68		52	4		121	7.2	5
May 21-31 ..	66,380	4.6	.07	16	2.9	3.1	1.1	48	7.4	7.2	.1	.8	63		53	12		126	7.2	6

TENNESSEE RIVER BASIN--Continued  
 TENNESSEE RIVER AT KENTUCKY DAM, NEAR PADUCAH, KY.--Continued  
 Chemical analyses, in parts per million, water year October 1953 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO <sub>3</sub>		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
June 1-10, 1953..	35,540	6.1	0.07	16	3.4	3.7	1.2	63	7.2	4.0	0.1	0.8		77			55	2		125	7.3	14
June 11-20 .....	41,260	6.8	.12	19	1.8	3.6	1.2	65	3.4	4.2	.1	1.4		80			56	2		131	7.3	2
June 21-30 .....	37,330	7.9	.08	20	2.4	4.0	1.2	68	5.0	6.5	.1	1.4		85			59	4		141	7.4	2
July 1-10 .....	39,020	11	.08	25	.8	5.0	.8	72	8.6	7.0	.1	.9		93			66	7		158	7.5	3
July 11-20 .....	35,020	6.4	.02	26	.5	4.8	1.0	74	9.1	7.0	.1	.9		89			66	6		158	7.5	2
July 21-31 .....	42,040	4.4	.02	21	3.5	4.7	1.2	73	9.7	7.4	.1	.4		92			68	7		162	7.3	5
Aug. 1-10 .....	40,490	3.1	.03	21	3.6	4.6	1.2	71	10	8.9	.1	.4		95			68	9		162	7.3	3
Aug. 11-20 .....	38,570	6.3	.02	21	3.8	4.7	1.2	69	10	8.0	.1	.3		94			68	11		158	7.4	5
Aug. 21-31 .....	30,960	4.3	.02	21	3.5	4.8	.9	68	11	8.0	.1	.5		91			68	11		157	7.5	5
Sept. 1-10 .....	25,500	5.3	.02	21	3.9	5.2	1.2	74	10	8.0	.1	1.0		88			68	8		164	6.9	5
Sept. 11-20 .....	25,570	4.7	.02	21	3.8	5.7	1.4	72	10	7.4	.2	.4		96			69	9		164	6.7	5
Sept. 21-30 .....	25,310	6.6	.02	22	4.2	6.1	1.5	76	12	8.2	.2	.4		102			72	10		174	6.9	4
Average .....	80,250	7.0	0.06	20	3.4	5.4	1.2	66	9.8	8.7	0.1	1.0		92			64	10		156	--	5

## TENNESSEE RIVER BASIN--Continued

## TENNESSEE RIVER AT KENTUCKY DAM, NEAR PADUCAH, KY.--Continued

Temperature (°F) of water, water year October 1952 to September 1953  
 /Once-daily temperature measurement at varying hours/

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





## STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued

## PAINT RIVER NEAR ALPHA, MICH.

LOCATION.--Temperature recorder at gaging station on right bank, 5/8 mile downstream from Paint River Diversion Dam, 5 1/2 miles upstream from confluence with Brule River, and 6 miles southeast of Alpha, Iron County.  
DRAINAGE AREA.--644 square miles (revised).  
RECORDS AVAILABLE.--Water Temperatures: October 1952 to September 1953.  
EXTREMES, 1952-53.--Water Temperatures: Maximum, 81°F Sept. 2; minimum, 32°F Dec. 26 to Mar. 24.

REMARKS.--Complete ice cover during winter months. Records of discharge for water year October 1952 to September 1953 given in WSP 1277.

Temperature (°F) of water, water year October 1952 to September 1953

/Recorder with temperature attachment, continuous ethyl-alcohol actuated thermometer/

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

## STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued

## EAST BRANCH PINE RIVER NEAR TUSTIN, MICH.

LOCATION.--Temperature recorder at gaging station on left bank 75 feet below county road bridge, half a mile upstream from North Branch, 2½ miles west of Tustin, Osceola County, and ¾ miles northwest of LeRoy.

DRAINAGE AREA.--63 square miles.

RECORDS AVAILABLE.--Water temperatures: July 1952 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 70°F June 20, 21, 22; minimum, 34°F on many days during January, February, and March.

EXTREMES, 1952-53.--Water temperatures: Maximum, 70°F July 26, 1952; minimum, 34°F on many days during January, February, and March.

REMARKS.--Stream frozen Dec. 16-19, 26-28, Jan. 6, 26, Feb. 14-18. Temperatures given for these periods are for the underflow. Records of discharge for water year October 1952 to September 1953 given in WSP 1277.

Temperature (°F) of water, water year October 1952 to September 1953

Recorder with temperature attachment, continuous ethyl alcohol actuated thermograph

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

## STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued

## PINE RIVER NEAR LE ROY, MICH.

LOCATION.--Temperature recorder at gaging station on right bank 15 feet downstream from county road bridge, 3½ miles downstream from East Branch, 5 miles northwest of Le Roy, Oscola County, and 5½ miles southwest of Tustin.

DRAINAGE AREA.--118 square miles.

RECORDS AVAILABLE.--Water temperatures: January to September 1953.

EXTREMES 1953.--Water temperatures: Maximum, 69°F July 22; minimum, 32°F Feb. 9.

REMARKS.--Stream frozen Jan. 7, 8, 13, 17-20, 26, 27, Feb. 1, 2, 17, 18, 22-25, Feb. 28 to Mar. 4, Mar. 6-9. Temperatures given for these periods are for the underflow. Records of discharge for water year October 1952 to September 1953 given in WSP 1277.

Temperature (°F) of water, January to September 1953  
/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
1.....				35	34	33	42	46	58	65	65	62
2.....				35	33	33	43	46	58	64	64	62
3.....				35	35	33	43	46	58	64	63	60
4.....				35	34	33	43	50	61	62	61	59
5.....				34	33	33	44	54	61	60	60	57
6.....				34	33	33	43	54	61	62	61	54
7.....				34	33	33	43	54	60	62	60	56
8.....				34	33	33	43	54	58	65	60	55
9.....				34	33	32	44	59	60	62	60	52
10.....				34	33	33	46	59	60	62	60	54
11.....				34	33	33	43	59	60	62	61	55
12.....				34	33	35	44	60	59	62	57	54
13.....				34	33	36	43	60	58	61	60	56
14.....				34	33	35	43	58	61	60	63	54
15.....				34	33	35	43	55	61	60	60	51
16.....				36	34	35	44	54	61	60	62	48
17.....				36	33	35	43	55	61	60	62	50
18.....				33	33	35	44	53	61	65	58	51
19.....				33	33	36	43	56	60	64	59	53
20.....				33	33	36	42	56	60	63	59	54
21.....				33	34	35	42	57	62	65	55	54
22.....				33	34	35	42	50	64	66	59	53
23.....				33	33	36	43	59	64	63	58	50
24.....				34	33	36	48	59	65	65	56	49
25.....				34	33	39	49	55	63	61	58	50
26.....				34	33	39	47	55	62	61	58	48
27.....				34	33	39	48	54	63	59	56	51
28.....				34	33	38	47	55	63	61	58	49
29.....				34	33	39	48	57	63	62	58	50
30.....				34	33	40	47	54	63	62	56	51
31.....				34	33	41	47	56	62	64	60	49
32.....				34	33	41	45	57	62	64	59	50
33.....				34	33	41	46	57	62	64	58	51
34.....				34	33	41	46	58	62	64	58	52
35.....				34	33	40	46	58	64	63	60	53
36.....				34	33	41	46	58	64	63	60	54
37.....				34	33	41	46	58	64	63	60	55
38.....				34	33	41	46	58	64	63	60	56
39.....				34	33	41	46	58	64	63	60	57
40.....				34	33	41	46	58	64	63	60	58
41.....				34	33	41	46	58	64	63	60	59
42.....				34	33	41	46	58	64	63	60	60
43.....				34	33	41	46	58	64	63	60	61
44.....				34	33	41	46	58	64	63	60	62
45.....				34	33	41	46	58	64	63	60	63
46.....				34	33	41	46	58	64	63	60	64
47.....				34	33	41	46	58	64	63	60	65
48.....				34	33	41	46	58	64	63	60	66
49.....				34	33	41	46	58	64	63	60	67
50.....				34	33	41	46	58	64	63	60	68
51.....				34	33	41	46	58	64	63	60	69
52.....				34	33	41	46	58	64	63	60	70
53.....				34	33	41	46	58	64	63	60	71
54.....				34	33	41	46	58	64	63	60	72
55.....				34	33	41	46	58	64	63	60	73
56.....				34	33	41	46	58	64	63	60	74
57.....				34	33	41	46	58	64	63	60	75
58.....				34	33	41	46	58	64	63	60	76
59.....				34	33	41	46	58	64	63	60	77
60.....				34	33	41	46	58	64	63	60	78
61.....				34	33	41	46	58	64	63	60	79
62.....				34	33	41	46	58	64	63	60	80
63.....				34	33	41	46	58	64	63	60	81
64.....				34	33	41	46	58	64	63	60	82
65.....				34	33	41	46	58	64	63	60	83
66.....				34	33	41	46	58	64	63	60	84
67.....				34	33	41	46	58	64	63	60	85
68.....				34	33	41	46	58	64	63	60	86
69.....				34	33	41	46	58	64	63	60	87
70.....				34	33	41	46	58	64	63	60	88
71.....				34	33	41	46	58	64	63	60	89
72.....				34	33	41	46	58	64	63	60	90
73.....				34	33	41	46	58	64	63	60	91
74.....				34	33	41	46	58	64	63	60	92
75.....				34	33	41	46	58	64	63	60	93
76.....				34	33	41	46	58	64	63	60	94
77.....				34	33	41	46	58	64	63	60	95
78.....				34	33	41	46	58	64	63	60	96
79.....				34	33	41	46	58	64	63	60	97
80.....				34	33	41	46	58	64	63	60	98
81.....				34	33	41	46	58	64	63	60	99
82.....				34	33	41	46	58	64	63	60	100
83.....				34	33	41	46	58	64	63	60	101
84.....				34	33	41	46	58	64	63	60	102
85.....				34	33	41	46	58	64	63	60	103
86.....				34	33	41	46	58	64	63	60	104
87.....				34	33	41	46	58	64	63	60	105
88.....				34	33	41	46	58	64	63	60	106
89.....				34	33	41	46	58	64	63	60	107
90.....				34	33	41	46	58	64	63	60	108
91.....				34	33	41	46	58	64	63	60	109
92.....				34	33	41	46	58	64	63	60	110
93.....				34	33	41	46	58	64	63	60	111
94.....				34	33	41	46	58	64	63	60	112
95.....				34	33	41	46	58	64	63	60	113
96.....				34	33	41	46	58	64	63	60	114
97.....				34	33	41	46	58	64	63	60	115
98.....				34	33	41	46	58	64	63	60	116
99.....				34	33	41	46	58	64	63	60	117
100.....				34	33	41	46	58	64	63	60	118
Average.....				34	33	36	45	56	61	64	58	54

## ST. LAWRENCE RIVER BASIN

STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued  
PINE RIVER NEAR HOXEYVILLE, MICH.

LOCATION.--Temperature recorder at gaging station on right bank 500 feet upstream from State Highway 37 bridge, 4½ miles northwest of Hoxeyville, Wexford County, 6½ miles southwest of Dublin, 7 miles east of Wellston, and 9 miles upstream from mouth.

DRAINAGE AREA.--251 square miles.

RECORDS AVAILABLE.--Water temperatures: July 1952 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, not determined; minimum, 33°F Feb. 2.

EXTREMES, 1952-53.--Water temperatures: Maximum, 66°F July 21-24, 1952; minimum, 33°F Feb. 2, 1953.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1277.

Temperature (°F) of water, water year October 1952 to September 1953

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

# 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 104 miles southeast of Wolverine.

DRAINAGE AREA. --63 square miles.

RECORDS AVAILABLE, --Water temperatures: October 1950 to September 1953.

EXTREMES, 1952-53. --Water temperatures: Maximum, 77°F July 22; minimum, 33°F Nov. 30, Dec. 1, 3.

EXTREMES, 1950-53. --Water temperatures: Maximum, 78°F July 6, 7, 1952; minimum, freezing point on many days during November to March of first water year. RECORDS. Stream frozen Dec. 1, 3, 27-29, Jan. 6-9, 12, 16-18, 25-27, 29, Feb. 1-3, 16-19, 22, 24, 25, Mar. 1-9. Temperatures given for these periods are for the underflow. Records of discharge for water year October 1952 to September 1953 given in WSP 1277.

are for the underflow. Records of discharge for water year October 1992 to September 1993 given in *see entry*.

Temperature ( $^{\circ}\text{F}$ ) of water. water year October 1952 to September 1953

Recorder with temperature attachment, continuous ethyl alcohol actuated thermograph/  
temperature (2) or water; water year October 1962 to September 1966

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	
1.....	59	55	45	41	34	33	36	35	34	34	39	35	47	44	45	43	56	49	68	63	71	64	74	
2.....	56	52	45	43	35	34	36	35	34	34	35	35	47	44	46	42	62	53	87	65	72	64	75	
3.....	55	50	43	41	35	33	36	35	34	34	36	35	45	43	50	44	62	56	85	60	67	62	75	
4.....	51	48	42	40	35	35	36	35	34	34	37	35	44	42	52	46	63	57	88	58	64	60	71	
5.....	49	47	43	40	36	35	35	35	34	35	34	37	35	43	41	56	60	88	62	64	60	66		
6.....	47	44	42	40	37	36	34	34	35	34	36	35	43	41	61	51	62	57	71	63	66	60		
7.....	46	42	40	38	38	37	34	34	35	34	36	35	46	41	61	52	63	57	70	62	67	62		
8.....	49	43	38	36	38	36	34	34	36	34	35	35	48	43	64	54	65	57	68	61	63	61		
9.....	50	44	38	36	38	37	34	34	36	34	35	35	46	45	66	56	63	59	64	59	67	60		
10.....	50	44	38	36	39	38	34	34	36	34	36	35	45	43	67	58	67	59	69	58	69	59		
11.....	49	44	38	36	39	38	34	34	35	34	40	35	43	41	67	59	68	59	70	60	73	63		
12.....	48	44	38	36	39	37	35	34	36	34	39	37	47	41	65	57	68	61	71	61	70	60		
13.....	48	45	39	36	37	36	35	34	35	34	38	37	44	41	65	52	68	62	72	62	71	64		
14.....	48	45	41	38	37	36	35	35	36	34	37	36	47	41	57	50	70	61	71	63	68	63		
15.....	45	45	42	40	36	35	37	35	36	34	37	36	47	43	58	48	70	61	72	63	70	61		
16.....	45	42	42	41	37	35	37	34	35	34	38	37	45	42	61	50	64	61	74	64	68	61		
17.....	44	40	42	41	36	35	34	34	35	34	41	37	44	40	58	54	64	60	73	65	68	60		
18.....	42	39	45	41	36	35	34	34	34	34	43	37	43	39	61	54	66	60	71	66	67	58		
19.....	41	38	46	45	36	34	34	34	36	34	40	38	41	39	62	54	72	62	72	65	68	58		
20.....	41	38	45	42	35	34	34	34	35	34	39	36	39	38	62	55	74	66	75	65	68	57		
21.....	41	37	42	40	35	34	36	34	35	34	40	38	45	37	63	56	75	68	76	66	63	59		
22.....	43	39	40	40	36	35	36	34	35	34	40	39	50	41	57	53	73	65	77	69	66	59		
23.....	45	40	41	40	37	36	36	34	34	34	43	41	54	46	61	50	71	62	69	64	67	60		
24.....	42	41	40	38	37	36	35	34	35	34	42	39	55	47	63	51	69	59	71	61	69	61		
25.....	46	41	41	38	37	35	34	37	35	34	40	38	49	46	58	56	68	62	64	60	63	61		
26.....	46	42	42	41	37	35	34	34	35	34	40	38	46	41	56	54	70	62	69	62	69	61		
27.....	44	42	41	36	35	34	34	34	37	35	41	40	41	40	57	53	70	62	73	63	69	62		
28.....	43	41	36	35	35	34	34	34	36	34	40	39	44	39	61	52	71	62	72	63	72	64		
29.....	41	39	35	35	35	34	34	34	34	34	---	39	38	49	43	56	54	73	61	64	72	65		
30.....	41	38	35	33	35	34	35	34	---	---	43	38	47	45	54	50	66	64	73	63	67	65		
31.....	44	40	---	---	36	35	34	34	---	---	46	41	---	---	50	49	---	72	64	70	63	---		
Average.....	47	43	41	39	36	35	34	34	35	34	39	37	46	42	59	52	67	60	71	65	68	61		

STREAMS TRIBUTARY TO LAKE HURON--Continued  
MIDDLE BRANCH AU SABLE RIVER AT GRAYLING, MICH.

LOCATION--Temperature recorder at gaging station on right bank 65 feet upstream from bridge on U. S. Highway 27 at Grayling, Crawford County, and three-quarters of a mile upstream from East Branch.

DRAINAGE AREA.--110 square miles.

RECORDS AVAILABLE.--March to September 1953

EXTREMES, 1953.--Water temperatures: Maximum, 80° F June 20, 21.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1277

Temperatures (° F) of water, March to September 1953

/Recorder with temperature attachment, continuous ethyl alcohol actuated thermometer

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

## STREAMS TRIBUTARY TO LAKE HURON --Continued

AU SABLE RIVER AT MIO, MICH.

LOCATION.--Temperature recorder at gaging station on right bank 150 feet upstream from bridge on State Highway 33 at Mto, Oscoda County, 10 miles downstream from Big Creek, and about 80 miles upstream from mouth.  
DRAINAGE AREA.--1,100 square miles.

RECORDS AVAILABLE. --Water temperatures: July 1952 to September 1953.

EXTREMES, 1952-53. --Water temperatures: Maximum, 73°F July 22; minimum, 32°F Jan. 8.

EXTREMES, 1952-53. --Water temperatures: Maximum, 74°F July 27, 28, 1952; minimum, 32°F Jan. 8, 1953.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1277.

REMAINING. --RECORDS OF DISCHARGE FOR WATER YEAR OCTOBER 1932 TO SEPTEMBER 1933 GIVEN IN HQS 1211.

Temperature ( $^{\circ}\text{F}$ ) of water, water year October 1952 to September 1953

temperature (2) or water; water year October 1962 to September 1966

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

## STREAMS TRIBUTARY TO LAKE HURON--Continued

## AU GRES RIVER NEAR NATIONAL CITY, MICH.

LOCATION.--Temperature recorder at gaging station on left bank, 1½ miles upstream from Elm Creek, 4 miles southwest of National City, Iosco County, 12½ miles southwest of Tawas City, and 15½ miles upstream from mouth.

DRAINAGE AREA.--169 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1951 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 81°F June 21, July 21; minimum, freezing point on many days during January, February, and March.

EXTREMES, 1951-53.--Water temperatures: Maximum, 83°F June 25, 1952; minimum, freezing point on many days during winter months.

REMARKS.--Stream frozen Nov. 29 to Dec. 2, Dec. 16-21, Dec. 28 to Mar. 20. Temperatures given for these periods are for the underflow. Records of discharge for water year October 1952 to September 1953 given in WSP 1277.

Temperature (°F) of water, water year October 1952 to September 1953

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



STREAMS TRIBUTARY TO LAKE HURON--Continued  
EAST BRANCH AU GRES RIVER AT McIVOR, MICH.

LOCATION.--Temperature recorder at gaging station on right bank 25 feet downstream from county road bridge at McIvor, Iosco County, 1.1 miles east of National City, and 9 miles southwest of Tawas City.

DRAINAGE AREA.--84 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1951 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 73°F June 21; minimum, freezing point on many days during January, and February.

EXTREMES, 1951-52.--Water temperatures: Maximum, 75°F June 25, 1952; minimum, freezing point on many days during January and February, 1953.

REMARKS.--Stream frozen Dec. 1-3, 19, 28-31, Jan. 4-20, Jan. 25 to Feb. 12, Feb. 16-24, Feb. 28 to Mar. 10. Temperatures given for these periods are for the underflow. Records of discharge for water year October 1952 to September 1953 given in WSP 1277.

Temperature (°F) of water, water year October 1952 to September 1953

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

## STREAMS TRIBUTARY TO LAKE HURON--Continued

## HOUGHTON CREEK NEAR LUPTON, MICH.

LOCATION.--Temperature recorder at gaging station on right bank half a mile upstream from mouth, 3 miles downstream from Wilkins Creek, and 3 miles southwest of Lupton, Ogemaw County.

DRAINAGE AREA.--27.5 square miles (revised).

RECORDS AVAILABLE.--Water temperatures: July 1950 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 67°F June 20, July 2, 21; minimum, freezing point on several days during January and February.

EXTREMES, 1950-53.--Water temperatures: Maximum, 69°F June 26, 1952; minimum, freezing point on many days during winter months.

REMARKS.--Stream frozen Jan. 5-9, 26, 27, Feb. 2-4, 16, 18, 19, 21, 22, Mar. 2, 8. Temperatures given for these periods are for the underflow. Records of discharge for water year October 1952 to September 1953 given in WSP 1277.

Temperature (°F) of water, water year October 1952 to September 1953

/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.....	54	52	46	43	36	34	37	36	33	32	34	33	48	43	45	44	58	50	65	59	62	58	63	58
2.....	54	52	46	45	37	36	38	37	32	32	34	33	48	41	44	43	59	52	67	63	61	58	64	60
3.....	49	46	45	41	38	36	38	35	32	32	36	34	45	41	45	43	58	53	63	58	60	57	63	60
4.....	49	46	41	39	38	34	33	35	32	37	34	44	42	52	44	58	52	61	56	59	57	62	57	57
5.....	48	45	43	40	39	38	34	34	37	35	35	33	43	41	56	48	61	56	62	58	60	57	57	53
6.....	45	42	44	41	38	38	34	32	37	36	34	33	44	41	56	49	61	56	63	60	60	56	57	52
7.....	45	44	41	39	38	32	32	32	36	35	33	33	46	40	55	50	58	52	63	57	59	57	56	53
8.....	47	44	39	37	40	38	32	31	36	35	35	33	47	42	59	51	59	53	61	56	59	56	55	52
9.....	46	44	40	38	42	40	35	32	36	35	37	33	47	44	61	53	60	57	58	54	60	57	55	51
10.....	46	43	40	39	42	41	37	35	36	35	36	36	46	42	61	54	61	55	61	54	60	55	57	53
11.....	46	43	40	38	41	39	38	35	36	34	40	37	43	40	62	55	60	54	61	55	62	55	57	54
12.....	46	44	40	38	39	39	35	34	36	34	40	40	43	40	58	54	63	55	62	57	61	57	53	49
13.....	47	45	39	37	39	38	38	35	36	35	40	35	--	--	54	49	61	56	62	57	61	56	53	49
14.....	47	45	40	38	37	35	39	38	37	34	35	35	--	--	52	48	60	54	61	57	62	56	51	48
15.....	47	46	43	40	37	36	40	39	37	33	37	35	--	--	56	46	61	54	63	57	61	56	52	50
16.....	46	44	43	42	37	36	40	34	33	32	36	35	--	--	58	50	59	55	64	58	60	55	53	51
17.....	44	42	42	42	38	37	34	33	34	32	40	35	41	37	56	53	59	56	63	58	59	54	53	49
18.....	43	40	45	42	38	36	36	33	33	32	37	34	42	38	58	52	58	54	62	56	59	52	54	53
19.....	43	42	45	44	36	35	37	36	36	32	34	33	42	39	58	52	63	60	64	59	59	54	53	50
20.....	42	39	44	42	36	35	38	36	36	32	38	33	42	40	59	51	67	60	66	60	61	54	53	50
21.....	42	39	42	40	37	36	38	37	38	32	39	36	46	38	60	55	66	61	67	60	60	56	51	49
22.....	44	41	42	40	39	37	37	35	32	32	38	36	50	43	56	50	65	59	66	61	60	56	50	48
23.....	46	43	44	43	39	38	38	37	36	33	41	38	52	46	56	48	63	57	63	59	61	57	50	47
24.....	47	44	43	42	38	38	38	36	36	33	42	37	50	44	55	51	62	56	60	54	62	57	51	48
25.....	46	43	43	42	38	38	35	32	37	34	40	37	48	45	55	51	61	57	58	53	57	52	50	47
26.....	46	43	43	40	38	36	32	32	37	37	40	38	45	44	57	51	64	57	62	55	63	57	53	50
27.....	46	45	40	38	36	33	35	32	38	36	43	40	44	42	57	51	63	57	64	59	63	59	53	50
28.....	45	43	36	36	34	33	35	34	36	34	42	40	48	41	56	50	64	57	62	56	60	59	52	48
29.....	43	42	36	35	36	34	34	33	--	--	41	39	46	43	59	51	63	57	63	56	63	60	54	49
30.....	43	41	36	35	36	34	32	--	--	--	42	39	47	44	51	63	57	63	57	63	59	54	52	49
31.....	43	42	--	--	36	36	33	34	--	--	45	40	--	--	52	50	--	--	63	57	61	58	--	--
Average.....	46	44	42	40	38	37	36	34	36	34	38	36	46	42	55	50	61	56	63	57	61	57	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, Ogemaw County.

Drainage Area.--53.9 square miles (revised).

RECORDS AVAILABLE.--July 1950 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 70°F, June 20, 21; minimum, freezing point on Feb. 3-5, 22, 23.

EXTREMES, 1950-53.--Water temperatures: Maximum, 72°F, June 25, 26; minimum, freezing point on many days during winter months.

REMARKS.--Stream frozen Jan. 3-8, 26, Feb. 2-4, 22, 23; Mar. 1-8. Temperatures given for these periods are for the underflow. Records of discharge for water year October 1952 to September 1953 given in WSP 1277.

Temperature (°F) of water, water year October 1952 to September 1953

/Recorder with temperature attachment, continuous ethyl alcohol actuated thermometer/7

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

STREAMS TRIBUTARY TO LAKE HURON--Continued  
PRIOR CREEK NEAR SELKIRK, MICH.

LOCATION.--Temperature recorder at gaging station on right bank a quarter of a mile upstream from mouth, half a mile downstream from Ammond Creek, and 1½ miles north of Selkirk, Ogemaw County.  
DRAINAGE AREA.--19.1 square miles (revised).

RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 71° F. Sept. 1, 2; minimum, freezing point on many days during December, January, February, and March.

EXTREMES, 1950-51.--Water temperatures: Maximum, 71° F. June 26; July 13, 14, 1952; Sept. 1, 2, 1953; minimum, freezing point on many days during winter months.

REMARKS.--Stream frozen Nov. 30 to Dec. 3, Dec. 19, 20, Dec. 27 to Jan. 2, Jan. 4-21, Jan. 24 to Mar. 12. Temperatures given for these periods are for the underflow. Records of discharge for water year October 1952 to September 1953 given in WSP 1277.

Temperature (°F) of water, water year October 1952 to September 1953

/Recorder with temperature attachment, continuous ethyl alcohol actuated thermograph/

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

## STREAMS TRIBUTARY TO LAKE HURON

## RIFLE RIVER AT SELKIRK, MICH.

LOCATION.--Temperature recorder at gaging station on left upstream bank of highway bridge at Selkirk, Ogemaw County, and 1½ miles downstream from Prior Creek.

DRAINAGE AREA.--110 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 76°F June 21; minimum, freezing point on several days during January and February.

EXTREMES, 1950-53.--Water temperatures: Maximum, 76°F June 25, 26, 1952, June 21, 1953; minimum, freezing point on many days during winter months.

REMARKS.--Stream frozen Dec. 1, 27-29, Jan. 6-10, 12, 17, 18, 25-30, Feb. 1-3, 6-9. Temperatures given for these periods are for the underflow. Records of discharge for water year October 1952 to September 1953 given in WSP 1277.

Temperature (°F) of water, water year October 1952 to September 1953

Recorder with temperature attachment, continuous ethyl alcohol actuated thermograph<sup>7</sup>

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



STREAMS TRIBUTARY TO LAKE ERIE  
MAUWEE RIVER AT WATERVILLE, OHIO

LOCATION.--At gaging station at bridge on State Highway 64 in Waterville, Lucas County, 3 miles downstream from Tontogany Creek.

DRAINAGE AREA.--6.314 square miles.

RECORDS AVAILABLE.--Chemical analyses: March 1950 to February 1952.

Water temperatures: March 1950 to September 1953.

Sediment records: April 1950 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 88°F June 30; minimum, 33°F on several days during November, January and February.

Sediment concentrations: Maximum daily, 1,600 ppm Mar. 5; minimum daily, 2 ppm on several days during October and November.

Sediment loads: Maximum daily, 140,000 tons Mar. 5; minimum daily, 1 ton on several days during October and November.

EXTREMES, 1950-53.--Water temperatures: Maximum, 90°F July 22, 1952; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 1,600 ppm Mar. 5, 1953; minimum daily, 2 ppm on several days during October 1951, September, October and November 1952.

Sediment loads: Maximum daily, 140,000 tons Mar. 5, 1953; minimum daily, 1 ton on several days during October 1951, October and November 1952.

REMARKS.--Flow affected by ice Dec. 28-29, Jan. 6-9. Records of discharge for water year October 1952 to September 1953 given in WSP 1277.

Temperature (°F) of water, water year October 1952 to September 1953

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

ST. LAWRENCE RIVER BASIN  
STREAMS TRIBUTARY TO LAKE ERIE--Continued  
MAUMEE RIVER AT WATERVILLE, OHIO--Continued

Suspended sediment, water year October 1952 to September 1953

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	274	7	5	152	3	1	470	7	9
2.....	226	7	4	134	3	1	482	12	16
3.....	162	7	3	234	3	2	353	10	10
4.....	188	7	4	206	4	2	332	8	7
5.....	187	6	a3	206	3	2	445	8	10
6.....	138	6	2	275	3	a2	374	8	8
7.....	138	5	2	235	3	2	408	11	12
8.....	138	3	1	154	3	1	578	15	23
9.....	142	2	1	142	2	a1	680	12	22
10.....	122	7	2	186	2	1	854	17	39
11.....	162	6	3	205	2	1	774	18	38
12.....	192	5	2	219	2	1	727	15	29
13.....	186	4	2	192	6	3	1,710	20	92
14.....	146	5	2	210	4	2	1,760	18	86
15.....	203	5	3	204	2	1	1,130	12	37
16.....	234	5	3	210	2	1	1,030	9	25
17.....	157	2	2	218	4	2	727	7	14
18.....	189	5	2	218	5	3	636	6	10
19.....	228	3	2	274	7	5	774	5	10
20.....	178	2	1	274	7	5	534	5	7
21.....	152	2	1	226	9	5	680	9	16
22.....	204	2	1	371	10	10	758	10	20
23.....	250	2	1	508	10	14	2,200	13	77
24.....	250	2	1	265	8	6	2,380	12	77
25.....	192	3	2	407	7	8	1,960	10	53
26.....	163	8	4	1,030	147	s523	1,460	14	55
27.....	218	6	4	487	40	s72	1,100	17	50
28.....	212	5	3	364	9	9	950	25	64
29.....	168	4	2	470	8	10	850	25	a55
30.....	180	6	3	564	6	9	622	15	25
31.....	186	5	2	--	--	--	680	11	20
Total.	5,765	--	73	8,820	--	705	28,418	--	1,016
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.....	727	15	29	1,870	109	550	2,200	213	1,260
2.....	534	17	24	1,580	96	410	1,830	174	860
3.....	508	19	26	1,740	78	366	1,940	142	744
4.....	592	20	32	1,960	70	370	13,700	289	s12,700
5.....	458	20	25	1,580	62	284	32,500	1,600	140,000
6.....	440	20	24	1,460	63	248	33,200	1,300	116,000
7.....	370	17	17	1,010	57	155	23,400	815	51,500
8.....	600	19	31	956	60	155	16,400	550	24,400
9.....	550	12	18	820	49	108	12,200	408	13,400
10.....	549	10	15	880	33	78	9,170	325	8,290
11.....	1,770	20	96	712	35	67	6,660	284	5,110
12.....	1,810	--	e200	973	32	84	6,260	238	4,020
13.....	3,140	--	e470	1,100	27	80	7,480	190	3,840
14.....	4,390	--	e750	2,080	24	135	7,480	132	2,660
15.....	4,390	--	e850	2,400	19	123	10,100	136	3,710
16.....	6,660	--	e1,300	1,670	14	63	13,700	240	8,880
17.....	7,060	--	e1,300	1,740	12	56	15,800	366	15,600
18.....	7,060	71	1,350	1,780	11	a55	13,700	373	13,800
19.....	7,480	80	1,620	1,380	10	a35	11,700	348	11,000
20.....	8,310	102	2,290	1,040	9	25	11,700	288	9,100
21.....	7,680	107	2,220	5,420	42	s735	10,500	218	6,180
22.....	6,060	117	1,910	11,200	245	s8,100	8,310	164	3,680
23.....	3,280	102	903	12,700	525	18,000	6,860	162	3,000
24.....	4,740	112	s1,520	9,390	388	9,840	4,740	146	1,870
25.....	9,620	330	a8,600	6,860	314	5,820	3,840	120	1,240
26.....	7,890	330	7,030	5,100	282	3,880	2,900	103	806
27.....	6,260	238	4,020	3,720	278	2,790	2,100	77	436
28.....	4,160	182	2,040	2,730	257	1,890	2,560	54	373
29.....	2,600	156	1,100	--	--	--	2,150	45	a260
30.....	2,110	137	780	--	--	--	1,460	33	130
31.....	2,180	127	748	--	--	--	2,640	32	228
Total.	113,978	--	41,338	85,851	--	54,482	299,180	--	465,077

e Estimated.

s Computed by subdividing day.

a Computed from estimated concentration graph.



STREAMS TRIBUTARY TO LAKE ERIE  
STREAMS TRIBUTARY TO LAKE ERIE--Continued

MAUMEE RIVER AT WATERVILLE, OHIO--Continued

Suspended sediment, water year October 1952 to September 1953--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.....	2,590	39	273	2,340	30	190	1,420	62	238
2.....	7,480	62	1,250	2,020	28	153	1,380	53	197
3.....	10,100	115	3,140	1,760	29	138	889	39	94
4.....	6,260	183	3,090	1,400	41	155	737	32	64
5.....	5,670	144	2,200	1,900	45	231	1,060	30	86
6.....	4,120	138	1,540	1,880	33	168	709	22	42
7.....	3,500	140	1,320	1,810	27	132	573	15	23
8.....	2,200	113	671	2,260	36	220	534	18	26
9.....	2,480	95	636	2,340	31	196	920	19	47
10.....	4,160	102	1,140	2,450	29	192	796	25	a 55
11.....	3,900	100	1,050	1,780	21	101	653	26	46
12.....	3,500	76	718	3,560	33	317	874	28	66
13.....	3,780	102	1,040	2,120	23	132	653	22	39
14.....	2,480	64	428	1,740	26	122	586	22	35
15.....	2,120	57	326	2,050	37	205	495	21	28
16.....	3,350	63	570	1,400	30	113	438	16	19
17.....	4,220	58	661	2,440	50	329	547	23	34
18.....	5,670	50	764	2,930	67	530	495	17	23
19.....	5,670	70	1,070	5,130	62	859	484	18	24
20.....	3,930	80	849	7,480	78	1,580	426	20	23
21.....	3,320	81	547	7,480	86	1,740	370	17	17
22.....	3,260	73	642	6,080	73	1,190	304	17	14
23.....	2,760	67	499	12,000	187	6,060	262	17	12
24.....	1,480	53	212	13,200	295	10,500	218	15	9
25.....	2,200	56	333	12,500	332	11,200	334	18	16
26.....	1,900	55	282	9,620	188	4,880	380	20	20
27.....	1,880	48	244	6,260	137	2,320	392	22	23
28.....	1,740	40	188	3,780	125	1,280	414	17	19
29.....	1,580	32	135	3,350	113	1,020	361	18	18
30.....	2,100	32	181	3,050	91	749	332	23	21
31.....	--	--	--	2,620	73	516	--	--	--
Total.	109,380	--	25,999	130,710	--	47,518	18,036	--	1,378
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.....	285	25	19	319	12	10	134	12	a 4
2.....	524	44	62	449	11	13	134	13	5
3.....	737	70	139	482	20	26	126	15	5
4.....	392	36	38	1,360	43	158	142	16	6
5.....	1,220	96	316	1,000	40	108	179	18	9
6.....	709	62	119	1,920	55	285	138	16	a 6
7.....	765	52	107	1,740	49	230	114	15	5
8.....	737	40	a 80	1,520	49	201	114	15	5
9.....	460	28	35	1,780	50	240	101	15	4
10.....	521	45	63	1,500	46	186	98	15	
11.....	438	24	28	971	37	97	104	15	4
12.....	314	23	19	780	30	63	192	22	11
13.....	270	15	11	1,000	28	76	304	38	31
14.....	248	11	7	599	20	32	174	17	8
15.....	232	8	5	426	15	17	118	13	4
16.....	218	6	4	380	17	17	138	15	6
17.....	210	6	3	323	15	13	114	13	4
18.....	232	6	4	304	13	11	83	15	3
19.....	225	6	4	294	8	6	138	19	7
20.....	204	6	3	255	6	4	204	10	6
21.....	186	5	2	248	4	3	174	16	8
22.....	318	18	15	248	3	2	151	17	7
23.....	449	21	25	248	3	2	104	15	4
24.....	314	8	7	240	3	2	110	18	5
25.....	1,190	46	s 194	1,000	21	s 66	142	24	9
26.....	1,640	44	195	462	12	15	134	17	6
27.....	920	34	84	218	17	10	122	15	5
28.....	361	18	18	162	20	9	240	15	a 10
29.....	255	8	6	156	13	5	211	14	8
30.....	198	9	5	156	10	4	138	8	3
31.....	186	9	4	156	11	5	--	--	--
Total.	14,958	--	1,621	20,696	--	1,916	4,375	--	202

Total discharge for year (cfs-days)..... 840,167

Total load for year (tons)..... 641,325

e Estimated.

s Computed by subdividing day.

a Computed from estimated concentration graph.

## STREAMS TRIBUTARY TO LAKE ERIE--Continued

## MAUMEE RIVER AT WATERVILLE, OHIO--Continued

Particle-size analyses of suspended sediment, water year October 1952 to September 1953  
 (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	Water discharge (cfs)	Water temperature (° F)	Suspended sediment											Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters								1.000		
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500
Mar. 5, 1953. . . . .	8:00 a. m.	31,800		2,200	1,830	68	82	90	96	99	100	--			BSWCM	
Mar. 6. . . . .	4:45 a. m.	34,700		1,420	2,060	70	86	92	96	98	100	--			BSWCM	
Mar. 6. . . . .	11:30 a. m.	33,900		1,290	2,530	79	84	92	96	98	99	100			BSWCM	
Mar. 6. . . . .	11:30 a. m.	33,900		1,290	2,650	29	46	67	86	99	99	100			BSN	
Mar. 17. . . . .	12:45 p. m.	16,400		386	596	77	89	96	98	99	99	--			BSWCM	
Mar. 19. . . . .	6:10 p. m.	11,500		328	523	82	89	91	97	99	100	--			BSWCM	
Apr. 4. . . . .	5:50 a. m.	8,950		208	326	86	93	97	99	100	--	--			BWCM	

STREAMS TRIBUTARY TO LAKE ERIE  
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.--Water temperatures: October 1952 to September 1953.

Sediment records: October 1950 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Minimum, freezing point Dec. 26-27.

Sediment concentrations: Maximum daily, 1,130 ppm Mar. 4; minimum daily, 1 ppm on many days during December, January, February, March and April.

Sediment loads: Maximum daily, 8,080 tons Mar. 4; minimum daily, less than 0.050 ton on several days during November, December, and January.

EXTREMES, 1950-53.--Sediment concentrations: Maximum daily, 1,210 ppm Mar. 12, 1952; minimum daily, 1 ppm on many days during October, December, 1950, May, December, 1952, January February, March, and April, 1953.

Sediment loads: Maximum daily, 27,900 tons Mar. 12, 1952; minimum daily, less than 0.050 ton on several days during November, 1951, November, December, 1952, and January 1953.

REMARKS.--Flow affected by ice Dec. 28-29, Jan. 5-7, Feb. 16, Mar. 2-3. Records of discharge for water year October 1952 to September 1953 given in WSP 1277.

Temperature (°F) of water, water year October 1952 to September 1953  
(Once-daily temperature measurement at approximately 5 p.m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	55	34	35	35	38	--	60	76	--	--	91
2	60	58	35	35	35	38	--	--	--	--	--	92
3	59	49	38	34	34	--	50	60	79	--	--	82
4	60	--	--	33	35	40	48	68	81	--	--	84
5	58	50	36	33	35	38	--	66	82	--	--	75
6	55	43	36	33	38	37	49	68	86	--	--	81
7	55	44	37	33	--	36	52	64	75	--	--	84
8	58	44	38	33	39	34	52	68	75	--	--	78
9	58	--	54	33	41	37	58	74	84	--	--	75
10	54	48	50	33	36	38	50	76	78	--	--	80
11	59	44	--	--	--	42	50	72	80	--	--	75
12	60	45	42	--	--	--	--	70	81	--	--	83
13	63	46	34	--	--	--	49	62	78	--	--	87
14	62	50	34	48	42	48	52	--	--	--	--	88
15	56	52	33	40	40	49	48	66	80	--	--	85
16	55	53	--	42	35	44	--	62	--	--	--	65
17	53	58	35	38	--	--	44	64	78	--	--	80
18	--	51	35	39	--	50	45	68	78	--	--	81
19	--	50	33	42	37	--	--	--	--	--	--	79
20	45	48	35	40	40	--	40	70	90	--	--	84
21	41	46	37	40	38	--	52	70	90	--	--	85
22	51	49	39	38	38	--	55	61	89	80	82	64
23	--	45	42	40	40	--	60	58	86	81	--	70
24	58	45	39	40	40	--	53	60	--	81	85	70
25	57	47	35	36	40	36	60	65	--	81	--	70
26	58	43	32	--	--	--	--	75	80	--	--	89
27	--	--	32	39	42	--	48	72	82	85	87	68
28	46	33	--	35	40	--	50	71	--	88	89	72
29	45	33	--	34	--	--	52	72	88	85	87	70
30	49	34	35	35	--	--	55	74	--	85	88	74
31	50	--	34	41	--	--	--	76	--	--	90	--
Average	55	47	37	37	--	--	--	68	--	--	84	--

ST. LAWRENCE RIVER BASIN  
STREAMS TRIBUTARY TO LAKE ERIE--Continued  
PORTAGE RIVER AT WOODVILLE, OHIO--Continued

Suspended sediment, water year October 1952 to September 1953

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.....	3.1	17	a 0.1	23	9	0.6	6.5	5	0.1
2.....	3.3	24	.2	27	12	.9	6.9	8	.1
3.....	3.7	21	.2	23	18	1.1	7.3	8	.2
4.....	4.1	18	.2	19	13	a .7	7.3	7	a .1
5.....	4.1	25	.3	24	6	.4	11	5	.1
6.....	4.5	17	.2	22	8	.5	19	3	.2
7.....	4.5	14	.2	14	5	.2	22	6	.4
8.....	4.1	15	.2	11	4	.1	14	7	.3
9.....	3.3	15	.1	11	4	a .1	12	14	.4
10.....	3.7	13	.1	8.5	5	.1	72	45	sb 20
11.....	3.7	11	.1	7.9	4	.1	206	125	70
12.....	3.7	23	.2	7.9	4	.1	108	59	17
13.....	2.9	22	.2	7.9	5	.1	64	39	6.7
14.....	2.9	16	.1	8.5	4	.1	41	27	3.0
15.....	3.7	20	.2	8.5	12	.3	28	15	1.1
16.....	3.7	15	.1	8.5	14	.3	30	10	a .8
17.....	9.8	10	.3	7.9	21	.4	22	6	.4
18.....	6.1	14	.2	9.8	20	.5	16	5	.2
19.....	6.9	13	a .2	14	22	.8	13	2	.1
20.....	6.5	11	.2	13	12	.4	15	1	(t)
21.....	6.1	10	.2	26	10	.7	17	2	.1
22.....	6.5	9	.2	20	11	.6	32	1	.1
23.....	9.2	9	a .2	14	7	.3	50	1	.1
24.....	11	17	.5	14	4	.2	44	3	.4
25.....	12	25	.8	13	9	.3	40	5	.5
26.....	12	22	.7	12	11	.4	31	2	.2
27.....	16	18	a .8	10	10	a .3	19	3	.2
28.....	19	15	.8	7.9	7	.1	17	3	a .1
29.....	21	12	.7	7.3	2	(t)	14	4	a .2
30.....	23	9	.6	6.9	8	.1	12	4	.1
31.....	23	10	.6	--	--	--	11	2	.1
Total.	247.1	--	9.7	407.5	--	10.8	1,008.0	--	123.3
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.....	12	2	0.1	76	6	1.2	79	8	1.7
2.....	12	1	(t)	56	7	1.0	50	13	1.8
3.....	13	1	(t)	66	5	.9	70	--	e 8
4.....	12	1	(t)	53	5	.7	2,350	1,130	s 8,080
5.....	11	1	(t)	57	5	.8	2,690	610	s 4,860
6.....	10	1	(t)	57	6	.9	1,120	224	677
7.....	11	3	.1	48	5	.6	575	106	164
8.....	13	2	.1	41	4	.4	353	59	56
9.....	18	2	.1	29	4	.3	277	38	28
10.....	76	14	s 4.0	30	2	.2	216	25	14
11.....	390	--	e 180	29	3	.2	230	22	14
12.....	505	--	e 250	31	2	.2	280	36	27
13.....	340	--	e 80	52	1	.1	264	33	24
14.....	410	76	84	64	1	.2	219	28	16
15.....	825	214	s 503	53	1	.1	265	35	sb 30
16.....	675	155	282	40	3	.3	825	250	b 550
17.....	392	74	78	31	3	a .2	455	129	158
18.....	920	234	s 756	35	3	a .3	298	54	43
19.....	1,020	250	s 719	39	2	.2	248	25	a 17
20.....	496	106	142	46	2	.2	178	14	6.7
21.....	286	52	40	744	240	sb 900	131	13	4.6
22.....	190	35	18	1,010	567	s 1,670	112	15	4.5
23.....	138	29	11	428	180	s 221	107	16	4.6
24.....	183	36	s 19	264	61	43	103	12	3.3
25.....	650	129	226	180	29	14	94	6	1.5
26.....	314	91	77	162	20	a 9	86	4	.9
27.....	204	49	27	151	18	7.3	69	3	a .6
28.....	156	25	10	120	12	3.9	63	1	.2
29.....	97	19	5.0	--	--	--	61	1	.2
30.....	78	12	2.5	--	--	--	56	1	.2
31.....	108	7	2.0	--	--	--	49	4	.5
Total.	8,565	--	3,516.1	3,992	--	2,877.2	11,973	--	14,797.3

e Estimated.

s Computed by subdividing day.

t Less than 0.050 ton.

a Computed from estimated concentration graph.

b Computed partly from water-sediment discharge curve.

STREAMS TRIBUTARY TO LAKE ERIE  
STREAMS TRIBUTARY TO LAKE ERIE--Continued

PORTAGE RIVER AT WOODVILLE, OHIO--Continued

Suspended sediment, water year October 1952 to September 1953--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.....	122	15	sb13	129	3	1.0	74	33	6.6
2.....	1,210	230	b750	147	3	a1	54	30	a4
3.....	700	91	172	135	2	.7	43	17	2.0
4.....	401	46	50	125	2	.7	34	19	1.7
5.....	267	23	16	131	2	.7	29	21	1.6
6.....	185	17	8.5	141	2	.8	25	21	1.4
7.....	153	15	6.2	180	2	1.0	45	21	2.6
8.....	129	12	4.2	251	7	4.7	98	20	5.3
9.....	116	10	3.1	200	5	2.7	79	32	6.8
10.....	894	200	s708	139	4	1.5	72	25	4.9
11.....	1,020	218	s634	105	4	1.1	49	23	3.0
12.....	464	85	a110	80	7	1.5	37	25	2.5
13.....	324	26	23	71	8	1.5	28	35	2.6
14.....	233	14	8.8	61	10	a2	22	30	a2
15.....	173	8	3.7	60	8	1.3	19	22	1.1
16.....	202	15	a8	72	6	1.2	19	31	1.6
17.....	280	16	12	98	9	s2.7	20	22	1.2
18.....	224	5	3.0	1,420	226	s1,000	26	20	1.4
19.....	178	3	a1	1,100	141	s439	33	20	a2
20.....	147	1	.4	437	64	76	25	22	1.5
21.....	129	1	.3	221	33	20	18	28	1.4
22.....	116	2	.6	160	26	11	14	32	1.2
23.....	105	5	1.4	2,970	500	b4,000	9.8	27	.7
24.....	99	4	1.1	3,130	228	s2,070	7.3	25	a.5
25.....	96	3	.8	1,240	128	428	12	33	1.1
26.....	118	2	a.6	650	78	137	70	38	7.2
27.....	147	1	.4	320	59	51	151	33	13
28.....	139	1	.4	180	43	21	118	26	8.3
29.....	122	1	.3	125	31	10	63	41	7.0
30.....	118	1	.3	103	25	7.0	41	45	a5
31.....	--	--	--	87	25	5.9	--	--	--
Total.	8,611	--	2,541.1	14,268	--	8,302.0	1,335.1	--	101.2
Day	July			August			September		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	36	47	4.6	13	40	a1	4.5	28	0.3
2.....	37	47	4.7	38	36	3.7	4.1	31	.3
3.....	82	47	10	61	32	5.3	2.9	43	.3
4.....	112	43	13	36	44	4.3	5.3	37	.5
5.....	61	45	a7	36	57	5.5	7.3	32	.6
6.....	31	53	4.4	52	50	7.0	9.2	38	.9
7.....	19	55	2.8	66	41	7.3	11	33	1.0
8.....	14	50	a2	58	40	6.3	8.5	22	.5
9.....	11	43	1.3	66	40	a7	5.7	30	.5
10.....	8.5	38	.9	56	34	5.1	4.9	25	.3
11.....	7.3	31	.6	34	30	a3	6.1	36	.6
12.....	5.7	26	.4	22	33	2.0	9.8	28	.7
13.....	4.9	26	.3	15	34	1.4	11	25	a.7
14.....	4.5	25	.3	12	31	1.0	11	27	.8
15.....	3.3	32	.3	8.5	28	.6	12	30	a1
16.....	3.1	28	.2	6.9	22	.4	7.9	28	.6
17.....	3.1	29	.2	5.7	18	.3	7.9	28	.6
18.....	4.1	30	a.3	4.9	17	.2	7.3	37	.7
19.....	7.5	29	.6	3.7	15	.1	7.9	36	.8
20.....	15	36	1.4	2.9	15	.1	11	35	a1
21.....	54	36	5.2	2.7	15	.1	13	35	1.2
22.....	49	39	5.2	3.3	12	.1	9.8	45	1.2
23.....	248	88	s82	3.3	12	a.1	8.5	34	.8
24.....	228	133	82	3.3	13	.1	8.5	29	.7
25.....	87	98	23	3.1	14	a.1	7.9	28	.6
26.....	41	80	a9	2.7	15	.1	7.9	48	1.0
27.....	23	68	4.2	2.3	20	.1	8.5	34	.8
28.....	16	54	2.3	2.9	17	.1	7.9	28	.6
29.....	11	60	1.8	3.7	20	.2	7.3	21	.4
30.....	9.8	48	1.3	4.1	25	.3	5.3	24	.3
31.....	9.2	40	a1	4.5	23	.3	--	--	--
Total.	1,246.0	--	272.3	633.5	--	63.2	239.9	--	20.3

a Computed from estimated concentration graph.

b Computed partly from water-sediment discharge curve.

s Computed by subdividing day.

STREAMS TRIBUTARY TO LAKE ERIE--Continued  
PORTAGE RIVER AT WOODVILLE, OHIO--Continued

Particle-size analyses of suspended sediment, water year October 1952 to September 1953

(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	Water discharge (cfs)	Water temperature (° F)	Suspended sediment												Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	
Jan. 18, 1953	6:00 p. m.	1,400	416	539	67	81	89	94	97	99	--	--	--	--	--	BSWCM
Mar. 4	4:00 p. m.	3,220	1,440	1,030	65	75	85	93	96	98	99	99	99	99	99	BSWCM
Mar. 4	4:00 p. m.	3,220	1,440	1,060	35	50	68	88	96	97	99	99	99	99	99	BSN
Mar. 6	10:10 a. m.	1,180	223	504	87	92	93	96	97	100	--	--	--	--	--	BSWCM
Mar. 6	10:10 a. m.	1,180	223	561	27	57	87	98	98	99	--	--	--	--	--	BSN
Apr. 10	4:45 p. m.	1,430	399	555	71	80	91	96	98	100	--	--	--	--	--	BSWCM
May 18	5:30 p. m.	1,880	248	385	59	71	86	95	97	98	--	--	--	--	--	BSWCM
May 23	10:50 a. m.	3,220	587	806	68	77	87	94	96	98	--	--	--	--	--	BSWCM

STREAMS TRIBUTARY TO LAKE ERIE  
STREAMS TRIBUTARY TO LAKE ERIE--Continued

SANDUSKY RIVER NEAR FREMONT, OHIO

LOCATION:--At gaging station at highway bridge, 2½ miles downstream from Wolf Creek, 2.3 miles upstream from Ballville power dam, and 3½ miles southwest of Fremont, Sandusky County.

DRAINAGE AREA.--1,248 square miles.

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

Water temperatures: October 1950 to September 1953.

Sediment records: October 1950 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 90°F Sept. 1-2; minimum, freezing point on several days during November, December, and January.

Sediment concentrations: Maximum daily, 780 ppm Mar. 5; minimum daily, 1 ppm on several days during October, November, December, and February.

Sediment loads: Maximum daily, 14,000 tons May 23; minimum daily, less than 0.05 ton on several days during October.

EXTREMES, 1950-53.--Water temperatures: Maximum, 90°F Sept. 1-2, 1953; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 780 ppm Mar. 5, 1953; minimum daily, 1 ppm on many days during February 1951, October, November, December, 1952, and February 1953.

Sediment loads: Maximum daily, 31,900 tons Mar. 12, 1952; minimum daily, less than 0.05 ton on several days during October 1952.

REMARKS.--Flow affected by ice Nov. 29, Dec. 27-30, Jan. 6-9, Feb. 18. Records of discharge for water year October 1952 to September 1953 given in WSP 1277.

Temperature (°F) of water, water year October 1952 to September 1953  
(Once-daily temperature measurement at approximately 5 p.m.)

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

ST. LAWRENCE RIVER BASIN  
STREAMS TRIBUTARY TO LAKE ERIE--Continued  
SANDUSKY RIVER NEAR FREMONT, OHIO--Continued

Suspended sediment, water year October 1952 to September 1953

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.....	24	2	0.1	26	1	0.1	34	1	0.1
2.....	21	2	.1	28	3	.2	34	3	.3
3.....	21	2	.1	34	2	.2	37	5	.5
4.....	19	2	.1	43	1	.1	37	4	.4
5.....	17	2	.1	34	2	.2	52	3	.4
6.....	17	1	(t)	30	2	.2	80	5	1.1
7.....	15	1	(t)	30	1	.1	84	4	.9
8.....	17	1	(t)	34	1	.1	87	2	.5
9.....	17	1	(t)	49	2	.3	91	4	1.0
10.....	17	1	(t)	46	8	1.0	135	5	1.8
11.....	17	1	(t)	40	7	.8	191	8	4.1
12.....	17	1	(t)	37	6	.6	242	7	4.6
13.....	17	1	(t)	34	6	.6	254	5	3.4
14.....	21	4	.2	32	5	.4	213	5	2.9
15.....	32	2	.2	34	9	.8	149	5	2.0
16.....	37	2	.2	34	7	.6	110	2	.6
17.....	28	5	.4	34	4	.4	95	3	.8
18.....	26	1	.1	37	5	.5	72	3	.6
19.....	26	1	.1	46	6	.7	76	20	4.1
20.....	24	7	.4	58	6	.9	72	9	1.7
21.....	26	7	.5	55	5	.7	72	5	1.0
22.....	24	4	.2	61	5	.8	68	4	.7
23.....	23	5	.3	68	4	.7	68	6	1.1
24.....	23	6	.4	55	4	.6	72	5	1.0
25.....	23	6	.4	55	3	.4	68	5	.9
26.....	24	6	.4	55	5	.7	68	4	.7
27.....	26	5	.4	52	5	.7	65	2	.4
28.....	28	3	.2	40	3	.3	60	4	.6
29.....	30	2	.2	40	4	.4	55	3	.4
30.....	28	1	.1	37	2	.2	55	5	.7
31.....	28	3	.2	--	--	--	52	5	.7
Total.	713	--	5.7	1,258	--	14.3	2,848	--	40.0
Day	January			February			March		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	49	6	0.8	242	14	9.1	267	44	32
2.....	52	5	.7	248	9	6.0	225	32	19
3.....	55	8	1.1	273	8	5.9	213	20	s 12
4.....	58	13	2.0	287	6	4.6	2,340	682	s 5,940
5.....	58	18	2.8	213	3	1.7	3,630	780	7,640
6.....	45	13	1.6	191	4	2.1	2,410	397	2,580
7.....	50	10	1.4	185	2	1.0	1,270	187	641
8.....	60	10	1.6	170	1	.4	767	156	323
9.....	90	10	2.4	149	3	1.2	565	133	203
10.....	126	9	3.1	126	3	1.0	483	94	122
11.....	574	66	s 120	126	4	1.4	483	57	74
12.....	1,570	85	360	126	4	1.4	604	44	72
13.....	1,320	82	292	131	3	a 1	842	40	91
14.....	816	78	172	180	3	1.4	894	35	84
15.....	594	58	93	260	4	2.8	829	42	94
16.....	519	52	73	273	5	3.7	1,110	61	183
17.....	450	43	52	219	4	2.4	1,020	70	193
18.....	1,000	93	s 318	150	2	.8	790	75	160
19.....	2,390	221	1,430	180	1	.5	604	69	112
20.....	2,120	214	1,220	213	5	2.9	538	50	73
21.....	1,130	197	601	488	20	sb 40	547	49	72
22.....	675	144	262	1,410	90	343	458	49	60
23.....	483	93	121	1,360	132	485	379	38	39
24.....	409	70	77	790	100	213	334	29	26
25.....	434	55	64	519	88	123	307	25	21
26.....	417	35	39	394	82	87	273	18	13
27.....	379	23	24	342	70	65	248	12	8.0
28.....	342	24	22	307	62	51	230	10	6.2
29.....	280	16	12	--	--	--	213	7	4.0
30.....	242	17	11	--	--	--	201	6	3.2
31.....	225	17	10	--	--	--	185	8	4.0
Total.	17,012	--	5,390.5	9,552	--	1,458.3	23,259	--	18,904.4

s Computed by subdividing day.

a Computed from estimated concentration graph.

t Less than 0.05 ton.

b Computed from partly estimated concentration graph.



STREAMS TRIBUTARY TO LAKE ERIE  
STREAMS TRIBUTARY TO LAKE ERIE--Continued

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SANDUSKY RIVER NEAR FREMONT, OHIO--Continued

Suspended sediment, water year October 1952 to September 1953--Continued

Day	April			May			June		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	219	11	6.5	294	15	12	314	43	36
2.....	349	19	18	294	15	12	287	40	29
3.....	357	25	24	294	13	10	219	47	28
4.....	371	23	23	300	13	10	185	34	17
5.....	342	27	25	334	13	12	159	30	13
6.....	287	27	21	434	14	16	144	43	17
7.....	248	19	13	655	17	30	149	47	19
8.....	230	13	8.1	624	21	35	131	40	14
9.....	225	12	7.3	732	20	40	140	39	15
10.....	518	47	s 77	992	33	88	112	40	a 12
11.....	732	148	292	790	34	72	103	35	9.7
12.....	920	75	186	510	24	33	99	32	8.6
13.....	816	42	92	1,910	320	sb 1,800	91	30	7.4
14.....	565	48	73	1,480	222	887	80	31	6.7
15.....	450	48	58	1,020	128	352	76	27	5.5
16.....	401	47	51	1,110	122	366	72	26	5.0
17.....	409	35	39	1,520	145	s 635	80	49	10
18.....	434	20	23	3,750	240	2,430	72	49	9.5
19.....	450	15	18	4,250	276	3,170	64	40	6.9
20.....	401	9	9.7	3,270	232	2,050	61	39	6.4
21.....	371	4	4.0	1,820	139	683	52	29	4.1
22.....	334	8	7.2	1,510	110	s 527	46	24	3.0
23.....	314	12	10	8,820	589	14,000	43	22	2.6
24.....	314	6	6.8	7,150	374	7,220	37	18	1.8
25.....	294	5	4.0	4,890	274	3,620	37	20	2.0
26.....	294	6	4.8	3,750	247	2,500	40	20	2.2
27.....	280	8	6.0	2,180	208	1,220	46	20	2.5
28.....	280	7	5.3	1,240	138	462	37	20	2.0
29.....	294	6	4.8	710	86	165	68	47	s 10
30.....	287	6	4.6	510	53	73	91	70	17
31.....	--	--	--	394	46	49	--	--	--
Total.	11,786	--	1,122.1	57,537	--	42,579	3,115	--	322.9
Day	July			August			September		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	58	40	6.3	95	42	11	14	19	0.7
2.....	135	30	s 13	159	54	23	12	14	.4
3.....	709	147	s 356	121	55	18	12	16	.5
4.....	842	125	284	91	47	12	11	15	.4
5.....	554	95	a 140	135	55	20	11	16	.5
6.....	260	80	a 55	159	59	25	11	14	.4
7.....	154	70	a 30	117	47	15	10	13	a .4
8.....	103	58	16	140	46	17	9.4	12	.3
9.....	80	45	a 10	117	40	13	10	11	.3
10.....	61	38	6.2	95	29	7.4	10	12	.3
11.....	52	27	3.8	76	25	5.1	12	12	.4
12.....	43	21	2.4	64	23	4.0	13	12	.4
13.....	37	19	1.9	64	44	7.6	12	19	.6
14.....	32	17	1.5	58	40	a 6.0	13	14	.5
15.....	28	19	1.4	52	23	3.2	13	11	.4
16.....	46	21	2.6	49	16	2.1	14	11	a .4
17.....	49	21	2.8	40	18	1.9	14	10	.4
18.....	58	19	3.0	34	14	1.3	13	11	.4
19.....	95	20	5.1	28	10	.8	13	12	.4
20.....	61	17	2.8	26	10	.7	13	14	.5
21.....	55	18	2.7	24	10	.6	14	12	a .4
22.....	69	34	s 7.2	23	12	.7	19	10	.5
23.....	1,170	278	s 1,030	21	12	.7	23	10	.6
24.....	2,000	370	2,000	21	14	.8	21	11	.6
25.....	1,720	324	1,500	19	15	a .8	19	11	.6
26.....	732	224	443	19	16	.8	17	11	.5
27.....	371	165	165	17	16	.7	14	7	.3
28.....	225	117	71	15	16	.6	13	12	.4
29.....	154	70	a 30	14	16	.6	13	10	.4
30.....	117	50	a 16	14	15	.6	13	7	.2
31.....	91	43	11	15	20	.8	--	--	--
Total.	10,161	--	6,219.7	1,922	--	201.8	406.4	--	13.1
Total discharge for year (cfs-days).....									
Total load for year (tons).....									
s Computed by subdividing day.									
a Computed from estimated concentration graph.									
b Computed from partly estimated concentration graph.									

Total discharge for year (cfs-days)..... 139,569.4  
Total load for year (tons)..... 76,271.8

STREAMS TRIBUTARY TO LAKE ERIE--Continued  
SANDUSKY RIVER NEAR FREMONT, OHIO.--Continued

Particle-size analyses of suspended sediment, water year October 1952 to September 1953  
(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	Water discharge (cfs)	Water tem- per- ature (° F)	Suspended sediment												Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	
Jan. 20, 1953 . . .	5:20 p. m.	1,820		212	336	77	89	93	95	96	100	--				BSWCM
Mar. 6. . . . .	2:10 a. m.	2,820		475	641	72	84	88	91	94	100	--				BSWCM
May 13 . . . . .	7:30 p. m.	2,520		374	596	77	87	94	97	99	99	--				BSWCM
May 18 . . . . .	6:30 p. m.	4,380		256	394	60	73	82	92	97	99	--				BSWCM
May 23 . . . . .	9:15 a. m.	9,100		782	538	61	73	84	92	96	98	--				BSWCM
May 23 . . . . .	9:15 a. m.	9,100		782	700	34	47	67	86	95	98	--				BSN
May 25 . . . . .	5:30 p. m.	4,500		259	689	72	78	81	92	96	99	100				BSWCM
May 25 . . . . .	5:30 p. m.	4,500		259	803	32	44	64	86	97	99	99				BSN
July 24 . . . . .	7:45 p. m.	2,310		393	579	67	81	89	95	97	98	99				BSWCM

STREAMS TRIBUTARY TO LAKE ERIE  
STREAMS TRIBUTARY TO LAKE ERIE--Continued

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CUYAHOGA RIVER AT INDEPENDENCE, OHIO

LOCATION.--At gaging station at highway bridge on Rockside Road, 1 mile northeast of Independence, Cuyahoga County, and 3 miles downstream from Tinkers Creek.  
DRAINAGE AREA.--709 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.

Water temperatures: October 1952 to September 1953.

Sediment records: October 1950 to September 1953.

EXTREMES, 1952-53.--Water temperatures: Maximum, 85°F June 20; minimum, 34°F Jan. 6-7.

Sediment concentrations: Maximum daily, 885 ppm Apr. 10; minimum daily, 3 ppm on several days during October, November and September.

Sediment loads: Maximum daily, 5,650 tons Apr. 10; minimum daily, 1 ton on many days during October, November, July, August, and September.

EXTREMES, 1950-53.--Sediment concentrations: Maximum daily, 1,070 ppm Feb. 21, 1951; minimum daily, 2 ppm Aug. 25-30, 1951.

Sediment loads: Maximum daily, 26,000 tons Jan. 27, 1952; minimum daily, 1 ton on many days during August, September, October, 1951, August, September, October, November 1952, and July, August, September 1953.

REMARKS.--Records of discharge for water year October 1952 to September 1953 given in WSP 1277.

Temperature (°F) of water, water year October 1952 to September 1953  
(Once-daily temperature measurement at varying hours)

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

ST. LAWRENCE RIVER BASIN  
STREAMS TRIBUTARY TO LAKE ERIE--Continued

CUYAHOGA RIVER AT INDEPENDENCE, OHIO--Continued

Suspended sediment, water year October 1952 to September 1953

Day	October			November			December		
	Suspended sediment			Suspended sediment			Suspended sediment		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	99	7	2	118	5	2	165	9	4
2.....	118	5	2	118	3	1	157	6	2
3.....	124	7	2	148	5	2	182	5	2
4.....	106	7	2	173	5	2	165	10	4
5.....	106	7	2	160	5	2	531	121	s 219
6.....	133	8	3	138	5	2	513	76	s 110
7.....	145	5	2	131	4	1	374	38	38
8.....	131	5	2	130	4	1	321	20	17
9.....	126	5	2	128	4	1	356	13	12
10.....	122	8	3	130	4	1	604	74	s 129
11.....	114	7	2	116	3	1	678	76	143
12.....	120	11	4	120	5	2	513	33	46
13.....	101	11	3	108	4	1	455	23	28
14.....	131	8	3	112	5	2	398	15	16
15.....	133	5	2	104	6	2	370	15	15
16.....	129	5	2	113	3	1	366	17	17
17.....	129	5	2	102	13	4	321	17	15
18.....	124	5	2	120	7	2	307	12	10
19.....	120	7	2	131	7	2	273	9	7
20.....	108	8	2	197	20	11	253	8	6
21.....	157	6	2	208	14	8	230	11	7
22.....	138	7	3	568	330	sa 600	208	7	4
23.....	131	8	3	377	42	s 47	214	7	4
24.....	129	5	2	286	18	14	218	7	4
25.....	124	3	1	263	15	11	199	5	3
26.....	112	4	1	250	15	10	190	6	3
27.....	94	4	1	240	10	6	205	16	9
28.....	108	3	1	214	6	4	179	8	4
29.....	124	3	1	211	6	3	155	8	3
30.....	138	3	1	170	8	4	140	7	3
31.....	129	7	2	--	--	--	163	9	4
Total.	3,803	--	64	5,384	--	750	9,403	--	888
Day	January			February			March		
	Suspended sediment			Suspended sediment			Suspended sediment		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	147	7	3	1,160	44	138	398	10	11
2.....	142	5	2	810	22	48	335	7	6
3.....	165	5	2	734	32	63	346	7	6
4.....	165	8	4	678	28	51	1,290	189	s 716
5.....	145	7	3	586	33	52	1,000	122	329
6.....	155	4	2	568	30	46	772	32	67
7.....	138	4	2	549	27	40	678	22	40
8.....	145	9	4	459	20	25	642	21	36
9.....	320	26	s 24	412	16	18	586	14	22
10.....	734	130	sa 370	356	17	16	586	17	27
11.....	1,600	390	sa 1,800	366	18	18	531	16	23
12.....	905	77	188	412	22	24	586	21	33
13.....	678	43	79	427	18	21	531	17	24
14.....	697	29	54	394	20	21	513	13	18
15.....	660	27	48	391	18	19	734	39	s 89
16.....	623	21	35	384	13	13	772	46	96
17.....	747	60	sa 210	352	13	12	660	22	39
18.....	3,170	600	sa 5,400	321	18	16	586	16	25
19.....	1,650	176	784	324	17	* 5	568	13	20
20.....	1,200	88	285	434	30	sa 50	513	15	21
21.....	1,040	63	177	1,080	197	574	459	15	19
22.....	962	54	140	867	82	192	423	14	16
23.....	886	56	134	660	27	48	384	12	12
24.....	1,040	55	154	623	22	37	473	23	29
25.....	1,120	43	130	586	20	32	678	48	88
26.....	866	30	72	568	17	26	697	35	66
27.....	867	46	108	513	17	24	1,000	110	s 352
28.....	1,380	98	365	470	12	15	1,040	97	272
29.....	1,200	66	214	--	--	--	905	34	83
30.....	962	40	104	--	--	--	810	31	68
31.....	1,160	55	172	--	--	--	734	20	40
Total.	25,689	--	11,069	15,484	--	1,654	20,230	--	2,693

s Computed by subdividing day.

a Computed partly from water-sediment discharge curve.

STREAMS TRIBUTARY TO LAKE ERIE  
STREAMS TRIBUTARY TO LAKE ERIE--Continued

CUYAHOGA RIVER AT INDEPENDENCE, OHIO--Continued

Suspended sediment, water year October 1952 to September 1953--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.....	1,120	90	sa340	531	17	24	342	17	16
2.....	1,380	101	376	477	13	17	307	17	14
3.....	1,160	47	147	430	12	14	273	14	10
4.....	943	30	76	377	10	10	246	13	9
5.....	772	20	42	568	36	55	256	16	11
6.....	697	17	32	513	28	39	259	28	20
7.....	623	18	30	1,040	180	sa700	360	30	29
8.....	513	14	19	1,120	115	s375	280	14	10
9.....	495	14	19	716	32	62	405	40	sa55
10.....	1,990	885	s5,650	513	21	29	273	20	15
11.....	1,520	228	s984	586	21	33	211	13	7
12.....	1,080	73	213	642	33	57	208	11	6
13.....	905	40	98	848	58	133	205	14	b8
14.....	791	62	132	716	33	64	179	18	9
15.....	660	23	41	753	27	55	182	13	6
16.....	753	22	45	697	32	60	185	11	6
17.....	753	18	b35	1,650	--	e1,200	459	160	sa250
18.....	848	25	57	2,560	380	sa3,000	253	25	17
19.....	848	24	55	1,380	71	264	196	11	6
20.....	886	30	sa80	1,040	48	135	208	12	7
21.....	1,380	--	e500	848	45	103	160	10	4
22.....	1,380	--	e500	1,260	--	e1,000	140	10	4
23.....	1,080	33	96	2,400	380	a2,400	160	8	3
24.....	829	23	51	1,560	133	560	142	10	4
25.....	716	27	52	1,200	85	275	138	20	7
26.....	810	29	63	943	64	163	173	21	10
27.....	772	20	42	810	45	98	370	--	e170
28.....	678	18	33	678	35	64	224	70	sa50
29.....	586	22	35	531	28	40	362	--	e140
30.....	549	19	28	412	23	26	218	30	18
31.....	--	--	--	394	18	19	--	--	--
Total.	27,517	--	9,871	28,193	--	11,074	7,374	--	921
Day	July			August			September		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	199	18	10	92	11	3	166	--	e15
2.....	331	110	sa120	97	15	4	89	15	4
3.....	307	86	s79	99	20	5	83	8	2
4.....	180	20	9	108	8	2	80	10	2
5.....	194	--	e65	341	120	sa130	156	12	5
6.....	380	--	e140	190	15	8	108	10	3
7.....	214	18	10	124	6	2	70	5	1
8.....	160	14	6	160	--	e35	66	7	1
9.....	140	13	5	116	21	7	70	8	2
10.....	124	13	4	106	7	2	71	13	2
11.....	114	12	4	120	8	3	73	16	3
12.....	101	16	4	130	8	3	75	9	2
13.....	90	23	6	99	8	2	79	7	2
14.....	101	13	4	97	8	2	63	7	1
15.....	104	9	2	96	8	2	77	8	2
16.....	114	9	3	84	7	2	90	7	2
17.....	106	9	3	71	7	1	97	7	2
18.....	160	20	c9	84	6	1	87	7	2
19.....	185	20	c10	82	7	2	89	4	1
20.....	112	12	4	82	8	2	114	6	2
21.....	120	10	3	83	8	2	84	9	2
22.....	126	9	3	79	8	2	94	4	1
23.....	240	25	c16	77	7	1	84	3	1
24.....	145	13	5	68	7	1	78	6	1
25.....	127	10	3	80	8	2	77	7	1
26.....	92	7	2	79	8	2	78	5	1
27.....	77	8	2	84	6	1	75	5	b1
28.....	96	4	1	79	7	2	63	15	3
29.....	94	4	1	77	5	1	72	12	2
30.....	97	10	b3	71	6	1	72	7	1
31.....	97	28	7	63	9	2	--	--	--
Total.	4,707	--	543	3,218	--	235	2,580	--	70

Total discharge for year (cfs-days) ..... 153,582

Total load for year (tons) ..... 39,832

e Estimated.

s Computed by subdividing day.

a Computed partly from water-sediment discharge curve.

b Computed from estimated concentration graph.

c Computed from partly-estimated concentration graph.

STREAMS TRIBUTARY TO LAKE ERIE--Continued  
 CUYAHOGA RIVER AT INDEPENDENCE, OHIO--Continued

Particle-size analyses of suspended sediment, water year October 1952 to September 1953  
 (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	Water discharge (cfs)	Water temperature (° F)	Suspended sediment											Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500
Apr. 10, 1953 . . .	1:45 p. m.	3,170		1,300	32	43	59	77	91	96	98					BSWCM
Apr. 10 . . . . .	1:45 p. m.	3,170		1,300	2	8	20	38	81	91	97					BSN
May 18 . . . . .	12:35 p. m.	2,510		343	53	66	74	86	94	97	99					BSWCM
May 23 . . . . .	1:10 p. m.	2,400		366	24	50	62	78	90	95	97					BSWCM

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