

# Quality of Surface Waters of the United States 1954

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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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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## PREFACE

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# QUALITY OF SURFACE WATERS OF THE UNITED STATES, 1954

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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, 1953, to September 30, 1954. 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.

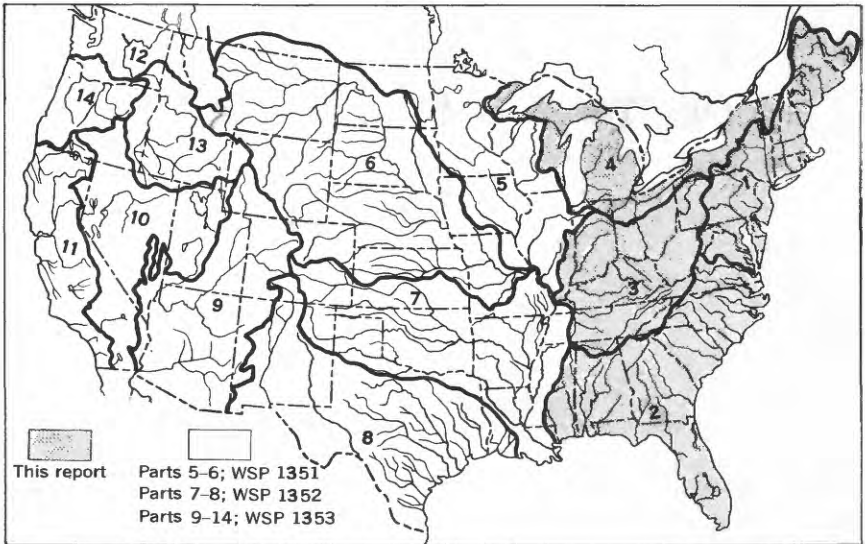


Figure 1. Map of the United States showing basins covered by the four water-supply papers on quality of surface waters in 1953. The shaded portion represents the section of the country covered by this volume; the unshaded portion represents the section of the country covered by other water-supply papers.

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, 1954, 64 regular sampling stations on 56 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 101 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 42 stations during the year ended September 30, 1954. 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 28 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 *Streamflow*, 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. 7 .) 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.

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

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 many of the stations listed in this report for the water years ending September 30, 1941-1954 are listed below.

Numbers of water-supply papers containing records for  
Part Part 1-4, 1941-1954

Year	WSP	Year	WSP	Year	WSP	Year	WSP
1941	942	1945	1030	1949	1162	1953	1290
1942	950	1946	1050	1950	1186	1954	1350
1943	970	1947	1102	1951	1187	--	--
1944	1022	1948	1132	1952	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 southeastern Kansas, 1911.
- \*274. Some stream waters of the western United States, with chapters on sediment carried by the Rio Grande and the industrial application of water analyses, 1911.
- \*339. Quality of the surface waters of Washington, 1914.
- \*363. Quality of the surface waters of Oregon, 1914.
- \*418. Mineral springs of Alaska, with a chapter on the chemical character of some surface waters of Alaska, 1917.
- \*596-B. Quality of water of Colorado River in 1925-26, 1928.
- \*596-D. Quality of water of Pecos River in Texas, 1928.
- \*596-E. Quality of the surface waters of New Jersey, 1928.
- \*636-A. Quality of water of the Colorado River in 1926-28, 1930.
- \*636-B. Suspended matter in the Colorado River in 1925-28, 1930.
- \*638-D. Quality of water of the Colorado River in 1928-30, 1932.
- \*839. Quality of water of the Rio Grande basin above Fort Quitman, Tex., 1938.
- \*889-E. Chemical character of surface water of Georgia, 1944.
- \*998. Suspended sediment in the Colorado River, 1925-41, 1947.
- 1048. Discharge and sediment loads in the Boise River drainage basin, Idaho, 1939-40, 1948.
- 1110-C. Quality of water of Conchas Reservoir, New Mexico, 1939-49, 1952.

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

## COOPERATION

The table on p. 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
Alabama	Alabama Geological Survey, W. B. Jones, State Geologist.	South Atlantic slope and Eastern Gulf of Mexico.	P. O. Box 607, Ocala, Fla.
Delaware	Newcastle County Soil Conservation District, E. Sherman Webb, chairman, and Marvin V. Klair, president.	North Atlantic slope.	1302 Custom House, Philadelphia 6, Pa.
Florida	Florida Geological Survey, Her man Gunter, director. Central and Southern Florida Flood Control District, W. Turner Wallis, secretary. City of Pensacola, O. J. Semmes, Jr., City Manager.	South Atlantic slope and Eastern Gulf of Mexico	P. O. Box 607, Ocala, Fla.
Georgia	Department of Mines, Mining and Geology, Garland Peyton, director.		
Kentucky	Agricultural and Industrial Development Board of Kentucky, George W. Hubley, Jr., executive director.	Ohio River.	2822 East Main Street, Columbus 9, Ohio.

State	Cooperating agency	Drainage basin	District office
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.
North Carolina	North Carolina Department of Conservation and Development, Ben E. Douglas, 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.

<sup>a</sup> Succeeded by William P. Saunders, director, Dec. 15, 1955.



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

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

## 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 chemist as follows: In Alabama, Georgia and 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 and New England, F. H. Pauszek. Any additional analytical data on file may be obtained by writing the responsible Survey district office.

## STREAMFLOW

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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## CHEMICAL ANALYSES, WATER TEMPERATURES, AND SUSPENDED SEDIMENT

## 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 1953 to September 1954

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 ST. JOHN RIVER BASIN

## ST. JOHN RIVER AT FORT KENT, MAINE

Oct. 13, 1953.....	a 2,560		3.2	0.03	12	1.6	2.0	0.6	36	4.6	3.9	0.2	2.3	54	38	9	82.6	7.0	15
Sept. 24, 1954.....	13,500		3.4	.48	8.1	1.5	.9	.2	25	5.7	.4	.2	1.1	61	26	6	56.4	6.8	55

## FISH RIVER NEAR FORT KENT, MAINE

Oct. 13, 1953.....	a 146		3.3	0.02	11	1.8	1.6	0.4	36	3.4	2.9	0.1	0.4	51	35	5	74.1	7.4	15
Apr. 26, 1954.....	a 9,300		3.5	.24	6.2	.1	.8	.5	16	2.4	.3	.0	1.5	44	17	4	40.7	6.3	40

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

## GRAND LAKE STREAM AT GRAND LAKE STREAM, MAINE

Oct. 15, 1953.....	a 319		2.2	0.06	2.3	0.8	1.6	0.4	9.0	1.7	1.9	0.3	0.5	23	9	2	25.4	6.6	10
Apr. 21, 1954.....	1,080		2.7	.04	2.1	.7	1.3	.5	9.2	3.4	1.4	.1	.2	21	8	0	25.6	6.5	9

## MISCELLANEOUS ANALYSES OF STREAMS IN NARRAGUAGUS RIVER BASIN

## NARRAGUAGUS RIVER AT CHERRYFIELD, MAINE

Oct. 16, 1953.....	a 116		6.7	0.32	4.2	1.2	3.0	0.4	12	9.2	2.7	0.1	0.7	41	18	8	35.0	6.4	60
Apr. 19, 1954.....	6,350		3.4	.24	1.4	.2	1.3	.3	3.8	1.2	.7	.0	.4	23	4	0	20.2	5.8	33

a Discharge at time of sampling.

MISCELLANEOUS ANALYSES OF STREAMS IN PENOBSCOT RIVER BASIN

PENOBSCOT RIVER NEAR MATTAWAMKEAG, MAINE

Oct. 12, 1953	a 2,760	3.0	0.11	4.6	1.1	1.4	0.3	13	6.7	1.3	0.0	0.6	47	16	6	38.8	6.4	30
Apr. 22, 1954	20,200	5.0	.14	3.1	.3	1.2	.5	11	1.6	.5	.0	.6	33	9	0	32.9	6.3	28

MATTAWAMKEAG RIVER NEAR MATTAWAMKEAG, MAINE

Oct. 12, 1953	a 1,560	2.6	0.09	8.4	1.6	1.9	0.6	30	5.1	1.4	0.2	0.6	56	28	4	65.4	6.9	20
Apr. 22, 1954	22,500	5.7	.23	4.1	.2	1.1	.5	12	1.2	.9	.0	.8	33	11	2	34.4	6.2	39

SEBEC RIVER AT SEBEC, MAINE

Oct. 30, 1953	256	3.2	0.23	3.4	1.2	1.5	0.4	10	7.4	0.9	0.3	0.6	29	14	6	30.3	6.4	25
Apr. 24, 1954	a 5,150	3.1	.06	2.6	.5	1.1	.3	8.6	.8	1.0	.1	.4	25	9	2	25.7	6.2	23

PENOBSCOT RIVER AT PASSADUMKEAG, MAINE

Oct. 12, 1953	4,880	3.2	0.12	5.0	1.2	1.7	0.5	14	9.6	0.9	0.1	0.6	44	18	7	41.9	6.5	25
Apr. 23, 1954	72,500	3.6	.10	1.7	.1	1.2	.6	6.0	1.0	.6	.1	.4	26	5	0	22.2	5.7	42

MISCELLANEOUS ANALYSES OF STREAMS IN KENNEBEC RIVER BASIN

KENNEBEC RIVER AT BINGHAM, MAINE

Sept. 25, 1953	a 4,780	2.3	0.08	4.2	1.2	1.2	0.3	12	8.2	0.4	0.1	0.4	25	16	6	30.8	6.6	5
Apr. 21, 1954	10,200	4.2	.20	4.1	.5	1.4	.9	12	1.6	2.2	.0	.6	33	12	3	34.3	6.6	17

CARRABASSET RIVER NEAR NORTH ANSON, MAINE

Sept. 25, 1953	a 96	7.0	0.04	4.2	1.2	1.8	0.4	18	4.8	0.3	0.1	0.4	31	16	1	38.0	6.8	8
Apr. 20, 1954	a 4,560	4.4	.25	1.9	.2	1.0	.5	7.4	1.0	1.0	.0	.7	28	7	1	23.1	6.2	15

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 1953 to September 1954--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 KENNEBEC RIVER BASIN--Continued

SANDY RIVER NEAR MERCER, MAINE

Oct. 30, 1953	a 735		6.7	0.31	5.1	1.2	3.5	1.1	16	11	3.0	0.0	0.8	42	18	5	55.8	6.6	20
Apr. 20, 1954	a 6,240		4.6	.39	2.3	.3	2.1	.9	8.0	1.6	1.8	.0	.6	28	7	1	28.8	6.3	14

MISCELLANEOUS ANALYSES OF STREAMS IN ANDROSCOGGIN RIVER BASIN

DIAMOND RIVER NEAR WENTWORTH, N. H.

Nov. 5, 1953			5.8	0.20	5.0	1.4	1.5	0.3	16	7.0	1.1	0.1	0.4	31	19	6	38.1	6.8	12
June 2, 1954			4.7	.13	2.3	.2	1.2	.1	9.2	.8	.7	.0	.7	29	8	0	26.2	6.5	26

ANDROSCOGGIN RIVER NEAR AUBURN, MAINE

Oct. 3, 1953	a 1,280		4.0	1.5	11	1.2	12	0.6	36	16	9.8	0.1	1.6	101	34	4	121	6.7	100
May 10, 1954	41,700		5.9	.43	3.0	.4	2.3	.9	9.4	2.0	2.6	.0	.7	39	10	2	36.8	6.2	33

MISCELLANEOUS ANALYSES OF STREAMS IN SACO RIVER BASIN

OSSIPEE RIVER AT CORNISH, MAINE

Nov. 3, 1953	a 272		6.4	0.03	2.7	0.8	2.3	0.4	10	2.6	2.3	0.2	0.5	25	11	3	29.5	6.6	18
May 5, 1954	2,230		4.2	.21	2.1	.1	1.5	.6	6.4	.8	1.4	.1	.4	26	6	0	24.4	6.2	27

SACO RIVER AT CORNISH, MAINE

Nov. 3, 1953	a 1,240		6.4	0.08	3.5	0.9	2.0	0.7	8.4	7.0	1.6	0.3	0.7	33	13	6	29.1	6.4	22
May 4, 1954	7,460		4.8	.38	3.3	1.2	5.2	.9	7.6	5.0	1.2	.2	.2	40	13	7	60.4	6.3	13

a Discharge at time of sampling.

## MISCELLANEOUS ANALYSES OF STREAMS IN MERRIMACK RIVER BASIN

## CONTOCOOK RIVER AT PENACOOK, N. H.

Oct. 2, 1953.....	a 133	4.3	0.15	3.6	0.6	4.5	1.5	13	5.6	4.5	0.1	0.3	48	12	2	53.9	6.9	14
Apr. 2, 1954.....	a 1,930	5.0	.08	3.3	.3	1.9	.5	5.4	3.8	2.8	.0	.9	32	10	5	34.9	6.0	15

## SUNCOOK RIVER AT NORTH CHICHESTER, N. H.

Oct. 1, 1953.....	a 17	1.1	0.64	2.6	1.4	8.2	0.6	10	5.2	15	0.1	0.7	60	13	5	86.4	6.1	18
Apr. 3, 1954.....	a 268	4.5	.06	2.2	.5	1.8	.5	4.8	4.6	2.7	.1	.8	29	8	4	30.8	6.0	12

## MERRIMACK RIVER BELOW CONCORD RIVER AT LOWELL, MASS.

Oct. 19, 1953.....	a 2,160	7.1	1.0	12	2.3	19	4.8	36	19	16	0.3	7.0	133	40	11	190	6.7	20
Apr. 30, 1954.....	a 17,000	3.0	.08	5.9	.7	5.8	1.7	12	14	7.8	.0	2.2	61	21	11	83.2	6.1	42

## MISCELLANEOUS ANALYSES OF STREAMS IN THAMES RIVER BASIN

## NATCHAUG RIVER AT WILLIMANTIC, CONN.

Sept. 17, 1953.....	a 5.3	8.7	0.52	8.0	1.5	20	2.1	36	15	20	0.3	0.8	103	27	0	157	6.9	8
Apr. 20, 1954.....	a 885	5.6	.17	2.8	1.7	2.3	.8	8.0	8.4	2.4	.1	.8	40	15	8	41.4	6.2	2

## SHETUCKET RIVER NEAR WILLIMANTIC, CONN.

Sept. 17, 1953.....	a 44	3.6	0.47	6.9	1.2	9.6	1.9	22	13	9.3	0.1	1.5	75	22	4	97.5	6.8	9
Apr. 20, 1954.....	a 1,980	6.1	.53	3.9	1.6	2.7	.8	6.2	10	2.8	.1	.7	41	17	13	45.5	6.3	28

## MISCELLANEOUS ANALYSES OF STREAMS IN CONNECTICUT RIVER BASIN

## CONNECTICUT RIVER AT WHITE RIVER JUNCTION, VT.

Oct. 23, 1953.....	a 995	3.7	0.15	29	2.9	3.2	1.3	91	14	4.1	0.1	0.4	115	84	10	181	7.5	7
Apr. 20, 1954.....	a 42,800	5.4	.03	11	.9	1.1	.9	30	9.4	1.1	.0	.9	52	31	7	71.4	6.9	20

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 1953 to September 1954--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-magnesium			

MISCELLANEOUS ANALYSES OF STREAMS IN CONNECTICUT RIVER BASIN--Continued

SUGAR RIVER AT WEST CLAREMONT, N. H.

Oct. 13, 1953.....	a 86		3.1	0.31	6.0	1.4	7.6	1.2	19	9.6	9.8	0.1	0.6	67	22	6	96.0	6.7	7
May 5, 1954.....	a 1,970		4.2	.09	3.7	.8	1.9	.9	6.0	8.1	2.5	.1	.8	40	13	8	38.9	6.3	30
Nov. 13, 1953.....	a 55		6.2	0.12	4.5	1.3	2.5	1.2	14	4.7	4.1	0.0	0.2	45	17	6	53.6	6.9	10

WEST RIVER AT JAMAICA, VT.

WEST RIVER AT NEWFARE, VT.

May 8, 1954.....	a 897		4.2	0.00	3.3	1.0	1.2	1.1	7.2	8.0	2.6	0.0	0.4	31	13	7	32.7	6.3	30
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WARE RIVER AT GIBBS CROSSING, MASS.

Sept. 23, 1953.....	a 27		6.7	1.8	7.4	0.9	21	6.5	36	19	18	0.1	2.6	112	22	0	167	7.3	19
Apr. 6, 1954.....	a 415		6.3	.05	4.4	1.1	4.6	2.6	5.0	17	5.3	.0	1.9	53	16	12	66.3	5.6	25

SWIFT RIVER AT W. WARE, MASS.

Sept. 23, 1953.....	a 142		2.3	0.53	3.0	0.9	1.4	0.6	9.0	1.7	2.9	0.1	0.4	31	12	5	33.6	6.4	18
Apr. 1, 1954.....	a 151		1.7	.00	2.9	.8	1.4	.5	6.4	8.6	2.0	.0	.4	27	11	5	33.7	6.2	25

CONNECTICUT RIVER NEAR MIDDLETOWN, CONN.

Sept. 17, 1953.....	--		1.0	0.60	17	2.0	7.0	2.2	42	22	7.5	0.1	1.4	102	52	17	144	7.1	15
Apr. 14, 1954.....	a 56,000		4.7	.43	8.9	1.1	2.1	1.0	21	10	4.1	.2	1.4	54	27	10	70.9	6.4	18

a Discharge at time of sampling.



MISCELLANEOUS ANALYSES OF STREAMS IN QUINNIPIAC RIVER BASIN  
QUINNIPIAC RIVER AT WALLINGFORD, CONN.

Sept. 17, 1953.....	a 65	8.4	2.3	24	3.4	8.8	3.0	46	43	10	6.0	0.1	3.1	151	75	214	6.6
Apr. 20, 1954.....	a 380	7.6	.35	13	2.6	4.3	1.2	32	19	6.0	.2	3.7	84	43	118	7.0	30

MISCELLANEOUS ANALYSES OF STREAMS IN HOUSATONIC RIVER BASIN  
TENMILE RIVER NEAR GAYLORSVILLE, CONN.

Sept. 17, 1953.....	a 41	4.9	0.12	42	18	4.8	3.8	176	37	7.8	0.1	1.3	216	180	348	8.2
Apr. 19, 1954.....	a 820	5.1	.31	24	9.7	2.1	1.1	98	19	3.8	.2	2.2	132	100	204	7.3

SHEPAUG RIVER NEAR ROXBURY, CONN.

Sept. 17, 1953.....	a 9.4	1.7	0.16	10	2.8	2.9	2.0	34	16	3.2	0.0	0.4	61	37	9	93.5
Apr. 19, 1954.....	a 660	5.3	.12	5.7	2.2	1.9	1.0	15	12	3.3	.2	2.0	51	24	12	63.7

POMPERAUG RIVER AT SOUTHBURY, CONN.

Sept. 17, 1953.....	a 7.6	6.6	0.15	13	3.3	3.6	1.4	44	16	4.4	0.0	1.0	88	47	11	118
Apr. 19, 1954.....	a 302	7.0	.15	5.5	1.6	2.9	.7	14	13	2.0	.0	1.0	47	21	10	63.2

MISCELLANEOUS ANALYSES OF STREAMS IN HUDSON RIVER BASIN  
HOOSIC RIVER NEAR WILLIAMSTOWN, MASS.

Sept. 16, 1953.....	a 42	5.8	0.23	37	10	46	5.8	210	29	35	0.1	4.5	306	134	0	485
Mar. 30, 1954.....	a 376	3.6	.01	18	4.0	20	2.6	70	14	26	.0	1.8	129	61	4	229

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 1953 to September 1954--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			
Oct. 22, 1953	a 14.4		3.0	0.38	35	6.4	8.5	2.1	130	23	3.7	0.1	0.3	152	114	7	247	7.9	6
Apr. 21, 1954	a 613		2.6	.04	17	3.1	1.4	.6	50	15	1.6	.1	1.4	78	55	14	118	6.8	4
OTTAWA CREEK AT MIDDLEBURY, VT.																			
Oct. 22, 1953	a 226		4.8	0.25	24	9.2	3.5	2.0	109	14	3.9	0.1	0.8	120	98	9	190	7.6	7
Apr. 21, 1954	a 2,995		2.4	.41	14	4.0	1.4	1.1	47	12	1.2	.1	2.3	69	52	13	110	6.9	22
MISSISQUOI RIVER NEAR RICHFORD, VT.																			
Oct. 21, 1953	a 97		4.1	0.22	11	3.7	3.0	1.3	43	10	2.9	0.0	0.4	64	43	8	94.5	7.7	8
Apr. 4, 1954	a 550		4.2	.14	7.7	1.7	1.3	.6	21	9.4	1.9	.0	1.7	49	26	9	68.9	6.8	10

a Discharge at time of sampling.

## 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  $8\frac{1}{4}$  miles upstream from mouth.

DRAINAGE AREA.--98.4 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1953 to September 1954.

Sediment records: November 1952 to September 1954.

EXTREMES, 1953-54.--Water temperature: Maximum, 83°F Aug. 2; minimum, freezing point on several days during December, January, and February.

Sediment concentrations: Maximum daily, 135 ppm Sept. 11; minimum daily, 2 ppm on several days in November, December, February, April, and July.

Sediment loads: Maximum daily, 189 tons Apr. 19; minimum daily, 0.2 ton July 25.

EXTREMES, 1952-54.--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 ton Aug. 23, 1953 and July 25, 1954.

REMARKS.--Records of specific conductance of daily samples available in district office at Albany, N. Y. Records of discharge for water year October 1953 to September 1954 given in WSP 1331.

Temperature (°F) of water, water year October 1953 to September 1954.

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

## NORTH ATLANTIC SLOPE BASINS, MAINE TO CONNECTICUT

## CONNECTICUT RIVER BASIN--Continued

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

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	34			132	11	3.9	80	4	0.9
2.....	32	5	0.4	96	9	2.3	76	4	.8
3.....	35			78	7	1.4	73	2	.4
4.....	31			67	10	1.8	68	2	.4
5.....	31			62	8	1.3	131	23	8.1
6.....	37	5	.6	57	8	1.2	161	15	6.5
7.....	53			70	7	1.3	256	43	30
8.....	52			99	4	1.1	248	26	17
9.....	50			106	2	.6	209	19	11
10.....	43			85	2	.4	223	--	a 14
11.....	43	5	.6	75	2	.4	231	--	b 15
12.....	44			67	2	.3	223	17	10
13.....	46			62			202	12	6.5
14.....	43			54	2		311	67	s 68
15.....	42	4	.5	55		.3	389	47	49
16.....	44			57	4	.6	378	37	38
17.....	44			55			256	15	10
18.....	39	4	.5	52	2	.3	178	12	5.8
19.....	43			52			138	14	5.2
20.....	47			52	4	.6	126	7	2.4
21.....	48			48			125	8	2.7
22.....	42	6	.7	49	7	.9	150	16	6.5
23.....	43			78	15	3.2	172	10	4.6
24.....	46			118	14	4.5	166	7	3.1
25.....	72	33	s 8.0	144	26	10	137	11	4.1
26.....	112	21	6.4	190	22	11	124	6	2.0
27.....	96	9	2.3	178	12	5.8	117	4	1.3
28.....	102	13	3.6	144	8	3.1	113	4	1.2
29.....	144	20	7.8	99	4	1.1	112		
30.....	172	22	10	85	3	.7	115	9	2.7
31.....	150	12	4.9	--	--	--	111		
Total.	1,860	--	56.2	2,564	--	60.2	5,399	--	331.1
	January			February			March		
1.....	103	12	3.3	125	7	2.4	150	10	4.0
2.....	99			107	7	2.0	172	17	7.9
3.....	98	6	1.6	108	8	2.3	200	12	6.5
4.....	102			156	14	5.9	327	37	33
5.....	100			166	8	3.6	307	27	22
6.....	100	6	1.6	144	6	2.3	239	15	9.7
7.....	103	11	2.9	124	4	1.3	178	10	4.8
8.....	92			109	7	2.1	161	8	3.5
9.....	67	5	.9	104	16	4.5	150	7	2.8
10.....	86	6	1.4	102	10	2.8	144	6	2.3
11.....	90	8	1.9	100	8	2.2	137	5	1.8
12.....	93	9	2.2	91	7	1.7	129	4	1.4
13.....	89	9	2.2	71	21	4.0	122	3	1.0
14.....	82	12	2.6	76	9	1.8	150	10	4.0
15.....	85	7	1.6	83	2	.4	196	7	3.7
16.....	88	5	1.2	99	5	1.3	184	5	2.5
17.....	88	5	1.2	134	18	6.5	161	4	1.7
18.....	82	7	1.5	161	12	5.2	138	4	1.5
19.....	83	6	1.3	150	8	3.2	129	5	1.7
20.....	86	3	.7	130	9	3.2	245	50	s 34
21.....	146	11	s 5.8	121	7	2.3	284	21	16
22.....	200	15	8.1	216	39	23	275	15	11
23.....	180	7	3.4	216	29	17	202	9	4.9
24.....	145	5	2.0	196	16	8.5	166	6	2.7
25.....	116	4	1.2	184	20	9.9	156	9	3.8
26.....	111	4	1.2	184	12	6.0	216	14	8.2
27.....	150	18	s 7.8	178	13	6.2	231	13	8.1
28.....	209	20	11	161	10	4.3	216	12	7.0
29.....	160	11	4.8	--	--	--	178	8	3.8
30.....	130	11	3.9	--	--	--	161	7	3.0
31.....	130	12	4.2	--	--	--	150	8	3.2
Total.	3,493	--	90.9	3,796	--	135.9	5,854	--	221.5

s Computed by subdividing day.

a Computed from partly estimated concentration graph.

b Computed from estimated concentration graph.

## CONNECTICUT RIVER BASIN--Continued

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

Suspended sediment, water year October 1953 to September 1954--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.....	144	6	2.3	166	15	6.7	166	11	4.9
2.....	130	4	1.4	150	12	4.9	132	11	3.9
3.....	130	4	1.4	150	12	4.9	112	10	3.0
4.....	122	4	1.3	202	24	13	103	9	2.5
5.....	120	3	1.0	216	18	10	100	9	2.4
6.....	124	2	.7	209	17	9.6	98	9	2.4
7.....	128	6	2.1	172	15	7.0	95	8	2.0
8.....	144	7	2.7	166	15	6.7	89	6	1.4
9.....	135	6	2.2	327	38	34	82	7	1.5
10.....	124	6	2.0	378	34	35	76	8	1.6
11.....	117	7	2.2	420	38	43	76	9	1.8
12.....	130	8	2.8	389	24	25	76	9	1.8
13.....	138	8	3.0	314	14	12	80	9	1.9
14.....	128	8	2.8	239	10	6.4	85	9	2.1
15.....	115	8	2.5	196	12	6.4	89	9	2.2
16.....	113	6	1.8	202	14	7.6	150	28	11
17.....	208	32	s 22	202	14	7.6	144	20	7.8
18.....	500	109	147	196	14	7.4	109	11	3.2
19.....	624	112	189	172	9	4.2	88	7	1.7
20.....	450	41	50	150	7	2.8	76	7	1.4
21.....	307	28	23	166	10	4.5	71	7	1.3
22.....	223	21	13	248	19	13	64	7	1.2
23.....	196	19	10	256	20	14	73	12	2.4
24.....	196	18	9.5	223	13	7.8	109	26	7.6
25.....	190	17	8.7	184	10	5.0	103	16	4.4
26.....	178	15	7.2	156	9	3.8	78	10	2.1
27.....	168	14	6.3	134	7	2.5	70	8	1.5
28.....	184	15	7.4	118	6	1.9	67	8	1.4
29.....	190	12	6.2	118	7	2.2	78	13	2.7
30.....	190	16	8.2	158	17	7.2	92	13	3.2
31.....	--	--	--	166	13	5.8	--	--	--
Total.	5,849	--	539.7	6,539	--	321.9	2,831	--	88.3
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.....	104	15	4.2	48	7	0.9	178	59	28
2.....	92	9	2.2	47	8	1.0	161	30	13
3.....	76	8	1.6	80	33	s 9.3	122	16	5.9
4.....	70	7	1.3	113	36	11	80	11	2.4
5.....	67	--	a 1.0	86	18	4.2	64	10	1.7
6.....	67	7	1.3	64	11	1.9	58	6	.9
7.....	65	10	1.8	54	8	1.2	58	9	1.4
8.....	61	12	2.0	50	6	.8	75	18	s 3.9
9.....	57	9	1.4	50	10	1.4	93	17	4.3
10.....	49	6	.8	76	16	3.3	83	10	2.2
11.....	49	6	.8	96	18	4.7	301	135	s 138
12.....	52	9	1.3	95	15	3.8	524	84	119
13.....	43	8	.9	70	9	1.7	599	65	106
14.....	42	8	.9	54	6	.9	356	23	22
15.....	39	8	.8	50	7	.9	196	12	6.4
16.....	36	7	.7	50	6	.8	166	11	4.9
17.....	36	6	.6	48	4	.5	196	17	9.0
18.....	35	5	.5	43	4	.5	196	11	5.8
19.....	40	4	.4	44	4	.5	202	12	6.5
20.....	38	4	.4	49	4	.5	184	12	6.0
21.....	39	4	.4	44	4	.5	161	14	6.1
22.....	40	4	.4	41	4	.4	161	10	4.3
23.....	43	4	.5	44	4	.5	144	6	2.3
24.....	44	4	.5	40	4	.4	124	5	1.7
25.....	44	2	.2	42	4	.4	106	4	1.1
26.....	41	9	1.0	43	6	.7	102	9	2.5
27.....	44	6	.7	46	8	1.0	120	7	-2.3
28.....	43	8	.9	39	8	.8	117	6	1.9
29.....	47	7	.9	39	7	.7	102	6	1.6
30.....	55	11	1.6	42	7	.8	93	4	1.0
31.....	54	8	1.2	95	48	s 13	--	--	--
Total.	1,612	--	33.2	1,782	--	69.0	5,122	--	512.1

Total discharge for year (cfs-days).....

46,701

Total load for year (tons).....

2,460.0

s Computed by subdividing day.

a Computed from partly estimated concentration graph.

CONNECTICUT RIVER BASIN--Continued  
SCANTIC RIVER AT BROAD BROOK, CONN.--Continued

Particle size analyses of suspended sediment, water year October 1953 to September 1954  
(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	Discharge (cfs)	Water temperature (°F)	Suspended sediment		Percent finer than indicated size, in millimeters										Methods of analysis		
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Suspended sediment												
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500		1.000	
Aug. 31, 1954	6:30 p.m.	138	64	61	351	20	21	38	52	63	76	90	98					SFCW
Sept. 1	8:26 p.m.	187	64	59	200	10	24	37	53	68	64	96	99					SFCW
Sept. 13	9:53 a.m.	657	57	41	231	1	3	25	37	55	74	92	99					SFCW

PART 1B. 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 Ballston Spa--26.0 square miles.

DRAINAGE AREA--26.0 square miles.

RECORDS AVAILABLE.--Chemical analyses: March 1953 to September 1954.

Water temperatures: March 1953 to September 1954.

EXTREMES, 1953-54.--Hardness: Maximum, 131 ppm Nov. 21-30; minimum, 68 ppm Feb. 17-20.

Specific conductance: Maximum daily, 222 micromhos Nov. 6; minimum daily, 220 micromhos Apr. 18.

Temperature: Maximum, 78 F June 22; minimum, 42 F Feb. 18-22.

EXTREMES, March 1955-54.--Hardness: Maximum, 131 ppm Nov. 21-30, 1953; minimum, 60 ppm (revised) Aug. 12, 1953.

Specific conductance: Maximum daily, 222 micromhos Nov. 6, 1953; minimum daily, 130 micromhos Apr. 18, 1954.

Temperature: Maximum, 84 F July 18, 1953; minimum, freezing point Feb. 18-22, 1954.

REMARKS. Records of specific conductance and pH of daily samples available in district office at Albany, N. Y. Records for discharge for water year October 1953 to September 1954 given in WSP 1332.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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
														Total	Non-carbonate			
Oct. 1-10, 1953	5.6	8.4	0.15	29	10	2.8	1.2	119	20	4.0	0.1	0.5	136	114	18	324	7.5	15
Oct. 11-20	4.3	9.9	.13	30	11	2.6	1.0	120	22	3.0	.2	.4	140	121	22	322	7.5	12
Oct. 21-31	11	10	.23	33	12	2.6	1.0	108	24	4.0	.2	.5	144	116	21	230	7.5	15
Nov. 1-10	9.0	9.0	--	32	12	2.0	1.0	108	48	3.0	.2	.4	158	129	42	250	7.5	15
Nov. 11-20	7.4	12	--	31	12	2.7	.6	105	39	3.0	.2	.5	153	129	41	247	7.5	15
Nov. 21-30	14	8.4	.16	31	13	2.7	.7	98	44	3.0	.2	.5	156	131	51	241	7.6	13
Dec. 1-10	39	8.5	.50	27	10	2.5	1.4	83	41	4.0	.3	.5	136	109	41	216	7.5	17
Dec. 11-20	23	7.8	.31	29	11	2.5	1.4	92	41	5.0	.3	.5	141	118	42	228	7.7	17
Dec. 21-31	15	8.4	.36	31	11	2.5	1.0	98	36	5.0	.3	.5	141	118	39	230	7.6	15
Jan. 1-3, 5-10, 1954	8.9	8.1	--	31	12	2.8	.5	107	34	5.0	.2	.8	149	127	39	241	7.7	20
Jan. 4	10	--	--	--	6.2	--	--	105	26	4.0	--	.8	109	109	23	227	8.2	--
Jan. 11-20	9.8	9.8	.13	30	11	2.8	1.0	108	30	5.0	.2	.6	146	120	33	232	7.8	17
Jan. 21-26, 29-31	28	7.8	--	29	10	3.1	.6	94	32	5.0	.1	1.1	138	114	36	221	7.8	20
Jan. 27-28	56	--	--	--	5.2	--	--	64	22	4.0	--	.7	--	70	18	165	7.5	--
Feb. 1-10	25	7.6	.12	26	9.5	3.5	.7	93	29	5.3	.3	.3	137	104	28	223	7.9	16
Feb. 11-16	16	8.6	.12	28	10	3.5	.7	100	27	4.7	.1	.4	140	112	30	225	7.8	12
Feb. 17-20	182	--	--	--	2.6	--	--	58	19	4.2	--	.6	--	68	20	148	7.6	--
Feb. 21-28	136	7.1	.10	21	6.7	2.8	.6	67	25	3.8	.2	.3	103	81	26	158	7.6	14
Mar. 1-10	82	13	--	--	--	--	--	78	19	5.6	--	1.6	--	89	25	225	7.3	2
Mar. 11-20	43	14	--	--	--	--	--	84	19	4.8	--	1.6	--	85	22	184	7.6	2
Mar. 21-31	61	13	--	--	1.5	--	--	76	18	4.4	--	1.4	--	85	23	171	7.3	5

HUDSON RIVER BASIN--Continued  
GLOWEGEE CREEK AT WEST MILTON, N. Y.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--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
														Total	Non-carbonate			
Apr. 1-10, 1954.....	64	15	--	--	--	2.4	78	19	4.4	--	--	1.6	--	86	22	176	7.2	5
Apr. 11-20.....	89	10	--	--	--	1.1	78	16	4.0	--	--	1.4	--	87	23	172	7.0	10
Apr. 21-30.....	86	13	--	--	--	2.5	83	19	4.4	--	--	1.1	--	97	21	191	7.2	7
May 1-10.....	100	12	--	--	--	1.4	80	16	2.8	--	--	.9	--	82	18	176	7.4	10
May 11-20.....	86	10	--	--	--	1.5	103	15	4.0	--	--	.7	--	105	19	204	7.3	9
May 21-31.....	54	11	--	--	--	1.8	104	13	4.0	--	--	.7	--	101	16	189	7.1	7
June 1-10.....	73	10	--	--	--	1.3	109	13	2.8	--	--	1.2	--	105	16	201	7.2	10
June 11-20.....	15	14	--	--	--	2.5	121	14	3.6	--	--	.7	--	114	15	218	7.2	5
June 21-30.....	13	13	--	--	--	2.4	114	14	4.2	--	--	.7	--	114	16	219	7.3	3
July 1-10.....	5.7	15	--	--	--	4.4	128	11	4.2	--	--	1.6	--	112	9	222	7.2	5
July 11-20.....	2.7	13	--	--	--	2.6	118	12	3.4	--	--	1.0	--	112	15	220	7.2	5
July 21-31.....	6.1	14	--	--	--	2.0	114	13	4.4	--	--	1.6	--	110	17	212	7.5	10
Aug. 1-10.....	3.9	16	--	--	--	1.9	125	10	4.4	--	--	1.4	--	116	14	222	7.3	12
Aug. 11-20.....	1.8	16	--	--	--	2.5	125	11	3.6	--	--	1.8	--	115	13	220	7.6	5
Aug. 21-31.....	8.8	15	--	--	--	1.6	118	11	3.8	--	--	1.2	--	111	14	214	7.3	8
Sept. 1-10.....	7.8	17	--	--	--	4.5	111	16	6.4	--	--	1.4	--	110	19	218	7.6	15
Sept. 11-20.....	13.	13	--	--	--	2.4	106	16	6.8	--	--	1.4	--	109	22	220	7.4	15
Sept. 21-30.....	6.4	14	--	--	--	3.4	117	18	6.4	--	--	1.6	--	118	22	233	7.6	11
Average.....	32.0	11	--	--	--	--	101	22	4.6	--	--	0.9	--	107	24	210	--	--

a Yearly mean discharge.



HUDSON RIVER BASIN--Continued

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

Temperature (°F) of water, water year October 1953 to September 1954

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

## HUDSON RIVER BASIN--Continued

KAVADEROSERAS CREEK NEAR WEST MILTON, N. Y.--Continued

LOCATION. --On highway bridge 1,500 feet downstream from gaging station, 1 mile east of West Milton, Saratoga County.

DRAINAGE AREA. --90 square miles, approximately.

RECORDS AVAILABLE. --Chemical analyses: October 1953 to September 1954.

Water temperatures: October 1952 to September 1954.

Sediment records: February 1953 to September 1954.

EXTREMES, 1953-54. --Dissolved solids: Maximum, 112 ppm Jan. 1-10; minimum, 74 ppm Mar. 1-10.

Hardness: Maximum, 83 ppm Nov. 1-10; minimum, 40 ppm Mar. 21-22.

Specific conductance: Maximum, 168 microhos Jan. 26, June 30; minimum daily, 90.0 microhos Mar. 21.

Water temperatures: Maximum, 75° F June 22, Aug. 1; minimum, freezing point many days during December, January, and February.

Sediment concentrations: Maximum, 143 ppm May 8; minimum, 0.1 ppm Dec. 28 to 30.

Sediment loads: Maximum daily, 299 tons Apr. 17; minimum daily, less than 0.05 ton Aug. 7, 29, Sept. 6, 7, and 10.

EXTREMES, 1952-53. --Water temperatures: Maximum, 78° F June 20, 27 and July 18, 1953; minimum, freezing point many days during winter months.

Sediment concentrations: Maximum, observed, 193 ppm Mar. 16, 1953; minimum, 0.1 ppm Dec. 28, 29 and 30, 1953.

Sediment loads: Maximum daily, 453 tons Apr. 7, 1953; minimum daily, less than 0.05 ton Aug. 7, 29, Sept. 6, 7 and 10, 1954.

REMARKS. --Records of specific conductance of daily samples available in district office at Albany, N. Y. Records of discharge for water year October 1953 to September 1954 given in WSP 1332. No appreciable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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 (microhos at 25°C)	pH	Color
														Total	Non-carbonate			
Oct. 6-10, 1953.....	54	5.6	0.09	18	7.8	2.8	1.2	84	13	3.0	0.1	0.4	98	77	8	159	7.5	17
Oct. 11-20.....	35	6.6	0.20	19	8.1	3.2	1.2	86	14	3.0	0.1	0.3	99	81	10	164	7.6	20
Oct. 21-31.....	54	8.7	0.10	19	7.5	3.0	1.2	83	16	3.0	0.2	0.3	88	78	10	162	7.3	20
Nov. 1-10.....	48	9.0	0.15	20	8.0	3.2	1.2	86	14	4.0	0.2	0.3	102	83	12	171	7.5	20
Nov. 11-20.....	41	9.2	0.11	18	8.2	3.2	1.2	82	15	3.0	0.2	0.3	100	79	12	169	7.5	20
Nov. 21-30.....	59	7.3	0.14	19	8.2	3.2	1.1	86	15	3.0	0.2	0.3	100	81	11	167	7.6	23
Dec. 1-10.....	155	5.6	0.16	17	7.1	3.2	1.1	65	22	3.0	0.2	0.5	96	72	19	150	7.3	22
Dec. 11-20.....	102	8.2	0.13	17	7.6	3.1	0.6	68	22	3.5	0.4	0.5	98	74	19	156	7.4	25
Dec. 21-31.....	72	8.0	0.14	17	7.8	3.1	0.6	72	18	2.5	0.2	0.4	97	75	16	155	7.5	21
Jan. 1-10, 1954.....	49	9.0	0.16	20	7.7	2.7	1.1	79	20	4.0	0.1	0.6	112	82	17	166	7.7	20
Jan. 11-20.....	53	9.4	0.16	20	7.5	2.5	0.8	79	18	3.5	0.1	0.6	108	81	16	160	7.5	20
Jan. 21-31.....	146	8.3	0.16	18	6.2	2.8	0.7	67	18	5.5	0.1	0.6	93	72	17	154	7.3	18
Feb. 1-10.....	125	11	0.16	18	6.2	3.0	0.7	68	20	3.3	0.2	0.3	96	72	16	153	7.6	14
Feb. 11-17.....	159	8.7	0.18	18	6.4	3.4	0.7	73	17	3.3	0.1	0.5	97	72	12	157	7.6	16
Feb. 18-20.....	487	--	--	--	--	2.4	0.6	41	17	3.3	--	0.5	101	51	18	111	7.4	--
Feb. 21-28.....	389	7.8	0.11	14	4.7	2.6	0.6	48	17	3.6	0.2	0.3	79	55	15	116	7.6	14
Mar. 1-10.....	292	7.9	0.10	14	3.6	1.8	0.4	48	13	2.8	0.1	0.8	74	50	11	113	7.4	5
Mar. 11-20.....	142	8.6	0.10	18	4.4	2.4	0.8	62	14	3.8	0.1	0.8	86	58	7	135	7.4	5
Mar. 21-22.....	340	--	--	--	--	2.3	0.3	35	12	2.0	--	1.1	90	40	11	90.3	7.5	--
Mar. 23-31.....	219	7.1	0.14	14	4.0	1.9	0.4	50	14	2.8	0.1	0.8	76	54	13	116	7.4	5

HUDSON RIVER BASIN

Apr. 1-10, 1954.....	222	7.7	.09	16	3.4	1.9	.4	52	14	3.0	.1	.8	78	54	12	120	7.3	6
Apr. 11-17.....	292	6.7	---	17	3.2	2.2	.5	56	14	2.5	.1	.8	88	57	11	123	7.4	7
Apr. 18-19.....	436	---	---	---	---	1.5	---	40	12	1	.8	---	---	44	11	97.3	7.4	---
Apr. 21-28.....	200	7.4	---	18	4.3	1.8	.6	65	8.8	2.9	.1	.9	82	63	9	134	7.6	7
Apr. 29-30.....	256	---	---	---	---	4.1	---	52	14	1	.4	---	---	50	7	112	7.7	---
May 1-8.....	268	11	---	---	3.5	2.0	.5	62	12	3.6	.1	.8	86	58	7	129	7.3	7
May 9-10.....	645	---	---	17	---	1.4	---	45	12	2	1.0	---	---	50	13	97.0	7.2	---
May 11-13.....	328	---	---	---	---	2.5	---	71	8.4	1.6	---	.5	---	64	6	122	7.0	---
May 14.....	201	---	---	---	---	1.7	---	64	14	1.9	---	.6	---	66	14	129	8.1	---
May 15, 17-20.....	135	8.7	---	18	4.9	2.1	.4	72	10	1.8	.0	.6	91	66	7	140	7.4	17
May 16.....	155	---	---	---	---	4.6	---	68	13	2.9	---	.4	---	82	8	144	8.1	---
May 17.....	171	6.0	---	18	5.5	2.3	.5	69	11	3.6	.1	.4	93	69	14	137	7.3	18
May 21, 24-31.....	381	---	---	---	---	1.9	---	59	6.2	2.3	---	.5	---	54	6	118	7.2	---
June 1, 5-10.....	183	7.5	---	17	4.9	2.1	.3	70	11	2.6	.1	.4	100	66	8	134	7.4	20
June 2-4.....	673	---	---	---	---	2.0	---	48	5.4	.7	---	.6	---	42	3	98.3	7.3	---
June 11-20.....	100	6.4	.17	18	5.5	2.5	.3	77	6.6	1.8	.0	.4	91	69	6	146	7.3	22
June 21-26, 29.....	95	8.3	---	19	5.6	2.1	.7	82	7.0	1.7	.1	.4	99	71	4	137	7.3	19
June 27.....	76	---	---	---	---	4.4	---	84	11	2.3	---	.4	---	74	5	120	7.4	---
June 30.....	64	---	---	---	---	7.8	---	80	9.8	16	---	.4	---	80	16	168	7.1	---
July 1-10.....	51	8.8	.16	20	6.2	2.4	.5	86	8.2	2.7	.1	.4	102	78	8	137	7.5	21
July 11-20.....	37	9.2	.17	20	5.6	2.4	.7	75	8.6	3.1	.0	.6	100	74	4	186	7.5	12
July 21, 23, 24, 26-31.....	35	8.5	---	18	5.7	1.6	.5	77	3.2	2.3	.1	.1	95	69	6	135	7.5	16
July 22.....	40	---	---	---	---	5.8	---	82	8.9	2.8	---	.6	---	74	0	161	7.4	---
July 25.....	92	---	---	---	---	3.3	---	60	8.4	1.8	---	.5	---	48	0	122	7.6	---
Aug. 1-10.....	44	11	.02	20	6.5	2.8	.3	84	9.8	2.4	.2	.9	93	77	8	165	7.6	15
Aug. 11-20.....	35	8.9	.06	20	6.8	2.6	.4	86	8.9	3.2	.2	1.0	95	76	8	183	7.3	15
Aug. 21-31.....	46	8.4	.06	21	6.8	2.7	.7	96	6.4	3.6	.1	.8	101	81	7	169	7.3	7
Sept. 1-10.....	213	---	---	---	---	3.1	---	43	8.8	2.0	---	1.8	---	43	7	109	7.0	---
Sept. 11-20.....	53	8.4	---	19	6.0	2.5	.3	75	11	3.0	.2	1.0	94	73	12	149	7.0	12
Sept. 21-30.....	94	9.0	.02	18	6.4	2.5	.7	75	9.6	3.5	.2	1.0	91	72	11	187	7.4	28
Sept. 11-20.....	61	8.5	.05	19	6.4	2.3	.3	79	8.2	3.0	.2	1.0	95	75	10	152	7.3	22
Average.....	a132	8.3	---	18	6.1	2.6	0.7	69	12	3.0	0.1	0.6	94	66	10	140	---	---

a Yearly mean discharge.

HUDSON RIVER BASIN--Continued  
 KAVADROSSERAS CREEK NEAR WEST MILTON, N. Y.--Continued  
 Temperature (°F) of water, water year October 1953 to September 1954

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

HUDSON RIVER BASIN--Continued

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

Suspended sediment, water year October 1953 to September 1954

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.....	25	1	0.1	58	4	0.6	49	1	0.1
2.....	24	1	.1	51	4	.6	52	1	.1
3.....	23	2	.1	46	4	.5	51	1	.1
4.....	24	3	.2	42	3	.3	49	1	.1
5.....	25	2	.1	40			86	2	.5
6.....	46	11	1.3	38	1	.1	109	13	s7.5
7.....	92	8	2.0	42			526	108	s167
8.....	52	2	.3	51			252	6	4.1
9.....	42	1	.1	55			145	3	1.2
10.....	38	1	.1	54	1	.1	227	8	4.9
11.....	35	2	.2	49			183	3	1.5
12.....	42	1	.1	46			131	1	.4
13.....	38	1	.1	43			110	1	.3
14.....	36	1	.1	41			105	2	.6
15.....	34	3	.3	41	1	.1	124	2	.7
16.....	34	2	.2	40			104	3	.8
17.....	33	2	.2	39	2	.2	74	4	.8
18.....	32	3	.3	39	2	.2	66	2	.3
19.....	31	3	.3	38			60	2	.3
20.....	32	2	.2	38			64	2	.3
21.....	31	2	.2	37	1	.1	72	3	.7
22.....	30	2	.2	37			94	3	.9
23.....	30	1	.1	70	5	.9	110	3	.9
24.....	30	2	.2	72	3	.6	78	2	.4
25.....	31	3	.3	63	2	.3	68	4	.7
26.....	43	3	.3	88	2	.5	74	1	.2
27.....	40	3	.3	66	2	.4	66	1	.2
28.....	71	8	1.5	56			58	.1	.2
29.....	80	8	1.7	50	1	.1	63	.1	.2
30.....	132	16	5.7	48			62	.1	.2
31.....	77	5	1.0	--	--	--	52	.2	.3
Total.	1,333	--	18.4	1,478	--	7.0	3,364	--	196.8
-----									
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.....	38	1	0.1	165	2	0.9	380	22	s25
2.....	46	4	.5	150	2	.8	556	62	s96
3.....	50	1	.1	140	4	1.5	390	12	s14
4.....	52	1	.1	135	4	1.5	492	26	s39
5.....	52			140	5	1.9	280	3	2.3
6.....	52	1	.1	130	3	1.1	190	1	.5
7.....	54	2	.3	106	3	.9	160	4	1.7
8.....	52			104	3	.8	160	1	.4
9.....	46			94	3	.8	150	2	.8
10.....	50	1	.1	86	3	.7	163	2	.9
11.....	52			84	3	.7	153	3	1.1
12.....	52	1	.1	72	4	.8	110	3	.9
13.....	52			72	5	1.0	106	2	.6
14.....	54	3	.4	78	3	.6	114	1	.3
15.....	54			80	4	.9	125	1	.3
16.....	54	3	.4	104	5	1.4	104	2	.6
17.....	52			620	81	s160	96	2	.5
18.....	52	2	.3	600	42	68	92	2	.5
19.....	52			480	30	39	90	2	.5
20.....	52	3	.4	380	28	29	447	52	s103
21.....	74	4	.8	380	51	s54	434	25	2.9
22.....	108	2	.6	640	87	150	246	10	6.6
23.....	100	1	.3	504	27	37	192	3	1.6
24.....	84	1	.2	342	16	15	170	2	.9
25.....	74	2	.4	318	18	15	251	4	2.7
26.....	72	7	1.4	310	13	11	391	20	21
27.....	260	16	s13	313	3	2.5	280	7	4.9
28.....	250	10	6.8	304	6	4.9	195	4	2.1
29.....	205	4	2.2	--	--	--	180	2	1.0
30.....	200	3	1.6	--	--	--	170	4	1.8
31.....	180	2	1.0	--	--	--	160	3	1.3
Total.	2,625	--	33.1	6,931	--	601.7	6,989	--	335.7

s Computed by subdividing day.

## HUDSON RIVER BASIN--Continued

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

## Suspended sediment, water year October 1953 to September 1954--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.....	170	1	0.5	168	2	0.9	183	8	s 7.2
2.....	180	1	.5	161	2	.9	1,060	139	398
3.....	300	5	4.0	163	2	.9	607	30	s 54
4.....	195	1	.5	450	41	s 52	352	12	11
5.....	160	1	.4	321	8	6.9	309	7	5.8
6.....	189	1	.5	213	6	3.4	218	4	2.4
7.....	345	9	s 88	178	5	2.4	182	4	2.0
8.....	282	6	4.6	492	143	s 208	150	3	1.2
9.....	223	5	3.0	780	56	122	127	2	.7
10.....	178	2	1.0	510	20	28	115	3	.9
11.....	205	4	s 2.6	433	14	16	108	3	.9
12.....	279	4	3.0	307	8	6.6	96	2	.5
13.....	199	2	1.1	244	6	4.0	103	2	.6
14.....	166	1	.4	201	5	2.7	94	1	.3
15.....	153	2	.8	174	5	2.3	121	4	1.3
16.....	286	17	s 16	155	4	1.7	135	3	1.1
17.....	794	132	s 299	135	3	1.1	108	3	.9
18.....	547	28	41	124	2	.7	88	2	.5
19.....	324	9	7.9	119	1	.3	76	4	.8
20.....	254	4	2.7	122	3	1.0	70	4	.8
21.....	209	4	2.3	245	5	s 4.2	64	4	.7
22.....	183	4	2.0	466	16	20	76	3	.6
23.....	197	6	3.2	296	6	4.8	184	12	6.0
24.....	183	6	3.0	199	3	1.6	135	4	1.5
25.....	157	3	1.3	168	3	1.4	91	4	1.0
26.....	145	4	1.6	143	4	1.5	78	3	.6
27.....	153	2	.8	122	2	.7	78	3	.6
28.....	371	25	s 28	112	2	.6	69	2	.4
29.....	307	7	5.8	148	5	2.0	65	2	.4
30.....	204	5	2.8	249	13	8.7	64	3	.5
31.....	--	--	--	151	1	.4	--	--	--
Total	7, 538	--	449.1	7, 749	--	507.7	5, 204	--	503.2
	July			August			September		
1.....	62	3	0.5	56	3	0.4	214	17	s 12
2.....	79	2	.4	44	3	.4	91	2	.5
3.....	58	3	.5	42	4	.4	65	.4	.1
4.....	52	2	.3	56	3	.4	58	.4	.1
5.....	49	1	.1	44	3	.4	47	.4	.1
6.....	48	1	.1	47	3	.4	41	.3	(t)
7.....	44	2	.2	41	.4	(t)	42	.4	(t)
8.....	42	2	.2	38	1	.1	50	1	.1
9.....	40	3	.3	39	1	.1	46	1	.1
10.....	39	3	.3	35	1	.1	39	.4	(t)
11.....	38	2	.2	40	2	.2	47	1	.1
12.....	37	1	.1	37	1	.1	57	.4	.1
13.....	37	2	.2	35	1	.1	43	1	.1
14.....	34	2	.2	32	1	.1	50	.4	.1
15.....	50	3	.4	32	1	.1	49	1	.1
16.....	40	2	.2	34	1	.1	118	14	s 9.9
17.....	35	1	.1	43	1	.1	248	17	s 13
18.....	35	2	.2	31	1	.1	120	4	1.3
19.....	35	2	.2	31	1	.1	92	2	.5
20.....	32	2	.2	32	1	.1	120	5	1.6
21.....	32	2	.2	28	2	.2	84	2	.5
22.....	40	3	.3	26	3	.2	85	2	.5
23.....	64	2	.3	27	4	.3	69	1	.2
24.....	62	5	.8	31	3	.2	59	1	.2
25.....	92	11	2.7	32	1	.1	54	1	.1
26.....	54	4	.6	25	1	.1	53	.4	.1
27.....	46	4	.5	26	1	.1	61	1	.2
28.....	63	6	1.0	23	1	.1	54	1	.1
29.....	56	3	.5	24	.3	(t)	46	1	.1
30.....	67	4	.7	32	1	.1	45	1	.1
31.....	54	5	.7	233	56	s 56	--	--	--
Total	1, 510	--	13.2	1, 296	--	61.2	2, 247	--	41.9
Total discharge for year (cfs-days)	48, 264								
Total load for year (tons)	2, 769.0								

s Computed by subdividing day.

t Less than 0.05 ton.

HUDSON RIVER BASIN

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 1954.  
 water temperatures: October 1951 to September 1954.  
 water temperatures: Maximum, 79°F June 26, July 30; minimum freezing point on many days in January and February.  
 water temperatures: Maximum, 84°F July 17, 1952; minimum, freezing point many days during December, January, February, and March.

EXTREMES, 1951-54. --Water temperatures: Maximum, 84°F July 17, 1952; minimum, freezing point many days during December, January, February, and March.  
 EXTREMES, 1951-54. --Water temperatures: Maximum, 84°F July 17, 1952; minimum, freezing point many days during December, January, February, and March.

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

Temperature (°F) of water, water year October 1953 to September 1954  
 /Twice-daily readings at approximately 8 a. m. and 4 p. m./

## HUDSON RIVER BASIN--Continued

## MOHAWK RIVER AT COHOES, N. Y.

LOCATION.--U. S. sediment sampler on Route 4 highway bridge, 1,200 feet downstream from gaging station at Cohoes, Albany County.

DRAINAGE AREA.--3,456 square miles.

RECORDS AVAILABLE.--Sediment records: January 1954 to September 1954.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1332.

Day	Suspended sediment, January to September 1954								
	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.....	--	--	--	5,330	24	345	11,000	13	386
2.....	--	--	--	4,930	18	240	19,400	21	1,100
3.....	--	--	--	4,760	13	167	19,400	51	s 2,625
4.....	--	--	--	4,520	9	110	17,900	60	2,900
5.....	--	--	--	4,330	6	70	12,100	44	1,440
6.....	--	--	--	4,310	5	58	9,370	33	835
7.....	--	--	--	4,120	5	56	8,160	22	485
8.....	--	--	--	3,850	4	42	7,690	14	291
9.....	--	--	--	3,960	4	48	7,400	11	220
10.....	--	--	--	4,010	4	43	7,460	10	201
11.....	--	--	--	3,960	6	64	7,180	9	174
12.....	--	--	--	3,630	--	a 50	6,690	8	144
13.....	--	--	--	3,890	4	42	6,070	8	131
14.....	--	--	--	2,970	3	24	5,630	8	122
15.....	--	--	--	2,540	6	41	5,740	8	124
16.....	--	--	--	4,780	7	s 136	5,390	8	116
17.....	--	--	--	28,700	90	s 8,430	4,510	9	110
18.....	--	--	--	47,800	323	s 42,100	4,050	7	76
19.....	--	--	--	30,800	197	s 16,700	3,810	6	62
20.....	--	--	--	23,300	103	6,480	4,670	6	76
21.....	--	--	--	20,600	74	4,120	12,500	12	s 396
22.....	--	--	--	29,800	111	s 9,250	10,200	29	s 791
23.....	--	--	--	24,100	115	s 7,770	7,590	27	553
24.....	--	--	--	15,800	64	2,750	6,520	18	317
25.....	4,740	12	154	12,500	40	1,350	6,340	15	257
26.....	4,520	14	171	11,700	27	853	10,300	18	500
27.....	6,640	16	287	11,000	20	594	11,000	22	653
28.....	18,800	25	1,270	10,700	15	433	8,370	28	633
29.....	12,600	65	s 2,150	--	--	--	6,610	29	518
30.....	9,050	52	1,270	--	--	--	6,760	25	456
31.....	7,060	35	667	--	--	--	7,020	20	399
Total	63,410	--	5,969	332,690	--	102,341	266,830	--	17,081

s Computed by subdividing day.

a Computed from estimated concentration graph.



## HUDSON RIVER BASIN--Continued

## MOHAWK RIVER AT COHOES, N. Y.--Continued

## Suspended sediment, January to September 1954--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.....	6,180	14	234	10,109	35	954	3,280	27	299	
2.....	7,889	11	234	8,559	33	762	14,000	30	1,130	
3.....	8,980	12	280	8,090	35	764	18,300	34	1,680	
4.....	8,300	13	291	12,500	46	s 1,739	14,100	65	s 2,340	
5.....	6,330	16	273	14,500	50	s 2,061	10,900	46	1,350	
6.....	2,080	14	79	12,700	39	1,340	7,640	45	928	
7.....	11,200	18	544	7,150	37	714	4,706	28	482	
8.....	16,500	27	1,200	8,960	36	871	4,880	38	373	
9.....	12,400	27	904	16,200	47	2,060	3,370	24	218	
10.....	8,610	35	814	16,300	48	2,110	3,280	17	148	
11.....	10,300	35	973	22,800	43	2,650	3,110	21	176	
12.....	12,800	30	1,040	12,400	40	1,340	2,400	21	134	
13.....	14,900	27	1,090	19,400	40	1,120	1,940	12	68	
14.....	11,100	23	689	7,720	38	792	1,630	12	59	
15.....	9,240	26	649	7,490	28	566	3,200	11	95	
16.....	9,440	25	637	5,290	29	314	3,180	20	172	
17.....	30,400	63	s 6,110	4,280	20	231	3,060	20	165	
18.....	33,200	318	s 28,100	3,640	25	246	1,960	10	53	
19.....	18,200	132	s 7,220	3,610	28	273	1,320	6	21	
20.....	14,500	60	2,350	3,430	29	268	1,140	6	18	
21.....	11,300	40	1,220	3,500	38	s 366	1,850	13	69	
22.....	10,200	35	964	18,800	54	s 2,690	1,560	15	63	
23.....	7,920	84	727	12,900	42	1,460	1,890	15	76	
24.....	11,800	38	1,210	7,000	36	660	2,450	17	112	
25.....	10,100	38	1,040	6,510	35	615	1,500	15	61	
26.....	7,510	36	730	5,530	36	538	1,050	13	37	
27.....	6,500	35	614	3,610	34	331	834	14	32	
28.....	11,700	32	1,010	3,520	32	304	1,440	17	66	
29.....	18,500	32	1,600	5,010	38	514	1,590	20	86	
30.....	14,100	33	1,260	2,640	24	171	1,490	18	72	
31.....	--	--	--	3,080	25	208	--	--	--	
Total.	361,850	--	64,086	268,210	--	29,052	123,244	--	10,516	
		July			August			September		
1.....	1,680	19	86	374	9	9.1	2,900	15	117	
2.....	1,690	19	87	792	14	30	2,100	16	91	
3.....	1,520	20	82	1,150	10	31	1,930	16	83	
4.....	918	20	50	1,160	12	38	1,640	14	62	
5.....	764	20	41	1,190	16	51	364	13	13	
6.....	1,410	19	72	1,170	13	41	652	13	23	
7.....	1,510	17	69	650	9	16	1,100	13	39	
8.....	1,230	10	33	392	10	10	958	13	34	
9.....	1,250	14	47	1,090	10	29	884	13	31	
10.....	442	6	7.2	1,110	12	36	850	13	30	
11.....	228	4	2.5	1,140	10	31	1,300	13	46	
12.....	1,060	4	11	1,070	10	29	72	10	1.9	
13.....	1,270	5	17	1,050	10	28	1,130	17	52	
14.....	1,040	6	17	766	10	21	1,290	19	66	
15.....	1,520	8	33	352	12	11	1,610	20	87	
16.....	1,730	11	51	1,170	15	47	1,850	15	75	
17.....	84	6	1.4	988	19	51	2,160	20	117	
18.....	74	5	1.0	932	17	49	2,930	20	158	
19.....	1,230	12	40	1,110	15	45	1,520	17	70	
20.....	1,110	12	36	1,090	12	35	1,260	16	54	
21.....	1,070	10	29	516	12	17	1,400	17	64	
22.....	1,150	9	28	320	10	8.6	2,410	18	117	
23.....	1,340	8	29	1,220	10	39	2,050	17	94	
24.....	290	10	7.8	1,140	14	43	1,590	17	73	
25.....	478	8	10	932	14	35	1,620	16	70	
26.....	1,130	12	37	861	8	18	1,240	12	40	
27.....	962	8	21	944	12	30	1,280	17	59	
28.....	1,150	13	40	808	10	22	1,720	16	74	
29.....	1,240	10	33	78	10	2.1	1,560	16	67	
30.....	1,200	17	85	794	11	24	1,640	15	66	
31.....	631	20	34	1,730	14	65	--	--	--	
Total.	32,401	--	1,107.9	28,089	--	929.8	45,010	--	1,973.9	

s Computed by subdividing day.

## DELAWARE RIVER BASIN

## DELAWARE RIVER AT TRENTON, N. J. (MORRISVILLE, PA.)

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

DRAINAGE AREA --6 760 square miles

RECORDS AVAILABLE --Chemical analyses: October 1944 to September 1954.

Sediment records: October 1944 to September 1954.

Water temperatures: September 1949 to September 1954.

EXTREMES, 1953-54 --Dissolved solids: Maximum, 156 ppm Oct. 1-9; minimum, 55 ppm May 11-20.

Hardness: Maximum, 103 ppm Oct. 1-9; minimum, 25 ppm Feb. 21-28.

Specific conductance: Maximum daily, 263 micromhos Oct. 24; minimum daily, 74.1 micromhos Feb. 24.

Water temperatures: Maximum, 91°F July 30; minimum, 36°F Jan. 23.

Sediment concentrations: Maximum daily, 755 ppm Dec. 9; minimum daily, 1 ppm on many days.

Sediment loads: Maximum daily, 69,200 tons Dec. 9; minimum daily, 4 tons on several days during August.

EXTREMES, 1944-54 --Dissolved solids (1944-47, 1950-51, 1953-54): Maximum 156 ppm Oct. 1-9, 1953; minimum, 44 ppm Mar. 21-31, 1945.

Hardness (1944-47, 1949-54): Maximum, 103 ppm Oct. 1-9, 1953; minimum 25 ppm Apr. 1-10, 1950, Feb. 21-28, 1954.

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

Water temperatures: Maximum, 88°F July 30, 1949, Aug. 30, 1948; minimum, 33°F on many days during the winter months.

Sediment concentrations (1949-54): Maximum daily, 1,720 ppm Nov. 26, 1950; minimum daily, 0 ppm Oct. 21, 1952.

Sediment loads (1949-54): Maximum daily, 274,000 tons Nov. 26, 1950; minimum daily, 0 tons 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 1953 to September 1954 for Delaware River at Trenton, N. J., given in WSP 1332.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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
														Total	Non-carbonate			
Oct. 18-20	1,950	4.9	0.03	25	9.8	6.8	6.8	68	38	12	0.2	5.8	156	103	47	251	7.6	9
Oct. 21-31	1,990	--	--	--	--	4.5	4.5	60	29	12	--	4.3	--	90	41	228	7.3	5
Nov. 1-10	2,970	5.1	.03	22	8.7	7.2	7.2	65	31	12	--	4.6	152	91	37	242	7.3	6
Nov. 11-20	4,780	4.7	.03	17	6.0	5.5	5.5	35	33	9.0	.2	3.5	105	67	38	177	7.0	10
Nov. 21-30	4,590	4.2	.02	16	6.5	7.7	7.7	38	34	9.5	.1	4.0	121	67	36	172	6.9	6
Dec. 1-10	8,220	4.7	.03	14	5.0	3.2	3.2	30	24	7.0	.1	3.5	97	56	31	132	6.8	--
Dec. 11-20	17,600	4.9	.01	13	4.2	2.1	2.1	25	21	6.0	.1	4.1	86	50	29	131	6.9	10
Dec. 21-31	26,000	5.1	.02	11	3.5	1.3	1.3	19	19	5.0	.1	4.1	70	26	24	104	6.9	16
Jan. 1-10, 1954	10,960	5.4	.02	12	4.0	4.2	4.2	27	22	8.0	.1	4.0	76	41	24	124	7.2	5
Jan. 11-20	9,160	5.0	.03	19	5.0	5.6	5.6	43	34	8.0	.1	4.8	94	60	32	154	7.3	7
Jan. 21-30	11,700	6.0	.02	17	7.5	5.6	5.6	43	34	8.0	.1	5.6	118	73	39	171	7.3	12
Feb. 1-10	11,300	6.8	.02	13	4.7	4.3	4.3	29	24	6.0	.1	4.5	87	52	28	138	7.2	2
Feb. 11-20	9,680	6.2	.02	11	2.5	6.4	6.4	26	20	4.5	.1	3.8	73	16	16	115	7.2	1
Feb. 21-30	13,000	5.3	.03	13	3.5	6.0	6.0	17	25	6.0	.1	3.9	78	47	25	138	7.0	1
Mar. 1-10	22,500	5.4	.03	7.9	1.3	8.8	8.8	16	19	3.0	.1	3.1	61	25	12	86.6	7.1	2
Mar. 11-20	23,700	6.4	.02	8.7	2.7	5.8	5.8	24	24	3.5	.1	3.0	68	33	18	97.6	7.1	3
Mar. 21-30	13,300	8.1	.02	11	2.3	5.8	5.8	24	20	4.5	.1	3.0	85	37	17	117	6.8	3
Mar. 31-31	15,100	8.7	.02	10	3.2	6.5	6.5	27	20	5.0	.1	2.6	73	38	16	119	7.2	2

Apr. 1-10, 1954	10,000	6.4	.03	11	3.5	7.4	28	25	5.0	.1	2.1	74	42	19	127	7.1	2
Apr. 11-20	16,000	7.8	.11	11	2.0	6.0	27	18	4.0	.1	2.4	67	36	14	113	7.2	3
Apr. 21-30	15,900	5.6	.02	9.1	2.4	4.3	21	17	3.5	.1	2.2	69	33	15	197.6	7.1	3
May 1-10	19,000	8.8	.01	9.9	2.2	4.5	24	17	3.0	.1	2.0	65	34	14	102	7.3	2
May 11-20	21,400	5.4	.02	8.7	1.5	5.9	22	16	3.0	.1	1.8	55	28	10	194.0	7.2	3
May 21-31	11,000	11	.01	12	1.7	6.3	30	19	3.5	.1	1.4	87	37	12	112	7.4	3
June 1-10	6,810	11	.02	13	2.5	7.7	38	19	5.0	.1	1.4	86	43	12	130	7.4	2
June 11-20	3,120	5.1	.01	13	3.5	5.4	36	19	7.0	.1	3.2	86	43	12	149	7.3	3
June 21-30	3,350	5.2	.02	16	3.1	6.2	32	20	7.5	.1	3.1	85	52	21	149	7.3	3
July 1-10	2,350	4.1	.01	16	6.7	5.9	52	27	8.0	.1	2.1	113	73	29	192	7.5	2
July 11-20	2,050	4.3	.01	20	6.7	5.9	57	26	9.0	.1	2.5	120	77	31	201	7.3	2
July 21-31	1,730	4.2	.01	21	6.0	8.3	60	26	12	.1	2.3	129	77	28	221	7.3	3
Aug. 1-10	1,810	4.4	.02	23	7.1	6.3	64	27	12	.1	3.2	134	87	34	232	7.5	3
Aug. 11-20	1,680	6.1	.02	23	7.5	7.9	67	28	13	.1	3.4	136	88	33	242	7.7	3
Aug. 21-31	1,840	4.2	.01	23	8.0	6.3	65	28	13	.1	3.7	136	90	37	246	7.6	2
Sept. 1-10	3,880	4.3	.01	18	4.5	6.5	44	26	8.5	.1	2.8	101	63	27	183	7.5	2
Sept. 11-20	3,130	4.7	.12	21	6.5	6.3	52	31	10	.1	4.5	131	79	37	208	7.4	3
Sept. 21-30	3,470	2.6	.02	18	4.5	6.6	44	26	8.5	.1	2.9	102	63	27	184	7.6	2
Average	9,044	5.8	0.03	15	4.6	5.7	38	24	7.2	0.1	3.3	97	56	26	158	--	4

DELAWARE RIVER BASIN--Continued  
 DELAWARE RIVER AT TRENTON, N. J. (MORRISVILLE, PA.)--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
 Recorder with temperature attachment, continuous egg-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	60	56	54	45	40	34	36	31	31	45	42	49	47	60	57	73	70	82	73	86	76	73	
2.....	66	61	57	53	41	39	36	35	34	31	45	43	49	46	62	59	74	70	84	76	80	72	74	
3.....	71	63	57	53	41	39	37	35	34	32	44	41	47	45	62	61	76	72	83	78	78	72	75	
4.....	69	65	55	52	42	40	39	35	35	33	41	41	47	43	61	59	76	71	78	74	80	73	77	
5.....	65	64	52	48	44	42	36	35	35	33	37	35	47	44	61	57	73	68	76	73	75	69	75	
6.....	68	62	48	42	45	42	36	35	35	33	35	34	47	44	59	55	70	66	80	73	80	70	80	
7.....	62	54	43	39	47	45	35	34	35	33	36	33	51	46	57	54	70	69	74	72	82	71	81	
8.....	60	50	42	39	47	42	34	33	33	32	40	35	55	50	54	53	73	70	77	72	84	74	79	
9.....	59	53	46	40	42	41	33	32	35	33	40	36	54	50	55	53	75	70	80	71	74	71	82	
10.....	61	54	46	42	44	42	35	31	36	33	42	39	55	52	55	54	71	69	80	72	79	72	73	
11.....	61	54	44	41	43	42	31	31	37	35	41	40	57	52	54	51	76	74	82	73	77	68	70	
12.....	70	57	45	42	42	41	32	31	35	31	42	40	57	55	52	50	77	74	82	73	76	69	70	
13.....	61	55	45	43	43	41	31	31	33	31	41	40	57	53	53	52	79	76	83	75	80	69	69	
14.....	61	53	44	43	44	41	31	31	33	31	42	39	57	54	55	53	78	75	87	76	82	72	72	
15.....	62	53	44	42	42	40	31	31	35	31	41	38	57	54	57	55	75	71	84	74	76	72	65	
16.....	62	56	43	41	40	38	31	31	41	35	40	37	54	53	60	58	71	68	81	73	83	75	66	
17.....	64	56	46	44	38	34	34	32	31	43	41	37	54	51	60	58	72	69	83	74	81	69	67	
18.....	64	56	47	45	35	33	33	31	33	36	42	38	54	50	62	62	75	70	80	74	82	76	64	
19.....	63	56	47	45	35	31	31	31	36	34	43	40	53	49	62	58	76	73	82	74	84	76	66	
20.....	64	59	46	45	34	31	31	31	36	34	43	40	55	52	62	59	78	74	86	77	85	75	66	
21.....	64	58	48	45	36	31	32	31	36	36	45	43	59	55	59	57	80	76	84	74	75	70	65	
22.....	61	57	49	46	36	34	31	31	42	38	44	40	63	58	60	58	64	76	86	74	80	72	65	
23.....	65	57	52	49	38	33	32	31	42	40	44	41	64	62	61	59	82	77	84	74	79	72	64	
24.....	61	57	52	48	37	35	32	31	40	39	44	41	63	61	62	60	81	75	84	74	82	74	65	
25.....	61	56	50	48	37	35	33	31	42	40	44	43	62	60	63	61	81	76	83	73	85	76	66	
26.....	62	56	48	46	35	34	34	32	41	40	47	43	62	61	66	62	82	78	87	76	82	73	68	
27.....	62	56	46	44	36	33	33	33	39	34	41	39	47	45	60	63	82	78	89	78	80	74	67	
28.....	63	58	44	43	37	33	34	41	40	40	47	45	50	56	65	63	83	78	90	79	82	74	64	
29.....	61	59	43	41	38	34	33	31	40	40	50	48	58	55	67	66	76	71	80	79	82	73	68	
30.....	56	57	45	41	37	35	32	31	40	38	48	48	58	55	70	66	79	70	91	81	79	74	73	
31.....	58	56	45	41	37	35	33	31	40	38	47	47	58	55	70	68	79	70	91	81	75	71	71	
Average.....	63	57	48	45	40	37	33	32	37	35	43	40	55	52	60	58	76	72	83	75	80	72	71	

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT TRENTON, N. J. (MORRISVILLE, PA.)--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	1,810	7	34	7,140	42	810	7,620		
2.....	1,830	6	30	6,540	18	318	7,330	5	101
3.....	1,970	8	43	5,500	11	163	6,820		
4.....	2,080	7	39	4,680	7	88	6,320		
5.....	1,850	8	40	4,160	4	45	6,460	11	195
6.....	1,770	9	43	3,780	3	31	6,680		
7.....	1,790	9	43	3,680			21,300	233	s 18,900
8.....	2,060	11	61	4,050			42,000	438	s 49,000
9.....	2,650	9	64	4,450	4	44	38,500	755	s 69,200
10.....	2,390	10	65	3,950			32,500	270	23,700
11.....	2,340	7	44	3,810			31,300	350	29,600
12.....	2,390	7	45	4,300			28,900	150	11,700
13.....	2,200	7	42	4,570	2	23	26,000	35	2,460
14.....	2,030	7	38	4,530			30,200	55	4,480
15.....	2,080	6	34	4,680			32,500	30	2,630
16.....	2,240			4,530			31,600	18	1,540
17.....	2,270			4,490	4	51	26,700	10	721
18.....	2,100	4	23	4,840			21,000	7	397
19.....	1,990			5,250			16,800	6	272
20.....	1,930			4,880			15,100	5	204
21.....	1,830			4,610	5	63	13,400	7	253
22.....	1,750			4,380			12,700	7	240
23.....	1,850	4	20	4,840			13,100	7	248
24.....	1,990			7,330	25	495	12,500	6	202
25.....	1,970			9,140	50	1,230	11,500	5	155
26.....	1,930			12,100	87	2,860	9,840	6	159
27.....	1,850		21	11,100	35	1,050	9,140		
28.....	1,990			10,700	22	636	8,770		
29.....	2,740	12	s 118	9,570	14	362	8,610	4	95
30.....	7,330	85	sal, 670	8,410	7	159	8,930		
31.....	7,670	65	1,350	--	--	--	8,460		
Total.	74,670	--	4,081	175,990	--	9,022	552,580	--	217,518
-----									
	January			February			March		
1.....	7,860	26	552	12,400	16	536	16,400	19	s 861
2.....	6,910	27	504	10,400	10	281	22,300	84	s 5,230
3.....	6,010	4	65	9,990	8	214	34,500	185	s 17,600
4.....	5,880	3	48	11,200	6	181	36,000	60	5,830
5.....	5,880	3	48	10,900	8	235	30,600	35	2,890
6.....	6,410			9,940	8	215	24,900	15	1,010
7.....	6,460	1	17	9,140	6	148	20,700	9	503
8.....	6,230			8,010	--	e 110	18,300	5	247
9.....	5,290	4	57	7,140			17,000	4	184
10.....	4,680			7,520			16,000	4	173
11.....	4,000	6	70		2	40			
12.....	3,600	7	68	7,430			14,500	4	157
13.....	5,200	7	98	7,240	--	e 40	13,500	2	73
14.....	4,800	5	65	6,360	--	e 30	12,800	3	104
15.....	5,400	8	117	5,290			13,900	4	150
16.....	5,900			5,460	2	29	14,700	6	238
17.....	5,200	5	a 80	5,170			14,200	4	153
18.....	4,300			6,340	4	sa 78	13,400	2	72
19.....	3,900			21,800	101	s 5,480	12,100	1	33
20.....	5,200	2	27	38,300	194	s 20,500	11,400	2	62
21.....	6,000			26,900	79	5,740	12,800	--	e 140
22.....	7,000			21,300	40	2,300	16,600	12	538
23.....	6,600	8	a 143	21,700	34	1,990	17,500	9	425
24.....	10,000	25	675	29,200	65	5,120	16,500	14	624
25.....	8,200	10	221	27,800	50	3,750	14,800	9	360
26.....	8,110	8	219	22,400	22	1,330	14,600	9	355
27.....	9,030			20,200	15	818	15,600	10	421
28.....	10,900	28	638	19,500	--	e 530	15,400	8	333
29.....	23,500	37	1,090	17,700	10	478	15,600	8	337
30.....	19,400	274	sal 8,300	--	--	--	14,000	8	302
31.....	15,200	220	sal 1,900	--	--	--	13,000	4	a 140
Total.	233,050	--	36,678	406,730	--	50,311	536,200	--	38,647

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

## NORTH ATLANTIC SLOPE BASINS, NEW YORK TO YORK RIVER

## DELAWARE RIVER BASIN--Continued

## DELAWARE RIVER AT TRENTON, N. J. (MORRISVILLE, PA.)--Continued

Suspended sediment, water year October 1953 to September 1954--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.....	12,000	4	122	15,200	10	410	8,870	1	24		
2.....	11,400			13,500	12	437	8,410	1	23		
3.....	10,500			13,000	18	632	7,960	2	43		
4.....	9,990			18,100	53	2,590	7,190	1	19		
5.....	9,410			24,800	52	3,480	6,870	2	37		
6.....	8,820	4	102	25,400	35	2,400	6,730	5	91		
7.....	9,140			20,500	18	996	6,140	4	66		
8.....	9,570			18,300	9	445	5,370	2	29		
9.....	9,990			19,400	10	524	5,370	4	58		
10.....	9,570			22,200	15	899	5,210	4	56		
11.....	8,930	6	146	27,800	30	2,250	5,130	4	55		
12.....	8,460			36,900	58	5,780	4,920	4	53		
13.....	9,250			30,200	33	2,690	5,080	4	55		
14.....	9,990			8	216	24,800	15	1,000	4,960	4	54
15.....	9,190			6	149	21,100	8	456	4,960	7	94
16.....	8,870	5	120	18,100	8	391	5,670	9	138		
17.....	11,800	14	s 475	15,900	14	601	6,010	7	114		
18.....	29,400	131	s 11,600	14,400	7	272	5,250	13	184		
19.....	37,000	115	11,500	13,000	6	211	4,840	13	170		
20.....	27,000	53	3,860	12,100	5	163	4,380	11	130		
21.....	21,900	27	1,600	12,100	6	196	3,980	8	86		
22.....	18,400	18	894	12,800	2	69	3,460	4	37		
23.....	16,200	15	656	13,600	2	73	3,400	2	18		
24.....	14,700	17	675	13,000	2	70	3,680	2	20		
25.....	14,800	19	759	12,200	2	66	3,780	2	20		
26.....	13,700	21	777	11,400	1	31	3,490	2	19		
27.....	12,700	24	823	10,400	2	56	3,280	1	9		
28.....	13,400	15	543	9,620	2	52	3,070	1	8		
29.....	16,200	12	525	8,980	1	24	2,870	3	23		
30.....	17,200	20	929	8,980	1	24	2,440	1	7		
31.....	--	--	--	8,460	2	69	--	--	--		
Total.	419,480	--	37,748	526,240	--	27,357	152,770	--	1,740		
Day	July			August			September				
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment			
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		
1.....	2,370	2	13	1,700	2	9	6,460	65	1,130		
2.....	2,290	6	37	1,610	1	4	5,670	17	260		
3.....	2,290	5	31	1,770	2	10	5,000	16	216		
4.....	2,270	7	43	1,890	1	5	4,570	13	160		
5.....	2,370	5	32	1,730	1	a5	4,120	10	111		
6.....	2,520	7	48	1,810	1	a5	3,280	6	53		
7.....	2,570	9	62	1,750	1	a5	2,740	8	59		
8.....	2,570	12	83	1,700	1	a5	2,500	9	61		
9.....	2,470	9	60	2,180	6	sa40	2,340	7	44		
10.....	2,570	7	49	2,390	4	a26	2,170	7	41		
11.....	2,290	12	74	1,970	2	a11	3,600	34	s 353		
12.....	2,080	13	73	1,990	3	a16	2,900	8	63		
13.....	2,100	8	45	1,950	2	a11	2,760	4	30		
14.....	1,930	6	31	1,750	1	a5	2,470	5	33		
15.....	1,930	10	52	1,720	1	a5	2,170	3	18		
16.....	2,100	13	74	1,610	1	a4	2,150	5	29		
17.....	2,200	10	59	1,580	3	a13	3,020	10	82		
18.....	2,150	8	46	1,610	1	a4	4,190	20	226		
19.....	1,970	12	64	1,480	1	a4	3,920	20	212		
20.....	1,890	10	51	1,720	2	a9	4,120	15	167		
21.....	1,770	13	62	1,790	2	a10	4,340	18	211		
22.....	1,810	11	54	1,950	3	a16	4,570	25	308		
23.....	1,890	9	46	2,010	3	a16	4,680	20	253		
24.....	1,930	12	63	2,030	4	a22	4,050	12	131		
25.....	1,850	11	55	1,730	3	a14	3,520	8	76		
26.....	1,810	11	54	1,500	1	a4	3,070	6	50		
27.....	1,750	12	57	1,500	1	a4	2,820	7	53		
28.....	1,720	10	46	1,730	2	a9	2,650	4	29		
29.....	1,640	11	49	1,750	2	a9	2,550	3	21		
30.....	1,700	9	41	1,660	2	a9	2,440	5	33		
31.....	1,680	5	23	3,100	--	b200	--	--	--		
Total.	64,480	--	1,577	56,660	--	509	104,840	--	4,513		
Total discharge for year (cfs-days).....									3,303,690		
Total load for year (tons).....									430,701		

s Computed by subdividing day.

a Computed from estimated concentration graph.

b Computed from water-sediment discharge curve.

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

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1954. Additional data are published in REMARKS.--Data obtained from analyses of river samples taken at center of stream approximately 3 feet from bottom. WSP 126Z, Chemical characteristics of Delaware River water, Trenton, N.J. to Marcus Hook, Pa.

Date of collection	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	Biochemical oxygen demand	Dissolved oxygen
														Calcium	Non-carbonate				
Oct. 2, 1953	71	1.3	0.04	19	8.0	12	3.1	50	37	16	0.1	5.3	145	80	39	231	7.8	1.2	6.2
Nov. 18	46	4.5	.05	17	6.5	6.5	2.3	39	31	11	.1	5.2	127	66	36	190	7.6	2.3	9.5
Dec. 1	45	4.2	.06	12	3.5	2.6	1.3	22	23	6.5	.1	3.7	84	42	24	117	7.6	1.6	10.2
Jan. 15, 1954	35	4.6	.01	15	5.0	6.0	.9	30	28	8.5	.1	7.3	115	58	33	159	7.6	3.3	11.8
Mar. 8	40	4.4	.02	9.0	3.6	2.4	1.1	17	16	4.5	.1	3.6	70	37	23	91.0	7.2	7.2	11.4
Apr. 5	46	2.7	.02	11	4.3	3.4	.7	26	17	5	.1	3.4	74	45	22	136	7.4	1.6	11.3
May 3	62	3.6	.07	8.2	3.5	2.8	.6	20	15	4.5	.1	2.9	69	35	18	89.9	7.4	1.3	8.8
June 1	71	3.1	.03	11	3.9	3.2	1.3	27	18	5.5	.1	2.5	76	44	21	117	7.7	2.2	8.8
July 1	79	5.2	.31	13	6.2	9.2	2.1	40	26	12	.1	4.9	117	58	25	191	7.8	1.0	2.1
Aug. 3	80	2.1	.02	21	8.1	11	2.9	53	36	16	.2	5.5	143	86	42	247	7.9	1.4	5.3
Sept. 1	76	2.1	.06	23	7.5	11	2.7	53	45	15	.1	5.8	144	88	45	250	7.8	1.7	5.3

## DELAWARE RIVER BASIN--Continued

## DELAWARE RIVER AT TORRESDALE INTAKE, PHILADELPHIA, PA.

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1954.

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

## Chemical analyses, in parts per million, water year October 1953 to September 1954

Date	Temperature (°F)	Chloride (Cl)	Spe- cific conduct- ance (micro- mhos at 25°C)	pH	Biochemical oxygen demand	Dissolved oxygen
Oct. 2, 1953 .....	72	20	272	6.7	1.3	2.8
Nov. 18 .....	49	11	193	7.2	3.9	7.4
Dec. 1 .....	46	6.0	139	6.8	2.0	9.1
Jan. 15, 1954 .....	35	9	179	6.6	3.6	10.8
Mar. 8 .....	37	4	91.5	6.5	1.0	11.6
Apr. 5 .....	47	6	119	6.7	2.4	11.0
May 3 .....	61	5	98.7	6.6	0.4	7.6
June 1 .....	69	6	122	6.6	.7	7.6
July 1 .....	78	8	171	7.0	2.1	5.1
Aug. 3 .....	80	15	234	6.9	2.8	5.5
Sept. 1 .....	76	15	250	7.8	1.7	5.3

## DELAWARE RIVER AT LEHIGH AVENUE, PHILADELPHIA, PA.

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1954.

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

## Chemical analyses, in parts per million, water year October 1953 to September 1954

Date	Temperature (°F)	Chloride (Cl)	Spe- cific conduct- ance (micro- mhos at 25°C)	pH	Biochemical oxygen demand	Dissolved oxygen
Oct. 2, 1953 .....	72	46	433	6.7	1.6	5.5
Nov. 18 .....	53	21	287	6.5	1.1	2.3
Dec. 1 .....	48	12	221	6.7	3.1	6.4
Jan. 15, 1954 .....	37	12	217	6.8	5.6	7.6
Feb. 2 .....	35	6	129	6.5	3.5	11.3
Mar. 8 .....	37	4	98.0	6.4	0.8	10.7
Apr. 5 .....	47	7	132	6.5	2.1	10.1
May 3 .....	62	5	116	6.5	1.4	8.0
June 1 .....	71	8	142	6.3	.0	1.2
July 1 .....	77	15	207	6.8	3.9	4.5
Aug. 3 .....	80	26	287	6.6	2.2	2.3
Sept. 1 .....	77	42	361	6.7	2.4	2.8



DELAWARE RIVER BASIN--Continued  
 DELAWARE RIVER AT PHILADELPHIA, PA. - BENJAMIN FRANKLIN BRIDGE (PHILADELPHIA-CAMDEN BRIDGE)

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1954.  
 REMARKS.--Data obtained from analyses of river samples taken at center of stream approximately 3 feet from bottom. Additional data are published in WSP 1262. Chemical characteristics of Delaware River water, Trenton, N. J. to Marcus Hook, Pa.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	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 evap- oration at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro- mhos at 25°C)	pH	Bio- chem- ical- oxygen demand	Dis- solved oxygen
														Mag- nesium	Non- carbon- ate				
Oct. 2 1953	72	2.0	0.29	24	11	39	5.5	48	72	52	0.3	7.6	263	105	66	431	7.9	2.8	0.6
Nov. 18	53	4.2	.04	20	7.2	21	3.9	38	56	26	.2	10	188	80	48	291	7.8	1.6	1.0
Dec. 1	47	4.4	.04	15	5.7	8.7	2.2	32	32	12	.1	8.1	130	61	35	190	7.6	4.1	6.1
Jan. 15 1954	38	.01	.01	16	5.5	13	1.6	23	36	14	.1	13	154	62	44	210	7.4	5.1	7.0
Feb. 2	35	5.4	.01	12	4.6	5.3	1.0	21	26	8.0	.1	7.2	104	49	32	143	7.3	2.9	11.3
Mar. 8	38	4.6	.01	8.2	3.5	2.9	.6	14	18	4.5	.1	4.3	60	35	23	91.0	7.1	1.3	10.5
Apr. 5	47	3.5	.04	11	4.1	4.5	.8	21	21	7.0	.1	4.8	77	44	27	122	7.2	2.2	9.3
May 3	62	4.1	.21	10	3.8	4.1	.9	20	20	5	.1	4.4	79	41	24	112	7.3	1.2	6.5
June 1	71	4.4	.02	14	3.8	6.8	1.7	27	27	8.0	.2	7.2	90	51	28	146	7.0	.0	1.0
July 1	77	3.6	.01	15	5.4	12	2.4	31	34	14	.1	8.0	122	60	34	208	7.8	.0	2.1
Aug. 3	81	2.4	.04	21	6.4	24	3.4	40	49	34	.2	7.7	291	87	54	324	7.9	2.0	2.2
Sept. 1	73	3.5	.25	26	11	71	5.7	39	75	100	.4	7.3	347	110	78	653	7.5	.8	1.9

## DELAWARE RIVER BASIN--Continued

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

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1954.

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

Chemical analyses in parts per million, water year October 1953 to September 1954

Date	Temperature (°F)	Chloride (Cl)	Specific conductance (micromhos at 25°C)	pH	Bio-chemical oxygen demand	Dissolved oxygen
Oct. 1, 1953	74	78	551	6.7	3.9	1.5
Nov. 12	53	30	327	7.8	3.3	1.3
Dec. 2	48	13	215	6.5	0.6	4.8
Jan. 14, 1954	34	12	221	6.3	5.9	8.1
Feb. 1	35	8	159	7.5	4.1	11.5
Mar. 8	39	5	107	6.3	2.8	11.3
Apr. 6	51	9	142	6.3	4.2	6.1
May 3	63	6	125	6.4	1.8	5.4
June 2	72	10	146	6.3	1.4	2.0
July 2	78	17	245	6.8	2.4	1.6
Aug. 2	81	64	451	6.5	1.8	1.2
Sept. 2	77	125	713	6.6	2.4	0.9

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

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1954.

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

Chemical analyses in parts per million, water year October 1953 to September 1954

Date	Temperature (°F)	Chloride (Cl)	Specific conductance (micromhos at 25°C)	pH	Bio-chemical oxygen demand	Dissolved oxygen
Oct. 1, 1953	72	130	727	6.4	3.3	1.8
Nov. 12	53	45	408	6.5	2.7	1.0
Dec. 2	48	17	259	6.5	2.7	0.0
Jan. 14, 1954	34	12	228	6.3	3.0	9.0
Feb. 1	36	12	208	6.6	4.6	10.1
Mar. 4	42	5	119	6.4	3.5	10.3
Apr. 6	51	8	155	6.1	4.2	6.1
May 4	63	8	149	6.5	0.0	3.2
June 2	71	10	162	6.4	3.6	1.7
July 2	78	16	256	6.7	0.0	2.0
Aug. 2	79	124	675	6.4	1.1	1.8
Sept. 2	77	125	713	6.6	2.4	0.9

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.--Sediment records: October 1947 to September 1954.

EXTREMES, 1953-54.--Sediment concentrations: Maximum daily, 397 ppm Dec. 7; minimum daily, 1 ppm on many days.

Sediment loads: Maximum daily, 6,990 tons Dec. 7; minimum daily, 0.2 ton Sept. 8-12.

EXTREMES, 1947-54.--Sediment concentrations: Maximum daily, 8,030 ppm Nov. 4, 1947; minimum daily, 0 ppm on many days during 1952 water year.

Sediment loads: Maximum daily, 90,180 tons Nov. 12, 1947; minimum daily, 0 tons on many days during 1952 water year.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1332.

Suspended sediment, water year October 1953 to September 1954

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.....	134			188	3	1	410	7	8
2.....	125			165			380	8	8
3.....	131	4	1	147	5	2	357	6	6
4.....	140			140			327	7	6
5.....	131			137			410	7	8
6.....	131	3	1	140	4	2	632	100	s 422
7.....	178			165			5,770	397	s 6,990
8.....	137			183			2,780	23	173
9.....	125			188			1,880	17	86
10.....	125	6	2	183			2,140	21	121
11.....	137			204	5	3	1,630	18	79
12.....	128			216			1,430	9	35
13.....	125			234			1,610	12	52
14.....	125			258			2,100	20	113
15.....	120	10	3	299			2,280	16	98
16.....	122			306	4	3	1,800	11	53
17.....	125			285			1,430	7	27
18.....	128			264			1,150	7	22
19.....	128			252			940	6	15
20.....	117	3	1	234			890		
21.....	120			228	2	1	801	6	12
22.....	122			234			747		
23.....	125			592	32	s 51	688		
24.....	125			546	6	9	608		
25.....	128	2	.7	546	13	19	545		
26.....	125			735			538		
27.....	117	2	.6	605			508		
28.....	265	16	s 9	546	3	5	478		
29.....	306	35	29	489			500	5	6
30.....	514	30	42	450			462		
31.....	246	3	2	--	--	--	432		
Total.	4,805	--	122.4	8,159	--	152	36,653	--	8,410

s Computed by subdividing day.

## NORTH ATLANTIC SLOPE BASINS, NEW YORK TO YORK RIVER

## DELAWARE RIVER BASIN--Continued

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

Suspended sediment, water year October 1953 to September 1954--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.....	396			440	2	2	1,910	130	1,400
2.....	382		4	460	4	5	5,020	160	s2,450
3.....	362			470			3,490	48	452
4.....	355			470	4	5	2,940	38	302
5.....	328	4	4	432			2,280	25	154
6.....	341	2	2	410			1,840	15	75
7.....	328	3	3	376	3	3	1,540	9	37
8.....	300	1	1	355			1,310	8	28
9.....	303	3	2	362			1,140	11	34
10.....	310	2	2	362			1,020	3	8
11.....	270	2	1	348			900	2	5
12.....	290	1	1	290			801	2	4
13.....	280			260	2	2	792	2	4
14.....	270	--	e1	300			1,070	8	23
15.....	300			328			965	7	18
16.....	340	--	e3	315	2	2	801	3	6
17.....	310	--	e2	644			765	2	4
18.....	260			817			729	2	4
19.....	250	--	e1	624	4	7	720	2	4
20.....	290			584			1,630	19	s88
21.....	580	--	e6	1,050	6	s20	1,390	6	23
22.....	620	--	e10	2,200	30	178	1,200	2	6
23.....	450			1,740	8	38	1,090	3	9
24.....	450			1,420	4	15	965	4	10
25.....	430	--	e2	1,240	4	13	1,220	11	36
26.....	470			1,120	2	6	1,250	8	27
27.....	660	3	5	998	2	5	1,080	7	20
28.....	720	5	10	860	4	9	1,010	4	11
29.....	545	2	3	--	--	--	943	5	13
30.....	552	2	3	--	--	--	890	8	19
31.....	480	2	3	--	--	--	810	8	17
Total,	12,222	--	91	19,275	--	354	43,511	--	5,291
	April			May			June		
1.....	774	5	10	672			396	3	3
2.....	720			664	3	6	399	3	3
3.....	656			830			369		
4.....	616			1,570			335	2	2
5.....	584	2	3	1,350	7	26	309		
6.....	584			1,200			296		
7.....	648			1,070			277	2	2
8.....	568			1,140	3	9	271		
9.....	522			1,030			254		
10.....	492	3	4	2,350	31	s234	260	4	3
11.....	485			2,680	26	188	277		
12.....	522			2,200	13	77	248	8	5
13.....	470			1,760	9	43	355	10	10
14.....	462	3	4	1,450	6	23	283	4	3
15.....	440			1,220	10	33	248	2	1
16.....	560			1,080	5	15	260	5	4
17.....	2,640	74	s594	976			254		
18.....	2,520	27	184	870	2	5	214	2	1
19.....	1,920	10	52	756			209		
20.....	1,530	7	29	720			209		
21.....	1,270	8	27	696	1	2	203	2	1
22.....	1,100			632			188		
23.....	987	4	11	584			214		
24.....	890			545			248	4	2
25.....	820			515			193		
26.....	765	4	8	478	2	2	183		
27.....	774			432			188		
28.....	998	10	27	432			167	2	1
29.....	810	7	15	440			167		
30.....	712	7	13	676	14	s26	172		
31.....	--	--	--	470	5	6	--	--	--
Total,	26,839	--	1,063	31,488	--	803	7,636	--	67

e Estimated.

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BERNE, PA.--Continued

Suspended sediment, water year October 1953 to September 1954--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.....	167	5	2.0	95			282	12	9
2.....	162			92			162	8	3
3.....	155			122	1	0.3	136		
4.....	160	1	.4	162			126		
5.....	190			122			118	--	a.6
6.....	185			118			118		
7.....	149			111			114		
8.....	167			107	4	2	103		
9.....	154	1	.4	183			111		
10.....	136			219			103	--	a.2
11.....	140			149			107		
12.....	136			126			122		
13.....	118			111	--	a.6	107		
14.....	122	1	.4	107			95		
15.....	183			122			92	1	.3
16.....	149			131			136		
17.....	126			107			131		
18.....	131			99	1	.3	103		
19.....	126			103			114		
20.....	114	2	.7	122			198		
21.....	107			131			140	--	a.4
22.....	111			144			122		
23.....	99			114	2	.6	103		
24.....	95	2	.6	99			95		
25.....	107			95			88		
26.....	118			103			103	1	.3
27.....	99			95			103		
28.....	88	2	.5	88	2	.6	92		
29.....	92			95			84		
30.....	88			130			92	2	.5
31.....	88	3	1	424	45	s 57	--	--	--
Total.	4,042	--	17.5	4,026	--	79.0	3,600	--	22.2

Total discharge for year (cfs-days) ..... 203,256  
 Total load for year (tons) ..... 16,472.1

s Computed by subdividing day.  
 a Computed from water sediment discharge curve.

## 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 1954.

EXTREMES, 1953-54.--Sediment concentrations: Maximum daily, 579 ppm Dec. 7; minimum daily, 2 ppm Feb. 7, 8, 9, Mar. 19.

Sediment loads: Maximum daily, 32,000 tons Dec. 7; minimum daily, 7 tons several days.

EXTREMES, 1947-54.--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 random samples available at the Harrisburg area office. Records of discharge for water year October 1953 to September 1954 based on records for the Schuylkill River at Philadelphia (Fairmount Dam) given in WSP 1332, and includes water diverted by the City of Philadelphia for municipal water supply.

Day	Suspended sediment, water year October 1953 to September 1954								
	Mean discharge (cfs)	October		Mean discharge (cfs)	November		Mean discharge (cfs)	December	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	564	6	9	1,230	23	76	1,280		
2.....	536	5	7	863	16	37	1,190		
3.....	528	9	11	745	11	22	1,100		
4.....	539	7	10	685	11	20	1,040		
5.....	559	5	8	625	9	15	1,270		
6.....	562	6	9	631	7	12	1,400		
7.....	584	9	14	754	13	26	14,100	579	s 32,000
8.....	559	10	15	808	6	13	13,800	446	s 18,900
9.....	585	10	16	916	4	10	7,310	70	1,360
10.....	555	11	16	993	6	11	11,200	283	s 11,100
11.....	531	12	17	1,040	6	16	8,050	140	3,040
12.....	532	18	26	1,180	6	19	5,750	35	543
13.....	545	15	22	1,420	7	27	8,200	90	1,990
14.....	536	9	13	1,360	5	19	15,100	333	s 17,600
15.....	547	5	7	1,290	4	14	10,700	112	s 3,470
16.....	546	5	7	1,290	6	21	7,380	40	797
17.....	539	6	9	1,360	5	16	5,580	30	452
18.....	532	7	10	1,170	--	e 21	4,370	12	142
19.....	526	7	10	1,020	--	e 19	3,560	7	67
20.....	547	5	7	936	17	43	3,300	6	53
21.....	551	6	9	874	12	28	3,050	6	49
22.....	548	8	12	898	6	14	2,900	6	47
23.....	512	14	19	1,460	41	s 187	2,750	5	37
24.....	519	13	18	2,760	38	s 296	2,460	4	27
25.....	526	11	16	2,050	43	238	2,140	4	23
26.....	550	11	16	2,990	39	315	1,940	4	21
27.....	559	14	21	2,270	19	116	1,940	4	21
28.....	847	18	41	1,830	12	59	1,770	3	14
29.....	2,110	91	s 608	1,590	10	43	1,780	4	19
30.....	6,200	125	sa 2,400	1,390	9	34	1,810	6	29
31.....	2,280	40	248	--	--	--	1,680	6	27
Total	26,154	--	3,649	38,388	--	1,789	149,900	--	92,013

e Estimated.

s Computed by subdividing day.

a Computed from estimated concentration graph.

DELAWARE RIVER BASIN--Continued

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

Suspended sediment, water year October 1953 to September 1954 -- 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.....	1,520			1,700			2,800	80	605				
2.....	1,400	6	23	1,600	5	23	11,900	508	s 16,900				
3.....	1,390			1,740			10,700	195	5,630				
4.....	1,320			1,720			10,900	212	s 6,490				
5.....	1,290			1,670			6,960	70	1,320				
6.....	1,280			6			20	1,540	3	12	5,560	40	600
7.....	1,280	1,370	2		11	4,790		25			323		
8.....	1,170	1,290	2		7	4,240		16			188		
9.....	1,090	1,260	2		7	3,750		12			122		
10.....	1,120	1,300	3		11	3,360		8			78		
11.....	1,080	8	23	1,300	3	11	3,140	8	68				
12.....	902			1,210			4	13	2,820	8	61		
13.....	874			--			e 9	1,000	4	11	2,670	8	58
14.....	1,030			--			e 22	915	4	10	4,110	23	255
15.....	979			--			e 16	976	4	11	5,220	37	521
16.....	1,290	9	31	1,110	5	16	3,560	19	188				
17.....	1,450	6	23	1,400	10	38	2,950	8	64				
18.....	1,140	--	e 15	2,290	10	62	2,750	6	45				
19.....	923	5	12	2,540	8	55	2,540	2	14				
20.....	1,080	8	23	1,930	9	47	3,940	14	s 202				
21.....	2,020	9	49	1,970	11	59	5,710	42	648				
22.....	4,320	29	s 346	3,350	16	s 143	4,430	19	227				
23.....	2,710	23	168	4,420	26	310	3,990	11	119				
24.....	2,100	14	79	3,620	13	127	3,880	10	105				
25.....	1,920	8	41	3,240	11	96	4,150	20	224				
26.....	1,850	6	a 30	3,010	10	a 81	6,450	71	s 1,250				
27.....	2,430	9	59	2,950	8	64	4,830	25	326				
28.....	3,510	23	218	2,790	6	45	3,980	15	161				
29.....	2,910	36	283	--	--	--	3,670	12	119				
30.....	2,270	13	80	--	--	--	3,460	10	93				
31.....	2,010	8	43	--	--	--	3,200	9	78				
Total.	50,378	--	1,811	55,211	--	1,361	146,410	--	36,667				
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.....	2,990	10	81	2,520	11	75	1,500	10	41				
2.....	2,780	9	68	2,320	10	63	1,350	10	36				
3.....	2,560	13	90	2,140	13	75	1,210	10	33				
4.....	2,340	17	107	7,390	98	s 2,620	1,130	12	37				
5.....	2,180	9	53	6,140	60	995	1,060	13	37				
6.....	2,090	11	62	4,480	20	242	957	20	52				
7.....	2,140	18	104	3,780	12	122	950	16	41				
8.....	2,500	13	88	3,520	10	95	882	12	29				
9.....	2,220	19	114	3,560	12	115	865	11	26				
10.....	1,860	20	100	3,670	15	149	845	15	34				
11.....	1,750	21	99	4,880	48	632	804	17	37				
12.....	1,730	20	93	5,810	35	549	870	16	38				
13.....	1,680	18	82	5,100	20	275	926	15	38				
14.....	1,570	20	85	4,310	14	163	1,030	17	47				
15.....	1,480	19	76	3,720	15	151	1,010	20	55				
16.....	1,610	15	65	3,350	11	99	1,500	38	154				
17.....	3,260	36	317	2,950	8	64	1,080	26	76				
18.....	6,660	63	1,130	2,760	6	45	923	18	45				
19.....	5,010	23	311	2,560	10	69	862	18	42				
20.....	4,180	17	192	2,360	6	38	774	18	38				
21.....	3,610	12	117	2,420	8	39.	765	11	23				
22.....	3,310	10	89	2,470	8	53	759	9	18				
23.....	2,990	12	97	2,270	12	74	768	15	31				
24.....	2,760	13	97	1,940	10	52	720	15	29				
25.....	2,540	17	117	1,770	15	72	710	17	33				
26.....	2,440	17	112	1,680	11	50	709	15	29				
27.....	2,460	23	153	1,560	10	42	713	15	29				
28.....	2,890	25	195	1,420	11	42	652	21	37				
29.....	3,360	18	164	1,320	16	57	592	20	32				
30.....	3,050	17.	139	1,300	10	35	579	19	30				
31.....	--	--	--	1,410	7	27	--	--	--				
Total.	82,000	--	4,597	86,890	--	7,179	27,495	--	1,227				

e Estimated.

s Computed by subdividing day.

a Computed from estimated concentration graph.

## DELAWARE RIVER BASIN--Continued

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

Suspended sediment, water year October 1953 to September 1954 -- 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.....	594	52	83	376	24	24	2,780	45	338
2.....	733	50	99	360	22	21	1,420	30	115
3.....	772	36	75	462	128	160	840	16	36
4.....	651	13	23	579	130	203	682	12	22
5.....	620	15	25	641	128	222	612	15	25
6.....	651	20	35	709	170	325	565	12	18
7.....	720	15	29	782	108	228	541	9	13
8.....	700	15	28	741	98	196	527	8	11
9.....	629	15	25	698	20	38	572	8	12
10.....	647	13	23	1,390	80	a 300	554	12	18
11.....	648	12	21	1,550	60	251	799	33	71
12.....	597	15	24	1,000	22	59	808	20	44
13.....	551	12	18	747	20	40	714	15	29
14.....	578	11	17	643	20	35	609	9	15
15.....	584	22	35	610	22	36	539	8	12
16.....	570	25	38	576	20	31	497	9	12
17.....	552	15	22	542	16	23	492	10	13
18.....	511	14	19	505	17	23	579	9	14
19.....	549	18	27	520	5	7	619	10	17
20.....	507	19	26	490	8	11	608	14	23
21.....	484	15	20	1,490	30	121	628	12	20
22.....	474	15	19	1,880	40	203	720	15	29
23.....	446	16	19	1,000	25	68	667	10	18
24.....	430	26	30	735	15	30	564	6	9
25.....	435	38	45	606	6	10	510	8	11
26.....	655	48	85	545	5	7	521	9	13
27.....	535	21	30	493	10	13	513	10	14
28.....	494	30	40	493	10	13	471	10	13
29.....	486	50	66	543	9	12	531	10	14
30.....	446	31	37	510	10	14	508	10	14
31.....	413	52	58	1,940	80	s 483	--	--	--
Total.	17,662	--	1,141	24,156	--	3,207	20,990	--	1,013

Total discharge for year (cfs-days). . . . . 735,634  
 Total load for year (tons). . . . . 155,654

s Computed by subdividing day.

a Computed from estimated concentration graph.





## DELAWARE RIVER BASIN--Continued

## SCHUYLKILL RIVER AT BELMONT FILTER PLANT, PHILADELPHIA, PA.

LOCATION.--At Belmont Filter Plant, Philadelphia, Philadelphia County, 1.6 miles upstream from gaging station at Fairmount Dam in Philadelphia.  
DRAINAGE AREA.--1,890 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1954.

EXTREMES, 1953-54.--Dissolved solids: Maximum, 362 ppm Oct. 21-30; minimum, 124 ppm Dec. 11-20.

Hardness: Maximum, 212 ppm Oct. 16-20; minimum, 77 ppm Dec. 11-20.

Specific conductance: Maximum daily, 537 microhos Oct. 21; minimum daily, 171 microhos Dec. 11.

Water temperatures: Maximum, 85°F Aug. 2; minimum, 32°F Feb. 7.

EXTREMES, 1944-54.--Dissolved solids: Maximum, 362 ppm Oct. 21-30, 1953; minimum, 94 ppm Feb. 1-10, 21-28, 1951

Hardness: Maximum, 231 ppm Oct. 4-9, 1951; minimum, 77 ppm Dec. 11-20, 1953.

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

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

REMARKS.--Samples collected at raw-water intake on west side of river at Belmont Filter Plant by City of Philadelphia. Records of specific conductance

and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1953 to September 1954 based

on records for Schuylkill River at Philadelphia given in WSP 1332.

## Chemical analyses, in parts per million, water year, October 1953 to September 1954

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 (microhos at 25°C)	pH	Color
																	Calcium	Non-carbonate				
Oct. 16-20, 1953	245	--	--	--	--	--	45	16	15	83	127	26	212	--	9.2	--	362	212	144	534	7.5	5
Oct. 21-30	1,002	7.3	0.02	0.02	0.02	0.02	31	12	26	81	122	24	178	8.1	8.1	362	178	112	507	7.2	5	
Oct. 31	2,000	--	--	--	--	--	35	15	12	52	98	16	78	10	10	253	149	106	218	6.7	4	
Nov. 1-10	545	10	0.02	0.02	0.02	0.02	35	15	10	61	87	16	253	2	8.7	253	149	106	388	7.0	4	
Nov. 11-20	916	12	0.02	0.02	0.02	0.02	35	15	10	61	87	16	253	2	9.3	250	149	89	388	7.2	4	
Nov. 21-30	1,530	11	0.02	0.02	0.02	0.02	32	13	11	49	87	14	236	2	7.7	236	133	93	354	7.0	6	
Dec. 1-10	5,090	11	0.04	0.04	0.04	0.04	28	12	6.4	42	74	10	119	1.1	9.1	213	119	85	309	7.1	4	
Dec. 11-20	6,910	12	0.02	0.02	0.02	0.02	26	12	4.5	26	46	7.0	124	1.1	9.2	124	77	56	204	7.1	6	
Dec. 21-31	1,920	13	0.02	0.02	0.02	0.02	26	12	4.8	38	69	9.5	186	1.1	10	186	114	83	292	7.6	3	
Jan. 1-10, 1954	1,000	14	0.02	0.02	0.02	0.02	48	14	8.5	48	87	12	236	1.1	11	236	137	98	347	7.3	4	
Jan. 11-20	778	15	0.02	0.02	0.02	0.02	35	14	11	54	90	16	259	1.1	11	259	145	101	375	7.1	5	
Jan. 21-31	2,250	13	0.02	0.02	0.02	0.02	35	14	5.7	43	70	12	210	1.1	11	210	122	86	312	7.1	4	
Feb. 1-10	1,210	12	0.01	0.01	0.01	0.01	29	12	5.5	45	68	12	190	1.1	11	190	122	85	307	7.1	4	
Feb. 11-20	1,830	11	0.06	0.06	0.06	0.06	33	12	6.0	50	72	14	209	1.1	11	209	132	91	338	7.1	4	
Feb. 21-28	2,830	11	0.11	0.11	0.11	0.11	34	12	6.4	54	72	10	188	1.1	8.6	188	110	82	282	6.9	4	
Mar. 1-10	6,200	11	0.13	0.13	0.13	0.13	25	11.4	5.8	33	51	0	145	1.1	8.5	145	160	97	215	7.0	5	
Mar. 11-20	3,100	13	0.12	0.12	0.12	0.12	20	11	4.5	36	66	8.5	173	1.1	8.7	173	108	78	268	7.1	5	
Mar. 21-30	4,060	12	0.08	0.08	0.08	0.08	23	9.3	5.8	35	59	8.0	134	1.1	8.1	134	96	87	247	7.1	6	

Apr. 1-10, 1954...	2,080	12	.12	27	11	4.7	44	64	10	.1	7.1	173	113	77	282	7.4	5
Apr. 11-20.....	2,610	8.4	.09	29	12	6.1	45	75	10	.1	7.2	180	122	85	307	7.1	6
Apr. 21-30.....	2,680	8.0	.02	24	8.9	4.2	37	57	6.0	.1	5.6	182	96	86	289	7.0	7
May 1-10.....	3,480	12.4	.04	22	8.6	7.6	37	62	7.5	.1	6.3	184	96	70	284	7.1	3
May 11-20.....	3,480	7.4	.09	23	10	3.8	35	90	7.5	.1	5.0	184	96	70	284	7.1	7
May 21-31.....	1,500	7.6	.07	28	12	6.8	38	77	12	.1	5.8	188	119	87	302	7.1	3
June 1-10.....	774	7.2	.08	35	15	8.9	50	101	12	.1	6.3	231	149	108	377	7.4	4
June 11-20.....	678	8.4	.02	38	16	9.4	59	103	14	.1	6.9	244	161	112	402	7.6	3
June 21-30.....	375	9.2	.03	37	19	9.1	68	103	17	.1	5.9	260	170	116	436	7.5	4
July 1-10.....	363	7.9	.02	43	17	18	75	116	18	.1	5.9	297	177	116	482	7.7	7
July 11-20.....	238	8.5	.01	43	11	11	78	111	19	.2	5.2	290	185	123	487	7.6	4
July 21-31.....	145	10	.01	43	19	15	78	116	21	.2	5.1	301	185	122	477	7.4	3
Aug. 1-10.....	360	7.4	.03	43	18	14	78	109	22	.1	4.8	294	181	117	467	7.4	4
Aug. 11-20.....	414	7.3	.11	37	15	14	65	98	17	.1	7.2	265	154	101	395	7.6	4
Aug. 21-31.....	633	5.6	.06	37	15	11	64	90	18	.1	7.0	250	154	102	396	7.3	4
Sept. 1-10.....	607	6.9	.05	33	13	12	61	79	16	.1	7.4	227	136	86	365	7.4	6
Sept. 11-20.....	338	4.6	.13	42	18	12	71	108	21	.1	6.6	281	179	121	453	7.5	5
Sept. 21-30.....	260	6.6	.13	41	15	16	77	102	17	.2	7.5	280	184	101	457	7.7	6
Average.....	2,019	12	0.05	32	13	9.4	53	85	14	0.1	7.8	224	137	93	353	--	5

## DELAWARE RIVER BASIN--Continued

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

Temperature (°F) of water, water year October 1953 to September 1954  
 /Once-daily measurement at approximately 9 a. m./

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

DELAWARE RIVER BASIN

DELAWARE RIVER BASIN--Continued  
SCHUYLKILL RIVER AT PASSAYUNK AVENUE, PHILADELPHIA, PA.

LOCATION:--At the Atlantic Refining Company, Passayunk and Schuylkill Avenue, Philadelphia, Pa.  
DRAINAGE AREA.--1,893 square miles (at Fairmount Dam).  
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.  
EXTREMES, 1953-54.--Hardness: Maximum, 224 ppm October 11-20; minimum, 85 ppm March 1-10.  
Specific conductance: Maximum daily, 795 microhos October 26; minimum daily, 194 microhos December 15.  
Water temperatures: Maximum, 88°F August 1, 2; minimum, 35°F January 24.  
REMARKS.--Continuous samples collected from intake pipe at Atlantic Refining Company, Passayunk and Schuylkill Avenues, Philadelphia, Pa. Records of discharge for water year October 1953 to September 1954 for Schuylkill River at Philadelphia, Pa. given in WSP 1332.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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
														Total	Non-carbonate			
Oct. 8-10, 1953	270	--	--	--	--	38	--	145	107	42	--	0.4	--	208	89	637	7.7	9
Oct. 11-20	230	--	--	--	--	44	--	139	138	44	--	.5	--	224	110	686	7.6	7
Oct. 21-30	1,000	--	--	--	--	45	--	123	130	96	--	2.8	--	220	119	706	7.7	5
Oct. 31	2,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	403	6.9	6
Nov. 1-9	530	9.6	0.10	33	11	22	--	51	85	24	0.3	12	285	128	86	394	7.3	4
Nov. 11-16, 18-20	680	--	--	--	--	20	--	69	109	28	--	8.5	--	169	112	478	7.4	7
Nov. 17-18	1,070	--	--	--	--	--	--	--	--	22	--	--	--	--	--	448	7.1	7
Nov. 20-30	1,450	--	--	--	--	15	--	87	81	22	--	4.4	--	158	87	428	7.6	9
Dec. 1-10	5,090	10	.07	30	12	20	20	56	85	18	.2	10	282	124	78	374	8.0	6
Dec. 11-23	5,590	--	--	--	--	6.1	6.1	28	52	9.5	--	11	--	186	43	293	7.2	2
Dec. 23-28	1,900	--	--	--	--	9.7	9.7	40	76	15	--	15	--	128	91	335	7.2	8
Jan. 1-11, 1954	1,900	11	.05	36	8.8	23	23	51	92	18	.2	15	268	128	84	407	7.8	3
Jan. 12-26	775	--	--	--	--	21	--	74	104	28	--	3.5	--	168	105	478	7.5	8
Jan. 21-29	235	--	--	--	--	13	--	54	90	18	--	9.8	--	144	100	387	7.4	5
Feb. 1-10	1,210	10	.07	30	11	21	21	47	87	18	.2	12	235	120	82	370	7.9	5
Feb. 11-19	1,110	--	--	--	--	20	20	70	95	23	--	3.2	--	147	90	417	7.7	6
Feb. 23-28	3,285	--	--	--	--	7.3	7.3	38	78	12	--	12	--	123	92	322	7.2	6
Mar. 1-10	6,200	9.2	.08	23	6.7	9.0	9.0	31	58	8.5	.1	8.1	180	85	60	240	7.7	4
Mar. 12-21	3,360	--	--	--	--	10	10	41	77	12	--	7.6	--	115	81	304	7.5	4
Mar. 21-31	4,060	--	--	--	--	4.2	4.2	34	58	10	--	11	--	102	74	265	7.5	4
Apr. 1-9	2,140	12	.03	23	8.5	13	13	43	70	10	.1	13	211	105	70	312	7.8	4
Apr. 9-30	2,470	--	--	--	--	7.9	7.9	52	74	14	--	11	--	131	88	351	7.5	6
Apr. 21-24, 28-30	2,685	--	--	--	--	6.8	6.8	36	69	11	--	11	--	111	82	295	7.4	8
Apr. 25	2,270	--	--	--	--	--	--	--	--	14	--	--	--	--	--	303	6.9	--

DELAWARE RIVER BASIN--Continued  
SCHUYLKILL RIVER AT PASSAYUNK AVENUE, PHILADELPHIA, PA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954.--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
														Total	Non-carbonate			
May 1-10, 1954	3,680	8.4	0.03	25	8.5	17		39	69	15	0.2	9.8	181	97	65	284	7.8	7
May 10-20	3,470	--	--	--	--	4.7		33	63	8.5	--	8.2	--	101	74	265	7.4	8
May 20-31, June 1	1,520	--	--	--	--	11		54	88	14	--	5.4	--	136	92	354	7.5	5
June 1-10	775	6.7	.03	37	12	26		54	112	20	.2	11	263	142	97	434	8.0	5
June 11-21	585	--	--	--	--	20		77	106	23	--	5.0	--	166	103	462	7.7	5
June 21-30	375	--	--	--	--	22		72	110	28	--	13	--	176	117	494	7.3	7
July 1-11	360	10	.09	44	16	36		66	128	34	.3	23	351	176	122	565	8.1	8
July 11-21	230	--	--	--	--	27		93	121	40	--	.7	--	200	124	615	7.1	9
July 21-31, Aug. 1	135	11	.45	46	19	62		137	133	46	.4	14	405	193	81	648	7.3	22
Aug. 1-10	360	9.2	.23	45	18	62		146	123	48	.4	5.0	401	186	67	667	7.4	23
Aug. 12-20	320	10	.08	40	15	52		99	130	36	.2	7.6	347	162	80	534	7.8	10
Aug. 20-31	740	8.7	.10	41	16	55		91	141	40	.3	12	365	168	94	569	7.7	11
Sept. 1-10	607	8.1	.41	36	13	46		96	105	36	.3	4.3	307	143	65	491	7.9	22
Sept. 10-20	380	8.7	.06	39	15	54		99	127	38	.2	9.8	356	139	78	547	7.8	13
Sept. 20-30, Oct. 1	265	9.8	.07	44	15	60		128	133	41	.4	7.0	377	176	71	398	7.8	15
Average	2,019	--	--	--	--	26		72	98	25	--	9.6	--	139	88	444	--	8

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT PASSAYUNK AVENUE, PHILADELPHIA, PA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
 /Each entry is average of 24-hour readings./

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

## DELAWARE RIVER BASIN--Continued

## DELAWARE RIVER AT EDDYSTONE, PA.

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1954.  
 REMARKS.--Data obtained from analyses of center river samples taken approximately 3 feet from surface and 3 feet from bottom. Additional data are published in WSP 1262, Chemical characteristics of Delaware River water, Trenton, N. J. to Marcus Hook, Pa.

Chemical analyses, in parts per million, water year October 1953 to September 1954

	Sampling Station	Temperature (°F)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	pH	Bio-chemical oxygen demand	Dissolved Oxygen
Oct. 1, 1953.....	Top	72	400	1,620	6.5	2.1	2.2
	Bottom	72	470	1,860	6.4		
Nov. 12.....	Top	53	125	692	6.5	1.5	6.8
	Bottom	53	120	699	6.6		
Dec. 2.....	Top	49	110	649	6.4	1.8	1.7
	Bottom	50	116	635	7.7		
Jan. 14, 1954.....	Top	34	22	285	5.9	3.5	9.3
	Bottom	34	20	280	5.9		
Feb. 1.....	Top	36	17	278	6.5	4.2	7.7
	Bottom	36	18	284	6.6		
Mar. 4.....	Top	42	7	145	6.3	4.0	9.3
	Bottom	42	6	147	6.3		
Apr. 6.....	Top	50	10	175	6.3	4.5	5.6
	Bottom	50	11	183	6.4		
May 4.....	Top	64	8	150	6.4	3.0	2.1
	Bottom	63	9	152	6.3		
June 2.....	Top	71	10	176	6.4	8.9	2.9
	Bottom	72	11	176	6.4		
July 2.....	Top	78	35	295	6.7	0.8	2.4
	Bottom	78	26	292	6.8		
Aug. 2.....	Top	80	380	1,560	6.2	1.5	2.2
	Bottom	79	370	1,520	6.2		
Sept. 2.....	Top	77	430	1,770	6.3	2.9	1.1
	Bottom	77	425	1,760	6.3		



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

RECORDS AVAILABLE.--Chemical analyses: August 1949 to September 1954.  
 REMARKS.--Data obtained from analyses of river samples taken at center of stream approximately 3 feet from surface and 3 feet from bottom. Additional data are published in WSP 1262, Chemical characteristics of Delaware River water, Trenton, N. J. to Marcus Hook, Pa.

Date of collection	Sam-pling station	Tem-perature (f)	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)	Nitrate (NO <sub>3</sub> )	Hardness		Specific conductance (micro-mhos at 25°C)	pH	Bio-chemical oxygen demand	Dis-solved oxygen	
													Calcium	Non-carbonate					
Oct. 1, 1953	Top	72	0.00	42	65	435	20	23	200	690	0.8	5.4	1,810	372	353	2,530	6.3	0.0	2.2
Nov. 12	Bottom	72	0.00	42	65	435	20	23	200	690	0.8	5.4	1,810	372	353	2,530	6.3	0.0	2.2
Nov. 12	Top	52	.06	37	48	305	14	23	212	438	.7	7.6	1,210	290	271	1,720	6.3	5.8	2.0
Jan. 14, 1954	Bottom	34	.01	20	9.9	30	1.9	4.0	73	54	.4	11	274	91	87	2,406	5.8	4.1	9.8
Feb. 1	Top	35	.01	20	9.9	30	1.9	12	75	34	.4	14	248	96	86	385	5.6	4.4	8.0
Feb. 1	Bottom	35	.01	22	9.9	29	1.9	12	75	41	.4	14	248	96	86	354	6.4	4.4	8.0
Mar. 4	Top	44	.01	17	5.8	7.5	1.4	8	58	8.0	.3	2.3	137	66	60	162	6.7	3.5	8.6
Mar. 4	Bottom	44	.01	17	5.8	7.5	1.4	8	58	8.5	.3	2.3	137	66	60	162	6.7	3.5	8.6
Apr. 6	Top	50	.01	14	5.1	8.7	1.2	17	38	10	.2	9.1	123	56	42	179	6.4	4.0	6.3
Apr. 6	Bottom	50	.01	14	5.1	8.7	1.2	17	38	10	.2	9.1	123	56	42	176	7.2	4.0	6.3
May 4	Top	64	.06	13	3.9	7.4	1.4	16	30	9	.2	7.8	112	48	35	157	6.3	0.0	1.4
May 4	Bottom	64	.06	13	3.9	7.4	1.4	16	30	8.5	.2	7.8	112	48	35	151	6.8	0.0	1.4
June 2	Top	72	.02	16	4.3	9.5	1.8	26	36	11	.2	8.3	106	58	36	172	6.3	5.4	2.5
June 2	Bottom	72	.02	16	4.3	9.5	1.8	26	36	10	.2	8.3	106	58	36	169	6.8	5.4	2.5
July 2	Top	80	.31	19	9.7	41	3.4	16	70	60	.4	7.9	232	74	74	434	6.6	.0	2.4
July 2	Bottom	80	.31	19	9.7	41	3.4	16	70	60	.4	7.9	232	74	74	421	7.5	.0	2.4
Aug. 2	Top	80	.07	40	46	410	20	14	172	675	.7	7.3	1,540	289	285	2,520	6.0	1.3	2.3
Aug. 2	Bottom	80	.07	40	46	410	20	14	172	713	.7	7.3	1,540	289	285	2,650	7.5	.9	1.8
Sept. 2	Top	77	.11	46	55	420	17	22	187	750	.4	5.5	1,630	341	323	2,780	6.4	.9	1.8
Sept. 2	Bottom	77	.11	46	55	420	17	22	187	750	.4	5.5	1,630	341	323	2,810	7.3	.9	1.8

NORTH ATLANTIC SLOPE BASINS, NEW YORK TO YORK RIVER

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 1953 to September 1954.  
EXTREMES, 1953-54.--Water temperatures: Maximum, 86°F July 31; minimum, freezing point on several days during November and January.  
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1332.

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

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

LOCATION.--At Henry Clay Bridge in Wilmington, New Castle County, 0.2 mile upstream from gaging station, and 4.4 miles upstream from mouth. DRAINAGE AREA.--314 square miles. RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1954.

Sediment records: December 1946 to September 1954. EXTREMES, 1953-54.--Sediment concentrations: Maximum daily, 712 ppm May 4; minimum daily, 1 ppm on several days during December and on June 1, Sept. 18. Sediment loads: Maximum daily, 4,580 tons May 4; minimum daily, less than 0.5 tons Sept. 7, 8, 18. EXTREMES, 1946-54.--Sediment concentrations: Maximum daily, 1,420 ppm July 9, 1952; minimum daily, 1 ppm on many days. Sediment loads: Maximum daily, 17,300 tons Nov. 25, 1950; minimum daily, less than 0.5 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 1953 to September 1954 given in WSP 1352.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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
															Calcium magnesium	Non-carbonate		
Apr. 15, 1954	240						5.7		36	20	6.5		6.0		52	22	147	7.7
Apr. 28	528						5.3		30	20	4.5		4.6		44	10	128	7.6
June 3	214						5.4		42	19	6.0		3.8		54	20	146	7.2
July 6	134						7.4		46	21	8.0		4.1		58	20	175	7.8

## NORTH ATLANTIC SLOPE BASINS, NEW YORK TO YORK RIVER

## DELAWARE RIVER BASIN--Continued

## BRANDYWINE CREEK AT WILMINGTON, DELAWARE--Continued

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	101	5	1	167	3	1	163		
2.....	98	4	1	147	2	1	157	2	1
3.....	94	4	1	137	3	1	153	2	1
4.....	96	5	1	128	5	2	147	2	1
5.....	98	6	2	125	3	1	182	4	2
6.....	106	8	2	131	3	1	184	13	6
7.....	131	9	3	167	3	1	1,070	234	s 760
8.....	114	9	3	196	3	2	456	70	86
9.....	109			200	3	2	280	20	15
10.....	109			212	4	2	822	132	s 420
11.....	109	5	1						
12.....	106			224	2	1	548	93	138
13.....	103			245	4	3	372	45	45
14.....	101			255	2	1	802	60	130
15.....	101	6	2	240	2	1	2,270	473	s 3,530
16.....	103			228	4	2	1,120	125	378
17.....	103			260	7	5	568	30	46
18.....	101			240	6	4	432	25	29
19.....	101	10	3	208	7	4	325	4	4
20.....	98			185	8	4	280	2	2
21.....	101			167	6	3	306	1	1
22.....	101	13	4	160	6	3	284	1	1
23.....	98	19	5	157	5	2	284	2	2
24.....	98	21	6	264	11	s 9	284	1	1
25.....	103			335	14	s 12	250	1	1
26.....	109			255	16	11	222	1	1
27.....	106	7	2	325	10	9	232	1	1
28.....	195			228	7	4	222	1	1
29.....	195			196			218	1	1
30.....	729	340	s 1,030	178	2	1	232	1	1
31.....	879	135	s 356	170			232	1	1
Total.	4,637	--	1,465	6,130	--	95	13,319	--	5,608
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.....	204			182			601	50	81
2.....	200	2	1	214	3	2	1,530	308	s 1,230
3.....	200			218			736	193	s 374
4.....	200			214	3	2	736	60	119
5.....	193			204	2	1	448	20	24
6.....	196	3	2	196	2	1	380	14	14
7.....	190			193	2	1	346	10	9
8.....	176			182	3	1	320	9	8
9.....	172			200	2	1	306	6	5
10.....	190			196	5	3	300	4	3
11.....	160			204	14	8	278	7	5
12.....	180			196	10	5	272	11	8
13.....	170			160	3	1	294	7	6
14.....	170			186	4	2	608	66	s 116
15.....	200	5	3	186	3	2	544	40	59
16.....	294			196	6	3	365	10	10
17.....	350			245	8	5	320	10	9
18.....	190	4	3	272	4	3	294	10	8
19.....	236			209	8	5	289	10	8
20.....	267			193	9	5	808	43	94
21.....	712	19	s 42	283	24	18	552	28	42
22.....	696	4	8	432	41	48	402	17	18
23.....	280	5	4	313	28	24	358	9	9
24.....	306			245	9	6	346	25	23
25.....	262			245	8	5	453	12	15
26.....	262	4	3	240	3	2	640	18	31
27.....	300			256	7	5	440	6	7
28.....	320			232	6	4	380	6	6
29.....	236			--	--	--	352	5	5
30.....	218	4	3	--	--	--	330	11	10
31.....	204			--	--	--	332	7	6
Total.	7,934	--	122	6,292	--	167	14,369	--	2,362

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

BRANDYWINE CREEK AT WILLINGTON, DELAWARE--Continued

Suspended sediment, water year October 1953 to September 1954--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.....	346	5	5	346	24	22	218	1	1
2.....	320	8	7	326	8	7	218	2	1
3.....	300	10	8	410	15	17	214	2	1
4.....	278	10	8	1,870	712	s 4,580	209	9	5
5.....	272	9	7	736	160	318	204	10	6
6.....	289	10	8	512	24	33	196	16	8
7.....	339	16	15	440	17	20	193	17	9
8.....	313	17	14	456	21	26	190	9	5
9.....	306	15	12	480	19	25	182	12	6
10.....	278	13	10	520	21	29	182	7	3
11.....	267	12	9	528	21	30	190	8	4
12.....	262	13	9	418	24	27	186	13	7
13.....	245	14	9	380	15	15	176	11	5
14.....	245	15	10	352	10	10	168	14	6
15.....	240	14	9	346	9	8	172	19	9
16.....	262	8	6	332	6	5	240	26	17
17.....	504	14	19	320	6	5	209	25	14
18.....	544	13	19	313	10	8	186	19	10
19.....	339	18	16	300	11	9	172	18	8
20.....	284	19	15	364	10	10	162	15	7
21.....	262	15	11	568	20	31	155	10	4
22.....	250	14	9	410	25	28	150	16	6
23.....	299	14	11	326	8	7	150	14	6
24.....	313	12	10	294	8	6	145	13	5
25.....	287	14	10	284	10	8	140	11	4
26.....	262	12	8	284	9	7	138	22	8
27.....	544	45	66	262	7	5	136	14	5
28.....	800	53	114	256	6	6	124	11	4
29.....	528	29	41	262	3	2	126	14	5
30.....	402	33	36	245	2	1	126	14	5
31.....	--	--	--	227	2	1	--	--	--
<b>Total.</b>	<b>10,160</b>	<b>--</b>	<b>531</b>	<b>13,167</b>	<b>--</b>	<b>5,306</b>	<b>5,257</b>	<b>--</b>	<b>184</b>
	July			August			September		
1.....	126	18	6	64	6	1	194	16	8
2.....	126	18	6	62	7	1	125	3	1
3.....	122	26	9	215	28	s 18	108	6	2
4.....	122	17	6	265	12	9	98	8	2
5.....	128	14	5	145	13	5	95	6	2
6.....	134	13	5	142	10	4	88	3	1
7.....	130	6	2	133	8	3	82	2	(t)
8.....	128	9	3	108	8	2	80	2	(t)
9.....	120	10	3	130	12	4	82	6	1
10.....	114	2	1	378	20	s 21	85	5	1
11.....	112	5	2	184	13	6	125	14	5
12.....	108	9	3	125	8	3	125	21	7
13.....	104	7	2	108	8	2	100	6	2
14.....	102	6	2	102	11	3	92	4	1
15.....	116	5	2	100	9	2	82	4	1
16.....	116	5	2	105	13	4	98	3	1
17.....	104	5	1	112	16	5	122	2	1
18.....	100	8	2	100	8	2	110	1	(t)
19.....	98	8	2	90	7	2	105	3	1
20.....	96	10	3	100	6	2	108	5	1
21.....	92	10	2	152	10	4	110	2	1
22.....	90	10	2	280	11	8	167	9	4
23.....	88	8	2	174	10	5	122	4	1
24.....	82	11	2	122	28	9	98	6	2
25.....	78	10	2	110	21	6	90	10	2
26.....	82	5	1	102	14	4	88	9	2
27.....	82	8	2	98	12	3	85	5	1
28.....	80	10	2	98	26	7	82	4	1
29.....	74	9	2	98	17	4	80	7	2
30.....	72	6	1	95	13	3	82	8	2
31.....	68	5	1	271	26	s 20	--	--	--
<b>Total.</b>	<b>3,194</b>	<b>--</b>	<b>86</b>	<b>4,368</b>	<b>--</b>	<b>172</b>	<b>3,108</b>	<b>--</b>	<b>57</b>

Total discharge for year (cfs-days)..... 91,935

Total load for year (tons)..... 16,155

s Computed by subdividing day.

t Less than 0.5 tons.

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

Chemical analyses, in parts per million, water year October 1953 to September 1954

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
															Calcium	Non-carbonate		
NESHAMINY CREEK AT NEWPORTVILLE, PA.																		
Oct. 28, 1953	23.5		3.4	0.14	10	2.7	10	9.8	57	25	14		3.4	101	74	24	206	7.0
Aug. 25, 1954									22	22	6.5	0.8	6.9		36	16	129	7.4
POQUESSING CREEK AT PHILADELPHIA, PA.																		
Oct. 28, 1953	24.6						17	30	30	30	20		11	140	57	32	207	6.6
Aug. 25, 1954	5.1		11	0.02	16	5.5	19	19	22	30	28	0.1	19		62	44	254	7.3
PENNYPACK CREEK AT PHILADELPHIA, PA.																		
Oct. 28, 1953	78.2						11		36	28	13		8.5	164	60	30	199	6.9
Aug. 25, 1954	15.5		9.2	0.07	15	4.3	7.9		27	30	9.5	0.3	5.9		55	33	164	7.4
FRANKFORD CREEK, BRIDGE STREET, PHILADELPHIA, PA.																		
Oct. 28, 1953	20						44		246	4.9	11		0.4	946	126	126	636	6.6
Aug. 25, 1954			12	0.58	40	8.5	194	154	336	55		0.9	.6		135	9	1,520	7.3
SCHUYLKILL RIVER AT MANAYUNK, PA.																		
Oct. 1-9, 1953	261		8.4	0.03	44	18	21		66	130	24	0.2	7.4	367	184	130	514	7.5
DANBY CREEK AT DANBY, PA.																		
Oct. 28, 1953							12		32	20	16		11	311	53	27	169	6.7
Aug. 25, 1954	12		11	0.02	19	6.2	32		44	35	44	0.1	9.5		73	37	311	7.5

DARBY CREEK AT DARBY TOWNSHIP, PA.

Oct. 28, 1953 .....					23	120	4.2	18		0.4		78	78	318	6.7
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CRUM CREEK AT EDDYSTONE, PA.

Oct. 28, 1953 .....	11.3				11	32	31	13		1.0		54	28	176	6.9
Aug. 25, 1954 .....	2.25	6.4	0.02	14	4.7	12	44	28	8.5	0.2	3.1	118	54	187	7.8

RIDLEY CREEK AT CHESTER, PA.

Oct. 28, 1953 .....					11	32	17	14		9.1		48	22	155	6.4
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RIDLEY CREEK AT MOYLAND, PA.

Oct. 28, 1953 .....	39				6.9	31	14	10		11		48	23	146	6.6
Aug. 25, 1954 .....	5.1	15	0.02	12	5.2	16	32	16	12	0.1	16	103	51	174	7.6

CHESTER CREEK, ROUTE 13

Oct. 28, 1953 .....					21	42	27	25		10		61	27	229	6.6
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CHESTER CREEK AT MORGAN, PA.

Oct. 28, 1953 .....	74				21	46	31	23		12		66	28	239	6.6
Aug. 25, 1954 .....	18	16	0.02	14	6.5	21	30	32	28	0.1	7.0	181	62	261	8.0

MARCUS HOOK CREEK, TRAINOR, PA.

Oct. 28, 1953 .....	8.4				13	22	62	15		6.8		80	62	255	6.5
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DELAWARE RIVER BASIN--Continued  
MISCELLANEOUS ANALYSES OF STREAMS IN DELAWARE RIVER BASIN IN PENNSYLVANIA--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--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
															Calcium-magnesium	Non-carbonate		
MARCUS HOOK CREEK, MARCUS HOOK, PA.																		
Aug. 25, 1954.....	1.0						79		24	385	34		0.8		298	278	1,030	6.2
NAAMANS CREEK AT MARCUS HOOK, PA.																		
Oct. 28, 1954.....	30						55		45	35	96		2.7		92	50	460	6.6



COREY CREEK NEAR MAINESBURG, PA.

LOCATION.--At gaging station, 1.1 miles downstream from Mainesburg, Tioga County, 3½ miles east of Mansfield, and 4¼ miles upstream from mouth.

DRAINAGE AREA.--12.2 square miles.

RECORDS AVAILABLE.--Sediment records: May to September 1954.

EXTREMES, May to September 1954.--Sediment concentrations: Maximum daily, 939 ppm May 29; minimum daily, 2 ppm on many days.

Sediment loads: Maximum daily, 175 tons June 1; minimum daily, less than 0.005 tons many days during July, August and September.

REMARKS.--Station established May 1954 as an index station for the Corey Creek Watershed Project and part of an SCS Pilot Watershed study of Corey Creek. Records of specific conductance and pH of periodic sediment samples available in district office at Philadelphia, Pa. Records of discharge for period May to September 1954 given in WSP 1332.

Suspended sediment, May to September 1954

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.....				23	--	--	25	673	s175
2.....				21	--	--	41	150	17
3.....				22	--	e 0.2	13	20	.70
4.....				58	--	--	28	56	s4.70
5.....				39	--	--	15	10	.40
6.....				35	2	.19	12	5	.16
7.....				26	2	.14	9.0	5	.12
8.....				33	17	1.5	6.8	5	.09
9.....				26	3	.21	5.8	4	.06
10.....				20	3	.16	4.8	8	.10
11.....				16	4	.17	4.2	7	.08
12.....				14	2	.08	3.3	12	.11
13.....				12	2	.06	6.5	12	.21
14.....				9.6	2	.05	3.5	6	.05
15.....				8.4	2	.05	2.9		
16.....				7.3	4	.08	2.3	8	.04
17.....				6.1	3	.05	2.3		
18.....				5.0	7	.09	2.0		
19.....				4.8	8	.10	1.8		
20.....				4.6	6	.07	1.4		
21.....				4.2	3	.03	1.1	4	.01
22.....				3.5	4	.04	1.0		
23.....				3.2	3	.03	3.2	10	.09
24.....				2.9	2	.02	5.8		
25.....				3.5	5	.05	1.4		
26.....				2.4	2	.01	1.1	6	.02
27.....				2.4	2	.01	1.0		
28.....				2.8	156	s2.4	1.2		
29.....				14	939	s66	1.0		
30.....				8.8	80	1.9	.9		
31.....				3.9	30	.32	--		
Total.				442.4	--	74.81	208.3	--	199.40

e Estimated.

s Computed by subdividing day.

## NORTH ATLANTIC SLOPE BASINS, NEW YORK TO YORK RIVER

## SUSQUEHANNA RIVER BASIN--Continued

## COREY CREEK NEAR MAINESBURG, PA.--Continued

## Suspended sediment, May to September 1954--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.....	0.9	7	0.02	0.1	5	(t)	1.1	4	0.01
2.....	.7			.2	4	(t)	.7		
3.....	.7			.6	3	0.01	.5		
4.....	1.3			1.6			.3		
5.....	1.2			.7			.3		
6.....	1.0	8	.02	.5	2	(t)	.2	4	(t)
7.....	.9			.3			.2		
8.....	1.0			.3			.7		
9.....	.7			.3			.7		
10.....	.6	4	.01	.2	4	(t)	.4	4	(t)
11.....	.5			.3			.4		
12.....	.5			.3			.4		
13.....	.3	5	.01	.3	8	.01	.3	4	(t)
14.....	.4			.2			.3		
15.....	1.6			.3			.5		
16.....	.7			6			.01		
17.....	.5	3	(t)	.3	10	.01	1.1	8	.02
18.....	.4			.2			.8	7	b.02
19.....	.5			.2			.7	6	b.01
20.....	.4			.2			.6	4	b.01
21.....	.3			.2			.5	6	(t)
22.....	.3	.2	.8						
23.....	.2	.1	.4						
24.....	.2	.1	.4						
25.....	.2	.3	.4						
26.....	.2	8	(t)	.3	4	(t)	.4	2	(t)
27.....	.2			.3			.4		
28.....	.2			.3			.4		
29.....	.2			.2			.4		
30.....	.2	5	.01	1.0	8	.11	.3	--	--
31.....	.2			4.1			.3		
Total.	17.2	--	0.31	14.5	--	0.28	17.4	--	0.24
Total discharge for period (cfs-days).....									699.8
Total load for period (tons).....									275.04

t Less than 0.005 ton.

b Computed from water-sediment discharge curve.

SUSQUEHANNA RIVER BASIN--Continued

ELK CREEK NEAR MAINESBURG, PA.

LOCATION.--At gaging station, 2.7 miles northeast of Mainesburg, Tioga County, 5.8 miles east of Mansfield and 5½ miles upstream from mouth.  
DRAINAGE AREA.--10.2 square miles.

RECORDS AVAILABLE.--Sediment records: May to September 1954.

EXTREMES, May to September 1954.--Sediment concentrations: Maximum daily, 554 ppm, June 1; minimum daily, 1 ppm on many days.

Sediment loads: Maximum daily, 193 tons June 1; minimum daily, less than 0.005 tons on many days.

REMARKS.--Station established May 1954 as an index station for Elk Creek Watershed Project and part of SCS Pilot Watershed Study of Corey Creek which is adjacent to Elk Creek. Records of specific conductance and pH of periodic sediment samples available in district office at Philadelphia, Pa. Records of discharge for period May to September 1954 given in WSP 1332.

Suspended sediment, May to September 1954

Day	Suspended sediment			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.....				22			37	554	s 193
2.....				20			69	269	s 110
3.....				21			14	10	.38
4.....				56	--	e 0.5	20	80	s 5
5.....				39			14	12	.45
6.....				35			14	7	.26
7.....				23	8	.50	13	6	.21
8.....				29	26	s 2.1	8.7	5	.12
9.....				26	11	.77	6.5	6	.11
10.....				21	8	.45	6.7		
11.....				19	7	.36	5.6	2	.03
12.....				18	7	.34	4.5		
13.....				13	5	.18	8.3		
14.....				9.8	4	.11	4.8	3	.05
15.....				8.7	4	.09	4.2		
16.....				7.3	5	.10	3.8		
17.....				6.4	4	.07	3.3	2	.02
18.....				5.6	4	.06	2.8		
19.....				4.8	4	.05	2.3		
20.....				4.2	6	.07	1.7	2	.01
21.....				3.8	5	.05	1.2		
22.....				3.4	8	.07	1.1	4	.01
23.....				3.2	6	.05	3.0	10	.08
24.....				3.1	4	.03	6.0	7	.11
25.....				3.1	14	.12	1.5	2	.01
26.....				2.5	7	.05	1.1	1	(t)
27.....				2.2	4	.02	.9	1	(t)
28.....				2.7	168	1.2	1.0	1	(t)
29.....				14	221	s 13	1.0	1	(t)
30.....				11	79	s 3.6	.9	5	.01
31.....				5.3	9	.13	--	--	--
Total.				443.1	--	26.57	261.9	--	310.09

e Estimated.  
s Computed by subdividing day.  
t Less than 0.005 tons.

SUSQUEHANNA RIVER BASIN

SUSQUEHANNA RIVER BASIN--Continued

ELK CREEK NEAR MAINESBURG, PA.--Continued

Suspended sediment, May to September 1954--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.....	0.9	4	0.01	0.1	5	(t)	2.0	2	b 0.04
2.....	.9			0			.7		
3.....	.9			.1			.4		
4.....	.9			1.4			.3		
5.....	.9			.3			.3		
6.....	.9	4	01	.3	1	(t)	.2	2	(t)
7.....	.9			.3			.2		
8.....	1.0			.2			.6		
9.....	1.0			.2			.4		
10.....	1.0			.2			.3		
11.....	.9	2	(t)	.2	1	(t)	.2	1	(t)
12.....	.9			.2			.2		
13.....	.9			.2			.2		
14.....	.8			.2			.2		
15.....	1.1			.2			.6		
16.....	.9	3	(t)	.2	2	(t)	.5	2	(t)
17.....	.7			.2			.5		
18.....	.7			.1			.5		
19.....	.7			.1			.5		
20.....	.6			.1			.5		
21.....	.6	2	(t)	0	4	(t)	.5	1	(t)
22.....	.5			0			.5		
23.....	.4			0			.4		
24.....	.4			.2			.4		
25.....	.4			.6			.4		
26.....	.3	4	(t)	.5	2	(t)	.3	1	(t)
27.....	.2			.4			.3		
28.....	.2			.2			.2		
29.....	.1			.2			.2		
30.....	0			.6			.2		
31.....	.1	4	(t)	4.5	8	s 0.02	.2	--	--
Total.	20.7			--	0.17	12.0	--		

Total discharge for period (cfs - days) ..... 750.4  
 Total load for period (tons) ..... 337.19

e Estimated.  
 s Computed by subdividing day.  
 t Less than 0.005 tons.  
 b Computed from water-sediment discharge curve.

SUSQUEHANNA RIVER BASIN--Continued  
CHEMUNG RIVER AT CHEMUNG, N. Y.

LOCATION --At gaging station at highway bridge, three-quarters of a mile southwest of Chemung, Chemung County and 10 miles upstream from mouth.  
DRAINAGE AREA 2,530 square miles, approximately.  
RECORDS AVAILABLE --Chemical analyses October 1953 to September 1954.

Water temperatures: October 1953 to September 1954.

EXTREMES 1953-1954. --Dissolved solids: Maximum, 316 ppm Aug. 1-10; minimum, 97 ppm May 3-7.

Total hardness: Maximum, 182 ppm Nov. 1-10; minimum, 52 ppm Apr. 18-20, May 3-7, June 3-4, 5.

Specific conductance: Maximum daily, 586 micromhos May 28; minimum daily, 127 micromhos Mar. 3.

Water temperatures: Maximum, 78°F June 23, Aug. 1; minimum, freezing point on several days in January and Feb. 13.

REMARKS --Records of specific conductance of daily samples available in district office, Albany, N. Y. Records of discharge for water year October 1953 to September 1954 given in WSP 1332.

Chemical analyses, in parts per million, water year October 1953 to September 1954.

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	
														Total	Non-carbonate				Unfiltered	Filtered
Oct. 1-10, 1953	170	2.5	0.19	52	11	14	2.8	151	50	23	0.1	2.1	253	176	52	406	7.8	7	3.8	3.6
Oct. 11-20	172	2.2	1.0	50	12	16	3.0	142	62	23	.1	2.6	242	177	60	415	7.9	8	4.5	2.4
Oct. 21-31	169	1.0	.51	51	12	18	2.7	154	47	31	.1	3.1	248	179	53	427	7.8	12	3.2	2.2
Nov. 1-10	171	2.5	.16	53	12	19	2.2	158	56	26	.1	1.9	255	182	53	429	7.7	8	2.3	1.5
Nov. 11-20	312	1.3	.12	48	12	18	2.2	142	57	28	.1	1.4	242	173	56	409	7.6	16	2.1	1.4
Nov. 21-24	735	1.0	--	43	9.5	15	2.6	121	55	19	.1	1.1	228	148	49	354	7.3	15	--	--
Nov. 25-30	710	5.1	--	29	6.3	8.1	2.6	70	42	13	.1	.9	154	99	42	243	7.0	14	6.5	2.2
Nov. 21-30	--	--	.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec. 1-10	549	3.6	.13	37	8.2	11	1.7	87	62	14	.0	1.6	176	127	55	294	7.5	14	2.4	1.6
Dec. 11-20	890	2.9	.27	30	6.2	11	1.8	74	46	11	.1	1.3	153	101	40	241	7.2	13	2.7	1.5
Dec. 21-31	870	2.8	.18	31	6.7	11	1.6	81	48	12	.0	1.4	159	106	39	252	7.6	12	2.5	1.4
Jan. 1-10, 1954	458	2.5	.11	37	8.0	13	1.9	99	50	16	.0	1.5	173	126	45	293	7.6	8	2.3	1.4
Jan. 11-20	325	2.8	.09	46	9.5	16	2.5	127	57	20	.2	2.4	220	184	50	364	7.6	10	2.0	1.5
Jan. 21-24	1,140	3.8	--	41	7.0	16	2.0	112	51	19	.1	2.3	216	132	40	344	7.6	19	8.4	2.0
Jan. 25-27	1,200	--	--	--	--	10	--	84	35	13	--	1.9	--	103	34	251	7.5	--	--	--
Jan. 28-31	2,920	--	--	--	--	--	6.3	53	29	7.1	--	1.8	--	71	28	176	7.3	--	--	--
Jan. 21-31	--	--	.53	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 1-10	897	9.8	.12	36	6.2	7.6	1.6	76	36	12	.1	3.8	147	101	38	239	7.3	15	--	--
Feb. 11-16	725	3.8	--	30	7.6	11	1.6	96	39	16	.1	3.8	173	122	43	292	7.7	20	10	3.6
Feb. 17-20	6,030	3.8	--	21	3.3	9.5	2.2	51	24	14	.2	3.2	115	87	25	166	7.5	20	--	--
Feb. 11-20	--	--	.14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 21-28	4,800	4.8	.21	19	3.3	7.2	1.7	40	29	13	.1	1.3	118	61	28	167	7.1	15	--	24

SUSQUEHANNA RIVER BASIN--Continued  
 CHEMUNG RIVER AT CHEMUNG, N. Y.--Continued

Chemical analyses in parts per million, water year October 1953 to September 1954--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	
														Total	Non-carbonate				Unfiltered	Filtered
Mar. 1-2, 6-10, 1954	7,030	5.2	--	21	4.3	9.6	2.0	43	34	16	0.2	1.0	134	71	36	195	7.4	16	23	6.5
Mar. 3-5	9,490	--	0.45	--	--	6.6	--	33	27	8.3	--	--	--	53	26	144	7.4	--	--	--
Mar. 1-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mar. 11-20	2,010	4.5	.13	24	4.5	18	1.1	66	29	26	.1	1.8	144	79	25	252	7.4	15	5.1	3.5
Mar. 21-26	2,060	3.7	--	26	5.4	19	1.6	62	35	29	.1	1.6	166	87	36	266	7.3	14	4.0	2.8
Mar. 27-31	3,290	--	.08	--	--	--	--	49	33	20	--	1.5	--	63	23	201	7.4	--	--	--
Mar. 21-31	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 1-2, 4-7, 10	3,770	3.1	--	20	4.0	12	.9	50	28	18	.0	1.6	124	68	27	183	7.4	7	3.2	2.5
Apr. 3	3,570	--	--	--	--	16	--	42	30	30	--	1.0	40	68	40	234	6.9	--	--	--
Apr. 8, 9	5,180	--	.06	--	--	8.0	--	40	27	11	--	1.4	--	60	27	165	7.4	--	--	--
Apr. 1-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 11-17	3,290	3.3	--	22	4.9	15	1.4	54	31	22	.0	1.0	134	75	31	221	7.5	7	3.5	2.1
Apr. 18-20	7,690	--	--	--	--	8.9	--	36	27	9.2	--	1.2	--	52	23	147	7.5	--	--	--
Apr. 11-20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 23-28	5,470	3.9	--	20	2.9	14	1.5	50	26	22	.2	1.1	124	62	21	205	7.4	2	3.9	2.5
Apr. 21, 22, 30	5,300	--	--	--	--	9.2	--	45	24	12	--	1.7	--	60	23	170	7.5	--	--	--
Apr. 29	1,080	--	.17	--	--	5.3	--	25	22	7.0	--	1.4	--	53	32	145	6.7	--	--	--
Apr. 21-30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
May 1, 2, 8-10	6,900	5.5	--	19	2.3	11	1.3	47	24	15	.2	1.0	115	58	19	182	7.6	5	6.9	2.6
May 3-7	12,700	5.9	--	17	2.2	5.9	1.5	40	22	8.8	.2	1.4	97	52	19	146	7.4	10	2.9	3.6
May 1-10	--	--	.24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
May 11-17	3,110	4.3	--	24	3.8	20	1.3	64	29	29	.2	1.0	152	76	24	254	7.8	2	2.9	2.4
May 18-20	1,530	--	--	--	--	33	--	86	32	47	--	.6	--	99	29	353	7.7	--	--	--
May 11-20	--	--	.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
May 21-24	1,110	1.8	--	33	5.8	44	1.6	92	36	68	.1	.8	--	106	31	432	7.8	1	2.6	2.5
May 25-30	1,020	1.3	--	37	6.7	58	1.7	102	51	91	.1	1.0	306	120	37	529	7.7	1	3.8	2.7
May 31	1,840	--	.09	--	--	16	--	71	30	26	--	.6	--	92	34	292	7.7	--	--	--
May 21-31	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June 2, 4, 5	13,900	--	--	--	--	16	--	86	27	23	--	.8	--	96	25	275	6.8	6	--	--
June 3, 4, 5	5,790	--	--	--	--	11	--	49	21	10	--	1.0	--	52	12	164	7.2	5	--	--
June 1, 6-10	2,010	6.2	--	24	5.4	10	1.5	73	25	14	.1	.8	140	82	22	219	7.5	8	4.9	4.4
June 1-10	--	--	.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June 11-14, 16-17	1,180	9.9	--	31	6.6	23	2.0	92	35	37	.2	1.0	198	104	29	327	7.3	8	4.6	3.3
June 15, 18, 20	920	--	--	--	--	34	--	98	30	50	--	.8	--	108	29	387	7.4	7	--	--



## SUSQUEHANNA RIVER BASIN--Continued

## CHEMUNG RIVER AT CHEMUNG, N. Y.--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
 /Once-daily measurement at approximately 7:30 a. m. /

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



SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT TOWANDA, PA.

LOCATION.--At Bridge Street Bridge at Towanda, Bradford County, 1 3/4 miles upstream from Towanda Creek.

DRAINAGE AREA.--7,797 square miles.

RECORDS AVAILABLE.--Sediment records: January 1951 to July 1954.

EXTREMES, 1953-54.--Sediment concentrations: Maximum daily, 1,040 ppm Mar. 2; minimum daily, 2 ppm many days during October, December and February.

Sediment loads: Maximum daily, 139,000 tons Mar. 2; minimum daily, 3 tons Oct. 2.

EXTREMES, 1951-54.--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 1953 to September 1954 given in WSP 1332. Flow affected by ice Jan. 11-22. This station discontinued July 31, 1954.

Suspended sediment, October 1953 to July 1954

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.....	551	4	6	929	3	9	3,160	4	34		
2.....	524	2	3	1,350							
3.....	515	4	6	1,660	3	11	2,730				
4.....	488			2,550							
5.....	497			2,490							
6.....	682	4	11	1,120	4	12	2,530	28	847		
7.....	842			1,130							
8.....	1,030			1,100							
9.....	1,150	4	19	1,090	3	12	14,400	100	3,890		
10.....	1,780			1,090			14,400			87	2,600
11.....	1,640	4	14	1,100	3	12	11,200	22	877		
12.....	1,390			1,190							
13.....	1,180			1,330							
14.....	1,060	2	5	1,490	3	12	8,100	8	175		
15.....	988			1,590			11,400			22	877
16.....	916			1,610			11,400			17	523
17.....	890	2	4	1,610	3	12	9,700	--	e370		
18.....	842			1,610			6,900			--	e110
19.....	794			1,590			5,040			4	55
20.....	770	1,570	4,380								
21.....	759	2	4	1,500	3	12	5,210	6	111		
22.....	737			1,410			5,210			5,780	
23.....	693			2,710			80			585	6,320
24.....	682	2	4	4,860	32	420	7,900	3	38		
25.....	660			4,860			51			669	7,300
26.....	630			5,210			38			535	5,940
27.....	640	2	4	4,690	7	66	5,390	3	38		
28.....	671			4,520			18			228	5,040
29.....	693			4,050			10			122	4,690
30.....	715	2	4	3,490	7	66	4,380	3	38		
31.....	748			--			--			--	4,050
Total.	26,137	--	214	64,099	--	2,955	209,970	--	12,695		

e Estimated.

s Computed by subdividing day.

## SUSQUEHANNA RIVER BASIN--Continued

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

## Suspended sediment, October 1953 to July 1954--Continued

Day	January			February			March			
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day	
1.....	3,620			10,400	15	421	19,800	50	2,670	
2.....	3,060	4	36	8,800	9	214	47,500	1,040	s 139,000	
3.....	3,160			8,800	7	166	43,100	265	s 35,200	
4.....	3,310			8,800	6	143	29,800	55	4,430	
5.....	3,240			7,950	5	107	21,500	32	1,860	
6.....	3,280	5	42	7,320	3	59	17,000	18	826	
7.....	3,210			6,520	2	35	14,500	15	587	
8.....	2,640			5,440	7	103	13,000	13	456	
9.....	2,150			5,440	5	73	12,600	11	374	
10.....	2,360	3	15	5,120	4	55	11,700	9	284	
11.....	1,600			4,960	2	27	11,700	9	284	
12.....	1,250			4,660	2	25	10,800	10	292	
13.....	1,200			2,940	2	16	9,680	10	261	
14.....	1,450			3,650	3	30	9,900	8	214	
15.....	1,600			3,790	2	20	11,700	7	221	
16.....	2,200	--	e 13	5,570	15	226	11,200	8	242	
17.....	2,100			23,300	208	s 19,900	9,900	5	134	
18.....	1,700			52,300	380	53,700	9,020	4	97	
19.....	1,600			46,700	190	24,000	8,160	3	66	
20.....	2,000			33,700	80	7,280	8,580	4	93	
21.....	2,500	10	a 69	29,200	50	3,940	13,400	12	s 445	
22.....	6,900	50	a 932	41,400	124	s 14,100	15,500	15	628	
23.....	10,600	26	s 716	38,300	90	9,310	13,500	12	437	
24.....	9,100	20	491	30,400	40	3,280	11,700	10	316	
25.....	7,300	18	355	25,000	30	2,020	11,200	11	333	
26.....	6,700	12	217	23,500	20	1,270	14,500	16	s 636	
27.....	12,200	90	s 3,820	23,500	20	1,270	18,000	30	1,460	
28.....	28,400	118	s a 8,800	20,000	20	1,080	16,000	20	864	
29.....	24,500	55	a 3,640	--	--	--	14,000	13	491	
30.....	18,000	36	1,750	--	--	--	14,000	10	378	
31.....	13,500	22	802	--	--	--	13,500	7	255	
Total.	186,430	--	22,067	487,460	--	142,870	486,440	--	193,834	
		April			May			June		
1.....	13,500	5	182	21,000	40	2,270	5,960	13	209	
2.....	12,600	4	136	20,500	120	6,640	16,800	326	s 22,400	
3.....	12,200	6	264	20,500	158	s 8,720	19,100	262	s 15,000	
4.....	12,200	6	198	56,300	660	s 102,000	15,500	50	2,090	
5.....	10,800	5	146	48,400	155	21,200	14,300	30	1,170	
6.....	10,600	4	114	31,600	60	5,120	11,700	20	632	
7.....	13,600	11	s 439	21,000	30	1,940	9,900	17	454	
8.....	15,500	37	1,550	20,500	19	1,050	8,580	14	324	
9.....	14,500	28	1,100	24,000	24	1,550	7,320	13	257	
10.....	13,500	20	729	21,500	23	1,330	6,330	9	154	
11.....	11,700	13	411	21,000	18	1,020	5,780	12	187	
12.....	11,700	13	411	20,500	18	996	6,920	11	206	
13.....	13,000	15	526	10,000	16	821	7,320	13	257	
14.....	12,600	14	478	16,000	12	518	9,900	24	642	
15.....	11,000	14	416	13,500	16	583	10,400	37	1,040	
16.....	10,400	13	365	11,700	16	505	8,160	25	551	
17.....	20,100	90	s 6,270	10,400	12	337	6,520	23	405	
18.....	41,100	201	s 22,300	9,240	9	225	5,780	21	328	
19.....	34,600	73	6,820	7,950	5	107	4,960	11	147	
20.....	29,200	57	4,490	7,120	7	135	4,360	6	71	
21.....	22,000	43	2,550	6,520	8	141	3,790	13	133	
22.....	17,500	24	1,130	6,330	7	120	3,430	7	65	
23.....	17,000	31	1,420	6,520	7	123	3,150	8	68	
24.....	20,500	36	1,990	7,950	6	129	3,150	7	60	
25.....	19,500	33	1,740	7,950	8	172	3,210	6	52	
26.....	17,000	30	1,380	6,720	6	109	3,130	3	25	
27.....	15,500	30	1,260	5,780	4	62	2,790	7	53	
28.....	27,000	80	s 6,290	5,440	3	44	2,520	20	136	
29.....	30,400	105	8,620	5,120	3	41	2,470	15	100	
30.....	25,600	41	2,830	5,780	3	47	2,570	12	83	
31.....	--	--	--	6,520	3	53	--	--	--	
Total.	536,400	--	77,053	495,340	--	158,108	216,000	--	47,299	

e Estimated.

s Computed by subdividing day.

a Computed from estimated concentration graph.

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT TOWANDA, PA.--Continued

Suspended sediment, October 1953 to July 1954--Continued

Day	July			Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment			
	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.....	2,570	3	21								
2.....	2,330	4	25								
3.....	2,350	4	25								
4.....	2,280	4	25								
5.....	2,120	6	34								
6.....	2,020	3	16								
7.....	1,840	4	20								
8.....	1,780	2	10								
9.....	1,680	2	9								
10.....	1,580	2	9								
11.....	1,520	2	8								
12.....	1,420										
13.....	1,310	8	29								
14.....	1,240										
15.....	1,240										
16.....	1,210	6	21								
17.....	1,390										
18.....	1,720										
19.....	1,580	4	17								
20.....	1,290										
21.....	1,090										
22.....	1,060	5	14								
23.....	1,050										
24.....	1,050										
25.....	1,050	3	8								
26.....	1,030										
27.....	1,000										
28.....	948										
29.....	920	7	18								
30.....	920										
31.....	881										
<b>Total</b>	<b>45,469</b>	<b>--</b>	<b>559</b>								
Total discharge for period (cfs-days) .....							2,753,745				
Total load for period (tons) .....							657,654				

## NORTH ATLANTIC SLOPE BASINS, NEW YORK TO YORK RIVER

## 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.

DRAINAGE AREA.--3,354 square miles.

RECORDS AVAILABLE.--Sediment records: January 1951 to September 1954.

EXTREMES, 1953-54.--Sediment concentrations: Maximum daily, 1,130 ppm Mar. 2; minimum daily, 1 ppm several days during October and July.

Sediment loads: Maximum daily, 128,000 tons Mar. 2; minimum daily, 2 tons several days during October and July.

EXTREMES, 1951-54.--Sediment concentrations: Maximum daily, 1,130 ppm Mar. 2, 1954; minimum daily, 0 ppm several days.

Sediment loads: Maximum daily, 128,000 tons Mar. 2, 1954; minimum daily, 0 tons several days.

REMARKS.--Flow affected by ice Nov. 7, Jan. 9-29, Feb. 12-14. Records of discharge for water year October 1953 to September 1954 given in WSP 1332.

## Suspended sediment, water year October 1953 to September 1954

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.....	635			569	2	3	648		
2.....	635			525			602	--	b19
3.....	547			475	7	9	648		
4.....	547			591			591	12	19
5.....	547			595			672	12	22
6.....	495	2	3	425	4	6	730	9	18
7.....	465			640			1,890		
8.....	624			635			1,780		
9.....	660			580			1,720	--	b25
10.....	624			602			1,530		
11.....	613			685	10	17	1,340		
12.....	580			685			1,160	--	b16
13.....	505			660			1,210		
14.....	425	2	3	580			2,000		
15.....	416			591			2,580		
16.....	475			624	5	8	2,560	--	b42
17.....	465			525			2,260		
18.....	525			495			1,340	--	b18
19.....	525	6	7	580			699	--	b10
20.....	475			580			1,230		
21.....	416			613	3	5	1,410	--	b16
22.....	547			591			1,170		
23.....	536			1,020			1,110		
24.....	495	2	3	1,400			878		
25.....	515			1,600	--	b19	788		
26.....	495			1,140			921		
27.....	525			872			851	--	b11
28.....	547			784			788		
29.....	591	3	5	698			660		
30.....	648	1	2	672			748		
31.....	591			--			722		
Total.	16,679	--	97	20,972	--	306	37,236	--	612

b Computed from water-sediment discharge curve.

SUSQUEHANNA RIVER BASIN--Continued

JUNIATA RIVER AT NEWPORT, PA.--Continued

Suspended sediment, water year October 1953 to September 1954--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.....	680	--	b 10	2,560	--	b 50	7,920	161	s 7,390
2.....	726	--	b 10	1,930			43,100	1,130	s 128,000
3.....	685	--	b 10	1,690			38,900	368	s 41,100
4.....	613	--	b 9	1,800	--	b 27	19,600	126	s 6,940
5.....	635	--	b 9	1,650			12,200	95	3,130
6.....	664	--	b 9	1,470			8,990	65	1,580
7.....	748	--	b 10	1,290			7,020	37	701
8.....	572			1,090			6,020	28	455
9.....	520			1,110	--	b 16	5,340	33	476
10.....	540	4	6	1,120			4,940	26	347
11.....	620			1,010			4,420	13	155
12.....	640			840			3,920	10	106
13.....	540			520			3,550	7	67
14.....	450			460	--	b 10	3,430	9	83
15.....	580	3	5	962			3,430	13	120
16.....	740			830			3,800	15	154
17.....	800			1,820			4,040	18	196
18.....	720			2,040			3,920	16	169
19.....	640			2,130	--	b 32	3,550	15	144
20.....	680			2,040			3,920	18	191
21.....	800	2	4	2,940	--	b 70	4,680	29	366
22.....	920			5,740	--	b 910	4,940	34	453
23.....	1,100			5,470	--	b 800	5,970	23	315
24.....	1,250			4,300	--	b 600	4,690	15	190
25.....	1,700	6	24	4,040	50	545	5,070	22	301
26.....	1,500			3,920	35	370	6,720	54	980
27.....	2,100	10	57	3,900	30	308	6,870	60	1,110
28.....	4,500	135	184	3,430	35	324	6,300	44	748
29.....	5,200		b 340	--	--	--	5,740	32	496
30.....	3,470	--	b 110	--	--	--	5,600	28	423
31.....	3,120	--	b 80	--	--	--	5,340	23	332
Total.	38,453	--	969	61,802	--	4,349	253,020	--	197,218
	April			May			June		
1.....	4,300			7,160	35	877	2,190	7	41
2.....	4,420			6,870	36	868	2,330	14	88
3.....	3,670	14	147	7,610	50	1,030	5,040	46	s 622
4.....	3,800			16,100	322	s 14,800	5,340	118	1,700
5.....	3,190			13,400	118	s 4,450	6,580	155	2,750
6.....	3,430			9,630	40	1,040	5,200	137	1,920
7.....	3,550			7,460	28	564	4,420	80	955
8.....	3,310	10	88	7,460	21	423	3,800	44	451
9.....	3,090			8,060	20	435	2,860	28	216
10.....	2,980			6,720	20	363	2,700	20	146
11.....	2,420			6,300	21	357	3,020	208	1,670
12.....	2,490	14	96	5,470	25	369	3,430	261	2,350
13.....	2,740			5,070	24	329	3,920	75	794
14.....	2,650			4,680	20	253	3,050	85	700
15.....	2,380	10	68	4,040	18	196	2,670	44	317
16.....	2,540			3,920	19	201	2,310	22	137
17.....	6,460	48	s 1,450	3,550	15	144	2,440	25	165
18.....	10,000	96	s 2,640	3,310	12	107	2,170	28	164
19.....	8,370	69	1,560	3,430	12	111	1,950	17	90
20.....	7,020	50	948	2,900	10	78	1,780	10	48
21.....	5,880	37	587	3,550	20	192	1,610	10	43
22.....	5,200	31	435	4,170	23	259	1,530		
23.....	4,810	24	312	4,040	15	164	1,570	5	21
24.....	4,810	21	273	3,670	15	149	1,530		
25.....	5,200	25	351	3,190	10	86	1,760		
26.....	4,300	22	248	2,810	11	835	1,450	4	16
27.....	4,170	22	248	2,880	15	117	1,190		
28.....	7,720	35	1,960	2,470	11	73	1,120		
29.....	10,600	164	4,690	2,150	6	35	931	2	5
30.....	8,060	55	1,211	2,260	7	43	978		
31.....	--	--	--	3,050	7	58	--	--	--
Total.	143,460	--	18,576	167,380	--	27,654	80,869	--	15,493

s Computed by subdividing day.

b Computed from water-sediment discharge curve.

## SUSQUEHANNA RIVER BASIN--Continued

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

Suspended sediment, water year October 1953 to September 1954--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.....	946	14	28	722	--	e 6	1,110	8	24	
2.....	916			708			930	6	15	
3.....	844			558			858			
4.....	1,090	9	28	558	4	7	774	--	b 10	
5.....	1,190			710						
6.....	1,650	2	6	788	3	7	698	--	b 6	
7.....	1,390			830						
8.....	1,190			872						
9.....	1,140			858						
10.....	946			858						
11.....	962	2	4	981	4	9	547	--	b 7	
12.....	830			1,060						
13.....	735			886						
14.....	788			816						
15.....	858			735						
16.....	839	3	10	735	3	7	602	--	b 14	
17.....	1,190			748						
18.....	2,150			648						
19.....	1,590			790						
20.....	794			1,090						
21.....	735	1	2	900	3	9	1,120	--	b 21	
22.....	766			931						
23.....	624			978						
24.....	735			946						
25.....	602			1,570						
26.....	602	2	3	991	3	6	840	5	9	
27.....	590			748						
28.....	580			774						
29.....	580			722						
30.....	558			660						
31.....	624	1,950	48	s 317	--	--	8	13		
Total.	29,005	--	293	27,071	--	542	23,510	--	375	
Total discharge for year (cfs-days)										899,457
Total load for year (tons)										266,684

e Estimated.

s Computed by subdividing day.

b Computed from water-sediment discharge curve.

SUSQUEHANNA RIVER BASIN--Continued  
SHERMAN CREEK AT SHERMANDALE, PA.

LOCATION --Temperature recorder at gaging station at highway bridge on State Highway 34 at Shermandale, Perry County, 1 1/2 miles upstream from Fishing Run. DRAINAGE AREA --200 square miles.

RECORDS AVAILABLE --June 1953 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 89° F July 31; minimum freezing point on many days during December and January.

EXTREMES, 1952-54.--Water temperatures: Maximum, 89° F Sept. 2, 1953, July 31, 1954; minimum, freezing point on many days during December 1953 and January 1954.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1332.

Temperature (°F) of water, water year October 1953 to September 1954  
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.....	72	62	54	46	41	39	34	32	33	33	46	42	48	43	59	55	70	82	82	70	84	78	70	65
2.....	69	57	56	46	42	38	35	32	33	33	44	40	48	43	66	68	85	85	85	72	80	74	75	64
3.....	67	56	52	46	41	36	32	33	33	33	42	38	47	44	67	61	69	64	83	73	78	72	78	68
4.....	65	56	50	47	43	36	37	32	34	33	39	36	46	41	61	54	70	66	75	71	80	70	79	68
5.....	63	59	48	43	44	40	33	32	35	33	37	35	46	41	54	67	62	65	69	76	71	81	68	68
6.....	59	55	44	36	43	40	34	32	37	33	38	35	50	46	54	50	66	59	79	68	79	68	84	71
7.....	59	52	36	34	44	42	34	32	37	33	41	36	57	49	52	50	70	60	73	71	80	68	84	74
8.....	59	48	42	35	42	40	33	32	33	33	43	38	57	54	53	50	74	64	77	68	79	68	78	74
9.....	58	48	44	36	41	40	33	32	36	33	43	38	56	50	54	51	73	68	80	67	76	69	79	70
10.....	59	49	44	37	42	40	32	32	38	33	46	42	55	49	53	50	73	69	78	66	75	68	73	69
11.....	59	50	44	37	40	38	32	32	37	33	44	41	55	53	52	49	78	70	79	67	74	69	73	67
12.....	61	52	44	39	40	38	32	32	35	33	43	40	56	51	53	50	78	71	82	68	75	66	74	62
13.....	60	50	41	39	40	39	32	32	33	33	43	41	58	49	55	52	80	74	83	71	78	65	72	61
14.....	56	48	43	41	41	40	32	32	33	33	42	40	59	53	56	51	81	74	85	73	77	65	72	63
15.....	58	48	46	40	41	39	32	32	36	33	41	38	59	56	57	53	76	72	81	74	76	70	66	62
16.....	59	50	48	40	39	35	32	32	32	36	41	35	55	52	62	54	72	66	79	70	82	70	68	62
17.....	61	50	48	41	35	34	32	32	44	41	43	37	52	50	61	68	69	64	81	68	82	71	73	63
18.....	58	49	47	41	34	34	32	32	41	38	44	39	56	49	62	56	76	64	78	71	80	67	69	69
19.....	60	52	46	40	34	34	32	32	42	36	43	40	60	52	62	57	78	66	83	72	84	70	72	66
20.....	61	52	45	39	34	33	32	32	39	37	44	43	64	56	61	55	80	67	85	72	80	74	70	66
21.....	61	52	45	42	34	33	32	32	42	39	43	39	67	59	57	53	83	71	82	75	76	69	66	61
22.....	62	55	51	45	37	34	32	32	43	41	42	36	68	61	60	54	86	74	82	71	77	68	64	60
23.....	61	51	52	49	38	34	32	32	42	39	42	40	67	62	62	62	81	75	80	69	76	70	66	56
24.....	60	49	46	46	34	33	32	32	40	39	46	40	62	59	64	66	80	73	81	69	81	70	67	57
25.....	57	50	48	45	33	33	32	32	42	40	46	44	64	58	64	61	83	73	82	69	84	74	69	56
26.....	58	49	45	41	34	33	32	32	40	39	49	44	65	61	69	60	85	72	83	70	82	75	71	60
27.....	53	49	41	39	34	33	32	32	40	37	48	44	64	58	66	62	83	71	84	71	76	71	71	61
28.....	51	53	41	38	33	32	32	32	42	39	49	44	56	56	66	61	75	69	83	73	78	70	73	60
29.....	56	53	41	36	36	33	33	33	42	40	46	46	57	55	55	55	68	68	84	76	80	68	73	62
30.....	57	50	40	38	35	34	33	33	42	40	48	47	54	54	54	54	78	67	88	74	74	70	75	65
31.....	55	47	--	--	35	32	33	33	--	--	48	45	--	--	--	--	78	67	89	77	70	66	--	--
Average.....	60	52	46	41	38	36	33	32	38	36	44	40	57	52	59	55	76	68	81	71	78	70	73	64

## SUSQUEHANNA RIVER BASIN--Continued

## BIXLER RUN NEAR LOYSVILLE, PA.

LOCATION.--At bridge on Pennsylvania Highway 850, 400 feet downstream from gaging station, 3.6 miles west of Loysville, Perry County, and 2.3 miles upstream from mouth.

DRAINAGE AREA.--15.0 square miles.

RECORDS AVAILABLE.--Sediment records: February to September 1954.

EXTREMES, February to September 1954.--Sediment concentrations: Maximum daily, 986 ppm June 10; minimum daily, 1 ppm many days.

Sediment loads: Maximum daily, 269 tons Mar. 1; minimum daily less than 0.05 tons many days during August and September.

REMARKS.--Station established February 1954 as an index station for the Bixler Run Watershed Project. Records of specific conductance and pH of periodic sediment samples available in district office at Philadelphia, Pa. Records of discharge for period February 1954 to September 1954 given in WSP 1332.

## Suspended sediment, February to September 1954

Day	Mean discharge (cfs)	Suspended sediment		February			March		
		Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
					Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....				8.7			194	294	s269
2.....				7.3			98	44	12
3.....				6.7			69	93	s23
4.....				6.1			42	13	1.5
5.....				5.5			31	12	1.0
6.....				5.0			25	10	.7
7.....				4.5			24	8	.5
8.....				5.0			21	8	.5
9.....				5.6	--	e.1	20	8	.4
10.....				5.5			18	9	.4
11.....				5.0			17	7	.3
12.....				4.1			16	5	.2
13.....				4.5			26	49	s4.9
14.....				5.0			24	10	.6
15.....				5.5			18	5	.2
16.....				5.5			16	2	.1
17.....				17	21	s1.1	16	3	.1
18.....				9.4	14	.4	15	1	(t)
19.....				8.0	10	.2	19	29	s2.7
20.....				7.3	10	.2	30	23	s2.9
21.....				89	198	s66	16	3	.1
22.....				58	44	6.9	15	2	.1
23.....				31	20	2.0	15	4	.2
24.....				25	10	.7	15	5	.2
25.....				23	10	.6	40	80	s11
26.....				22	5	.3	32	16	1.4
27.....				18	3	.2	23	15	.9
28.....				16	3	.1	22	15	.9
29.....				--	--	--	20	11	.6
30.....				--	--	--	19	9	.5
31.....				--	--	--	17	6	.3
Total.				413.2	--	80.3	973	--	337.2

e Estimated.

s Computed by sub-dividing day.

t Less than 0.05 tons.



SUSQUEHANNA RIVER BASIN--Continued

BIXLER RUN NEAR LOYSVILLE, PA.--Continued

Suspended sediment, February to September 1954 --Continued

Day	April			May			June		
	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.....	16			14	10	0.4	8.7	37	s 2.1
2.....	14			14	10	.4	19	253	s 20
3.....	16	5	0.2	92	216	s 101	11	33	.9
4.....	13			94	66	s 21	28	354	s 43
5.....	13			42	15	1.7	11	28	.8
6.....	13			31	10	.8	8.8	12	.3
7.....	14			29	27	2.1	7.6	10	.2
8.....	13	7	.2	35	23	2.2	6.9	12	.2
9.....	10			24	4	.3	6.7	12	.2
10.....	10			24	6	.4	14	986	s 88
11.....	11			20	2	.1	15	633	s 49
12.....	11			19	2	.1	8.0	68	1.5
13.....	11	4	.1	18	1	(t)	7.2	66	1.3
14.....	10			18	1	(t)	6.4	42	.7
15.....	11			16	1	(t)	6.7	40	.7
16.....	19	20	s 1.1	15	1	(t)	6.7	39	.7
17.....	53	69	s 12	14	1	(t)	6.4	34	.6
18.....	31	15	1.3	13	1	(t)	5.9	24	.4
19.....	23	9	.5	12	2	.1	5.6	28	.4
20.....	19			19	14	.7	5.4	29	.4
21.....	17			15	2	.1	5.4	30	.4
22.....	16			12	2	.1	5.2	39	.6
23.....	16	8	.3	11	2	.1	6.4	80	1.4
24.....	14			9.7	2	.1	5.4	47	.7
25.....	14			9.2	3	.1	5.0	28	.4
26.....	13	8	.3	8.4	2	(t)	4.9	30	.4
27.....	18			8.0	2	(t)	4.8	28	.4
28.....	20			7.6	2	(t)	4.8	19	.2
29.....	16	9	.4	8.0	9	.2	4.8	20	.3
30.....	14			10	18	.5	4.8	23	.3
31.....	--	--	--	6.9	2	(t)	--	--	--
Total.	489	--	21.4	668.8	--	132.9	246.5	--	216.5
	July			August			September		
1.....	4.8	20	0.3	4.0			4.6	12	0.1
2.....	4.6	15	.2	4.1			4.4	5	.1
3.....	4.5	15	.2	4.8			4.5	5	.1
4.....	6.2	90	.8	4.2			4.2		
5.....	6.2	65	e 1.1	5.8	--	e 0.3	4.1		
6.....	5.0	19	.3	4.8			4.0	--	e (t)
7.....	5.2	15	.2	4.2			4.0		
8.....	5.0	13	.2	4.2			4.0		
9.....	4.8			9.7	50	1.7	3.9		
10.....	4.6	11	.1	5.0			3.8		
11.....	4.6			4.5			3.9	1	(t)
12.....	4.5			4.2			3.6		
13.....	4.5	12	.1	4.2	--	e. 1	3.6	--	e (t)
14.....	4.5			4.2			3.6		
15.....	6.8	67	1.2	4.4			4.4	--	e. 2
16.....	4.6	15	.2	4.5			4.5	--	e. 3
17.....	4.6			4.5	11	.1	4.0	4	(t)
18.....	4.5			4.1			3.9	--	e (t)
19.....	4.5	9	.1	4.1			5.0	--	e. 2
20.....	4.5			4.1			4.7	--	e. 2
21.....	4.5			5.6	--	e. 2	5.5	45	.7
22.....	4.4			4.5			5.2	9	.1
23.....	4.4			4.1			4.2	5	.1
24.....	4.4			4.6			4.1		
25.....	4.2	8	a. 1	4.2	4	(t)	4.0		
26.....	4.2			4.1			3.9		e (t)
27.....	4.1			4.0	--	e (t)	3.9		
28.....	4.1			4.0			3.8		
29.....	4.1			4.1			3.8	2	(t)
30.....	4.2	9	a. 1	8.0	120	s 4.4	3.8	--	(t)
31.....	4.1			10	102	s 4.2	--	--	--
Total.	145.2	--	6.8	150.8	--	15.1	124.9	--	2.8
Total discharge for period (cfs-days) .....									3,211.4
Total load for period (tons) .....									813.0

e Estimated.

s Computed by sub-dividing day.

t Less than 0.05 tons.

a Computed from estimated concentration graph.

POTOMAC RIVER BASIN  
CRABTREE CREEK NEAR SWANTON, MD.

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

DRAINAGE AREA.--16.7 square miles.

RECORDS AVAILABLE.--Water temperatures: February 1952 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 81° F July 14, 31; minimum, freezing point on several days during January, February, and March.

REMARKS.--Temperatures only fair, probably because of friction in recorder. Records of discharge for water year 1953-54 given in WSP 1332.

Temperature (°F) of water, water year October 1953 to September 1954

Recorder with temperature attachment, continuous ethylalcohol-actuated thermograph

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

a Recorder stopped; range in temperature only from Apr. 4 to May 1; maximum 60°; minimum 36° during this period.

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.  
 DRAINAGE AREA.--681 square miles above power plant; 677 square miles above gaging station.  
 RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1954.  
 EXTREMES, 1953-54.--Water temperatures: Maximum observed, 80°F Aug. 1; minimum observed, 32°F Feb. 4.  
 EXTREMES, 1946-54.--Water temperatures: Maximum observed, 96°F July 23, 1952; minimum observed, 32°F many days most years.  
 REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1332.

Temperature (°F) of water, water year October 1953 to September 1954

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

POTOMAC RIVER BASIN--Continued  
POTOMAC RIVER AT HANCOCK, MD.

LOCATION.--Temperature recorder at gaging station on left bank 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 Tonoloway Creek (formerly called Great or Big Tonoloway Creek). DRAINAGE AREA.--4,073 square miles.

RECORDS AVAILABLE.--Water temperatures: July 1952 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 91° F July 31; minimum, 33° F Dec. 18-22, 24-29.

EXTREMES, 1952-54.--Water temperatures: Maximum, 93° F July 22, 1952; minimum, 33° F Dec. 30, 1952, Jan. 1, Dec. 18-22, 24-29, 1953.

REMARKS.--Temperatures only fair, probably because of friction in recorder. Records of discharge for water year October 1953 to September 1954 given in WSP 1532.

Temperature (°F) of water, water year October 1953 to September 1954

/Recorder with temperature attachment, continuous ethyl alcohol-actuated thermograph/

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

a Recorder stopped; range in temperature from Nov. 25 to Dec. 4, 38° to 49°, Dec. 6, 7, 38° to 41°.

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 1954.  
Water temperatures: April 1953 to September 1954.

Sediment records: April 1953 to September 1954.  
EXTREMES, 1953-54.--Hardness: Maximum, 172 ppm Oct. 21-31; minimum, 77 ppm Mar. 1-10.  
Specific conductance: Maximum daily observed, 405 micromhos Dec. 16; minimum daily observed, 127 micromhos Mar. 2, 4.  
Water temperatures: Maximum, 87 F July 14; minimum, freezing point on several days in January.  
Sediment concentrations: Maximum daily, 726 ppm Mar. 2; minimum daily, 1 ppm on many days.

Water quality: Maximum daily, 1 ton on many days.  
EXTREMES, 1952-54.--Hardness: Maximum, 142 ppm Oct. 21-31, 1953; minimum, 65 ppm Feb. 23-28, 1953.  
Specific conductance: Maximum, 405 micromhos Dec. 16, 1953; minimum daily, 111 micromhos Feb. 24, 1953.

Water temperatures: Maximum, 87 F July 14, 1953; minimum, 32 F Jan. 2, 1954; minimum daily, 1 ppm on many days during each year.  
Sediment loads (April 1953 to September 1954): Maximum daily, 726 ppm Mar. 2, 1954; minimum daily, 1 ton on many days during each year.  
Sediment loads (April 1953 to September 1954): Maximum daily, 33,300 tons Mar. 2, 1954; minimum daily, 1 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 1953 to September 1954 given in WSP 1332.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean dis-charge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Cal-cium (Ca)	Mag-nesium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO <sub>3</sub> )	Car-bonate (CO <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			
Oct. 1-10, 1953	348	1.8	0.02	34	18	9.2	3.0	183	0	21	8.7	0.0	0.4	181	158	9	310	8.2	10
Oct. 11-20	360	---	.01	36	16	---	---	184	8	20	---	---	---	---	189	21	310	8.5	14
Oct. 21-30	438	---	.01	36	20	---	---	190	0	24	---	---	---	---	172	16	340	7.9	10
Nov. 1-10	369	---	.01	36	17	---	---	184	0	22	---	---	---	---	181	9	331	8.0	10
Nov. 11-20	338	---	.01	38	16	---	---	185	0	20	---	---	---	---	181	9	331	8.2	8
Nov. 21-30	410	---	.02	37	17	---	---	188	0	17	---	---	---	---	184	8	329	8.3	10
Dec. 1-10	437	---	.01	35	15	---	---	175	0	12	---	---	---	---	150	6	316	8.0	7
Dec. 11-20	756	---	.02	40	15	---	---	178	0	16	---	---	---	---	180	17	335	7.7	10
Dec. 21-31	487	---	.02	33	13	---	---	147	0	18	---	---	---	---	136	15	294	7.6	10
Jan. 1-10, 1954	421	15	.00	38	14	7.2	2.2	175	0	7	6.6	.0	1.9	174	152	10	322	8.2	5
Jan. 11-20	681	---	.02	38	12	---	---	184	0	15	---	---	---	---	144	10	300	8.2	7
Jan. 21-31	1,033	---	.01	35	12	---	---	150	0	18	---	---	---	---	139	14	280	7.9	7
Feb. 1-10	719	---	.02	32	9.7	---	---	148	0	12	---	---	---	---	120	16	246	7.7	7
Feb. 11-20	540	---	.02	34	12	---	---	128	0	18	---	---	---	---	136	13	276	7.9	5
Feb. 21-28	1,671	---	.01	29	10	---	---	116	0	13	---	---	---	---	115	18	238	7.5	7
Mar. 1-10	5,253	---	.03	20	6.5	---	---	78	0	5	---	---	---	---	77	13	160	7.5	5
Mar. 11-20	2,057	---	.01	25	8.5	---	---	101	0	7	---	---	---	---	96	15	195	7.6	7
Mar. 21-31	2,299	---	.01	24	8.7	---	---	101	0	7	---	---	---	---	96	13	196	7.6	7

POTOMAC RIVER BASIN--Continued  
 SOUTH FORK SHENANDOAH RIVER AT FRONT ROYAL, VA.--Continued  
 Chemical analyses, in parts per million, water year October 1953 to September 1954.--Continued

Date of collection	Mean dis-charge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Cal-cium (Ca)	Mag-ne-sium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO <sub>3</sub> )	Car-bonate (CO <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 conductance (micro-mhos at 25°C)	pH	Color
															Calcium	Non-carbonate			
Apr. 1-10, 1954.....	1,530	4.8	0.02	27	6.6	4.9	1.4	109	0	12	4.9	0.0	3.0	132	94	5	223	7.8	5
Apr. 11-20.....	1,674	--	.01	24	7.7	--	--	100	0	5	--	--	--	--	80	10	199	8.1	6
Apr. 21-30.....	1,648	--	.02	23	6.6	--	--	84	16	11	--	--	--	--	87	0	209	8.7	9
May 1-10.....	1,058	--	.02	26	9.9	--	--	121	0	7	--	--	--	--	101	6	225	8.2	8
May 11-20.....	867	--	.01	25	7.9	--	--	101	0	11	--	--	--	--	95	12	201	7.8	10
May 21-31.....	2,396	--	.01	25	9.4	--	--	104	0	9	--	--	--	--	102	16	204	8.1	8
June 1-5, 12.....	1,376	--	.06	29	7.9	--	--	115	0	14	--	--	--	--	120	11	220	7.9	9
June 21, 24-30.....	1,018	--	.05	25	6.1	--	--	93	0	21	--	--	--	--	88	11	193	7.7	5
July 1-10.....	509	2.8	.03	33	9.2	6.2	2.1	144	0	12	6.8	.1	1.2	155	120	2	272	8.1	5
July 11-20.....	546	--	.00	34	11	--	--	148	3	14	--	--	--	--	130	7	279	8.5	10
July 21-31.....	382	--	.01	34	12	--	--	109	23	21	--	--	--	--	134	16	277	9.1	10
Aug. 1-10.....	354	--	.01	34	12	--	--	107	27	13	--	--	--	--	134	2	264	9.2	10
Aug. 11-16, 30.....	325	--	.04	34	14	--	--	132	14	11	--	--	--	--	142	11	283	8.7	10
Sept. 1-10.....	236	--	.04	39	15	--	--	142	12	15	--	--	--	--	152	15	310	8.6	15
Sept. 11-20.....	315	--	.05	39	15	--	--	136	14	14	--	--	--	--	144	18	310	8.7	17
Sept. 21-30.....	418	--	.05	38	16	--	--	150	11	16	--	--	--	--	161	19	324	8.6	10
Average.....	a 993	--	0.02	32	12	--	--	137	--	14	--	--	--	--	129	12	268	--	9

a Discharge average includes only days on which samples were collected.

POTOMAC RIVER BASIN--Continued

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

Temperature (°F) of water, water year October 1953 to September 1954

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

## POTOMAC RIVER BASIN--Continued

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

Suspended sediment, water year October 1953 to September 1954

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.....	369			446	1	a1	350		
2.....	362			414			340		
3.....	355	1	1	355			350		
4.....	341			334	1	1	350	1	1
5.....	348			334			341		
6.....	348	1	1	348			369		
7.....	327			376			540		
8.....	320			369			540		
9.....	355			369			560		
10.....	334			348	1	1	630		
11.....	362	1	1	334			520	1	1
12.....	334			308			500		
13.....	341			334	1	a1	530		
14.....	376			320	1	a1	780	6	13
15.....	369			334	1	a1	995		
16.....	341	1	1	348	1	a1	1,130		
17.....	362			369	1	a1	1,030	9	22
18.....	406			348	1	a1	716		
19.....	348			334	1	a1	697		
20.....	362	2	2	355	1	a1	680		
21.....	369			362	1	a1	517		
22.....	362			355	1	a1	569	4	6
23.....	341	1	1	414			526		
24.....	382			406			534		
25.....	406			500	1	1	520		
26.....	369	1	1	510			500		
27.....	355			430			460	1	1
28.....	376			390			450		
29.....	500	1	1	376	1	1	470		
30.....	681	1	a2	362			450	1	a1
31.....	590	1	2	--	--	--	487	1	1
Total.	11,771	--	37	11,182	--	30	17,391	--	173
	January			February			March		
1.....	452			951			6,440	478	s.12,000
2.....	414			877			17,000	726	33,300
3.....	421	1	1	785	2	4	6,990	492	11,900
4.....	421			765			5,250	126	1,790
5.....	414			697			3,900	55	579
6.....	421			707			2,940	28	222
7.....	414			641			2,450	14	93
8.....	399	1	1	632	2	3	2,100	8	45
9.....	429			623			1,820	5	25
10.....	429			509			1,640	4	18
11.....	437	14	17	569			1,440	3	12
12.....	429			569			1,430	1	4
13.....	391			560	1	1	1,460	3	12
14.....	501	1	1	534			2,030	7	38
15.....	551			534			2,660	16	115
16.....	526			534			2,800	21	159
17.....	534	1	a1	509			2,520	16	109
18.....	578	3	5	526	1	1	2,170	12	70
19.....	795	5	11	543			1,890	8	41
20.....	669	2	4	526			2,170	11	64
21.....	735	1	a2	641	1	2	3,680	37	368
22.....	726	1	2	795	5	11	3,750	38	385
23.....	716	1	2	3,150	68	a636	3,010	43	349
24.....	805	1	2	2,660	20	144	2,520	25	170
25.....	835	1	2	2,030	28	153	2,170	16	94
26.....	962	1	3	1,580	20	85	1,960	15	79
27.....	1,110	10	30	1,290	10	35	1,820	8	39
28.....	1,520	19	78	1,220	5	16	1,700	7	32
29.....	1,490	4	16	--	--	--	1,640	6	27
30.....	1,370	4	15	--	--	--	1,520	5	21
31.....	1,100	3	9	--	--	--	1,520	4	16
Total.	20,994	--	214	25,957	--	1,127	98,390	--	62,176

s Computed by subdividing day.

a Computed from estimated concentration graph.



POTOMAC RIVER BASIN--Continued

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

Suspended sediment, water year October 1953 to September 1954--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.....	1,520	3	12	1,220	5	16	1,340	3	11
2.....	1,520	5	21	1,040	5	a 14	1,960	6	32
3.....	1,520	4	16	1,040	5	14	1,290	4	14
4.....	1,480	4	16	1,080	5	15	952	3	8
5.....	1,470	3	12	1,150	4	12	966	3	8
6.....	1,440	3	12	1,130	4	12	868	3	7
7.....	1,490	3	12	1,060	3	9	784	4	8
8.....	1,520	4	16	1,040	3	8	744	5	10
9.....	1,640	4	18	938	2	5	718	2	4
10.....	1,700	3	14	882	3	7	1,090	1	3
11.....	1,640	3	a 13	882	3	7	1,220	58	191
12.....	1,480	3	12	798	4	9	1,750	7	7
13.....	1,370	3	11	666	3	5	1,960	5	26
14.....	1,280	2	7	692	3	6	1,820	16	79
15.....	1,250	2	7	757	3	6	3,380	40	s 399
16.....	1,220	2	7	896	3	7	3,680	99	984
17.....	1,340	2	7	980	3	8	2,400	357	2,310
18.....	1,700	7	a 32	1,040	2	6	1,780	341	1,640
19.....	2,870	13	101	910	2	5	2,100	301	1,710
20.....	2,590	7	49	1,050	3	9	2,850	217	1,670
21.....	2,170	5	29	3,150	23	196	2,480	93	623
22.....	1,820	4	20	5,100	68	936	2,020	44	240
23.....	1,600	3	13	3,600	32	311	1,480	26	104
24.....	1,480	3	12	2,800	22	166	1,280	16	55
25.....	1,680	7	32	2,310	11	69	1,030	10	28
26.....	1,640	13	58	1,960	8	42	766	6	12
27.....	1,550	7	29	1,640	6	27	836	6	14
28.....	1,690	13	59	1,530	4	17	682	5	9
29.....	1,530	8	33	1,440	4	16	536	4	6
30.....	1,320	6	21	1,390	10	38	536	4	6
31.....	--	--	--	1,440	5	19	--	--	--
Total.	48,520	--	701	45,611	--	2,017	45,298	--	10,244
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.....	536	3	4	332	5	4	458	3	4
2.....	484	2	a 3	272	4	3	484	3	4
3.....	308	1	1	296	6	5	344	2	2
4.....	536	1	1	419	6	7	260	2	1
5.....	536	1	1	368	6	6	188		
6.....	575	2	3	432	6	7	140	2	1
7.....	588	9	14	344	4	4	176		
8.....	710	29	56	320	5	4	200		
9.....	484	7	9	380	4	4	248		
10.....	332	2	2	380	4	4	344	3	3
11.....	497	4	5	356	5	5	575	2	3
12.....	526	3	4	356	4	4	406	3	3
13.....	393	3	3	272	4	3	332	3	3
14.....	176	5	2	200	2	1	272	3	2
15.....	562	8	12	272	2	1	248		
16.....	471	7	9	296	2	2	260		
17.....	780	4	8	248	2	1	212	3	2
18.....	850	6	14	248	2	1	188		
19.....	640	5	9	406	2	1	176		
20.....	562	7	11	368	4	4	484	2	3
21.....	296	6	5	497	4	5	520	2	3
22.....	471	6	8	380	6	6	484	1	1
23.....	484	6	8	356	3	3	508	2	3
24.....	458	5	6	471	3	3	424	2	2
25.....	458	6	7	432	3	3	412	2	2
26.....	356	5	5	432	1	1	388	2	2
27.....	344	6	6	344	3	3	388	3	3
28.....	368	6	6	523	2	3	364	2	2
29.....	356	6	6	588	2	3	340	2	2
30.....	284	7	5	523	3	4	352	1	1
31.....	332	5	4	549	3	4	--	--	--
Total.	14,753	--	237	11,660	--	109	10,175	--	64

Total discharge for year (cfs-days) ..... 361,702  
 Total load for year (tons) ..... 77,129

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

## POTOMAC RIVER BASIN--Continued

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

Particle-size analyses of suspended sediment, water year October 1953 to September 1954

(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	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		
Mar. 1, 1954 ...	7:14 p. m.	10,170		911	43	63	82	93	97	99	100	100			BWCM
Mar. 2 ...	8:10 a. m.	13,350		622	27	40	68	85	90	96	98	100			BN
May 22 .....	7:30 a. m.	5,400		114	22	46	68	85	94	98	100				BWCM

POTOMAC RIVER BASIN--Continued  
 LINGANORE CREEK NEAR FREDERICK, MD.  
 LOCATION --Temperature recorder at gaging station on left bank, 2 1/2 miles upstream from mouth, and 4 miles east of Frederick, Frederick, County  
 DRAINAGE AREA --82.3 square miles.  
 RECORDS AVAILABLE --82.3 square miles.  
 RECORDS 1953-54. --Water temperatures: Maximum, 88°F July 31; minimum, freezing point on several days during December and January.  
 EXTREMES 1951-54. --Water temperatures: Maximum, 88°F July 31, 1954; minimum, freezing point on many days during winter months.  
 REMARKS. --Records of discharge for water year October 1953 to September 1954 given in WSP 1332.

Temperature (°F) of water, water year October 1953 to September 1954  
 /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.....	67	61	54	49	41	39	37	34	33	33	51	46	49	43	67	59	78	68	82	71	85	78	71	64
2.....	64	56	54	48	41	38	37	34	33	33	47	42	52	42	64	57	74	64	80	72	80	70	72	64
3.....	63	55	55	49	39	36	37	36	36	36	45	42	52	47	72	64	74	67	78	72	76	71	76	66
4.....	63	54	53	50	44	38	38	36	37	34	42	36	50	44	66	58	71	67	78	73	78	70	76	68
5.....	62	57	50	45	43	43	36	34	36	34	38	35	49	45	58	53	67	63	74	71	74	71	78	67
6.....	61	55	45	35	45	41	36	35	36	35	40	35	56	47	57	57	69	67	67	67	77	68	80	70
7.....	57	51	39	35	47	43	36	35	36	33	44	37	64	54	56	54	70	61	72	69	78	68	80	72
8.....	56	48	41	37	43	40	35	34	34	33	46	40	62	57	57	54	74	64	75	69	77	68	75	72
9.....	56	47	41	37	43	39	35	33	35	33	48	40	60	51	57	53	73	66	75	72	76	71	76	71
10.....	56	48	42	39	47	43	37	33	38	33	49	44	58	49	55	52	72	69	75	67	76	69	74	71
11.....	57	49	43	39	44	41	33	32	39	35	46	42	61	53	56	51	78	69	78	68	76	69	72	67
12.....	59	51	43	39	42	41	32	32	36	33	42	41	63	55	58	53	80	70	79	68	76	66	71	63
13.....	57	49	43	40	43	42	32	32	33	33	42	42	62	51	58	54	80	73	80	68	76	66	69	60
14.....	55	48	42	41	43	42	32	32	36	33	44	42	65	53	56	55	81	72	84	73	74	65	70	62
15.....	56	50	45	41	43	40	32	32	32	32	43	35	61	58	57	53	76	69	77	72	74	70	67	65
16.....	58	52	47	42	40	37	32	32	40	42	36	58	55	65	55	71	68	77	68	88	77	72	72	65
17.....	59	53	47	43	37	33	32	32	32	32	50	46	46	38	55	52	62	60	68	66	78	68	77	72
18.....	59	53	47	43	33	32	32	32	47	42	48	40	60	50	60	58	74	65	78	70	74	66	71	66
19.....	60	55	46	42	32	32	32	32	45	39	45	41	66	56	62	56	76	64	81	73	77	69	73	68
20.....	60	55	46	42	33	32	32	32	42	41	49	45	69	59	60	55	77	65	82	73	77	65	70	68
21.....	61	55	47	44	33	32	36	32	47	42	47	41	72	61	57	53	80	69	78	74	75	69	68	64
22.....	62	57	53	47	40	38	36	33	49	45	46	37	72	62	61	54	82	72	81	71	75	68	65	61
23.....	53	55	52	40	38	33	33	33	46	42	45	43	70	64	65	60	75	60	70	73	69	64	67	60
24.....	55	53	52	49	38	34	33	33	43	40	49	41	66	60	67	64	71	60	69	76	73	69	63	56
25.....	58	53	49	46	34	32	34	37	42	42	48	47	68	59	68	78	70	81	69	79	72	66	66	56
26.....	57	52	46	42	32	32	40	34	47	43	54	46	67	63	70	62	79	71	82	70	78	74	68	60
27.....	54	52	42	40	33	32	45	40	45	40	47	65	62	71	65	81	72	83	70	75	71	67	60	59
28.....	59	54	41	40	35	33	43	35	46	42	53	44	63	60	70	65	73	68	83	72	75	71	68	59
29.....	58	56	40	38	37	35	35	33	--	--	49	61	58	73	66	66	82	74	78	69	74	69	70	62
30.....	56	53	41	39	38	37	36	33	--	--	56	51	62	57	67	68	87	75	74	71	73	67	62	56
31.....	55	50	--	--	38	35	34	33	--	--	51	45	--	--	75	65	--	--	88	77	71	67	--	--
Average.....	59	53	46	42	39	37	35	33	41	38	47	42	61	54	63	58	76	68	79	71	76	70	71	64

## 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 Rizeyville, Culppeper 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 1954.

Sediment records: October 1951 to September 1954.

EXTREMES, 1953-54.--Specific conductance: Maximum daily, 78.5 micromhos Oct. 6; minimum daily, 37.9 micromhos Apr. 20.

Water temperatures: Maximum, 84°F July 3, 14; minimum observed, freezing point on several days in December and January.

Sediment concentrations: Maximum daily, 1,063 ppm Mar. 1; minimum daily, 1 ppm Sept. 27.

Sediment loads: Maximum daily, 7,530 tons Mar. 1; minimum daily, less than 0.5 ton on many days.

EXTREMES, 1951-54.--Water temperatures: Maximum, 84°F July 3, 14, 1954; minimum, freezing point on several days during winter months.

Sediment concentrations: Maximum daily, 1,063 ppm Mar. 1, 1954; minimum daily, 1 ppm on several days each water year 1951-53, and Sept. 27, 1954.

Sediment loads: Maximum daily, 12,100 tons Mar. 11, 1952; minimum daily, less than 0.5 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 1953 to September 1954 given in WSP 1332.

Temperature (°F) of water, water year October 1953 to September 1954

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

RAPPAHANNOCK RIVER BASIN--Continued

HAZEL RIVER AT RIXEYVILLE, VA.--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	14			52	8	1	50		
2.....	12	4	(t)	43	4	(t)	47	7	1
3.....	11			40					
4.....	10	4	a(t)	39	8	1	46	8	1
5.....	11			36					
6.....	11	4	(t)	36	6	1	70	198	s 249
7.....	11			42					
8.....	12	4	a(t)	46	15	2	215	41	24
9.....	13				47	11	1	131	
10.....	14	4	a(t)	47	3	(t)	133	8	3
11.....	15						46		
12.....	17	3	(t)	44	2	(t)	104	10	3
13.....	17				43	2	(t)	182	24
14.....	18	3	(t)	42	2	a(t)	720	398	s 1,080
15.....	18						42		
16.....	19	4	(t)	42	3	(t)	283	13	10
17.....	19						40		
18.....	19	4	(t)	39	6	1	147	10	4
19.....	20						39		
20.....	20		39			160			
21.....	20	4	(t)	42	4	(t)	129	4	1
22.....	21						44		
23.....	21	4	(t)	205	44	s 40	108		
24.....	22				186	65	33	91	
25.....	23		96	16	4	89	10	3	
26.....	23	3	(t)	74					102
27.....	31	3	(t)	62	3	(t)	102	5	a 1
28.....	104	96	s 41	56					84
29.....	179	136	66	53			80	2	(t)
30.....	119	73	23	50			77		
31.....	68	18	3	--			75	2	a(t)
Total.	932	--	137	1,712	--	96	4,847	--	1,518
	January			February			March		
1.....	68	2	a(t)	184	6	a 3	1,910	1,063	s 7,530
2.....	75	2	a(t)	182	6	3	1,810	248	1,210
3.....	67	2	a(t)	169					1,080
4.....	65	2	a(t)	154			788	68	a 145
5.....	65	2	a(t)	141			578	44	a 69
6.....	65	3	a 1	131	4	1	471	28	a 36
7.....	64	5	a 1	121	3	1	397	7	a 18
8.....	60	10	a 2	110	3	a 1	356	11	a 11
9.....	60	14	3	121	3	1	314	10	8
10.....	65				110	5	1	283	10
11.....	87			110	7	2		10	a 7
12.....	75			102	6	2	266	10	a 7
13.....	75	15	a 3	93	13	3	294	11	a 9
14.....	80	16	a 3	102	14	a 4	397	18	a 19
15.....	90	18	a 4	110	10	a 3	397	17	a 18
16.....	131	20	a 7	98	7	a 2	322	10	a 9
17.....	205	20	11	111	6	2	289	7	a 5
18.....	156	17	7	127					269
19.....	173	10	5	106			250	3	a 2
20.....	145	9	4	100	3	a 2	501	19	a 26
21.....	203	19	10	215	42	a 24	426	14	a 16
22.....	229	21	a 13	501	80	108	365	7	7
23.....	239	16	a 10	322	17	15	333	5	4
24.....	247	10	a 7	261	12	8	303	5	4
25.....	194	6	3	232	8	5	280		
26.....	250	12	8	203	8	4	291	5	4
27.....	516	50	70	173	17	8	258		
28.....	426	12	14	154	5	2	234		
29.....	305	8	7	--	--	--	222	4	2
30.....	255	7	a 5	--	--	--	212	7	4
31.....	219	7	a 4	--	--	--	229	6	4
Total.	4,954	--	213	4,543	--	218	14,360	--	9,432

s Computed by subdividing day.

t Less than 0.5 ton.

a Computed from estimated concentration curve.

## NORTH ATLANTIC SLOPE BASINS, NEW YORK TO YORK RIVER

## RAPPAHANNOCK RIVER BASIN--Continued

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

## Suspended sediment, water year October 1953 to September 1954--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.....	250			339	28	26	203	27	15		
2.....	222	4	2	297	22	18	171	22	10		
3.....	210			484	694	s 1,030	147	16	6		
4.....	196			516	380	529	137	14	5		
5.....	198			356	45	43	117	22	7		
6.....	200	4	2	300	30	24	110	16	a 5		
7.....	217			266	22	16	102	11	3		
8.....	212			266	19	14	111	24	7		
9.....	191			245	17	11	110	10	3		
10.....	173	4	2	234	13	8	276	436	s 414		
11.....	173			205	12	7	280	257	s 240		
12.....	169			194	11	6	229	130	80		
13.....	156			175	10	5	139	45	17		
14.....	152	4	2	169	7	3	397	437	s 515		
15.....	156			222	12	7	222	90	54		
16.....	215			20	12	263	16	11	247	442	s 319
17.....	847			138	316	191	8	4	252	89	61
18.....	694	35	66	173	8	4	368	63	63		
19.....	532	20	29	171	8	a 4	311	50	42		
20.....	426	12	14	196	9	5	237	45	29		
21.....	368	10	10	368	38	38	189	37	19		
22.....	325	10	9	303	36	29	156	28	12		
23.....	303	35	29	255	15	10	139	22	8		
24.....	412	247	275	219	10	6	125	18	6		
25.....	426	232	s 424	196	7	4	104	15	4		
26.....	788	672	s 1,600	175	9	4	89	11	3		
27.....	642	513	s 1,100	164	9	4	86	11	3		
28.....	626	342	578	704	609	s 1,810	75	8	2		
29.....	456	60	74	368	105	104	64	8	1		
30.....	397	34	36	412	225	250	59	6	1		
31.....	--	--	--	247	50	33	--	--	--		
Total.	10,332	--	4,602	8,673	--	4,067	5,252	--	1,954		
		July			August			September			
1.....	59	4	1	13	6	(t)	40	74	8		
2.....	59	5	1	12	6	(t)	23	28	2		
3.....	52	4	1	11	5	(t)	18	20	1		
4.....	49	6	1	12	5	(t)	14	14	1		
5.....	50	7	1	16	8	(t)	11	12	(t)		
6.....	50	8	1	25	7	(t)	10	7	(t)		
7.....	47	9	1	35	6	(t)	8.0	8	(t)		
8.....	84	23	5	23	4	(t)	8.0	14	(t)		
9.....	84	12	3	17	6	(t)	7.0	4	(t)		
10.....	56	6	1	15	5	(t)	7.0	5	(t)		
11.....	47	6	1	14	5	(t)	59	9	1		
12.....	42	5	1	11	6	(t)	28	4	(t)		
13.....	37	4	(t)	10	8	(t)	16	4	(t)		
14.....	31	6	1	9.0	6	(t)	11	4	(t)		
15.....	120	18	6	8.0	5	(t)	10	5	(t)		
16.....	140	29	11	9.0	4	(t)	15	5	(t)		
17.....	68	14	3	11	4	(t)	12	4	(t)		
18.....	54	8	1	10	5	(t)	10	3	(t)		
19.....	49	8	1	10	5	(t)	10	4	a (t)		
20.....	46	11	1	36	10	1	10	4	(t)		
21.....	40	8	1	100	50	14	12	3	(t)		
22.....	44	7	1	44	45	5	13	3	(t)		
23.....	46	7	1	37	20	2	11	3	(t)		
24.....	40	8	1	28	11	1	8.0	2	(t)		
25.....	28	8	1	22	8	(t)	7.0	2	(t)		
26.....	21	8	(t)	20	6	(t)	6.0	2	(t)		
27.....	19	7	(t)	16	6	(t)	5.6	1	(t)		
28.....	17	7	(t)	15	5	(t)	4.8	2	(t)		
29.....	15	7	(t)	14	6	(t)	4.4	2	(t)		
30.....	14	6	(t)	44	23	s 8	4.0	2	(t)		
31.....	13	4	(t)	174	132	s 74	--	--	--		
Total.	1,521	--	49	821	--	111	403.8	--	16		
Total discharge for year (cfs-days).....									58,350.8		
Total load for year (tons).....									22,412		

s Computed by subdividing day.

t Less than 0.5 ton.

a Computed from estimated concentration curve.

RAPPAHANNOCK RIVER BASIN--Continued  
HAZEL RIVER AT RIXEYVILLE, VA.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954  
(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	Dis-charge (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								0.500		1.000	
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250				0.350
Dec. 7, 1953 . . . . .	10:39 a. m.	547		264	511	62	78	89	94	97	99	100					BWCM
Dec. 14, . . . . .	3:14 p. m.	1,300		872	2,900	14	25	40	57	75	83	92					BWCM
Mar. 1, 1954 . . . . .	3:10 p. m.	3,475		2,580	6,870	15	25	38	52	74	94	98					BWCM
June 14 . . . . .	5:26 p. m.	382		494	1,060	76	90	97	99	100	--	--					BWCM

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  
 DRAINAGE AREA, 616 square miles downstream from Hazel River, and at mile 39.2.

RECORDS AVAILABLE --Chemical analyses: October 1951 to September 1954.

Water temperatures --July 1951 to September 1954.

Specific conductance --Maximum daily, 95.0 microhos Aug. 11, minimum daily, 46.8 microhos Mar. 4.

Water temperatures: Maximum daily, 81.7° Aug. 1; minimum, freezing point on several days in December, January, and February.

Sediment concentrations: Maximum daily, 820 ppm Apr. 26; minimum daily, 1 ppm Oct. 8, Nov. 22.

Sediment loads: Maximum daily, 5,670 tons Mar. 2; minimum daily, less than 0.5 ton on many days during July to December.

EXTREMES 1951-54. --Dissolved solids (October 1951 to September 1952): Maximum, 51 ppm July 1-10, 1952; minimum, 39 ppm Feb. 21-29, 1952.

Hardness (October 1951 to September 1954): Maximum, 25 ppm Oct. 11-20, 1952, Oct. 21-31, 1953, July 21-31, Aug. 11-20, 1954; minimum,  
 15 ppm Feb. 21-28, 1953, Mar. 1-10, 1954.

Specific conductance (October 1951 to September 1954): Maximum daily, 95.0 microhos Aug. 11, 1954; minimum daily, 41.8 microhos Mar. 27, 1953.

Water temperatures (May 1951 to September 1954): Maximum, 82° F July 30, 1953; minimum, freezing point on one or more days during each winter.

Sediment concentrations (April 1951 to September 1954): Maximum daily, 1,240 ppm June 10, 1951; minimum daily, 1 ppm on several days during each year.

Sediment loads (April 1951 to September 1954): Maximum daily, 23,400 tons June 10, 1951; minimum, less than 0.5 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 1953 to September 1954 given in WSP 1332. Flow affected by ice Dec. 19-21.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Tem-perature (°F)	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 (microhos at 25°C)	pH	Color
															Calcium, mag-nesium	Non-carbon-ate			
Oct. 1-10, 1953	21.8		7.8	0.10	5.9	2.1	3.6	2.1	35	2	2.8	0.1	0.4	46	23	0	75.1	7.3	7
Oct. 11-20	33.1			.03	6.1	1.9			35	3					23	0	64.0	6.8	14
Oct. 21-31	88.8			.01	6.0	2.5			36	3					25	0	74.2	6.9	20
Nov. 1-10	75.5			.08	5.3	2.7			30	3					24	0	69.7	7.2	16
Nov. 11-20	76.6			.14	5.5	2.2			32	4					23	0	64.3	7.1	15
Nov. 21-30	146			.08	4.8	2.0			26	3					20	0	60.4	7.1	25
Dec. 1-10	232			.09	4.8	2.1			24	6					21	1	59.5	7.4	15
Dec. 11-20	486			.07	4.8	1.7			19	7					19	3	38.5	6.8	18
Dec. 21-31	181			.11	4.8	1.6			21	6					19	1	36.9	7.9	6
Jan. 1-10, 1954	236		15	.07	4.2	2.4	3.4	1.2	24	4.9	2.7	.1	1.4	42	20	1	50.1	7.4	10
Jan. 11-20	230			.14	4.8	1.8			22	6					20	1	50.6	7.7	6
Jan. 21-31	609			.09	4.8	2.4			18	4					22	7	59.3	7.0	21
Feb. 1-10	272			.10	4.7	1.6			20	2					18	2	54.1	7.5	5
Feb. 11-20	206			.09	5.0	1.4			22	2					18	0	53.6	7.5	5
Feb. 21-28	486			.08	5.2	1.7			18	5					18	3	54.3	7.5	10
Mar. 1-10	1,201			.10	4.5	2.0			14	1					15	4	48.1	7.1	20
Mar. 11-20	659			.12	4.2	2.0			19	1					15	3	51.6	7.1	14
Mar. 21-31	563			.06	4.1	1.6			18	3					17	2	48.6	7.0	10



Apr. 1-10, 1954	405	13	.02	4.3	2.6	3.3	.9	22	7.7	2.4	.1	.8	37	21	3	55.4	7.2	7
Apr. 11-20	727	--	.08	5.0	1.9	--	--	28	5	--	--	--	--	21	0	63.1	7.4	10
Apr. 21-30	924	--	.06	4.7	2.0	--	--	22	4	--	--	--	--	20	2	60.1	7.0	23
May 1-10	685	--	.12	4.8	1.8	--	--	22	4	--	--	--	--	19	1	56.1	7.1	21
May 11-20	397	--	.11	4.8	1.4	--	--	23	3	--	--	--	--	18	0	53.2	7.3	9
May 21-31	547	--	.10	4.9	1.2	--	--	21	3	--	--	--	--	17	0	53.3	7.1	21
June 1-10	290	--	.09	4.8	1.8	--	--	24	3.9	--	--	--	--	19	0	54.9	7.4	11
June 11-20	461	--	.15	4.8	1.5	--	--	18	3.4	--	--	--	--	18	1	55.2	7.1	50
June 21-30	176	--	.10	4.6	1.4	--	--	25	3.4	--	--	--	--	17	0	51.4	7.2	13
July 1-10	138	9.8	.09	4.9	1.9	3.2	1.9	27	3.3	2.1	.1	1.7	44	20	0	61.1	7.4	25
July 11-20	112	--	.03	5.7	1.6	--	--	28	3.5	--	--	--	--	21	0	62.8	7.3	20
July 21-31	46.8	--	.00	6.0	2.5	--	--	33	3.7	--	--	--	--	25	0	66.6	7.1	5
Aug. 1-10	36.0	--	.00	6.4	1.8	--	--	36	3.0	--	--	--	--	23	0	71.4	7.3	10
Aug. 11-20	23.3	--	.00	6.8	1.9	--	--	40	2.5	--	--	--	--	25	0	75.7	7.3	5
Aug. 21-31	88.2	--	.08	4.9	1.4	--	--	30	2.7	--	--	--	--	18	0	66.2	7.2	30
Sept. 1-10	27.1	--	.02	5.9	1.8	--	--	29	4.6	--	--	--	--	22	0	67.0	7.1	20
Sept. 11-20	20.9	--	.00	6.4	2.3	--	--	33	3.6	--	--	--	--	25	0	68.6	7.3	5
Sept. 21-30	12.9	--	.03	6.7	1.8	--	--	33	--	--	--	--	--	24	0	70.2	7.5	5
Average	303	--	0.07	5.2	1.9	--	--	26	3.8	--	--	--	--	20	1	60.7	--	15

## RAPPAHANNOCK RIVER BASIN--Continued

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

Temperature (°F) of water, water year October 1953 to September 1954

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

RAPPAHANNOCK RIVER BASIN--Continued

RAPPAHANNOCK RIVER AT REMINGTON, VA.--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	25	2	(t)	96	6	2	92		
2.....	23	2	(t)	77			90	2	(t)
3.....	20	3	(t)	70	2	(t)	90		
4.....	18	2	(t)	68			90	2	a (t)
5.....	20	2	(t)	66			98	2	1
6.....	21	3	(t)	64			124	2	1
7.....	21	2	(t)	68	2	(t)	662	173	309
8.....	21	1	(t)	77			545	98	144
9.....	24	3	(t)	83			275	18	13
10.....	25			86			250	10	7
11.....	27	4	(t)	86	2	(t)	250	10	7
12.....	30			83			210	7	4
13.....	32			79			344	17	16
14.....	34			77	3	1	1,220	317	1,040
15.....	32	4	(t)	75			1,150	265	823
16.....	34			75	2	(t)	578	36	56
17.....	36			72			385	12	12
18.....	34			72			241	14	9
19.....	36			72			230	27	17
20.....	36	3	(t)	72	4	1	250	38	26
21.....	36			72			250	169	114
22.....	38			77	1	(t)	232	14	9
23.....	38	2	(t)	118	15	5	214		
24.....	40			448	70	85	181		
25.....	42			201	34	18	127	3	1
26.....	42	2	(t)						
27.....	44			144	11	4	148		
28.....	72	11	2	118			193		
29.....	247	29	19	106	3	1	177		
30.....	238	52	33	98			162	4	2
31.....	140	29	11	95	--	--	158		
Total	1,526	--	71.4	--	--	129.6	9,170	--	2,623
	January			February			March		
1.....	144			344	5	5	1,270	254	s 2,710
2.....	137			355	5	5	3,450	511	5,670
3.....	144	4	2	328			1,640	116	514
4.....	140			280	6	5	1,360	60	220
5.....	134			275			1,010	37	101
6.....	137	5	2	255			838	28	63
7.....	134			236	4	2	708	17	32
8.....	127			197			642	15	26
9.....	127	3	1	228			578	14	22
10.....	137			214	4	2	512	12	17
11.....	201			210			480	13	17
12.....	144	18	8	197			480	10	13
13.....	140			169	4	2	578	47	73
14.....	162	18	a 8	205			870	77	181
15.....	181	17	a 8	214	4	2	940	56	142
16.....	241	16	a 10	197			708	20	38
17.....	415	12	13	205	7	4	610	12	20
18.....	333	9	8	255	7	5	545	9	13
19.....	355	8	a 8	218	6	4	512	11	15
20.....	425	16	18	193	5	3	870	35	82
21.....	480	25	32	260	12	8	905	39	95
22.....	545	26	38	905	94	230	708	14	27
23.....	480	27	35	675	43	78	642	10	17
24.....	610	9	15	512	15	21	578	13	20
25.....	480	12	16	448	11	13	545	8	12
26.....	578	30	47	415	8	9	545	10	15
27.....	1,080	107	312	355	7	7	512	8	11
28.....	905	51	125	316	4	3	448	5	6
29.....	610	17	28	--	--	--	448	5	6
30.....	512	9	12	--	--	--	415	6	7
31.....	415	6	7	--	--	--	448	7	8
Total	10,653	--	781	8,671	--	432	24,795	--	10,193

s Computed by subdividing day.

t Less than 0.5 ton.

a Computed from estimated concentration graph.

## RAPPAHANNOCK RIVER BASIN--Continued

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

Suspended sediment, water year October 1953 to September 1954--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.....	512	8	11	708	35	67	415	33	37
2.....	480	6	8	642	37	64	344	23	21
3.....	448	5	6	940	390	990	300	20	16
4.....	385	6	6	1,130	729	2,220	275	16	12
5.....	385			740	75	150	250	13	9
6.....	385	4	4	610	39	64	228	10	6
7.....	385			545	28	41	214	9	5
8.....	385	4	4	545	25	37	236	14	9
9.....	355			512	22	30	255	18	12
10.....	328	4	4	480	17	22	385	193	s 252
11.....	322			448	15	18	415	339	s 422
12.....	322			385	10	10	578	160	250
13.....	300	4	3	355	28	27	322	66	57
14.....	290			344	10	9	675	448	816
15.....	285	7	5	385	14	15	448	150	181
16.....	415	58	65	545	23	34	415	85	95
17.....	1,850	266	1,330	415	13	15	344	153	142
18.....	1,570	123	521	355	10	10	512	108	149
19.....	1,080	40	117	355	12	12	512	70	97
20.....	838	22	50	385	13	14	385	40	42
21.....	708	18	34	675	32	58	300	29	23
22.....	642	17	29	610	22	36	246	23	15
23.....	578	18	28	480	11	14	214	22	13
24.....	970	208	545	415	9	10	201	20	11
25.....	838	270	611	355	6	6	165	14	6
26.....	1,290	820	2,860	338	7	6	151	15	6
27.....	1,010	123	335	306	6	5	144	14	5
28.....	1,360	385	1,410	772	883	s 2,290	772	6	2
29.....	1,010	117	319	578	131	204	112	5	2
30.....	838	47	106	940	509	s 1,380	103	4	1
31.....	--	--	--	545	117	172	--	--	--
Total.	20,564	--	8,433	16,838	--	8,030	9,271	--	2,714
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.....	103	6	2	26	7	(t)	69	52	10
2.....	173	135	63	24	8	1	41	29	3
3.....	121	66	22	22	7	(t)	32	20	2
4.....	95	21	5	22	8	(t)	27	13	1
5.....	90	11	3	27	10	1	23	12	1
6.....	92	10	2	36	7	1	20	12	1
7.....	88	10	2	75	8	2	18	12	1
8.....	289	614	s 633	57	16	2	15	10	(t)
9.....	201	132	72	39	7	1	13	10	(t)
10.....	124	16	5	32	6	1	13	14	(t)
11.....	98	20	5	28	8	1	31	13	1
12.....	82	19	4	28	10	1	38	7	1
13.....	72	34	7	24	9	1	24	8	1
14.....	67	10	2	19	9	(t)	19	9	(t)
15.....	100	17	5	18	11	1	18	5	(t)
16.....	335	64	58	18	11	1	17	3	(t)
17.....	130	29	10	18	12	1	18	5	(t)
18.....	88	18	4	19	8	(t)	15	5	(t)
19.....	75	10	2	23	12	1	14	4	(t)
20.....	69	8	1	38	16	2	15	7	(t)
21.....	65	8	1	254	161	s 141	16	8	(t)
22.....	65	8	1	109	71	21	18	9	(t)
23.....	65	7	1	82	35	8	20	6	(t)
24.....	63	6	1	59	25	4	18	5	(t)
25.....	53	6	1	43	19	2	14	5	(t)
26.....	43	6	1	36	15	1	11	5	(t)
27.....	38	5	1	33	15	1	9.6	7	(t)
28.....	36	5	(t)	28	11	1	8.0	8	(t)
29.....	32	7	1	27	10	1	8.0	4	(t)
30.....	28	6	(t)	28	9	1	6.8	7	(t)
31.....	27	7	1	271	157	115	--	--	--
Total.	3,008	--	916.9	1,563	--	316.3	609.4	--	27.1

Total discharge for year (cfs-days)..... 109,663.4

Total load for year (tons)..... 34,667

s Computed by subdividing day.

t Less than 0.5 ton.

## RAPPAHANNOCK RIVER BASIN--Continued

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

Particle-size analyses of suspended sediment, water year October 1953 to September 1954

(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	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							0.500		1.000		
						0.002	0.004	0.008	0.016	0.031	0.062	0.125				0.250	0.350
Dec. 14, 1953	1:28 p. m.	1,290		323	723	31	48	66	88	94	99	100					BWCM
Mar. 2, 1954	11:47 a. m.	3,223		401	985	29	51	69	76	87	94	98			99		BWCM
Apr. 26	8:20 a. m.	1,450		1,230	1,920	24	52	74	92	98	100						BN
May 3	12:00 p. m.	1,170		897	1,850	23	47	71	93	98	100						BN
May 4	10:00 a. m.	1,020		1,890	1,670	33	50	76	93	98	100						BN
May 4	12:07 p. m.	1,080		839	2,070	55	75	91	97	99	99	100					BWCM
May 28	6:00 p. m.	840		928	2,060	57	76	88	96	99	99	100					BWCM
June 11	3:53 p. m.	385		408	805	68	84	96	98	98	98	99			99		BWCM
June 14	8:45 p. m.	870		491	1,410	33	56	80	94	98	99	100					BN
July 2	3:10 p. m.	250		192	469	51	77	89	95	98	99	100					BN
Aug. 21	4:27 p. m.	385		223	530	36	62	78	89	95	97	99			100		BWCM
Aug. 31	11:14 a. m.	512		212	510	59	79	90	96	98	99	100					BWCM

## 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 1954.

Sediment records: April 1951 to September 1954.

EXTREMES, 1953-54.--Specific conductance: Maximum daily, 67.0 micromhos, Sept. 29; minimum daily, 37.8 micromhos Mar. 25.

Water temperatures: Maximum, 85°F Aug. 2, Sept. 6; minimum, freezing point Dec. 18, Jan. 12, 13.

Sediment concentrations: Maximum daily, 1,210 ppm Mar. 1; minimum daily, 2 ppm Oct. 1-10, 16-24, Nov. 16-22, Dec. 1-3, 30.

Sediment loads: Maximum daily, 12,900 tons Mar. 1; minimum daily, less than 0.50 ton on many days during October to December and July to September.

EXTREMES, 1945-46, 1951-54.--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 1954): Maximum, 91°F Aug. 9, 1951; minimum, freezing point on several days during winter of 1951-52, Dec. 18, 1953, Jan. 12, 13, 1954.

Sediment concentrations (April 1951 to September 1954): Maximum daily, 1,380 ppm Mar. 16, 1953; minimum daily, 1 ppm Oct. 2, 1952.

Sediment loads (April 1951 to September 1954): Maximum daily, 16,500 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 1953 to September 1954 given in WSP 1332.

Temperature (°F) of water, water year October 1953 to September 1954  
(Once-daily measurement, generally between 4 p. m. and 6 p. m.)

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

RAPPAHANNOCK RIVER BASIN--Continued

RAPIDAN RIVER NEAR CULPEPER, VA.--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	30			86			89		
2.....	24			91	24	a 6	80	2	(t)
3.....	28	2	(t)	82			76		
4.....	24			56	8	2	84	4	a 1
5.....	17			70			88	4	1
6.....	28			87	6	a 1	93	3	1
7.....	28			86			697	181	s 407
8.....	31	2	(t)	73			452	82	100
9.....	28			91	4	1	270	18	13
10.....	26			84			303	17	14
11.....	32			72	3	1	307	18	15
12.....	30			69	3	1	239	14	9
13.....	32	3	(t)	71			374	53	54
14.....	33			70	3	1	1,220	376	s 1,620
15.....	32			68			928	150	376
16.....	34			80			535	29	42
17.....	30			73	2	(t)	390	10	11
18.....	27	2	(t)	68			265		
19.....	32			74			222		
20.....	33			72	2	(t)	265	6	4
21.....	34			62			235		
22.....	35	2	(t)	71			214		
23.....	34			126	4	1	192	5	2
24.....	32			317	27	23	171		
25.....	32			177	19	9	154		
26.....	39	3	(t)	122	15	5	145		
27.....	37			120			158		
28.....	57	6	1	96	4	1	145	4	2
29.....	207	29	16	82			139		
30.....	246	48	32	97			139	2	1
31.....	131	45	16	--	--	--	136		1
Total.	1,463	--	70.7	2,753	--	68.8	8,805	--	2,699.2
January									
1.....	128			288			2,080	1,210	s 12,900
2.....	120			274	6	4	2,770	475	3,550
3.....	120	3	1	285			1,470	130	516
4.....	122			248			1,190	77	247
5.....	125	3	a 1	226	5	3	882	40	95
6.....	112			211			717	24	46
7.....	114			199			620	19	32
8.....	104	3	1	188	5	3	542	15	22
9.....	107			192	4	a 2	481	12	16
10.....	110			181			434	11	13
11.....	164	4	a 2	177	4	2	395	9	10
12.....	136	6	2	164			434	12	14
13.....	112	8	2	142			574	24	37
14.....	117	10	a 3	139	4	2	947	84	215
15.....	136	8	3	158			845	64	146
16.....	177	4	2	158	6	3	632	20	34
17.....	317	13	11	174	6	3	542	11	16
18.....	244	13	9	192	6	3	487	10	13
19.....	261	9	6	168	6	3	452	19	23
20.....	279	11	8	154	5	2	990	108	289
21.....	343	13	12	230	11	7	786	46	98
22.....	348	15	14	658	66	117	639	16	28
23.....	390	14	15	481	26	34	574	12	19
24.....	368	14	14	406	11	12	523	13	a 18
25.....	353	13	12	363	8	8	481	13	17
26.....	481	24	31	327	7	6	481	11	14
27.....	691	43	80	284	5	4	434	8	9
28.....	548	30	44	285	4	3	401	6	a 6
29.....	423	14	16	--	--	--	385	6	6
30.....	368	8	a 8	--	--	--	358	6	6
31.....	327	6	a 5	--	--	--	363	5	5
Total.	7,745	--	309	6,912	--	246	22,909	--	18,480

s Computed by subdividing day.

t Less than 0.5 ton.

a Computed from estimated concentration graph.

## RAPPAHANNOCK RIVER BASIN--Continued

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

Suspended sediment, water year October 1953 to September 1954--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.....	406	8	9	452	28	34	288	19	15
2.....	368	6	6	412	22	24	256	13	9
3.....	332			463	39	49	231	11	7
4.....	322			505	234	319	218	10	6
5.....	322	4	4	440	126	150	192	10	5
6.....	343			385	26	27	177	10	5
7.....	343			368	20	20	181	13	6
8.....	327			368	19	19	174	10	5
9.....	307	5	4	348	15	14	203	12	7
10.....	284			332	14	13	261	20	14
11.....	288			312	12	10	218	21	12
12.....	284	5	4	288	11	9	265	29	21
13.....	261			261	12	8	195	35	18
14.....	252	4	3	256	13	9	199	8	4
15.....	256	4	3	298	16	13	252	19	13
16.....	353	26	25	406	22	24	499	812	s 1,360
17.....	1,190	148	476	327	18	16	256	250	s 173
18.....	1,070	74	214	298	12	10	274	80	59
19.....	786	24	51	303	13	a 11	261	33	23
20.....	652	13	23	458	41	51	222	28	16
21.....	561	10	15	1,150	237	736	192	21	11
22.....	493	8	11	737	62	123	164	15	7
23.....	458	9	11	580	22	34	139	10	4
24.....	481	10	13	499	25	34	134	7	3
25.....	452	24	29	434	13	15	122	5	2
26.....	830	630	1,410	395	14	15	102	5	1
27.....	698	232	437	348	15	14	100	5	1
28.....	646	150	262	693	s 1,580		100	4	1
29.....	542	53	78	429	122	141	84	5	1
30.....	487	28	37	374	26	26	80	4	1
31.....	--	--	--	327	20	18	--	--	--
Total.	14,394	--	3,157	13,246	--	3,566	6,039	--	1,810
Day	July			August			September		
	Mean discharge (cfs days)	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.....	70	4	1	24	4	(t)	52	28	4
2.....	74	7	1	20	6	(t)	32	15	1
3.....	73	5	1	16	6	(t)	22	18	1
4.....	109	21	6	18	4	a (t)	19	18	a 1
5.....	80	31	7	23	3	(t)	20	20	a 1
6.....	86	13	3	25	6	(t)	14	24	1
7.....	72	9	2	37	12	1	11	18	1
8.....	80	9	2	32	10	1	15	11	(t)
9.....	90	8	2	27	9	1	14	7	(t)
10.....	72	7	1	28	6	(t)	16	7	(t)
11.....	74	5	1	23	5	(t)	17	7	a (t)
12.....	65	4	1	19	6	(t)	11	6	(t)
13.....	55	4	1	18	9	(t)	10	5	(t)
14.....	52	3	(t)	18	5	(t)	17	5	(t)
15.....	105	78	s 36	13	6	(t)	17	7	(t)
16.....	288	249	194	8.0	7	(t)	16	5	(t)
17.....	114	42	13	23	9	1	9.6	3	a (t)
18.....	77	29	6	19	7	(t)	12	3	(t)
19.....	84	29	7	23	26	2	8.8	4	(t)
20.....	67	18	3	163	515	232	5.6	11	(t)
21.....	52	7	1	46	233	29	13	5	(t)
22.....	56	10	2	25	82	6	13	14	(t)
23.....	56	8	1	30	52	4	8.4	10	(t)
24.....	52	6	1	36	36	3	8.7	4	(t)
25.....	35	6	1	23	25	2	9.2	7	(t)
26.....	52	7	1	25	22	1	5.9	6	a (t)
27.....	34	6	1	23	15	1	4.1	4	(t)
28.....	30	8	1	24	18	1	7.8	3	(t)
29.....	36	4	(t)	19	23	1	6.0	8	(t)
30.....	31	5	(t)	24	14	1	6.3	10	a (t)
31.....	29	3	(t)	37	21	2	--	--	--
Total.	2,250	--	298.4	689	--	293.2	421.4	--	14.6
Total discharge for year (cfs days).....									87,826.4
Total load for year (tons).....									30,993

s Computed by subdividing day.

t Less than 0.50 ton.

a Computed from estimated concentration graph.



RAPPAHANNOCK RIVER BASIN --Continued  
 RAPIDAN RIVER NEAR CULPEPER, VA.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954  
 (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	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. 14, 1953 . . . . .	10:55 a. m.	1,190		179	484													BWCM
Mar. 1, 1954 . . . . .	12:22 p. m.	1,640		338	832													BWCM
May 21 . . . . .	7:45 a. m.	1,430		348	1,010													BWCM

## 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, September 1951 to September 1954.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1332.

## Periodic determinations of suspended sediment discharge, water year October 1953 to September 1954

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (pounds per day)
Oct. 5, 1953	0.00	--	0
Oct. 12	.00	b--	--
Oct. 19	.07	14	5
Oct. 26	.11	2	1
Nov. 2	.28	3	5
Nov. 9	.60	1	3
Nov. 23	.74	2	8
Nov. 30	.48	1	3
Dec. 7	3.7	18	359
Dec. 14	21	57	6,450
Dec. 21	1.0	5	27
Dec. 28	.82	6	27
Jan. 4, 1954	.82	9	40
Jan. 11	2.0	10	108
Jan. 18	3.7	9	180
Jan. 25	3.3	6	107
Feb. 1	2.0	5	54
Feb. 8	1.6	4	34
Feb. 15	1.4	4	30
Feb. 22	4.5	11	267
Mar. 2	8.5	20	917
Mar. 8	2.5	5	67
Mar. 15	6.8	8	293
Mar. 22	3.7	5	100
Mar. 29	2.5	4	54
Apr. 5	2.0	3	32
Apr. 12	1.8	3	29
Apr. 19	4.5	9	218
Apr. 26	3.5	12	226
May 3	1.7	9	82
May 10	1.8	3	29
May 17	1.8	7	68
May 21	21	36	4,080
May 24	2.1	7	79
June 1	1.4	5	38
June 4	1.2	4	26
June 14	1.3	29	203
June 21	.67	5	18
June 28	.28	6	9
July 5	.60	6	19
July 14	.08	15	6
July 19	.37	42	84
July 26	.04	9	2
Aug. 2	.01	14	1
Aug. 9	.01	13	1
Aug. 16	.00	--	0
Aug. 23	.07	23	9
Aug. 30	.06	13	4
Sept. 6	.00	--	0
Sept. 13	.00	--	0
Sept. 20	.00	--	0
Sept. 27	.00	--	0

b Cattle in creek stirred up sediment.

YORK RIVER BASIN--Continued  
 HUDSON CREEK NEAR BOSWELLS TAVERN, VA.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954  
 (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	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
Mar. 1, 1954 . . . . .	1:20 p. m.	161		255	333	35	47	65	75	90	99	100		BWCM
Mar. 1 . . . . .	1:23 p. m.	161		248	398	21	34	52	73	90	98	100		BN

## 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 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 1954.

Sediment records: May 1951 to September 1954.

EXTREMES, 1953-54.--Specific conductance: Maximum daily, 945 micromhos Sept. 27; minimum daily, 87.2 micromhos Mar. 2.

Water temperatures: Maximum observed, 83°F July 31; minimum observed, 34°F Dec. 25, Jan. 16.

Sediment concentrations: Maximum daily, 626 ppm Mar. 1; minimum daily, 1 ppm Jan. 1-3, 6-10.

Sediment loads: Maximum daily, 50,000 tons Mar. 1; minimum daily, 1 ton Jan. 1-3, 6-10.

EXTREMES, 1929-30, 1947-48, 1951-54.--Dissolved solids (1929-30, 1947-48): Maximum, 289 ppm Sept. 21-30, 1929; minimum, 77 ppm Mar. 21-31, 1948.

Hardness (1929-30, 1947-48): Maximum, 163 ppm Sept. 21-30, 1929; minimum, 56 ppm May 1-10, 1929.

Water temperatures (1947-48, May 1951 to September 1954): Maximum, 86°F July 26, Aug. 12, 1951; minimum, freezing point Dec. 20, 1951.

Sediment concentrations (May 1951 to September 1954): Maximum daily, 740 ppm Aug. 7, 1952; minimum daily, 1 ppm on several days during each year.

Sediment loads (May 1951 to September 1954): Maximum daily, 59,000 tons Mar. 12, 1952; minimum daily, 1 ton Oct. 26-31, Nov. 5-9, 1952, Jan. 1-3, 6-10, 1954.

REMARKS.--Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year October 1953 to September 1954 given in WSP 1333.

Temperature (°F) of water, water year October 1953 to September 1954

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

JAMES RIVER BASIN--Continued

JAMES RIVER AT BUCHANAN, VA.--Continued

Suspended sediment, water year October 1953 to September 1954.

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.....	353	4	4	450	3	a4	380	2	2
2.....	348			420			380	2	a2
3.....	353			392			380		
4.....	348	4	4	381	2	2	380	2	2
5.....	342			375			430		
6.....	332			364			490		
7.....	315			370			540	3	4
8.....	310			370			892	7	17
9.....	321	3	3	370	2	2	980	10	26
10.....	321			370			916	6	15
11.....	332			375			1,020	13	36
12.....	337			375			1,260	16	54
13.....	342			375			1,180	19	61
14.....	348	3	3	375	2	2	2,000	64	346
15.....	348			375			2,940	127	1,010
16.....	348			375			2,220	81	a486
17.....	348			380			1,530	60	a248
18.....	348			380			1,080	43	a125
19.....	348	3	3	380	2	2	764	32	a66
20.....	342			380			684	22	a41
21.....	337			380			748	9	a18
22.....	342			380			691	3	6
23.....	342			380	3	3	621	4	7
24.....	342			400			582		
25.....	342	3	3	470			528		
26.....	342			520	3	4	468	4	5
27.....	348			470	3	a4	450		
28.....	375	4	5	430	4	5	516	2	3
29.....	444			410	3	a3	504		
30.....	510			390	2	2	486		
31.....	492			--	--	--	474		
<b>Total.</b>	<b>11,000</b>	<b>--</b>	<b>109</b>	<b>11,862</b>	<b>--</b>	<b>74</b>	<b>26,514</b>	<b>--</b>	<b>2,610</b>
	<b>January</b>			<b>February</b>			<b>March</b>		
1.....	462			1,480			20,400	626	s50,000
2.....	450	1	1	1,320	6	22	34,500	512	47,700
3.....	438			1,190			11,800	122	3,890
4.....	428	2	2	1,120			7,520	43	873
5.....	428	2	2	1,060	4	11	5,290	10	143
6.....	426	1	a1	980			4,070	7	77
7.....	420	1	a1	908	3	7	3,270	8	71
8.....	414	1	a1	828			2,720	7	51
9.....	409	1	a1	772	3	6	2,400	6	39
10.....	414	1	a1	719			2,120	6	34
11.....	498	5	a7	719	4	8	1,950	7	37
12.....	576	6	a9	691	4	7	1,840	14	a70
13.....	677	4	a7	656	4	7	2,280	27	166
14.....	635	4	a7	621	3	a5	3,710	40	401
15.....	614	6	10	582	3	5	5,090	47	646
16.....	1,540	146	s824	588	5	a8	4,070	24	264
17.....	5,700	313	4,820	670	7	a13	3,100	21	176
18.....	3,890	37	389	719	10	19	2,580	10	70
19.....	2,340	23	145	756	12	24	2,340	8	51
20.....	1,900	12	62	748	22	44	5,620	67	1,020
21.....	1,630	10	44	5,170	214	s4,560	7,760	73	1,530
22.....	2,800	78	590	8,250	122	2,720	7,320	25	508
23.....	9,250	211	5,270	5,380	70	1,020	5,700	12	185
24.....	5,400	55	802	3,440	20	186	3,180	8	69
25.....	3,360	20	181	2,650	13	93	2,650	8	57
26.....	2,790	11	83	2,280	12	74	2,650	7	50
27.....	3,180	11	94	1,950	7	37	4,070	16	176
28.....	2,940	12	95	1,730	4	19	3,530	20	191
29.....	2,400	8	52	--	--	--	3,100	6	50
30.....	2,000	7	38	--	--	--	2,720	5	37
31.....	1,730	7	33	--	--	--	2,580	6	42
<b>Total.</b>	<b>60,135</b>	<b>--</b>	<b>13,574</b>	<b>47,977</b>	<b>--</b>	<b>8,975</b>	<b>172,130</b>	<b>--</b>	<b>108,674</b>

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 1953 to September 1954--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.....	2,520	5	34	1,680	4	18	1,530	32	132
2.....	2,790	5	38	1,530	7	29	1,330	5	18
3.....	2,720	5	37	1,530	2	8	1,430		
4.....	2,520	5	34	1,580	4	17	1,310		
5.....	2,340	3	19	1,530	3	12	1,150		
6.....	2,340	3	19	1,430	2	8	1,040		
7.....	2,720	4	29	1,320	2	7	940	4	11
8.....	4,430	18	215	1,300	4	14	868		
9.....	4,070	15	165	1,300	12	42	820		
10.....	3,000	7	57	1,250	4	14	772		
11.....	2,790	5	38	1,230	4	13	740	3	6
12.....	2,520	4	27	1,160	2	6	748		
13.....	2,220	3	18	1,090	2	a 6	836		
14.....	2,000	3	16	1,140	2	6	1,120	38	115
15.....	1,900	3	a 15	2,510	42	s 444	1,250	13	44
16.....	1,900	3	a 15	4,250	84	964	1,530	29	120
17.....	2,820	19	145	3,360	31	281	1,630	22	97
18.....	5,090	31	426	2,790	21	158	1,480	19	76
19.....	4,160	18	202	3,020	27	220	1,430	23	89
20.....	3,180	6	52	3,980	30	322	1,320	16	57
21.....	2,650	6	43	3,800	20	205	1,150	12	37
22.....	2,280	4	25	3,100	14	117	996	10	27
23.....	2,120	5	29	2,520	9	61	860	9	21
24.....	2,170	7	41	2,170	8	47	740	6	12
25.....	3,270	15	132	1,950	9	47	656	6	11
26.....	3,440	25	232	1,730	6	28	614	6	10
27.....	2,650	13	93	1,990	55	s 387	558	5	8
28.....	2,280	10	62	3,100	94	787	714	10	19
29.....	2,120	11	63	2,460	23	153	1,080	12	35
30.....	1,900	3	15	2,000	19	103	734	8	16
31.....	--	--	--	1,780	19	91	--	--	--
Total.	82,910	--	2,336	65,580	--	4,615	31,376	--	1,106
	July			August			September		
1.....	584	6	9	584	8	13	435	12	114
2.....	514	5	7	584	47	s 98	405	12	13
3.....	470	5	6	726	90	176	380	11	11
4.....	435	5	6	605	23	38	370	12	12
5.....	619	8	13	556	22	33	350	10	9
6.....	626	8	14	805	26	42	340	10	9
7.....	528	6	9	598	14	23	331	11	10
8.....	605	6	10	766	17	35	327	10	9
9.....	542	7	10	668	11	20 <sup>b</sup>	318	10	9
10.....	542	4	6	556	9	14	314	10	8
11.....	521	4	6	488	8	11	309	11	9
12.....	458	4	5	452	5	6	309	10	8
13.....	420	6	7	420	5	6	300	10	8
14.....	400	4	4	395	6	6	296	8	a 6
15.....	400	3	3	390	6	6	296	7	6
16.....	4,180	284	s 4,950	385	5	5	296	7	6
17.....	2,760	202	1,510	380	4	4	288	5	4
18.....	1,530	54	223	380	5	5	283	6	5
19.....	1,950	484	s 2,710	390	6	6	279	7	5
20.....	3,620	142	1,390	476	43	s 76	380	7	7
21.....	2,460	96	638	556	68	102	591	11	18
22.....	2,940	86	683	570	123	s 208	758	13	27
23.....	4,070	82	901	458	44	54	570	10	15
24.....	2,280	43	265	440	25	30	440	10	12
25.....	1,480	27	108	549	33	49	400	10	11
26.....	1,120	20	60	598	25	40	355	9	9
27.....	894	18	43	696	15	28	340	9	8
28.....	742	13	26	854	50	115	336	8	7
29.....	647	10	17	703	65	123	336	7	6
30.....	594	8	13	570	24	37	327	4	4
31.....	563	7	11	521	15	24	--	--	--
Total.	39,484	--	13,663	16,919	--	1,430	11,059	--	285
Total discharge for year (cfs-days).....									576,946
Total load for year (tons).....									157,451

s Computed by subdividing day.

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 1953 to September 1954

(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	Dis-charge (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								0.350		0.500	1.000	
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250					
Feb. 21, 1954.....	4:03 p. m.	10,000		729	2,030		41	58	72	88	97	99	100					BWCM
Mar. 1.....	1:09 p. m.	22,540		1,080	3,150		11	17	29	42	65	99	100					BN
Mar. 2.....	1:26 a. m.	46,000		690	1,060		41	55	73	83	91	96	99				100	BWCM
Mar. 2.....	5:41 a. m.	41,220		584	1,940		43	59	77	87	95	98	100					BWCM
May 28.....	2:50 p. m.	3,180		118	310		50	67	94	96	99	100	--					BN
July 16.....	7:54 p. m.	5,490		542	1,470		50	69	85	96	99	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 1954.

Sediment records: December 1950 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 89° F July 31; minimum, freezing point Jan. 15.

Specific conductance: Maximum daily, 400 micromhos Sept. 24; minimum daily, 86.5 micromhos Mar. 1.

Sediment concentrations: Maximum daily, 1,261 ppm Mar. 2; minimum daily, 1 ppm Sept. 2, 8.

Sediment loads: Maximum daily, 170,000 tons Mar. 2; minimum daily, 2 tons Sept. 2, 8.

EXTREMES, 1930-31, 1951-54.--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 (1951-54): Maximum daily, 400 micromhos Sept. 24, 1954; minimum daily, 70.6 micromhos Mar. 11, 1952.

Water temperatures (May 1951 to September 1954): Maximum, 93°F June 26-28,

July 21, 1952; minimum, freezing point Jan. 15, 1954.

Sediment concentrations (December 1950 to September 1954): Maximum daily, 1,261 ppm Mar. 2, 1954; minimum daily, 1 ppm Sept. 2, 8, 1954.

Sediment loads (December 1950 to September 1954): Maximum daily, 170,000 tons Mar. 2, 1954; minimum daily, 2 tons Sept. 2, 8, 1954.

REMARKS.--Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year, October 1953 to September 1954 given in WSP 1333.

Temperature (°F) of water, water year October 1953 to September 1954.

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



JAMES RIVER BASIN--Continued

JAMES RIVER AT SCOTTSVILLE, VA.--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	718	4	8	1,090	9	24	905	8	20					
2.....	695			886			7		17					
3.....	702			1,030			9		25					
4.....	665			876			8		19					
5.....	605			876			8		20					
6.....	665	3	5	810	7	16	1,060	10	29					
7.....	598			838			7		1,200					
8.....	710			905			3,120		144	1,210				
9.....	688			829			2,210		38	227				
10.....	642			838			3,660		58	573				
11.....	688	4	7	725	8	17	3,990	85	916					
12.....	688			802			3,200		40	346				
13.....	688			793			5,010		78	1,060				
14.....	688			848			10,100		355	9,680				
15.....	582			838			9,600		313	8,110				
16.....	530	4	7	838	8	18	6,640	101	1,810					
17.....	590			867			6,010		44	714				
18.....	658			848			4,080		24	264				
19.....	688			838			3,030		15	123				
20.....	688			793			2,370		9	58				
21.....	688	5	9	802	8	23	2,140	8	46					
22.....	672			958			2,210		9	54				
23.....	688			1,010			2,060		8	44				
24.....	680			1,220			2,060		8	44				
25.....	695			1,190			1,760		8	38				
26.....	680	6	11	1,250	12	40	1,560	8	34					
27.....	734			1,200			1,440		8	31				
28.....	1,020			21			58		1,020	7	19	1,560	7	a29
29.....	2,060			46			256		1,030	8	22	1,360	6	22
30.....	2,450			63			417		867	8	19	1,420	7	27
31.....	1,560	32	135	--	--	--	1,440	12	47					
Total.	25,103	--	1,071	27,919	--	650	91,133	--	26,837					
	January			February			March							
1.....	1,360	14	51	3,990	12	129	9,420	373	9,490					
2.....	1,290	13	45	3,630	12	118	43,900	1,261	s170,000					
3.....	1,300	11	39	3,280	9	80	44,800	734	88,800					
4.....	1,320	11	39	3,030	9	74	18,900	299	15,300					
5.....	1,220	12	40	2,780	9	68	13,000	116	4,070					
6.....	1,310	13	46	2,610	8	56	10,100	39	1,060					
7.....	1,220	13	43	2,370	9	58	8,400	30	680					
8.....	1,200	14	45	2,290	8	49	7,060	24	457					
9.....	1,170	10	32	2,210	8	48	6,010	22	357					
10.....	1,120	10	30	1,980	9	48	5,610	22	333					
11.....	1,360	12	44	2,140	9	52	5,010	19	257					
12.....	2,140	16	92	1,910	9	46	4,630	19	238					
13.....	1,690	19	87	1,840	7	35	4,260	43	495					
14.....	1,340	16	a58	1,620	8	35	4,720	35	446					
15.....	1,620	12	52	1,690	9	41	6,850	42	777					
16.....	3,280	23	204	1,690	8	37	7,720	25	521					
17.....	6,850	87	1,610	1,690	9	41	7,720	24	500					
18.....	6,640	94	1,690	1,840	11	55	6,640	19	341					
19.....	7,720	71	1,480	1,690	17	78	5,410	23	336					
20.....	5,410	38	555	1,760	15	71	7,280	26	511					
21.....	3,810	37	381	2,290	28	173	11,200	75	2,270					
22.....	4,540	39	478	13,000	352	12,400	13,300	82	2,940					
23.....	8,400	149	3,380	15,700	268	11,400	9,850	44	1,170					
24.....	11,200	143	4,320	10,400	141	3,960	8,170	32	706					
25.....	9,350	80	2,020	7,940	66	1,410	7,060	25	477					
26.....	7,940	53	1,140	6,220	45	756	6,430	20	347					
27.....	7,500	49	992	5,010	31	419	5,810	21	329					
28.....	7,060	38	724	4,630	28	350	6,220	19	319					
29.....	6,850	28	518	--	--	--	6,850	20	370					
30.....	5,410	23	336	--	--	--	6,430	19	339					
31.....	5,010	18	189	--	--	--	5,610	23	348					
Total.	127,630	--	20,760	111,230	--	32,087	314,370	--	304,575					

s Computed by subdividing day.

a Computed from estimated concentration graph.

## JAMES RIVER BASIN--Continued

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

## Suspended sediment, water year October 1953 to September 1954--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.....	5,210	23	324	4,080	26	a 286	3,460	8	a 75
2.....	5,010	19	257	3,460	24	a 224	3,030	7	a 57
3.....	4,820	15	195	3,370	24	a 218	2,860	5	a 39
4.....	5,010	15	203	4,720	22	a 280	2,450	3	a 20
5.....	4,820	12	156	4,170	21	a 236	2,370	3	a 19
6.....	4,720	14	178	3,720	19	a 191	2,210	4	a 24
7.....	4,260	15	173	3,460	18	a 168	2,290	4	a 25
8.....	4,720	16	204	3,200	16	a 138	1,620	4	a 17
9.....	6,010	24	389	3,120	15	a 126	1,980	4	a 21
10.....	7,060	24	457	2,780	14	a 105	2,140	4	a 23
11.....	6,010	21	341	2,940	12	a 95	2,060	4	a 22
12.....	5,210	19	267	2,690	11	a 80	2,210	4	a 24
13.....	4,630	16	200	2,370	10	a 64	1,760	4	a 19
14.....	4,350	16	188	2,690	7	51	1,910	4	a 21
15.....	3,990	17	183	3,200	8	69	2,690	8	a 58
16.....	4,350	31	364	4,080	50	a 551	3,900	23	a 242
17.....	6,430	54	937	6,010	78	a 1,270	3,030	28	a 229
18.....	6,430	60	1,040	5,810	50	a 784	3,540	25	a 239
19.....	9,110	86	1,620	5,210	24	a 338	3,280	24	a 213
20.....	7,940	39	836	5,810	39	612	3,030	22	a 180
21.....	7,060	33	629	9,600	74	1,920	2,940	20	a 159
22.....	5,410	25	365	8,400	42	953	2,610	19	a 134
23.....	6,220	17	285	6,640	20	359	2,450	18	a 119
24.....	4,630	24	300	5,410	18	283	1,980	18	a 96
25.....	4,440	38	456	5,010	12	162	1,480	17	a 68
26.....	5,410	45	657	4,170	9	101	1,180	16	a 51
27.....	6,850	48	888	3,630	10	98	1,230	16	a 53
28.....	5,410	33	482	3,460	10	a 93	1,230	16	a 53
29.....	4,630	43	538	4,170	10	a 113	1,190	17	a 55
30.....	4,260	32	a 368	5,010	11	a 149	1,170	17	a 54
31.....	--	--	--	4,260	10	a 115	--	--	--
Total.	164,410	--	13,480	136,650	--	10,212	69,280	--	2,409
		July		August		September			
1.....	1,370	18	a 67	1,120	4	12	759	2	4
2.....	1,450	16	a 70	925	5	13	802	1	2
3.....	1,200	20	a 65	989	5	13	802	2	4
4.....	1,590	21	a 90	1,440	8	31	759		
5.....	1,440	23	a 89	1,310	8	28	710	2	4
6.....	1,280	19	66	1,140	5	15	658		
7.....	1,190	14	45	1,000	6	16	672	5	9
8.....	1,310	15	53	1,260	6	20	568	1	2
9.....	1,780	18	86	1,010	4	11	575	3	5
10.....	1,240	17	57	867	3	7	582	3	5
11.....	1,450	9	35	858	5	12	504		
12.....	1,030	7	19	867	3	7	498	2	3
13.....	848	4	9	793	2	4	498		
14.....	1,390	2	8	810	3	7	480	2	3
15.....	867	4	9	695	2	a 4	498	2	3
16.....	1,360	8	29	742	2	4	474	2	3
17.....	2,460	17	113	598	4	6	492	4	5
18.....	5,210	98	1,380	650	5	9	510	4	6
19.....	2,940	25	498	925	8	20	510	4	6
20.....	2,530	9	61	1,190	6	19	510	4	a 6
21.....	4,080	21	231	848	7	16	562	3	5
22.....	3,990	44	474	978	7	18	688	4	7
23.....	3,280	33	292	936	10	25	768	14	29
24.....	4,260	32	368	947	8	20	947	10	26
25.....	3,810	50	514	1,120	5	15	896	9	22
26.....	2,290	21	130	829	5	a 11	759	6	12
27.....	2,140	17	98	848	6	a 14	718	3	6
28.....	1,690	9	41	896	7	a 17	695	2	4
29.....	1,250	6	20	1,290	8	a 28	605	3	5
30.....	1,000	4	11	1,690	7	a 32	605	3	5
31.....	1,010	4	11	1,380	5	18	--	--	--
Total.	62,715	--	4,739	30,933	--	472	19,104	--	205
Total discharge for year (cfs-days).....									1,180,477
Total load for year (tons).....									417,497

a Computed from estimated concentration graph.

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

Particle-size analyses of suspended sediment, water year October 1953 to September 1954  
 (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	Dis-charge (cfs)	Water temperature (°F)	Suspended sediment										Methods of analysis		
				Concentration of sample (ppm)	Concentration of analyzed (ppm)	Percent finer than indicated size, in millimeters									0.500	1.000
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250			
Dec. 15, 1953 . . . . .	10:07 a.m.	10,380		356	2,490	22	31	44	57	65	68	73	77	82	BWCM	
Feb. 22, 1954 . . . . .	12:50 p.m.	14,640		366	1,160	10	20	31	53	81	89	96	99	100	BN	
Feb. 23 . . . . .	10:10 a.m.	15,660		304	1,030	44	59	75	85	92	95	98	100	--	BWCM	
Mar. 1 . . . . .	2:55 p.m.	10,930		450	694	28	42	59	72	76	78	86	89	95	BWCM	
Mar. 2 . . . . .	7:20 p.m.	59,560		1,860	5,960	6	10	17	24	42	100	--	--	--	BN	
Mar. 3 . . . . .	11:37 a.m.	46,810		622	2,350	32	47	65	76	88	94	99	100	--	BWCM	

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 1954.

Water temperatures: October 1947 to September 1951, October 1952 to September 1954.

EXTREMES 1953-54.--Hardness: Maximum, 104 ppm Sept. 11-30; minimum, 36 ppm May 21-31.

Specific conductance: Maximum daily, 337 micromhos Sept. 26; minimum daily, 71.6 micromhos Apr. 19.

Temperature: Maximum, 82 F July 1, Aug. 3, Sept. 6; minimum, freezing point Jan. 19.

EXTREMES 1947-51, 1952-54.--Dissolved solids (1947-51): Maximum, 104 ppm Sept. 11, 1954; minimum, 36 ppm Apr. 1-10, Dec. 1-10, 1948.

Hardness (1947-51, 1952-54): Maximum, 104 ppm Sept. 11, 1954; minimum, 36 ppm Apr. 1-10, Dec. 1-10, 1948.

Specific conductance (1947-51, 1952-54): Maximum, 337 micromhos daily, 337 micromhos Sept. 26, 1954; minimum daily, 71.6 micromhos Aug. 17, 1949.

Separation (1947-51, 1952-54): Maximum, 89 Aug. 28, 1948; minimum, freezing point Feb. 8, 9, 1951, Jan. 19, 1954.

REMARKS.--Records of specific conductance, maximum, 89 Aug. 28, 1948; minimum, freezing point Feb. 8, 9, 1951, Jan. 19, 1954. Records of discharge for gaging station near Richmond for water year October 1953 to September 1954 given in WSP 1333. No appreciable inflow between gaging station and sampling point.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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 ignition at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium	Non-carbonate			
Oct. 1-10, 1953	81.4		6.9	0.02	28	7.2	21	2.9	77	56	21	0.2	0.5	190	100	36	287	7.5	18
Oct. 11-20	73.1			.02	28	7.3			79	46	18				101	35	297	7.7	17
Oct. 21-31	692			.02	26	7.8			71	50	15				96	36	283	7.6	20
Nov. 1-10	796			.04	19	5.8			53	44	13				72	28	218	7.0	25
Nov. 11-20	492			.07	23	6.7			63	48	15				84	33	247	7.1	30
Nov. 21-30	778			.05	24	6.2			67	48	15				85	31	252	7.2	29
Dec. 1-10	1,387			.19	23	7.2			65	28	12				87	34	244	7.6	20
Dec. 11-20	7,078			.23	15	4.8			43	13	8.1				58	22	158	7.6	40
Dec. 20-31	1,770			.44	16	4.0			43	28	5.4				55	21	150	7.3	35
Jan. 1-10, 1954	1,078		13	.88	14	1.8	12	1.5	40	31	4.2	.0	.9	112	42	10	158	7.1	45
Jan. 11-20	3,710			.72	14	4.2			40	16	5.6				51	19	160	7.0	50
Jan. 21-31	9,784			.26	12	3.7			37	20	5.4				46	15	121	7.1	45
Feb. 1-10	3,436			.33	13	2.7			32	18	5.0				45	17	116	7.6	15
Feb. 11-20	1,770			.50	15	3.1			41	20	4.8				48	17	133	7.7	22
Feb. 21-28	8,735			.32	14	3.1			42	15	4.8				49	13	129	7.7	35
Mar. 1-10	19,830			.17	12	2.5			35	15	2.5				40	12	95.4	7.7	58
Mar. 11-20	6,865			.15	13	3.2			44	14	4.2				46	10	116	7.1	25
Mar. 21-31	8,918			.10	12	2.7			44	11	3.7				42	5	111	7.3	20
Apr. 1-10	5,288		10	.05	14	3.4	4.9	1.1	47	15	3.9	.1	.9	76	40	10	126	7.3	7
Apr. 11-20	7,779			.07	13	3.3			45	13	4.6				46	11	133	7.3	22
Apr. 21-30	6,262			.04	13	3.2			45	15					45	15	115	6.9	15
May 1-10	4,111			.14	14	4.0			48	14	4.6				47	14	127	7.6	18
May 11-20	4,676			.15	14	3.4			46	11	4.3				49	11	127	7.2	16
May 21-31	9,415			.22	11	2.6			38	15	3.0				38	9	98.6	7.1	32

June 1-10, 1954.....	2,618	.04	15	2.0	--	45	17	4.3	--	--	46	9	128	7.3	8
June 11-20.....	2,633	.07	15	3.0	--	44	20	4.3	--	--	50	14	135	7.2	27
June 21-30.....	1,614	.04	20	4.4	--	60	30	9.3	--	--	68	19	190	7.5	9
July 1-10.....	935	7.5	.02	18	2.7	1.8	29	6.6	.9	108	56	17	171	7.8	5
July 11-20.....	1,425	.02	18	3.6	--	45	30	6.6	--	--	59	23	168	7.5	8
July 21-31.....	2,184	.01	25	3.7	--	73	35	10	--	--	78	18	216	7.3	20
Aug. 1-10.....	697	.00	22	3.6	--	62	35	6.6	--	--	70	19	195	7.2	10
Aug. 11-20.....	171	.01	20	3.7	--	53	30	6.6	--	--	65	22	187	7.4	15
Aug. 21-31.....	426	.04	23	4.7	--	62	41	9.9	--	--	77	26	210	7.4	16
Sept. 1-10.....	235	.05	29	5.0	--	82	48	14	--	--	83	26	281	7.7	15
Sept. 11-20.....	46.0	.04	32	5.8	--	80	51	18	--	--	104	38	304	7.3	10
Sept. 21-30.....	149	.04	32	6.0	--	80	60	20	--	--	104	39	319	7.4	18
Average.....	3,523	0.15	19	4.2	--	53	29	8.4	--	--	64	20	180	--	23

## JAMES RIVER BASIN--Continued

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

Temperature (°F) of water, water year October 1953 to September 1954

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

CHOWAN RIVER BASIN  
MISCELLANEOUS ANALYSES OF STREAMS IN CHOWAN RIVER BASIN IN NORTH CAROLINA  
Chemical analyses, in parts per million, water year October 1953 to September 1954

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 magnesium	Non-carbonate				
MEHERRIN RIVER NEAR SEVERN																			
Apr. 7, 1954 .....	951			9.6	2.9			21	5						15	0	66.0	6.5	
Sept. 30 .....	21.1							52	9	5.0		0.8		36	0	131	6.7		

## 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 1953 to September 1954.

Sediment records: February 1953 to September 1954.

EXTREMES, 1953-54.--Specific conductance: Maximum daily, 388 micromhos Aug. 19; minimum daily, 66.4 micromhos Jan. 23.

Water temperatures: Maximum, 80°F July 3, 14, 15; minimum, freezing point on several days in December and January.

Sediment concentrations: Maximum daily, 1,442 ppm Mar. 1; minimum daily, 5 ppm Jan. 8, 9.

Sediment loads: Maximum daily, 48,400 tons Mar. 2; minimum daily, 6 tons Sept. 14.

EXTREMES, 1950-51, February 1953 to September 1954.--Dissolved solids (1950-51): Maximum, 150 ppm Sept. 21-30, 1951; minimum, 70 ppm Apr. 1-10, 1951.

Hardness (1950-51): Maximum, 70 ppm Sept. 10-20, 21-30, 1951; minimum, 44 ppm Dec. 1-10, 1950, Apr. 1-10, 1951.

Specific conductance: Maximum daily, 388 micromhos Aug. 19, 1954; minimum daily, 58.2 micromhos Apr. 3, 1951.

Water temperatures (1950-51, February 1953 to September 1954): Maximum, 86°F

Aug. 10, 1951; minimum, freezing point on several days during winter months.

Sediment concentrations (February 1953 to September 1954): Maximum daily, 1,442 ppm Mar. 1, 1954; minimum daily, 5 ppm Jan. 8, 9, 1954.

Sediment loads (February 1953 to September 1954): Maximum daily, 59,000 tons Mar. 24, 1953; minimum daily, 5 tons Sept. 1-4, 1953.

REMARKS.--Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year October 1953 to September 1954 given in WSP 1333.

Temperature (°F) of water, water year October 1953 to September 1954.

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

a Includes estimated temperature, 32°F, on missing days when river was frozen over.



ROANOKE RIVER BASIN--Continued

ROANOKE RIVER AT ALTAVISTA, VA.--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	358	10	10	498	38	51	457	6	7				
2.....	347	8	7	465	19	a24	477	7	9				
3.....	331			449	19	a23	465						
4.....	322			449	19	a23	477						
5.....	316			445			530						
6.....	322	9	8	438	13	15	640	28	48				
7.....	325			434			1,320	112	399				
8.....	322			438			1,180	126	401				
9.....	328			438			830	57	128				
10.....	334			445			1,110	58	174				
11.....	350	10	10	453	8	10	1,250	60	203				
12.....	354			453			1,110	54	162				
13.....	364			453			2,020	200	1,090				
14.....	364			453			4,600	708	8,790				
15.....	361	8	8	449	7	8	3,510	534	5,060				
16.....	364	9	9	445	7	8	1,860	168	844				
17.....	364			445			1,320	71	253				
18.....	368			449			935	52	a131				
19.....	361			445			694	36	a67				
20.....	358	10	10	445			760	20	a41				
21.....	364	8	8	469	19	28	885	22	51				
22.....	378			503			830	20	45				
23.....	375			540			830	18	40				
24.....	375			664			712	21	a40				
25.....	375			640			604	20	a33				
26.....	372	9	9	550	12	17	521	20	a28				
27.....	382			503			616	18	a30				
28.....	704			195			371	485	16	a28			
29.....	1,460			597			s 2,500	473	9	11	658	13	a23
30.....	900	113	275	465	12	15	634	11	a19				
31.....	586	45	71	--	--	--	604	9	a15				
Total.	13,184	--	3,543	14,281	--	497	33,077	--	18,186				
-----													
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.....	580	8	12	1,600	27	117	7,580	1,442	s 42,300				
2.....	560			1,460	22	87	11,100	1,435	s 48,400				
3.....	555			1,390	20	75	4,950	438	5,850				
4.....	555			1,320	19	68	3,600	190	1,850				
5.....	545			1,250	18	61	2,970	129	1,030				
6.....	550	7	10	1,320	21	75	2,430	85	558				
7.....	540			1,140	22	68	2,160	62	362				
8.....	521			5	7	1,040	21	59	1,960	48	254		
9.....	521			5	7	1,000	21	57	1,640	53	235		
10.....	530	9	13	970	19	50	1,640	56	248				
11.....	900	29	70	935	17	43	1,480	38	152				
12.....	1,600			76			328	900	17	41	1,340	38	137
13.....	1,080			45			131	830	18	40	1,340	46	166
14.....	748			27			55	795	15	32	1,640	68	301
15.....	970			43			113	795	15	32	1,880	87	442
16.....	5,270			686			9,760	830	22	49	1,500	58	235
17.....	4,600			552			6,860	900	31	75	1,300	52	a 183
18.....	2,700			288			2,100	935	26	66	1,200	50	162
19.....	1,670			111			500	865	20	47	1,900	40	205
20.....	1,500			56			227	830	25	56	3,000	495	4,010
21.....	1,530			108			446	1,430	295	s 1,590	2,500	308	2,080
22.....	9,180			987			s 33,900	6,010	1,150	18,700	2,200	208	1,240
23.....	13,000			1,030			36,200	3,260	471	4,150	2,000	89	481
24.....	5,000			462			6,240	2,380	183	1,180	1,800	82	399
25.....	3,180			186			1,600	1,980	113	604	1,600	71	307
26.....	3,180	106	910	1,670	70	316	1,500	41	166				
27.....	3,510	129	1,220	1,460	53	209	1,400	46	174				
28.....	3,020	103	840	1,320	50	178	1,300	41	144				
29.....	2,380	77	495	--	--	--	1,200	32	104				
30.....	2,060	47	261	--	--	--	1,260	33	112				
31.....	1,780	34	163	--	--	--	1,340	40	145				
Total.	74,315	--	102,522	40,615	--	28,125	74,710	--	112,432				

s Computed by subdividing day.

a Computed from estimated concentration graph.

## ROANOKE RIVER BASIN--Continued

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

Suspended sediment, water year October 1953 to September 1954--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.....	1,440	40	156	940	86	a218	910	36	88
2.....	1,400	47	178	940	65	a165	820	29	64
3.....	1,400	43	163	940	45	114	820	28	62
4.....	1,300	29	102	1,640	190	841	748	24	48
5.....	1,230	35	116	1,400	212	a801	720	25	a49
6.....	1,230	42	139	1,090	138	406	650	23	40
7.....	1,200	32	104	1,000	92	248	600	19	31
8.....	1,340	39	141	970	96	251	690	83	s197
9.....	1,480	48	192	970	54	141	790	179	382
10.....	1,340	36	130	910	41	101	705	66	126
11.....	1,260	30	102	910	45	111	1,160	186	s617
12.....	1,230	30	100	850	34	78	1,160	315	987
13.....	1,200	33	107	820	29	64	820	150	332
14.....	1,120	22	67	940	33	84	680	172	316
15.....	1,090	23	68	3,240	305	2,670	1,030	773	2,150
16.....	2,130	288	s2,100	3,420	339	3,130	940	334	848
17.....	3,690	588	5,860	2,420	185	1,210	2,480	924	s7,830
18.....	2,700	259	1,890	1,840	102	507	2,430	862	5,660
19.....	1,920	108	560	1,920	98	508	1,560	377	1,590
20.....	1,520	72	295	2,610	179	1,260	1,160	218	683
21.....	1,370	55	203	2,970	257	2,060	910	154	378
22.....	1,260	50	170	2,250	147	893	910	104	256
23.....	1,200	51	165	1,720	128	594	790	96	205
24.....	1,160	65	204	1,440	96	373	705	80	152
25.....	1,260	169	s648	1,300	58	204	635	82	141
26.....	1,230	256	850	1,200	44	143	585	54	85
27.....	1,340	141	510	1,090	53	156	600	40	65
28.....	1,160	75	235	1,030	91	253	490	33	44
29.....	1,060	103	295	970	33	86	420	31	75
30.....	1,000	99	267	970	32	84	545	54	39
31.....	--	--	--	940	35	89	--	--	--
Total.	43,260	--	16,117	45,650	--	17,843	27,463	--	23,540
		July		August		September			
1.....	420	35	40	405	58	63	475	202	259
2.....	425	62	71	395	106	113	312	85	72
3.....	450	34	41	910	547	1,340	308	79	66
4.....	455	33	41	680	336	617	296	60	48
5.....	445	37	44	490	149	197	268	46	33
6.....	348	24	23	480	129	167	224	33	20
7.....	390	31	33	550	138	205	191	16	8
8.....	455	42	52	505	96	131	224	36	22
9.....	1,190	501	s1,800	368	62	62	312	59	50
10.....	766	422	873	340	52	48	251	25	17
11.....	555	184	276	425	71	81	242	26	17
12.....	445	102	123	304	30	25	276	34	25
13.....	340	82	a75	268	21	15	200	14	8
14.....	420	69	78	254	21	14	170	14	6
15.....	415	67	75	276	23	17	218	18	11
16.....	360	38	37	257	24	17	218	14	8
17.....	380	39	40	215	21	12	221	15	9
18.....	410	46	51	308	36	30	221	13	8
19.....	435	78	92	282	29	23	224	14	8
20.....	902	513	s1,450	572	784	s1,550	230	23	14
21.....	1,370	763	2,820	560	325	491	480	124	161
22.....	1,640	700	3,100	520	256	359	590	117	186
23.....	1,160	505	1,580	485	128	168	415	58	65
24.....	820	190	421	525	182	258	356	41	39
25.....	670	117	212	470	125	159	276	26	19
26.....	455	72	88	730	452	s1,270	320	45	39
27.....	480	68	88	736	491	976	236	18	11
28.....	530	74	106	550	305	453	212	24	14
29.....	430	50	58	970	875	s2,530	284	46	35
30.....	420	41	46	625	451	761	284	40	31
31.....	380	36	37	570	280	431	--	--	--
Total.	18,361	--	13,871	15,035	--	12,583	8,534	--	1,309
Total discharge for year (cfs-days)	408,485								
Total load for year (tons)	350,568								

s Computed by subdividing day.

a Computed from estimated concentration graph.

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

Particle-size analyses of suspended sediment, water year October 1953 to September 1954.  
 (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	Dis-charge (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
Oct. 29, 1953	12:19 p. m.	1,560		393	1,050	53	68	78	86	92	97	99	100	100	---	BW/CM
Dec. 14	1:55 p. m.	5,300		688	1,800	27	38	46	58	68	76	80	86	100	100	BW/CM
Dec. 15	7:38 a. m.	3,960		644	1,960	30	42	50	66	76	81	83	89	100	100	BW/CM
Jan. 16, 1954	2:32 p. m.	6,780		693	2,950	11	27	37	51	55	71	77	82	85	85	BN
Jan. 23	9:52 a. m.	14,580		1,400	2,970	19	27	38	50	68	82	100	---	---	---	BN
Mar. 1	5:22 p. m.	11,580		1,690	5,160	15	22	31	41	58	82	100	---	---	---	BN
Mar. 2	12:08 a. m.	17,700		2,420	3,560	35	46	63	75	86	91	95	98	100	100	BW/CM
May 15	6:07 p. m.	4,410		517	1,470	39	50	64	71	79	84	97	100	---	---	BW/CM
May 21	9:12 a. m.	3,060		259	1,742	25	38	53	76	85	90	95	98	100	---	BN
June 17	3:43 p. m.	3,430		1,330	3,563	48	64	79	90	95	98	100	---	---	---	BW/CM
July 22	5:21 p. m.	1,780		1,965	2,660	37	50	69	89	98	99	100	---	---	---	BN

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 27.3.  
DRAINAGE AREA.--3,000 square miles, approximately.  
RECORDS AVAILABLE.--Chemical analyses: April 1939 to March 1950, October 1950 to September 1954.  
Water temperatures: October 1950 to September 1954.  
Sediment records: January to September 1954.  
EXTREMES 1953-54.--Hardness: Maximum, 69 ppm Sept. 11-20; minimum, 34 ppm May 21-31.  
Specific conductance: Maximum daily, 277 micromhos Aug. 28; minimum daily, 54.7 micromhos Jan. 23.  
Water temperatures: Maximum, 82° F July 15; minimum, freezing point Dec. 19, 20.  
Sediment concentrations (January to September 1954): Maximum daily, 1,568 ppm Mar. 2; minimum daily, 10 ppm Feb. 14, 15.  
Sediment loads (January to September 1954): Maximum daily, 71,500 tons Mar. 2; minimum daily, 15 tons Sept. 16.  
EXTREMES 1929-30, 1950-54.--Dissolved solids (1929-30, 1950-52): Maximum, 116 ppm Oct. 1-10, 1951; minimum, 59 ppm Feb. 1-10, 1952.  
Hardness (1929-30, 1950-54): Maximum, 69 ppm Sept. 11-20, 1954; minimum, 30 ppm Dec. 1-10, 1950, Mar. 21-31, 1952.  
Specific conductance (1950-54): Maximum daily, 277 micromhos Aug. 28, 1954; minimum daily, 48.4 micromhos Dec. 23, 1951.  
Water temperatures (1950-54): Maximum, 82° F July 15, 1954; minimum, freezing point on several days during some winters.  
REMARKS.--Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year October 1953 to September 1954 given in WSP 1333.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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, 1953.....	542		11	0.03	13	5.8	14	2.3	70	18	11	0.1	0.4	111	58	0	172	7.5	10
Oct. 11-20.....	558			.01	14	6.8			72	24					63	4	180	7.2	8
Oct. 21-31.....	1,204			.16	13	5.1			65	26					53	0	172	7.4	30
Nov. 1-10.....	836			.07	12	5.2			59	15					50	3	154	7.7	20
Nov. 11-20.....	774			.07	12	5.0			62	9					52	0	168	7.8	10
Nov. 21-30.....	921			.09	11	5.2			60	8					49	0	154	7.3	14
Dec. 1-10.....	1,215			.11	11	5.0			56	8					48	2	142	7.3	30
Dec. 11-20.....	3,550				8.0	3.7			33	8					35	8	96.7	7.5	100
Dec. 21-31.....	1,284			.04	11	4.8			46	11					46	10	124	7.4	5
Jan. 1-10, 1954.....	575		18	.00	11	5.5	7.2	1.5	50	16	5.2	.1	1.9	80	50	9	127	7.4	4
Jan. 11-20.....	3,951			.13	8.9	4.6			39	16					41	9	111	7.0	40
Jan. 21-31.....	7,079			.27	8.1	3.6			32	8					35	9	89.1	7.0	100
Feb. 1-10.....	2,170			.06	9.8	4.5			48	12					43	4	117	7.3	9
Feb. 11-20.....	1,606			.03	10.1	4.4			48	11					43	7	122	7.2	5
Feb. 21-28.....	3,793			.11	9.2	3.9			38	12					39	6	102	7.0	50
Mar. 1-10.....	5,758			.17	8.6	3.9			32	11					37	6	81.6	6.8	30
Mar. 11-20.....	2,458			.09	10.1	3.1			44	8					37	4	109	7.0	30
Mar. 21-31.....	2,857			.13	9.5	4.1			44	7					41	4	101	7.2	40

Apr. 1-10, 1954.....	2,044	13	.01	11	4.1	4.1	6.8	4.1	.1	.9	73	43	0	114	7.8	10
Apr. 11-20.....	3,286	--	.09	9.8	4.0	4.0	13	--	--	--	--	41	2	102	7.9	40
Apr. 21-30.....	1,934	--	.04	9.8	4.4	4.4	12	--	--	--	--	43	2	112	7.7	23
May 1-10.....	1,636	--	.06	11	4.0	4.0	7	--	--	--	--	37	4	116	7.2	28
May 11-20.....	2,661	--	.11	9.8	3.0	3.0	6	--	--	--	--	37	2	108	7.1	28
May 21-31.....	2,521	--	.09	9.4	2.6	2.6	7	--	--	--	--	34	1	96.3	7.0	22
June 1-10.....	1,240	--	.00	11	3.8	3.8	7	--	--	--	--	43	1	115	7.1	7
June 11-20.....	2,005	--	.10	10	3.4	3.4	12	--	--	--	--	40	1	114	7.3	50
June 21-30.....	1,095	--	.07	11	4.2	4.2	11	--	--	--	--	44	2	130	7.6	32
July 1-10.....	740	14	.03	12	4.8	4.8	11	7.6	.2	1.0	90	56	2	145	7.4	5
July 11-20.....	1,281	--	.09	11	4.2	4.2	19	--	--	--	--	45	0	149	7.5	35
July 21-31.....	1,281	--	.12	12	4.0	4.0	17	--	--	--	--	48	0	157	7.4	70
Aug. 1-10.....	918	--	.09	11	3.6	3.6	14	--	--	--	--	42	0	147	7.3	45
Aug. 11-20.....	508	--	.00	14	5.1	5.1	23	--	--	--	--	56	1	205	7.4	10
Aug. 21-31.....	950	--	.02	14	4.9	4.9	29	--	--	--	--	55	7	210	7.3	25
Sept. 1-10.....	478	--	.04	14	5.3	5.3	25	--	--	--	--	57	5	203	7.4	30
Sept. 11-20.....	299	--	.00	17	6.5	6.5	30	--	--	--	--	69	6	239	7.5	5
Sept. 21-30.....	539	--	.00	15	5.7	5.7	20	--	--	--	--	61	5	211	7.4	5
Average.....	1,852	--	0.08	11	4.5	4.5	14	--	--	--	--	46	4	139	--	28

## ROANOKE RIVER BASIN--Continued

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

Temperature (°F) of water, water year October 1953 to September 1954

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

ROANOKE RIVER BASIN--Continued

ROANOKE RIVER AT RANDOLPH, VA.--Continued

Suspended sediment, January to September 1954

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.....	--	--	--	2,800	40	302	4,920	790	10,500	
2.....	--	--	--	2,530	30	205	17,000	1,558	71,500	
3.....	--	--	--	2,350	33	209	9,720	1,034	27,100	
4.....	--	--	--	2,260	29	177	5,960	374	6,020	
5.....	--	--	--	2,180	45	265	4,730	183	2,340	
6.....	--	--	--	2,100	31	176	3,900	100	1,050	
7.....	960			2,000	21	113	3,300	75	668	
8.....	960			1,940	22	115	2,900	56	438	
9.....	930	11	28	1,800	20	97	2,710	47	344	
10.....	930			1,740	14	66	2,440	44	290	
11.....	1,080	22	64	1,780	12	58	2,350	43	273	
12.....	1,820	36	157	1,740	14	66	2,180	40	235	
13.....	2,100	46	a 261	1,700	16	73	2,100	40	227	
14.....	1,540	35	a 146	1,600	10	43	2,530	140	856	
15.....	1,500	48	194	1,500	10	45	3,400	131	1,200	
16.....	6,420	363	6,290	1,500	14	57	2,800	81	612	
17.....	8,980	524	12,700	1,500	24	97	2,260	60	366	
18.....	5,810	370	5,800	1,600	31	134	2,100	36	204	
19.....	3,850	231	2,400	1,700	26	119	1,980	32	171	
20.....	2,710	140	1,020	1,440	27	105	2,860	68	680	
21.....	3,000	131	1,060	2,440	295	1,940	5,480	268	3,970	
22.....	7,160	157	3,040	5,400	397	5,790	4,280	246	2,840	
23.....	23,200	730	45,700	6,430	625	10,900	3,300	110	980	
24.....	15,400	539	22,400	4,280	508	5,870	2,800	74	559	
25.....	6,360	384	6,590	3,400	197	1,810	2,530	54	369	
26.....	5,720	183	2,830	2,900	103	806	2,530	54	369	
27.....	6,290	137	2,330	2,530	64	437	2,350	42	266	
28.....	5,800	109	1,710	2,260	47	287	2,180	37	218	
29.....	4,640	82	1,030	--	--	--	2,020	40	218	
30.....	3,700	62	619	--	--	--	1,930	33	172	
31.....	3,200	47	406	--	--	--	1,880	32	171	
Total.	123,860	--	116,859	67,400	--	30,362	113,520	--	135,306	
		April			May			June		
1.....	2,100	36	204	1,500	74	300	1,400	40	151	
2.....	2,180	38	224	1,470	70	278	1,330	38	136	
3.....	2,100	36	204	1,440	48	187	1,300	36	126	
4.....	2,020	38	207	1,660	67	300	1,260	37	126	
5.....	1,900	32	164	2,350	126	799	1,260	37	126	
6.....	1,900	34	174	1,980	192	1,030	1,160	37	116	
7.....	1,860	33	166	1,620	187	818	1,120	31	94	
8.....	2,020	70	382	1,500	105	425	1,050	32	91	
9.....	2,260	252	1,540	1,440	76	295	1,120	178	538	
10.....	2,100	63	357	1,400	59	223	1,400	152	575	
11.....	1,940	46	241	1,360	51	187	1,360	130	477	
12.....	1,860	40	201	1,330	41	147	1,780	166	798	
13.....	1,820	40	197	1,300	40	140	1,620	242	1,060	
14.....	1,740	40	188	1,360	41	151	1,400	202	764	
15.....	1,700	35	161	2,530	108	738	1,400	287	1,080	
16.....	2,710	307	2,250	5,160	232	3,230	2,400	388	2,510	
17.....	6,990	775	14,600	4,370	300	3,540	2,180	405	2,380	
18.....	6,570	358	6,350	3,300	195	1,740	2,990	611	4,930	
19.....	4,550	170	2,090	2,900	123	963	2,900	822	6,440	
20.....	3,100	114	954	3,000	111	899	2,020	492	2,680	
21.....	2,440	74	488	5,160	192	2,670	1,620	252	1,100	
22.....	2,180	61	359	4,730	240	3,070	1,330	165	593	
23.....	2,020	54	295	3,300	151	1,350	1,300	132	463	
24.....	1,900	50	256	2,530	105	717	1,260	108	367	
25.....	1,860	45	226	2,180	78	459	1,120	98	296	
26.....	1,900	42	215	1,940	65	340	1,020	71	196	
27.....	1,860	57	286	1,780	53	255	930	59	148	
28.....	1,900	92	472	1,860	62	278	840	56	a 127	
29.....	1,700	120	551	1,540	70	291	810	51	112	
30.....	1,580	200	853	1,470	47	187	700	40	76	
31.....	--	--	--	1,440	42	163	--	--	--	
Total.	72,760	--	34,855	70,700	--	26,170	43,380	--	28,676	

a Computed from estimated concentration graph.

## ROANOKE RIVER BASIN--Continued

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

Suspended sediment, January to September 1954--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.....	675	40	73	640	52	90	810	282	573
2.....	700	44	83	625	54	91	750	188	381
3.....	675	48	87	1,150	372	s 1,460	615	127	211
4.....	650	52	91	1,360	528	1,940	470	82	104
5.....	875	70	128	1,260	302	1,030	445	72	87
6.....	750	86	174	930	211	530	425	60	69
7.....	750	68	138	900	204	496	380	46	47
8.....	700	64	121	840	133	302	314	32	27
9.....	700	61	115	780	112	236	283	30	23
10.....	1,120	79	239	700	94	a 178	283	34	26
11.....	1,190	136	437	595	75	120	390	42	44
12.....	810	150	328	585	63	100	314	30	25
13.....	725	134	262	590	56	89	289	27	21
14.....	610	85	140	555	47	70	342	30	28
15.....	530	156	223	520	44	62	286	26	20
16.....	700	626	1,180	495	40	53	256	22	15
17.....	810	294	643	470	44	56	262	25	18
18.....	725	157	307	405	42	46	274	30	22
19.....	780	146	307	355	47	45	276	32	24
20.....	930	344	864	485	57	75	298	37	30
21.....	1,860	426	2,140	875	283	s 787	545	67	99
22.....	2,440	580	3,820	930	325	a 816	605	66	108
23.....	2,100	609	3,450	900	216	525	780	94	198
24.....	1,620	379	1,660	700	154	291	675	59	108
25.....	1,300	287	937	750	150	304	565	41	63
26.....	1,020	172	474	725	105	206	500	30	40
27.....	900	100	a 243	675	81	148	465	30	38
28.....	725	78	153	1,440	380	1,480	475	32	41
29.....	725	72	141	1,050	326	924	410	30	33
30.....	725	62	121	1,360	342	1,260	370	27	27
31.....	675	55	100	1,050	329	933	--	--	--
Total.	29,295	--	19,179	24,695	--	14,743	13,152	--	2,550
Total discharge for period (cfs-days).....									558,762
Total load for period (tons).....									408,700

s Computed by subdividing day.

a Computed from estimated concentration graph.



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

Particle-size analyses of suspended sediment, January to September 1954

(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	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								Methods of analysis			
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500	1.000
Jan. 17, 1954.....	11:10 a. m.	10,000		458	1,120	22	31	47	69	84	92	99			100	100	BN
Jan. 24.....	8:26 a. m.	22,020		489	1,270	31	44	60	76	85	87	94			98	98	BW
Mar. 2.....	12:14 p. m.	16,260		1,630	1,820	45	59	72	84	91	95	99			100	100	BWCM
Mar. 2.....	6:05 p. m.	18,280		1,360	4,760	20	29	42	56	82	99	100			--	--	BN
June 18.....	10:05 a. m.	2,900		404	1,070	31	48	65	75	84	88	92			95	97	BN
June 25.....	11:03 a. m.	1,120		104	381	46	68	81	89	94	96	99			100	100	BWCM
July 22.....	11:50 a. m.	2,530		574	1,650	55	73	84	91	95	97	100			--	--	BWCM

## ROANOKE RIVER BASIN--Continued

## DAN RIVER AT PACES, VA.

LOCATION.--At gaging station at highway bridge, 0.5 mile southeast of Paces, Halifax County, 0.5 mile upstream from Big Toby Creek, 2.7 miles upstream from Birch Creek, and at mile 36.0.

DRAINAGE AREA.--2,550 square miles, approximately.

RECORDS AVAILABLE.--Water temperatures: January to September 1954.

Sediment records: January to September 1954.

EXTREMES, January to September 1954.--Specific conductance: Maximum daily, 199 micromhos, Sept. 22; minimum daily, 39.7 micromhos Jan. 24.

Water temperatures: Maximum, 91°F July 3, 14; minimum, 35°F Jan. 13, 14.

Sediment concentrations: Maximum daily, 1,803 ppm June 17; minimum daily, 15 ppm Feb. 15.

Sediment loads: Maximum daily, 64,700 tons Jan. 23; minimum daily, 14 tons Sept. 29.

REMARKS.--Records of specific conductance of daily samples for January to September 1954 available in district office at Charlottesville, Va. Records of discharge for water year October 1953 to September 1954 given in WSP 1333.

Temperature (°F) of water, January to September 1954

(Once-daily measurement generally between 11 a.m. and 2 p.m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				--	42	52	55	76	82	89	84	72
2				--	44	51	56	78	83	89	82	71
3				--	44	48	57	79	81	91	88	80
4				--	43	47	52	72	81	81	84	83
5				--	43	43	55	68	78	85	85	85
6				--	44	45	61	69	75	87	83	85
7				44	42	45	68	68	76	82	84	85
8				40	41	42	69	68	80	85	83	84
9				44	44	49	65	63	82	80	82	84
10				48	45	53	62	63	82	81	83	82
11				42	46	54	63	64	82	82	83	81
12				39	44	51	64	66	82	81	78	77
13				35	42	50	65	64	83	84	81	76
14				35	42	51	68	59	85	91	81	80
15				37	51	42	69	58	81	86	--	79
16				39	54	41	70	61	82	79	87	82
17				40	54	48	64	65	73	78	88	84
18				39	52	50	64	65	73	83	83	84
19				42	52	50	65	67	72	81	83	82
20				44	51	54	68	64	74	88	--	78
21				50	54	48	72	62	77	82	86	80
22				45	54	49	72	63	83	75	81	71
23				39	52	52	73	65	82	75	82	79
24				38	50	54	75	67	84	79	82	75
25				39	51	51	77	71	82	81	84	77
26				45	52	61	73	73	85	82	86	70
27				47	51	59	76	74	88	84	87	77
28				46	51	60	77	77	89	84	83	78
29				45	--	60	71	80	83	87	--	80
30				44	--	64	72	81	88	87	82	80
31				42	--	63	--	82	--	89	81	--
Average				42	48	51	67	68	81	83	83	79

ROANOKE RIVER BASIN--Continued

DAN RIVER AT PACES, VA.--Continued

Suspended sediment, January to September 1954

Day	January			February			March		
	Suspended sediment			Suspended sediment			Suspended sediment		
	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.....	--	--	--	2,040	35	193	3,160	492	s 5,660
2.....	--	--	--	1,830	38	188	6,340	654	11,200
3.....	--	--	--	1,900	33	169	4,340	326	3,820
4.....	--	--	--	1,830	26	128	3,370	140	1,270
5.....	--	--	--	1,830	25	124	2,810	101	766
6.....	--	--	--	1,700	21	96	2,390	64	413
7.....	1,010	19	52	1,700	20	92	2,180	48	283
8.....	1,070	19	55	1,400	22	83	1,970	42	223
9.....	1,010	16	44	1,340	19	69	1,700	42	193
10.....	1,010	17	46	1,520	21	86	1,830	55	272
11.....	1,430	64	247	1,520	20	82	1,760	76	361
12.....	2,110	105	598	1,490	20	80	1,760	56	266
13.....	2,390	192	1,240	1,400	20	76	1,640	48	213
14.....	1,560	70	299	1,400	17	64	4,340	788	s 11,800
15.....	1,520	64	263	1,190	15	48	8,390	1,128	25,600
16.....	5,550	511	7,660	1,160	19	60	5,140	496	6,880
17.....	10,800	1,145	33,400	1,580	35	149	3,090	179	1,490
18.....	5,300	581	8,310	1,580	41	175	2,670	105	757
19.....	2,810	253	1,920	1,520	33	135	2,390	74	478
20.....	2,390	107	690	1,430	26	100	3,240	325	s 3,960
21.....	3,790	694	7,100	1,970	501	s 2,980	7,950	985	21,100
22.....	9,160	992	24,500	5,380	946	s 15,700	4,260	347	3,990
23.....	19,300	1,242	64,700	5,140	920	12,800	2,880	193	1,500
24.....	24,100	680	44,200	3,060	317	2,640	2,670	110	793
25.....	11,300	357	10,900	2,600	116	814	2,460	87	578
26.....	5,140	246	3,410	2,250	82	498	2,390	78	503
27.....	4,820	149	1,940	2,040	75	413	2,320	75	470
28.....	4,100	116	1,280	1,830	69	341	2,180	51	300
29.....	3,300	84	748	--	--	--	1,900	46	236
30.....	1,670	53	382	--	--	--	1,830	48	237
31.....	460	40	266	--	--	--	1,970	56	298
Total.	130,120	--	214,250	55,660	--	38,383	97,320	--	105,910
Day	April			May			June		
	Suspended sediment			Suspended sediment			Suspended sediment		
	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.....	2,950	155	1,230	1,580	88	375	1,070	50	144
2.....	4,260	293	3,370	1,220	82	270	1,280	60	207
3.....	3,230	299	2,610	1,220	79	260	1,130	56	171
4.....	2,530	154	1,050	1,400	95	359	1,100	56	166
5.....	2,110	74	422	2,250	181	1,100	1,070	50	144
6.....	1,900	56	287	2,040	320	1,760	1,020	64	185
7.....	2,040	59	325	1,400	192	772	920	41	102
8.....	1,970	52	277	1,490	109	439	700	36	68
9.....	2,040	65	358	1,160	113	354	980	49	130
10.....	1,900	56	287	1,250	88	297	980	58	153
11.....	1,830	46	227	1,040	66	191	1,760	167	794
12.....	1,520	81	332	1,250	73	246	2,250	434	2,640
13.....	1,560	56	239	1,280	72	249	1,490	303	1,220
14.....	1,640	48	213	1,400	64	242	1,100	239	710
15.....	1,580	48	205	2,460	118	784	1,340	192	695
16.....	1,640	48	213	3,790	242	2,480	1,970	494	s 4,110
17.....	3,300	214	1,910	3,090	167	1,390	7,260	1,803	35,300
18.....	4,100	281	3,110	2,110	105	598	4,740	1,257	16,100
19.....	3,090	186	1,550	1,970	88	468	3,650	1,335	13,200
20.....	2,390	146	942	2,390	112	723	2,110	650	3,700
21.....	2,040	99	545	4,260	419	4,820	1,580	322	1,370
22.....	1,830	74	366	4,660	448	5,640	1,160	199	623
23.....	1,760	63	299	2,880	233	1,810	1,340	170	615
24.....	1,640	49	217	2,250	128	778	1,160	145	454
25.....	1,900	294	s 2,060	1,760	84	399	1,160	111	348
26.....	3,090	904	7,540	1,830	82	405	1,040	104	292
27.....	1,830	405	2,000	1,640	96	425	980	118	312
28.....	1,760	183	870	1,580	58	247	860	88	204
29.....	1,640	123	545	1,580	66	282	700	64	121
30.....	1,520	104	427	1,490	69	278	750	79	180
31.....	--	--	--	1,160	58	182	--	--	--
Total.	66,610	--	34,046	60,970	--	28,623	48,700	--	84,438

s Computed by subdividing day.

## ROANOKE RIVER BASIN--Continued

## DAN RIVER AT PACES, VA.--Continued

Suspended sediment, January to September 1954--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.....	750	81	164	750	72	146	800	321	693
2.....	775	76	159	700	72	136	640	314	543
3.....	800	76	164	650	63	111	625	200	338
4.....	750	75	152	1,130	86	262	540	116	169
5.....	675	54	98	980	111	294	450	107	130
6.....	595	52	84	830	119	267	440	104	124
7.....	700	80	151	725	117	229	352	80	76
8.....	750	81	164	700	118	223	340	70	64
9.....	775	70	146	650	104	183	525	100	142
10.....	1,040	105	295	800	148	a 320	500	67	90
11.....	1,190	109	350	650	200	351	388	61	64
12.....	800	81	175	675	178	324	450	59	72
13.....	520	66	93	650	94	165	396	55	59
14.....	590	88	140	540	87	127	300	39	32
15.....	675	61	111	550	92	137	265	27	19
16.....	2,870	634	4,570	550	76	113	470	36	46
17.....	1,130	376	1,150	336	58	53	405	42	46
18.....	920	274	681	802	193	418	396	28	30
19.....	725	143	280	1,460	376	1,480	372	31	31
20.....	550	116	172	1,370	393	1,450	405	36	39
21.....	2,620	776	s 8,060	1,070	459	1,330	392	36	38
22.....	5,700	1,695	26,100	980	375	992	415	55	62
23.....	4,100	1,006	11,100	700	194	367	600	56	91
24.....	2,870	750	5,410	625	183	309	590	46	73
25.....	1,580	417	1,780	950	210	539	485	36	47
26.....	1,040	337	946	725	180	352	465	61	77
27.....	750	211	427	800	165	356	435	40	47
28.....	950	163	418	775	158	331	360	22	21
29.....	860	107	248	920	190	a 472	296	18	14
30.....	860	97	225	1,250	272	918	455	29	36
31.....	725	74	145	890	286	687	--	--	--
Total.	39,235	--	64,158	25,183	--	13,442	13,552	--	3,313

Total discharge for period (cfs-days)..... 537,350

Total load for period (tons)..... 586,563

s Computed by subdividing day.

a Computed from estimated concentration graph.



ROANOKE RIVER BASIN--Continued  
ROANOKE RIVER NEAR SCOTLAND NECK, N. C.

LOCATION.--At gaging station at bridge on U. S. Highway 258, 1 mile downstream from tributary on right, 3 miles downstream from Bridgers Creek, 5 1/2 miles north of Scotland Neck, Halifax County, and at mile 102.5.

DRAINAGE AREA.--8,700 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1954.

Water temperatures: October 1944 to September 1953 to September 1954.

EXTREMES, 1953-54.--Dissolved solids: Maximum, 94 ppm Oct. 21-31; minimum, 65 ppm Mar. 21-31.

Hardness: Maximum, 44 ppm Oct. 21-31; minimum, 26 ppm Feb. 20-28, Mar. 11-20, Mar. 21-31.

Water temperatures: Maximum, 80°F June 15, 16, July 7, Aug. 3, 17, 18, 19, 27, 28; minimum, 33°F Dec. 31.

EXTREMES, 1944-45.--Dissolved solids: Maximum, 173 ppm Apr. 1-10; minimum, 47 ppm Oct. 1-10.

Hardness: Maximum, 57 ppm Apr. 1-10; minimum, 18 ppm Oct. 1-10.

Water temperatures: Maximum, 85°F July 3, 4, 6, 7, 8; minimum, 35°F Jan. 31.

REMARKS.--Records of specific conductance of daily samples available in district office at Raleigh, N. C. Records of discharge for water year October 1953 to September 1954 given in WSP 1333. available in district office at Raleigh, N. C. Records of discharge for water year October 1953 to September 1954

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	Magnesium					Unfiltered	Filtered
Oct. 1-10, 1953	3,940	6.7	0.48	12	2.9	8.3	3.0	60	6.3	5.2	0.1	0.7	81	42	0	131	7.2	23	5.6	4.4
Oct. 11-20	2,210	7.5	0.12	12	2.3	13		66	8.0	6.2	.1	.6	94	41	0	135	7.9	26	6.8	6.0
Oct. 21-31	2,080	7.7	0.08	11	2.3	13		61	8.7	7.0	.1	.4	89	36	0	146	7.1	27	6.6	6.5
Nov. 1-10	2,200	7.0	0.08	11	2.3	14		62	8.6	6.5	.2	.4	90	40	0	145	6.9	23	7.4	6.5
Nov. 11-20	2,990	9.9	0.08	12	2.8	12		60	8.3	6.5	.6	.6	88	41	0	151	6.9	23	6.4	5.6
Dec. 1-10	3,550	7.7	0.07	12	2.8	12		60	8.4	6.5	.2	.8	83	41	0	133	7.2	24	5.5	4.6
Dec. 11-20	5,180	9.9	0.06	10	2.5	10		48	8.1	6.0	.1	1.3	78	35	0	121	7.0	22	6.5	5.1
Dec. 21-31	4,480	7.8	0.08	11	2.7	13		56	9.1	6.8	.2	1.1	84	39	0	132	7.1	18	6.2	4.4
Jan. 1-10, 1954	5,260	8.4	0.06	11	2.9	11	3.7	56	8.9	6.5	.2	1.4	84	39	0	134	7.2	16	5.4	4.2
Jan. 11-20	7,450	8.2	0.08	8.8	2.9	12		44	11	7.0	.2	1.2	75	34	0	124	7.0	18	6.7	4.4
Jan. 21-31	13,900	10	0.07	8.2	1.9	11		39	10	6.5	.1	.8	70	28	0	106	7.0	21	8.5	4.3
Feb. 1-10	11,600	9.8	0.07	8.7	2.4	10		41	9.5	6.0	.0	1.7	77	32	0	112	7.0	23	5.7	4.1
Feb. 11-19	11,600	10	0.09	9.3	2.5	6.5		36	9.5	5.5	.0	.5	75	34	6	104	7.2	17	9.4	5.5
Feb. 20-28	5,970	8.6	0.08	7.7	1.6	8.7		34	9.4	4.5	.0	1.0	69	26	0	97.3	7.0	27	12	6.4
Mar. 1-10	7,020	7.8	0.01	7.5	2.0	10		35	11	5.2	.0	1.3	70	27	0	95.3	7.2	18	7.4	5.4
Mar. 11-20	9,770	13	0.06	7.2	2.0	10		34	9.9	6.0	.1	1.2	70	26	0	105	6.9	16	7.3	5.2
Mar. 21-31	7,400	12	0.10	7.6	1.6	8.3		33	8.4	4.8	.1	.9	65	26	0	104	6.8	18	6.7	4.3
Apr. 1-10	7,740	9.6	0.08	7.8	2.3	9.2	1.9	35	9.0	5.0	.1	.9	67	29	0	97.2	6.9	18	7.0	4.9
Apr. 11-20	6,780	9.0	0.08	8.7	1.6	7.5		35	8.1	4.8	.1	.7	66	28	0	97.4	6.8	17	6.2	4.7
Apr. 21-30	8,400	9.8	0.08	8.3	1.6	8.9		37	8.2	4.8	.1	.9	67	27	0	98.2	6.9	10	6.4	4.5
May 1-10	7,170	8.1	0.04	8.1	2.1	8.9		39	8.1	4.8	.1	1.0	70	29	0	100	7.0	9	5.6	3.6
May 11-20	6,260	14	0.03	8.6	1.8	9.2		39	9.1	4.5	.1	1.1	71	29	0	100	7.0	24	6.0	4.0
May 21-31	9,180	11	0.03	8.0	1.6	7.1		34	7.0	4.2	.1	.8	66	27	0	89.9	6.9	21	6.0	4.4

June 1-10, 1954	3,160	10	.05	9.6	2.1	10	47	8.8	4.5	.1	.6	76	33	0	113	7.0	8	6.6	4.8
June 11-20	2,920	7.3	.01	11	1.7	11	52	9.8	4.5	.1	.9	78	32	0	120	7.1	7	6.6	4.8
June 21-30	2,810	10	.01	11	2.2	10	52	7.9	5.5	.1	1.2	79	42	1	118	7.2	6	5.8	3.9
July 1-10	3,110	16	.05	11	3.6	7.4	50	5.5	5.0	.1	1.0	86	34	0	120	7.3	10	6.8	3.7
July 11-20	3,980	12	.05	10	2.9	6.0	50	7.2	5.0	.1	1.0	86	34	0	120	7.3	13	6.6	5.3
July 21-31	4,660	12	.07	10	2.2	6.8	48	7.2	5.0	.1	1.0	80	34	0	115	6.9	18	5.6	4.3
Aug. 1-10	3,490	11	.10	10	2.1	7.3	50	7.4	5.0	.2	.8	80	34	0	118	6.8	18	6.4	5.0
Aug. 11-20	3,210	11	.12	11	2.2	9.0	55	8.0	5.0	.1	.6	87	36	0	126	7.1	18	7.2	6.0
Aug. 21-31	3,240	6.2	.12	11	1.8	9.0	54	7.9	5.0	.1	.7	80	35	0	122	6.9	18	6.0	5.4
Sept. 1-10	3,840	9.5	.14	11	1.9	8.5	56	7.0	5.5	.1	.8	79	36	0	125	6.8	15	6.3	5.1
Sept. 11-20	3,520	7.9	.15	11	1.9	8.9	56	7.1	5.5	.1	1.0	81	35	0	124	7.0	17	6.3	4.8
Sept. 21-30	3,350	7.9	.16	11	1.9	9.5	56	7.9	6.0	.1	.7	80	35	0	127	7.0	25	6.7	5.5
Average	5,469	9.6	0.09	9.9	2.3	11	48	8.5	5.5	0.1	0.9	78	34	0	119	--	18	6.7	4.9

## ROANOKE RIVER BASIN--Continued

## ROANOKE RIVER NEAR SCOTLAND NECK, N. C.--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
 (/Once-daily measurement at 7:30 a. m./)

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



Chemical analyses, in parts per million, water year October, 1953 to September, 1954

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	Non-carbonate			

DAN RIVER NEAR FRANCISCO

Mar. 11, 1954	122	9.4	0.02	2.6	0.7	3.3	1.1	12	3.6	1.5	0.1	0.7	28	9	0	35.2	6.5	6
Aug. 27	178	10	.00	3.0	.5	1.4	1.4	14	2.1	.8	.0	.8	27	10	0	40.7	6.6	17

TOWN FORK CREEK AT WALNUT COVE

Mar. 10, 1954	55.1							34	4	2.8				21	0	68.4	6.9	
Sept. 8	13.6			7.2	1.5			34	2	3.2		1.0		24	0	76.6	6.7	

BELEW CREEK NEAR PINE HALL

Mar. 10, 1954	46.0							25	3	2.8				17	0	57.0	7.0	
Sept. 14	2.82							34	3	3.2				18	0	63.6	7.4	

BIG BEAVER ISLAND CREEK NEAR MADISON

Mar. 10, 1954	6.7							23	3	2.0				14	0	51.6	6.8	
Sept. 14	.557							47	4	3.0				29	0	86.5	7.4	

READY BRANCH NEAR WILLIAMSTON

Feb. 16, 1954	9.37							12	13	8.8				18	8	86.1	6.2	
Apr. 8	18.8							14	10	8.8				17	6	80.8	6.5	
July 14	1.17							18	3	8.8				17	2	78.0	6.5	
Sept. 30	1.06			5.6	0.7			18	13	8.5		2.0		17	2	76.8	6.4	

ROQUIST CREEK NEAR WINDSOR

Apr. 8, 1954	104							9	3	5.8				11	4	49.7	6.0	
July 14	.02							15	11	8.0				23	11	102	6.1	

<sup>a</sup> Mean discharge.

## PAMLICO RIVER BASIN

## FISHING CREEK NEAR ENFIELD, N. C.

LOCATION.--Temperature recorder on right bank 15 feet downstream from bridge on U. S. Highway 301, 2,000 feet downstream from Atlantic Coast Line Railroad bridge, 2 miles southwest of Enfield, Halifax County, and  $\frac{1}{2}$  miles downstream from Rocky Creek, and at mile 27.7.

DRAINAGE AREA.--521 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1948 to September 1949, October 1953 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 84° F July 31, Aug. 1, 2, 3; minimum, 35° F Jan. 26.

EXTREMES, 1948-49, 1953-54.--Water temperatures: Maximum, 84° F July 31, Aug. 1, 2, 3, 1954; minimum, 33° F Dec. 28, 1948.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1333.

Temperature (°F) of water, water year October 1953 to September 1954

$\frac{1}{2}$  Continuous ethyl alcohol-actuated thermograph

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

PAMLICO RIVER BASIN

TAR RIVER AT TARBORO, N. C.

LOCATION.--At gaging station at bridge on U. S. Highway 64 in Tarboro, Edgecombe County, 6 1/2 miles downstream from Fishing Creek, and at mile 46.2. DRAINAGE AREA.--2,140 square miles (approximately). RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1953 to September 1954. Water temperatures: October 1944 to September 1954. EXTREMES, 1953-54.--Dissolved solids: Maximum, 89 ppm Sept. 21-30; minimum, 45 ppm Jan. 21-31.

Hardness: Maximum, 25 ppm Aug. 11-20; minimum, 9 ppm Jan. 21-31. Water temperatures: Maximum, 82°F July 3, 4, 5, 6, 31, Aug. 1, 17, 27, 28; minimum, 37°F Jan. 13, 14. EXTREMES, 1944-45.--Dissolved solids: Maximum, 62 ppm May 1-10, June 11-20; minimum, 45 ppm Feb. 20-28.

Hardness: Maximum, 22 ppm Apr. 11-20; minimum, 11 ppm Oct. 1-10. Water temperatures: Maximum, 84°F July 2; minimum, 34°F Dec. 20, Jan. 27, Feb. 2, 3, 4. RECORDS OF SUSPENDED MATTER OF COMPOSITE SAMPLES AVAILABLE IN DISTRICT OFFICE AT RALEIGH, N. C. Records of discharge for water year October 1953 to September 1954 given in WSP 1333.

REMARKS.--Records of specific conductance of daily samples available in district office at Raleigh, N. C. Records of discharge for water year October 1953 to September 1954 given in WSP 1333.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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, 1953	391	13	0.07	4.3	1.2	7.4	2.4	19	7.2	6.5	0.1	1.0	59	16	0	78.2	6.6	12	6.0	4.4
Oct. 11-20	240	14	.10	4.9	1.5	9.7	9.7	23	7.4	8.5	.1	.8	65	18	0	95.9	7.4	23	--	--
Oct. 21-31	217	12	.05	5.4	2.0	9.5	9.5	29	6.3	8.1	0	8	65	22	0	96.1	6.9	13	5.0	3.3
Nov. 1-10	277	18	.11	5.1	1.7	12	12	30	5.6	9.0	.1	1.6	73	20	0	97.8	7.3	16	--	--
Nov. 11-20	359	18	.13	4.8	1.7	9.2	9.2	28	4.8	7.0	.1	1.1	64	19	0	90.9	7.3	20	--	--
Nov. 21-30	414	13	.15	4.6	1.6	9.4	9.4	27	5.3	7.2	0	.9	66	18	0	87.1	6.5	18	3.8	3.7
Dec. 1-10	538	17	.08	4.7	1.6	8.4	8.4	24	5.7	7.2	.1	.8	65	18	0	93.4	6.8	26	5.0	4.4
Dec. 11-20	2,940	14	.05	4.2	1.8	6.8	6.8	13	8.0	6.2	.1	.8	58	14	3	96.6	6.1	34	--	--
Dec. 21-31	1,510	15	.20	4.1	1.2	7.2	7.2	12	11	6.2	0	.9	65	15	0	70.8	6.3	32	7.4	6.3
Jan. 1-10, 1954	4,997	19	.07	4.4	1.4	7.2	2.0	17	13	7.1	.1	.6	66	17	3	77.2	6.3	27	4.9	4.0
Jan. 11-20	4,940	13	.02	2.8	1.2	9.6	9.6	14	7.7	8.5	.1	.8	61	12	1	78.9	6.6	21	7.6	5.7
Jan. 21-31	17,800	6.2	.11	2.9	.5	5.3	5.3	7	8.4	3.8	.1	.8	45	9	4	47.2	6.1	38	12	7.6
Feb. 1-10	4,680	10	.07	3.7	1.0	5.8	5.8	10	8.4	5.5	.1	1.2	52	13	5	59.6	6.8	26	6.0	6.0
Feb. 11-20	1,740	15	.21	3.4	1.4	4.9	4.9	14	7.8	6.0	.1	.9	62	13	6	73.3	6.6	26	5.3	5.1
Feb. 20-28	6,900	8.2	.13	3.4	1.2	3.1	3.1	4	5.8	4.5	.1	.3	56	16	3	60.9	6.4	40	7.4	6.0
Mar. 1-10	5,150	9.8	.08	3.4	1.4	5.8	5.8	12	6.4	5.0	.1	2.3	53	13	6	58.6	6.7	31	9.0	7.0
Mar. 11-20	4,070	12	.07	3.5	1.6	6.9	6.9	13	7.2	5.2	0	.8	51	11	1	55.5	6.4	26	7.9	6.0
Mar. 21-31	2,730	12	.07	3.9	1.3	5.5	5.5	15	5.8	5.5	.1	.8	50	15	3	67.3	6.6	28	7.0	5.5
Apr. 1-10	5,540	9.9	.08	3.6	1.3	4.6	1.4	15	5.1	4.8	.1	.4	49	14	2	68.4	6.3	3	9.4	7.7
Apr. 11-20	2,650	11	.49	4.8	1.8	6.4	6.4	20	3.5	5.2	.1	.6	60	15	0	60.7	6.5	32	8.4	8.0
Apr. 21-30	1,540	14	.16	4.2	1.6	7.8	7.8	23	3.6	5.0	.1	.6	59	17	0	70.1	6.7	30	8.5	6.6
May 1-10	1,130	11	.31	5.2	1.4	7.8	7.8	29	3.4	5.2	.1	.8	64	19	0	76.5	7.1	23	8.7	5.6
May 11-20	2,490	14	.10	4.4	1.3	2.9	2.9	13	4.1	4.8	0	1.1	58	16	6	62.1	6.2	27	6.2	5.6
May 21-31	5,550	12	.09	3.8	1.5	3.2	3.2	14	4.5	4.0	.0	1.1	52	16	4	56.5	6.4	45	12	7.2

PAMLICO RIVER BASIN--Continued  
 TAR RIVER AT TARBORO, N. C.--Continued  
 Chemical analyses, in parts per million, water year October 1953 to September 1954.--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-magnesium	Non-carbonate				Unfiltered	Filtered
June 1-10, 1954	972	16	0.38	5.0	1.4	6.3		24	3.7	5.0	0.0	1.6	65	18	0	69.2	6.8	45	8.8	5.6
June 11-20	1,320	16	.02	4.8	1.2	8.7		27	3.7	6.0	.1	1.6	60	17	0	76.1	6.8	11	5.0	3.8
June 21-30	1,350	14	.06	4.2	.9	6.6		19	4.8	4.5	.1	1.6	54	14	0	66.9	6.6	19	7.4	5.6
July 1-10	299	14	.23	5.9	1.8	7.4	1.9	29	5.5	6.8	.1	1.4	70	22	0	84.7	6.9	17	4.6	3.8
July 11-20	350	16	.00	5.5	1.3	9.7		31	4.6	6.0	.1	1.5	62	19	0	88.7	7.0	14	4.0	3.2
July 21-31	270	16	.00	5.2	1.4	7.5	2.2	26	6.4	7.5	.1	1.7	67	19	0	89.8	6.8	11	5.6	3.5
Aug. 1-10	485	10	.06	4.8	1.3	6.6	2.1	23	6.0	7.0	.2	1.8	66	17	0	83.4	6.5	18	5.8	4.1
Aug. 11-20	187	13	.03	6.6	2.0	7.5	2.2	22	7.2	8.8	.2	1.8	70	25	7	92.1	6.5	8	5.7	4.5
Aug. 21-31	238	12	.04	4.6	1.8	8.7	2.2	26	7.1	8.5	.1	1.3	66	19	0	92.3	6.7	21	6.2	4.7
Sept. 1-10	138	12	.01	6.0	1.2	10	2.4	30	8.2	10	.1	1.9	72	20	0	113	6.6	7	4.3	4.0
Sept. 11-20	89	7.3	.04	6.5	1.9	12	2.8	30	9.5	12	.1	2.3	78	24	0	118	6.6	7	4.8	4.1
Sept. 21-30	78	11	.02	7.2	1.2	15	2.9	32	11	14	.2	3.5	89	23	0	138	7.0	7	4.9	4.0
Average	2,229	13	0.11	4.7	1.3	8.2		21	6.5	6.7	0.1	1.2	62	17	2	80.3	--	22	6.8	5.3

## PAMLICO RIVER BASIN--Continued

## TAR RIVER AT TARBORO, N. C.--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
 /Once-daily temperature measurement at 8 a. m./

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

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

Chemical analyses, in parts per million, water year October 1953 to September 1954

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	Non-carbonate			
TABBS CREEK NEAR KITTRELL																		
July 14, 1954	3.64			7.2	2.4			43	3	4.5		0.7		23	0	85.0	7.1	
Sept. 17	.784							45	1	4.2				28	0	89.3	6.8	
CEDAR CREEK NEAR LOUISBURG																		
Apr. 13, 1954	43.9	24	0.00	--	--	7.8		25	3	3.8		--	60	13	0	55.9	6.9	
July 14	8.99			3.2	0.9			25	2.6	3.8	0.1	0.3		12	0	60.7	7.0	
Sept. 16	5.43				1.2			26	1	4.0		1.0		13	0	62.2	6.7	5
CYPRESS CREEK NEAR BUNN																		
Apr. 13, 1954	40.6	15	0.40	3.4	1.3	5.7	1.2	19	3	3.8		0.3	57	11	0	48.2	6.5	
July 14	2.39							28	2.4	3.5	0.1			14	0	59.5	6.3	17
SWIFT CREEK NEAR RED OAK																		
July 14, 1954	26.1			5.6	1.7			31	1	3.5		0.8		17	0	64.2	7.1	
Sept. 17	8.76							34	1	4.0				21	0	88.9	6.6	
FISHING CREEK NEAR WARRENTON																		
Apr. 13, 1954	32.3							27	2	3.2				16	0	57.4	7.0	
July 14	5.30			4.0	1.2			28	1	3.5		0.0		18	0	58.9	7.0	
Sept. 17	2.23							29	2	3.5				15	0	66.7	6.7	
TOWN CREEK NEAR PINETOPS																		
Apr. 7, 1954	240			4.4	1.7			9	6	7.8		2.3		13	6	63.5	6.3	
Sept. 11	.26							19	3	5.8				18	2	74.9	6.6	



NEUSE RIVER BASIN

NEUSE RIVER AT FALLS, N. C.

LOCATION. --At bridge on county road at Falls, Wake County, 1.8 miles downstream from Horse Creek and 1½ miles upstream from Richland Creek.

DRAINAGE AREA. --526 square miles (at gaging station near Northside, N. C.).

RECORDS AVAILABLE. --Chemical analyses: October 1953 to September 1954.

Water temperatures: October 1953 to September 1954.

EXTREMES, 1953-54. --Dissolved solids: Maximum, 129 ppm Sept. 21-30; minimum, 13 ppm Jan. 21-31.

Hardness: Maximum, 41 ppm Sept. 21-30; minimum, 13 ppm Jan. 21-31.

Water temperatures: Maximum, 81° F July 15; minimum, 35° F Dec. 20, Jan. 14.

REMARKS. --Records of specific conductance of daily samples available in district office at Raleigh, N. C. Records of suspended matter of composite samples available in district office at Raleigh, N. C. Records of discharge for gaging station near Northside, N. C. for water year October 1953 to September 1954 given in WSP 1333. No appreciable inflow between gaging station and sampling station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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-magnesium	Non-carbonate				Unfiltered	Filtered
Oct. 1-10, 1953	26	10	0.01	7.1	2.0	7.9	3.3	34	7.9	6.5	0.1	1.3	69	26	0	109	6.5	11	5.0	4.0
Oct. 11-20	19	17	.01	8.2	2.7	15		50	7.2	10	.2	1.1	91	32	0	160	7.3	12	3.2	3.1
Oct. 21-31	16	18	.13	8.5	2.4	17	6.6	56	7.1	11	.2	1.1	95	31	0	151	6.9	19	3.8	3.4
Nov. 1-10	18	19	.01	7.6	3.0	16		53	5.7	11	.1	1.5	98	32	0	154	6.7	14	3.8	3.6
Nov. 11-20	18	17	.01	9.1	2.4	22		64	5.5	14	.1	1.4	116	33	0	172	6.7	10	3.9	3.7
Nov. 21-30	28	17	.01	8.7	2.5	21		57	6.2	14	.1	4.7	114	32	0	166	7.0	13	4.5	4.2
Dec. 1-10	43	18	.04	8.2	2.8	19		54	7.0	12	.2	5.1	104	32	0	166	6.8	17	4.3	3.2
Dec. 11-20	95	18	.06	4.6	2.0		6.6	55	13	14	--	--	--	34	0	186	7.0	--	--	--
Dec. 21-30	534	11	.06	4.6	2.0			16	10	6.2	.2	1.7	59	20	7	85.6	6.6	18	8.2	5.6
Jan. 1-10, 1954	55	17	.03	6.2	2.5	10		29	10	8.2	.3	2.4	78	28	2	122	6.7	13	4.2	3.6
Jan. 11-15	40	18	.13	6.8	2.7	10	2.4	33	14	9.8		3.7	87	28	1	117	6.8	12	3.7	3.5
Jan. 16-20	171	15	.10	7.2	2.7	14		29	14	12	.0	4.2	92	29	5	123	6.8	16	6.9	4.2
Jan. 21-31	1,920	8.0	.11	3.6	1.1	6.9		9	13	4.8	.0	1.2	51	14	6	59.4	6.3	30	13	6.9
Feb. 1-10	2,850	9.0	.11	3.6	.9	5.8		10	9.6	4.5	.0	1.0	46	13	4	55.4	6.2	30	11	7.1
Feb. 11-19	251	10	.06	5.5	1.4	6.6		19	9.5	5.0	.0	1.4	62	19	4	76.2	7.0	21	5.0	4.8
Feb. 20-28	118	14	.09	6.0	2.0	8.4		27	8.6	6.0	.0	2.4	70	23	1	92.4	6.7	14	3.6	2.6
Mar. 1-10	587	11	.04	4.8	1.5	6.7		18	8.6	5.5	.0	1.6	60	18	3	74.5	6.6	19	9.5	5.8
Mar. 11-20	996	11	.05	2.9	1.8	6.8		14	10	4.8	.0	.9	51	15	3	64.4	6.5	20	7.8	5.0
Mar. 21-30	1,220	11	.07	3.6	1.2	6.6		16	7.2	5.0	.0	.7	54	14	1	68.7	6.5	18	6.9	4.8
Mar. 21-31	472	14	.01	4.6	1.8	5.5		20	6.5	5.5	.0	1.4	57	19	2	69.1	6.6	17	5.3	3.8



Apr. 1-10, 1954.....	981	14	.02	4.5	1.4	5.5	6.3	1.5	18	7.2	4.5	0	1.1	52	17	2	64.4	6.6	18	6.6	4.8
Apr. 11-20.....	602	14	.02	4.9	1.6	5.5	6.3		23	5.6	5.0	0	1.6	56	19	0	72.5	5.8	19	5.8	4.5
Apr. 21-30.....	216	14	.06	5.3	2.0	7.3	7.3		27	6.7	5.0	0	1.2	64	21	0	79.2	4.8	18	4.8	4.0
May 1-10.....	170	14	.08	6.8	1.6	8.3	8.3		30	5.0	7.2	1	1.8	75	24	0	93.0	6.8	8	5.2	3.6
May 11-20.....	477	10	.08	5.7	1.5	7.0	7.0		28	5.5	5.0	1	1.4	67	20	0	79.6	6.0	4.0	6.0	4.0
May 21-31.....	505	14	.04	5.0	1.2	6.4	6.4		22	5.5	4.5	0	1.4	62	17	0	71.7	6.7	23	6.1	4.4
June 1-10.....	100	18	.08	5.9	1.5	9.9	9.9		33	4.4	6.0	1	2.4	68	21	0	93.7	7.0	16	3.6	3.0
June 11-20.....	216	13	.02	5.1	1.8	5.8	5.8		19	4.9	4.5	1	1.8	59	16	0	78.3	6.7	10	5.8	4.3
June 21-30.....	91	15	.03	5.6	1.5	10	10		32	5.1	6.0	1	2.4	70	20	0	90.9	4.4	9	4.4	3.6
July 1-10.....	44	17	.04	6.7	2.1	11	11	2.1	41	6.2	4.5	1	1.8	78	25	0	110	7.0	17	4.5	3.5
July 11-15.....	30	17	.00	7.4	2.0	13	13	2.6	51	5.3	8.5	1	1.4	88	27	0	124	7.2	16	4.4	3.7
July 16-20.....	157	9,6	.00	5.1	1.3	7.1	7.1	2.5	27	8.4	5.8	1	2.1	64	18	0	78.5	6.8	16	8.2	5.6
July 21-31.....	47	10	.04	7.2	1.6	9.4	9.4	2.4	38	5.8	7.5	1	2.0	86	25	0	108	6.6	11	4.8	3.7
Aug. 1-10.....	55	14	.00	6.7	1.7	12	12	3.2	40	6.4	8.5	1	3.0	87	24	0	116	6.8	20	6.8	4.6
Aug. 11-20.....	43	12	.01	7.1	1.2	15	15	3.3	47	6.1	9.5	2	2.4	93	22	0	130	6.7	16	7.0	5.3
Aug. 21-31.....	26	10	.04	8.3	1.7	14	14	3.3	48	6.8	9.5	2	2.6	99	28	0	138	6.8	15	6.1	5.3
Sept. 1-10.....	20	14	.02	9.2	3.3	21	21	3.9	66	6.1	14	2	2.0	114	36	0	174	6.9	15	4.8	4.5
Sept. 11-20.....	19	11	.01	10	3.5	24	24	4.4	78	5.7	16	2	2.4	126	39	0	186	7.5	20	5.7	4.8
Sept. 21-30.....	15	14	.01	11	3.3	24	24	4.8	72	4.6	16	2	4.4	129	41	0	197	6.9	18	6.2	4.9
Average.....	337	14	0.04	6.4	2.0	12	12		36	7.4	8.1	0.1	2.0	79	24	0	112	--	17	5.8	4.3

## NEUSE RIVER BASIN--Continued

## NEUSE RIVER AT FALLS, N. C.--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
 /Once-daily temperature measurement at 9 a. m. /

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

NEUSE RIVER BASIN  
 SWIFT CREEK NEAR VANCEBORO, N. C.

LOCATION --On left bank at bridge 2½ miles upstream from bridge on State Highway 118, 2¼ miles from Clayroot Swamp, and 3½ miles northwest of Vanceboro, Craven County, North Carolina.

DRAINAGE AREA --182 square miles

RECORDS AVAILABLE --Water temperatures: October 1951 to September 1954

EXTREMES --July to September 1954 --Water temperatures: Maximum, not determined; minimum, 67°F Sept. 25, 26, 27.

REMARKS --No stream flow Aug. 7-28.

Temperature (°F) of water, July to September 1954  
 (Continued ethyl alcohol-actuated thermograph. Temperature observed once daily October 1951 to September 1952 at approximately 7:30 a.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	min							
1.....																								74	74						
2.....																									74	72					
3.....																									72	71					
4.....																									78	75					
5.....																									72	72					
6.....																									78	76					
7.....																									76	72					
8.....																										76	74				
9.....																											75	74			
10.....																												75	74		
11.....																												74	73		
12.....																												74	71		
13.....																												71	70		
14.....																												71	70		
15.....																												71	70		
16.....																												71	71		
17.....																												71	70		
18.....																												72	71		
19.....																												72	71		
20.....																												74	72		
21.....																												75	72		
22.....																												75	70		
23.....																												70	68		
24.....																												68	68		
25.....																												68	67		
26.....																												67	67		
27.....																												68	67		
28.....																												68	68		
29.....																												73	71		
30.....																												73	71		
31.....																												75	70		
Average.....																												74	74		
																												--	--	72	71

NEUSE RIVER BASIN--Continued  
MISCELLANEOUS ANALYSES OF STREAMS IN NEUSE RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	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-magnesium			
LITTLE RIVER NEAR ORANGE FACTORY																			
July 15, 1954	2.21		13	0.10	7.0	2.1	7.1		41	2.1	3.8	0.1	0.1	59	26	0	84.5	7.5	8
Aug. 19	13.0				--	--			19	2	2.8		--		19	2	51.3	6.4	
Sept. 9	.189				7.6	2.7			37	6	4.5		1.5		30	0	91.7	6.7	
FLAT RIVER AT DAM NEAR BAHAMA																			
Feb. 26, 1954	a.143		10	0.05	4.3	1.7	5.0		16	8.6	4.5	0.0	0.2	57	18	5	57.9	6.7	19
July 15	a.13		13	.09	5.9	1.9	6.3		33	2.8	4.2	.1	.1	60	22	0	74.0	6.9	13
NEUSE RIVER NEAR NORTHSIDE																			
Feb. 18, 1954	a.121		12	0.06	7.2	2.4	15		39	11	10	0.1	2.8	86	28	0	138	6.5	20
Aug. 19	a.61		8.2	.04	9.9	2.4	16		4.0	46	14	.1	7.5	106	35	0	161	6.3	30
UPPER BARTON CREEK NEAR BAYLEAF																			
July 13, 1954	1.40		16	0.06	5.5	2.2	6.8		38	1.4	3.2	0.1	0.1	57	23	0	78.2	7.2	12
Sept. 2	.89				5.6	2.9			40	1	4.0		1.5		26	0	84.4	6.9	
Sept. 24	.414				--	--			34	2	3.8		--		27	0	79.4	7.3	
LOWER BARTON CREEK NEAR BAYLEAF																			
July 13, 1954	2.12								37	1	3.2				20	0	65.9	7.2	
Sept. 2	2.06								34	1	4.0				21	0	86.4	7.2	
Sept. 24	1.05								34	1	4.5				20	0	89.4	7.3	
HORSE CREEK NEAR WAKE FOREST																			
July 13, 1954	6.46				4.4	1.5			35	3	3.2		0.6		19	0	87.6	7.2	
Sept. 2	5.18								31	1	3.2				17	0	82.4	6.7	
MINE CREEK NEAR MILLBROOK																			
July 13, 1954	2.40				2.0	1.7			23	1	3.2		0.0		11	0	47.9	6.9	
Sept. 9	1.89								23	1	3.0				12	0	49.9	6.8	

a Mean discharge.





CAPE FEAR RIVER BASIN--Continued  
 NEW HOPE RIVER NEAR PITTSBORO, N. C.  
 LOCATION.--At gaging station at bridge on U. S. Highway 64, a quarter of a mile downstream from Whiteoak Creek and 8 1/2 miles east of Pittsboro, Chatham County.  
 DRAINAGE AREA.--285 square miles.  
 RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.  
 REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1333.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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			
Oct. 25, 1953	6.0		11	0.09	14	4.0	27	5.2	53	23	25	2.3	2.6	150	51	8	261	6.7	21
Nov. 20	9.1		12	.08	14	4.1	37		60	14	32	1.3	26	83	52	3	305	6.6	27
Dec. 14	1,200		6.3	.09	3.0	1.1	4.6	4.6	7	7.7	5.2	.2	.4	59	12	6	53.9	6.1	65
Jan. 19, 1954	2,550		8.5	.15	3.1	1.2	4.6	1.2	7	9.1	4.2	.2	.3	54	13	7	53.4	5.9	55
Feb. 17	64		12	.15	6.9	2.1	10		20	14	10	.2	3.5	81	26	9	113	6.4	15
Mar. 29	276		9.8	.03	5.1	1.5	7.7		18	7.6	8.0	.2	1.3	65	19	4	87.4	6.5	25
Apr. 16	134		13	.02	6.6	2.2	7.9	1.6	27	6.6	8.0	.4	2.2	68	26	3	97.4	6.4	24
May 25	60		15	.19	7.0	1.3	10		26	8.0	8.2	.8	1.5	79	23	2	104	6.3	27
June 22	16		12	.01	7.7	1.6	13		33	9.4	9.5	.9	1.7	84	26	0	123	6.8	17
July 19	39		10	.02	9.2	1.6	14	3.9	20	25	12	2.0	7.2	107	30	13	168	6.5	12
Aug. 11	6.5		10	.03	11	2.0	20	4.4	50	11	18	.9	3.9	120	35	0	187	6.5	7
Sept. 23	4.0		7.3	.01	11	1.3	39	7.1	88	12	38	1.5	1.1	182	45	0	314	7.2	25

a Large proportion of organic matter present; sum of mineral constituents 32 ppm.

CAPE FEAR RIVER BASIN--Continued  
ROCKFISH CREEK NEAR HOPE MILLS, N. C.

LOCATION --At gaging station at bridge on U. S. Highway 301, at mouth of Little Rockfish Creek, 1½ miles east of town of Hope Mills, Cumberland County, and 5½ miles upstream from mouth of Little Rockfish Creek.

DRAINAGE AREA--284 square miles, includes that of Little Rockfish Creek.

RECORDS AVAILABLE--Chemical analyses: October 1953 to September 1954.

REMARKS --Monthly station water year 1948-49. Records of discharge for water year October 1953 to September 1954 given in WSP 1333. Records include flow of Little Rockfish Creek.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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. 15, 1953	106		5.8	0.10	1.3	0.3	3.5	2.0	5	2.3	4.5	0.0	0.7	27	4	0	39.9	5.7	25
Nov. 15	33		6.3	.04	1.2	.6	4.2		5	3.7	4.5	.0	.4	27	5	1	30.7	5.8	17
Dec. 15	725		6.5	.14	2.3	.4	2.8		3	4.3	4.0	.1	.7	39	7	5	31.2	5.5	32
Jan. 15, 1954	426		6.2	.20	1.4	.2	2.1	1.4	2	3.5	3.5	.0	.5	32	4	3	30.1	5.7	31
Feb. 15	390		4.1	.19	1.6	.2	3.5		2	3.8	4.5	.1	.4	37	5	3	31.3	5.5	16
Mar. 15	470		3.3	.15	.9	.3	3.7	.8	4	2.5	3.8	.1	.0	24	4	0	33.4	6.0	27
Apr. 15	603		3.0	.15	1.6	.7	3.3		4	3.7	4.2	.1	1.3	32	7	4	34.5	6.0	45
May 15	241		3.3	.03	1.6	1.1	1.1		2	2.9	4.2	.0	.4	25	8	7	27.7	5.5	10
June 15	414		4.6	.14	2.7	.1	2.6		2	4.5	4.2	.1	.4	37	7	6	34.1	5.3	18
July 15	118		4.4	.09	1.7	.7	2.9	.7	6	2.9	3.8	.1	1.3	25	7	2	28.6	5.4	8
Aug. 15	30		4.0	.03	1.6	.1	3.1	.9	3	4.1	4.2	.1	1.0	28	4	2	33.7	5.4	37
Sept. 15	126		4.1	.02	2.0	1.9	2.6	1.0	7	4.4	4.5	.0	1.2	27	13	7	34.3	5.6	28

a Large proportion of organic matter present; sum of mineral constituents 23 parts per million.

b Large proportion of organic matter present; sum of mineral constituents 19 parts per million.

c Large proportion of organic matter present; sum of mineral constituents 20 parts per million.



CAPE FEAR RIVER BASIN--Continued

CAPE FEAR RIVER NEAR ELIZABETHTOWN, N. C.

LOCATION.--At lock 2, Browns Landing, 1 1/4 miles south of Elizabethtown, Bladen County.

DRAINAGE AREA.--4,810 square miles (at gaging station at lock 3, near Tarheel, N. C.).

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.

REMARKS.--Records of discharge for gaging station at lock 3, near Tarheel, N. C., for water year October 1953 to September 1954 given in WSP 1333. No appreciable inflow between gaging station and sampling station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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. 15, 1953	472		4.3	0.06	3.2	1.2	10	2.8	20	6.8	8.5	0.2	1.1	54	13	0	86.5	6.3	23
Nov. 26	680		5.5	.05	1.8	1.0	8.6		11	6.9	6.8	.2	1.3	46	9	0	82.2	6.2	22
Dec. 15	15,800		9.2	1.0	4.1	1.7	16		15	19	9.2	.4	1.5	70	13	1	88.5	6.3	45
Jan. 15, 1954	2,900		9.0	.14	2.5	.6	6.1	2.5	8	8.3	5.5	.0	.8	47	9	2	59.4	6.2	24
Feb. 15	2,270		6.8	.14	6.0	1.0	7.9		22	8.0	6.0	.2	.9	61	19	1	92.2	6.4	18
Mar. 15	14,400		7.2	.07	3.2	1.0	6.8		12	7.4	5.8	.2	1.1	51	12	2	71.1	5.8	28
Apr. 15	4,960		8.5	.07	3.2	1.2	5.4	1.2	13	5.6	3.2	.2	1.0	50	13	2	57.1	6.3	50
May 15	2,420		9.2	.16	3.8	.9	7.5		16	5.8	6.5	.3	.6	56	13	0	66.3	6.3	31
June 15	2,000		5.7	.09	3.4	.6	6.3		13	5.8	5.2	.2	.4	47	11	0	57.2	6.2	17
July 15	570		7.4	.10	3.5	.8	6.6		15	6.7	6.0	.2	2.1	52	12	0	69.0	6.0	8
Aug. 16	282		4.0	.09	3.8	.8	13	1.8	25	8.3	9.0	.4	1.8	70	11	0	105	6.3	9
Sept. 15	352		3.8	.04	2.8	.6	9.3	2.0	19	8.0	7.2	.3	1.2	49	10	0	82.4	6.3	32

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 1953 to September 1954

Date of collection	Dis-charge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Cal-ium (Ca)	Mag-nesium (Mg)	Sod-ium (Na)	Potas-sium (K)	Bicar-bonate (HCO <sub>3</sub> )	Sul-fate (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 conductance (micro-mhos at 25° C)	pH	Color
														Calcium	Non-carbonate			

TROUBLESOME CREEK NEAR REIDSVILLE

Mar. 11, 1954	27.7							23	5	2.8				16	0	52.6	6.9	
Aug. 10	2.66							35	2	2.8				21	0	68.1	7.0	

NORTH BUFFALO CREEK NEAR GREENSBORO

Feb. 18, 1954	a 27	21	0.21	13	1.2	347	b 554	268	79	0.0	0.5	1,000		37	0	1,650	10.1	
Aug. 18	a 46	9.8	.17	10	.1	183	c 422	49	34	.2	.5	554		26	0	817	9.3	

ALAMANCE CREEK AT ALAMANCE

Sept. 2, 1954	6.39			8.0	2.9		39	15	10			2.4		32	0	113	6.5	
Sept. 28	.454						60	16	188					99	50	702	7.3	

LITTLE ALAMANCE CREEK NEAR WHITSETT

Sept. 2, 1954	2.88			7.6	2.9		42	7	4.8			2.1		31	0	97.3	6.7	
Sept. 22	.709						67	4	6.5					47	0	130	7.3	

CANE CREEK NEAR CARBORO

Aug. 12, 1954	1.02				2.6	3.1	34	1	3.0			1.3		21	0	69.7	6.9	
Sept. 1	1.05	9.5	0.05	5.7		2.3	35	3.9	2.5	0.1			53	25	0	76.4	7.0	15
Sept. 21	.756						38	2	3.5					25	0	79.5	6.9	

HAW RIVER NEAR PITTSBORO

Feb. 17, 1954	a 612	17	0.06	7.5	2.6	29	48	26	16			2.8		29	0	201	6.8	19
Sept. 7	a 25	1.9	.01	8.7	2.5	88	139	31	50	2.9	2.6	2.7	278	32	0	464	7.6	19

<sup>a</sup> Mean discharge.

<sup>b</sup> Includes equivalent of 182 parts per million of carbonate (CO<sub>3</sub>).

<sup>c</sup> Includes equivalent of 30 parts per million of carbonate (CO<sub>3</sub>).

NEW HOPE CREEK NEAR DURHAM

June 30, 1954	1.66			18	4.9		60	16	18			44	0	209	6.7
Sept. 9	1.11						59	23	30		12	66	18	338	6.5

POLECAT CREEK NEAR CLIMAX

Apr. 14, 1954	19.7						34	5	3.2			24	0	75.3	7.0
Aug. 25	.35						44	5	3.0			32	0	87.3	6.8
Sept. 17	.13	11	0.02	9.0	3.6	5.3	3.5	4.9	5.8	0.2	1.3	80	37	128	6.6
															17

SANDY CREEK NEAR LIBERTY

June 29, 1954	2.10						44	3	4.2			28	0	91.1	6.9
Aug. 4	8.68						30	4	3.8			20	0	66.0	6.6

RICHLAND CREEK NEAR ASHEBORO

July 15, 1954	1.58						41	2	3.0			24	0	77.8	7.0
Sept. 9	.16			5.2	1.2		23	2	2.5		2.9	18	0	60.9	6.8

BRUSH CREEK NEAR COLERIDGE

July 15, 1954	1.37						35	3.3	4.0			24	0	89.0	6.2
Aug. 27	1.46			6.4	2.0	4.7	31	2	3.0	0.1	1.4	20	0	69.7	7.0
Sept. 9	1.01			5.6	1.5		27	2	3.5		1.3	20	0	64.7	6.5

FORK CREEK NEAR COLERIDGE

July 15, 1954	1.14	18	0.15	5.9	1.3	7.8	36	2.4	3.5	0.0		64	20	77.0	7.0
Aug. 27	.66			--	--		26	3	3.0			17	0	58.1	6.8
Sept. 9	.35			5.6	1.5		25	20	3.0	3.7		20	0	67.2	6.2

McLENDONS CREEK NEAR CARTHAGE

Apr. 13, 1954	48.2						5	2	2.8			4	0	23.0	6.2
July 14	.82						7	2	3.2			4	0	27.7	5.8
July 21	4.85						5	4	2.5			4	0	21.6	5.9
Aug. 10	.015						11	2	3.5			9	0	31.9	6.1

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 1953 to September 1954--Continued

Date of collection	Dis-charge (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 evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Apr. 14, 1954	6.08							30	4	4.5				20	0	72.9	6.7	
July 20	.99							33	7	4.8				24	0	83.5	6.9	

NORTH BRANCH ROCKY RIVER NEAR STALEY

NEILL CREEK NEAR LILLINGTON

Apr. 13, 1954	45.2							9	5	5.2				8	1	46.3	6.2	
July 15	.83							17	2	3.0				9	0	52.1	6.4	

SOUTH RIVER NEAR PARKERSBURG

Mar. 11, 1954	a 660	1.5	0.22	2.1	1.0	4.8	3.1	2	6.9	7.5	0.1	0.0	d50	9	8	51.6	4.9	64
Aug. 25	a 2.2	7.1	.20	2.6	3.9	43		4	15	66	.0	.4	172	22	19	278	5.4	90

a Mean discharge.

d Large proportion of organic matter present; sum of mineral constituents 25 parts per million.

LOCKWOODS FOLLY RIVER BASIN  
 MISCELLANEOUS ANALYSES OF STREAMS IN LOCKWOODS FOLLY RIVER BASIN IN NORTH CAROLINA  
 Chemical analyses, in parts per million, water year October 1953 to September 1954.

Date of collection	Dis-charge (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 evaporation at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Aug. 26, 1954	0.733			68	0.7			208	2	10				175	4	368	7.7	
Sept. 16	1.00							207	1	10		0.6		173	3	366	7.4	

PINCH GUT CREEK NEAR BOLIVIA

PEE DEE RIVER BASIN

REDDIES RIVER AT NORTH WILKESBORO, N. C.

LOCATION.--At bridge on U. S. Highway 421, at city limits of North Wilkesboro, Wilkes County, a quarter of a mile downstream from North Wilkesboro municipal dam, half a mile upstream from mouth and 1 1/2 miles downstream from gaging station.

DRAINAGE AREA.--93.9 square miles (at gaging station).

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.

Water temperatures: October 1953 to September 1954.

REMARKS.--Monthly station water year 1947-48. Records of discharge for water year October 1953 to September 1954 given in WSP 1333.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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. 15, 1953	45		12	0.03	2.5	0.9	2.4	1.4	15	1.5	1.1	0.0	0.0	30	10	0	41.5	6.5	6
Nov. 16	49		13	.01	1.7	.8	4.1	4.1	14	1.9	1.8	.1	.2	31	8	0	28.7	6.6	6
Dec. 16	102		9.2	.10	2.2	.6	4.3	4.3	12	2.7	2.5	.1	.9	30	8	0	42.6	6.7	7
Jan. 18, 1954	74		13	.12	1.8	.9	2.6	1.3	12	2.6	1.2	.1	.4	30	8	0	30.6	6.5	6
Feb. 16	60		9.4	.05	2.2	.7	4.2	4.2	15	2.0	1.8	.1	.4	31	8	0	34.8	6.7	6
Mar. 19	114		9.2	.12	1.9	.5	3.4	3.4	12	1.9	1.5	.1	.0	28	7	0	29.4	6.9	4
Apr. 20	98		10	.07	2.4	.8	2.3	1.0	13	1.4	1.5	.1	.5	28	9	0	30.3	6.4	9
May 19	110		11	.01	2.5	1.0	2.4	2.4	13	2.1	1.5	.1	.4	32	10	0	29.2	6.8	7
June 17	79		9.2	.02	2.0	1.1	2.1	2.1	10	2.9	1.5	.1	.6	29	10	1	45.8	6.2	8
July 14	40		11	.02	2.4	.2	2.6	1.1	13	2.0	1.5	.1	.5	32	7	0	32.2	6.2	5
Aug. 16	25		10	.02	2.8	.7	2.3	1.0	14	2.2	1.2	.1	.7	31	10	0	33.5	6.4	3
Sept. 20	32		12	.05	2.8	.5	2.7	1.4	16	3.2	.8	.0	.5	34	9	0	49.9	6.6	7

## PEE DEE RIVER BASIN--Continued

## 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 1954.

EXTREMES, 1953-54.--Sediment concentrations: Maximum daily, 1,260 ppm Jan. 23; minimum daily, 1 ppm Dec. 3.

Sediment loads: Maximum daily, 108,000 tons Jan. 23; minimum daily, 3 tons Dec. 3.

EXTREMES, 1943-44, 1950-54.--Dissolved solids: Maximum, 85 ppm Nov. 1-10, 1950; minimum, 32 ppm Mar. 21-31, 1944.

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

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

Sediment concentrations: Maximum daily, 2,970 ppm May 26, 1952; minimum daily, 1 ppm Dec. 3, 1953.

Sediment loads: Maximum daily, 108,000 tons Jan. 23, 1954; minimum daily, 3 tons Dec. 3, 1953.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1333.

## Suspended sediment, water year October 1953 to September 1954

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.....	910	36	82	888	226	537	948	4	10										
2.....	824			873			948	4	10										
3.....	782			838			940	1	3										
4.....	810			838			1,030	6	17										
5.....	845			824			1,110	24	72										
6.....	747	18	39	845	108	244	1,520	113	s 509										
7.....	796			803			3,150	316	s 2,690										
8.....	796			845			2,250	174	1,060										
9.....	761			866			1,700	90	413										
10.....	775			852			1,790	85	410										
11.....	789			10			22	866	58	135	2,650	128	915						
12.....	831							852			2,550	202	s 1,450						
13.....	747							859			3,650	375	s 3,720						
14.....	782							852			6,750	566	s 10,700						
15.....	710							866			5,900	509	s 8,190						
16.....	796	122	252		888	102		263			4,150	317	s 3,700						
17.....	754				866						2,500	195	1,320						
18.....	775				859						1,970	40	180						
19.....	782				859						1,560								
20.....	747				852						1,480								
21.....	747				149						302	838	247	772	1,700	18	65		
22.....	761											1,070			1,660			40	176
23.....	754											1,350			1,520				
24.....	728											1,560			1,480				
25.....	728											1,480			1,310				
26.....	775	1,110	1,270	12		42													
27.....	775	1,010	1,270																
28.....	810	1,000	1,350																
29.....	1,020	970	1,310																
30.....	1,070	978	1,310																
31.....	880	--	--	1,270	--	--	--	--	--										
Total.	24,807	--	7,204	28,457	--	10,972	63,996	--	36,685										

s Computed by subdividing day.

PEE DEE RIVER BASIN--Continued

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

Suspended sediment, water year October 1953 to September 1954--Continued

Day	January			February			March		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	1,230			2,300			5,860	285	s 6,600
2.....	1,150	10	32	2,100	89	529	13,200	1,050	s 37,600
3.....	1,190			2,060			5,780	462	7,210
4.....	1,230			2,060			4,150	262	2,940
5.....	1,150	10	32	2,020	101	537	3,450	204	1,900
6.....	1,150			1,880			2,950		
7.....	1,150			1,840			2,650	98	721
8.....	1,150	6	18	1,840			2,550		
9.....	1,110			1,740			2,350		
10.....	1,150			1,740	27	127	2,250	90	559
11.....	1,350			1,700			2,150		
12.....	1,740	30	125	1,660			2,060	54	305
13.....	1,520			1,610			2,100		
14.....	1,190	2	7	1,610	16	70	6,000	980	s 17,000
15.....	1,350			1,610			5,190	544	7,610
16.....	5,870	673	s 11,200	1,610			3,350	213	1,930
17.....	5,870	476	s 7,960	1,700			2,550	109	751
18.....	3,350	244	2,210	1,790	148	702	2,400	59	383
19.....	2,300	210	1,300	1,880			2,400	215	s 1,570
20.....	1,970	56	297	1,660			8,830	930	s 22,600
21.....	6,730	985	s 18,200	5,580	647	s 12,700	4,860	312	4,130
22.....	12,100	996	s 38,100	17,200	1,120	s 52,800	3,450	180	1,510
23.....	31,400	1,260	s 108,000	6,740	370	6,720	2,750		
24.....	26,600	1,140	s 86,500	4,150	286	3,210	2,550	70	470
25.....	6,880	544	10,000	3,450	159	1,480	2,400		
26.....	5,080	440	6,050	2,950	107	794	2,550	70	475
27.....	4,550	246	3,020	2,550			2,500		
28.....	3,650	200	1,970	2,350	93	591	2,550		
29.....	2,950	112	853	--			2,400	52	351
30.....	2,550			--			2,300		
31.....	2,350	89	564	--			2,750		
Total.	143,010	--	297,730	81,380	--	86,555	113,280	--	122,734
	April			May			June		
1.....	4,450	436	5,240	1,740	144	678	1,610	76	329
2.....	4,050	416	4,540	1,790	47	234	1,480	70	281
3.....	3,150	166	1,410	1,880			1,390		
4.....	2,750	102	756	2,750	622	4,620	1,350	34	123
5.....	2,500			2,850	234	1,800	1,270		
6.....	2,350	51	332	2,200	261	1,550	1,270		
7.....	2,300	53	329	1,880	84	427	1,230	30	100
8.....	2,990	205	s 2,210	1,740	73	343	1,190		
9.....	3,900	505	s 5,830	1,790	50	242	1,150		
10.....	2,350	172	1,090	1,740	40	188	1,350	53	193
11.....	2,250	66	400	1,610	38	162	1,560		
12.....	2,250			1,560			1,390	331	1,240
13.....	2,150			1,520	44	200	1,190	178	572
14.....	2,020	54	302	1,840			1,150	358	1,110
15.....	1,970			3,150	86	732	1,150		
16.....	2,450	52	310	4,350	242	2,840	1,430	73	254
17.....	3,450	295	2,750	3,150	166	1,410	3,020	360	s 3,190
18.....	2,950	150	1,190	2,450	74	459	4,750	660	s 8,970
19.....	2,400	73	454	2,150	202	s 1,810	2,500	826	5,566
20.....	2,200			2,840			1,880	226	1,150
21.....	2,020	36	191	6,020	712	s 11,700	1,610	104	421
22.....	1,920			3,250	458	4,020	1,390		
23.....	1,880	28	137	2,400	157	1,020	1,230	74	238
24.....	1,740			2,100			1,150		
25.....	1,920			1,920	60	313	1,070		
26.....	1,970	31	162	1,790			970	35	94
27.....	2,060	43	235	1,700			962		
28.....	1,970			1,660	50	221	925		
29.....	2,200	71	421	1,560			859	34	80
30.....	2,020	54	294	1,740	46	219	824		
31.....	--	--	--	1,790			--		
Total.	74,580	--	37,106	70,910	--	37,530	44,300	--	25,998

s Computed by subdividing day.

a Computed from estimated concentration graph.

## PEE DEE RIVER BASIN--Continued

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

## Suspended sediment, water year October 1953 to September 1954--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.....	824			716	28	54	824	290	645	
2.....	754	22	46	1,000	148	400	674	151	275	
3.....	722			625			86	145		
4.....	859	51	131	940	218	432	577	48	75	
5.....	1,110			580						
6.....	888							662	128	229
7.....	775	85	177	638	70	121	550			
8.....	764			500						
9.....	788	18	44	632	51	86	470	13	16	
10.....	1,030			470						
11.....	955			1,090			613			s 1,880
12.....	940	31	61	644	98	170	405	17	21	
13.....	812			495						
14.....	747	46	88	460	22	29	460	14	15	
15.....	710			430						
16.....	788	42	72	520	24	39	430	14	15	
17.....	632			425						
18.....	632	159	s 614	475	256	613	345	10	14	
19.....	1,130	600	s 1,900	818			355			
20.....	1,190			886	425					
21.....	1,370	898	s 3,380	817	158	348	460	10	14	
22.....	2,750	1,050	s 7,820	1,650	935	s 4,610	505			
23.....	1,660	930	s 4,110	2,250	701	4,270	560			
24.....	1,170	426	134	2,060	620	3,460	525			
25.....	910	231	57	1,150	412	1,280	445			
26.....	880	116	275	902	179	435	485	8	10	
27.....	753	94	191	852	109	251	480			
28.....	734	52	105	1,090	70	206	440	6	7	
29.....	763			480						
30.....	684	28	50	1,070	210	608	480			
31.....	632			286	1,200	405	250	1,200	405	
Total	29,356	--	20,266	28,371	--	22,976	14,790	--	1,622	
Total discharge for year (cfs-days) .....									717,237	
Total load for year (tons) .....									707,378	

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 1953 to September 1954  
 (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	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									0.500	1.000
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250			
Dec. 14, 1953	2:15 p. m.	8, 310		819	819	23	26	68	84	91	94					BW
Jan. 16, 1954	6:30 p. m.	9, 090		694	694	28	41	56	70	80	87					BN
Jan. 16	6:15 p. m.	9, 090		933	933	18	28	35	57	76	81					BW
Jan. 17	9:45 a. m.	6, 380		575	575	--	25	37	68	85	88					BW
Jan. 21	2:10 p. m.	9, 350		1, 260	1, 260	24	35	50	68	75	78					BW
Mar. 2	12:45 p. m.	14, 000		1, 560	1, 560	31	42	61	87	92	94					BW
Mar. 14	6:30 p. m.	8, 500		1, 920	1, 920	46	57	74	87	89	90					BW
Mar. 15	8:15 a. m.	5, 540		991	991	52	65	76	83	89	94					BW
Mar. 20	10:15 a. m.	11, 000		1, 390	1, 390	42	54	64	74	77	78			81		BW
Apr. 1	6:15 p. m.	4, 750		480	480	20	37	56	69	78	85			91		BW
Apr. 8	7:33 a. m.	4, 200		860	860	19	28	36	50	63	84			96		BW
May 6	7:50 a. m.	2, 100		260	260	35	63	84	92	94	96			99		BW
May 21	12:10 p. m.	6, 560		955	955	14	24	62	86	87	91			94		BW
June 12	9:00 a. m.	1, 430		373	373	57	61	95	96	97	99			--		BW

## PEE DEE RIVER BASIN--Continued

## SOUTH YADKIN RIVER NEAR MOCKSVILLE, N. C.

LOCATION.--At gaging station at highway bridge, 1 mile upstream from Little Creek, 4 miles downstream from Fifth Creek, 4½ miles upstream from Little Creek and 6½ miles southwest of Mocksville, Davie County.

DRAINAGE AREA.--3,300 acres.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.

Water temperatures: October 1953 to September 1954.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1333.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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			
Nov. 16, 1953.....	108		16	0.05	3.1	1.5	4.8	23	23	1.9	2.0	0.2	0.2	41	14	0	47.5	6.8	8
Dec. 15 .....	610		10	.09	2.7	.9	4.5	13	13	4.0	2.8	.1	1.6	36	10	0	43.3	6.4	8
Jan. 15, 1954.....	208		14	.08	3.5	1.3	4.9	23	23	2.2	2.0	.1	.6	40	14	0	51.9	6.6	7
Feb. 16 .....	187		13	.12	3.8	1.0	4.4	21	21	2.2	2.2	.1	.4	43	14	0	55.2	6.7	16
Mar. 17 .....	373		8.1	.10	2.9	1.0	4.0	16	16	2.6	2.5	.2	.2	36	11	0	58.3	6.8	9
Apr. 23 .....	220		14	.00	3.8	1.6	3.0	1.2	22	1.6	2.0	.2	.5	39	16	0	50.1	6.8	27
May 17 .....	322		12	.00	3.1	.7	5.1	19	19	2.4	2.2	.0	.7	38	11	0	51.7	6.5	7
June 15 .....	141		14	.04	4.0	1.2	5.8	22	22	4.7	2.8	.1	.4	46	15	0	49.4	6.6	2
Aug. 19 .....	120		10	.09	3.6	.4	2.1	2.3	13	4.6	1.8	.1	1.4	39	11	0	45.2	6.3	3
Sept. 20 .....	38		15	.00	4.8	1.5	2.8	1.9	27	2.6	2.0	.1	.5	44	18	0	60.5	6.6	5

PEE DEE RIVER BASIN--Continued  
DROWNING CREEK NEAR HOFFMAN, N. C.

LOCATION.--Temperature recorder at gaging station on right bank 10 feet downstream from bridge on U. S. Highway 1, three-quarters of a mile downstream from Deep Creek 1 mile upstream from Seaboard Airline Railway bridge, and 4 miles northeast of Hoffman, Richmond County.

DRAINAGE AREA.--178 square miles

RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1947, October 1953 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 76° F. Aug. 21, 22; minimum, 36° F. Dec. 19, 20.

EXTREMES, 1946-47, 1953-54.--Water temperatures: Maximum, 77° F. June 9, 11, 12, 30, Aug. 23, 1947; minimum, 36° F. Dec. 19, 20, 1953.

REMARKS.--Records of discharge for water year October 1953 to September 1954

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

Temperature (°F) of water, water year October 1953 to September 1954  
/Continuous ethyl alcohol-actuated thermograph/

PEE DEE RIVER BASIN--Continued  
PEE DEE RIVER NEAR SOCIETY HILL, S. C.

LOCATION.--at bridge on U. S. Highway 15 near Society Hill, Darlington County.  
DRAINAGE AREA.--7,960 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954 available in district office at Columbia, S. C.

REMARKS.--Discharge records for water year October 1953 to September 1954.

Date of collection	Dis-charge (cfs)	Silica (SiO <sub>2</sub> )	Iron (Fe)	Cal-cium (Ca)	Mag-nesium (Mg)	Sodium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chlo-ride (Cl)	Fluo-ride (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	Mag-nesium				Unfil-tered	Fil-tered
Oct. 29, 1953	1,820	8.2	0.02	5.0	1.6	9.2	2.0	29	4.7	5.9	0.1	0.4	54	12	0	96.9	6.7	10	4.0	3.5
Nov. 30	708	7.0	.09	3.5	1.3	11		28	5.1	6.2	.0	.4	49	14	0	95.0	6.7	19	3.8	3.2
Dec. 28	7,808	6.7	.11	3.7	1.8	6.1		21	4.6	5.2	.0		51	17	0	76.5	6.8	29	4.9	4.7
Feb. 1, 1954	12,100	11	.05	3.4	1.1	5.0	1.8	16	7.9	4.5	.0	1.0	43	13	0	59.8	6.4	17	4.3	3.5
Feb. 26	7,480	6.4	.08	3.4	1.0	6.1		15	5.2	5.0	.1	1.0	42	13	0	73.5	6.4	16	7.1	4.4
Mar. 30	13,500	8.0	.09	3.1	1.2	7.0		17	5.1	5.8	.1	.3	49	13	0	65.6	6.6	17	7.6	--
Apr. 29	7,560	9.0	.00	3.8	1.5	6.5	1.4	20	4.9	4.5	.1	.5	46	16	0	62.0	7.0	17	5.1	3.7
May 27	5,880	10	.04	4.7	1.0	6.3	1.5	25	6.1	4.5	.0	1.6	53	16	0	75.2	6.5	17	3.4	2.6
June 28	1,260	11	.07	5.1	1.5	5.0		16	5.1	3.8	.1	1.7	53	19	0	68.7	7.3	11	3.4	3.2
July 29	1,870	9.6	.01	4.6	1.6	7.0	1.8	24	5.5	5.2	.1	1.5	55	18	0	77.1	6.2	12	--	2.8
Sept. 1	2,440	8.1	.00	4.6	2.3	10	1.8	35	5.4	7.5	.1	1.2	60	21	0	98.3	6.5	8	--	2.4
Sept. 30	1,580	6.2	.05	4.2	1.8	15	2.0	45	6.7	9.0	.1	1.1	73	18	0	119	7.4	8	--	2.7

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 1953 to September, 1954

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	Non-carbonate			

ELK CREEK AT ELKVILLE, N. C.

Nov. 30, 1953	20.6							24	7	3.0				11	0	48.6	8.0	
Mar. 9, 1954	71.7							12	1	1.0				7	0	27.7	6.7	
Aug. 9	12.2							17	1	1.5				7	0	32.8	7.0	

MIDDLE FORK REDDIES RIVER AT WILBAR, N. C.

Mar. 9, 1954	23.4							9	1	1.2				5	0	22.2	7.0	
July 2	11.4							10	2	1.5	/			4	0	26.7	6.1	

ROARING RIVER NEAR ROARING RIVER, N. C.

Mar. 9, 1954	147							9	2	2.8				7	0	26.8	6.6	
Aug. 12	33.2							13	2	1.0				3	0	25.6	7.0	

MITCHELL RIVER NEAR STATE ROAD, N. C.

Mar. 9, 1954	98.9							11	2	1.2				6	0	24.7	6.8	
Aug. 12	28.1							15	2	2.5				9	0	26.9	6.8	

ARARAT RIVER AT MOUNT AIRY, N. C.

Mar. 11, 1954	56.9							14	3	2.0				11	0	35.3	6.5	
Aug. 13	12.3							19	3	2.0				13	0	42.7	6.7	

STEWART CREEK NEAR MOUNT AIRY, N. C.

Mar. 11, 1954	93.3							12	2	1.2				8	0	29.2	6.8	
Aug. 13	24.0							15	1	1.5				8	0	32.4	6.9	

TOMS CREEK AT PILOT MOUNTAIN, N. C.

Mar. 11, 1954	16.8							18	3	1.5				11	0	39.2	6.6	
Aug. 13	7.33							21	4	2.5				11	0	41.5	7.0	

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 1953 to September 1954--Continued

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	Non-carbonate				
FORBUSH CREEK NEAR YADKINVILLE, N. C.																			
Mar. 10, 1954	18	15	0.00	3.4	1.4	2.9	1.5	18	1.8	2.2	0.2	0.4	36	14	0	40.5	6.6		
Aug. 26	4.3	13	.00	3.4	1.1	2.3	2.0	20	2.2	2.0	.1	1.3	39	13	0	46.0	6.7	18	
DEEP CREEK AT SHACKTOWN, N. C.																			
Mar. 10, 1954	56.0							17	1	1.8				11	0	37.7	6.7		
Aug. 13	9.47							18	5	1.2				9	0	37.8	6.9		
MUDDY CREEK NEAR CLEMMONS, N. C.																			
Oct. 19, 1953	24.3							46	4	2.5				32	0	90.4	6.8		
July 28, 1954	20.0							44	4	2.8				31	0	95.2	6.3		
FIFTH CREEK AT COOLSPRING NEAR STATESVILLE, N. C.																			
Oct. 5, 1953	10.6							33	2	2.0				20	0	61.2	6.8		
May 13, 1954	17.9							27	1	2.0				18	0	55.4	6.7		
Aug. 13	9.42							28	3	2.2				18	0	56.9	6.9		
BEAR CREEK AT MOCKSVILLE, N. C.																			
Oct. 19, 1953	2.64							60	2	3.5				45	0	112	6.8		
Feb. 22, 1954		13	0.04	5.6	2.5	3.6	24	7.7	2.8	0.1	0.3	55	24	5	139	6.8	26		
SECOND CREEK NEAR BARBER, N. C.																			
Oct. 5, 1953	28.1							45	10	2.5				32	0	92.4	6.8		
May 12, 1954	57.5							45	7	3.0				34	0	95.8	6.8		
Aug. 13	19.2							48	7	2.2				33	0	97.9	7.3		
GRANTS CREEK AT SALISBURY, N. C.																			
Oct. 5, 1953	6.40							58	4	5.8				42	0	132	6.8		
July 2, 1954	8.74							57	6	5.2				40	0	124	7.2		
Aug. 13	5.61							58	6	5.0				37	0	123	7.1		

<sup>a</sup> Mean discharge.

SWEARING CREEK AT LINWOOD, N. C.

Oct. 5, 1953	6.74																		35	0	129	6.6
July 2, 1954	5.31																		35	0	231	6.8

ABBOTTS CREEK NEAR THOMASVILLE, N. C.

Oct. 19, 1953	11.2																						
July 2, 1954	10.0																						

RICH FORK NEAR HOLLY GROVE, N. C.

Oct. 19, 1953	1.86																						
July 2, 1954	2.19																						
Aug. 13	4.64																						

CEDAR CREEK AT SOCIETY HILL, S. C.

Oct. 29, 1953	23.3	6.8	0.07	1.0	0.3	2.5	4	1.6	2.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Apr. 29, 1954	67.8	4.3	.11	1.0	.1	1.6	1	1.6	3.2	.0	.0	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3

LYNCHEs RIVER NEAR BETHUNE, S. C.

Oct. 29, 1953	111	7.6	0.20	1.8	0.5	2.9	8	1.2	3.5	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Apr. 26, 1954	116	8.8	.14	2.5	.7	3.9	10	2.6	4.2	.0	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9

LITTLE LYNCHES RIVER NEAR BETHUNE, S. C.

Oct. 29, 1953	71.3	7.2	0.52	1.1	0.4	3.5	4	3.9	3.0	0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Apr. 26, 1954	53.5	7.4	.15	2.0	.8	3.5	4	6.9	3.5	.0	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6

LYNCHEs RIVER NEAR BISHOPVILLE, S. C.

Mar. 12, 1954	a510	8.0	0.20	1.8	0.4	4.2	7	3.4	4.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
May 27	a285	7.7	.37	1.4	.7	2.7	7	2.6	3.0	.0	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9

a Mean discharge.

e Large proportion of organic matter present; sum of mineral constituents 13 percent per million.

## 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 1953 to September 1954--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 100° C)	Hardness as CaCO <sub>3</sub>		Specific conduct- ance (micro- mhos at 25° C)	pH	Color	
														Calcium, magn- esium	Non- carbon- ate				
LYNCHEES RIVER AT EFFINGHAM, S. C.																			
Oct. 30, 1953 .....	288	7.4	0.14	1.6	1.0	4.5	12	2.5	3.5	0.1	0.2	29	8	0	29.6	6.3	21		
Feb. 26, 1954 .....	853	8.6	.19	2.6	.4	5.2	8	4.5	5.5	.0	.5	40	8	2	44.1	6.1	32		
GUM SWAMP CREEK NEAR LAURINBURG, N. C.																			
July 15, 1954 .....	20.8						2	1	2.2				1	0	15.6	5.7			
Aug. 25 .....	19.2						4	1	3.0				2	0	15.3	5.8			
SHOHEEL CREEK NEAR LAURINBURG, N. C.																			
July 15, 1954 .....	14.8						4	1	5.2				1	0	26.7	5.9			
Aug. 25 .....	5.87						5	1	5.0				2	0	27.3	5.9			
DROWNING CREEK NEAR JACKSON SPRINGS, N. C.																			
July 15, 1954 .....	7.98						6	1	3.2				2	0	23.4	6.3			
Aug. 26 .....	8.21						6	1	4.5				3	0	22.3	6.3			
LUMBER RIVER NEAR PEMBROKE, N. C.																			
July 15, 1954 .....	189						2	4	2.5				3	1	20.7	5.7			
Aug. 20 .....	119						5	2	3.5				2	0	23.6	6.2			
Sept. 17 .....	99.0	0.8	0.2				2	1	3.8		1.3		3	1	29.2	5.4			
																			a Mean discharge.



SANTEE RIVER BASIN

HENRY FORK NEAR HENRY RIVER, N. C.

LOCATION.--At gaging station at highway bridge, at site of old Link Ford, 14 miles downstream from Burke-Catawba County line, and 2 miles southeast of village of Henry River, Burke County.

DRAINAGE AREA.--80 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1333.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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			
Oct. 15, 1953	59		11	0.14	2.2	0.6	3.1	0.9	11	3.3	1.8	0.1	0.1	29	8	0	35.5	6.4	17
Nov. 15	8.1		10	.06	1.6	.7	3.5	3.2	10	3.5	1.2	.1	.1	28	7	0	33.3	6.7	5
Dec. 15	242		8.4	.09	1.5	.4	4.7	3.6	6	4.7	2.5	.0	.3	33	5	0	24.1	6.3	6
Jan. 15, 1954	31		9.2	.08	1.0	.4	5.1	5.1	8	5.0	2.2	.0	.4	27	4	0	29.3	6.5	6
Feb. 15	99		5.9	.12	2.2	.5	2.4	2.4	7	4.0	1.5	.2	.3	34	8	2	30.2	6.3	8
Mar. 15	342		4.8	.11	1.5	.4	2.5	2.5	6	3.4	1.5	.1	.0	21	5	1	37.3	6.7	9
Apr. 15	153		9.0	.00	1.6	.8	1.7	.9	8	2.9	1.0	.2	.4	23	7	1	46.1	6.3	9
May 15	356		7.6	.01	1.8	.3	2.3	2.3	6	3.3	1.5	.0	.5	22	6	1	28.5	5.7	6
June 15	65		9.2	.01	1.6	.3	4.0	4.0	9	3.7	1.5	.1	.4	26	5	0	26.3	6.3	7
July 15	90		10	.05	2.3	.2	1.8	1.1	8	3.0	1.5	.1	.3	29	6	0	27.8	6.0	3
Aug. 15	31		9.8	.00	2.0	.6	1.4	1.1	10	3.0	1.8	.0	.3	25	6	0	32.8	6.1	7
Sept. 15	30		10	.02	2.2	.4	2.0	1.1	11	3.3	1.2	.1	.3	26	7	0	29.0	6.3	3

SANTEE RIVER BASIN--Continued  
INDIAN CREEK NEAR LABORATORY, N. C.

LOCATION.--Temperature recorder at gaging station on left bank, 250 feet upstream from remains of Rudisill Mill dam, half a mile upstream from highway bridge, 1 1/2 miles upstream from mouth, 1 1/2 miles south of Laboratory, Lincoln County, and 3 1/2 miles south of Lincolnton.  
DRAINAGE AREA.--68.4 square miles.

RECORDS AVAILABLE.--Water temperatures: January 1953 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 83° F July 14, 15, Aug. 27; minimum, 33° F Jan. 13, 14, 15.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1333.

Temperature (° F) of water, water year October 1953 to September 1954

(Continuous ethyl alcohol-actuated thermograph)

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

SANTEE RIVER BASIN--Continued  
 SALUDA RIVER NEAR PELZER, S. C.  
 LOCATION ---At gaging station half a mile downstream from Hurricane Creek and 2 miles north of Pelzer, Anderson County.  
 DRAINAGE AREA. ---405 square miles.  
 RECORDS AVAILABLE. ---Chemical analyses: October 1953 to September 1954.  
 REMARKS. ---Records of discharge for water year October 1953 to September 1954 given in WSP 1333.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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. 13, 1953	282	12	0.08	2.7	0.9	3.1	1.6	16	1.4	2.0	0.2	0.1	34	10	0	52.4	6.5	9	2.1	1.6
Nov. 15	236	14	.09	2.2	.6	4.7	3.4	16	1.6	2.0	.1	.5	34	8	0	35.2	6.4	12	1.9	1.6
Dec. 28	546	12	.07	2.1	.5	4.3	1.6	14	2.2	1.8	.1	.2	31	7	0	31.1	6.4	16	2.4	1.7
Jan. 15, 1954	477	8.5	.06	2.2	.4	3.1	1.6	12	3.2	2.0	.1	.0	30	7	0	29.1	6.2	4	5.4	2.4
Feb. 15	583	9.4	.04	1.4	.8	4.0	1.4	11	1.4	2.5	.2	1.1	30	7	0	45.4	6.3	6	2.6	1.8
Mar. 15	1,340	11	.00	2.0	.6	3.4	3.4	11	1.1	2.2	.1	1.0	31	7	0	31.7	6.4	8	3.8	2.0
Apr. 15	843	12	.01	2.2	.8	2.5	1.0	11	1.1	2.0	.2	.9	28	9	0	30.1	6.3	6	2.3	1.9
May 17	662	11	.00	2.6	.3	2.9	1.0	14	2.0	1.0	.0	1.2	30	8	0	31.3	6.1	3	1.8	1.7
June 15	596	13	.00	2.4	.7	2.3	1.2	12	3.0	2.0	.1	1.2	33	9	0	34.1	6.6	7	2.3	1.6
July 15	264	13	.01	2.7	.4	2.5	1.3	14	2.1	2.0	.1	1.2	34	9	0	36.3	6.6	4	1.7	1.6
Aug. 15	274	15	.00	2.2	1.0	3.1	1.1	17	.9	2.0	.1	.7	35	10	0	36.0	6.3	7	--	1.6
Sept. 15	154	17	.16	2.2	.8	5.3	1.4	24	.8	1.8	.0	.4	45	9	0	50.0	6.6	12	--	3.2

SANTEE RIVER BASIN--Continued  
MISCELLANEOUS ANALYSES OF STREAMS IN SANTEE RIVER BASIN IN NORTH CAROLINA AND SOUTH CAROLINA

Chemical analyses, in parts per million, water year October 1953 to September 1954

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			
CATAWBA RIVER AT OLD FORT, N. C.																		
Nov. 4, 1953	4.03			--	--			24	3	1.0				17	0	45.8	6.7	
Dec. 2, 1953	5.25			--	--			23	3	2.8				18	0	59.3	6.7	
Feb. 3, 1954	11.8			--	--			10	2	1.0				16	2	38.3	6.8	
June 14	10.1			--	--			22	4	1.5				18	2	40.4	7.0	
Aug. 5	4.97			4.8	1.7			24	3	3.5		0.1		19	0	60.6	7.0	
Sept. 7	2.57			4.4	1.0			23	4	1.8		.9		15	0	49.5	6.6	
CURTIS CREEK NEAR OLD FORT, N. C.																		
Dec. 2, 1953	6.27			--	--			9	1	1.0				6	0	28.8	6.4	
Feb. 3, 1954	25.5			--	--			8	2	2.0				8	1	27.3	7.0	
June 14	12.9			1.6	0.5			8	1	.8		0.4		7	0	28.6	7.0	
Aug. 5	5.57			1.6	.5			8	3	.8		1.0		6	0	29.0	6.2	
Sept. 7	3.18															24.7	6.3	
NORTH FORK CATAWBA RIVER AT PITTS, N. C.																		
Feb. 2, 1954	28.2			--	--			28	2	1.2				23	0	55.7	7.3	
June 14	16.8			--	--			35	2	1.5				25	0	63.2	7.2	
Aug. 5	5.23			6.8	4.4			42	1	1.2		0.5		35	1	81.0	6.9	
Sept. 7	3.26			8.8	4.1			50	1	1.0		.8		39	0	89.5	7.1	
LINVILLE RIVER AT BRANCH, N. C.																		
Mar. 2, 1954	350	5.9	0.05	1.1	0.3	2.7	1.5	6	2.1	1.5	0.0	0.8	24	4	0	21.0	6.1	20
Sept. 7	13.9	5.7	.00	2.0	1.0	1.8	0.8	13	2.6	1.0	.0	.1	23	9	0	30.5	7.2	7
MUDDY CREEK AT BRIDGEWATER, N. C.																		
Oct. 20, 1953	58.7							25	2	5.5				15	0	88.7	6.7	
May 12, 1954	105							23	2	3.2				22	2	60.5	6.5	
Aug. 11	47.4							26	3	.9				13	0	99.1	6.9	

SILVER CREEK NEAR GLEN ALPINE, N. C.

Oct. 20, 1953	15.1				23	3	3.0			17	0	54.3	6.6
May 27, 1954	25.7				19	1	2.0			11	0	37.7	6.7
Aug. 11	9.86				21	2	1.0			10	0	38.9	6.6

JOHNS RIVER AT COLLETTSVILLE, N. C.

Oct. 20, 1953	20.0				15	1	1.0			9	0	32.9	6.6
May 27, 1954	74.4				12	2	1.5			7	0	26.4	6.7
Aug. 11	0.84				19	1	2.2			11	0	34.0	7.0

LOWER CREEK AT LENOIR, N. C.

Mar. 11, 1954	11.9				24	5	2.0			17	0	55.8	6.9
July 30	4.28				32	3	1.8			16	0	62.5	7.0

DAVIDSON CREEK NEAR CORNELIUS, N. C.

Mar. 12, 1954	23.0				29	4	1.0			28	0	83.4	7.0
Aug. 7	6.03				53	5	3.8			33	0	96.4	7.4

DUTCHMAN'S CREEK NEAR STANLEY, N. C.

Mar. 12, 1954	76.4				32	3	2.0			21	0	66.1	7.0
Aug. 7	12.3				32	4	2.8			21	0	63.5	7.3

JACOB FORK NEAR STARTOWN, N. C.

Oct. 6, 1953	68.7				15	3	2.0			9	0	32.4	6.4
May 27, 1954	108				4	1	2.0			7	4	28.7	6.5

CLARK CREEK AT LINCOLNTON, N. C.

Nov. 29, 1953	30.0				32	3	7.2			22	0	95.6	6.8
Mar. 12, 1954	74.6				31	5	10			19	0	94.4	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, 1953 to September, 1954--Continued

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 evap- oration at 180°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro- mhos at 25°C)	pH	Color	
														Calcium	Non- carbon- ate				
CROWDERS CREEK NEAR GASTONIA, N. C.																			
Oct. 5, 1953	18.2							40	5	5.2					25	0	105	6.7	
Mar. 12, 1954	58.8							50	5	6.8					23	0	123	7.0	
MCALPINE CREEK NEAR PINEVILLE, N. C.																			
Jan. 6, 1954	18.0							53	10	6.2					45	2	125	7.0	
Aug. 7	2.12							67	4	5.8					49	0	134	7.3	
TWELVEMILE CREEK NEAR WAXHAW, N. C.																			
Jan. 6, 1954	12.4							30	10	5.5					25	0	80.6	7.0	
Aug. 7	1.02							37	2	6.0					26	0	83.8	7.2	
-- COVE CREEK NEAR LAKE LURE, N. C.																			
Mar. 3, 1954	80.1							13	2	1.5					8	0	32.5	6.9	
Aug. 6	28.4							21	2	2.8		0.2			16	0	43.4	6.7	
Sept. 8	21.2							19	2	1.5		.5			10	0	39.2	6.6	
MOUNTAIN CREEK NEAR RUTHERFORDTON, N. C.																			
Mar. 2, 1954	62.2							21	3	2.2					13	0	43.2	6.7	
July 9	26.2							23	8	1.5					14	0	45.1	6.7	
Aug. 6	20.0							30	1	3.5		0.7			22	0	70.3	6.9	
Sept. 8	14.0							23	1	1.2		.3			14	0	47.1	6.7	
SECOND BROAD RIVER AT BOSTIC, N. C.																			
Nov. 29, 1953	83.3							27	2	2.8					17	0	57.5	6.9	
Aug. 5, 1954	49.3							61	9	2.6					14	0	196	7.2	
FIRST BROAD RIVER NEAR CASAR, N. C.																			
Nov. 29, 1953	31.1							18	2	1.5					10	0	35.7	6.9	
Aug. 5, 1954	19.1							19	2	2.0					10	0	40.8	7.0	

## BUFFALO CREEK NEAR WACO, N. C.

Oct. 5, 1953 .....	18.2						2	2.5			14	0	46.9	6.7
Aug. 5, 1954 .....	4.59						20	3.5			12	0	50.2	6.5

## BUFFALO CREEK NEAR BLACKSBURG, S. C.

Oct. 14, 1953 .....	64.1	9.3	0.12	3.7	1.1	6.8	25	3.0	6.8	0.2	0.4	57	14	0	72.0	6.8	12
Mar. 26, 1954 .....	435.1	6.8	.02	3.6	.6	5.5	16	4.3	5.5	.1	.8	45	11	0	62.9	6.6	9

## BROAD RIVER NEAR GAFFNEY, S. C.

Nov. 12, 1953 .....	a,900	6.3	0.05	2.6	1.1	2.8	21	2.8	2.8	0.2	0.2	40	11	0	64.0	7.0	8
Mar. 19, 1954 .....	a,2,870	5.0	.04	2.6	.5	2.5	14	3.3	2.5	.0	.9	34	9	0	58.9	6.5	26
June 24 .....	a,1,020	6.1	.00	2.6	.5	2.8	17	2.6	2.8	.1	1.3	38	9	0	44.0	6.6	9

## BULLOCK CREEK NEAR SHARON, S. C.

Oct. 2, 1953 .....	10.5	8.5	0.13	7.2	2.3	3.2	43	5.5	3.2	0.1	0.1	69	27	0	93.4	6.8	9
Mar. 17, 1954 .....	74.3	9.4	.08	5.2	1.4	4.5	28	8.7	4.5	.1	.6	61	19	0	108	6.6	11
June 24 .....	16.0	8.3	.00	5.9	1.1	2.8	33	4.8	2.8	.2	.8	65	19	0	78.3	6.6	4

## NORTH FALCOLET RIVER NEAR TRYON, N. C.

Mar. 3, 1954 .....	109			3.2	2.2		29	4	2.2		1.3	11	0	64.1	7.2		
Aug. 6 .....	23.0						b,64	3	3.2			17	0	130	9.2		

## LAWSON FORK CREEK AT SPARTANBURG, S. C.

Nov. 13, 1953 .....	29.1	7.6	0.06	4.0	1.1	3.4	25	3.4	4.0	0.2	1.0	47	14	0	69.1	6.6	8
June 23, 1954 .....	46.2	6.9	.00	4.4	.9	4.2	22	3.9	4.2	.1	1.8	48	15	0	62.9	6.3	3

## BROAD RIVER NEAR CARLISLE, S. C.

Nov. 16, 1953 .....	a,955	7.6	0.10	4.2	1.0	2.8	28	2.8	3.5	0.1	0.2	46	15	0	70.6	6.7	12
Mar. 19, 1954 .....	a,3,840	4.5	.02	3.6	1.1	3.3	18	3.3	3.0	.1	.6	40	14	0	66.0	6.6	8
June 25 .....	a,1,770	7.5	.00	3.6	.5	3.0	22	3.1	3.0	.1	2.0	45	11	0	59.2	7.2	2

a Mean discharge  
 b Includes equivalent of 12 parts per million of carbonate (CO<sub>3</sub>).

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 1953 to September 1954--Continued

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	Calcium	Calcium	Non-carbonate			
<b>ENOKEE RIVER NEAR ENOKEE, S. C.</b>																			
Nov. 16, 1953	129	15	0.29	3.4	0.8	29		68	11	4.5	0.1	0.1	100	12	0	154	7.0	16	
May 20, 1954	258	15	.01	2.5	.6	13		31	5.5	3.2	.1	1.7	59	9	0	79.1	6.3	4	
<b>WARRIOR CREEK AT LANFORD, S. C.</b>																			
Oct. 13, 1953	6.34	24	0.13	3.5	0.9	6.6		26	5.6	2.5	0.2	0.2	55	13	0	55.2	6.5	6	
June 23, 1954	7.79	24	.12	3.5	.7	7.1		24	2.1	2.5	.1	1.6	57	12	0	55.4	6.5	12	
<b>WILSON CREEK NEAR NINETY SIX, S. C.</b>																			
Oct. 14, 1953	7.31	29	0.04	7.2	2.7	19		47	4.9	17	0.2	3.8	109	29	0	160	6.8	6	
Apr. 21, 1954	29.1	25	.37	8.0	3.0	12		45	5.1	8.5	.2	4.1	97	32	0	125	6.5	37	
<b>SALUDA RIVER AT CHAPPELLS, S. C.</b>																			
Mar. 10, 1954	2,100	11	0.13	2.2	0.7	6.1		14	4.7	2.8	0.1	1.3	40	6	0	46.2	6.7	12	
May 27	3,349	7.9	.05	2.6	1.0	7.1	1.7	22	5.4	3.5	.1	1.1	43	11	0	56.5	6.8	12	
<b>LITTLE RIVER NEAR SILVERSTREET, S. C.</b>																			
Oct. 14, 1953	84.7	29	0.04	7.1	2.0	9.8		42	4.5	5.0	0.2	0.4	79	29	0	94.7	6.7	7	
Apr. 21, 1954	186.7	24	.07	7.0	2.4	7.9		40	4.3	4.2	.2	1.3	74	27	0	88.5	7.0	16	
May 20	98.8	25	.12	6.0	2.7	6.6		39	3.6	3.2	.1	1.6	86	26	0	102.2	6.8	7	
June 11	42.7	29	.62	5.9	3.7	11		42	2.7	5.2	.2	1.5	79	21	0	93.2	6.3	2	
<b>COBARGE RIVER AT COLUMBIA, S. C.</b>																			
Jan. 12, 1954	8.2	29	0.29	4.6	1.3	6.4		24	6.5	5.6	0.4	0.7	55	17	0	83.1	6.7	29	
Feb. 16	9.1	12	.12	3.5	1.1	10		24	5.3	5.2	.7	.8	32	13	0	78.7	6.7	7	
May 12	12	68	.68	3.9	1.8	8.1	1.6	28	5.6	4.2	.4	.9	53	11	0	73.1	6.5	14	

a Mean discharge.



GILLS CREEK NEAR COLUMBIA, S. C.

May 4, 1964.....	55.1	2.6	0.07	3.9	0.7	6.0	0	8.2	7.2	0.0	8.7	51	13	13	74.7	4.7	16
June 21 .....	18.2	4.9	.02	5.1	2.6	12	d.05	7.3	24	.1	13	91	26	26	141	4.1	7

d Acidity as H<sup>+</sup>.

SAVANNAH RIVER BASIN  
KEOWEE RIVER NEAR NEWRY, S. C.

LOCATION (revised) --At gaging station, 0.7 mile upstream from Sixmile Creek, and 2½ miles east of Newry, Oconee County.  
DRAINAGE AREA 455 square miles.  
RECORDS AVAILABLE --October 1953 to September 1954.  
REMARKS --Records of discharge for water year October 1953 to September 1954 given in WSP 1333.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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
Oct. 14, 1953	500	13	0.05	2.2	0.7	2.8	3.2	1.1	1.5	1.2	0.1	0.1	30	8	8	43.0	6.3	9	2.5	1.6
Nov. 16	402	15	.07	2.4	.6	2.4	3.2	1.5	1.1	1.2	.0	.2	31	8	0	43.7	6.4	11	1.6	1.2
Dec. 15	2,700	8.9	.08	1.4	.4	1.4	1.4	6	1.9	1.2	.0	.2	20	5	1	37.2	6.3	21	3.0	2.6
Jan. 16, 1954	11,100	5.7	.03	1.4	.4	1.4	.6	5	2.0	1.2	.0	.4	19	5	1	20.6	5.6	6	--	1.8
Feb. 15	978	10	.01	1.1	.5	2.6	2.6	9	.9	1.2	.1	.2	22	5	0	20.2	6.4	3	2.1	2.0
Mar. 15	1,590	8.0	.02	1.4	.4	1.8	1.8	7	1.2	1.0	.1	.5	20	5	0	21.1	5.7	18	4.5	2.4
Apr. 14	1,210	9.9	.01	1.8	.5	2.1	.7	9	1.9	1.2	.2	.2	23	7	0	22.4	6.6	8	2.5	1.4
May 16	1,280	7.9	.00	1.4	1.1	1.2	.7	10	2.5	.8	.0	.4	25	8	0	23.6	6.1	3	2.8	1.8
June 16	740	11	.00	1.8	.8	1.5	.8	10	1.5	1.2	.1	.7	26	8	0	25.8	6.2	4	2.8	1.6
July 16	376	12	.05	2.0	.5	2.4	.7	14	1.2	1.2	.0	.4	29	7	0	29.5	6.3	8	--	1.6
Aug. 15	235	11	.04	1.8	.7	2.4	.8	14	.8	1.2	.0	.4	29	7	0	28.2	6.6	7	--	1.6
Sept. 17	203	10	.06	1.9	.9	2.5	1.1	15	.7	1.5	.0	.6	30	8	0	31.7	6.6	15	--	1.8

SAVANNAH RIVER BASIN--Continued  
LITTLE RIVER NEAR MOUNT CARMEL, S. C.

LOCATION --At gaging station 480 feet downstream from Island Ford Bridge, 2.8 miles upstream from Calhoun Creek, and 4.5 miles north of Mount Carmel, McCormick County, 21.7 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1953 to September 1954.

REMARKS --Records of discharge for water year October 1953 to September 1954 given in WSP 1333.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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-mesium	Non-carbonate				Unfiltered	Filtered
Oct. 11, 1953	36	19	0.18	5.5	1.5	5.5	1.8	34	2.3	3.2	0.2	0.0	60	20	0	108	6.9	10	2.3	1.8
Nov. 15	42	23	0.17	5.4	1.5	7.5	4.3	34	3.5	3.0	0.0	1.1	62	20	0	78.2	6.6	13	2.1	1.8
Dec. 16	468	12	0.09	3.8	0.9	4.3	1.8	14	5.3	3.8	0.0	0.3	48	13	2	95.9	6.3	25	5.6	4.0
Jan. 18, 1954	1,520	9.9	0.06	2.5	0.7	3.1	1.8	13	4.2	2.5	0.0	0.8	38	9	0	54.2	6.1	19	7.6	4.4
Feb. 16	107	18	0.03	4.2	2.3	6.6	4.7	31	3.2	3.2	0.2	0.6	55	20	0	71.9	6.8	13	2.8	2.4
Mar. 14	517	10	0.00	3.6	1.4	4.7	1.6	21	3.3	2.5	0.0	0.9	44	15	0	50.1	6.5	17	9.3	6.6
Apr. 18	138	18	0.04	5.6	2.4	5.2	1.5	35	2.5	3.0	0.3	1.2	58	24	0	74.9	7.0	17	3.2	2.0
May 16	119	18	0.04	6.5	1.4	4.2	1.5	33	4.0	3.0	0.1	1.1	58	22	0	76.7	7.1	17	2.6	1.8
June 13	53	22	0.00	5.5	2.2	4.1	2.1	35	5.1	2.5	0.1	1.1	61	23	0	74.5	6.7	3	3.6	2.0
July 19	32	21	0.01	6.0	1.6	4.4	3.2	34	3.4	3.0	0.2	0.4	59	21	0	72.8	6.3	6	3.4	1.8
Aug. 15	16	21	0.01	5.7	2.5	5.1	2.5	38	2.1	2.8	0.2	0.9	64	24	0	84.9	6.9	7	--	2.2

PART 2 B. SOUTH ATLANTIC SLOPE AND EASTERN GULF OF MEXICO BASINS, OGEECHEE RIVER TO PEARL RIVER

ST. JOHNS RIVER BASIN  
ST. JOHNS RIVER NEAR COCOA, FLA.

LOCATION.--At State Highway 520, approximately one-half mile downstream from outlet of Lake Poinsett, 10 1/2 miles west of Cocoa, Brevard County. DRAINAGE AREA.--1,237 square miles. RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.

Water temperatures: October 1953 to September 1954. EXTREMES, 1953-54.--Dissolved solids: Maximum, 350 ppm June 1-8; minimum, 103 ppm Oct. 21-31. Hardness: Maximum, 94 ppm June 1-8; minimum, 30 ppm Oct. 21-31. Specific conductance: Maximum daily, 542 micromhos May 1; minimum daily, 107 micromhos Oct. 10. Water temperatures: Maximum, 88°F May 16, July 6, Aug. 17, 27, 28, Sept. 8, 15, 16, 23, 25, 26; minimum, 50°F Mar. 16. REMARKS.--Values reported for dissolved solids are residue on evaporation at 180°C. Records of specific conductance of daily samples available in district office, Ocala, Fla. Records of discharge for water year October 1953 to September 1954 computed on basis of records for St. Johns River near Melbourne, Fla. are given in WSP 1334.

Chemical analyses in parts per million, water year October 1953 to September 1954

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			
Oct. 1-10, 1953	8,960	4.8	0.17	9.2	2.1	12	0.6	23	7.2	21	0.1	0.1	105	32	13	128	6.7	160
Oct. 11-20	9,850	4.1	0.15	8.6	2.3	12	0.6	21	6.8	22	0.1	0.1	108	31	14	127	6.6	140
Oct. 21-25, 27-31	8,020	4.2	0.15	8.6	2.2	12	0.6	23	6.2	22	0.1	0.1	103	30	12	127	6.8	140
Nov. 1-10	5,500	4.9	0.20	8.8	3.4	13	0.4	25	3.0	26	0.1	0.2	117	36	12	138	7.1	150
Nov. 11-20	3,750	10.0	0.19	8.8	3.4	13	0.4	30	2.5	23	0.2	0.2	121	33	9	134	7.1	150
Nov. 21-30	3,410	6.6	0.17	8.4	2.6	13	0.4	27	2.5	24	0.1	0.1	115	32	10	132	7.0	150
Dec. 1-10	3,410	5.2	0.18	9.2	3.1	14	0.5	25	8.5	27	0.1	0.3	121	36	15	151	6.8	110
Dec. 11-20	2,710	9.5	0.17	10.7	2.7	16	0.7	29	7.8	29	0.1	0.3	125	36	12	157	7.2	110
Dec. 21-31	2,430	11.1	0.17	9.7	2.4	15	0.6	31	6.5	26	0.1	0.2	117	34	9	151	7.1	110
Jan. 1-10, 1954	2,040	15.0	0.11	9.7	3.0	15	0.4	26	5.0	29	0.1	0.1	116	37	15	161	7.1	100
Jan. 11-20	1,700	4.5	0.12	10.0	3.4	17	0.5	25	6.0	33	0.1	0.2	123	39	18	173	6.9	100
Jan. 21-31	1,520	3.3	0.09	9.9	2.9	17	0.4	23	5.2	34	0.1	0.2	121	37	18	170	6.9	100
Feb. 1-10	1,060	1.7	0.10	9.7	2.6	16	0.5	22	4.2	33	0.1	0.2	121	35	17	162	6.8	110
Feb. 11-20	818	8.7	0.12	13	2.6	23	0.6	29	6.2	42	0.1	0.1	152	41	17	208	7.3	100
Feb. 21-28	694	7.8	0.25	13	4.1	26	0.8	21	9.8	52	0.1	0.3	179	49	32	248	7.3	90
Mar. 1-10	510	4.8	0.13	15	3.7	25	1.0	26	10	58	0.1	0.1	192	53	31	273	7.1	100
Mar. 11-20	449	3.5	0.12	16	4.6	34	1.1	27	13	70	0.1	0.1	232	59	37	323	7.2	100
Mar. 21-31	388	2.5	0.12	17	4.2	35	1.1	28	14	71	0.1	0.1	232	60	37	326	7.2	100
Apr. 1-10	300	9	0.08	18	5.4	40	1.2	31	16	81	0.1	0.3	258	67	42	360	7.0	110
Apr. 11-20	248	2.7	0.09	18	5.9	41	1.3	32	16	81	0.1	0.3	257	69	43	364	6.9	100
Apr. 21-28, 30	252	3.5	0.08	18	6.0	41	1.3	32	16	81	0.1	0.3	251	70	43	370	7.0	110
May 1, 2, 7-10	178	7.0	0.15	22	7.1	54	1.8	42	20	107	0.0	0.2	346	84	50	462	7.6	75
May 12-18, 20	137	4.2	0.24	21	7.0	50	1.9	42	19	97	0.1	0.1	329	81	47	430	7.7	80
May 21-24, 27, 28, 30-31	195	5.5	0.30	22	7.8	46	1.3	33	36	87	0.0	0.0	335	87	60	417	7.4	120

June 1-8, 1954.....	1,700	3.7	20	24	8.3	46	1.4	32	42	90	.1	1.5	950	94	68	449	7.3	120
June 11-12, 14-20.....	1,690	7.2	21	18	4.6	25	1.2	30	17	51	.2	.2	202	64	39	276	6.9	160
June 21-30.....	2,610	6.7	23	16	4.6	22	1.2	30	17	46	.1	.0	183	59	34	247	6.8	160
July 1-10.....	2,020	5.2	30	14	3.7	18	.9	29	9.0	39	.1	.4	157	50	26	205	6.9	160
July 11-19.....	2,440	5.4	.19	13	2.8	16	.5	28	9.2	34	.0	.4	136	44	21	180	6.8	160
July 22-31.....	2,600	4.7	.19	12	3.3	16	.5	28	8.2	34	.1	.4	137	44	21	181	6.8	160
Aug. 1-10.....	2,230	11	.22	13	3.2	17	.5	35	8.2	34	.1	.4	144	46	17	189	7.1	160
Aug. 11-20.....	1,800	9.8	.21	12	3.3	16	.3	31	7.8	31	.1	.4	139	44	18	176	7.1	160
Aug. 21-31.....	1,490	16	.19	13	3.2	18	.4	39	7.8	36	.1	.2	154	46	14	193	7.5	160
Sept. 1-5, 7, 9.....	1,370	14	.04	13	3.8	22	.6	36	10	40	.1	.2	155	48	19	210	7.5	120
Sept. 11-15, 17, 19.....	1,260	6.1	.02	13	4.8	24	.6	29	13	50	.1	.1	169	52	28	236	7.2	120
Sept. 21, 23, 25, 27, 29.....	1,490	4.7	.04	14	3.7	24	.6	25	12	48	.1	.1	169	50	30	235	7.1	120
Average.....	2,257	6.4	0.17	14	4.0	24	0.8	29	11	47	0.1	0.2	177	50	26	235	7.1	125

ST. JOHNS RIVER BASIN--Continued  
ST. JOHNS RIVER NEAR COCOA, FLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

LOCATION.--at gaging station at State Highway 70 bridge, 9.4 miles west of Okeechobee, Okeechobee County, and 13 miles upstream from Lake Okeechobee.  
DRAINAGE AREA.--2,586 square miles.  
RECORDS AVAILABLE.--Chemical analyses: March 1940 to February 1941, October 1953 to September 1954.  
Water temperatures: October 1953 to September 1954.  
EXTREMES, 1953-54.--Dissolved solids: Maximum, 95 ppm May 1-10; minimum, 51 ppm Oct. 21-31.  
Sardness: Maximum, 25 ppm Aug. 11-20; minimum, 12 ppm Oct. 14-20.  
Specific conductance: Maximum, 117.12 micromhos daily, 42.4 micromhos Oct. 18.  
Water temperatures: Maximum, 89.7 F. Oct. 12; minimum, 58.7 F. Dec. 19, Mar. 8.  
REMARKS.--Rains reported for dissolved solids are residue on evaporation at 180°C. Records of specific conductance of daily samples available in district Office, Ocala, Fla. Records of discharge for water year October 1953 to September 1954 given in WSP 1334.

Chemical analyses in parts per million, water year October 1953 to September 1954

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. 1-10, 1953	9,071	4.1	0.22	3.8	2.1	5.0	0.2	14	5.5	8.6	0.0	0.0	62	18	7	63.4	6.5	100
Oct. 11-20	15,630	3.1	.14	3.2	1.1	4.5	.4	12	3.8	7.0	.2	.1	52	12	3	50.1	6.3	120
Oct. 21-30	10,740	2.8	.10	3.8	1.0	4.8	.3	12	3.8	7.0	.1	.0	51	14	4	51.3	6.4	90
Nov. 1-10	8,580	4.1	.14	3.8	1.6	6.4	.2	15	1.0	9.5	.1	.1	53	16	4	63.5	6.9	110
Nov. 11-20	7,502	3.6	.15	4.2	1.7	6.1	.1	15	1.5	10	.1	.2	77	18	5	68.4	6.8	110
Nov. 21-30	6,583	3.5	.21	4.8	2.3	5.6	.2	16	6.2	10	.1	.1	71	21	8	74.0	6.5	120
Dec. 1-10	7,610	.8	.18	3.8	1.5	5.1	.2	12	5.0	8.2	.1	.0	68	16	6	58.1	6.3	110
Dec. 11-20	6,959	1.5	.25	3.6	1.2	4.8	.1	12	4.2	8.0	.1	.1	61	14	4	54.5	6.3	110
Dec. 21-31	6,436	5.9	.21	4.4	2.6	5.6	.2	17	6.5	9.5	.1	.2	70	22	8	70.8	6.6	120
Jan. 1-10, 1954	5,924	5.4	.14	4.6	2.4	5.8	.1	17	6.0	8.5	.1	.0	76	21	7	78.5	6.8	110
Jan. 11-20	5,447	2.4	.16	4.0	1.7	5.2	.1	12	3.5	8.8	.1	.1	61	17	7	62.5	6.3	105
Jan. 21-31	4,879	4.5	.15	4.0	1.9	5.5	.1	16	4.8	8.2	.1	.1	69	18	5	66.3	6.6	120
Feb. 1-10	4,164	10	.17	5.3	2.1	6.8	.2	23	4.8	8.8	.1	.1	78	22	3	79.0	6.9	110
Feb. 11-20	3,624	3.5	.15	4.2	1.6	5.3	.1	15	4.2	8.6	.1	.1	65	16	6	66.1	6.2	130
Feb. 21-30	3,295	2.4	.15	4.2	1.6	5.1	.1	13	4.2	8.2	.1	.1	61	17	6	61.2	6.3	120
Mar. 1-10	3,036	1.5	.16	4.2	1.6	5.0	.1	11	3.2	8.5	.1	.1	62	17	7	60.1	6.3	120
Mar. 11-20	2,907	1.5	.16	4.2	1.6	5.2	.1	12	3.6	8.5	.1	.1	63	18	7	61.3	6.3	120
Mar. 21-31	2,491	1.3	.19	4.8	1.1	5.3	.1	14	4.5	8.0	.1	.1	63	16	5	61.8	6.3	110
Apr. 1-10	2,089	2.0	.19	4.5	1.8	5.1	.2	16	5.8	8.2	.0	.3	66	19	6	65.5	6.5	120
Apr. 11-20	1,942	2.6	.17	4.3	1.8	5.2	.2	16	5.2	8.5	.0	.3	73	18	6	64.3	6.6	100
Apr. 21-30	1,791	2.4	.16	4.3	1.6	4.9	.2	15	4.5	8.0	.0	.6	70	17	5	61.1	6.6	100
May 1-10	1,814	14	.23	5.5	2.8	6.3	.3	26	6.0	8.8	.1	.4	95	24	3	84.6	7.1	120
May 11-20	1,589	6.2	.22	5.3	2.0	7.0	.3	24	5.5	9.2	.0	.4	80	21	4	74.5	7.0	120
May 21-31	1,505	2.3	.18	4.7	1.8	5.4	.4	15	5.5	10	.0	.3	78	19	7	70.4	6.7	120

## LAKE OKEECHOBEE AND THE EVERGLADES--Continued

## KISSIMMEE RIVER NEAR OKEECHOBEE, FLA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954

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			
June 1-10, 1954.....	2,689	5.5	0.18	4.8	1.9	5.5	1.2	23	3.0	10	0.0	0.3	76	20	1	71.7	7.0	140
June 11-13, 13-20.....	3,407	6.9	.26	4.6	1.7	5.2	.9	24	.2	8.2	.0	.1	74	18	0	62.8	6.9	100
June 21-30.....	3,973	4.0	.21	4.6	1.7	5.1	.5	25	2.0	7.2	.0	.1	65	18	0	59.6	7.1	100
July 1-9.....	3,530	4.3	.23	4.4	2.3	5.7	.6	17	3.8	8.8	.1	.1	69	20	6	66.9	6.5	90
July 11-20.....	3,533	5.0	.16	4.0	1.7	5.1	.6	16	1.8	8.0	.0	.1	57	17	4	58.2	6.7	120
July 21-31.....	3,018	4.7	.22	4.0	1.5	5.4	1.2	22	1.8	7.5	.0	.0	62	16	0	55.3	7.1	100
Aug. 1-10.....	2,539	11	.17	5.0	1.9	5.9	.2	22	5.2	9.8	.0	.2	74	20	2	74.7	6.8	120
Aug. 11-20.....	2,344	5.3	.17	5.6	2.8	7.7	.3	26	6.5	10	.0	.2	67	23	2	75.6	6.9	90
Aug. 21-31.....	2,166	11	.19	5.0	1.9	6.6	.3	22	6.0	9.8	.0	.1	73	20	2	63.5	6.9	100
Sept. 1-10.....	2,218	15	.04	5.4	2.4	8.0	.6	14	6.9	10	.0	.2	58	23	6	82.5	7.1	100
Sept. 11-20.....	2,140	3.7	.04	4.0	1.9	5.1	.6	14	5.9	10	.1	.2	58	18	6	64.6	7.1	100
Sept. 21-30.....	2,606	4.1	.09	4.2	1.8	5.2	.6	15	4.5	10	.0	.2	62	18	6	65.6	6.4	100
Average.....	4,449	4.8	0.17	4.4	2.7	5.6	0.3	17	4.3	8.8	0.1	0.2	69	18	5	66.6	6.6	110



LAKE OKEECHOBEE AND THE EVERGLADES--Continued  
 KISSIMMEE RIVER NEAR OKEECHOBEE, FLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80	72	67	64	66	64	78	80	80	87	85	80
2	80	72	67	66	67	63	79	81	82	86	85	83
3	78	73	67	68	66	63	77	80	80	87	85	83
4	79	73	69	68	65	64	77	80	80	87	87	84
5	80	73	70	67	64	63	78	81	80	85	83	84
6	82	74	72	66	63	60	78	81	83	84	87	84
7	82	68	71	63	63	60	77	80	82	84	85	84
8	79	72	71	63	61	58	78	82	85	82	85	83
9	79	71	72	64	61	60	76	83	85	82	85	84
10	78	68	72	65	63	62	76	85	86	83	85	84
11	78	68	72	63	64	64	78	82	86	82	83	84
12	88	67	73	60	65	66	76	82	87	82	84	83
13	78	68	74	60	65	70	79	80	85	83	83	83
14	78	71	69	62	65	72	79	81	84	85	84	82
15	78	70	63	63	65	62	79	81	83	80	84	83
16	78	70	63	65	65	66	80	81	83	82	85	83
17	77	71	61	62	69	64	78	82	84	84	85	83
18	78	71	59	65	70	65	74	81	80	85	86	83
19	76	71	58	67	70	66	75	82	79	85	86	83
20	74	72	59	69	71	67	75	79	82	84	87	83
21	77	73	63	70	68	69	75	81	83	85	85	83
22	76	74	65	71	68	70	75	80	81	86	84	82
23	72	75	65	67	68	71	75	79	81	86	85	82
24	75	75	65	66	61	72	76	78	81	85	85	81
25	76	73	67	68	66	73	77	78	85	84	85	82
26	77	69	64	68	66	75	77	76	82	82	85	82
27	77	67	67	69	66	73	78	77	87	82	85	82
28	76	68	--	68	67	76	80	79	88	82	83	83
29	73	66	67	67	--	77	82	79	87	83	82	83
30	72	67	67	67	--	77	82	79	87	83	82	83
31	--	--	65	67	--	78	--	79	--	83	82	--
Average	78	71	67	66	66	67	77	80	83	84	85	83

LAKE OKEECHOBEE AND THE EVERGLADES--Continued  
WEST PALM BEACH CANAL AT CANAL POINT, FLA.

LOCATION.--At downstream side of bridge on U. S. Highway 441, 240 feet downstream from outlet of Lake Okeechobee in Canal Point, Palm Beach County.  
RECORDS AVAILABLE.--October 1953 to September 1954.

REMARKS.--Values reported for dissolved solids are residue on evaporation at 180°C. Records of discharge for water year October 1953 to September 1954 given in WSP 1334.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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/cm at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 9, 1953	a-308	33	0.33	75	43	289	7.5	464	120	308	0.6	5.5	1,200	364	0	1,800	7.6	240
Nov. 24	b-0	33	.08	97	34	55	2.4	368	82	.45	.3	.3	644	382	81	903	7.7	140
Jan. 5, 1954	c-360	6.8	.33	31	6.2	18	.5	106	18	24	.1	.7	192	103	16	290	7.7	110
Feb. 9	203	8.1	.60	32	6.8	17	.6	110	17	24	.2	.8	212	108	18	292	8.0	130
Mar. 4	284	9.7	.33	35	6.6	18	.9	116	22	26	.1	1.3	229	114	19	319	7.8	80
Apr. 22	203	7.8	.33	31	6.8	18	.8	105	20	24	.2	.0	197	105	19	280	8.0	75
May 14	389	7.8	.28	30	7.3	16	.6	107	18	23	.0	1.0	195	105	17	283	7.9	90
June 23	-865	37	.30	124	51	92	4.8	404	153	124	.6	1.2	1,050	519	188	1,320	7.2	460
Aug. 5	-96	12	.25	39	12	49	1.3	154	20	67	.2	2.3	355	147	21	488	7.4	460
Aug. 19	157	22	.06	31	8.7	20	.8	126	22	26	.1	.7	213	113	10	299	8.0	90

a Discharge obtained by averaging discharges for intervals of a day.

b No gage-height record; discharge computed on basis of gage heights estimated by comparison with adjacent gages.

c No point-velocity record; discharge estimated on basis of control operation and other factors.

LAKE OKEECHOBEE AND THE EVERGLADES--Continued  
WEST PALM BEACH CANAL AT RANGELINE ROAD NEAR LOXAHATCHEE, FLA.

LOCATION --At downstream side of State Highway 7 Bridge, 5.3 miles east of Loxahatchee, Palm Beach County.

RECORDS AVAILABLE.--Chemical analyses, October 1953 to September 1954.

REMARKS.--Values reported for dissolved solids are residue on evaporation at 180°C. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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			
Oct. 29, 1953		14	--	48	14	54	1.9	180	37	74	0.3	1.7	404	178	30	550	7.6	220
Dec. 30		19	0.60	81	24	104	2.4	338	35	138	.4	3.7	704	300	24	1,020	7.7	300
Feb. 3, 1954		24	.60	60	16	74	2.0	244	32	100	.2	1.5	504	216	16	754	7.9	220
Mar. 11		20	.18	76	18	87	2.7	276	52	120	.3	2.4	659	264	38	915	7.7	160
Apr. 15		22	.12	80	23	96	3.0	308	58	131	.2	4.4	653	294	41	975	7.8	90
May 20		9.9	.10	53	3.8	22	1.0	167	14	32	.1	.7	262	148	11	391	7.7	90
June 22		4.3	.18	19	3.1	7.6	.9	61	6.0	12	.1	.6	106	60	10	160	7.0	100
July 20		18	.33	32	8.5	28	1.9	123	10	40	.1	.2	253	115	14	340	7.4	240
Aug. 19		11	.14	42	11	68	2.0	169	21	90	.1	3.0	409	150	12	498	7.5	360

LAKE OKEECHOBEE AND THE EVERGLADES--Continued  
 HILLSBORO CANAL AT HURRICANE GATE 4, NEAR BELLE GLADE, FLA.

LOCATION.--At outlet of Lake Okeechobee in hurricane gate structure No. 4, 3½ miles northwest of Belle Glade, Palm Beach County.  
 RECORDS AVAILABLE.--Chemical analyses: October 1953 to October 1954.  
 REMARKS.--Values reported for dissolved solids are residue on evaporation at 180°C. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1953 to October 1954

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			
Oct. 9, 1953		18	0.07	71	22	52	1.6	230	92	64	0.3	1.0	490	268	79	716	7.9	100
Nov. 24		18	--	83	28	63	2.2	293	97	82	.3	1.8	573	322	82	851	7.9	130
Jan. 5, 1954		7.9	.16	38	8.8	21	.7	131	23	30	.1	.6	232	131	24	358	7.7	90
Feb. 9		11	.19	45	9.4	29	.8	164	22	36	.2	.7	280	151	17	432	7.7	90
Mar. 4		12	.19	36	7.7	20	.9	124	24	28	.3	.7	238	121	20	345	7.9	100
Apr. 23		7.9	.12	37	8.7	22	.9	127	28	31	.1	1.1	227	128	24	357	7.9	65
May 13		6.9	.22	31	7.5	18	.7	109	20	26	.1	1.0	202	108	19	299	7.9	75
June 23		37	.28	122	55	114	4.6	466	167	150	.7	9.7	1,070	530	148	1,450	7.4	260
Aug. 5		19	.02	65	25	63	2.1	243	73	82	.4	1.8	527	265	66	751	7.8	200
Aug. 26		20	.01	63	21	48	1.8	230	61	62	.1	1.4	415	244	55	655	7.9	200
Oct. 8		9.8	.08	64	18	36	1.1	201	58	53	.1	1.1	404	234	69	597	7.8	180

LAKE OKEECHOBEE AND THE EVERGLADES--Continued  
 HILLSBORO CANAL AT RANGELINE ROAD NEAR DEERFIELD BEACH, FLA.

LOCATION.--At U. S. Highway 441 Bridge, 6.3 miles northwest of Deerfield Beach, Palm Beach-Broward County Line.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.

REMARKS.--Values reported for dissolved solids are residue on evaporation at 180°C. Records of discharge for Hillsboro Canal near Deerfield Beach for water year October 1953 to September 1954 given in WSP 1334.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collector	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. 12, 1953		2.5	0.21	24	1.5	9.2	0.5	72	9.0	14	0.1	0.3	140	66	7	172	7.3	140
Dec. 9		20	0.17	82	25	87	2.8	329	61	113	0.3	1.9	634	308	38	924	7.8	220
Dec. 30		16	0.12	94	15	88	1.5	314	34	124	0.3	1.8	598	298	38	937	7.8	150
Feb. 3, 1954		18	0.13	89	15	131	1.4	289	54	193	0.3	1.8	714	284	38	1,180	8.0	110
Mar. 11		11	0.04	96	7.1	72	0.7	297	34	108	0.1	1.0	525	269	26	867	8.1	80
Apr. 15		10	0.16	63	8.2	46	1.3	204	20	70	0.1	1.0	360	190	23	581	7.9	160
May 20		9.2	0.13	88	7.2	60	1.3	261	24	101	0.1	1.3	489	249	35	764	7.8	100
June 22		5.6	0.26	32	2.5	9.2	0.6	93	9.0	15	0.1	0.3	156	90	14	227	7.3	140
July 20		22	0.26	29	7.5	26	0.9	123	9.5	31	0.0	0.2	236	103	2	311	7.7	190
Aug. 26		19	0.07	60	18	72	2.2	257	26	97	0.3	2.4	496	234	13	738	7.9	220

## LAKE OKEECHOBEE AND THE EVERGLADES--Continued

## NORTH NEW RIVER CANAL AT SOUTH BAY, FLA.

LOCATION.--At bridge on State Highway 80, 2.4 miles south of Lake Okeechobee, in South Bay, Palm Beach County.  
 RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.

REMARKS.--Values reported for dissolved solids are residue on evaporation at 180°C. Records of discharge for water year October 1953 to September 1954 are given in WSP 1334.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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	
													Calcium, magnesium	Non-carbonate				
Oct. 9, 1953	514	33	0.33	119	46	106	4.3	420	197	114	0.6	3.3	943	486	142	1,260	7.4	280
Nov. 24	-82	21	.17	123	40	77	2.5	416	155	100	.3	1.6	822	469	128	1,140	7.7	200
Jan. 5, 1954	382	12	.11	53	15	48	1.6	186	46	61	.2	1.0	374	194	41	591	7.7	110
Feb. 9	491	9.3	.22	37	11	27	.8	136	24	38	.2	.7	258	138	26	392	7.8	110
Mar. 4	556	9.8	.15	40	8.6	26	1.0	138	26	37	.1	.6	249	135	22	398	7.7	80
Apr. 22	582	13	.14	54	17	47	1.6	191	60	62	.1	1.7	386	204	47	612	7.9	80
May 13	522	10	.19	42	12	30	1.1	152	34	42	.1	1.8	293	154	29	511	7.8	80
June 23	-210	30	.25	141	54	72	3.2	410	234	96	.6	3.7	1,020	574	238	1,330	7.5	200
Aug. 5	164	23	.05	74	29	80	2.7	297	90	100	.4	2.2	631	304	60	893	7.6	260
Aug. 26	139	32	.02	139	55	71	3.0	472	187	95	.8	1.4	972	573	186	1,260	7.5	220

LAKE OKEECHOBEE AND THE EVERGLADES--Continued  
NORTH NEW RIVER CANAL AT HOLLOWAY LATERAL NEAR FORT LAUDERDALE, FLA.

LOCATION --Approximately 10 miles upstream from Fort Lauderdale, and 4 miles upstream from gaging station near Fort Lauderdale, Broward County.  
RECORDS AVAILABLE.--Chemical analyses: July 1950 to June 1951, October 1953 to September 1954.  
REMARKS --Values reported for dissolved solids are residue on evaporation at 180°C. Records of discharge for gaging station near Fort Lauderdale for water year October 1953 to September 1954 given in WSP 1334.

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. 5, 1953		9.9	0.33	62	12	25	0.8	210	33	33	0.3	1.9	355	204	32	471	7.6	240
Nov. 23		12	.02	99	3.9	17	.7	294	28	23	.2	.8	376	263	22	553	7.9	110
Dec. 28		22	.20	107	4.4	15	.5	297	36	23	.6	1.0	412	285	42	588	7.7	80
Feb. 8, 1954		15	.21	52	8.3	25	.6	182	14	33	.2	.7	292	164	15	425	7.8	110
Mar. 15		12	.23	61	12	35	1.1	214	33	50	.1	1.2	363	202	26	556	7.7	100
Apr. 12		9.5	.52	62	11	32	1.0	203	32	48	.1	1.8	345	200	34	526	8.0	100
May 17		8.8	.16	60	12	30	1.3	199	34	44	.1	1.7	347	199	36	518	7.7	100
June 21		9.5	.19	55	8.0	20	1.0	184	17	31	.2	.8	291	170	19	425	7.5	160
July 26		28	.01	73	9.0	21	.8	260	11	23	.2	.8	341	219	6	475	8.0	160
Aug. 23		25	.23	67	15	36	1.2	256	29	48	.4	.5	428	228	18	575	7.8	220

Chemical analyses, in parts per million, water year October 1953 to September 1954

LAKE OKEECHOBEE AND THE EVERGLADES--Continued  
SOUTH NEW RIVER CANAL AT DAVIE, FLA.

LOCATION.--At lock, 1½ miles west of Davie, Broward County.  
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.  
REMARKS.--Values reported for dissolved solids are residue on evaporation at 180°C. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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			
Oct. 5, 1953		8.1	0.22	66	6.2	13	1.6	190	32	19	0.2	3.7	310	190	34	408	7.4	150
Nov. 23		11	.06	92	7.4	17	.8	291	25	25	.2	1.3	383	260	22	530	7.8	120
Dec. 28		7.2	.06	92	6.9	17	.5	288	13	24	.1	1.5	372	258	22	544	7.6	130
Feb. 8, 1954		32	.07	86	8.1	24	.5	299	11	28	.4	.9	396	248	3	559	7.9	90
Mar. 15		10	.08	87	7.8	22	.7	285	19	33	.1	1.6	374	249	16	572	7.7	100
Apr. 12		7.6	.22	83	7.5	16	.8	260	22	24	.0	2.3	345	238	25	512	7.6	100
May 17		5.2	.16	48	4.7	9.0	1.9	136	21	14	.1	3.4	229	139	28	312	7.6	140
June 21		11	.20	72	7.9	11	1.1	218	24	17	.2	1.3	333	212	34	443	7.6	140
July 26		9.4	.00	82	8.4	15	1.0	253	21	22	.2	2.0	353	239	32	495	7.3	160
Aug. 23		19	.03	89	11	23	.9	300	17	31	.4	1.8	402	267	21	574	7.8	160



LAKE OKEECHOBEE AND THE EVERGLADES--Continued  
MIAMI CANAL AT LAKE HARBOR, FLA.

LOCATION.--At bridge on U. S. Highway 27, in Lake Harbor, one quarter of a mile south of hurricane gate structure 3, Lake Okeechobee, Palm Beach County.  
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.

REMARKS.--Values reported for dissolved solids are residue on evaporation at 180°C. No discharge records available for this station.  
Chemical analyses, in parts per million, water year, October 1953 to September 1954

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. 9, 1953		19	0.23	98	32	66	2.2	302	146	79	0.6	16	710	384	137	942	7.5	220
Nov. 24, .....		35	--	109	36	104	2.7	432	112	122	.6	3.3	828	428	74	1,190	7.9	--
Jan. 5, 1954		30	.01	84	10	82	1.8	346	172	96	.7	2.1	644	333	48	972	7.8	130
Feb. 9, .....		9.0	.20	40	11	31	.8	347	26	40	.1	1.8	276	143	25	429	7.9	110
Mar. 4, .....		14	.11	62	16	51	1.6	225	72	67	.3	2.0	431	228	44	681	7.7	100
Apr. 22, .....		11	.10	57	16	34	1.7	193	51	48	.2	4	354	206	50	551	7.9	80
May 15, .....		10	.10	45	16	37	1.1	183	36	52	.1	1.4	316	166	32	500	7.9	65
June 25, .....		35	.2	145	59	107	3.2	464	210	138	.7	4.6	1,150	322	206	1,510	7.5	200
Aug. 5, .....		1	.25	66	16	56	.9	232	33	38	.2	2.1	407	236	92	543	7.4	290
Aug. 26, .....		7.1	.39	27	7.7	7.5	.3	95	10	9.0	.0	.6	166	99	21	187	7.5	360

## LAKE OKEECHOBEE AND THE EVERGLADES--Continued

## MIAMI CANAL AT WATER PLANT, HIALEAH, FLA.

LOCATION.--At 54th Street Bridge, one half a mile downstream from water plant in Hialeah, Dade County.

RECORDS AVAILABLE.--Chemical analyses: March 1941 to February 1942, October 1953 to September 1954.

REMARKS.--Values reported for dissolved solids are residue on evaporation at 180°C. Records of discharge for water year October 1953 to September 1954 given in WSP 1334.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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			
Oct. 5, 1953	1,480	7.4	0.07	57	4.3	9.0	0.4	188	7.0	12	0.1	0.7	230	160	6	334	7.6	90
Nov. 27, Dec. 7	a, 1,430	7.3	.64	79	7.3	14	.6	269	11	17	.2	.5	311	227	6	467	7.8	140
Jan. 5, 1954	1,140	5.4	.06	80	6.0	13	.2	264	2.0	18	.2	.8	308	224	8	461	7.7	90
Feb. 3	895	13	.17	83	5.6	16	.3	280	1.0	21	.1	.8	332	230	1	480	7.8	90
Mar. 11	793	4.9	.03	52	3.1	11	.4	168	7.5	18	.0	.5	211	142	5	323	7.7	50
Apr. 11	793	6.0	.13	79	7.4	16	.6	268	6.0	24	.1	1.0	317	228	8	481	7.8	90
May 21	722	6.0	.21	79	6.9	14	.5	268	6.0	20	.0	1.0	311	226	6	459	7.9	80
June 16	1,000	11	.09	73	8.7	12	.5	258	1.5	15	.2	.9	308	218	6	457	7.8	80
Aug. 6	844	6.8	.01	70	7.9	12	.5	238	6.2	16	.2	1.2	282	207	12	421	7.7	160
Aug. 31	742	5.3	.08	62	9.3	23	.8	247	14	18	.2	.9	363	193	0	434	8.1	120

a Discharge obtained by averaging the mean daily discharge for the two dates.

LAKE OKEECHOBEE AND THE EVERGLADES--Continued  
TAMIAMI CANAL AT BRIDGE 45, 27 MILES WEST OF MIAMI, FLA.

LOCATION.--At bridge on U. S. Highway 41, 27 miles west of Miami, Dade County.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.

REMARKS.--Values reported for dissolved solids are residue on evaporation at 180°C. Miscellaneous discharge records are available in district office of the Surface Water Branch, Ocala, Fla.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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			
Oct. 6, 1953	--	5.7	0.13	41	2.4	4.9	0.2	132	7.5	7.0	0.1	0.1	160	112	4	230	7.4	70
Nov. 25	--	8.4	.28	36	2.7	7.9	.4	119	6.0	9.0	.2	.1	165	101	3	224	7.7	90
Dec. 28	139	8.6	.17	41	3.8	8.1	.1	139	.5	10	.0	.3	180	118	4	256	7.6	120
Feb. 11, 1954	--	3.0	.18	50	3.5	9.0	.1	165	.5	14	.1	.1	206	139	4	301	7.7	75
Mar. 12	33.8	11	.09	83	5.3	16	.5	278	7.0	22	.1	.8	326	229	1	326	7.9	70
Apr. 20	4	5.0	.59	63	4.0	14	.4	201	5.0	23	.1	.7	263	174	9	366	7.6	75
May 18	0	6.9	.19	51	3.3	10	.4	164	3.5	16	.1	.7	209	141	7	313	7.8	55
June 23	--	13	.02	38	4.2	6.3	.2	132	1.0	8.0	.1	.4	168	112	4	240	7.4	70
July 29	67	17	.52	43	3.8	6.0	.4	144	4.2	8.0	.2	.3	186	123	5	258	7.5	120
Aug. 18	78	35	.51	46	6.4	11	.4	169	4.8	9.8	.2	.4	243	141	3	295	7.7	120

SUWANNEE RIVER BASIN  
ALAPAMA RIVER NEAR ALAPAMA, GA.

LOCATION.--Temperature recorder at gaging station near left bank on downstream side of bridge on State Highway 50, 2 miles east of Alapaha, Berrien County and 6 miles upstream from Willacoochee River.  
DRAINAGE AREA.--644 square miles.  
RECORDS AVAILABLE.--Water temperatures: March 1933 to September 1954. Maximum, 91° F June 29; minimum, 42° F Dec. 19, 20, 21.  
EXTREMES, 1933-54.--Water temperatures: Maximum, 91° F June 29; minimum, 42° F Dec. 19, 20, 21. No flow in stream July 23, 24, Sept. 1-30, 1954.  
REMARKS.--Records of discharge for water year October 1953 to September 1954.

Temperature (°F) of water, water year October 1953 to September 1954  
Recorder with temperature attachment, continuous ethyl alcohol-actuated thermograph.7

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1.....	73	72	59	56	52	51	49	48	53	51	50	55	72	72	78	75	82	77	87	77	84	74	85	73
2.....	73	73	59	56	52	51	48	47	51	50	55	53	72	68	79	76	82	77	87	78	83	75	82	70
3.....	73	73	60	58	54	53	49	47	52	50	55	53	68	78	76	82	77	88	77	84	74	82	69	
4.....	73	73	60	60	55	52	50	49	52	51	55	52	69	66	78	73	79	76	87	78	86	74	85	70
5.....	73	73	60	60	58	55	50	50	51	50	52	51	69	67	73	70	78	70	85	77	86	77	86	73
6.....	73	72	60	59	60	58	50	50	50	49	50	48	70	68	72	69	79	69	86	77	87	78	84	74
7.....	72	73	59	56	54	53	48	48	48	48	48	47	72	68	72	68	73	72	87	80	77	85	71	
8.....	71	69	55	54	57	54	48	47	50	48	50	48	72	70	72	70	83	72	85	77	80	76	86	74
9.....	69	69	55	54	57	54	48	47	50	48	52	48	73	70	72	68	86	76	79	77	85	74	86	72
10.....	69	69	55	54	57	54	49	48	51	49	55	52	72	70	72	69	87	78	84	75	85	78	87	70
11.....	68	66	55	53	58	55	50	49	54	50	58	55	70	68	71	68	85	76	84	76	84	72	86	73
12.....	66	65	53	51	57	55	50	47	55	54	62	58	71	68	74	68	85	77	83	75	86	72	85	70
13.....	66	65	51	50	56	54	47	45	54	52	65	62	73	70	72	68	85	77	84	75	87	75	82	73
14.....	67	66	51	50	56	54	45	45	54	52	68	65	72	70	71	69	85	78	85	74	86	74	78	72
15.....	67	66	52	50	57	53	47	45	56	53	67	62	73	70	71	68	87	78	85	76	85	74	78	73
16.....	67	67	53	52	57	53	51	47	56	55	62	58	73	72	71	66	87	78	83	76	87	74	79	73
17.....	67	67	54	52	58	54	51	48	57	56	63	58	72	68	72	68	87	80	83	77	89	78	80	73
18.....	67	67	54	54	58	54	48	48	58	57	65	59	68	74	69	84	79	85	77	86	75	83	74	74
19.....	66	67	54	54	58	54	48	48	58	57	65	59	68	74	71	80	77	85	75	88	76	84	73	73
20.....	66	67	57	57	57	54	48	48	52	52	59	56	70	66	74	72	82	76	87	77	84	75	84	73
21.....	66	67	57	57	57	54	48	48	52	52	59	56	70	66	74	72	82	76	87	77	84	75	84	73
22.....	67	66	60	57	44	42	56	54	60	56	65	65	70	66	74	68	84	76	86	76	86	83	74	74
23.....	67	66	60	57	44	42	56	54	60	56	65	65	70	66	74	68	84	76	86	76	86	83	74	74
24.....	67	65	62	60	48	46	57	54	57	55	64	61	70	69	72	67	85	79	85	77	79	73	74	71
25.....	67	65	62	58	48	48	54	51	56	55	66	63	78	68	72	67	82	78	86	77	81	74	78	65
26.....	66	64	59	58	48	47	51	51	55	53	69	66	72	69	73	67	85	79	82	77	83	75	78	71
27.....	66	63	58	54	47	46	54	51	58	54	68	68	74	70	72	69	88	81	77	75	84	75	79	72
28.....	64	63	54	51	46	43	54	51	58	56	68	68	74	72	74	70	90	83	76	74	87	75	80	72
29.....	64	62	51	49	46	43	55	54	59	57	68	68	74	72	74	72	90	84	76	74	87	75	80	72
30.....	62	59	51	49	46	46	54	52	57	57	67	66	77	74	77	73	91	83	76	73	85	74	82	72
31.....	63	59	52	50	46	46	52	52	57	56	69	69	74	74	80	74	81	83	82	73	85	74	82	72
Average.....	68	67	56	55	52	50	51	50	55	53	61	58	72	69	74	70	84	77	84	76	85	75	82	72

SUWANNEE RIVER BASIN--Continued  
SUWANNEE RIVER AT BRANFORD, FLA.

LOCATION.--At gaging station, on bridge on U. S. Highways 27 and 129 at Branford, Suwannee County, 10 1/2 miles upstream from Santa Fe River. DRAINAGE AREA.--7,090 square miles, approximately. RECORDS AVAILABLE.--Chemical analyses: January 1954 to September 1954.

Water temperatures: January 1954 to September 1954.

EXTREMES, January 1954 to September 1954.--Dissolved solids: Maximum, 224 ppm Aug. 11-20; minimum, 88 ppm Jan. 8-20.

Hardness: Maximum, 168 ppm Sept. 1-10; minimum, 37 ppm Jan. 8-20.

Specific conductance: Maximum daily, 357 micromhos Aug. 2; minimum daily, 54.2 micromhos Jan. 10.

Water temperatures: Maximum 84°F July 18, 19, Aug. 4-6, 14, 16-19, 27; minimum, 52°F Jan. 12.

REMARKS.--Values reported for dissolved solids are residue on evaporation at 180°C. Records of specific conductance of daily samples available in district office, Ocala, Fla. Records of discharge for water year October 1953 to September 1954 are given in WSP 1334.

Chemical analyses, in parts per million, January to September 1954

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			
Jan. 8-20, 1954.....	14,400	9.6	0.24	11	2.4	3.8	0.3	38	4.2	6.0	0.1	0.2	88	37	6	92.6	7.0	130
Jan. 21-31.....	11,500	14	.18	24	4.3	4.3	.3	85	6.2	6.0	.1	.3	125	77	8	171	7.8	120
Feb. 1-10.....	8,820	7.7	.19	30	4.8	3.1	.2	102	7.8	5.5	.1	.4	131	95	11	201	7.5	110
Feb. 11-20.....	7,060	9.1	.17	35	5.4	3.3	.2	116	9.5	5.8	.2	.5	142	110	14	230	7.7	100
Feb. 21-28.....	5,990	10	.12	37	6.7	3.5	.3	128	11	6.0	.2	.6	155	120	15	254	7.8	100
Mar. 1-10.....	5,740	7.4	.16	33	6.4	4.9	.3	118	11	6.8	.1	.3	154	109	12	236	7.9	100
Mar. 11-17, 19, 20.....	5,150	17	.09	35	7.5	5.4	.6	130	15	8.0	.2	1.0	166	118	12	261	7.9	45
Mar. 24, 26-31.....	4,850	8.2	.13	34	6.8	3.9	.5	123	12	7.8	.1	1.1	152	113	12	245	7.6	50
Apr. 1-10.....	4,360	8.5	.10	37	6.7	3.4	.4	131	12	6.0	.1	1.1	157	120	12	243	7.7	45
Apr. 11-17, 19, 20.....	4,020	7.7	.12	36	7.5	3.6	.4	130	14	6.0	.1	1.1	155	121	14	243	7.7	50
Apr. 21-30.....	3,530	11	.06	43	8.2	3.7	.5	151	16	6.5	.2	.9	179	141	17	277	7.7	30
May 1-10.....	3,300	8.2	.06	42	8.7	3.6	.5	150	16	6.0	.1	1.0	175	141	18	264	7.8	40
May 11-20.....	2,990	11	.02	45	9.4	3.9	.4	163	17	6.2	.2	.6	191	151	17	308	7.8	25
May 21-31.....	2,770	9.2	.03	46	10	3.8	.5	167	21	5.2	.2	.9	192	136	19	317	7.8	10
June 1-10.....	2,620	10	.02	46	11	3.8	.5	172	21	5.5	.2	1.0	196	160	19	319	7.8	7
June 11-20.....	2,540	9.5	.01	45	10	3.6	.5	174	21	4.5	.2	.5	195	161	18	321	7.8	6
June 21-29.....	2,430	12	.02	47	11	4.0	.5	173	21	5.2	.2	.5	198	162	21	321	7.9	7
July 1-10.....	2,300	9.9	.01	48	11	3.8	.5	176	21	5.0	.2	.7	199	165	21	326	7.9	10
July 11-20.....	2,340	10	.03	48	11	4.2	.5	175	21	4.6	.2	.6	197	165	22	324	8.0	10
July 21-31.....	2,280	9.6	.02	48	11	4.0	.3	178	22	4.5	.2	.7	203	165	22	328	8.0	10
Aug. 1-10.....	2,180	20	.02	48	12	6.3	.3	184	23	4.8	.1	.6	216	165	13	338	8.2	17
Aug. 11-20.....	2,160	12	.06	48	11	5.0	.4	183	22	5.1	.1	.5	223	165	15	335	8.2	11
Aug. 21-31.....	2,050	13	.03	48	11	4.7	.4	183	21	5.2	.1	.5	218	165	17	332	8.2	9
Sept. 1-10.....	2,000	14	.00	49	11	4.4	.4	183	21	4.5	.2	.6	197	168	18	333	8.0	6
Sept. 11-20.....	2,020	8	.00	48	11	3.6	.4	181	21	4.5	.1	.5	180	165	17	333	8.0	6
Sept. 21-30.....	2,010	5.8	.00	48	11	3.9	.4	181	22	4.5	.1	.5	185	165	17	325	8.0	10

## SUWANNEE RIVER BASIN--Continued

## SUWANNEE RIVER AT BRANFORD, FLA.--Continued

Temperature (°F) of water, January 1954 to September 1954

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

ESCAMBIA RIVER BASIN

PINE BARREN CREEK NEAR BARTH, FLA.

LOCATION --At gaging station, 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.

DRAINAGE AREA --76.4 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1952 to September 1954.

Water temperatures: March 1953 to September 1954.

EXTREMES, 1953-54 --Water temperatures: Maximum, 78°F Aug. 6, 7, 9, 10; minimum, 48°F Dec. 19, 26, 27, Jan. 8, 13, 14.

REMARKS --Values reported for dissolved solids are residue on evaporation at 180°C. Records of discharge for water year October 1953 to September 1954 given in WSP 1334.

Chemical analyses in parts per million, water year October 1953 to September 1954

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. 22, 1953	73	7.1	0.13	0.4	0.4	1.6	0.2	4	0.5	3.2	0.1	0.4	22	3	0	15.5	5.9	8
Dec. 5	1,210	3.1	.29	.4	.5	1.5	.6	1	2.5	3.0	.1	.2	38	3	2	18.7	5.0	90
Jan. 13, 1954	127	6.1	.33	.6	.9	1.9	.3	4	2.2	3.8	.1	.6	19	5	2	16.6	6.1	24
Feb. 25	136	6.1	.29	.4	.3	2.0	.3	4	.8	3.0	.0	.6	28	2	0	17.1	5.6	60
Apr. 9	99	5.4	.30	.4	.3	2.0	.3	4	.8	3.0	.0	.2	18	3	0	16.3	6.0	18
May 20	103	5.0	.25	.4	.6	1.6	.3	4	1.2	3.0	.1	.3	28	3	0	18.7	6.0	10
July 9	103	6.1	.33	.4	.4	1.9	.4	4	2.2	3.0	.1	.3	27	3	0	17.0	5.7	23
Aug. 11	64	7.1	.15	.6	.4	1.7	.2	4	.5	3.0	.0	.4	18	3	0	18.0	6.0	10
Sept. 21	64	7.2	.23	.4	.6	2.1	.2	5	.8	5.5	.1	.0	20	3	0	19.2	6.2	30

ESCAMBIA RIVER BASIN--Continued  
 PINE BARREN CREEK NEAR BARTH, FLA.--Continued

Temperature (°F) of water, March to September 1933  
 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	63	69	68	75	73	75	75	74	73	72	72
2.....													66	63	69	69	76	74	76	74	74	74	73	72
3.....													66	63	71	69	75	74	76	75	75	74	73	72
4.....													64	62	71	70	74	73	76	74	75	74	73	72
5.....													64	63	70	69	74	74	76	75	76	74	73	72
6.....													64	64	69	69	74	73	77	76	76	75	72	71
7.....													66	64	69	67	74	73	76	76	76	75	71	69
8.....													67	65	67	67	75	74	76	75	76	74	70	69
9.....													66	66	68	67	76	74	75	75	75	74	70	69
10.....													69	66	68	67	76	74	75	74	75	74	70	69
11.....													69	67	69	68	76	75	75	74	74	73	71	69
12.....													68	67	68	68	76	74	75	74	74	74	73	71
13.....													65	65	68	68	76	75	74	74	74	73	72	70
14.....													65	61	69	68	76	75	74	73	74	73	71	70
15.....													62	61	69	69	75	74	73	73	73	72	71	70
16.....													63	62	69	68	76	74	73	73	73	73	72	70
17.....													62	60	70	69	76	75	73	73	73	73	72	71
18.....													63	61	70	70	77	75	74	74	74	73	72	71
19.....													64	62	71	70	77	76	74	73	72	72	72	71
20.....													61	59	71	71	77	76	74	74	73	72	72	72
21.....													59	57	72	71	77	76	74	74	74	73	72	71
22.....													60	58	73	72	76	76	74	73	72	72	71	70
23.....													63	60	73	72	76	75	74	74	72	72	70	69
24.....													66	63	74	73	78	75	75	74	72	72	70	70
25.....													66	66	74	73	76	76	75	74	72	72	70	70
26.....													67	65	74	73	74	74	75	74	72	72	70	70
27.....													65	64	75	73	74	74	75	74	72	72	70	70
28.....													62	59	64	62	74	74	75	74	72	72	70	70
29.....													61	60	66	64	74	74	75	74	72	72	70	70
30.....													61	60	68	66	74	73	75	74	72	72	70	70
31.....													63	61	--	74	72	--	--	75	74	73	--	--
Average.....													65	63	71	70	75	74	75	74	74	73	71	70



ESCAMBIA RIVER BASIN--Continued  
 PINE BARREN CREEK NEAR BARTH, FLA.--Continued  
 Temperature (°F) of water, water year October 1953 to September 1954  
 (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.....	71	70	63	60	58	53	50	56	54	59	56	70	67	72	70	72	71	74	73	74	76	74	76	74
2.....	71	71	63	62	58	57	51	50	54	54	67	65	73	71	71	72	71	74	72	76	75	74	74	72
3.....	71	71	63	63	61	58	54	50	55	54	56	55	66	65	72	71	72	71	74	72	76	74	74	72
4.....	71	71	63	63	61	54	53	55	54	56	58	67	66	71	67	71	70	74	72	76	74	74	74	72
5.....	71	70	63	63	63	62	55	54	53	55	54	68	67	66	64	70	68	74	72	76	76	76	73	73
6.....	70	69	63	62	62	61	54	51	54	53	55	52	69	68	65	63	69	67	74	72	78	76	74	74
7.....	69	68	62	60	61	57	52	50	54	53	53	51	70	69	65	63	70	68	74	72	78	76	74	74
8.....	67	66	61	61	57	55	51	48	54	52	55	53	70	70	67	65	71	69	73	72	77	76	74	74
9.....	68	66	61	60	59	56	52	50	52	51	56	55	70	70	66	64	73	70	72	72	77	76	74	74
10.....	68	67	60	59	59	57	54	51	55	52	58	56	71	69	67	65	73	71	74	72	78	76	74	74
11.....	67	66	59	58	57	56	54	51	58	55	61	59	70	69	67	66	72	72	73	73	76	75	74	74
12.....	66	66	59	58	57	56	51	49	58	56	64	61	70	69	67	66	72	71	74	72	76	74	74	74
13.....	67	66	58	58	56	56	49	48	56	54	67	65	70	69	68	66	72	70	74	73	76	74	74	74
14.....	66	67	58	58	56	55	50	48	57	54	67	63	70	69	68	68	72	70	75	73	77	75	74	74
15.....	66	67	58	58	54	53	55	49	60	57	62	59	70	67	65	73	71	75	74	77	75	73	73	73
16.....	68	67	60	58	53	52	53	55	60	60	59	57	70	70	65	64	72	71	75	74	77	75	73	73
17.....	68	67	60	60	52	52	57	54	61	60	56	56	69	66	67	65	72	71	74	73	76	75	74	73
18.....	67	67	61	60	52	50	54	52	60	58	53	57	65	64	67	66	71	71	73	73	77	75	75	74
19.....	67	67	62	61	50	48	54	52	58	58	60	58	66	64	67	67	72	71	74	72	76	75	75	74
20.....	67	67	63	62	50	49	57	54	58	57	62	60	66	64	68	67	73	71	74	73	76	75	75	74
21.....	67	66	63	63	53	49	59	57	58	57	62	62	66	66	67	65	73	71	74	73	76	75	75	74
22.....	67	66	64	63	56	53	60	57	56	56	62	61	67	66	66	64	73	71	74	73	76	75	74	74
23.....	66	65	65	61	56	53	56	52	57	56	63	61	66	67	66	64	73	71	76	74	76	75	74	74
24.....	65	65	61	59	53	51	52	51	58	57	66	63	66	67	67	66	74	72	76	74	76	74	73	72
25.....	65	65	59	59	51	50	54	52	58	56	66	66	66	66	66	71	76	75	76	75	76	74	73	72
26.....	65	64	59	57	50	48	55	54	60	57	69	68	69	68	67	66	73	72	75	75	76	75	73	72
27.....	66	65	67	56	49	48	58	55	62	60	68	64	70	69	68	66	74	72	75	75	76	75	73	72
28.....	66	64	57	57	52	49	58	55	62	59	64	62	70	69	68	68	74	72	74	73	77	75	73	72
29.....	64	61	57	57	54	52	56	54	--	--	64	63	70	69	68	68	74	72	74	73	77	76	72	72
30.....	61	60	58	57	55	54	56	54	--	--	60	64	71	70	71	69	74	72	75	73	77	76	73	72
31.....	60	60	--	--	55	53	57	55	--	--	70	67	--	--	72	70	--	--	75	74	77	75	--	--
Average.....	67	66	61	60	58	54	55	52	57	56	61	59	69	68	66	72	71	74	73	77	75	74	74	73

## MOBILE RIVER BASIN

MOBILE RIVER NEAR MOUNT VERNON, ALA.

LOCATION.--At Mount Vernon Landing, one quarter of a mile downstream from outlet of David Lake and three quarters of a mile south of recording gage, approximately 41 miles north of Mobile, Mobile County.

DRAINAGE AREA.--43,000 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.

Water temperatures: October 1953 to September 1954.

EXTREMES, 1953-54.--Dissolved solids: Maximum, 126 ppm Nov. 11-20; minimum, 73 ppm Aug. 12-18.

Hardness: Maximum, 52 ppm Jan. 11-20; minimum, 30 ppm Feb. 1-10.

Specific conductance: Maximum, 100 F Aug. 4, 9; minimum, 34 F Dec. 16.

Water temperatures: Maximum, 222 micromhos Dec. 5; minimum daily, 85.7 micromhos Feb. 5.

REMARKS.--Values reported for dissolved solids are residue on evaporation at 180°C. Records of specific conductance of daily samples available in district office, Ocala, Fla. Records of discharge for water year October 1953 to September 1954 are given in WSP 1334.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO <sub>2</sub> )	Aluminum (Al)	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, 1953.....	21,600	6.3	0.19	0.18	12	2.6	5.1	1.5	48	2.0	6.0	0.1	0.9	82	41	1	109	7.5	12
Oct. 11-20.....	11,570	6.8	.08	.08	13	2.7	7.0	1.2	49	.5	8.5	.1	.6	84	41	1	122	7.5	15
Oct. 21-31.....	13,530	4.7	.05	.05	12	2.8	8.3	1.0	51	.5	9.0	.1	.2	76	41	0	125	7.4	4
Nov. 1-10.....	11,730	9.7	.05	.09	13	3.3	9.8	1.2	56	.5	10	.1	.2	90	46	0	137	7.7	7
Nov. 11-20.....	12,720	29	.06	.10	14	3.5	11	1.2	66	5.0	9.0	.3	.2	126	49	0	152	8.0	17
Nov. 21-30.....	15,960	6.3	.00	.07	12	3.4	11	1.2	51	5.0	14	.3	.2	94	44	2	145	7.3	9
Dec. 1-5.....	22,220	11	.--	.00	13	3.2	14	1.6	51	9.8	16	.1	.5	96	46	4	160	7.5	--
Dec. 11-20.....	99,000	9.9	.19	.06	14	1.7	5.1	1.6	44	12	5.2	.1	.8	92	42	6	119	7.2	30
Dec. 21-31.....	65,530	13	.16	.03	12	3.3	5.9	1.3	39	14	7.0	.1	.9	91	44	12	124	7.2	30
Jan. 1-10, 1954.....	50,500	17	.11	.09	14	3.3	7.7	1.4	47	15	9.0	.1	1.1	105	48	10	143	7.4	23
Jan. 11-20.....	41,760	18	.02	.18	16	2.9	9.9	1.4	52	18	9.5	.1	1.1	112	52	9	160	7.6	11
Jan. 21-31.....	114,600	16	.14	.20	15	2.9	6.0	1.6	48	16	4.5	.1	1.1	109	49	10	135	7.2	26
Feb. 1-10.....	119,100	7.4	.20	.07	9.7	1.4	3.8	1.5	29	10	3.5	.1	1.1	81	30	6	90.4	7.3	18
Feb. 11-20.....	37,860	10	.04	.26	12	2.3	5.7	1.3	38	12	7.8	.1	1.2	91	39	8	118	7.2	50
Feb. 21-28.....	62,310	21	.05	.33	14	3.1	8.4	1.2	47	12	6.1	.1	1.1	114	48	9	146	7.5	50
Mar. 1-10.....	71,410	14	.07	.27	14	2.7	6.2	1.3	42	15	8.0	.1	1.1	99	46	12	136	7.3	80
Mar. 11-20.....	48,850	10	.02	.23	13	3.5	6.5	1.2	54	12	7.2	.1	1.2	123	47	3	130	7.9	50
Mar. 21-26, 29-31.....	64,960	12	.15	.28	15	2.8	6.7	1.4	50	14	8.5	.4	1.4	116	49	8	141	7.3	25
Apr. 1-10.....	86,070	9.0	.55	.22	13	2.9	5.6	1.3	46	14	6.2	.4	1.5	106	44	7	125	7.0	15
Apr. 11-20.....	61,020	9.7	.00	.23	14	2.7	5.8	1.5	46	13	7.0	.1	1.3	102	46	8	134	7.3	15
Apr. 21-24, 26-30.....	78,520	13	.08	.28	15	2.7	5.2	1.4	51	12	8.0	.1	1.1	97	49	7	128	7.2	40
May 1, 3-10.....	47,640	20	.00	.14	15	2.9	7.6	1.5	56	13	9.0	.1	1.3	109	49	3	144	7.3	18
May 11-20.....	37,570	11	.02	.16	14	2.8	5.3	1.4	52	10	8.0	.1	1.3	90	46	4	128	7.1	23
May 21-31.....	20,600	8.0	.00	.03	13	3.4	6.3	1.3	51	10	10	.1	1.2	82	46	5	132	7.1	6

June 1, 2, 4-10, 1954	18,540	8.6	.00	.01	13	3.4	8.2	1.3	52	12	12	.1	1.0	88	46	4	143	7.3	4
June 12, 13, 15-20	17,160	5.6	.00	.02	14	3.8	9.5	1.3	54	13	13	.1	.6	94	51	6	157	7.2	5
June 21, 22, 24-30	13,110	5.6	.01	.01	13	3.8	9.2	1.3	54	12	13	.1	.7	85	48	4	147	7.2	3
July 1-8, 10	11,110	7.3	.00	.02	13	3.8	9.6	1.3	56	10	13	.1	.9	87	48	2	150	7.2	4
July 11-15, 17-18	10,850	7.2	.11	.02	14	3.4	10	1.2	55	11	13	.1	.7	89	49	4	154	7.3	4
July 21, 22, 24-28, 30, 31	10,480	13	.15	.01	14	3.9	9.5	1.2	59	9.8	11	.1	.6	92	51	3	156	7.4	5
Aug. 1, 3-10	8,167	9.8	.05	.08	12	3.8	8.3	1.2	56	7.8	9.0	.1	.5	80	46	0	139	7.2	7
Aug. 12, 14-15, 17-18	13,580	8.8	.11	.00	11	3.3	7.6	1.2	50	7.5	8.0	.1	.7	73	41	0	125	7.4	6
Aug. 23, 24, 29	10,690	14	.11	.04	12	3.9	12	1.6	60	10	13	.1	.6	94	46	0	159	7.5	7
Sept. 1, 2, 4, 8-10	8,772	14	.12	.00	12	3.4	9.1	1.3	57	8.0	8.5	.1	.4	80	44	0	137	7.4	4
Sept. 13-18	10,490	16	.06	.02	11	3.3	10	1.2	55	7.5	9.0	.2	.3	85	41	0	136	7.4	7
Sept. 21-25, 28, 30	8,220	15	.03	.02	12	3.7	13	1.3	58	8.0	12	.2	.4	96	45	0	147	7.6	7
Average	37,650	12	0.09	0.11	13.1	3.1	8.0	1.3	51	10	9.2	0.1	0.8	95	46	4	137	7.4	18

## MOBILE RIVER BASIN--Continued

MOBILE RIVER NEAR MOUNT VERNON, ALA.--Continued<sup>2</sup>

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	77	65	56	48	54	--	62	71	73	--	90	84
2	76	67	56	50	54	--	64	--	80	84	--	84
3	72	69	--	60	52	54	64	72	--	88	86	--
4	72	60	58	52	52	52	66	70	78	84	100	84
5	78	60	59	52	54	54	66	70	80	86	88	--
6	65	63	--	50	52	65	68	70	78	88	88	--
7	72	62	--	40	40	65	68	70	80	82	88	--
8	65	61	--	50	50	60	66	70	80	80	84	84
9	65	44	--	50	--	60	70	70	84	--	100	86
10	62	59	--	50	--	60	68	68	82	84	90	86
11	70	59	54	50	54	60	70	68	82	88	--	--
12	68	57	44	48	50	60	60	68	82	86	84	--
13	79	58	54	40	52	70	70	66	84	88	--	89
14	74	48	50	50	54	--	70	66	--	89	90	82
15	74	58	50	52	58	50	70	65	84	84	90	82
16	72	60	34	56	58	50	70	70	84	--	--	80
17	75	59	48	49	56	58	70	70	84	90	88	82
18	76	60	47	50	56	58	68	70	84	88	86	80
19	70	60	--	50	58	60	70	70	86	--	--	--
20	72	60	--	--	61	61	70	70	89	--	--	--
21	67	60	50	58	58	60	70	79	89	89	--	80
22	67	62	50	50	58	50	68	72	84	84	--	80
23	65	60	48	50	58	62	66	73	--	--	86	80
24	67	62	--	50	58	62	70	76	82	88	88	82
25	72	59	--	54	58	62	--	74	84	90	--	82
26	72	59	48	54	70	60	70	72	86	84	--	--
27	65	60	45	54	60	--	74	76	88	84	--	--
28	67	48	50	52	58	--	72	78	89	84	--	80
29	66	58	48	54	--	66	72	76	88	--	--	--
30	64	58	50	--	--	64	76	80	90	84	--	82
31	64	--	48	54	--	66	--	80	--	88	--	--
Average	70	59	50	51	56	60	69	72	84	86	89	83

PEARL RIVER BASIN  
BOGUE CHITTO NEAR BUSH, LA.

LOCATION --At gaging station at bridge on State Highway 7, 0.2 mile downstream from Gulf, Mobile and Ohio Railroad bridge and 1.4 miles north of Bush, St. Tammany Parish.  
DRAINAGE AREA --1,210 square miles, approximately.  
RECORDS AVAILABLE --Chemical analyses: September 1953 to October 1954.  
REMARKS --Values reported for dissolved solids are sums of determined constituents. Records of discharge for water year October 1953 to September 1954 given in WSP 1334.

Chemical analyses, in parts per million, September 1953 to October 1954

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 (sum)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25 C)	pH
														Calcium, magnesium	Non-carbonate		
Sept. 28, 1953	628	12	0.14	1.6	1.0	4.5	0.6	12	1.2	5.5		0.5	33	8	0	39.2	6.5
Nov. 3	605	13	.12	1.5	.9	4.9	1.0	12	1.2	5.8		.8	35	7	0	40.4	6.7
Dec. 1	750	13	.32	1.8	1.3	4.5	.9	11	1.2	7.2		.2	35	10	1	43.1	6.6
Dec. 30	2,550	9.6	.26	1.4	.7	4.3	.8	8	1.8	5.2		.8	29	6	0	34.2	5.9
Jan. 26, 1954	1,500	9.6	.08	1.9	.8	4.5	2.0	11	1.3	7.5		.2	33	8	0	74.0	6.5
Feb. 24	1,540	9.2	.16	1.9	.9	4.2	.7	10	1.1	6.5		.5	30	8	0	40.5	6.3
Mar. 22	1,060	10	.06	1.4	.8	3.9	1.3	10	1.1	6.0		.2	31	7	0	40.1	6.3
May 25	880	9.2	.20	2.4	1.0	7.6	--	10	1.7	12		.8	40	10	2	65.0	6.2
June 22	850	12	.03	1.8	.9	6.1	.8	17	.9	5.8		.5	37	8	0	39.5	6.7
July 20	790	11	.10	2.0	1.1	6.8	.8	17	1.1	7.0		.5	38	10	0	49.5	6.9
Aug. 17	560	12	.04	1.6	.8	5.3	.9	12	1.0	6.2		.8	35	7	0	43.9	7.0
Oct. 4	--	12	.10	1.5	.7	5.9	1.0	11	1.4	7.5		.5	36	7	0	48.0	6.5









Aug. 1, 1954	285	--	--	--	130	90	34	270	--	1.0	--	207	133	1,110	7.0	5	--	--
Aug. 2, 4	282	--	4	--	89	80	26	171	--	1.5	--	142	76	755	7.3	5	--	--
Aug. 5, 10	219	5.9	--	11	98	98	30	209	.1	1.5	528	178	107	894	7.3	5	4.4	3.9
Aug. 1, 10	--	.14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 13, 14, 20	193	--	--	--	129	98	34	249	--	3.0	--	188	106	1,040	7.5	5	--	--
Aug. 11, 12, 15-19	195	5.0	--	11	107	95	33	218	.1	1.4	545	183	105	916	7.5	5	4.6	2.7
Aug. 11-20	--	--	.36	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 21-25	186	38	--	12	112	96	33	236	.1	2.5	582	200	121	997	7.3	5	4.9	3.8
Aug. 26	340	4.0	--	--	189	84	54	380	--	7.0	--	256	187	1,480	7.0	10	--	--
Aug. 27-31	285	--	--	7.4	100	80	31	204	.1	1.5	512	161	95	857	7.3	7	5.0	4.0
Aug. 21-31	--	--	.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sept. 1, 4-10	173	4.7	--	11	108	90	32	227	.1	1.0	568	188	115	941	7.6	7	4.5	3.6
Sept. 2, 3	242	--	--	--	162	89	42	319	--	1.6	--	216	143	1,270	7.5	5	--	--
Sept. 1-10	--	--	.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sept. 11-13, 15-17, 19	182	5.4	--	63	10	98	36	252	.1	1.4	606	200	120	1,050	7.5	5	5.0	3.9
Sept. 14-18	193	--	--	--	157	103	44	315	--	1.5	--	234	150	1,280	7.5	5	--	--
Sept. 20	215	--	--	--	108	86	32	218	--	1.0	--	176	106	929	7.4	5	--	--
Sept. 11-20	--	--	.16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sept. 21-24, 28-30	257	4.3	--	63	9.8	88	37	262	.1	1.0	624	188	126	1,060	7.7	5	5.0	3.9
Sept. 25, 26, 27	249	--	--	--	97	82	30	195	--	1.0	--	164	97	835	7.7	5	--	--
Sept. 21-30	--	--	.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Average	2,140	5.5	0.19	31	5.5	48.5	23	123	0.09	1.1	268	111	65	543	--	9	5.8	3.2

## OHIO RIVER MAIN STEM--Continued

## ALLEGHENY RIVER AT RED HOUSE, N. Y.--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
 [Once-daily measurement at approximately 5 p. m.]

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

## TYGART RIVER AT ELKINS, W. VA.

LOCATION.--At city water plant, at Elkins, Randolph County, 2½ miles upstream from gaging station. 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.

DRAINAGE AREA.--268 square miles above water plant. 272 square miles above gaging station.

RECORDS AVAILABLE.--Water temperatures: January 1947 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 77°F Aug. 2; minimum, 34°F Nov. 29, Dec. 3, 17-21, 24-27, 31, Jan. 1, 2, 11-14, 18, Feb. 1, 8-10, 12, 13.

EXTREMES, 1947-54.--Water temperatures: Maximum, 92°F July 22, 1952; minimum, freezing point many days during winter months.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given WSP 1335.

Temperature (°F) of water, water year October 1953 to September 1954

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



## MONONGAHELA RIVER BASIN--Continued

## CHEAT RIVER AT LAKE LYNN, PA.

LOCATION.--At the Lake Lynn hydro-electric plant of the West Penn Power Company at Lake Lynn, Fayette County, Pa. on the Cheat River, 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 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 81°F July 29, 31; minimum, 33°F several days during January.

EXTREMES, 1948-54.--Water temperatures: Maximum, 85°F July 30, 1949 and July 28, 1952; minimum, 33°F many days during the winter months.

REMARKS.--Records furnished by the West Penn Power Company. Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, water year October 1953 to September 1954

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



BEAVER RIVER BASIN  
MAHONING RIVER AT LEAVITTSBURG, OHIO

LOCATION.--At gaging station in Leavittsburg, Trumbull County, 300 feet downstream from Duck Creek and 1 1/4 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 1954.  
EXTREMES, 1953-54.--Water temperatures: Maximum, 77°F June 15; minimum, freezing point on many days during January, February, and March.  
EXTREMES, 1948-54.--Water temperatures: Maximum, 86°F July 2, 1949; minimum, freezing point on many days during winter months.  
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, water year October 1953 to September 1954  
/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.....	65	63	52	51	39	39	33	33	33	33	32	39	33	37	35	62	60	68	66	75	70	75	72	71
2.....	64	62	52	52	39	39	33	33	32	32	32	33	32	38	36	64	62	67	65	76	70	74	73	69
3.....	63	62	52	52	39	39	33	33	32	32	32	33	32	38	37	64	60	65	64	75	72	75	73	71
4.....	63	62	52	51	41	39	33	33	32	32	32	33	32	38	36	61	56	64	62	76	73	75	72	71
5.....	63	62	51	49	41	41	33	33	32	32	32	32	32	38	36	56	54	62	61	74	72	73	72	74
6.....	62	60	49	47	42	41	33	33	32	32	32	33	32	44	41	55	54	64	61	73	71	75	71	75
7.....	60	58	47	45	42	42	33	33	32	32	32	33	32	51	44	55	52	64	62	72	69	73	71	73
8.....	58	56	45	44	42	41	33	33	32	32	32	35	32	51	48	53	50	67	63	70	67	73	71	74
9.....	57	56	45	45	41	41	33	33	32	32	32	35	33	49	45	53	52	69	66	70	67	74	71	73
10.....	56	55	46	45	41	41	33	33	32	32	32	35	33	49	47	53	52	73	68	68	67	74	71	72
11.....	57	56	46	46	41	40	34	33	32	32	32	36	35	51	49	53	53	75	70	71	67	72	71	70
12.....	56	57	46	46	40	40	34	34	32	32	32	37	36	51	48	55	53	74	72	71	68	71	69	69
13.....	58	56	46	46	40	39	34	34	32	32	32	40	37	51	48	57	54	75	73	74	70	71	68	68
14.....	57	55	46	46	40	39	34	34	32	32	31	40	39	53	51	58	55	74	71	76	71	69	68	67
15.....	55	54	46	46	38	38	33	33	31	31	31	39	37	55	52	61	57	77	73	75	73	72	68	67
16.....	56	55	46	46	38	37	32	33	32	32	31	37	36	56	52	62	59	74	72	75	72	70	69	68
17.....	56	55	46	46	37	36	34	33	32	32	32	36	35	52	49	64	61	72	66	74	70	71	68	67
18.....	56	55	46	46	36	36	34	33	32	32	32	36	35	52	50	62	61	71	66	72	70	69	68	66
19.....	56	55	46	46	35	35	32	33	32	32	32	36	35	56	49	61	60	70	68	73	70	70	69	67
20.....	56	55	46	46	35	35	32	33	32	32	32	36	35	54	61	57	57	73	69	73	70	70	68	67
21.....	57	56	48	46	35	34	33	33	32	32	32	37	36	57	61	57	57	75	70	74	72	72	68	67
22.....	57	56	48	48	34	34	33	33	32	32	32	39	37	64	60	61	57	75	72	74	72	72	69	65
23.....	57	56	48	48	35	34	33	33	32	32	32	39	37	66	62	55	63	75	72	74	71	74	71	64
24.....	56	55	48	48	35	35	33	33	32	32	32	38	36	60	53	60	75	70	74	70	74	70	75	72
25.....	55	55	48	46	35	35	33	33	32	32	32	38	38	60	62	65	62	74	71	73	70	75	71	63
26.....	55	54	46	44	35	34	33	33	32	32	32	37	35	63	60	64	62	74	72	75	69	75	73	63
27.....	54	54	44	42	34	34	34	33	32	32	32	37	37	64	62	75	71	76	71	75	69	75	72	64
28.....	54	54	42	41	34	34	33	33	32	32	32	37	37	64	62	74	71	76	71	75	69	75	72	65
29.....	54	54	41	40	34	33	33	33	32	32	32	37	37	64	62	75	71	76	71	75	69	75	72	65
30.....	54	52	41	40	34	33	33	33	32	32	32	37	37	64	62	75	71	76	71	75	69	75	72	65
31.....	53	52	40	39	33	33	33	33	32	32	32	37	37	60	57	68	63	70	67	75	71	75	72	65
Average.....	57	56	47	46	38	37	33	33	32	32	32	38	36	53	49	61	58	74	68	74	70	73	70	68

## BEAVER RIVER BASIN--Continued

## MAHONG 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 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 109 F July 14; minimum, 43 F Mar. 3-4.

EXTREMES, 1949-54.--Water temperatures: Maximum, 109 F Aug. 17, 1950, June 2, 1951, July 14, 1954; minimum, freezing point Dec. 5, 1950.

REMARKS.--Water temperature affected by cooling water from steel mills. Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, water year October 1953 to September 1954

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.....	105	95	97	90	82	78	81	76	63	69	52	56	49	74	69	99	88	105	96	104	93			
2.....	100	90	89	82	79	83	76	70	70	52	45	59	51	77	68	88	84	107	96	104	84			
3.....	100	87	82	80	84	76	80	76	47	43	56	74	66	95	95	104	95	100	92	103	82			
4.....	98	87	82	80	84	76	80	75	46	43	67	67	64	91	84	98	91	104	94	106	84			
5.....	95	80	89	84	86	81	86	82	80	76	51	47	69	62	86	82	84	82	83	86	92	105	96	
6.....	95	91	90	82	86	81	86	82	80	78	55	50	78	68	71	63	90	80	85	84	104	92	107	95
7.....	93	88	86	84	84	76	84	80	79	75	57	51	80	69	68	66	93	82	83	87	102	93	103	88
8.....	98	87	84	80	90	77	86	80	78	74	60	53	78	65	68	63	100	88	88	84	101	91	98	90
9.....	101	90	86	81	91	86	91	84	79	75	60	54	70	62	63	58	104	85	100	88	100	92	102	90
10.....	101	92	92	82	90	77	89	79	85	75	58	51	70	62	65	57	107	95	97	90	99	91	105	94
11.....	100	93	90	84	85	76	86	77	78	73	56	51	70	60	70	64	108	88	89	89	96	91	98	91
12.....	102	92	91	86	87	83	76	73	70	57	50	60	56	74	65	101	90	104	90	95	90	87	86	82
13.....	101	90	84	86	84	77	83	74	73	72	64	55	64	72	60	90	80	104	94	100	89	97	90	87
14.....	102	90	93	86	80	77	88	80	80	74	61	56	71	59	66	75	100	90	108	95	96	91	97	90
15.....	104	93	89	87	82	78	72	92	86	77	56	55	76	65	90	79	106	82	99	90	96	85	87	88
16.....	106	95	96	87	76	72	91	78	88	85	62	54	74	62	91	81	91	77	102	90	100	88	101	87
17.....	105	95	98	87	74	71	78	72	85	73	67	55	62	57	91	83	86	82	103	91	99	86	99	82
18.....	100	92	96	90	72	69	95	71	77	70	57	58	55	89	80	91	83	98	92	99	91	96	96	84
19.....	102	90	93	87	76	69	93	85	72	64	62	67	55	90	81	94	84	100	92	103	95	96	84	80
20.....	104	92	94	86	77	76	96	89	67	62	72	64	75	63	90	81	87	103	92	101	95	98	90	80
21.....	104	91	95	89	85	77	90	75	68	67	64	55	83	67	91	80	105	90	103	95	103	93	83	85
22.....	102	92	92	88	84	75	77	72	68	66	58	52	89	75	83	81	107	95	103	82	101	83	80	84
23.....	103	92	90	80	76	68	76	68	70	66	58	55	72	93	81	100	82	100	82	101	92	88	84	84
24.....	101	83	88	85	69	64	77	69	70	67	65	55	74	68	93	81	102	91	100	89	102	88	85	85
25.....	95	90	88	82	65	60	83	77	70	68	66	55	74	66	94	87	104	93	99	90	108	97	101	90
26.....	97	90	84	80	64	59	93	82	71	67	55	48	81	68	93	86	105	98	--	--	102	96	96	88
27.....	96	90	84	80	71	65	91	69	72	67	55	46	72	66	97	87	99	89	--	--	107	96	99	87
28.....	95	90	84	80	71	69	84	72	69	60	52	66	62	102	92	103	99	88	--	--	105	89	105	90
29.....	92	89	80	78	86	77	64	63	63	--	--	58	56	67	62	98	89	103	90	--	--	96	84	94
30.....	96	86	81	78	83	79	67	63	--	--	56	47	73	65	98	87	100	93	--	--	99	92	107	98
31.....	97	88	--	--	80	76	65	62	--	--	55	49	--	97	87	--	--	--	--	--	--	98	91	--
Average.....	100	91	91	85	81	75	83	76	76	71	60	52	71	62	84	75	98	88	101	91	101	91	100	90



## MUSKINGUM RIVER BASIN

## WALONDING RIVER BELOW MORAWK DAM AT NELLIE, OHIO

LOCATION --At gaging station on State Highway 79 at Nellie, Coshocton County, half a mile upstream from Mohawk Creek and 1 1/2 miles downstream from Mohawk Dam.

DRAINAGE AREA --1,502 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1953 to September 1954.

Water temperatures: October 1953 to September 1954.

EXTREMES 1953-54 --Dissolved solids: Maximum, 325 mgm per liter, 144 ppm Apr. 21-30.

Hardness: Maximum, 255 ppm Jan. 11-20, 147 mgm per liter, 144 ppm Apr. 21-30.

Specific conductance: Maximum, 255 micro-mhos daily, 246 micro-mhos Apr. 16, 18.

Water temperatures: Maximum, 87.7 F., July 2; minimum, 45.7 F., during freezing on several days during December, January, and February.

REMARKS --Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1953 to September 1954 given in MSP 1335. Flow affected by ice Dec. 25-29, Jan. 13-20, 24-25.

## Chemical analyses, in parts per million, water year October 1953 to September 1954

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, mgm-nesium	Non-carbonate			
Oct. 1-10, 1953	186	7.6	0.02	56	19	15	2.9	192	71	14	0.3	2.7	305	224	65	478	7.3	2
Oct. 11-20	180	5.3	.02	57	20	14	2.6	196	65	14	.3	2.4	292	225	62	476	7.3	2
Oct. 21-31	208	5.3	.06	58	20	15	2.4	204	66	14	.3	2.5	307	228	60	496	7.3	2
Nov. 1-5, 1-10	201	5.0	.03	62	19	13	3.1	201	63	13	.2	3.2	326	230	59	480	7.7	7
Nov. 11-20	204	2.7	.01	58	20	14	2.7	205	63	13	.2	2.9	286	230	59	480	7.7	7
Nov. 21-30	233	3.8	.05	56	19	13	2.6	210	62	14	.2	2.9	272	217	46	479	7.5	5
Dec. 1-10	222	3.3	.07	59	19	15	2.4	208	62	17	.2	3.6	282	224	55	491	7.5	5
Dec. 11-20	266	4.1	.01	59	19	15	2.4	206	63	16	.2	3.7	296	226	56	495	7.4	5
Dec. 21-31	313	5.1	.02	61	19	15	2.7	210	64	16	.2	3.6	306	230	58	501	7.2	5
Jan. 1-10, 1954	218	5.0	.02	63	21	15	2.2	219	67	17	.1	3.2	306	242	84	539	7.3	3
Jan. 11-20	213	5.3	.00	66	21	17	2.4	228	67	17	.0	3.0	306	253	64	538	7.5	3
Jan. 21-31	666	5.9	.00	53	16	14	2.6	155	67	17	.2	7.1	266	197	71	442	7.3	7
Feb. 1-10	373	8.2	.02	69	19	13	2.8	181	75	15	.2	8.6	294	234	84	490	7.4	5
Feb. 11-20	403	6.2	.01	62	19	15	2.4	191	76	16	.2	6.7	303	233	76	511	7.4	6
Feb. 21-28	499	7.3	.00	45	17	13	2.1	163	69	12	.2	6.1	286	210	74	447	7.4	8
Mar. 1-10	959	5.2	.01	43	16	10	2.1	143	72	18	.2	6.0	266	196	81	442	7.4	8
Mar. 11-13, 15-20	1,303	6.7	.01	42	17	8.5	2.0	122	66	11	.1	8.9	231	177	75	386	7.3	7
Mar. 21-26, 30-31	2,120	5.5	.02	45	13	7.4	2.0	116	62	11	.2	8.5	217	166	71	364	7.3	11
Apr. 1-10	2,453	7.4	.02	45	13	6.3	2.0	115	60	9.3	.2	9.7	223	165	72	353	7.0	1
Apr. 11-20	3,204	6.5	.03	41	10	5.8	2.2	108	54	8.3	.3	7.8	194	145	57	310	7.2	1
Apr. 21-30	3,243	8.1	.03	41	10	5.8	2.5	108	53	7.6	.4	6.3	195	144	55	311	7.2	1
May 1-10	2,157	8.5	.03	45	11	6.3	2.2	128	54	7.0	.2	5.2	208	158	54	346	7.0	15
May 11-20	1,046	7.1	.04	51	14	7.3	2.1	149	62	8.0	.1	3.6	239	186	63	398	7.1	10
May 21-31	437	4.1	.01	55	17	10	2.2	180	59	12	.2	2.2	258	205	60	439	7.5	8

MUSKINGUM RIVER BASIN--Continued  
 WALHONDLING RIVER BELOW MOHAWK DAM AT NELLIE, OHIO--Continued  
 Chemical analyses, in parts per million, water year October 1953 to September 1954--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			
June 1-10, 1954	504	5.3	0.01	54	16	10	2.4	180	58	13	0.2	3.3	257	202	53	438	7.5	5
June 11-20	469	6.9	.00	55	15	10	2.1	178	56	11	.2	4.3	259	198	53	434	7.7	10
June 21-30	447	9.2	.01	54	15	11	2.4	176	62	11	.3	4.5	262	196	52	434	7.6	9
July 1-10	242	4.5	.02	55	16	13	2.0	188	59	17	.2	3.0	269	204	49	454	7.9	10
July 11-20	194	3.0	.01	51	17	14	2.1	193	54	15	.2	1.7	265	200	39	452	7.9	12
July 21-31	253	2.5	.01	46	16	13	2.6	163	60	14	.3	2.0	247	181	47	421	7.8	10
Aug. 1-10	251	6.2	.01	49	17	12	2.3	174	55	12	.2	2.4	243	194	50	415	8.1	7
Aug. 11-20	205	4.5	.02	50	18	14	2.6	182	58	15	.3	2.2	254	198	52	429	8.1	8
Aug. 21-31	231	9.2	.01	51	17	14	2.7	178	60	15	.3	1.9	261	198	51	433	7.8	7
Sept. 1-10	185	8.3	.03	53	19	14	2.5	190	61	14	.2	2.6	273	212	55	451	8.0	5
Sept. 11-20	164	8.9	.02	57	19	15	2.8	194	67	15	.3	2.9	265	220	61	472	7.8	8
Sept. 21-30	138	11	.01	57	19	18	3.2	199	66	18	.4	2.8	265	220	57	484	8.2	5
Time weighted average a	678	6.0	0.02	54	17	12	2.4	177	63	14	0.2	4.2	266	205	60	445	---	6

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

b Represents 98 percent of days and 97 percent of runoff.

## MUSKINGUM RIVER BASIN--Continued

## WALHONDING RIVER BELOW MOHAWK DAM, AT NELLIE, OHIO--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
 /Once-daily measurement at approximately 5 p.m./

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

## MUSKINGUM RIVER BASIN--Continued

## MUSKINGUM RIVER AT DRESDEN, OHIO

LOCATION.--At gaging station at bridge on State Highway 208, half a mile east of Dresden, Muskingum County, and half a mile downstream from Wakatomika Creek.

DRAINAGE AREA.--5,982 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1952 to September 1954.

Sediment records: October 1952 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 81°F June 16, Aug. 28; minimum, freezing point on several days during December, January, and February.

Sediment concentrations: Maximum daily, 463 ppm Mar. 30; minimum daily, 2 ppm Nov. 7, Nov. 29 to Dec. 1.

Sediment loads: Maximum daily, 20,800 tons Mar. 30; minimum daily, 3 tons Nov. 7.

EXTREMES, 1952-54.--Water temperatures: Maximum, 82°F Aug. 1, Sept. 3, 1953; minimum, freezing point on several days during winter months.

Sediment concentrations: Maximum daily, 490 ppm Jan. 19, 1953; minimum daily, 1 ppm Dec. 26-27, 1952.

Sediment loads: Maximum daily, 20,800 tons Mar. 30, 1954; minimum daily, 3 tons

Dec. 26-27, 1952, Nov. 7, 1953.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1335. Flow regulated by 14 flood-control reservoirs. Flow affected by ice Dec. 17-19, 25-28, Jan. 13-19, 23-24.

Temperature (°F) of water, water year October 1953 to September 1954

(/Once-daily measurement at varying hours/)

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

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

MUSKINGUM RIVER BASIN--Continued

MUSKINGUM RIVER AT DRESDEN, OHIO--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	518	25	35	608	10	16	671	2	4
2.....	518	27	38	608	10	16	662	3	5
3.....	527	29	41	590	9	14	662	3	5
4.....	518	--	e 40	563	6	9	689	4	7
5.....	590	--	e 50	536	9	13	680	8	15
6.....	790	--	e 60	545	4	6	680	7	13
7.....	850	--	e 70	563	2	3	671	6	11
8.....	900	--	e 70	572	9	14	671	5	9
9.....	950	--	e 80	572	11	17	671	8	14
10.....	950	27	69	581	19	30	716	12	23
11.....	950	21	54	581	7	11	761	8	16
12.....	950	21	54	572	4	6	840	9	20
13.....	940	21	53	572	6	9	850	7	16
14.....	930	--	e 50	581	5	8	820	5	11
15.....	940	--	e 50	590	8	13	840	5	11
16.....	940	--	e 50	590	11	16	880	7	17
17.....	830	17	38	572	11	17	850	8	18
18.....	862	16	28	554	5	7	700	17	32
19.....	590	14	22	545	5	7	850	20	a 45
20.....	554	11	16	545	5	7	1,090	20	59
21.....	518	10	14	572	10	15	1,120	12	36
22.....	500	11	15	590	10	16	1,100	15	44
23.....	509	12	16	617	12	20	1,090	15	44
24.....	518	11	15	662	16	28	1,320	17	a 60
25.....	518	9	12	698	12	23	1,400	20	76
26.....	527	14	20	698	8	15	1,300	20	a 70
27.....	545	14	21	707	5	10	1,200	15	a 50
28.....	554	13	19	734	3	6	1,100	10	30
29.....	572	13	20	698	2	4	990	7	19
30.....	608	10	16	680	2	4	840	7	16
31.....	608	10	16	--	--	--	752	5	10
Total.	21,374	--	1,152	18,096	--	382	27,466	--	806
January February March									
1.....	725	6	12	1,920	19	98	2,350	48	304
2.....	707	5	10	1,620	13	57	3,600	104	s 1,120
3.....	689	6	11	1,510	12	49	6,560	244	4,320
4.....	671	5	9	1,400	12	45	7,140	178	3,390
5.....	662	5	9	1,330	7	25	6,560	120	2,120
6.....	653	5	9	1,250	10	34	5,490	80	1,180
7.....	671	4	7	1,150	7	22	4,510	54	658
8.....	671	5	9	1,060	7	20	4,200	45	510
9.....	662	4	7	990	7	19	4,870	48	605
10.....	680	5	9	990	7	19	6,560	94	1,660
11.....	662	4	7	980	3	8	8,600	173	4,020
12.....	617	--	e 7	970	3	8	7,740	144	3,010
13.....	600	--	e 6	910	5	12	6,560	95	1,680
14.....	650	--	e 9	930	8	20	5,660	68	1,040
15.....	700	--	e 9	960	11	28	5,150	52	734
16.....	750	--	e 10	940	10	25	4,510	38	463
17.....	750	--	e 10	1,020	11	30	3,900	31	526
18.....	700	--	e 9	1,360	15	55	3,450	26	242
19.....	750	5	10	2,040	23	127	3,180	26	222
20.....	880	12	28	1,920	16	83	3,380	35	319
21.....	1,510	57	232	1,620	15	66	4,510	41	499
22.....	1,860	72	362	1,620	16	70	5,840	48	757
23.....	2,500	77	520	1,740	17	80	5,150	44	612
24.....	2,400	34	220	1,680	14	64	4,510	36	438
25.....	1,620	21	92	1,510	10	41	4,050	35	383
26.....	1,370	17	63	1,390	7	26	4,830	47	613
27.....	1,400	20	76	1,050	3	8	6,940	110	2,060
28.....	3,090	202	s 1,890	990	10	27	6,560	164	2,900
29.....	4,200	201	2,280	--	--	--	9,480	303	s 8,240
30.....	3,161	91	776	--	--	--	16,600	463	20,800
31.....	2,350	39	247	--	--	--	19,300	363	18,900
Total.	39,310	--	6,957	36,850	--	1,166	191,520	--	84,114

e Estimated.

s Computed by subdividing day.

a Computed from estimated concentration graph.

## MUSKINGUM RIVER BASIN--Continued

## MUSKINGUM RIVER AT DRESDEN, OHIO--Continued

## Suspended sediment, water year October 1953 to September 1954--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.....	17,900	238	11,500	13,600	210	7,710	1,800	10	49
2.....	14,600	155	6,110	11,700	162	5,120	1,860	11	55
3.....	11,200	108	3,260	10,400	139	3,900	2,160	12	70
4.....	8,820	81	1,930	10,400	149	4,180	2,280	12	74
5.....	7,140	62	1,200	10,800	109	3,180	2,280	14	86
6.....	6,200	58	971	10,600	109	3,120	2,220	15	90
7.....	6,380	65	1,120	9,260	94	2,350	2,100	14	79
8.....	6,740	82	1,490	8,160	76	1,670	1,920	10	52
9.....	7,340	95	1,880	7,740	77	1,610	2,220	15	90
10.....	7,340	115	2,280	7,540	59	1,200	2,160	25	146
11.....	6,200	75	1,260	6,740	54	983	2,350	27	171
12.....	6,200	76	1,270	6,380	57	982	2,220	32	192
13.....	8,160	153	3,370	6,020	51	829	2,220	36	228
14.....	7,740	137	2,860	5,660	52	795	2,100	21	119
15.....	6,560	94	1,660	5,320	45	646	2,040	20	110
16.....	6,200	93	1,560	4,670	40	504	2,100	24	136
17.....	11,000	258	7,660	4,050	28	306	2,040	28	154
18.....	16,100	278	12,100	3,680	26	258	2,040	24	132
19.....	17,400	263	12,400	3,380	21	192	2,610	44	310
20.....	16,100	192	8,350	3,020	20	163	2,540	40	274
21.....	13,100	138	4,880	2,810	17	129	2,220	38	228
22.....	10,400	106	2,980	2,610	15	106	1,980	27	144
23.....	9,480	118	3,020	2,420	12	78	1,800	25	122
24.....	11,900	175	5,820	2,220	10	60	1,620	21	92
25.....	13,100	172	6,080	2,100	8	45	1,510	23	94
26.....	11,900	132	4,240	1,980	8	43	1,400	24	91
27.....	9,920	129	3,460	1,920	6	31	1,300	22	77
28.....	9,480	136	3,480	1,860	8	40	1,260	20	68
29.....	12,400	331	11,100	1,800	11	53	1,240	20	67
30.....	14,100	258	9,820	1,860	12	60	1,170	17	54
31.....	--	--	--	1,860	10	50	--	--	--
Total.	311,100	--	138,911	172,560	--	40,393	58,760	--	3,654
July									
1.....	1,100	20	59	725	15	29	752	13	26
2.....	1,060	18	52	940	18	46	698	15	28
3.....	1,000	14	36	860	15	35	680	20	37
4.....	970	11	29	761	13	27	653	15	26
5.....	920	12	30	820	15	33	626	9	15
6.....	880	15	36	920	15	37	608	11	18
7.....	920	17	42	1,030	13	36	590	12	19
8.....	940	15	36	1,150	15	46	581	15	24
9.....	1,000	16	43	1,180	16	51	536	14	20
10.....	1,000	13	35	1,000	16	43	536	15	22
11.....	940	13	33	850	12	28	527	14	20
12.....	890	16	38	810	11	24	509	12	16
13.....	830	16	36	752	7	14	500	16	22
14.....	770	15	31	725	12	23	460	20	25
15.....	770	17	35	725	13	25	635	22	38
16.....	752	12	24	698	13	24	590	22	35
17.....	752	7	14	716	20	39	599	21	34
18.....	716	13	25	800	25	54	662	28	50
19.....	698	13	24	1,000	27	73	671	21	38
20.....	725	15	29	990	30	80	743	26	52
21.....	1,030	25	70	920	30	74	716	24	46
22.....	1,170	47	148	890	22	53	680	25	46
23.....	1,090	25	74	800	17	37	662	24	43
24.....	960	19	49	725	15	29	644	25	43
25.....	860	17	39	707	15	29	590	23	37
26.....	780	20	42	900	16	39	545	22	32
27.....	725	17	33	930	15	38	509	24	33
28.....	671	20	36	1,050	18	51	484	26	34
29.....	653	15	26	1,040	17	48	468	34	43
30.....	626	14	24	940	13	33	460	27	34
31.....	626	15	25	840	12	27	--	--	--
Total.	26,824	--	1,257	27,194	--	1,225	17,914	--	956
Total discharge for year (cfs-days)..... 946,968									
Total load for year (tons)..... 280,973									

## MUSKINGUM RIVER BASIN--Continued

## MUSKINGUM RIVER AT DRESDEN, OHIO--Continued

Particle-size analyses of suspended sediment, water, near October, 1953 to September, 1954.  
 (Methods of analysis: B, bottom with manual sifter; D, decantation; P, pipette; S, sieve; N, in native water;  
 W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	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	
Mar. 30, 1954, . . .	12:05 P. M.	18,900		489	818	41	59	70	81	88	93	94						BSWCM
Mar. 31, . . . . .	2:30 P. M.	18,900		383	658	44	54	63	80	89	92	98						BSWCM
May 1, . . . . .	5:15 P. M.	13,400		203	518	58	63	70	76	82	84	89						BSWCM

## LITTLE KANAWHA RIVER BASIN

## LITTLE KANAWHA RIVER AT GLENVILLE, W. VA.

LOCATION.--At water plant, at Glenville, Gilmer County, half a mile upstream from gaging station.

DRAINAGE AREA.--386 square miles.

RECORDS AVAILABLE.--October 1946 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum observed, 80°F June 16, 23-25, July 31; minimum observed, 32°F Jan. 12-14.

EXTREMES, 1946-54.--Water temperatures: Maximum observed, 86°F Aug. 22, 1947; minimum observed, freezing point many days during winter months.

REMARKS.--Record furnished by West Virginia Water Service Company. Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, water year October 1953 to September 1954

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



KANAWHA RIVER BASIN  
NEW RIVER AT EGLESTON, 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 1954.

Water temperatures: December 1952 to September 1954.

EXTREMES 1953-54 --Hardness: Maximum, 106 ppm Oct. 11-20; minimum, 44 ppm Feb. 21-28, Mar. 1-10.

Specific conductance: Maximum daily, 267 microhos Oct. 15; minimum daily, 83.8 microhos Feb. 23.

Water temperatures: Maximum, 82°F July 15; minimum, freezing point Jan. 13.

EXTREMES December 1952 to September 1954 --Hardness: Maximum, 114 ppm Aug. 21-31, 1953; minimum, 43 ppm Feb. 21-28, 1953.

Specific conductance: Maximum daily, 267 microhos Oct. 15, 1953; minimum daily, 83.8 microhos Mar. 14, 1953, Feb. 23, 1954.

Water temperatures: Maximum, 82°F July 15, 1954; minimum, freezing point Jan. 13, 1954.

REMARKS --Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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 (microhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 1-10, 1953	1,189	6.4	0.01	29	7.0	3.2	1.6	71	37	0.6	0.1	18	137	102	43	212	7.7	6
Oct. 11-20	1,233	--	.01	30	7.3	--	--	69	30	--	--	--	--	106	48	232	7.7	5
Oct. 21-31	1,278	--	.02	29	7.0	--	--	70	30	--	--	--	--	101	44	220	7.9	5
Nov. 1-10	1,237	--	.01	28	8.4	--	--	66	28	--	--	--	--	103	50	226	7.4	6
Nov. 11-20	1,186	--	.02	26	7.6	--	--	66	24	--	--	--	--	96	42	220	7.5	5
Nov. 21-30	1,330	--	.02	26	7.4	--	--	67	28	--	--	--	--	94	40	220	7.4	4
Dec. 1-10	1,419	--	.02	26	7.8	--	--	65	24	--	--	--	--	97	44	218	7.3	5
Dec. 11-20	3,398	--	.01	17	7.0	--	--	59	11	--	--	--	--	72	23	166	7.5	5
Dec. 21-31	1,595	--	.01	22	8.1	--	--	62	22	--	--	--	--	89	37	189	7.6	2
Jan. 1-10, 1954	1,266	8.0	.00	24	7.0	4.1	1.4	61	30	3.3	1.1	13	121	89	39	202	7.7	4
Jan. 11-20	2,831	--	.02	18	6.4	--	--	56	24	3.3	--	--	--	71	25	168	7.6	6
Jan. 21-31	8,128	--	.08	11	4.6	--	--	45	18	2.4	--	--	--	48	10	114	7.2	6
Feb. 1-10	2,629	--	.07	15	5.0	--	--	48	16	2.4	--	--	--	57	19	132	7.1	8
Feb. 11-20	1,638	--	.04	18	4.9	--	--	46	7	--	--	--	--	64	27	144	7.8	8
Feb. 21-30	5,214	--	.06	12	3.4	--	--	45	11	--	--	--	--	64	27	102	7.8	25
Mar. 1-10	9,722	--	.05	10	4.3	--	--	41	7	--	--	--	--	44	9	96.5	7.3	20
Mar. 11-20	3,749	--	.07	11	4.4	--	--	44	9	--	--	--	--	46	10	103	7.3	35
Mar. 21-31	3,310	--	.02	12	4.6	--	--	57	8	--	--	--	--	50	2	114	7.9	15
Apr. 1-10	4,558	9.8	.02	12	4.2	2.3	1.0	45	11	2.0	.1	3.3	75	47	10	106	7.5	8
Apr. 11-20	3,420	--	.02	13	5.5	--	--	46	10	--	--	--	--	55	17	120	7.7	6
Apr. 21-30	3,181	--	.01	12	5.9	--	--	54	8	--	--	--	--	50	6	114	7.8	7
May 1-10	3,017	--	.01	12	5.1	--	--	54	9	--	--	--	--	52	7	116	7.8	5
May 11-20	3,978	--	.01	13	4.7	--	--	51	5	--	--	--	--	10	10	118	7.4	8
May 21-31	3,701	--	.03	13	5.4	--	--	57	7	--	--	--	--	55	8	118	7.7	7

KANAWHA RIVER BASIN--Continued  
 NEW RIVER AT EGGLESTON, VA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954.--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			
June 1-10, 1954	2,150	--	0.01	14	5.0	--	--	52	11	--	--	--	--	56	13	119	7.5	5
June 11-20	2,185	--	.01	14	4.6	--	--	50	11	--	--	--	--	53	13	120	7.5	7
June 21-30	1,434	--	.01	14	4.6	--	--	52	11	--	--	--	--	54	11	122	7.6	5
July 1-10	1,326	6.5	.02	13	5.1	2.6	1.1	54	11	1.8	0.1	3.0	72	53	9	123	7.6	4
July 11-20	1,270	--	.00	14	5.1	--	--	54	8	--	--	--	--	55	12	123	7.8	8
July 21-31	1,892	--	.00	13	4.7	--	--	54	16	--	--	--	--	52	8	124	7.8	5
Aug. 1-10	1,257	--	.00	15	5.3	--	--	60	14	--	--	--	--	59	10	136	7.6	5
Aug. 11-20	1,101	--	.00	15	4.9	--	--	59	17	--	--	--	--	58	9	145	7.6	5
Aug. 21-31	1,447	--	.00	15	5.2	--	--	59	17	--	--	--	--	59	10	143	7.6	5
Sept. 1-10	1,111	--	.03	17	5.1	--	--	58	12	--	--	--	--	63	16	147	7.6	5
Sept. 11-20	1,095	--	.03	20	5.2	--	--	61	18	--	--	--	--	71	21	161	7.6	5
Sept. 21-30	1,172	--	.00	17	5.5	--	--	59	14	--	--	--	--	65	17	149	7.6	5
Average	2,537	--	0.02	17	5.6	--	--	56	16	--	--	--	--	66	20	149	--	8

## KANAWHA RIVER BASIN--Continued

## NEW RIVER AT EGGLESTON, VA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

## KANAWHA RIVER BASIN--Continued

## NEW RIVER AT GLENLYN, VA.

LOCATION.--At the Glenlyn steam electric plant of the Appalachian Electric Power Company on the right bank of New River, across the river from the stream gaging station, at Glenlyn, Giles County.

DRAINAGE AREA.--3,768 square miles.

RECORDS AVAILABLE.--October 1950 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum observed, 83°F July 14, 15, 31, Aug. 1; minimum observed, 32°F Jan. 26.

EXTREMES, 1951-54.--Water temperatures: Maximum observed, 84°F June 28, 1952; minimum observed, 32°F Dec. 16, 1951, Mar. 10, 1953, Jan. 26, 1954.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	67	46	37	39	36	43	47	60	69	77	83	73
2	66	46	35	39	38	41	43	62	69	80	81	73
3	65	47	34	40	40	41	45	65	68	80	80	73
4	63	62	40	40	39	38	45	62	67	79	78	74
5	65	62	40	41	38	35	44	56	63	79	77	78
6	65	62	42	40	37	36	48	57	60	78	76	77
7	58	60	42	40	35	37	52	57	64	77	75	79
8	54	60	40	38	34	38	55	56	67	76	78	78
9	52	56	37	38	35	44	52	56	71	76	77	74
10	56	56	40	40	36	43	50	53	72	77	77	77
11	55	39	39	42	41	47	51	53	73	77	77	74
12	57	39	39	39	39	46	52	53	73	77	74	75
13	58	39	40	37	36	47	52	57	74	78	73	71
14	58	40	41	38	37	47	53	56	75	83	73	72
15	58	39	38	39	--	40	55	53	77	83	74	69
16	60	40	38	37	44	36	58	53	76	82	77	71
17	59	40	--	38	47	35	56	57	73	80	79	75
18	59	41	33	34	43	41	50	61	67	80	79	75
19	61	41	35	36	43	43	53	58	--	80	78	76
20	59	43	36	40	44	43	58	58	--	78	80	75
21	58	46	38	42	46	42	58	54	--	75	80	73
22	57	48	42	43	46	41	58	55	--	73	79	69
23	56	51	44	40	42	42	60	57	78	75	77	68
24	55	49	40	39	42	44	59	57	76	75	77	68
25	54	47	36	37	42	46	60	60	77	77	78	68
26	52	42	34	a32	45	50	62	63	80	77	80	66
27	52	40	35	41	42	50	61	63	81	78	80	68
28	54	38	37	41	44	46	61	63	78	78	80	70
29	52	35	40	38	--	46	60	66	76	78	80	71
30	48	36	42	38	--	49	60	68	76	82	79	73
31	47	--	42	38	--	51	--	68	--	83	76	--
Average	57	46	39	39	40	43	54	59	72	78	78	73

a Estimated.

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.--May 1953 to September 1954.  
EXTREMES, 1953-54.--Water temperatures: Maximum observed, 82°F July 14, 15, 17-20; minimum observed, 34°F Dec. 21-24, but could have been lower during period of no record.  
EXTREMES, 1953-54.--Water temperatures: Maximum observed, 83°F Aug. 5, 1953; minimum observed, 34°F Dec. 21-24, 1953  
REMARKS.--Records of discharge for gaging station at Hinton given in WSP 1335.

Temperature (°F) of water, water year October 1953 to September 1954

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

## 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 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum observed, 77°F Aug. 1; minimum, freezing point Nov. 14, Dec. 20, 21.

EXTREMES, 1946-54.--Water temperatures: Maximum observed, 82°F July 24, 1952; minimum, freezing point on many days during winter months.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, water year October 1953 to September 1954

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

a Includes estimated temperature, 32° on missing days.

## KANAWHA RIVER BASIN--Continued

## KANAWHA RIVER AT CABIN CREEK, W. VA.

LOCATION.--At the Cabin Creek steam electric plant of the Appalachian Electric Power

Company on the left bank of the Kanawha River, at Cabin Creek, Kanawha County.

DRAINAGE AREA.--8,661 square miles above the power plant.

RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum observed, 86°F July 14; minimum observed, 34°F Jan. 14.

EXTREMES, 1950-54: Water temperatures: Maximum observed, 89°F July 24, 1952; minimum observed, 32°F Feb. 10, 1951.

REMARKS.--Records furnished by the Appalachian Electric Power Company. No discharge records available for this station.

Temperature (°F) of water, water year October 1953 to September 1954

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

KANAWHA RIVER BASIN--Continued  
KANAWHA RIVER AT CHARLESTON, W. VA.

LOCATION.--Temperature recorder at gaging station on left bank at old lock 6, 1.0 mile upstream from Davis Creek, 1½ miles downstream from Twomile Creek, and 3.5 miles downstream from Elk River, at Charleston, Kanawha County, W. Va.

DRAINAGE AREA.--10,419 square miles.

RECORDS AVAILABLE.--Water temperatures: March 1953 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 86°F July 3, 16; minimum, 38°F Jan. 15, 17.

EXTREMES, 1953-54.--Water temperatures: Maximum, 92°F Aug. 4, 1953; minimum, 38°F Jan. 15, 17, 1954.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, water year October 1953 to September 1954

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.....	80	76	66	64	56	52	47	44	46	46	49	55	55	70	69	71	71	83	81	84	81	80	77	
2.....	79	75	67	65	53	51	47	44	48	44	49	55	54	71	70	72	71	83	82	82	81	80	78	
3.....	77	75	68	65	53	50	47	44	47	42	44	55	54	71	74	72	82	86	83	82	81	81	79	
4.....	78	76	67	64	56	50	49	45	48	45	44	43	56	54	71	70	74	82	82	82	81	81	79	
5.....	79	76	67	64	57	49	48	44	47	46	43	57	56	70	69	72	72	85	83	82	81	82	79	
6.....	79	77	66	64	55	49	47	44	48	46	44	43	57	56	70	69	73	72	85	83	84	81	81	
7.....	78	74	66	62	58	51	49	44	47	46	44	43	57	56	70	68	74	73	85	83	82	78	83	
8.....	75	73	65	61	54	51	47	43	48	44	44	58	56	68	68	74	73	84	83	78	74	83	81	
9.....	75	73	62	59	52	50	47	44	48	41	46	44	59	58	67	64	77	74	83	81	74	73	84	
10.....	75	73	62	58	55	50	47	45	48	43	46	45	60	59	85	83	78	75	82	81	76	73	83	
11.....	75	73	61	58	53	49	45	48	44	44	46	60	60	64	61	78	76	82	81	76	75	83	82	
12.....	74	72	61	58	52	49	45	48	43	49	49	61	60	63	61	77	76	85	82	76	75	82	79	
13.....	73	72	61	58	52	49	45	42	48	42	49	62	60	63	59	78	77	85	83	77	75	80	79	
14.....	74	72	60	58	52	50	46	40	47	43	49	62	61	60	59	78	77	85	84	76	75	82	79	
15.....	74	71	60	58	51	49	47	38	47	44	49	62	60	61	59	81	78	85	84	77	76	81	80	
16.....	75	72	59	57	49	46	44	39	50	47	48	63	61	60	80	81	80	86	84	81	77	83	80	
17.....	75	72	59	57	46	45	39	38	50	46	40	63	62	60	80	81	79	84	75	80	78	82	81	
18.....	75	72	59	57	47	45	41	39	50	46	47	62	62	60	80	80	75	72	81	79	82	81		
19.....	74	72	60	58	47	45	40	39	51	48	48	57	56	57	62	61	80	79	80	75	82	79		
20.....	74	72	59	55	47	42	41	40	50	48	48	61	58	63	62	80	78	80	68	82	80	83	79	
21.....	74	73	58	56	47	43	43	41	51	49	48	63	61	63	62	78	77	73	69	81	78	81	80	
22.....	74	72	60	56	47	43	42	51	50	48	47	66	63	63	63	79	77	72	68	81	78	81	79	
23.....	73	71	61	58	48	43	42	50	49	49	48	67	65	63	62	80	78	72	68	81	80	79	77	
24.....	74	71	60	58	49	46	43	42	52	50	50	68	67	66	66	82	81	78	75	72	83	81	78	
25.....	74	70	62	58	48	47	43	43	52	50	52	50	68	66	64	63	81	79	75	73	85	81	77	
26.....	71	69	60	56	47	43	45	43	52	50	53	52	69	68	66	63	83	80	74	73	85	83	77	
27.....	70	68	58	55	46	42	46	45	33	51	54	53	69	68	65	82	81	75	74	84	84	81	76	
28.....	71	69	58	53	46	44	47	48	53	52	56	54	70	69	67	84	82	78	75	81	80	76	75	
29.....	71	68	55	53	48	44	47	47	57	56	70	68	70	69	68	83	82	79	77	81	80	72	74	
30.....	68	66	57	53	46	44	47	46	57	56	69	70	68	68	65	81	81	81	81	81	81	73	74	
31.....	68	65	57	53	46	43	46	46	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	
Average.....	74	72	61	59	51	47	45	43	49	46	49	48	62	61	66	64	78	77	81	78	81	79	80	



KANAWHA RIVER BASIN--Continued  
MISCELLANEOUS ANALYSES OF STREAMS IN KANAWHA RIVER BASIN

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Dis-charge (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> )	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color	
													Calcium	Non-carbonate				
PEAK CREEK AT PULASKI, VA.																		
Oct. 7, 1953	a 2.0	10	0.01	40	20	22	3.1	154	93	9.2	0.6	0.4	264	183	56	447	7.6	7
Oct. 8	a 2.0	7.6	.02	45	25	16	3.1	173	94	5.1	.3	.5	288	214	73	456	7.6	5
Mar. 30, 1954	a 48	5.9	.08	11	5.0	2.6	1.0	49	13	1.8	.0	1.0	74	49	8	108	7.3	8
MIDDLE FORK OF SOUTH FORK NEW RIVER NEAR BLOWING ROCK, N. C.																		
Mar. 11, 1954	32.4							9	1	1.2				6	0	23.9	6.8	
July 30	5.02							12	1	2.5				8	0	29.9	6.5	
NORTH FORK NEW RIVER AT CRUMPLER, N. C.																		
Mar. 23, 1954	356	9.9	0.00	3.4	0.4	3.2	1.7	14	2.6	1.0	0.1	1.6	30	10	0	46.3	6.8	8
Sept. 13	62.1	10	.01	3.4	1.3	2.5	3.0	21	3.0	2.5	.1	1.1	37	14	0	47.1	6.8	12

a Mean discharge.

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 1954.  
Water temperatures: October 1951 to September 1954.  
EXTREMES, 1953-54: --Dissolved solids: Maximum, 1,184 ppm Oct. 25-28; minimum, 93 ppm Aug. 26-27.  
Hardness: Maximum, 236 ppm Oct. 25-28; minimum, 45 ppm Aug. 26-27.  
Specific conductance: Maximum daily, 2,710 microhos Oct. 25; minimum daily, 144 microhos Aug. 26.  
Water temperatures: Maximum, 78 F July 14, 18, 22, 31; minimum, freezing point Jan 13.  
EXTREMES, 1951-54: --Dissolved solids: Maximum, 1,184 ppm Oct. 25-28, 1953; minimum, 93 ppm Aug. 26-27, 1954.  
Hardness: Maximum, 236 ppm Oct. 25-28, 1953; minimum, 45 ppm Aug. 26-27, 1954.  
Specific conductance: Maximum daily, 2,710 microhos Mar. 23, 1952.  
Water temperatures: Maximum, 84 F June 16, 1952; minimum, freezing point Dec. 19, 1951, Jan. 13, 1954.

REMARKS: --Acidity determined to phenolphthalein end point. Records of specific conductance & daily samples available in district office at Columbus, Ohio.  
Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	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>		Acidity (H <sub>2</sub> )		Specific conductance (microhos at 25°C)	pH	Color
																Calcium	Non-carbonate	Immediate	Potential free			
Oct. 1-12, 1953	3-51	6.4	0.5	0.16	0.83	36	16	110	4.6	27	118	179	0.2	1.7	504	156	134	0.2	0.0	893	6.4	1
Oct. 13-24	2-62	7.0	0.2	0.14	.02	37	14	134	4.2	32	98	221	.2	3.3	553	151	74	.4	.0	1,000	6.4	1
Oct. 25-28	4-70	8.2	.3	0.21	.00	60	21	336	7.0	44	84	590	.2	1.2	1,184	236	200	.2	.0	2,140	6.6	2
Oct. 29-31	7-27	8.0	0.1	0.33	.00	29	11	74	5.0	38	87	117	.2	1.4	357	116	86	.2	.0	644	6.3	2
Nov. 1-6	8-40	7.7	0.2	0.38	.02	56	19	293	6.0	44	81	520	.2	8	1,056	220	192	.2	.0	1,930	6.6	2
Nov. 8-14	9-57	9.3	0.2	0.61	.00	31	12	77	4.4	44	89	118	.2	5	373	126	91	.2	.0	871	6.4	3
Nov. 15-22	11-8	7.3	0.0	0.50	.00	35	12	101	4.7	50	83	161	.2	2	437	135	96	.2	.0	808	6.5	5
Nov. 23-28	12-3	8.2	0.0	0.76	.02	41	14	156	4.2	62	79	266	.2	3	604	161	109	.2	.0	1,140	6.6	3
Nov. 29-Dec. 6	9-65	7.5	0.1	0.01	.08	40	14	143	4.7	55	85	242	.1	3	560	155	112	.3	.0	1,060	6.5	5
Dec. 7-17	9-82	7.9	0.1	0.03	.07	39	13	120	4.2	45	94	205	.1	4	509	150	114	.2	.0	943	6.9	5
Dec. 18-28	8-70	8.8	0.0	0.02	.41	38	12	62	4.3	12	136	992	.1	1.5	376	146	134	.2	.0	628	6.5	10
Dec. 29-Jan. 10, 1954	6-65	8.5	0.3	0.04	2.3	45	13	58	3.2	14	161	97	.1	1.1	407	167	154	.1	.1	657	6.5	4
Jan. 11-21	18-5	8.5	0.5	0.01	3.1	47	15	62	2.9	10	173	99	.2	7	430	180	171	.1	.2	711	6.2	2
Jan. 22-31	186	13	6.1	0.02	4.8	47	20	23	3.8	0	232	29	.2	3.4	399	202	202	1.0	.3	581	4.20	3
Feb. 1-10	87.3	14	6.3	0.06	5.5	46	25	25	3.6	0	250	35	.2	2.6	429	220	210	1.2	.3	623	4.00	1
Feb. 11-18, 20	34.8	14	5.9	0.02	5.3	48	22	32	3.3	0	244	37	.2	1.9	433	210	210	1.0	.4	625	4.20	2
Feb. 21-27	28.6	14	7.5	0.28	6.2	47	17	31	3.0	0	240	48	.4	8	428	185	185	1.0	.0	501	4.20	1
Feb. 28-Mar. 1, 3-9	256	13	6.8	0.55	4.5	39	17	16	2.0	0	211	27	.6	7	343	167	167	1.0	.1	630	4.40	1
Mar. 11-20	570	11	3.6	0.12	1.9	24	13	8.5	1.5	0	133	10	.3	8	219	113	113	.5	.1	335	4.10	1
Mar. 21-31	387	10	2.1	0.02	2.0	23	11	8.8	1.9	0	114	9.0	1.0	8	190	101	101	.3	.1	298	4.5	5

Apr. 1-10, 1954...	376	10	1.8	.03	2.2	25	10	9.4	1.8	0	123	9.0	4	.5	206	105	105	.4	1	322	4.40
Apr. 11-20.....	1,030	10	1.1	.02	1.9	22	9.7	7.5	2.2	0	109	2.6	.1	.0	180	95	95	.4	1	287	4.45
Apr. 21-30.....	1,724	12	1.3	.02	1.9	24	8.3	7.0	2.0	0	109	6.0	.1	.0	182	83	83	.5	2	270	4.8
May 1-10.....	1,520	12	1.5	.02	1.3	19	7.5	5.2	1.6	2	102	4.5	.1	.0	146	78	77	.2	2	209	4.8
May 11-20.....	504	13	1.5	.02	1.9	23	9.7	8.6	1.5	1	108	12	.2	.5	172	97	96	.3	4	285	4.30
May 21-30.....	129	13	1.5	.02	2.3	28	13	18	1.9	2	131	24	.2	1.0	233	125	122	.3	4	374	4.40
June 1-10.....	81.9	11	1.5	.02	2.6	30	13	23	2.4	0	156	29	.1	.6	270	128	128	4	1	430	4.20
June 11-19.....	76.4	10	1.1	.02	2.8	35	14	27	3.3	3	158	31	.3	1.4	302	144	142	.2	2	459	5.0
June 21-26, 28-30	31.7	9	0	.00	2.8	36	16	47	3.0	4	158	65	.2	1.3	346	156	154	.1	1	533	5.9
July 1-3, 5-10.....	27.9	8.6	.1	.01	2.3	38	17	63	3.5	13	162	98	.2	1.9	412	166	164	.1	0	682	6.8
July 11, 13-20.....	15.7	7.8	.1	.02	1.5	34	12	47	4.1	26	128	64	.1	1.5	331	134	113	.1	2	538	7.1
July 21-22.....	416	5.4	.1	.19	1.74	17	4.3	14	3.5	18	159	14	.1	1.9	139	60	45	.1	2	232	6.7
July 23-31.....	31.3	9.9	.1	.16	2.8	39	10	41	4.2	4	143	62	.2	.9	335	141	135	.1	2	524	5.6
Aug. 1-7.....	217	6.8	3.4	.04	.34	34	13	24	3.9	0	152	34	.2	1.1	266	139	138	.2	2	464	4.40
Aug. 8-11.....	229	3.2	2.2	.00	.09	21	7.2	13	3.3	4	78	20	.1	1.6	162	83	70	.1	0	254	5.6
Aug. 12-18, 20.....	85.2	9.4	2.8	.02	.27	28	12	20	3.3	0	128	30	.2	1.8	244	119	119	.2	2	385	4.8
Aug. 21-25.....	108	7.4	2.0	.01	.50	13	5.8	14	3.4	8	61	22	.3	1.7	147	62	62	.1	1	237	6.7
Aug. 26-27.....	117	6.3	0	.02	.34	13	2.9	7.7	4.4	15	33	11	.8	3.0	93	45	32	.1	2	144	6.9
Aug. 28-31.....	180	11	.9	.02	2.4	42	17	19	4.4	2	131	22	.1	.6	292	174	173	.1	3	470	4.9
Sept. 1-3, 5-10.....	48.1	8.9	4.4	.04	3.0	45	19	31	4.3	1	212	50	.5	.5	393	182	190	.7	9	598	4.7
Sept. 11-18.....	17.8	8.9	1.6	.01	2.3	35	16	45	3.9	2	153	78	.4	.6	355	152	152	.3	4	584	4.9
Sept. 20-30.....	28.6	8.2	.2	.00	1.6	31	13	39	3.8	10	123	60	.1	.7	293	129	123	.0	6	491	6.3
Time-weighted average <sup>a</sup> .....	190	9.7	1.7	0.10	2.0	35	14	53	3.4	13	138	84	0.2	1.1	361	145	134	0.3	0.2	606	--

<sup>a</sup> Represents 97 percent of days and 99 percent of runoff.

## RACCOON CREEK BASIN--Continued

## RACCOON CREEK AT ADAMSVILLE, OHIO--Continued

Temperature (°F) of water, water year October 1953 to September 1954

/Once-daily measurement at varying hours/

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



## BIG SANDY RIVER BASIN--Continued

## TUG FORK AT KERMIT, W. VA.

LOCATION.--At city water plant, at Kermit, Mingo County, three quarters miles 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 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum observed, 88°F June 24; minimum observed, 35°F Dec. 19, Jan. 13.

EXTREMES, 1946-54.--Water temperatures: 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 October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, water year October 1953 to September 1954

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

## LITTLE SANDY RIVER BASIN

## LITTLE SANDY RIVER AT GRAYSON, KY.

LOCATION.--At bridge on new U. S. Highway 60, 0.9 mile upstream from base gage, ¼ mile east of Grayson, Carter County, and 1.2 miles upstream from lower Stinson Creek.

DRAINAGE AREA.--398 square miles, at base gage.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.

REMARKS.--Acidity determined to phenolphthalein end point. Records of discharge for gaging station near Grayson given in WSP 1335.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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 100°C)	Hardness as CaCO <sub>3</sub>		Acidity (H <sup>+</sup> )		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium	Non-carbonate	Immediate	Potential free			
Oct. 27, 1953	3.9		5.4	0.10	36	11	67	4.3	100	26	118	0.1	0.8	340.	135	53	--	--	623	6.7	7
Dec. 8	5.1		6.5	.02	29	7.9	32	2.8	94	23	56	.2	1.2	212	105	28	--	--	381	7.2	4
Jan. 20, 1954	115		3.2	.11	26	7.8	33	3.0	37	36	68	.2	3.5	215	96	67	0.1	0.0	378	5.9	25
Feb. 24	33		4.3	.07	26	8.0	34	2.4	49	31	72	.1	1.4	211	98	58	--	--	393	7.0	1
Apr. 13	108		5.2	.01	19	5.7	21	2.2	40	22	44	.1	.7	147	70	38	--	--	273	6.6	3
May 20	130		7.3	.02	16	4.4	12	1.6	39	20	24	.1	1.1	101	57	26	.2	.0	192	6.4	2
June 28	14		6.3	.03	21	5.2	15	2.9	69	16	26	.1	2.5	136	74	17	--	--	239	6.9	8
Aug. 24	22		7.3	.04	25	6.7	17	3.2	70	28	30	.2	2.1	157	91	33	--	--	274	7.6	10
Sept. 30	33		7.2	.08	24	7.6	23	3.5	64	27	43	.1	1.4	170	92	39	--	--	312	7.3	10

## SCIOTO RIVER BASIN

## OLENTANGY RIVER NEAR DELAWARE, OHIO

LOCATION.--Temperature recorder 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.--287 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1954.

EXTREMES, 1943-54.--Water temperatures: Maximum, 81°; July 14; minimum, 35° F on several days during January and February.

EXTREMES, 1946-54.--Water temperatures: Maximum, 83° F June 29, 1952; minimum, freezing point on several days during winter months.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 133B.

Temperature (°F) of water, water year October 1953 to September 1954

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



SCIOTO RIVER BASIN--Continued  
SCIOTO RIVER AT CHILLICOTHE, OHIO

LOCATION.--Temperature recorder at gaging station at north end of Chillicothe, Ross County, 400 feet downstream from Bridge Street Bridge.  
DRAINAGE AREA.--3,847 square miles.

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

Water temperatures: October 1950 to September 1951, October 1953 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 89°F July 14; minimum, 34°F on several days during December and January.

EXTREMES, 1950-51, 1953-54.--Water temperatures: Maximum, 89°F July 14, 1954; minimum, freezing point on several days during December 1950, January, February 1951.

REMARKS.--records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperatures (°F) of water, water year October 1953 to September 1954  
(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	50	42	41	38	37	40	39	45	43	44	43	65	77	75	84	78	84	80	74	71	
2.....	--	--	54	51	41	40	38	37	40	39	44	43	45	43	67	75	73	85	79	81	77	74	70	
3.....	--	--	55	52	42	41	38	38	41	40	44	43	47	45	67	73	70	85	81	80	76	76	72	
4.....	--	--	54	52	45	42	38	38	40	39	43	41	47	46	63	68	71	86	84	80	78	76	72	
5.....	--	--	52	49	45	43	38	38	40	40	41	39	46	45	58	66	64	84	81	77	75	80	74	
6.....	--	--	49	46	45	44	38	37	40	39	40	38	50	46	57	68	64	83	78	76	73	82	76	
7.....	--	--	47	45	45	44	38	37	39	38	40	38	56	50	57	71	67	81	78	77	73	81	78	
8.....	--	--	46	44	44	42	38	37	39	38	43	40	58	56	58	75	70	81	76	75	72	79	76	
9.....	60	56	45	44	44	43	39	38	38	44	41	57	56	57	56	76	72	81	75	73	72	78	73	
10.....	61	56	46	44	44	43	39	38	40	38	46	43	56	54	79	74	81	75	74	70	77	73	73	
11.....	61	57	46	44	43	41	38	37	41	40	46	45	56	55	82	77	82	76	73	70	75	70	75	
12.....	62	58	45	45	42	41	37	34	40	39	46	45	55	53	60	56	84	79	83	77	73	69	72	
13.....	61	58	46	45	42	41	34	34	40	39	47	45	56	53	61	57	84	81	86	79	75	70	73	
14.....	61	58	45	43	41	41	34	34	42	39	47	45	58	55	63	60	83	79	80	81	74	71	74	
15.....	62	58	46	44	41	40	34	34	48	42	45	44	60	58	66	61	84	80	86	82	76	71	77	
16.....	62	59	46	44	40	38	34	34	50	48	45	42	60	58	69	63	82	79	84	79	77	74	77	
17.....	62	58	46	45	38	37	34	34	50	47	44	42	58	57	68	66	82	78	84	78	77	75	76	
18.....	61	58	46	44	37	35	34	34	47	45	46	43	57	56	69	65	79	76	82	79	75	73	78	
19.....	61	58	46	44	35	34	35	34	47	45	46	46	57	55	68	64	76	75	83	77	74	78	75	
20.....	62	58	47	45	36	34	38	35	48	46	46	45	59	57	64	62	77	75	84	78	76	71	78	
21.....	63	59	51	47	37	36	39	38	50	48	46	44	63	59	65	61	78	76	81	78	76	71	76	
22.....	63	60	50	49	39	37	39	38	50	48	45	44	64	62	66	61	81	77	78	74	78	73	71	
23.....	62	58	49	49	39	37	38	37	49	48	44	44	64	63	67	62	81	78	76	73	81	76	71	
24.....	61	58	49	48	37	36	38	38	48	48	46	44	63	61	71	65	81	77	73	73	83	78	69	
25.....	58	57	49	47	36	34	38	38	49	47	50	46	62	61	73	69	82	77	78	74	83	79	72	
26.....	58	55	47	44	35	34	41	38	49	47	51	49	65	62	71	69	83	78	80	75	81	79	73	
27.....	57	56	44	43	36	34	42	41	48	46	51	49	67	65	70	67	84	80	81	76	79	78	73	
28.....	57	55	43	42	36	36	41	40	47	45	53	50	67	64	71	69	82	77	83	77	78	76	73	
29.....	55	52	42	42	38	36	42	40	--	--	55	52	64	63	74	70	82	76	82	80	77	74	71	
30.....	53	50	42	42	38	38	42	42	--	--	54	48	65	64	76	70	80	76	85	79	79	76	74	
31.....	53	50	--	--	38	37	42	40	--	--	48	49	--	--	77	72	--	--	87	81	76	73	--	
Average.....	--	--	48	46	40	39	38	37	44	43	46	44	53	56	66	62	79	75	83	78	78	74	75	

## SCIOTO RIVER BASIN--Continued

## SCIOTO RIVER AT HIGBY, OHIO

LOCATION.--At gaging station at highway bridge three-quarters of a mile downstream from Walnut Creek and 1½ miles north of Higby, Ross County.

DRAINAGE AREA.--5,129 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1953 to September 1954.

Sediment records: October 1953 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 81°F June 13; minimum, freezing point Jan. 13.

Sediment concentrations: Maximum daily, 2,130 ppm July 21; minimum daily, 3 ppm

Nov. 24, Dec. 9, 15, Sept. 6, 28.

Sediment loads: Maximum daily, 55,700 tons July 21; minimum daily, 2 tons Dec. 9, Sept. 28.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, water year October 1953 to September 1954  
/Once-daily measurement at approximately 7 a.m./

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

SCIOTO RIVER BASIN--Continued

SCIOTO RIVER AT HIGBY, OHIO--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	268	13	9	285	17	13	612	14	23
2.....	266	15	11	275	7	5	546	13	19
3.....	266	14	10	280	7	5	405	12	13
4.....	262	12	8	272	16	12	352	11	10
5.....	254	12	8	278	16	12	330	8	7
6.....	270	14	10	280	15	11	316	8	7
7.....	268	18	13	278	13	10	295	8	6
8.....	275	20	15	275	16	12	306	4	3
9.....	270	20	14	272	15	11	312	3	2
10.....	266	13	9	272	11	8	323	5	4
11.....	262	13	9	270	13	9	352	8	8
12.....	252	14	10	278	18	14	375	6	6
13.....	262	18	13	280	23	17	344	7	6
14.....	262	13	9	280	21	16	352	7	7
15.....	275	22	16	280	21	13	375	3	3
16.....	278	25	19	268	13	9	447	8	10
17.....	280	22	17	275	12	9	430	10	12
18.....	272	19	14	272	12	9	390	9	9
19.....	262	18	13	280	13	10	357	14	13
20.....	266	18	13	290	12	9	344	13	12
21.....	262	17	12	302	12	10	330	11	10
22.....	264	18	13	298	7	6	330	10	9
23.....	264	18	13	309	4	3	330	10	9
24.....	262	18	13	352	3	3	357	17	16
25.....	264	18	13	415	8	9	323	18	16
26.....	262	14	10	380	10	10	309	13	11
27.....	272	12	9	447	14	17	292	8	6
28.....	282	13	10	626	20	34	285	10	8
29.....	302	18	15	654	18	32	302	14	11
30.....	330	12	11	605	18	29	306	15	12
31.....	295	12	10	--	--	--	316	14	12
Total.	8,395	--	369	9,928	--	367	11,043	--	300
	January			February			March		
1.....	309	11	9	661	20	36	661	13	23
2.....	306	8	7	592	16	26	788	18	38
3.....	298	13	10	546	20	29	1,100	19	56
4.....	278	15	11	510	23	32	1,510	54	220
5.....	290	15	12	492	17	22	1,550	47	197
6.....	295	14	11	486	15	20	1,370	30	111
7.....	298	12	10	464	13	16	1,250	22	74
8.....	298	12	10	420	13	15	1,070	13	38
9.....	306	10	8	415	12	13	1,080	18	52
10.....	316	9	8	400	13	14	1,200	22	71
11.....	292	13	10	400	12	13	1,460	28	110
12.....	290	13	10	385	10	10	1,880	66	335
13.....	280	17	13	370	8	8	2,010	80	434
14.....	288	14	11	362	10	10	1,610	38	165
15.....	309	13	11	344	7	6	1,330	23	82
16.....	323	8	7	348	7	6	1,150	27	84
17.....	357	8	8	352	11	11	1,010	23	63
18.....	375	17	17	362	16	16	916	18	44
19.....	375	12	12	420	20	23	848	8	18
20.....	415	16	18	452	9	11	1,090	28	s 87
21.....	788	58	123	586	12	19	1,870	96	485
22.....	1,270	90	309	586	9	14	2,740	159	1,180
23.....	1,000	50	135	626	9	15	2,660	108	776
24.....	742	47	94	932	18	45	2,090	53	299
25.....	654	38	67	870	15	35	1,640	28	124
26.....	605	29	47	765	17	35	1,460	22	87
27.....	592	30	48	712	18	35	1,410	23	88
28.....	712	23	44	654	13	23	1,230	19	63
29.....	1,110	18	54	--	--	--	1,260	24	82
30.....	1,060	20	57	--	--	--	4,410	249	s 4,280
31.....	832	21	47	--	--	--	10,300	690	20,300
Total.	15,663	--	1,238	14,512	--	658	56,553	--	30,066

s Computed by subdividing day.

## SCIOTO RIVER BASIN--Continued

## SCIOTO RIVER AT HIGBY, OHIO--Continued

Suspended sediment, water year October 1953 to September 1954--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.....	11,900	354	11,400	4,130	82	914	619	14	23
2.....	7,710	185	3,850	6,650	865	s 16,400	841	--	e 200
3.....	4,490	142	1,720	6,650	490	8,800	1,420	42	161
4.....	3,180	114	973	6,860	276	5,110	1,200	35	113
5.....	2,410	103	670	5,440	144	2,120	1,180	52	166
6.....	2,330	83	585	4,310	104	1,210	1,150	27	84
7.....	2,660	124	890	3,500	92	869	1,040	23	64
8.....	3,080	137	1,140	3,250	80	702	892	22	53
9.....	3,420	98	905	2,820	62	472	810	21	46
10.....	3,860	110	1,150	2,820	57	434	832	21	47
11.....	3,880	117	1,220	2,740	67	496	848	22	50
12.....	3,250	103	904	2,490	53	356	758	20	41
13.....	2,570	77	534	2,170	40	234	765	26	54
14.....	2,410	68	442	1,830	34	168	1,090	25	74
15.....	3,860	--	e 3,000	1,610	30	130	832	37	83
16.....	4,580	590	s 9,390	1,440	33	128	772	97	s 230
17.....	9,740	1,940	51,000	1,300	35	123	3,300	--	e 18,000
18.....	12,100	471	15,400	1,240	48	161	7,490	870	17,600
19.....	11,700	227	7,170	1,170	47	148	10,200	634	17,500
20.....	9,280	165	4,130	1,060	36	103	7,710	320	6,860
21.....	6,860	118	2,180	988	32	85	5,440	228	3,350
22.....	4,400	92	1,090	940	31	79	3,250	153	1,340
23.....	3,420	87	803	862	27	63	2,090	87	491
24.....	7,610	190	s 4,350	788	27	57	1,550	53	222
25.....	9,980	248	6,680	742	26	56	1,260	33	112
26.....	7,070	142	2,710	712	18	35	1,060	27	77
27.....	5,080	112	1,530	690	12	22	932	27	68
28.....	4,780	125	1,610	898	30	s a 65	818	23	51
29.....	3,950	140	1,490	772	96	s 209	728	13	26
30.....	4,130	93	1,040	675	13	24	668	12	22
31.....	--	--	--	682	12	22	--	--	--
Total.	165,630	--	139,958	72,029	--	39,795	61,545	--	67,008
	July			August			September		
1.....	612	13	21	574	20	31	693	15	28
2.....	566	13	20	574	12	18	651	10	18
3.....	540	13	19	567	12	18	602	8	13
4.....	516	9	12	630	14	24	547	4	6
5.....	522	8	11	1,110	212	s 903	495	4	5
6.....	598	10	16	1,770	530	2,530	440	3	4
7.....	605	13	21	2,010	164	890	405	8	9
8.....	566	18	28	1,830	87	430	395	17	18
9.....	586	22	35	1,400	60	227	386	12	12
10.....	534	23	33	1,200	53	172	390	12	13
11.....	486	30	39	976	52	137	382	13	13
12.....	452	39	48	820	38	84	362	17	17
13.....	436	43	51	708	28	54	350	8	8
14.....	410	16	18	623	15	25	340	7	6
15.....	415	12	13	574	10	15	318	13	11
16.....	528	11	16	616	10	17	315	14	12
17.....	619	13	22	724	18	35	318	13	11
18.....	492	13	17	679	15	27	318	12	10
19.....	835	--	e 950	798	23	--	49	32	17
20.....	880	188	s 485	1,620	--	--	e 2,000	326	12
21.....	4,950	2,130	s 55,700	2,330	400	sa 3,200	362	8	8
22.....	9,280	978	s 29,400	1,180	88	280	358	14	14
23.....	4,490	298	3,610	844	44	100	346	14	13
24.....	2,570	142	965	772	26	54	340	9	8
25.....	1,630	62	273	672	23	42	326	5	4
26.....	1,160	42	132	900	32	78	312	8	7
27.....	940	27	68	1,240	60	201	300	14	11
28.....	796	23	49	1,360	42	154	297	3	2
29.....	693	21	39	1,170	33	104	291	7	5
30.....	616	18	30	949	27	69	300	15	12
31.....	560	17	26	772	26	54	--	--	--
Total.	38,883	--	92,187	31,990	--	12,022	11,591	--	323
Total discharge for year (cfs-days).....									497,762
Total load for year (tons).....									384,189

e Estimated.

s Computed by subdividing day.

a Computed from partly estimated concentration graph.

SCIOTO RIVER BASIN--Continued  
SCIOTO RIVER AT HIGBY, OHIO--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954  
(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	Discharge (cfs)	Water temperature (°F)	Suspended sediment										Methods of analysis		
				Concentration of sample (ppm)	Concentration of suspended (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
Apr. 1 1954	10:30 a. m.	12,400		364	975	56	70	74	90	93	98	100				BSWCM
Apr. 16	8:15 p. m.	7,290		1,210	1,450	38	48	62	78	82	99	--				BSWCM
Apr. 16	10:00 p. m.	7,830		1,510	1,640	36	43	58	74	80	98	--				BSWCM
Apr. 17	7:00 a. m.	9,690		2,380	1,861	17	26	46	66	81	96	97				BSWCM
Apr. 18	7:00 a. m.	11,200		527	634	53	58	66	79	89	94	--				BSWCM
May 2	7:00 a. m.	7,710		1,270	875	38	48	64	81	93	99	--				BSWCM
May 3	7:00 a. m.	6,440		538	642	60	62	74	90	97	98	--				BSWCM
June 17	7:00 a. m.	4,130		2,560	1,720	51	67	84	96	99	100	--				BSWCM
June 18	7:00 a. m.	7,280		1,290	749	52	67	80	89	96	99	--				BSWCM
June 18 <sup>a</sup>	4:20 p. m.	8,370		719	749	60	74	85	92	93	99	--				BSWCM
June 21	11:20 a. m.	5,440		240	755	63	71	84	92	97	99	--				BSWCM
July 21	7:00 p. m.	10,200		5,800	3,980	31	45	65	88	98	99	--				BSWCM
July 21	7:00 p. m.	10,200		5,800	3,980	7	12	21	38	73	100	--				BSNM
July 22	7:00 a. m.	11,200		785	584	46	58	73	87	97	100	--				BSWCM
Aug. 6	7:00 a. m.	1,930		608	856	72	83	92	98	99	100	--				BSWCM

<sup>a</sup> Average of individual analyses of samples from 4 verticals.

LITTLE MIAMI RIVER BASIN  
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 --10.6 square miles.  
RECORDS AVAILABLE --Chemicals: 1952 to September 1954.

Water temperatures: August 1952 to September 1954.  
Sediment records: September 1952 to September 1954.

EXTREMES 1953-54 --Dissolved solids: Maximum, 456 ppm Dec. 11-15, 17-20; minimum, 314 ppm June 17-19.

Hardness: Maximum, 404 ppm Oct. 21-31; minimum, 260 ppm June 17-19.

Specific conductance: Maximum daily, 812 micromhos Dec. 19; minimum daily, 427 micromhos Apr. 8.

Water temperatures: Maximum, 80°F, several days during June and July; minimum, 36°F Jan. 1.

Sediment concentrations: Maximum daily, 412 ppm Apr. 8; minimum daily, 1 ppm on several days during February.

Sediment loads: Maximum daily, 108 tons, Apr. 8; minimum daily, less than 0.05 ton on many days during February.

EXTREMES 1952-54 --Dissolved solids: Maximum, 456 ppm Dec. 11-15, 17-20, 1953; minimum, 300 ppm Aug. 1-10, 1953.

Hardness: Maximum, 404 ppm Oct. 21-31, 1953; minimum, 260 ppm Jan. 17-19, 1954.

Specific conductance: Maximum daily, 812 micromhos Dec. 19, 1953; minimum daily, 257 micromhos Aug. 2, 1953.

Water temperatures: Maximum, 80°F on several days during summer months; minimum, 35°F Dec. 27, 1952, Mar. 2, 5, 1953.

Sediment concentrations: Maximum daily, 412 ppm Apr. 8, 1954; minimum daily, 1 ppm on several days during May 1953, February 1954.

Sediment loads: Maximum daily, 180 tons Mar. 4, 1953; minimum daily, less than 0.05 ton on many days during October 1952, January, May, October to December 1953.

REMARKS --Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1953 to September 1954 given in WSP 1335. Flow affected by ice Jan. 11-13, 22, Feb. 4-7.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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	Sodium to adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Color		
														Tons per million	Tons per acre-foot	Tons per day							Calcium, magnesium	Non-carbonate
Oct. 1-10, 1953	1.48	13	0.02	91	37	5.2	1.1	306	116	7.0	0.2	1.3	0.00	424	380	128	670	7.5	1	670	7.5	1		
Oct. 11-20	1.60	11	.03	96	39	5.4	1.1	332	116	6.0	0.2	1.9	.00	438	402	128	693	7.6	1	693	7.6	1		
Oct. 21-31	1.73	11	.03	100	38	5.3	1.3	336	115	5.5	0.2	1.7	.00	445	404	130	697	7.7	1	697	7.7	1		
Nov. 1-10	1.87	11	.02	99	37	5.9	1.5	335	114	5.8	0.2	1.6	.00	454	400	125	703	7.8	5	703	7.8	5		
Nov. 11-20	2.35	9.5	.03	98	34	5.7	1.3	337	110	5.4	1.1	1.6	.00	443	386	108	698	7.8	2	698	7.8	2		
Nov. 21-30	2.59	8.2	.04	89	36	6.5	1.2	331	105	6.6	1.1	1.6	.00	424	371	99	676	7.7	4	676	7.7	4		
Dec. 1-10	2.52	8.9	.05	90	35	7.1	1.4	327	103	6.3	2.0	2.0	.00	421	367	100	670	7.7	4	670	7.7	4		
Dec. 11-15, 17-20	2.53	11	.00	97	37	7.3	1.1	342	103	7.0	2.1	2.0	.00	456	393	110	714	7.9	2	714	7.9	2		
Dec. 21-31	2.72	8.6	.00	94	35	7.3	1.0	347	105	7.4	1.1	2.3	.00	445	381	98	699	7.9	4	699	7.9	4		
Jan. 1-10, 1954	2.31	6.2	.02	89	35	6.2	1.2	321	103	6.5	2.0	2.0	.00	411	367	103	660	7.8	1	660	7.8	1		
Jan. 11-20	3.00	5.3	.04	94	37	7.0	1.5	340	103	9.0	2.2	2.2	.00	433	385	108	692	7.7	1	692	7.7	1		
Jan. 21-31	7.65	8.0	.02	86	34	8.4	2.0	294	107	9.0	3.0	6.2	.04	419	358	113	660	7.6	5	660	7.6	5		
Feb. 1-10	5.47	7.4	.03	86	36	6.6	1.1	320	105	7.0	2.0	1.9	.00	425	374	110	674	7.6	5	674	7.6	5		
Feb. 11-20	5.69	7.5	.04	86	36	7.6	1.4	312	103	8.2	3.0	1.9	.01	402	362	107	655	7.7	7	655	7.7	7		
Feb. 21-28	8.56	6.6	.05	86	35	7.1	1.3	312	99	8.2	3.0	1.9	.03	406	358	103	650	7.9	7	650	7.9	7		

Mar. 1-10, 1954	14.6	8.2	.03	81	34	6.2	1.1	277	93	8.8	.3	8.0	.01	390		342	115	627	7.5	4
Mar. 11-20	12.5	8.7	.02	81	33	6.6	1.1	289	91	8.2	.3	4.5	.01	387		338	101	624	7.8	4
Mar. 21-31	19.1	14	.02	78	32	7.1	1.0	280	87	8.6	.3	8.1	.01	380		327	97	606	7.6	4
Apr. 1-10	34.8	6.5	.03	72	31	5.6	1.3	252	82	8.5	.3	9.9	.02	346		309	101	566	7.5	8
Apr. 11-20	45.3	9.2	.04	72	30	4.7	1.1	247	81	9.2	.4	16	.00	350		304	101	578	7.5	1
Apr. 21-30	34.5	7.1	.02	77	30	4.7	1.1	262	82	8.8	.4	13	.00	362		317	101	589	7.7	2
May 1-10	18.7	6.3	.01	83	31	5.3	1.9	287	90	8.2	.3	6.5	.02	367		336	99	629	7.6	5
May 11-20	12.9	7.6	.01	73	34	6.0	1.1	272	96	8.0	.3	1.9	.01	373		322	99	604	7.3	5
May 21-31	7.62	9.0	.02	78	36	6.8	1.7	288	100	7.5	.4	1.1	.03	392		343	107	641	7.6	10
June 1-10	7.81	12	.03	82	33	6.5	1.1	286	94	8.5	.3	4.9	.03	408		340	78	642	7.7	10
June 11-16	6.78	15	.01	80	33	6.3	1.2	296	93	7.2	.3	2.8	.02	402		336	93	621	7.7	8
June 17-19	28.3	12	.01	60	21	5.0	2.1	216	61	8.5	.4	21	.03	314		200	84	506	7.3	12
June 20-30	8.65	12	.03	72	33	5.7	1.1	282	84	8.2	.3	4.9	.01	374		316	94	597	7.8	10
July 1-10	3.72	12	.02	72	33	6.9	1.3	282	89	7.6	.2	1.0	.01	392		327	92	618	7.8	10
July 11-20	1.63	12	.00	68	35	6.6	1.7	260	107	7.2	.2	.8	.01	383		316	100	605	7.7	8
July 21-31	1.13	14	.00	69	37	6.5	1.6	264	111	7.0	.3	1.5	.00	391		325	108	609	7.8	5
Aug. 1-10	1.79	13	.01	76	35	6.5	1.7	266	116	7.0	.3	1.2	.00	396		322	116	619	7.7	5
Aug. 12-20	1.66	13	.01	76	35	6.4	2.0	266	111	6.9	.3	3.5	.01	392		333	116	616	8.0	12
Aug. 21-31	5.84	13	.01	82	33	6.7	2.3	274	114	6.7	.3	3.0	.02	402		342	116	633	8.0	10
Sept. 1-10	2.02	13	.00	86	38	6.5	1.6	284	131	6.1	.2	.5	.02	432		364	123	667	7.8	4
Sept. 11-20	2.07	13	.01	84	38	6.7	1.6	286	122	6.2	.2	.5	.02	432		361	123	657	8.0	6
Sept. 21-30	1.75	14	.02	86	36	7.2	2.1	288	122	5.2	.1	.1	.01	433		361	127	658	8.0	13
Time-weighted average <sup>a</sup>	8.44	10	0.02	83	35	6.4	1.4	296	103	7.3	0.2	3.5	0.01	406		351	108	645	--	5

<sup>a</sup> Represents 99 percent of days and 100 percent of runoff.

LITTLE MIAMI RIVER BASIN--Continued  
 LITTLE MIAMI RIVER NEAR SELMA, OHIO--Continued  
 Temperature (°F) of water, water year October 1953 to September 1954  
 /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	61	51	47	39	38	38	36	40	38	45	42	48	46	63	62	72	70	80	77	79	77	71	85
2.....	62	58	52	49	40	38	39	37	41	38	43	42	48	45	64	63	70	68	80	78	78	76	71	87
3.....	64	60	53	48	43	39	39	39	41	41	43	38	47	47	64	61	68	66	78	76	77	73	71	89
4.....	64	62	52	48	48	43	39	38	41	41	38	38	47	46	61	57	67	62	77	75	75	73	72	70
5.....	63	57	48	42	45	44	39	38	41	41	39	38	46	45	57	55	63	60	78	75	75	71	73	71
6.....	58	54	43	38	48	44	38	37	41	41	40	38	50	46	57	56	67	63	78	75	72	70	73	72
7.....	56	49	41	39	45	40	39	38	41	41	41	39	50	48	58	57	70	66	77	75	72	71	74	73
8.....	56	49	41	37	43	40	39	38	41	37	42	40	53	50	58	56	72	70	75	72	72	71	75	73
9.....	57	51	42	40	46	43	41	38	40	38	43	42	52	50	57	56	73	69	75	72	71	70	75	71
10.....	57	52	43	41	46	42	41	38	41	39	44	43	51	50	56	54	75	72	75	72	76	71	73	71
11.....	58	53	44	39	42	41	38	38	41	41	44	44	52	51	56	55	76	74	76	73	74	70	73	70
12.....	58	56	44	43	42	41	38	37	41	41	44	43	53	52	58	56	78	75	78	75	72	68	70	67
13.....	57	52	45	43	42	42	37	37	41	39	44	43	54	53	59	57	78	76	79	76	72	70	70	67
14.....	57	53	45	41	42	38	37	37	41	38	44	43	54	54	61	58	78	76	80	77	72	70	70	68
15.....	58	54	47	41	38	37	37	37	46	41	43	42	55	54	62	59	78	76	80	78	72	70	72	70
16.....	58	54	47	44	39	38	37	37	49	46	43	42	57	55	62	61	78	76	79	75	73	72	72	70
17.....	57	53	48	44	39	38	38	37	48	46	44	43	56	53	64	62	77	74	78	75	73	72	72	70
18.....	57	53	48	44	39	38	38	37	46	45	44	43	54	54	65	63	76	74	78	76	72	70	72	70
19.....	58	53	48	45	38	37	37	37	46	44	45	45	54	54	63	61	78	74	78	74	73	71	73	72
20.....	58	55	51	47	38	37	37	36	47	45	45	45	57	54	62	60	79	76	78	76	73	72	73	71
21.....	58	56	52	51	38	38	38	37	46	45	45	44	57	57	62	60	79	77	78	76	74	70	73	69
22.....	58	56	51	48	38	37	37	37	46	46	44	44	59	57	63	60	79	77	77	73	75	73	69	66
23.....	58	54	49	47	39	38	37	37	46	45	44	44	59	59	64	62	78	75	77	74	76	72	68	64
24.....	57	53	47	46	39	37	37	37	46	45	44	44	59	57	66	64	78	75	77	74	73	71	67	64
25.....	55	53	46	41	37	37	38	37	46	45	46	44	60	58	66	66	79	76	77	74	75	73	68	66
26.....	56	51	41	38	37	37	37	37	46	44	48	46	63	61	66	64	79	77	77	75	74	72	68	66
27.....	55	53	38	39	37	37	46	39	46	45	48	46	63	63	64	62	80	78	78	75	73	72	68	66
28.....	59	49	38	37	38	38	40	39	45	45	48	46	63	62	66	64	79	75	79	76	73	72	70	67
29.....	49	46	38	38	39	38	40	40	--	--	48	48	62	60	69	66	78	75	79	78	74	72	70	69
30.....	49	44	38	38	39	39	41	39	--	--	48	47	62	60	70	67	79	76	80	78	74	72	70	68
31.....	50	45	45	--	--	--	--	--	--	--	47	45	--	--	72	69	--	--	80	79	73	67	--	--
Average.....	57	53	46	43	41	39	38	38	44	42	44	43	55	53	62	60	75	73	78	75	74	71	71	68



## LITTLE MIAMI RIVER BASIN--Continued

## LITTLE MIAMI RIVER NEAR SELMA, OHIO--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	1.3	26	0.1	1.6	6	(t)	2.4	17	0.1
2.....	1.3	27	.1	1.6	11	(t)	2.4	29	.2
3.....	1.3	24	.1	1.6	16	0.1	2.4	23	.1
4.....	1.3	27	.1	1.6	16	.1	2.4	8	.1
5.....	1.6	30	.1	1.8	19	.1	2.1	8	(t)
6.....	1.6	30	.1	1.8	10	(t)	2.6	16	.1
7.....	1.6	17	.1	2.1	18	.1	2.4	9	.1
8.....	1.6	14	.1	2.1	8	(t)	2.4	4	(t)
9.....	1.6	30	.1	2.1	4	(t)	2.9	12	.1
10.....	1.6	56	.2	2.4	10	.1	3.2	17	.1
11.....	1.6	58	.2	2.4	12	.1	2.6	10	.1
12.....	1.6	53	.2	2.4	12	.1	2.4	8	.1
13.....	1.6	40	.2	2.4	11	.1	2.4	5	(t)
14.....	1.6	48	.2	2.4	7	(t)	3.2	9	.1
15.....	1.6	48	.2	2.4	8	.1	3.2	11	.1
16.....	1.6	48	.2	2.4	13	.1	2.4	15	a.1
17.....	1.6	35	.2	2.2	10	.1	2.4	20	.1
18.....	1.6	30	.1	2.1	6	(t)	2.1	19	a.1
19.....	1.6	28	.1	2.4	5	(t)	2.1	17	a.1
20.....	1.6	47	.2	2.4	10	.1	2.4	14	a.1
21.....	1.6	42	.2	2.4	15	.1	2.6	14	.1
22.....	1.6	28	.1	2.9	16	.1	3.5	19	.2
23.....	1.6	17	.1	3.2	23	.2	3.2	23	.2
24.....	1.6	33	.1	2.6	17	.1	2.6	25	.2
25.....	1.6	32	.1	2.6	17	.1	2.4	21	.1
26.....	1.6	23	.1	2.4	8	.1	2.6	20	.1
27.....	2.1	27	.2	2.6	8	.1	2.6	34	.2
28.....	2.1	30	.2	2.4	7	(t)	2.6	45	a.3
29.....	1.8	16	.1	2.4	15	.1	2.6	49	.3
30.....	1.6	8	(t)	2.4	20	.1	2.6	39	.3
31.....	1.8	4	(t)	--	--	--	2.6	9	.1
Total.	49.8	--	4.2	68.1	--	2.5	80.3	--	4.0
	January			February			March		
1.....	2.2	6	(t)	6.0	9	0.1	13	3	0.1
2.....	2.1	23	0.1	6.0	12	.2	15	5	.2
3.....	2.1	42	.2	6.0	9	.1	23	17	1.0
4.....	2.1	14	.1	5.7	5	.1	18	8	.4
5.....	2.4	15	.1	5.7	5	.1	13	7	.2
6.....	2.4	14	.1	5.3	5	.1	11	7	.1
7.....	2.4	8	.1	5.0	5	.1	13	5	.2
8.....	2.4	15	.1	5.0	5	.1	15	6	.2
9.....	2.6	23	.2	5.0	5	.1	13	10	.4
10.....	2.4	9	.1	5.0	5	.1	12	10	.3
11.....	2.2	16	.1	5.0	9	.1	11	9	.3
12.....	2.0	6	(t)	4.6	6	.1	11	7	.1
13.....	1.9	8	(t)	4.3	11	.1	10	6	.2
14.....	2.4	21	.1	4.3	7	.1	9.7	10	.3
15.....	3.2	16	.1	4.6	7	.1	7.7	6	.1
16.....	4.0	11	.1	5.0	8	.1	6.8	8	.1
17.....	2.9	6	(t)	7.3	4	.1	7.3	6	.1
18.....	2.6	10	.1	7.3	1	(t)	6.8	9	.2
19.....	2.9	8	.1	6.8	1	(t)	9.3	14	.4
20.....	5.9	21	.3	7.7	1	(t)	45	68	6.8
21.....	11	8	.2	10	2	.1	34	21	1.9
22.....	7	10	.2	11	1	(t)	25	10	.7
23.....	6.0	9	.1	9.1	1	(t)	22	8	.5
24.....	5.3	8	.1	8.1	1	(t)	19	9	.5
25.....	5.0	6	.1	7.7	2	(t)	19	13	.7
26.....	5.7	14	.2	7.7	2	(t)	17	9	.4
27.....	12	12	.4	6.8	2	(t)	14	8	.3
28.....	10	3	.1	8.1	3	.1	14	16	.6
29.....	8.6	2	(t)	--	--	--	15	18	.7
30.....	7.3	3	.1	--	--	--	16	10	.4
31.....	6.4	4	.1	--	--	--	15	9	.4
Total.	137.4	--	3.8	180.1	--	2.2	480.6	--	20.8

s Computed by subdividing day.

t Less than 0.05 ton.

a Computed from estimated concentration graph.

LITTLE MIAMI RIVER BASIN--Continued

LITTLE MIAMI RIVER NEAR SELMA, OHIO--Continued

Suspended sediment, water year October 1953 to September 1954--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.....	13	7	0.2	23	20	1.2	9.1	15	0.4		
2.....	13	10	.4	23	14	.9	9.6	5	.1		
3.....	11	9	.3	22	12	.7	7.5	3	.1		
4.....	11	7	.2	19	10	.5	7.1	6	.1		
5.....	16	14	.6	18	10	.5	6.6	11	.2		
6.....	52	71	s 11	17	7	.3	6.2	17	.3		
7.....	52	55	7.7	17	10	.4	5.3	6	.1		
8.....	83	412	s 108	16	20	.9	8.6	27	.6		
9.....	56	55	8.3	16	21	.9	11	29	.9		
10.....	41	24	2.6	16	29	1.2	7.1	10	.2		
11.....	34	21	1.9	16	25	1.1	6.6	6	.1		
12.....	27	15	1.1	15	20	.8	6.2	6	.1		
13.....	23	13	.8	14	18	.7	5.3	5	.1		
14.....	21	14	.8	13	15	.5	5.3	5	.1		
15.....	26	24	1.7	13	19	.7	5.3	7	.1		
16.....	60	104	s 28	13	18	.6	12	40	sb 4		
17.....	110	103	s 34	12	13	.4	39	106	11		
18.....	65	26	4.6	11	16	.5	27	47	3.4		
19.....	49	30	4.0	11	20	.6	19	29	1.5		
20.....	38	25	2.6	11	20	.6	13	13	.4		
21.....	33	29	2.6	9.6	13	.3	10	18	.5		
22.....	30	23	1.9	9.1	10	.2	11	23	.7		
23.....	48	16	2.1	8.5	13	.3	14	30	1.1		
24.....	52	22	3.1	7.5	13	.3	10	15	.4		
25.....	41	16	1.8	7.5	13	.3	8.0	16	.3		
26.....	34	15	1.4	7.1	13	.2	7.5	23	.5		
27.....	32	20	1.7	7.1	15	.3	7.1	19	.4		
28.....	28	19	1.4	7.1	22	.4	6.2	19	.3		
29.....	24	20	1.3	7.5	15	.3	5.7	26	.4		
30.....	23	20	1.2	6.6	14	.2	4.9	19	.2		
31.....	--	--	--	6.2	17	.3	--	--	--		
Total..	1,146	--	237.3	399.8	--	17.1	301.2	--	28.6		
July			August			September					
1.....	4.5	22	0.3	0.7	41	0.1	2.7	13	0.1		
2.....	4.1	40	.4	1.0	35	.1	2.4	19	.1		
3.....	3.3	55	a.5	1.2	38	.1	2.1	26	.1		
4.....	3.7	59	.6	.8	32	.1	2.1	13	.1		
5.....	4.1	67	.7	5.6	27	.4	1.8	16	.1		
6.....	3.7	50	.5	3.0	33	.3	1.6	34	.1		
7.....	4.1	58	.6	1.6	39	.2	1.8	25	.1		
8.....	3.7	69	.7	1.4	31	.1	2.1	45	.2		
9.....	3.0	56	.4	1.4	34	.1	1.8	32	.2		
10.....	3.0	57	.5	1.2	35	.1	1.8	37	.2		
11.....	2.4	80	.5	1.0	34	.1	1.8	30	.1		
12.....	2.1	73	.4	.8	38	.1	1.8	25	.1		
13.....	1.8	38	.2	.8	38	.1	1.6	26	.1		
14.....	1.6	44	.2	1.2	20	.1	1.6	27	.1		
15.....	1.8	36	.2	3.0	25	.2	1.6	25	.1		
16.....	1.6	45	.2	2.1	11	.1	1.6	27	.1		
17.....	1.4	46	.2	1.6	7	.3	1.6	25	.1		
18.....	1.6	37	.2	1.8	14	.1	1.6	25	.1		
19.....	2.4	45	.3	1.8	8	(t)	3.0	24	.2		
20.....	1.6	37	.2	1.8	18	.1	4.5	19	.2		
21.....	2.1	45	.2	1.8	27	.1	2.7	19	.1		
22.....	1.8	36	.2	1.6	27	.1	2.1	8	(t)		
23.....	1.4	32	.1	5.6	30	b.4	1.8	11	.1		
24.....	1.2	24	a.1	5.3	23	.3	1.6	16	.1		
25.....	1.0	18	(t)	5.3	16	.2	1.6	21	.1		
26.....	1.0	26	.1	20	20	b1	1.4	13	(t)		
27.....	1.0	25	.1	7.5	10	.2	1.4	13	(t)		
28.....	.8	25	.1	4.9	10	.1	1.4	24	.1		
29.....	.7	28	.1	3.7	6	.1	1.4	24	.1		
30.....	.7	25	(t)	3.3	6	.1	2.1	30	.2		
31.....	.7	24	(t)	3.0	16	.1	--	--	--		
Total..	67.9	--	8.9	95.8	--	5.5	58.4	--	3.4		

Total discharge for year (cfs-days) ..... 3,065.4

Total load for year (tons) ..... 338.3

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

Particle-size analyses of suspended sediment, water year October 1953 to September 1954

(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	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			0.500
Apr. 8, 1954.....	9:00 a.m.	127		819	783	62	77	88	95	98	99					BSWCM
Apr. 8.....	4:00 p.m.	83		351	610	77	84	90	94	97	96					BSWCM
Apr. 16.....	8:00 p.m.	124		248	700	52	58	69	82	94	96					BSWCM
Apr. 17.....	2:15 a.m.	136		256	636	60	67	76	87	95	97					BSWCM

LITTLE MIAMI RIVER BASIN--Continued  
 NORTH FORK LITTLE MIAMI RIVER NEAR PITCHIN, OHIO

LOCATION--At gaging station at bridge on Jackson Road, 1.1 miles upstream from Goose Creek, and 1.3 miles southwest of Pitchin, Clark County.

GRAINAGE AREA--3.9 square miles.

RECORDS AVAILABLE--Chemical analyses: October 1953 to September 1954.

Water temperatures: August 1952 to September 1954.

EXTREMES: 1953-54.--Dissolved solids: Maximum, 411 ppm Jan. 17; minimum, 170 ppm June 17.

Hardness: Maximum, 367 ppm Jan. 22; minimum, 116 ppm June 17.

Specific conductance: Maximum, 441, 733, 733, 733 micromhos Jan. 13; minimum daily, 242 micromhos June 17.

Water temperatures: Maximum, 86°F daily 13 minimum, freezing point on several days during December, January, February and March.

Sediment loadings: Minimum, 86 tons daily 17; maximum daily, 1 ppm Dec. 30.

Sediment loads: Maximum daily, 75 tons June 17; minimum daily, 1 ppm Dec. 30.

EXTREMES: 1952-54.--Water temperatures: Maximum, 87°F Sept. 1953; minimum, freezing point on many days during October to March and September.

Sediment concentrations: Maximum daily, 668 ppm Feb. 10; 1953: minimum daily, 1 ppm Feb. 9-10, Dec. 30, 1953.

Sediment loads: Maximum daily, 75 tons June 17, 1954; minimum daily, less than 0.05 ton on many days during October to December 1952, February, September to December 1953.

REMARKS--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1953 to September 1954 given in WSP 1333. Flow affected by ice Jan. 1, 11, 22-23, Mar. 3-7.

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)	Color or pH	
														Parts per million	Tons per acre-foot					Calcium
Oct. 1-10, 1953	1.04	9.4	0.02	75	35	3.4	1.9	298	79	5.2	0.2	1.8	0.00	367	87	332	87	597	7.5	6
Oct. 11-20	1.12	9.4	0.02	76	35	3.3	1.5	300	75	5.5	0.2	1.2	0.00	351	88	334	88	590	7.5	5
Oct. 21-31	1.36	9.7	0.05	78	33	3.3	1.9	300	73	5.0	0.2	0.8	0.00	354	84	330	84	591	7.5	5
Nov. 1-10	1.35	10	0.01	79	36	3.6	1.2	316	73	5.6	1	1.5	0.00	375	86	345	86	613	7.5	6
Nov. 11-20	1.35	10	0.03	82	34	3.3	1.2	322	73	5.5	1	1.4	0.00	371	81	343	81	617	7.7	3
Nov. 21-30	1.51	9.4	0.05	63	40	3.6	1.2	308	73	5.3	1	1.5	0.00	353	69	322	69	590	7.7	4
Dec. 1-10	1.47	9.2	0.04	79	32	4.0	1.1	314	69	6.4	1	1.8	0.00	358	71	330	71	600	7.7	5
Dec. 11-20	1.44	9.4	0.01	81	35	3.8	1.2	328	71	6.1	1	2.3	0.00	376	77	346	77	620	7.7	2
Dec. 21-31	1.91	9.3	0.00	84	33	3.6	1.4	336	72	5.8	1	2.8	0.01	379	70	345	70	624	7.8	1
Jan. 1-10, 1954	1.26	7.0	0.01	79	33	3.9	0.9	324	67	6.5	1	2.7	0.00	352	67	334	67	598	7.7	1
Jan. 11-20	1.53	7.0	0.01	82	34	3.5	1.6	338	69	7.0	1	3.9	0.00	368	67	343	67	626	7.8	1
Jan. 21-31	6.17	8.3	0.02	90	34	3.3	1.1	296	103	5.5	2	8.4	0.00	411	122	364	122	646	7.6	5
Feb. 2-10	3.29	6.9	0.02	83	35	3.3	1.0	316	76	5.0	2	3.0	0.00	379	92	352	92	616	7.4	3
Feb. 12-20	3.57	6.8	0.03	78	34	6.9	1.2	310	76	5.5	1	2.1	0.00	352	80	337	80	597	7.6	5
Feb. 21-28	5.36	6.2	0.05	80	35	4.0	1.1	300	84	5.8	2	3.5	0.00	366	98	341	98	607	7.8	5
Mar. 1-10	7.44	11	0.02	85	34	4.2	1.1	307	89	6.6	2	6.6	0.00	392	100	352	100	633	7.8	5
Mar. 11-20	7.20	12	0.01	80	34	4.4	0.9	300	82	6.0	2	3.8	0.00	375	94	340	94	613	7.8	4
Mar. 21-26, 28-31	8.71	11	0.01	77	33	5.3	1.0	282	83	7.4	3	8.0	0.02	367	97	328	97	597	7.6	6

Apr 1-10, 1954	16.5	9.9	.03	75	32	4.7	1.2	267	81	7.2	.2	10	.02	356	321	100	579	7.8	7
Apr 11-20	20.2	11	.05	75	32	4.7	1.2	269	82	8.0	.3	11	.00	372	319	98	587	7.4	1
Apr 21-30	19.1	15.8	.05	76	29	3.6	1.2	271	85	6.9	.3	7.7	.00	364	309	87	589	7.7	1
May 1-10	6.81	7.8	.01	83	35	3.6	1.0	301	91	6.5	.2	4.3	.00	389	348	100	631	7.4	6
May 11-20	6.88	14	.00	74	35	4.2	1.6	282	87	6.2	.2	2.5	.00	372	330	89	603	7.4	5
May 21-22, 24-31	4.78	15	.02	73	36	4.6	1.5	286	83	6.0	.2	1.5	.01	365	330	96	605	7.7	6
June 1-10	6.20	11	.01	79	34	3.8	1.8	297	81	5.5	.2	3.4	.01	372	336	94	612	7.6	6
June 11-16	4.50	9.9	.00	72	35	3.9	1.5	302	76	5.4	.0	4.3	.00	387	325	76	608	7.6	2
June 17	35.0	7.2	.20	29	11	2.0	3.1	108	26	5.2	.0	5.9	.01	170	116	31	242	7.2	2
June 18-30	5.15	12	.01	71	32	3.8	1.4	278	79	6.0	.2	5.7	.01	359	310	83	581	7.7	10
July 1-10	2.40	8.1	.01	68	34	3.6	1.0	274	84	5.8	.1	3.6	.01	353	311	85	580	7.7	10
July 11-15, 17-20	1.73	7.8	.02	72	35	3.5	1.2	282	90	5.8	.1	3.1	.00	370	326	92	603	7.8	9
July 21-31	1.37	9.8	.01	74	37	3.4	1.3	286	89	6.0	.2	3.5	.00	377	339	94	615	7.8	5
Aug 1-10	1.39	8.9	.00	76	35	3.2	2.0	284	94	6.5	.2	3.0	.00	375	335	101	608	7.8	5
Aug 11-20	1.32	9.0	.01	75	34	3.3	1.8	278	89	5.8	.2	2.0	.01	361	329	99	592	8.1	10
Aug 21-31	2.80	11	.01	77	34	3.3	1.8	287	86	5.5	.2	3.1	.01	368	331	97	586	8.1	8
Sept 1-10	1.12	11	.02	76	36	3.7	1.7	305	83	5.8	.1	1.1	.03	379	338	88	612	7.1	4
Sept 11-20	.96	9.4	.02	78	37	3.6	1.4	308	82	5.8	.1	1.0	.00	378	348	96	609	7.2	2
Sept 21-30	.55	10	.01	75	36	3.5	1.9	288	82	6.0	.1	2.0	.06	387	337	91	599	8.1	7
Time-weighted average	4.61	9.6	0.02	77	34	3.8	1.3	298	81	6.0	0.2	3.6	0.01	369	332	88	606	--	5

a Represents 98 percent of days and 98 percent of runoff.

## LITTLE MIAMI RIVER BASIN--Continued

## NORTH FORK LITTLE MIAMI RIVER NEAR PITCHIN, OHIO--Continued

Temperature (°F) of water, water year October 1953 to September 1954

/Once-daily measurement at varying hours /

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

## LITTLE MIAMI RIVER BASIN--Continued

## NORTH FORK LITTLE MIAMI RIVER NEAR PITCHIN, OHIO--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	0.8	23	(t)	1.4	6	(t)	1.4	12	(t)
2.....	.8	17	(t)	1.4	15	0.1	1.4	33	0.1
3.....	1.0	12	(t)	1.3	13	(t)	1.4	28	.1
4.....	1.4	12	(t)	1.3	8	(t)	1.6	58	.2
5.....	1.4	13	(t)	1.3	7	(t)	1.1	17	.1
6.....	1.0	12	(t)	1.4	5	(t)	1.6	7	(t)
7.....	1.0	12	(t)	1.4	7	(t)	1.4	8	(t)
8.....	1.0	16	(t)	1.4	10	(t)	1.3	10	(t)
9.....	1.0	20	0.1	1.3	26	.1	1.6	10	(t)
10.....	1.0	22	.1	1.3	13	(t)	1.9	10	.1
11.....	1.0	24	.1	1.3	13	(t)	1.4	8	(t)
12.....	1.0	23	.1	1.3	6	(t)	1.4	16	.1
13.....	1.1	21	.1	1.4	4	(t)	1.4	17	.1
14.....	1.1	18	.1	1.4	3	(t)	1.7	12	.1
15.....	1.3	17	.1	1.4	5	(t)	2.0	8	(t)
16.....	1.1	17	.1	1.4	8	(t)	1.6	16	.1
17.....	1.1	13	(t)	1.3	6	(t)	1.4	5	(t)
18.....	1.3	15	.1	1.3	12	(t)	1.1	3	(t)
19.....	1.1	20	.1	1.3	6	(t)	1.1	6	(t)
20.....	1.1	13	(t)	1.4	11	(t)	1.3	12	(t)
21.....	1.1	8	(t)	1.4	17	.1	1.6	17	.1
22.....	1.3	5	(t)	1.6	10	(t)	2.4	17	.1
23.....	1.3	7	(t)	1.7	4	(t)	2.2	6	(t)
24.....	1.3	4	(t)	1.6	8	(t)	1.7	13	.1
25.....	1.3	4	(t)	1.6	5	(t)	1.6	3	(t)
26.....	1.3	8	(t)	1.6	5	(t)	1.7	3	(t)
27.....	1.6	6	(t)	1.4	4	(t)	1.6	2	(t)
28.....	1.4	3	(t)	1.4	3	(t)	1.6	3	(t)
29.....	1.6	7	(t)	1.4	3	(t)	1.6	2	(t)
30.....	1.4	6	(t)	1.4	5	(t)	1.6	1	(t)
31.....	1.4	5	(t)	--	--	--	1.5	2	(t)
Total.	36.6	--	1.6	42.1	--	1.0	48.2	--	1.7
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.....	1.4	13	(t)	4.2	12	0.1	6.8	10	0.2
2.....	1.7	27	0.1	3.8	3	(t)	7.5	9	.2
3.....	1.4	17	.1	3.6	2	(t)	10	17	.4
4.....	1.3	11	(t)	3.5	2	(t)	8	17	.4
5.....	1.1	8	(t)	3.6	3	(t)	7	13	.2
6.....	1.3	7	(t)	3.3	6	.1	6	8	.1
7.....	1.1	7	(t)	2.9	5	(t)	6	6	.1
8.....	1.0	8	(t)	3.1	3	(t)	8.1	8	.2
9.....	1.3	10	(t)	2.9	5	(t)	7.7	8	.2
10.....	1.0	6	(t)	2.9	7	.1	7.3	12	.2
11.....	1.0	5	(t)	2.7	5	(t)	6.8	10	.2
12.....	1.0	17	(t)	2.6	2	(t)	6.6	6	.1
13.....	.7	23	(t)	2.6	4	(t)	6.6	6	.1
14.....	.8	13	(t)	2.9	10	a.1	6.4	2	(t)
15.....	1.3	7	(t)	2.9	27	.2	6.2	4	.1
16.....	2.2	5	(t)	2.9	15	.1	5.8	3	(t)
17.....	1.6	3	(t)	4.2	8	.1	5.6	3	(t)
18.....	1.4	4	(t)	4.8	10	a.1	5.6	7	.1
19.....	1.7	3	(t)	4.6	13	.2	6.4	18	.3
20.....	3.6	7	.1	4.6	16	.2	16	55	sb3
21.....	7.7	8	.2	6.2	48	.8	14	24	.9
22.....	6	8	.1	6.6	23	.4	11	12	.4
23.....	5	4	.1	6.0	18	.3	9.2	7	.2
24.....	4.4	6	a.1	5.4	7	.1	8.1	5	.1
25.....	3.8	8	.1	4.8	8	.1	8.1	11	.2
26.....	4.0	14	.2	4.6	8	.1	7.5	7	.1
27.....	9.7	36	.9	4.4	7	.1	6.4	3	.1
28.....	7.9	17	.4	5.0	12	.2	6.2	7	.1
29.....	6.2	6	.1	--	--	--	7.0	7	.1
30.....	5.2	13	.2	--	--	--	7.9	5	.1
31.....	4.2	36	.4	--	--	--	6.1	3	.1
Total.	92.0	--	3.6	111.6	--	3.7	239.9	--	8.6

s Computed by subdividing day.

t Less than 0.05 ton.

a Computed from estimated concentration graph.

b Computed partly from water-sediment discharge curve.

## LITTLE MIAMI RIVER BASIN--Continued

## NORTH FORK LITTLE MIAMI RIVER NEAR PITCHIN, OHIO--Continued

Suspended sediment, water year October 1953 to September 1954 -Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	7.5	5	0.1	11	18	0.5	6.2	40	0.7
2.....	6.8	8	.1	11	22	.6	7.7	42	.9
3.....	6.2	5	.1	12	28	.9	6.2	39	.6
4.....	5.6	8	.1	10	18	.5	6.0	33	.5
5.....	7.3	23	.4	9.7	13	.3	5.4	42	.6
6.....	20	69	s 4.7	9.0	17	.4	4.8	44	.6
7.....	28	49	3.7	8.8	17	.4	4.6	37	.4
8.....	36	119	s 13	8.6	13	.3	7.4	265	s 8.6
9.....	27	37	s 3.0	9.0	18	.4	8.1	103	2.2
10.....	21	16	.9	9.0	17	.4	5.6	72	1.1
11.....	17	13	.6	8.6	16	.4	5.6	63	1.0
12.....	15	10	.4	8.1	28	.6	5.0	63	.8
13.....	13	8	.3	7.5	13	.3	4.4	64	.8
14.....	13	17	.6	7.0	15	.3	4.2	87	.8
15.....	14	51	1.9	6.8	23	.4	4.0	52	.6
16.....	18	60	s 3.1	6.6	18	.3	3.8	67	.7
17.....	46	90	11	6.4	33	.6	35	650	sb 75
18.....	29	47	3.7	6.0	25	.4	13	108	3.8
19.....	21	35	2.0	6.0	21	.3	8.6	87	2.0
20.....	16	37	1.6	5.8	23	.4	6.6	74	1.3
21.....	14	43	1.6	5.4	17	.2	5.4	74	1.1
22.....	13	34	1.2	5.0	17	.2	5.0	88	1.2
23.....	34	80	b 7	5.0	28	.4	4.8	90	1.2
24.....	33	38	3.4	4.8	27	.3	4.2	93	1.0
25.....	23	22	1.4	4.8	15	.2	4.0	115	1.2
26.....	19	32	1.6	4.6	18	.2	3.6	114	1.1
27.....	16	17	.7	4.6	17	.2	3.3	100	.9
28.....	14	23	.9	4.6	18	.2	2.9	102	.8
29.....	13	25	.9	5.0	23	.3	2.9	118	.9
30.....	12	23	.7	4.6	31	.4	2.7	123	.9
31.....	--	--	--	4.4	37	.4	--	--	--
Total.	558.4	--	70.7	219.7	--	11.7	191.0	--	113.3
	July			August			September		
1.....	2.6	132	0.9	1.1	82	0.2	1.3	26	0.1
2.....	2.4	122	.8	1.0	90	.2	1.3	28	.1
3.....	2.4	118	.8	1.3	80	.3	1.1	43	.1
4.....	2.6	114	.8	1.1	83	.2	1.1	27	.1
5.....	2.6	113	.8	2.2	92	.5	1.0	14	(t)
6.....	2.4	125	.8	1.9	83	.4	1.0	22	.1
7.....	2.4	113	.7	1.4	62	.2	1.1	22	.1
8.....	2.4	117	.8	1.3	58	.2	1.1	26	.1
9.....	2.2	86	.5	1.3	67	.2	1.1	33	.1
10.....	2.0	87	.5	1.3	58	.2	1.1	33	.1
11.....	1.9	75	.4	1.1	47	.1	1.1	26	.1
12.....	1.9	107	.5	1.0	48	.1	1.1	25	.1
13.....	1.9	112	.6	1.0	47	.1	1.1	27	.1
14.....	1.7	103	.5	1.1	58	.2	1.1	37	.1
15.....	1.7	103	.5	1.7	62	.3	1.3	36	.1
16.....	1.7	95	a .4	1.4	48	.2	1.1	30	.1
17.....	1.6	92	.4	1.3	40	.1	.8	34	.1
18.....	1.6	108	.5	1.6	41	.2	.6	22	(t)
19.....	1.7	123	.6	1.6	56	.2	.7	17	(t)
20.....	1.6	106	.4	1.4	58	.2	.7	21	(t)
21.....	1.7	104	.5	1.4	36	.1	.7	22	(t)
22.....	1.7	122	.6	1.3	32	.1	.5	22	(t)
23.....	1.6	110	.5	2.2	50	a .3	.5	23	(t)
24.....	1.4	92	.3	1.7	55	.2	.5	26	(t)
25.....	1.3	88	.3	3.2	65	a .6	.5	20	(t)
26.....	1.3	87	.3	9.0	50	a 1.2	.5	27	(t)
27.....	1.3	91	.3	4.0	38	.4	.5	20	(t)
28.....	1.3	95	.3	2.7	28	.2	.5	17	(t)
29.....	1.3	92	.3	2.0	23	.1	.5	23	(t)
30.....	1.1	75	a .2	1.7	28	.1	.8	26	.1
31.....	1.1	63	.2	1.6	26	.1	--	--	--
Total.	56.4	--	16.0	57.9	--	7.7	26.3	--	2.1

Total discharge for year (cfs-days)..... 1,680.1

Total load for year (tons)..... 241.7

s Computed by subdividing day.

a Computed from estimated concentration graph.

t Less than 0.05 ton.

b Computed partly from water-sediment discharge curve.





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 1954.

Water temperatures: August 1952 to September 1954.

Sediment records: August 1952 to September 1954.

EXTREMES 1953-54 --Dissolved solids: Maximum, 391 ppm Feb. 1-10; minimum, 185 ppm June 9.

Hardness: Maximum, 350 ppm Feb. 1-10; minimum, 137 ppm June 9.

Specific conductance: Maximum daily, 682 microhos Jan. 14; minimum daily, 282 microhos June 9.

Water temperatures: Maximum, 78°F July 15, 31; minimum, freezing point on many days during December, January, February, and March.

Sediment concentrations: Maximum daily, 1,370 ppm June 8; minimum daily, 1 ppm on several days during December and January.

Sediment loads: Maximum daily, 13,600 tons June 8; minimum daily, less than 0.05 ton on several days during December and January.

EXTREMES 1952-54 --Dissolved solids: Maximum, 391 ppm Feb. 1-10, 1954; minimum, 185 ppm June 9, 1954.

Hardness: Maximum, 350 ppm Feb. 1-10, 1954; minimum, 137 ppm June 9, 1954.

Specific conductance: Maximum daily, 682 microhos Jan. 14, 1954; minimum daily, 282 microhos June 9, 1954.

Water temperatures: Maximum, 78°F Aug. 1, 1953, July 15, 31, 1954; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 1,370 ppm June 8, 1954; minimum daily, less than 0.50 ppm on several days during October, November, and December 1952.

Sediment loads: Maximum daily, 13,600 tons June 8, 1954; minimum daily, less than 0.05 ton on many days during October, November, December 1952, December 1953 and January 1954.

REMARKS --Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1953 to September 1954 given in WSP 1335. Flow affected by ice Dec. 19-20, 26-27, Jan. 22-25, Mar. 4-7.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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> )	Carbonate (CO <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 100°C)		Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Col- or
															Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium			
Oct. 1-10, 1953	7.43	9.5	0.05	77	31	8.4	2.0	312	0	61	11	0.1	4.7	0.06	363	64	322	64	610	7.3	7
Oct. 11-20	8.69	8.4	.05	77	33	7.2	1.7	316	0	61	10	.1	4.0	.06	369	330	330	69	610	7.7	7
Oct. 21-31	12.0	6.8	.05	78	34	7.5	1.8	316	0	65	10	.1	3.5	.06	369	334	334	75	620	7.5	6
Nov. 1-10, 1954	11.3	8.8	.02	78	35	8.3	2.9	321	0	63	11	.2	4.1	.06	372	337	337	75	620	7.7	8
Nov. 11-20	11.0	8.5	.01	78	35	7.9	2.6	318	0	68	10	.1	4.2	.06	374	338	338	78	620	7.7	5
Nov. 21-30	11.7	6.3	.02	75	32	7.9	1.6	313	0	66	7.2	.1	4.0	.04	357	319	319	62	603	7.8	4
Dec. 1-10	11.2	5.9	.05	73	34	8.8	1.6	310	0	67	10	.1	4.2	.04	369	323	323	68	605	7.9	7
Dec. 11-20	11.3	6.7	.00	75	33	8.1	1.5	312	0	64	10	.2	4.9	.06	362	323	323	67	607	7.8	3
Dec. 21-25, 27-31	11.7	8.1	.01	79	33	7.9	1.4	318	0	66	10	.1	4.9	.06	375	334	334	72	619	7.8	3
Jan. 1-10, 1954	10.5	5.8	.01	78	34	6.8	1.7	324	0	68	10	.1	6.2	.06	365	337	337	69	614	7.8	1
Jan. 11-20	11.5	5.6	.01	79	35	8.0	1.8	324	0	68	12	.1	6.9	.08	371	343	343	76	624	7.7	1
Jan. 21-31	25.5	6.7	.02	78	33	6.1	1.6	288	0	76	8.0	.2	7.1	.04	367	332	332	94	600	7.2	5
Feb. 1-10	19.0	5.9	.02	83	34	6.6	1.0	310	0	75	9.0	.2	5.8	.02	391	350	350	93	635	7.4	5
Feb. 11-20	19.1	5.3	.01	76	35	7.0	1.7	302	0	83	9.8	.1	4.6	.05	360	332	332	86	609	7.8	5
Feb. 21-28	25.6	5.5	.03	74	35	6.7	1.4	296	0	79	8.8	.2	3.7	.03	358	331	331	86	601	7.8	5

Mar 1-10, 1954	33.0	9.6	.02	79	34	6.5	1.2	299	0	81	9.7	.2	6.1	.02	381	338	32	623	7.5	3
Mar 11-20	30.2	4.3	.02	76	33	6.3	1.3	290	0	77	9.1	.1	4.1	.02	362	326	88	601	7.8	3
Mar 21-31	41.5	4.4	.02	75	33	5.8	1.2	278	0	78	9.2	.2	7.3	.02	355	323	95	589	7.7	3
Apr 1-10	78.1	3.9	.01	68	32	5.8	1.5	258	0	75	8.8	.3	7.3	.02	336	301	94	558	7.5	6
Apr 11-20	116	7.3	.03	74	30	4.5	1.1	252	0	75	9.5	.1	14	.01	344	308	102	599	7.4	30
Apr 21-30	93.6	5.6	.02	76	31	4.5	1.0	264	0	76	10	.5	12	.01	348	316	101	565	7.6	20
May 1-10	49.7	5.9	.00	76	30	5.2	1.7	279	0	76	8.9	.2	6.3	.02	356	313	84	595	7.6	6
May 11-20	32.7	4.4	.00	70	33	5.2	1.1	276	0	77	8.1	.2	3.2	.02	345	308	84	579	7.8	7
May 21-31	24.3	11	.02	76	32	6.4	1.7	292	0	73	9.5	.2	2.8	.03	358	321	82	596	7.7	5
June 1-8	150	10	.00	75	33	6.5	1.9	301	0	70	9.4	.0	4.6	.03	372	324	76	600	7.8	2
June 9	340	6.5	.00	34	12	2.5	2.8	127	0	27	1.8	.0	8.3	.03	185	137	30	282	7.3	2
June 10-19	94.5	12	.02	72	29	5.3	1.8	272	0	63	8.3	.0	9.7	.03	353	300	76	560	7.8	2
June 22-30	20.7	13	.02	74	32	6.0	1.7	283	0	71	8.9	.0	5.3	.03	372	319	76	596	7.9	1
July 1-10	13.3	11	.03	70	33	5.7	1.1	288	0	73	9.2	.2	3.5	.02	358	311	74	582	7.9	10
July 11-20	9.48	10	.01	71	33	7.0	1.7	288	0	76	9.5	.2	2.6	.02	366	312	77	594	8.0	7
July 21-31	10.1	10	.00	70	32	7.1	1.6	284	0	74	10	.1	2.7	.03	364	306	75	582	8.0	9
Aug 1-10	9.75	9.0	.00	70	31	7.5	1.8	284	0	71	10	.1	2.2	.04	353	303	69	571	8.1	10
Aug 11-20	8.32	9.0	.03	70	32	6.9	2.1	264	1	72	10	.2	3.2	.04	342	306	73	560	8.4	5
Aug 21-26 28-31	16.1	10	.06	69	30	9.4	2.1	258	1	74	16.5	.2	3.6	.06	344	297	76	540	8.3	7
Sept 1-5 6-10	8.18	13	.01	77	33	0.1	2.3	278	7	85	10	.1	5.4	.04	380	326	90	591	8.4	7
Sept 11-19	8.40	13	.01	76	35	0.1	2.1	266	6	81	12	.1	2.0	.07	381	332	89	517	8.4	7
Sept 21-30	11.1	9.6	.01	74	33	7.8	2.4	278	4	77	11	.1	3.2	.10	361	318	86	592	8.2	6
Time-weighted average	28.8	7.9	0.02	75	33	6.8	1.7	282	1	72	9.6	0.1	5.1	0.04	362	323	82	598	--	6

a Represents 98 percent of days and 99 percent of runoff.

## LITTLE MIAMI RIVER BASIN--Continued

## LITTLE MIAMI RIVER NEAR OLDTOWN, OHIO--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
 /Once-daily measurement at approximately 7 a. m./

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

## LITTLE MIAMI RIVER BASIN--Continued

## LITTLE MIAMI RIVER NEAR OLDTOWN, OHIO--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	7.1	15	0.3	12	6	0.2	10	8	0.2
2.....	7.4	15	.3	11	6	.2	9.2	5	.1
3.....	7.4	13	.2	12	7	.2	9.7	5	.1
4.....	7.4	11	.2	11	7	.2	10	6	.2
5.....	7.4	13	.2	12	5	.2	9.2	5	.1
6.....	7.4	13	.2	11	3	.1	11	4	.1
7.....	7.6	12	.2	11	3	.1	13	3	.1
8.....	7.4	10	.2	12	2	.1	13	2	.1
9.....	7.8	10	.2	10	2	.1	13	2	.1
10.....	7.4	9	.2	11	2	.1	14	3	.1
11.....	7.8	10	.2	11	2	.1	12	1	(t)
12.....	7.8	10	.2	11	3	.1	11	3	.1
13.....	7.8	10	.2	11	2	.1	11	3	.1
14.....	7.8	10	.2	11	2	.1	13	2	.1
15.....	8.3	10	.2	11	2	.1	15	2	.1
16.....	8.8	10	.2	11	2	.1	13	2	.1
17.....	9.2	10	.2	10	3	.1	11	3	.1
18.....	9.7	9	.2	11	2	.1	9.7	2	.1
19.....	9.7	8	.2	10	3	.1	8	1	(t)
20.....	10	7	.2	10	3	.1	9	1	(t)
21.....	11	6	.2	11	4	.1	10	2	.1
22.....	11	7	.2	12	7	.2	14	2	.1
23.....	12	7	.2	12	5	.2	15	1	(t)
24.....	12	7	.2	12	4	.1	13	2	.1
25.....	13	7	.2	12	3	.1	11	2	.1
26.....	11	7	.2	11	2	.1	10	3	.1
27.....	13	6	.2	10	2	.1	9	3	.1
28.....	13	7	.2	10	2	.1	11	3	.1
29.....	13	7	.2	9.7	6	.2	12	3	.1
30.....	12	7	.2	10	7	.2	11	3	.1
31.....	11	6	.2	--	--	--	11	2	.1
Total.	293.2	--	6.4	329.7	--	3.9	351.8	--	3.0
January									
1.....	9.7	3	0.1	22	2	0.1	31	10	0.8
2.....	10	3	.1	21	3	.2	34	8	.7
3.....	11	2	.1	20	3	.2	42	12	1.4
4.....	10	1	(t)	20	2	.1	35	10	.9
5.....	11	1	(t)	20	2	.1	30	7	.6
6.....	11	1	(t)	19	2	.1	30	7	.6
7.....	11	1	(t)	17	2	.1	30	12	1.0
8.....	10	1	(t)	17	2	.1	34	10	.9
9.....	10	1	(t)	17	2	.1	33	10	.9
10.....	11	3	.1	17	3	.1	31	10	.8
11.....	10	2	.1	17	3	.1	31	8	.7
12.....	9.2	2	(t)	16	2	.1	30	8	.6
13.....	8.3	2	(t)	16	3	.1	30	9	.7
14.....	8.8	1	(t)	16	4	.2	28	7	.5
15.....	10	1	(t)	17	7	.3	26	5	.4
16.....	15	1	(t)	18	8	.4	24	5	.3
17.....	14	2	.1	23	9	.6	23	11	.7
18.....	11	2	.1	23	10	.6	23	11	.7
19.....	12	2	.1	22	10	.6	27	11	.8
20.....	17	3	.1	23	12	.7	60	16	b3
21.....	37	8	.8	27	13	.9	77	17	3.5
22.....	25	7	.5	30	8	.6	55	15	2.2
23.....	15	5	.2	28	5	.4	46	12	1.5
24.....	13	3	.1	26	6	a	41	10	1.1
25.....	18	3	.1	24	7	4	38	12	1.2
26.....	22	3	.2	23	8	.5	37	13	1.3
27.....	34	3	.3	22	13	.8	33	13	1.2
28.....	37	3	.3	25	14	.9	31	18	1.5
29.....	30	2	.2	--	--	--	32	20	1.7
30.....	27	2	.1	--	--	--	33	17	1.5
31.....	23	2	.1	--	--	--	33	15	1.3
Total.	501.0	--	4.2	586	--	9.8	1,088	--	35.0
February									
March									

t Less than 0.50 ton.

a Computed from partly estimated concentration graph.

b Computed partly from water-sediment discharge curve.

## LITTLE MIAMI RIVER BASIN--Continued

## LITTLE MIAMI RIVER NEAR OLDTOWN, OHIO--Continued

Suspended sediment, water year October 1953 to September 1954--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.....	32	13	1.1	53	31	4.4	29	35	a3
2.....	30	13	1.0	59	40	a6	38	36	3.7
3.....	29	19	1.5	65	34	6.0	33	32	2.8
4.....	27	20	1.4	55	26	3.9	30	33	2.7
5.....	33	22	2.0	49	25	3.3	27	32	2.3
6.....	75	20	s4.4	45	23	2.8	25	30	2.0
7.....	138	34	12	44	22	2.6	23	28	1.7
8.....	174	62	s31	43	23	2.7	998	1,370	s13,600
9.....	145	94	37	42	28	3.2	340	518	s631
10.....	98	37	9.8	42	27	3.1	104	135	38
11.....	76	22	4.5	40	27	2.9	66	68	12
12.....	62	24	4.0	38	24	2.5	47	63	8.0
13.....	53	23	3.3	35	22	2.1	45	64	7.8
14.....	47	28	3.6	34	16	1.5	31	48	4.0
15.....	79	65	sb16	31	12	1.0	27	28	2.0
16.....	118	53	s21	31	11	.9	25	27	1.8
17.....	308	115	96	30	12	1.0	81	--	e95
18.....	190	55	28	29	12	.9	75	--	e45
19.....	132	37	13	29	12	.9	44	--	e8
20.....	98	34	9.0	30	10	.8	34	--	e5
21.....	79	29	6.2	27	7	.5	29	61	4.8
22.....	71	32	6.1	26	8	.6	26	71	5.0
23.....	141	110	sb45	25	8	.5	29	63	4.9
24.....	167	42	19	24	10	.6	26	58	4.1
25.....	122	29	9.6	25	12	.8	22	58	3.4
26.....	95	33	8.5	24	14	.9	20	57	3.1
27.....	79	28	6.0	24	12	.8	18	62	3.0
28.....	69	28	5.2	24	12	.8	16	72	3.1
29.....	59	32	5.1	25	19	1.3	15	70	2.8
30.....	54	33	4.8	23	18	1.1	14	62	2.3
31.....	--	--	--	20	21	1.1	--	--	--
Total.	2,880	--	415.1	1,091	--	61.5	2,337	--	14,512.3
July									
1.....	14	58	2.2	7.0	23	0.4	12	19	0.6
2.....	13	41	1.4	7.5	27	.5	11	20	.6
3.....	13	42	1.5	7.9	26	.6	10	22	.6
4.....	13	40	1.4	7.7	25	.5	9.0	22	.5
5.....	13	37	1.3	11	27	.8	8.7	18	.4
6.....	13	33	1.2	17	28	1.3	8.2	18	.4
7.....	14	32	1.2	12	25	.8	7.9	17	.4
8.....	15	33	1.3	10	28	.8	7.9	15	.3
9.....	13	32	1.1	8.7	27	.6	7.9	14	.3
10.....	12	28	.9	8.7	32	.8	7.9	13	.3
11.....	10	25	.7	8.5	33	.8	7.7	13	.3
12.....	10	28	.8	7.9	34	.7	7.5	11	.2
13.....	11	28	.8	7.5	32	.6	7.2	12	.2
14.....	10	28	.8	7.7	29	.6	7.5	10	.2
15.....	9.3	27	.7	8.2	28	.6	7.5	12	.2
16.....	8.5	28	.6	8.5	27	.6	7.5	15	.3
17.....	8.2	25	.6	9.0	38	.9	7.5	11	.2
18.....	8.2	27	.6	8.7	34	.8	7.2	14	.3
19.....	9.6	28	.7	8.7	27	.6	16	--	e7
20.....	10	28	.8	8.5	31	.7	14	95	3.6
21.....	13	28	1.0	8.2	38	.8	15	32	1.3
22.....	12	28	.9	7.5	28	.6	13	25	.9
23.....	11	26	.8	7.5	18	.4	11	22	.6
24.....	10	25	.7	31	24	s2.5	9.6	18	.5
25.....	9.3	25	.6	19	17	.9	10	16	.4
26.....	8.5	26	.6	25	--	e5	10	17	.4
27.....	8.2	24	.5	36	85	sb10	10	13	.4
28.....	7.7	20	.4	21	24	1.4	10	9	.2
29.....	7.2	24	.5	16	17	.7	11	11	.3
30.....	7.2	23	.4	13	11	.4	11	13	.4
31.....	7.0	20	.4	13	14	.5	--	--	--
Total.	328.9	--	27.4	377.9	--	37.2	290.7	--	22.3
Total discharge for year (cfs-days)..... 10,455.2									
Total load for year (tons)..... 15,138.1									

e Estimated.

s Computed by subdividing day.

a Computed from partly estimated concentration graph.

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 1953 to September 1954

(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	Discharge (cfs)	Water temperature (°F)	Suspended sediment										Methods of analysis			
				Concentration of sample (ppm)	Concentration of suspended 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
Apr. 16, 1954 . . . . .	10:50 p. m.	241		115	531	49	58	69	87	94	96						BSWCM
June 8 . . . . .	7:00 p. m.	4,580		7,560	2,600	32	48	66	85	96	98						BSWCM
June 8 . . . . .	7:00 p. m.	4,560		7,560	2,900	24	37	57	82	97	98						BSNM
June 8 <sup>a</sup> . . . . .	11:05 p. m.	1,680		1,800	--	60	77	88	96	98	99						BSWCM
June 9 . . . . .	3:10 a. m.	630		991	1,420	71	81	91	96	99	99						BSWCM
June 9 . . . . .	3:10 a. m.	630		991	1,210	51	75	86	94	99	99						BSNM
June 9 . . . . .	9:10 a. m.	308		569	1,060	72	86	92	97	99	99						BSWCM

<sup>a</sup> Average of individual analyses of 3 verticals.





LITTLE MIAMI RIVER BASIN

Feb. 1-3, 5-6, 8-10, 1984.....	5.86	11	.04	91	41	12	1.8	310	122	15	.2	6.5	.16	469	386	142	730	7.5	5
Feb. 13-16, 21-27	6.81	12	.03	83	39	12	2.3	300	113	16	.1	6.2	.14	427	368	122	688	7.8	5
Mar. 1-2, 4, 6, 10.....	13.4	12	.02	86	38	12	1.7	289	119	16	.1	5.8	.06	448	372	134	699	7.8	7
Mar. 11-20.....	10.5	5.4	.02	81	36	9.2	1.5	278	107	12	.2	4.8	.04	412	349	122	654	7.7	6
Mar. 21-31.....	14.6	3.9	.01	82	34	8.7	1.6	264	106	14	.2	8.2	.05	396	347	128	640	7.6	6
Apr. 1-10.....	18.8	3.4	.01	77	30	8.7	1.7	254	93	12	.2	7.1	.06	368	316	107	602	7.5	5
Apr. 11-20.....	45.5	5.7	.03	70	32	6.0	1.0	230	88	13	.2	17	.01	347	306	118	569	7.3	25
Apr. 21-30.....	48.3	5.1	.03	74	30	5.3	.8	238	83	12	.2	22	.02	352	311	113	571	7.5	20
May 1-7, 9-10.....	21.4	3.4	.01	74	31	6.5	.9	264	83	12	.3	13	.04	364	312	96	596	7.8	8
May 11-20.....	11.4	5.1	.01	65	34	8.4	1.7	258	87	13	.2	6.3	.06	351	302	91	579	7.7	7
May 21-31.....	6.69	9.2	.01	65	35	11	2.0	266	81	16	.2	3.0	.12	363	308	88	605	7.6	7
June 1-10.....	13.2	9.8	.03	67	31	8.8	2.4	258	70	12	.2	7.3	.12	346	296	83	579	7.6	8
June 11-17.....	20.2	11	.00	78	33	6.7	1.7	277	86	10	.3	12	.00	397	333	103	623	7.8	25
June 18.....	66.0	6.3	.06	41	17	3.2	2.6	132	44	5.0	.4	24	.02	195	172	64	344	7.3	15
June 20-30.....	10.2	11	.02	76	33	8.2	1.5	274	83	12	.3	13	.03	379	326	101	617	7.9	15
July 1-6, 8-10.....	2.76	11	.00	70	34	15	1.9	280	82	20	.2	4.3	.11	392	312	95	629	8.0	10
July 11-20.....	1.20	11	.00	71	35	23	1.9	304	70	33	.1	3.9	.13	411	322	72	677	8.0	10
July 21-25, 27-28.....	1.69	13	.00	70	34	24	2.8	296	72	34	.1	4.3	.16	407	316	72	669	7.9	10
July 29.....	.69	16	.13	76	35	76	3.4	355	38	104	.1	1.8	.14	551	334	43	952	7.9	6
July 30 - Aug. 5, 7-10.....	1.12	13	.07	70	34	28	2.7	312	60	39	.1	3.1	.18	420	316	59	690	7.9	10
Aug. 11, 13-19.....	.88	13	.01	70	35	26	2.7	308	61	39	.2	4.3	.13	404	318	66	683	7.8	7
Aug. 21-26.....	1.28	13	.02	71	34	21	2.5	310	57	31	.2	6.1	.18	389	318	63	658	7.8	7
Aug. 27.....	39.0	8.1	.13	31	12	10	4.1	118	24	17	.4	4.2	.03	168	126	30	299	7.4	9
Aug. 28-29.....	1.80	9.0	.00	58	25	11	3.6	220	52	14	.2	5.2	.10	287	248	67	493	7.7	10
Aug. 30-Sept. 6, 8-10.....	.40	13	.02	73	37	19	3.1	320	66	25	.2	5.2	.16	402	335	72	667	7.9	9
Sept. 11-18, 20.....	.89	12	.01	71	33	23	3.5	304	58	29	.2	9.2	.28	389	313	64	659	7.7	10
Sept. 21-22.....	1.20	8.6	.02	54	22	17	6.3	217	43	24	.2	6.4	.12	292	223	47	497	7.9	10
Sept. 24-30.....	.60	13	.01	75	34	24	4.9	317	61	32	.2	8.5	.16	412	327	67	692	8.0	10
Time-weighted average <sup>a</sup> .....	9.61	9.2	0.02	74	34	16	2.3	291	77	22	0.2	8.5	0.14	393	324	86	651	--	9

<sup>a</sup> Represents 80 percent of days and 89 percent of runoff.

## LITTLE MIAMI RIVER BASIN--Continued

## MASSIE CREEK AT WILBERFORCE, OHIO--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
/Once-daily measurement at varying hours/

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

## LITTLE MIAMI RIVER BASIN--Continued

## MASSIE CREEK AT WILBERFORCE, OHIO--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	1.1	8	(t)	1.8	8	(t)	1.8	1	(t)
2.....	1.1	3	(t)	1.8	7	(t)	1.7	3	(t)
3.....	1.1	5	(t)	1.8	8	(t)	1.8	3	(t)
4.....	1.2	5	(t)	1.8	9	(t)	1.8	4	(t)
5.....	1.3	9	(t)	1.8	7	(t)	1.8	3	(t)
6.....	1.4	10	(t)	1.8	3	(t)	2.6	3	(t)
7.....	1.5	12	(t)	1.8	2	(t)	2.4	3	(t)
8.....	1.4	7	(t)	1.9	3	(t)	1.9	2	(t)
9.....	1.4	4	(t)	1.9	3	(t)	2.8	2	(t)
10.....	1.4	7	(t)	1.9	3	(t)	3.2	2	(t)
11.....	1.4	10	(t)	1.9	4	(t)	2.4	2	(t)
12.....	1.3	9	(t)	1.9	5	(t)	2.2	4	(t)
13.....	1.3	7	(t)	1.9	8	(t)	1.9	24	0.1
14.....	1.3	8	(t)	1.9	3	(t)	3.2	30	a.2
15.....	1.3	4	(t)	1.9	4	(t)	4.2	28	.3
16.....	1.4	8	(t)	1.9	7	(t)	3.0	27	.2
17.....	1.4	8	(t)	1.8	5	(t)	2.2	20	a.1
18.....	1.4	7	(t)	1.8	7	(t)	1.7	13	a.1
19.....	1.5	7	(t)	1.8	12	0.1	1.6	7	(t)
20.....	1.6	7	(t)	1.8	11	.1	1.8	1	(t)
21.....	1.7	7	(t)	1.9	11	.1	1.9	2	(t)
22.....	1.8	10	(t)	2.7	14	.1	3.7	2	(t)
23.....	1.9	11	0.1	3.0	15	.1	3.9	2	(t)
24.....	1.9	6	(t)	2.4	10	a.1	2.8	2	(t)
25.....	1.9	7	(t)	2.4	8	a.1	1.9	1	(t)
26.....	1.9	6	(t)	1.9	5	(t)	1.9	1	(t)
27.....	2.6	8	.1	1.9	3	(t)	1.9	1	(t)
28.....	2.2	6	(t)	1.9	3	(t)	2.2	1	(t)
29.....	1.9	8	(t)	1.8	4	(t)	2.4	1	(t)
30.....	1.8	12	.1	1.8	1	(t)	2.2	1	(t)
31.....	1.8	8	(t)	--	--	--	1.9	1	(t)
Total.	48.2	--	1.1	58.6	--	1.2	72.7	--	1.4
January									
1.....	1.9	2	(t)	7.1	6	0.1	14	10	0.4
2.....	1.9	4	(t)	6.8	3	.1	14	6	.2
3.....	1.9	10	0.1	6.0	3	(t)	19	3	a.2
4.....	1.9	16	a.1	6.0	3	(t)	16	1	.4
5.....	2.2	23	.1	5.7	3	(t)	15	1	.4
6.....	2.2	28	.2	5.5	7	.1	13	3	.1
7.....	1.9	30	a.2	4.6	4	(t)	12	6	a.2
8.....	2.2	32	.2	4.6	3	(t)	13	7	.2
9.....	1.9	30	.2	4.6	2	(t)	11	12	a.4
10.....	1.9	30	a.2	5.0	3	(t)	10	17	.4
11.....	1.9	27	.1	4.8	3	(t)	11	13	.4
12.....	1.7	25	a.1	4.1	3	(t)	11	13	.4
13.....	1.5	17	a.1	3.9	13	.1	10	14	.4
14.....	1.5	14	.1	4.2	12	.1	10	18	.5
15.....	2.2	16	.1	4.4	14	.2	7.7	13	.3
16.....	4.2	8	.1	5.0	14	.2	7.7	8	.2
17.....	3.2	8	a.1	8.4	12	a.3	7.7	12	.2
18.....	2.4	11	.1	7.7	10	.2	7.1	13	.2
19.....	2.8	11	.1	7.1	11	a.2	10	15	.4
20.....	13	80	sb3	7.4	--	e1	26	18	1.3
21.....	23	16	1.0	11	35	1.0	26	7	.5
22.....	8.7	12	a.3	9.8	9	.2	21	7	.4
23.....	7	8	.2	8.7	4	.1	18	8	.4
24.....	7	6	.1	7.7	7	.1	15	11	.4
25.....	7.7	4	.1	7.1	16	.3	14	14	.5
26.....	9.4	32	.8	6.8	14	a.2	13	12	.4
27.....	17	17	a.8	6.3	11	.2	11	8	.2
28.....	13	11	.4	9.1	12	.3	10	7	.2
29.....	11	6	.2	--	--	--	11	13	.4
30.....	9.4	5	a.1	--	--	--	11	15	.4
31.....	6.8	5	a.1	--	--	--	9.4	11	.3
Total.	174.3	--	9.3	179.4	--	5.4	404.6	--	11.3

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.

## LITTLE MIAMI RIVER BASIN--Continued

## MASSIE CREEK AT WILBERFORCE, OHIO--Continued

Suspended sediment, water year October 1953 to September 1954--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.....	8.1	5	0.1	25	13	0.9	9.5	40	b1
2.....	7.7	6	1	26	13	.9	13	27	.9
3.....	7.4	8	.2	27	12	.9	13	23	.8
4.....	7.1	7	1	23	8	.6	11	18	.5
5.....	14	85	3.2	21	7	.4	9.4	18	.4
6.....	31	40	3.3	19	5	.2	8.1	15	.3
7.....	37	27	2.7	19	8	.4	6.8	13	.2
8.....	32	15	1.3	17	3	.1	9.0	53	s 4.8
9.....	24	12	.8	17	2	.1	72	550	sb110
10.....	20	12	.6	16	3	.1	40	96	10
11.....	19	10	.5	15	6	.2	27	56	4.1
12.....	16	8	.3	14	8	.3	20	42	2.3
13.....	14	9	.3	13	8	.3	15	38	1.5
14.....	13	17	.6	12	7	.2	12	33	1.1
15.....	29	470	b 40	11	12	.4	9.8	27	.7
16.....	62	270	s 62	10	13	.4	9.4	23	.6
17.....	127	220	s 81	10	15	.4	48	--	e 80
18.....	78	56	12	9.4	16	.4	66	600	sb120
19.....	55	30	4.4	9.8	17	.4	36	110	a 11
20.....	42	27	3.1	10	12	.3	23	57	3.5
21.....	34	23	2.1	8.4	8	.2	17	46	2.1
22.....	31	19	1.6	7.7	8	.2	13	68	2.4
23.....	70	--	e 20	7.1	13	.2	12	70	2.3
24.....	92	56	14	6.5	17	.3	9.1	68	1.7
25.....	65	28	4.9	6.3	13	.2	7.4	44	.9
26.....	52	18	2.5	6.3	17	.3	6.5	36	.6
27.....	44	13	1.5	6.3	18	.3	5.3	34	.5
28.....	37	11	1.1	6.3	16	.3	4.6	43	.5
29.....	31	8	.7	7.4	18	.4	4.1	48	.5
30.....	27	9	.6	6.3	14	.2	3.7	48	.5
31.....	--	--	--	5.0	10	.1	--	--	--
Total.	1,126.3	--	265.6	397.8	--	10.5	540.7	--	365.7
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.....	3.4	42	0.4	0.6	14	(t)	0.4	32	(t)
2.....	2.8	33	.2	.9	7	(t)	.4	25	(t)
3.....	2.8	33	.2	1.0	5	(t)	.3	13	(t)
4.....	2.9	33	.2	.8	7	(t)	.3	8	(t)
5.....	2.9	33	.2	2.2	70	b 0.4	.3	12	(t)
6.....	2.6	38	.3	1.6	27	.1	.3	24	(t)
7.....	3.0	40	a .3	1.5	21	.1	.3	28	(t)
8.....	2.9	43	.3	1.6	20	.1	.4	29	(t)
9.....	2.5	42	.3	1.5	22	.1	.4	23	(t)
10.....	2.0	50	a .3	1.1	27	.1	.4	18	(t)
11.....	1.7	52	.2	.9	17	(t)	.5	18	(t)
12.....	1.6	33	.1	.7	15	(t)	.5	17	(t)
13.....	1.3	17	.1	.6	11	(t)	.5	22	(t)
14.....	1.2	18	.1	.7	12	(t)	.5	18	(t)
15.....	.9	22	.1	1.2	23	.1	.5	12	(t)
16.....	.9	38	.1	1.1	22	.1	.5	14	(t)
17.....	.7	24	(t)	.9	32	.1	.6	15	(t)
18.....	1.0	35	b .1	1.3	38	.1	.6	13	(t)
19.....	1.5	58	.2	1.1	21	.1	17	--	e 60
20.....	1.2	29	.1	1.0	15	(t)	3.8	151	s 1.9
21.....	3.6	47	.4	.9	15	(t)	1.3	65	.2
22.....	2.5	33	.2	.8	15	(t)	1.1	34	.1
23.....	1.8	22	.1	.7	16	(t)	.8	30	a .1
24.....	1.4	22	.1	.8	17	(t)	.6	26	(t)
25.....	1.1	15	(t)	.9	6	(t)	.6	23	(t)
26.....	.9	13	(t)	3.6	--	e 12	.5	21	(t)
27.....	.8	23	(t)	39	--	e 230	.5	21	(t)
28.....	.6	22	(t)	2.3	117	.7	.5	16	(t)
29.....	.6	15	(t)	1.3	52	.2	.6	27	(t)
30.....	.5	13	(t)	.7	37	.1	.9	22	(t)
31.....	.6	18	(t)	.5	40	.1	--	--	.1
Total.	54.2	--	4.9	73.8	--	244.9	35.9	--	63.0
Total discharge for year (cfs-days).....									
Total load for year (tons).....									
3,166.5									
984.3									

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.

LITTLE MIAMI RIVER BASIN--Continued  
 MASSIE CREEK AT WILBERFORCE, OHIO--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954  
 (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	Discharge (cfs)	Water temperature (°F)	Suspended sediment										Methods of analysis		
				Concentration of sample (ppm)	Concentration of suspended analyzed (ppm)	Percent finer than indicated size, in millimeters						0.500	1.000			
						0.002	0.004	0.008	0.016	0.031	0.062				0.125	0.250
Apr. 15, 1954	7:30 a. m.	29		840	721	70	87	97	99	99	100					BSWCM
Apr. 16	2:15 p. m.	82		1,140	972	47	61	74	90	97	99					BSWCM
Apr. 16	5:15 p. m.	94		370	658	49	56	67	85	93	98					BSWCM
Apr. 16	9:40 p. m.	116		370	656	58	63	73	84	96	99					BSWCM
Apr. 17	12:15 a. m.	143		440	1,020	40	49	60	76	92	98					BSWCM
June 9	7:15 a. m.	91		683	1,460	74	86	94	98	99	99					BSWCM
June 9	7:15 a. m.	91		683	1,390	29	43	75	100	--	--					BNM
June 18	7:55 a. m.	77		815	670	69	90	94	99	100	--					BSWCM
Aug. 27	8:30 a. m.	17		680	1,040	73	87	93	95	96	97			99		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, 2½ miles southwest of Morrow, and 4 miles upstream from mouth.

DRAINAGE AREA, 294 square miles.

RECORDS AVAILABLE.--Chemical analyses: September 1952 to September 1954.

Water temperatures: September 1952 to September 1954.

EXTREMES.--Dissolved solids: Maximum, 395 ppm Dec. 21-23, 26-31; minimum, 158 ppm July 21-22.

Hardness: Maximum, 288 ppm Dec. 21-23, 26-31; minimum, 134 ppm July 21-22.

Specific conductance: Maximum daily, 662 micromhos Dec. 29; minimum daily, 218 micromhos July 21.

Water temperatures: Maximum, 90 F July 14; minimum, freezing point Dec. 23.

Sediment concentrations: Minimum daily, 1 ppm on many days during November to February.

EXTREMES.--Dissolved solids: Maximum, 395 ppm Dec. 21-23, 26-31; minimum, 158 ppm July 21-22.

Hardness: Maximum, 288 ppm Dec. 21-23, 26-31; minimum, 134 ppm July 21-22.

Specific conductance: Maximum daily, 662 micromhos Dec. 29; minimum daily, 218 micromhos July 21, 1954.

Water temperatures: Maximum, 92 F July 13, 1953; minimum, freezing point Jan. 3-6, Dec. 23, 1953.

Sediment concentrations: Minimum daily, 1 ppm on many days during October, December 1952, January, February, April, May, November, December 1953, January, February 1954.

January loads: Maximum daily, 53 000 tons (estimated) July 21, 1954; minimum daily, less than 0.05 ton on many days during October to December 1952.

January, August to December 1953 and January 1954.

REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1953 to September 1954 given in NSP 1335. Flow affected by ice Dec. 16-18, 24-26, Jan. 10-19, 23.

## Chemical analyses, in parts per million, water year October 1953 to September 1954

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	Specific conductance (micro-mhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot					
Oct. 1-10, 1953	0.28	3.0	0.05	59	24	9.8	3.8	950	42	14	0.2	1.2	0.00	285	246	41	489	7.1	6	6
Oct. 11-20	.28	3.3	.02	62	24	7.7	3.0	952	41	12	.2	.8	.00	286	256	47	503	7.4	5	5
Oct. 21-31	.28	3.1	.02	65	24	7.7	3.2	940	40	12	.2	.6	.00	290	260	48	504	7.5	5	5
Nov. 1-10	.31	3.0	.01	65	24	6.7	2.7	963	38	9.1	.4	.00	.00	287	289	45	491	7.5	6	6
Nov. 11-20	2.13	3.7	.01	61	25	7.8	3.6	960	40	11	.2	.6	.01	288	257	42	493	7.5	6	6
Nov. 21-30	5.01	3.1	.03	62	24	12	3.4	272	39	16	.2	.4	.01	304	256	31	527	7.7	6	6
Dec. 1-10	2.18	3.8	.03	62	23	15	3.0	962	48	17	.2	.7	.00	294	249	35	522	7.6	5	5
Dec. 11-16	3.67	3.0	.00	66	24	22	3.5	968	64	21	.2	.4	.05	349	270	51	564	7.9	4	4
Dec. 17-23, 26-31	2.18	4.0	.02	73	25	30	3.6	988	77	26	.3	.5	.15	395	288	49	649	7.9	5	5
Jan. 1-6, 1954	2.73	3.5	.03	67	27	32	3.9	278	74	29	.3	1.0	.14	374	278	50	632	7.9	5	5
Jan. 7-11, 14-16, 18-20	104	4.9	.02	43	18	5.2	2.0	174	32	7.5	.2	2.9	.02	207	162	39	356	7.0	5	5
Jan. 21-31	97.7	5.0	.01	47	18	6.4	2.5	172	46	10	.2	5.5	.03	233	194	50	395	7.1	7	7
Feb. 1-10	43.0	3.9	.00	40	20	6.9	2.1	194	40	9.8	.2	3.4	.03	238	205	46	406	6.9	5	5
Feb. 11-20	37.2	3.6	.02	46	20	6.5	2.2	192	40	9.2	.2	2.3	.04	224	204	45	402	7.7	4	4
Feb. 21-8	15.2	1.6	.02	68	23	14	3.2	220	80	16	.2	2.5	.12	320	266	84	540	7.8	5	5

Mar. 1-10, 1954.	60.5	3.7	.01	65	22	11	2.5	202	71	15	.2	10	.04	300	254	87	509	7.7	6
Mar. 11-20	122	3.2	.01	60	21	8.3	2.4	184	68	12	.2	10	.02	279	235	85	468	7.4	6
Mar. 21-31	110	5.5	.02	62	20	6.8	1.8	194	61	12	.1	9.9	.01	276	238	78	462	7.4	25
Apr. 1-10	55.1	2.1	.03	64	24	8.1	1.6	220	66	14	.1	5.1	.04	294	258	78	491	7.7	15
Apr. 11-20	316	5.7	.03	63	19	6.6	1.7	202	57	12	.1	11	.02	276	237	70	460	7.5	20
Apr. 21-30	223	7.2	.02	67	20	5.7	1.7	210	55	11	.1	16	.02	285	249	77	470	7.5	20
May 1-10	305	6.6	.01	58	19	5.1	1.5	203	46	9.4	.2	13	.02	264	226	56	451	7.7	10
May 11-20	56.1	2.6	.00	59	24	6.3	1.4	222	52	10	.2	6.9	.02	277	244	64	473	7.8	6
May 21-24, 26-31	18.8	3.6	.02	65	25	8.6	1.9	260	54	12	.2	3.9	.01	303	267	52	519	7.8	10
June 1-10	41.3	7.9	.01	57	20	7.0	1.6	218	44	9.5	.2	4.4	.03	262	226	46	447	7.6	10
June 11-16	32.3	6.2	.00	62	20	8.2	2.4	220	41	10	.2	3.0	.02	260	222	44	443	7.6	12
June 17-19	71.0	6.1	.04	46	14	4.4	2.5	166	31	7.0	.2	4.4	.00	232	172	36	342	7.5	15
June 20-30	7.89	7.9	.02	51	19	6.2	1.9	206	37	9.0	.2	4.3	.01	238	206	37	410	7.6	15
July 1-10	40.8	7.1	.00	45	14	5.7	2.8	172	28	8.8	.1	1.5	.00	213	168	29	342	7.8	20
July 11-19	2.59	5.3	.00	44	12	5.4	2.8	174	25	6.2	.1	1.9	.01	202	160	17	330	7.8	17
July 21-22	5,030	5.0	.10	32	13	3.4	2.4	122	28	4.5	.2	4.9	.12	158	134	33	289	7.5	--
July 23-31	88.8	7.3	.01	58	19	5.8	2.5	204	43	9.5	.2	4.5	.00	253	224	56	433	7.8	7
Aug. 1-6	76.7	5.1	.01	57	22	7.3	2.7	221	45	10	.3	2.2	.00	261	232	52	451	7.8	7
Aug. 7-10	170	7.5	.02	37	12	4.2	2.8	144	23	6.0	.2	3.7	.03	168	143	24	292	7.6	10
Aug. 11-21	161	8.1	.02	41	13	3.7	2.7	158	25	6.2	.2	2.7	.02	180	154	26	310	7.8	9
Aug. 22-31	81.8	8.0	.00	47	15	4.7	2.9	162	28	7.5	.2	2.8	.03	210	181	30	358	7.8	10
Sept. 1-10	11.1	5.1	.01	52	20	6.0	2.7	216	35	9.0	.2	1.6	.01	239	213	35	418	7.8	6
Sept. 11-20	4.33	3.0	.01	60	23	7.3	3.2	a247	40	11	.1	.9	.01	274	245	42	461	8.4	5
Sept. 21-30	4.02	4.1	.02	62	24	9.1	3.1	260	42	13	.2	.8	.01	286	254	40	501	8.4	8
Time-weighted average <sup>b</sup>	91.0	5.0	0.02	57	21	8.7	2.6	218	46	12	0.2	4.0	0.02	267	229	50	458	--	9

<sup>a</sup> Includes equivalent of 8 parts per million of carbonate (CO<sub>3</sub>).

<sup>b</sup> Represents 97 percent of days and 99 percent of runoff.

## LITTLE MIAMI RIVER BASIN--Continued

## TODD FORK NEAR ROACHESTER, OHIO--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
 /Once-daily measurement at varying hours/

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



## LITTLE MIAMI RIVER BASIN--Continued

## TODD FORK NEAR ROCHESTER, OHIO--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	0.2			0.3	3	(t)	2.5	1	(t)
2.....	.2			.3	3	(t)	2.3	3	(t)
3.....	.2	10	(t)	.2			2.0	2	(t)
4.....	.2			.2			2.0	2	(t)
5.....	.5			.2			1.7	3	(t)
6.....	.4			.2	4	(t)	1.8	4	(t)
7.....	.3	9	(t)	.2			1.9	4	(t)
8.....	.3			.2			1.7	3	(t)
9.....	.3			.2			2.4	2	(t)
10.....	.3			1.1	5	(t)	3.5	2	(t)
11.....	.3			1.9			2.9	2	(t)
12.....	.3	20	(t)	2.2			3.8	2	(t)
13.....	.3			2.2			3.5	2	(t)
14.....	.3			2.3			4.0	3	(t)
15.....	.3			2.4	4	(t)	5.0	5	0.1
16.....	.3			2.5			4	5	.1
17.....	.3	20	(t)	2.5			3	5	(t)
18.....	.3			2.0	2	(t)	2.7	5	(t)
19.....	.2			1.7			2.5	5	(t)
20.....	.2			1.6			2.5	5	(t)
21.....	.2			1.4	4	(t)	2.6	6	(t)
22.....	.2	11	(t)	2.0	4	(t)	3.3	5	(t)
23.....	.2			5.2	9	0.1	3.8	5	a .1
24.....	.3			15	16	.6	3	5	(t)
25.....	.3			7.9	7	.1	2.7	5	(t)
26.....	.3			5.2	2	(t)	2.5	6	(t)
27.....	.4			4.0	1	(t)	2.7	5	(t)
28.....	.4	11	(t)	3.7	1	(t)	3.0	5	(t)
29.....	.3			3.0	1	(t)	3.3	4	(t)
30.....	.3			2.7	1	(t)	3.5	4	(t)
31.....	.3			--	--	--	3.7	4	(t)
Total.	8.9	--	0.4	74.5	--	1.1	89.8	--	1.1
January									
1.....	3.3	3	(t)	45	1	0.1	79	10	2.1
2.....	2.9	5	(t)	45	1	.1	88	8	1.9
3.....	2.7	4	(t)	43	1	.1	143	16	6.2
4.....	2.5	2	(t)	43	1	.1	95	10	2.6
5.....	2.5	2	(t)	43	2	.2	49	7	.9
6.....	2.5	2	(t)	43	2	.2	41	5	.6
7.....	178	25	b12	43	1	.1	34	2	.2
8.....	140	7	2.6	43	1	.1	28	2	.2
9.....	103	1	.3	41	1	.1	25	6	.4
10.....	80	--		41	1	.1	23	3	.2
11.....	60	--		41	1	.1	41	6	.7
12.....	45	--	e .1	40	2	.2	163	35	sb17
13.....	40	--		40	3	.3	134	32	12
14.....	55	--		40	7	.8	81	21	4.6
15.....	75	--		40	7	.8	58	8	1.2
16.....	85	1	.2	41	10	1.1	41	5	.6
17.....	60	1	a .2	47	12	1.5	34	4	.4
18.....	45	2	.2	49	10	1.3	28	7	.5
19.....	90	2	.5	22	7	.4	116	27	s12
20.....	235	90	sb75	12	6	.2	520	425	597
21.....	272	187	123	14	11	.4	260	144	s109
22.....	140	95	a35	21	10	.6	194	31	16
23.....	120	30	9.7	17	11	.5	163	20	8.8
24.....	108	10	2.9	15	9	.4	73	12	2.4
25.....	98	6	1.6	12	8	.2	68	7	1.3
26.....	58	6	.9	12	8	.2	123	12	4.0
27.....	62	6	1.0	11	7	.2	88	10	2.4
28.....	62	6	1.0	20	10	.5	68	8	1.5
29.....	56	3	.4	--	--	--	66	5	.9
30.....	50	2	.3	--	--	--	58	9	1.4
31.....	49	1	.1	--	--	--	52	6	.8
Total.	2,382.4	--	267.6	924	--	10.9	3,034	--	809.8
February									
March									

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

## TODD FORK NEAR ROACHESTER, OHIO--Continued

Suspended sediment, water year October 1953 to September 1954--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.....	41	3	0.3	125	--	e 70	49	--	e 30
2.....	35	5	.5	540	--	e 1,200	88	--	e 40
3.....	29	5	.4	858	--	e 1,800	66	63	11
4.....	25	4	.3	465	176	s 237	54	45	6.6
5.....	26	5	.4	284	59	45	34	37	3.4
6.....	104	18	5.0	194	38	20	25	32	2.2
7.....	105	20	5.7	163	35	15	20	27	1.4
8.....	83	15	3.4	154	31	13	16	20	.9
9.....	60	8	1.3	137	27	10	40	--	e 4
10.....	43	6	.7	128	22	7.6	21	32	1.8
11.....	47	5	.6	108	21	6.1	15	25	1.0
12.....	54	6	.9	88	19	4.5	15	17	.7
13.....	40	7	.8	73	17	3.4	13	17	.6
14.....	32	7	.6	60	19	3.1	26	19	sb 2
15.....	104	24	s 9.1	50	19	2.6	75	32	6.5
16.....	1,170	640	s 3,490	43	16	1.8	50	31	4.2
17.....	1,100	391	s 1,530	40	13	1.4	88	899	s 480
18.....	308	77	67	35	12	1.1	87	223	52
19.....	178	32	15	30	12	1.0	38	169	17
20.....	123	20	6.6	34	13	1.2	20	155	8.4
21.....	95	15	3.8	29	12	.9	13	112	3.9
22.....	98	60	sc 40	22	15	.9	10	78	2.1
23.....	856	900	c 2,100	20	16	.9	7.9	55	1.2
24.....	344	210	s 221	17	16	.7	7.4	42	.8
25.....	190	69	35	15	17	a.7	7.1	32	.6
26.....	137	36	13	14	18	.7	5.9	30	.5
27.....	123	50	sc 20	14	23	.9	4.8	27	.3
28.....	178	150	sc 80	15	21	.8	4.0	30	.3
29.....	110	62	18	16	28	1.4	3.5	30	.3
30.....	93	35	8.8	22	35	2.1	3.2	37	.3
31.....	--	--	--	17	30	1.4	--	--	--
Total.	5,933	--	7,678.2	3,812	--	3,455.2	906.8	--	684.0
July			August			September			
1.....	2.9	36	0.3	14	16	0.6	23	47	2.9
2.....	2.5	34	.2	36	--	e 12	16	40	1.7
3.....	2.5	36	.2	79	90	sc 20	13	35	1.2
4.....	162	--	e 700	34	40	3.7	11	33	1.0
5.....	83	--	e 160	107	--	e 50	9.9	36	1.0
6.....	108	350	sc 120	190	140	sc 85	8.7	32	.8
7.....	24	251	16	93	55	14	7.6	26	.5
8.....	11	242	7.2	68	50	9.2	7.4	20	.4
9.....	7.2	165	3.2	358	--	e 1,200	7.1	25	.5
10.....	5.2	98	1.4	163	195	86	6.9	29	.5
11.....	4.0	90	1.0	108	95	28	5.7	22	.3
12.....	3.5	74	.7	75	65	13	5.0	26	.4
13.....	2.9	49	.4	45	50	6.1	4.8	26	.3
14.....	2.3	39	.2	32	44	3.8	4.8	20	.2
15.....	2.0	27	.1	32	36	3.1	4.5	25	.3
16.....	1.6	25	.1	23	30	1.9	3.7	29	.3
17.....	1.4	30	.1	176	408	s 504	3.5	22	.2
18.....	1.5	37	.1	425	464	s 628	3.2	20	.2
19.....	4.1	75	b. 8	180	138	67	3.3	21	.2
20.....	305	--	e 3,200	429	170	sc 200	4.8	21	.3
21.....	8,760	--	e 53,000	242	165	108	5.7	20	.3
22.....	1,300	263	s 1,100	121	106	35	7.9	25	.5
23.....	324	61	53	81	76	17	5.4	30	.4
24.....	151	24	9.8	47	52	6.6	3.7	25	.2
25.....	105	14	4.0	32	35	3.0	3.3	14	.1
26.....	81	12	a 3	44	40	sc 6	3.2	21	.2
27.....	50	15	2.0	215	--	e 100	2.9	24	.2
28.....	32	14	1.2	115	118	37	2.7	15	.1
29.....	23	13	.8	81	107	23	2.7	12	.1
30.....	18	16	.8	50	80	11	2.7	25	.2
31.....	15	13	.5	32	62	5.4	--	--	--
Total.	11,595.6	--	58,387.1	3,727	--	3,287.4	194.1	--	15.5
Total discharge for year (cfs-days).....									32,682.1
Total load for year (tons).....									74,598.3

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.

LITTLE MIAMI RIVER BASIN--Continued  
TODD FORK NEAR ROACHESTER, OHIO--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954

(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	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. 20, 1954..	6:00 p. m.	435		414	695	80	84	93	96	98	98	--	--	--	--	BSWCM
Apr. 16.....	2:00 p. m.	955		1,610	1,560	47	61	66	65	96	96	--	--	--	--	BSWCM
Apr. 17.....	12:40 a. m.	2,490		976	880	49	63	77	90	97	99	--	--	--	--	BSWCM
Apr. 17.....	1:15 a. m.	2,280		915	1,140	--	65	73	89	96	97	99	--	--	--	BSWCM
Apr. 17.....	1:15 a. m.	2,280		915	953	28	44	65	86	93	96	--	--	--	--	BSNM
Apr. 23.....	2:00 p. m.	683		832	732	68	81	83	94	97	99	--	--	--	--	BSWCM
Apr. 23.....	5:30 p. m.	890		864	685	64	80	83	93	98	99	--	--	--	--	BSWCM
May 3.....	3:45 p. m.	641		473	794	71	84	87	92	94	95	--	--	--	--	BSWCM
June 17.....	8:00 p. m.	190		3,240	1,990	52	70	87	98	100	100	--	--	--	--	BWCM
July 4.....	29	502		502	756	75	91	93	97	98	99	--	--	--	--	BSWCM
July 21.....	6:15 p. m.	6,480		665	973	50	63	66	66	97	95	86	92	94	94	BSWCM
Aug. 9.....	7:30 p. m.	508		489	756	73	87	87	93	97	99	--	--	--	--	BSWCM
Aug. 17.....	6:00 p. m.	523		1,180	1,300	49	64	81	95	100	100	--	--	--	--	BWCM

## LICKING RIVER BASIN

## LICKING RIVER AT FARMERS, KY.

LOCATION ---Temperature recorder at gaging station at bridge on U. S. Highway 60, 300 feet upstream from Chesapeake & Ohio Railway bridge, three-quarters mile west of Farmers, Rowan County, and 1.1 miles upstream from Triplett Creek.

DRAINAGE AREA 826 square miles.

RECORDS AVAILABLE: October 1949 to September 1954. Average of twice-daily measurements October 1949 to September 1953; continuous records thereafter.

EXTREMES, 1953-54. ---Water temperatures: Maximum, 83°F July 20; minimum, 34°F Jan. 18, 19.

EXTREMES, 1949-54. ---Water temperatures: Maximum, 92°F July 19, 1951; minimum, freezing point at times during most years.

REMARKS. ---Records of discharge for water year October 1953 to September 1954

Temperature (°F) of water, water year October 1953 to September 1954

Continuous recorder with temperature attachment<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.....	58	57	49	49	39	37	41	40	46	44	50	48	63	62	70	70	79	76	90	79	74	70	70	
2.....	59	57	49	49	39	39	40	40	44	42	48	47	63	62	71	69	79	77	79	77	72	69	69	
3.....	59	57	49	49	39	38	41	40	42	42	47	46	63	62	71	69	79	77	77	77	75	73	71	
4.....	59	58	49	49	40	40	41	41	42	41	47	47	62	60	69	64	79	76	76	76	74	72	72	
5.....	58	56	49	49	40	40	41	41	41	41	40	49	47	60	57	65	62	81	79	76	74	75	72	
6.....	56	54	49	49	40	38	41	40	40	40	51	49	56	55	66	63	79	76	75	74	76	74	74	
7.....	54	51	49	49	40	39	40	39	40	39	55	51	55	55	68	65	78	74	75	73	76	76	76	
8.....	52	50	46	45	40	39	39	38	40	39	57	55	53	54	69	67	78	76	74	72	76	75	75	
9.....	52	50	45	45	40	39	38	37	42	39	57	56	54	54	70	68	78	74	73	73	75	75	74	
10.....	52	50	45	45	41	38	39	38	44	42	58	56	54	53	74	70	76	73	74	73	75	74	74	
11.....	52	50	45	43	39	38	39	38	46	44	58	58	53	53	74	73	75	72	74	72	75	72	72	
12.....	52	50	43	43	38	38	38	39	46	43	58	57	54	53	76	73	77	74	72	70	72	69	69	
13.....	51	49	43	43	38	38	39	38	48	46	58	57	54	54	76	75	79	76	71	69	71	68	68	
14.....	51	50	43	41	36	36	41	38	49	46	60	59	55	54	76	74	82	77	71	70	71	69	69	
15.....	59	57	51	50	41	40	36	35	43	41	48	45	62	60	54	54	77	73	82	81	70	72	71	
16.....	60	56	51	50	40	39	35	35	46	45	43	62	60	57	54	78	76	75	72	73	72	73	72	
17.....	55	51	50	38	37	35	35	35	46	46	43	42	60	57	57	78	75	78	74	75	75	74	72	
18.....	55	51	38	37	35	34	34	34	46	44	44	43	57	56	59	57	78	75	80	77	75	73	73	
19.....	52	51	37	36	35	34	34	34	46	45	45	44	58	56	60	58	75	73	81	79	77	76	74	
20.....	53	52	38	36	38	35	35	35	48	46	45	45	60	58	59	58	74	72	83	80	78	76	75	
21.....	53	37	36	41	38	49	48	45	48	45	45	62	60	59	56	76	74	80	80	76	75	75	70	
22.....	56	37	36	41	40	49	48	45	44	43	63	62	59	56	77	75	80	78	75	70	70	68	68	
23.....	56	38	37	41	40	46	47	45	44	44	64	63	59	57	78	76	79	76	78	77	68	67	68	
24.....	56	38	38	40	40	49	47	47	45	65	64	61	59	78	75	80	78	75	80	78	67	65	65	
25.....	55	38	37	40	40	49	47	49	47	67	65	63	61	78	74	80	78	74	80	78	66	65	65	
26.....	53	51	37	36	41	40	48	48	52	49	68	66	63	62	79	75	77	74	80	78	67	66	66	
27.....	52	50	37	36	42	41	48	47	52	51	68	67	65	63	80	77	74	80	78	80	68	67	66	
28.....	64	62	50	49	36	36	43	42	48	46	53	52	68	63	66	65	80	75	77	75	80	78	68	
29.....	60	60	50	48	37	36	43	43	43	43	53	53	64	61	68	66	77	74	79	77	78	69	68	
30.....	60	59	49	48	37	37	43	42	42	42	53	53	62	62	69	66	77	74	80	78	76	69	69	
31.....	59	57	42	41	39	37	42	41	42	41	53	50	47	46	70	67	74	72	79	76	75	73	72	
Average.....	54	52	44	43	38	38	44	43	46	45	59	57	60	58	74	72	79	76	76	75	72	70	70	

LICKING RIVER BASIN--Continued  
LICKING RIVER AT MCKINNEYSBURG, KY.

LOCATION,--At gaging station at 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 1954.

Water temperatures: October 1952 to September 1954.

Sediment records: October 1952 to September 1954.

EXTREMES, 1953-54,--Dissolved solids: Maximum, 162 ppm Dec. 14-22; minimum, 82 ppm May 10-14.

Hardness: Maximum, 134 ppm Oct. 14-26; Nov. 9-21, Dec. 14-22; minimum, 56 ppm May 10-14.

Specific conductance: Maximum daily, 296 micromhos Dec. 9; minimum daily, 114 micromhos May 11.

Water temperatures: Maximum, 86 F July 14; minimum, freezing point Jan. 10.

Sediment concentrations: Maximum daily, 4,200 ppm Aug. 20; minimum daily, 1 ppm on many days during December and January.

EXTREMES, 1952-54,--Dissolved solids: Maximum, 165 ppm Jan. 10, 1953; minimum, 57 ppm Apr. 16-17, 1953.

Hardness: Maximum, 134 ppm Oct. 14-26; Nov. 9-21, Dec. 14-22, 1953; minimum, 45 ppm Apr. 16-17, 1953.

Specific conductance: Maximum daily, 296 micromhos Dec. 9; minimum daily, 90.2 micromhos Mar. 9, 1953.

Water temperatures: Maximum, 87 F July 31; minimum, freezing point Dec. 28-29, 1953, Jan. 10, 1954.

Sediment concentrations: Maximum, 87 F July 31, 1953; minimum, freezing point Dec. 28-29, 1953, Jan. 10, 1954.

Sediment analyses: Maximum daily, 4,200 ppm Aug. 20, 1954; minimum daily, less than 0.5 ton on many days during November 1952, December 1953, and January 1954.

Remarks: Maximum daily, 126,000 tons Mar. 4, 1953; minimum daily, less than 0.5 ton on many days during October, November, 1952, September to December 1953, and January 1954.

REMARKS,--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1953 to September 1954 given in NSP 1535.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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			
Oct. 1-13, 1953	7.6	2.6	0.99	38	7.2	3.2	3.3	137	18	3.0	0.2	0.3	149	125	12	256	7.3	7
Oct. 14-26	4.8	4.7	.02	40	8.2	3.3	3.3	140	19	3.8	.2	.6	158	134	19	269	7.3	5
Oct. 27 - Nov. 8	5.6	2.5	.03	40	7.7	3.2	3.3	141	20	3.5	.2	.1	156	133	16	268	7.4	10
Nov. 9-21	6.2	4.2	.01	42	7.4	3.3	2.9	144	19	3.0	.1	.2	156	134	17	275	7.0	5
Nov. 22 - Dec. 2	22.7	2.8	.01	40	7.8	3.2	3.1	142	20	3.4	.1	.4	159	132	16	270	7.2	6
Dec. 3-13	25.1	5.0	.01	40	7.2	3.8	3.0	140	19	4.7	.1	.5	156	129	15	270	7.3	6
Dec. 14-22	29.6	2.6	.00	41	7.7	4.1	2.6	148	17	4.6	.1	.5	162	134	13	277	7.2	7
Dec. 23-31	32.4	3.5	.03	40	7.4	4.3	2.6	144	15	5.2	.1	.4	159	130	12	271	7.4	7
Jan. 1-8, 1954	22.1	3.2	.01	38	6.9	3.7	2.5	136	15	5.0	.2	.5	143	123	12	260	7.3	5
Jan. 11-20	903	4.0	.02	38	7.1	3.6	2.1	119	20	5.8	.2	6.6	146	123	26	259	7.3	10
Jan. 21-31	2,338	5.6	.03	27	5.5	3.5	1.9	61	29	5.8	.2	14	122	90	40	206	7.2	15
Feb. 1-10	616	7.9	.02	26	6.3	4.2	.9	60	32	7.5	.1	9.6	122	91	42	209	7.2	5
Feb. 11-23	289	8.9	.05	24	5.4	5.2	2.2	56	31	7.0	.1	4.8	124	81	36	195	7.1	12
Feb. 24 - Mar. 3	1,611	4.2	.03	31	5.8	6.3	2.0	78	33	8.5	.1	5.5	141	102	37	234	7.0	8

LICKING RIVER BASIN--Continued  
 LICKING RIVER AT MCKINNEYSBURG, KY.--Continued  
 Chemical analyses, in parts per million, water year October 1953 to September 1954--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 100°C)	Hardness as CaCO <sub>3</sub>		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Mar. 4-12, 1954	3,503	6.4	0.08	21	4.8	3.4	1.6	56	23	3.5	0.1	7.4	111	73	26	168	7.1	30
Mar. 15-18	3,635	7.9	.06	20	4.0	3.4	2.0	52	22	3.2	.2	5.8	99	66	24	146	6.9	2
Mar. 19-31	1,542	9.0	.05	34	5.6	3.4	1.9	94	25	4.1	.2	5.5	148	109	31	232	7.1	2
Apr. 1-10	1,427	9.8	.02	24	4.8	3.6	2.1	64	26	4.1	.2	2.5	110	79	27	176	7.3	1
Apr. 11-20	2,736	7.6	.03	25	4.8	4.1	2.0	75	23	4.0	.2	6.6	116	82	21	178	7.2	2
Apr. 21-22, 24 - May 1	1,723	8.5	.03	22	4.3	3.4	1.7	65	20	4.0	.1	1.9	103	72	19	164	7.3	10
May 2-9	3,921	7.2	.03	27	5.0	2.6	1.7	79	21	3.0	.1	3.2	114	88	23	185	7.2	10
May 10-14	3,804	8.1	.08	17	3.6	2.4	1.4	49	18	2.8	.2	2.3	82	56	17	129	7.2	25
May 15-27	694	6.8	.01	20	5.2	3.3	1.4	61	20	4.2	.1	2.0	106	70	21	153	7.3	5
May 26 - June 9	198	4.7	.00	20	5.9	4.0	1.7	70	19	5.1	.1	1.0	101	74	17	161	7.4	4
June 10-11	338	4.7	.03	36	8.0	4.1	1.9	122	22	5.0	.1	1.5	150	123	23	252	7.6	5
June 12-19	999	4.9	.01	31	3.8	2.4	2.6	94	15	3.0	.2	4.7	123	93	16	197	7.4	16
June 20-24	660	6.5	.02	21	4.0	3.2	2.6	64	14	4.6	.1	4.3	98	68	16	157	7.4	20
June 25 - July 2	109	16	.03	25	5.0	3.8	2.7	85	14	5.1	.2	2.6	120	84	13	183	7.6	15
July 3-10	51.8	6.8	.01	27	5.0	4.2	2.7	91	14	6.4	.1	1.5	111	88	13	188	7.4	5
July 11-20	86.2	7.6	.00	29	5.4	3.6	2.7	99	14	5.1	.2	1.0	119	94	13	206	7.4	5
July 21-31	80.6	9.6	.01	29	5.5	4.1	2.7	104	14	5.8	.2	1.2	124	96	10	211	7.5	5
Aug. 1-4	531	7.5	.00	30	3.4	3.3	2.9	90	13	5.2	.2	4.1	119	88	15	196	7.3	5
Aug. 5-7	376	4.5	.01	29	4.4	2.4	3.4	83	10	9.2	.2	5.8	122	90	22	162	7.2	70
Aug. 8-21	428	4.4	.00	27	3.3	2.4	3.0	80	12	3.5	.3	6.6	111	82	15	180	7.6	10
Aug. 22-26, 27	230	4.4	.01	29	3.3	2.9	2.7	86	14	3.0	.4	5.9	117	86	15	184	7.8	10
Aug. 28 - Sept. 10	204	3.6	.00	31	3.8	2.5	3.1	94	14	3.2	.4	3.8	124	93	16	201	7.9	15
Sept. 11-19	48.1	6.6	.01	30	4.8	3.4	3.4	98	19	4.0	.1	2.6	124	96	14	211	7.7	10
Sept. 20-22	3,113	4.9	.00	26	3.0	2.0	3.7	78	13	3.0	.2	5.3	108	78	13	172	7.3	30
Sept. 23-26	1,184	5.6	.00	27	4.6	2.4	4.6	86	13	3.0	.2	6.2	113	86	16	187	7.8	18
Sept. 27-30	284	5.3	.01	21	3.7	2.0	3.4	70	11	2.0	.1	3.4	93	68	10	155	7.5	20
Time-weighted average <sup>a</sup>	806	5.9	0.02	30	5.6	3.5	2.5	96	19	4.5	0.2	3.4	128	98	19	212	-	9

<sup>a</sup> Represents 99 percent of days and 97 percent of runoff.

## LICKING RIVER BASIN--Continued

## LICKING RIVER AT MCKINNEYSBURG, KY.--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
/Once-daily measurement at varying hours/

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

## OHIO RIVER BASIN EXCEPT CUMBERLAND AND TENNESSEE RIVER BASINS

## LICKING RIVER BASIN--Continued

## LICKING RIVER AT MCKINNEYSBURG, KY.--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	9.5	23	1	5	8		24	3	
2.....	9	23	1	5	8		24	3	
3.....	9	26	1	5	9		24	4	
4.....	8.5	25	1	5	10		29	5	
5.....	8.5	25	1	5	11		29	6	
6.....	8.5	27	1	7	9		30	4	
7.....	8	27	1	7	9		26	6	
8.....	7.5	26	1	7	8		22	4	
9.....	7	20		7	8		24	2	
10.....	6.5	18		6.5	7		26	2	
11.....	6	13		6.5	5		22	3	
12.....	5.5	12		6	6		22	4	
13.....	5	12		6	5		22	2	
14.....	5	10		5.5	3	(t)	26	2	
15.....	5	10		5.5	3		32	1	(t)
16.....	5	9		6	3		30	1	
17.....	5	10		7	4		31	2	
18.....	5	9		6.5	5		28	2	
19.....	5	9		6	5		26	1	
20.....	5	8	(t)	6	5		28	1	
21.....	5	7		6.5	5		30	1	
22.....	5	5		21	5		35	1	
23.....	4.6	7		22	3		41	2	
24.....	4.8	10		19	3		38	3	
25.....	4.8	12		22	4		35	4	
26.....	4.5	12		22	7		33	5	
27.....	5.5	9		24	8	1	31	5	
28.....	5.5	16		24	9	1	31	5	
29.....	5.5	22		24	12	1	29	5	
30.....	5.5	8		24	3	(t)	28	3	
31.....	5.5	6		--	--	--	26	2	
Total.	189.0	--	11	328.0	--	7	862	--	7
	January			February			March		
1.....	24	1		918	48	119	1,430	102	s 443
2.....	23	1		732	29	55	4,270	188	2,170
3.....	22	1		618	13	22	5,880	214	3,400
4.....	22	1		522	18	25	6,600	217	3,870
5.....	22	1		464	18	22	6,450	196	3,410
6.....	22	1		552	18	27	4,770	130	1,670
7.....	22	1		684	18	32	3,360	109	989
8.....	21	1	(t)	624	7	12	2,380	122	784
9.....	20	1		570	6	9	1,860	85	a 430
10.....	22	1		510	3	4	1,870	48	216
11.....	22	1		452	3	4	1,630	45	a 200
12.....	22	1		408	2	2	2,810	342	s 2,730
13.....	21	1		386	2	2	3,690	1,100	s 12,800
14.....	22	1		348	2	2	3,670	465	4,610
15.....	28	2		320	7	6	5,470	460	6,790
16.....	972	--	e 500	288	12	9	4,670	453	5,710
17.....	1,400	369	1,390	255	12	8	2,610	400	a 2,800
18.....	1,610	196	852	235	12	8	1,790	330	1,590
19.....	1,640	176	779	220	10	6	1,650	250	a 1,100
20.....	3,290	740	s 7,400	215	10	6	2,340	230	1,450
21.....	4,770	530	6,820	210	10	6	1,570	198	839
22.....	4,500	478	5,810	210	7	4	1,300	67	235
23.....	3,880	370	a 3,900	206	5	3	1,160	38	119
24.....	2,250	215	1,310	201	4	2	1,070	30	87
25.....	1,520	160	a 660	201	4	2	978	35	92
26.....	1,240	122	408	201	5	3	1,270	62	212
27.....	1,520	130	534	201	6	3	1,140	60	a 180
28.....	1,520	72	295	504	41	s 70	1,220	45	148
29.....	1,720	72	334	--	--	--	1,330	73	265
30.....	1,610	54	235	--	--	--	2,680	848	6,300
31.....	1,190	52	187	--	--	--	2,340	250	a 1,600
Total.	34,966	--	31,396	11,225	--	473	86,058	--	67,239

e Estimated.

s Computed by subdividing day.

t Less than 0.5 ton.

a Computed from estimated concentration graph.



## LICKING RIVER BASIN--Continued

## LICKING RIVER AT MCKINNEYSBURG, KY.--Continued

## Suspended sediment, water year October 1953 to September 1954--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.....	1,810	153	748	2,920	278	2,190	201	15	8
2.....	2,040	122	672	3,000	324	2,620	193	16	8
3.....	2,090	88	496	4,060	356	3,900	197	18	10
4.....	1,760	63	299	4,860	435	5,710	193	20	10
5.....	1,470	68	270	4,560	220	2,710	171	17	8
6.....	1,260	69	235	3,660	148	1,460	164	15	7
7.....	1,090	65	191	2,480	96	843	160	17	7
8.....	1,000	60	182	3,050	103	848	144	20	8
9.....	912	42	103	5,700	220	3,380	137	22	8
10.....	840	38	86	6,230	187	3,140	310	24	20
11.....	798	28	60	5,300	207	2,960	365	--	e 300
12.....	768	29	60	3,620	143	1,400	1,240	1,670	5,590
13.....	762	30	62	2,230	87	524	469	1,200	sb 1,800
14.....	900	28	68	1,640	57	252	1,530	3,600	sb 17,000
15.....	918	28	69	1,310	47	166	447	1,340	1,620
16.....	2,810	595	s 7,300	1,130	40	122	315	586	498
17.....	4,860	385	s 5,770	1,030	37	103	1,380	1,210	s 5,210
18.....	5,740	500	a 7,700	888	33	79	1,420	1,060	4,060
19.....	6,170	220	3,660	762	28	58	1,190	735	2,360
20.....	3,630	113	1,110	660	28	50	1,260	422	1,440
21.....	2,520	80	544	576	27	42	858	270	a 600
22.....	1,920	80	415	528	24	34	546	210	a 310
23.....	1,510	48	196	516	20	28	370	153	153
24.....	1,260	48	163	486	21	28	266	105	75
25.....	1,130	43	131	425	17	20	201	61	44
26.....	1,130	28	85	376	12	12	157	77	33
27.....	978	22	58	332	10	9	125	70	24
28.....	870	17	40	293	15	12	104	58	16
29.....	1,620	--	e 550	266	15	11	88	43	10
30.....	2,880	--	e 2,200	235	14	9	74	40	8
31.....	--	--	--	220	16	10	--	--	--
Total.	57,446	--	33,503	63,343	--	32,530	14,275	--	41,245
July									
1.....	65	38	7	61	48	8	403	196	213
2.....	65	34	5	169	140	sb 90	326	158	139
3.....	51	42	6	1,300	1,800	sb 6,800	225	206	125
4.....	49	47	6	594	2,160	3,460	160	163	70
5.....	46	37	4	354	1,370	1,310	125	142	48
6.....	43	30	3	310	570	477	99	148	40
7.....	38	38	4	464	294	368	81	157	34
8.....	37	32	3	315	152	129	70	148	28
9.....	34	26	2	660	240	sb 550	59	133	21
10.....	116	43	13	894	340	821	59	131	21
11.....	116	37	12	696	342	643	86	152	35
12.....	91	32	8	436	1,200	1,410	74	108	22
13.....	141	31	12	348	1,040	977	54	100	14
14.....	171	28	13	282	580	442	44	97	12
15.....	128	37	12	220	470	279	35	88	8
16.....	94	30	8	164	505	224	31	85	7
17.....	74	27	5	131	460	163	31	83	7
18.....	57	28	4	188	420	213	37	98	10
19.....	47	23	3	122	468	s 172	41	103	11
20.....	43	25	3	1,070	4,200	b 12,000	2,880	1,990	s 23,000
21.....	37	26	2	469	2,500	3,160	4,160	2,260	25,400
22.....	40	33	4	271	1,600	a 1,200	2,300	1,070	6,640
23.....	35	35	3	164	1,020	452	1,750	660	3,120
24.....	74	34	7	250	255	172	1,410	412	1,570
25.....	74	27	5	282	410	312	960	233	604
26.....	78	23	5	282	500	a 380	618	162	270
27.....	164	32	14	184	530	263	425	172	197
28.....	137	30	11	435	450	sb 650	304	142	116
29.....	104	32	9	326	440	387	230	125	78
30.....	81	27	6	260	296	208	176	117	56
31.....	63	33	6	235	270	171	--	--	--
Total.	2,383	--	206	11,936	--	37,891	17,253	--	61,916
Total discharge for year (cfs-days).....									
Total load for year (tons).....									
									299,284.0
									306,424

e Estimated.

s Computed by subdividing day.

a Computed from estimated concentration graph.

b Computed from partly estimated concentration graph.

LICKING RIVER BASIN--Continued  
LICKING RIVER AT MCKINNEYSBURG, KY.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954

(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	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. 20, 1954	10:00 a.m.	2,360		1,070	1,520	57	66	78	87	96	99	--	--	--	--	BSWCM
Mar. 13	10:30 a.m.	3,020		1,990	1,430	61	72	87	97	99	100	--	--	--	--	BSWCM
Mar. 30	9:00 a.m.	2,890		1,240	1,050	52	69	78	90	99	100	--	--	--	--	BSWCM
Apr. 16	2:00 p.m.	2,860		1,040	1,350	45	54	66	81	92	99	100	100	100	100	BSWCM
May 2	5:00 p.m.	3,000		335	472	62	78	87	94	99	100	--	--	--	--	BSWCM
May 4	11:05 p.m.	4,930		484	817	61	73	84	94	98	100	--	--	--	--	BSWCM
June 12	3:40 p.m.	1,010		1,590	1,160	88	83	97	99	--	--	--	--	--	--	BWCM
June 14	1:30 p.m.	1,010		3,710	3,060	51	68	91	96	100	100	--	--	--	--	BWCM
June 14	1:30 p.m.	2,030		3,710	2,910	71	68	87	97	98	100	--	--	--	--	BWCM
June 17	10:30 a.m.	1,600		1,600	1,220	71	87	99	100	99	99	--	--	--	--	BWCM
Aug. 3	12:40 p.m.	1,500		1,580	1,060	68	81	93	99	99	99	--	--	--	--	BWCM
Aug. 4	12:05 p.m.	564		2,360	1,720	72	86	94	96	99	99	--	--	--	--	BWCM
Aug. 5	8:15 a.m.	366		1,520	1,020	83	91	97	99	99	99	--	--	--	--	BWCM
Aug. 12	4:30 a.m.	408		1,520	1,020	77	95	98	99	99	99	--	--	--	--	BWCM
Aug. 16	12:30 p.m.	184		1,590	1,070	90	84	97	99	99	99	--	--	--	--	BWCM
Aug. 20	3:00 p.m.	972		3,660	3,020	71	84	95	98	100	100	--	--	--	--	BWCM
Aug. 21	3:45 a.m.	469		2,490	3,790	74	86	98	98	--	100	--	--	--	--	BWCM
Aug. 23	2:00 p.m.	157		995	1,710	90	96	98	--	--	99	--	--	--	--	BWCM
Sept. 20	3:30 p.m.	4,670		3,070	2,760	52	66	80	92	98	99	--	--	--	--	BSWCM
Sept. 21	3:30 p.m.	3,830		1,560	759	70	76	89	95	98	99	--	--	--	--	BSWCM
Sept. 24	2:00 p.m.	1,400		403	796	76	84	92	97	99	99	100	100	100	100	BSWCM

## LICKING RIVER BASIN--Continued

## SOUTH FORK LICKING RIVER AT CYNTHIANA, KY.

LOCATION.--At gaging station at bridge on State Highways 356 and 36, at Cynthiana, Harrison County, 0.4 mile downstream from Grays Run, and in pool formed by old mill dam 2.6 miles downstream.

DRAINAGE AREA.--615 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 87°F July 14; minimum, freezing point on several days during December.

EXTREMES, 1949-54.--Water temperatures: Maximum, 87°F June 30, 1952, July 14, 1954; minimum, freezing point on several days during December 1953.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, water year October 1953 to September 1954

Mean of twice-daily measurements at approximately 6:30 a. m. and 5:30 p. m.

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

## KENTUCKY RIVER BASIN

## NORTH FORK KENTUCKY RIVER AT HAZARD, KY.

LOCATION.--At gaging station at Woodland Park Bridge at Hazard, Perry County, 150 feet upstream from city waterworks dam, and 4.0 miles upstream from Lots Creek.

DRAINAGE AREA.--465 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 89°F June 27; minimum, freezing point Dec. 17.

EXTREMES, 1949-54.--Water temperatures: Maximum, 93°F Aug. 1, 1953; minimum, freezing point Dec. 17, 1953.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, water year October 1953 to September 1954  
/Mean of twice-daily measurements at approximately 7 a. m. and 5:30 p. m.7

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

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

LOCATION.--At gaging station at Broadway Street Bridge, at Frankfort, Franklin County, 300 feet upstream from Benson Creek, 0.9 mile upstream from lock 4, and at mile 65.9.  
DRAINAGE AREA.--5,430 square miles (includes that of Benson Creek).  
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1954.  
Water temperatures: October 1949 to September 1954.  
Sediment records: October 1952 to September 1954.

EXTREMES, 1953-54.--Dissolved solids: Maximum, 162 ppm Oct. 14-22, 24, Nov. 9-19; minimum, 86 ppm May 26 to June 4.  
Hardness: Maximum, 130 ppm Jan. 1, 3, 5, 7-9, 11; minimum, 49 ppm Mar. 6-12.

Specific conductance: Maximum daily, 386 microhos Jan. 21; minimum daily, 123 microhos Mar. 12.  
Water temperatures: Maximum, 84° F on several days during July and August; minimum, 37° F Jan. 18-20.

Sediment concentrations: Minimum daily, 1 ppm Nov. 1, 21, Dec. 11, Aug. 24.  
Sediment loads: Minimum daily, 1 ton on several days during November, August, and September.

EXTREMES, 1949-54.--Dissolved solids: Maximum, 224 ppm Nov. 21-30, 1949; minimum, 71 ppm May 10-13, 1953.  
Hardness: Maximum, 130 ppm Jan. 1, 3, 5, 7-9, 11, 1954; minimum, 42 ppm May 10-13, 1953.

Specific conductance: Maximum daily, 555 microhos Dec. 7, 1952; minimum daily, 79.8 microhos Feb. 4, 1951.  
Water temperatures: Maximum, 86° F Aug. 3-4, 1953; minimum, 34° F Feb. 8, 1951.

Sediment concentrations (1952-54): Maximum daily, 805 ppm Mar. 4, 1953; minimum daily, 1 ppm on several days during November 1952, November, December 1953, and August 1954.  
Sediment loads (1952-54): Maximum daily, 105,000 tons Mar. 4, 1953; minimum daily, 1 ton on several days during November 1952, November 1953, August and September 1954.

REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1953 to September 1954 given in WSP 1335. Records of discharge include flow of Benson Creek.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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 (microhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 1-3, 5-9, 11-13, 1953	190	0.6	0.04	36	7.6	8.2	2.8	109	29	12	0.1	1.6	157	120	32	272	7.0	5
Oct. 14-22, 24	164	2.1	.02	38	7.5	8.3	2.4	115	30	11	.2	2.3	162	126	31	285	7.0	5
Oct. 27-28, 30, Nov. 1, 3-8	223	1.2	.02	38	7.4	7.1	3.0	120	29	9.5	.2	2.1	160	126	27	279	7.3	5
Nov. 9-19	173	3.4	.00	40	7.3	6.6	2.0	121	28	7.2	.1	2.8	162	129	30	280	7.1	3
Nov. 21-23, 25, 27-30	459	1.6	.00	38	7.0	5.5	1.9	118	28	7.0	.1	2.8	158	124	27	274	7.2	5
Dec. 1-10	733	1.6	.00	38	6.9	4.3	1.6	125	22	5.4	.1	3.2	149	124	21	261	7.2	6
Dec. 11-13, 16, 20-21	496	2.4	.06	39	6.3	3.1	1.2	126	17	3.5	.1	5.7	146	122	20	253	7.2	5
Dec. 22-23, 26-27, 29-31	357	2.4	.04	39	6.4	3.9	1.0	125	16	3.7	.1	6.2	149	125	21	258	7.3	5
Jan. 1, 3, 5, 7-9, 11, 1954	262	4.6	.01	41	6.9	3.3	1.3	130	21	3.5	.2	5.7	151	130	24	265	7.3	6
Jan. 13-16, 21-22, 24-25	9,463	9.0	.02	35	6.5	3.6	1.8	95	33	8.5	.2	8.5	154	114	36	264	7.3	6
Jan. 27-Feb. 4	4,352	5.6	.02	22	4.1	3.6	.9	46	28	6.0	.2	9.8	99	71	34	171	7.2	7
Feb. 8-9, 11-15, 17	100	6.6	.03	28	5.6	6.2	1.3	64	32	7.5	.1	10	141	83	40	221	6.7	20
Feb. 20-Mar. 3, 5	4,691	6.3	.04	28	6.0	6.1	1.8	66	32	10	.1	6.5	140	94	40	224	6.9	25

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

Chemical analyses, in parts per million, water year October 1953 to September 1954--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			
Mar. 6-12, 1954.....	9,234	6.6	0.03	14	3.5	5.9	1.5	32	25	6.0	0.1	3.8	90	49	23	131	7.0	12
Mar. 13-15, 17-20, 22-23	5,350	8.2	.06	18	4.0	5.1	2.0	44	27	6.8	.2	3.7	106	63	25	152	6.6	2
Mar. 25-28, 30-31.....	4,698	7.8	.02	21	4.9	6.4	2.2	54	29	7.4	.2	4.0	113	74	28	174	6.8	1
Apr. 1-6, 8-10.....	4,263	8.4	.04	21	5.0	6.9	2.2	52	28	9.7	.1	2.0	113	73	30	184	6.9	1
Apr. 11-21, 23.....	7,407	7.8	.04	24	5.2	5.7	1.9	67	27	8.6	.1	3.9	118	82	26	194	7.0	1
Apr. 27-May 5.....	4,498	8.2	.01	20	4.3	5.1	1.5	55	22	6.6	.1	1.3	105	67	23	170	7.1	6
May 6-15.....	7,198	7.8	.01	20	4.5	5.4	1.5	56	24	7.8	.1	1.6	110	70	22	176	6.7	8
May 16-25.....	3,000	7.7	.01	18	3.3	4.4	1.5	51	20	6.0	.1	1.9	101	59	17	134	7.4	9
May 26-June 4.....	1,352	7.8	.02	17	4.1	4.5	1.2	49	21	5.9	.1	1.9	86	60	19	154	6.6	3
June 5-17.....	1,089	9.1	.02	19	4.8	6.2	2.0	51	26	7.8	.1	1.6	104	66	25	173	7.5	10
June 18-30.....	1,051	4.5	.01	20	5.5	6.0	1.9	58	28	7.0	.1	1.9	109	73	25	167	7.6	6
July 1-10.....	358	2.1	.03	23	5.2	6.0	2.2	64	30	7.5	.1	1.0	112	76	26	186	7.6	10
July 11-20.....	913	5.1	.01	21	5.0	6.6	2.2	62	29	7.0	.1	1.0	113	74	22	195	7.7	5
July 21-31.....	2,006	5.1	.03	25	5.5	8.7	2.1	66	28	12	.1	2.6	134	84	31	216	7.6	7
Aug. 1-10.....	742	4.7	.07	24	5.0	8.6	3.0	81	28	12	.1	3.9	135	81	30	212	7.5	15
Aug. 11-20.....	637	5.1	.01	24	5.6	9.9	2.2	92	36	14	.1	1.9	136	94	32	231	7.6	5
Aug. 21-31.....	391	3.2	.00	27	6.1	13	2.7	70	36	21	.1	1.6	151	92	35	261	7.7	7
Sept. 1-10.....	452	6.4	.01	27	6.2	11	2.8	74	34	18	.1	1.3	143	94	32	265	7.5	5
Sept. 11-20.....	655	6.2	.02	29	6.2	11	2.9	79	34	16	.1	1.6	146	98	33	255	7.5	5
Sept. 21-30.....	2,147	7.2	.05	33	6.2	6.3	2.7	95	30	9.1	.1	4.4	147	108	30	251	7.6	12
Time-weighted average <sup>a</sup> .....	2,146	5.4	0.02	27	5.6	6.7	2.0	76	28	9.1	0.1	3.3	130	90	28	218	--	7

<sup>a</sup> Represents 87 percent of days and 86 percent of runoff.

KENTUCKY RIVER BASIN

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

Temperature (°F) of water, water year October 1953 to September 1954  
 Continuous ethyl alcohol-actuated thermograph. Prior to November 14, 1952, once-daily measurement at varying hours.

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

## KENTUCKY RIVER BASIN--Continued

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

Suspended sediment, water year October 1953 to September 1954

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.....	184	12	6	211	1	1	699	9	17
2.....	225	10	6	211	3	a 2	788	6	13
3.....	268	10	7	190	5	a 2	966	6	16
4.....	239	8	5	166	6	a 3	878	6	14
5.....	239	7	4	232	7	4	706	8	15
6.....	225	16	10	218	11	6	268	9	6
7.....	178	16	8	190	10	5	351	11	10
8.....	160	12	5	211	8	4	816	7	15
9.....	178	12	6	184	8	4	849	3	7
10.....	204	14	a 8	197	8	4	1,010	2	5
11.....	190	17	9	178	8	4	719	1	2
12.....	130	17	6	136	5	2	610	2	3
13.....	115	13	4	120	4	1	253	4	3
14.....	125	13	4	154	9	4	902	6	15
15.....	130	12	4	142	6	2	707	6	a 11
16.....	136	12	4	140	6	2	552	7	a 10
17.....	184	10	5	246	4	3	639	7	a 12
18.....	166	8	4	225	2	1	754	7	14
19.....	136	10	4	184	2	1	610	7	12
20.....	160	9	4	246	2	a 1	360	11	11
21.....	218	7	4	284	1	1	278	10	8
22.....	218	8	5	580	5	8	726	12	23
23.....	218	11	a 6	292	3	2	672	13	24
24.....	172	17	8	568	2	a 3	597	12	a 19
25.....	160	17	a 7	878	4	9	209	12	a 7
26.....	148	8	3	686	4	a 7	160	14	6
27.....	232	4	2	352	3	3	150	15	6
28.....	253	5	3	598	6	10	200	14	8
29.....	218	7	a 4	423	7	8	253	14	a 10
30.....	239	10	6	26A	10	7	253	13	9
31.....	204	4	2	--	--	--	284	14	11
Total.	5,852	--	163	8,706	--	114	17,219	--	342
		January		February		March			
1.....	292	14	11	3,010	53	431	4,820	31	s 440
2.....	260	14	a 10	2,540	47	322	13,400	146	s 5,490
3.....	276	11	8	2,270	40	245	15,600	341	14,400
4.....	284	10	a 8	1,910	35	180	17,100	350	a 16,000
5.....	316	9	8	1,850	30	a 150	19,500	328	17,300
6.....	284	8	a 6	1,730	30	140	17,500	297	14,000
7.....	246	7	5	1,580	30	a 130	11,900	254	8,160
8.....	218	7	4	1,380	35	a 130	8,310	164	3,680
9.....	218	5	3	1,250	38	128	6,600	92	1,640
10.....	260	--	--	1,120	30	91	6,160	68	1,130
11.....	268	--	--	987	23	61	6,820	61	1,120
12.....	268	--	--	966	22	57	7,350	58	1,150
13.....	300	--	--	924	22	55	7,080	52	994
14.....	579	--	--	840	20	45	8,350	50	a 1,100
15.....	1,820	--	--	861	20	46	7,480	43	868
16.....	6,030	--	--	783	20	a 40	6,910	70	1,300
17.....	11,300	--	--	821	18	40	5,850	148	2,340
18.....	17,800	--	--	707	15	a 30	4,960	73	978
19.....	14,800	--	--	650	18	a 30	4,340	57	668
20.....	9,460	--	--	726	19	37	3,980	80	860
21.....	13,200	--	--	726	14	27	3,430	110	a 1,000
22.....	14,300	--	--	924	27	67	3,130	126	1,060
23.....	14,300	--	--	840	22	50	2,980	151	1,210
24.....	14,900	330	b 13,000	924	19	47	2,720	138	1,010
25.....	14,400	300	11,700	924	20	50	2,510	72	488
26.....	9,310	140	a 3,500	1,050	22	62	2,720	50	367
27.....	7,710	135	2,810	1,500	23	93	3,470	35	328
28.....	7,760	178	3,730	2,650	22	157	5,940	37	593
29.....	5,810	127	1,990	--	--	--	6,950	40	a 780
30.....	4,500	93	1,130	--	--	--	6,320	40	736
31.....	3,660	70	692	--	--	--	6,730	69	1,250
Total.	175,129	--	e 130,000	36,443	--	2,941	231,410	--	102,410

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 1953 to September 1954--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.....	6,560	67	1,190	5,220	25	352	1,120	20	60
2.....	6,030	38	619	4,750	33	423	1,150	16	50
3.....	5,260	30	426	4,260	34	391	987	23	61
4.....	4,500	33	401	3,900	34	358	1,100	25	74
5.....	4,020	30	326	4,100	32	354	1,580	22	94
6.....	3,510	26	246	4,300	30	348	1,700	15	69
7.....	3,090	25	a 210	4,420	30	358	1,440	15	98
8.....	2,900	27	211	8,540	48	s 1,190	1,150	10	31
9.....	2,830	34	280	14,100	132	5,020	1,050	7	20
10.....	2,760	23	171	12,700	124	4,250	924	10	25
11.....	2,790	17	128	9,170	86	2,130	903	14	34
12.....	3,240	21	184	6,560	70	1,240	632	12	30
13.....	3,620	20	195	5,010	66	893	578	10	16
14.....	3,470	23	215	3,940	62	660	614	10	16
15.....	3,050	24	198	3,240	51	446	821	13	29
16.....	6,720	45	s 985	2,830	42	321	1,010	11	30
17.....	13,600	177	6,500	2,680	43	311	1,360	13	48
18.....	13,600	279	10,200	2,680	35	253	1,790	13	63
19.....	13,300	212	7,610	2,830	30	229	1,940	22	115
20.....	11,900	170	5,460	2,680	32	232	1,910	22	113
21.....	8,540	112	2,580	3,550	33	316	1,790	30	145
22.....	6,380	70	1,200	4,140	37	414	1,580	27	115
23.....	5,050	53	723	3,820	35	361	1,150	17	58
24.....	4,300	50	580	2,650	26	186	682	13	31
25.....	3,820	32	330	2,140	28	162	596	10	16
26.....	4,020	31	336	1,820	27	133	506	9	12
27.....	4,220	26	296	1,550	22	92	542	10	15
28.....	4,140	18	201	1,580	23	98	418	8	9
29.....	4,800	21	272	1,520	21	86	300	10	8
30.....	5,090	24	330	1,410	20	78	260	12	8
31.....	--	--	--	1,280	15	52	--	--	--
<b>Total.</b>	<b>187,110</b>	<b>--</b>	<b>42,583</b>	<b>133,370</b>	<b>--</b>	<b>21,735</b>	<b>31,783</b>	<b>--</b>	<b>1,438</b>
	July			August			September		
1.....	246	12	8	542	220	322	405	28	31
2.....	260	10	7	536	270	391	431	48	56
3.....	253	11	8	470	298	378	506	60	82
4.....	353	12	11	550	260	386	437	21	25
5.....	366	10	10	652	202	356	300	15	12
6.....	232	15	9	614	160	265	308	18	15
7.....	184	12	6	840	100	227	466	13	16
8.....	490	11	14	861	65	161	708	5	10
9.....	361	16	16	1,200	51	165	578	11	17
10.....	837	16	36	1,150	43	134	379	10	10
11.....	1,980	16	86	987	30	80	316	7	6
12.....	2,230	24	144	882	23	55	260	11	8
13.....	1,330	24	86	821	20	44	280	11	8
14.....	1,030	19	53	726	25	49	596	12	19
15.....	745	19	38	579	21	33	560	15	23
16.....	500	18	24	470	23	29	308	15	12
17.....	366	18	18	524	27	38	246	3	2
18.....	332	16	14	560	24	36	260	2	1
19.....	284	16	12	444	18	22	260	4	3
20.....	332	15	13	379	20	20	3,460	439	sb 4,806
21.....	539	11	16	405	17	18	6,270	140	2,370
22.....	2,790	20	151	524	15	21	4,960	68	910
23.....	3,360	25	227	340	6	5	3,200	34	294
24.....	3,740	38	384	332	1	1	1,910	35	180
25.....	4,340	35	410	316	2	2	1,470	70	278
26.....	2,900	30	235	268	8	6	1,200	72	233
27.....	1,610	25	109	316	20	17	688	53	98
28.....	1,010	30	82	379	11	11	632	43	73
29.....	764	51	105	444	11	13	578	36	56
30.....	506	79	108	470	16	20	560	28	42
31.....	506	167	228	506	18	24	--	--	--
<b>Total.</b>	<b>34,776</b>	<b>--</b>	<b>2,668</b>	<b>18,087</b>	<b>--</b>	<b>3,319</b>	<b>32,532</b>	<b>--</b>	<b>9,690</b>
Total discharge for year (cfs).....									892,417
Total load for year (tons).....									317,403

s Computed by subdividing day.

a Computed from estimated concentration graph.

b Computed from partly estimated concentration graph.

## KENTUCKY RIVER BASIN--Continued

## EAGLE CREEK AT GLENCOE, KY.

LOCATION.--At gaging station at bridge on State Highway 16 at Gallatin-Owen County line, half a mile south of Glencoe, Gallatin County, 5.9 miles downstream from Tenmile Creek, and 22 miles upstream from mouth.

DRAINAGE AREA.--438 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 88°F July 24; minimum, freezing point Jan. 17-19, Mar. 3.

EXTREMES, 1949-54.--Water temperatures: Maximum, 93°F Sept. 1, 2, 1953; minimum, freezing point on several days most years.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, water year October 1953 to September 1954  
 [Mean of twice-daily measurements at approximately 8:30 a. m. and 4:30 p. m.]

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

## SALT RIVER BASIN

## SALT RIVER AT SHEPHERDSVILLE, KY.

LOCATION (revised).--At gaging station at bridge on State Highway 61 at Shepherdsville, Bullitt County, 500 feet downstream from Louisville & Nashville Railroad bridge, and 2.5 miles downstream from Floyds Fork.

DRAINAGE AREA.--1,230 square miles approximately.

RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1954.

Water temperatures: October 1952 to September 1954.

Sediment records: October 1952 to September 1954.

EXTREMES, 1953-54.--Dissolved solids: Maximum, 268 ppm Feb. 11-20; minimum, 95 ppm Sept. 20-21.

Hardness: Maximum, 216 ppm Feb. 11-20; minimum, 87 ppm Sept. 20-21.

Specific conductance: Maximum daily, 471 micromhos Nov. 22; minimum daily, 148 micromhos Sept. 22.

Water temperature: Maximum, 92°F June 27; minimum, 38°F Jan. 16.

Sediment concentrations: Maximum daily, 2,240 ppm Sept. 21; minimum daily, no flow on many days during October, November, and September.

Sediment loads: Maximum daily, 86,100 tons Sept. 21; minimum daily, no flow on many days during October, November, and September.

EXTREMES, 1952-54.--Dissolved solids: Maximum, 268 ppm Feb. 11-20, 1954; minimum, 95 ppm Sept. 20-21, 1954.

Hardness: Maximum, 216 ppm Feb. 11-20, 1954; minimum, 87 ppm Sept. 20-21, 1954.

Specific conductance: Maximum daily, 529 micromhos Dec. 23, 1952; minimum daily, 146 micromhos Mar. 5, 1953.

Water temperature: Maximum, 92°F June 27, 1954; minimum, 35°F Jan. 6-7, 1953.

Sediment concentrations: Maximum daily, 103,000 tons Mar. 4, 1953; minimum daily, no flow on many days during September to November 1953, and September 1954.

Sediment loads: Maximum daily, 103,000 tons Mar. 4, 1953; minimum daily, no flow on many days during September to November 1953, and September 1954.

REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1953 to September 1954 given in WSP 1335. No flow Oct. 1 - Nov. 21, Sept. 14-18.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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				
Oct. 1-Nov. 21, 1953	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 22-30	41.4	2.9	0.03	67	11	6.2	5.4	220	34	9.6	0.2	3.9	237	212	32	432	6.8	10	
Dec. 1-8	22.9	3.9	.02	60	9.2	4.8	4.9	199	21	6.6	.2	4.0	224	187	24	376	7.0	13	
Dec. 9-19	65.7	3.0	.03	47	5.0	3.3	4.0	128	32	4.6	.3	4.7	182	137	33	290	7.2	23	
Dec. 20-24, 26-31	26.2	5.7	.04	50	6.4	3.1	3.1	129	40	5.0	.3	4.3	193	152	45	309	6.9	32	
Jan. 1-10, 1954	24.3	4.7	.00	56	7.0	3.4	3.7	146	43	5.4	.3	4.5	209	168	49	341	6.9	26	
Jan. 11-20	893	4.5	.01	52	6.8	4.3	2.6	132	39	7.3	.2	11	197	156	50	331	7.0	16	
Jan. 21-31	1,566	6.5	.00	53	5.6	2.7	1.9	122	32	4.7	.2	24	195	155	35	318	7.0	21	
Feb. 1-10	238	7.2	.02	66	8.0	3.1	2.1	165	39	6.0	.1	26	235	199	62	389	7.5	8	
Feb. 11-20	91.1	6.3	.01	72	9.0	3.2	1.8	188	44	7.0	.1	18	266	216	53	433	7.3	6	
Feb. 21-28	316	2.7	.01	67	11	5.9	2.2	188	46	8.0	.1	11	201	213	38	427	7.5	9	
Mar. 1-5	143	4.1	.03	53	7.4	3.7	1.9	142	32	4.8	.1	13	212	163	46	333	7.5	22	
Mar. 6-13	274	3.9	.00	66	10	4.5	1.8	186	40	5.8	.1	14	236	208	53	313	7.4	9	
Mar. 14-22	297	5.5	.04	61	9.5	4.8	2.2	164	45	6.6	.2	10	236	171	37	338	7.4	1	
Mar. 23-31	530	4.7	.02	60	9.2	4.4	2.6	171	42	5.2	.2	7.0	233	186	47	378	7.5	1	

SALT RIVER BASIN--Continued  
SALT RIVER AT SHEPHERDSVILLE, KY.--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			
Apr. 1-10, 1954	995	5.1	0.03	64	11	4.2	1.9	180	43	6.2	0.2	9.7	240	204	57	401	7.3	7
Apr. 11-20	1,523	5.1	.03	59	9.5	3.8	1.9	168	37	5.0	.2	8.1	217	186	49	369	7.3	10
Apr. 21-30	1,867	4.8	.02	58	8.7	3.6	1.9	166	31	4.9	.2	7.7	206	182	44	359	7.3	10
May 1-8	755	6.4	.03	54	8.8	3.5	2.1	167	26	4.2	.2	4.8	200	171	34	335	7.4	10
May 9-15	415	6.0	.03	62	9.6	3.6	1.7	189	30	4.2	.2	4.9	220	194	39	377	7.6	10
May 16-25	91.2	6.0	.02	68	11	4.3	2.3	216	34	6.0	.2	5.7	237	215	38	424	7.7	7
May 26-June 4	92.2	4.3	.01	64	12	5.2	2.4	211	35	6.0	.2	1.5	240	208	36	413	7.7	10
June 5-16	144	4.4	.01	54	9.3	4.3	2.9	177	27	5.0	.3	3.2	206	174	28	355	7.6	8
June 17-25	140	5.0	.01	45	6.6	3.2	3.2	140	19	4.0	.2	5.4	169	139	25	283	7.6	15
June 26-July 5	10.3	6.1	.04	47	6.9	3.6	3.4	152	20	4.9	.6	2.9	190	146	21	301	8.0	15
July 6-15	47.7	5.1	.03	51	6.8	4.1	3.8	170	18	5.4	.6	1.8	192	156	16	317	8.2	10
July 16-25	12.1	7.7	.00	52	6.6	4.0	3.4	175	18	5.0	.2	2.4	192	157	14	318	7.6	10
July 26-Aug. 2	3.90	2.4	.00	53	7.3	4.1	3.5	178	17	5.4	.2	3.0	190	162	16	327	7.5	10
Aug. 3-4	648	2.3	.03	44	5.6	3.3	3.5	145	18	4.2	.2	3.4	162	134	14	275	7.6	9
Aug. 8-19	75.0	12	.02	37	4.5	3.0	3.5	120	16	3.4	.4	4.3	155	112	12	240	7.7	20
Aug. 20-31	8.96	4.3	.01	42	5.1	2.1	3.6	134	16	3.6	.4	2.4	157	125	16	261	7.9	15
Sept. 1-10	3.08	4.0	.01	46	5.8	2.7	3.9	152	16	4.8	.4	2.0	175	140	14	287	8.1	15
Sept. 11-14	1.10	5.0	.13	56	7.5	6.4	5.3	180	21	6.5	.3	15	219	171	23	368	7.2	10
Sept. 15-19	.08	5.2	.11	55	8.5	6.0	4.7	166	24	6.3	.3	16	220	173	18	372	7.2	15
Sept. 20-21	11,730	4.4	.13	27	4.6	1.8	4.0	84	9.1	3.0	.3	6.4	95	87	17	176	7.4	10
Sept. 22-30	935	6.8	.05	37	3.9	2.3	4.0	108	15	3.2	.4	6.7	139	108	20	235	7.6	30
Time-weighted average <sup>a</sup>	34C	5.3	0.02	55	7.9	3.9	3.0	162	30	5.5	0.3	7.6	207	170	37	343	--	13

<sup>a</sup> Includes equivalent of 4 parts per million of carbonate (CO<sub>3</sub>).

<sup>b</sup> Represents 98 percent of days and 98 percent of runoff.

SALT RIVER BASIN--Continued  
SALT RIVER AT SHEPHERDSVILLE, KY.--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
Continuous ethyl alcohol-acetated 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.....					52	48	44	41	46	45	51	56	55	73	73	78	76	87	78	83	79	84	74	
2.....					54	46	44	42	46	46	51	49	55	54	74	73	79	76	85	79	82	79	82	73
3.....					52	47	44	42	46	46	50	50	56	55	74	74	77	77	86	79	82	80	84	75
4.....					56	52	44	42	48	46	50	48	56	56	74	69	77	75	87	84	82	80	86	76
5.....					55	47	44	42	46	46	48	47	57	56	69	67	75	74	89	84	80	80	87	78
6.....					56	51	42	42	46	46	46	59	57	67	66	74	73	88	81	81	80	86	78	
7.....					54	48	45	41	46	46	45	63	59	66	65	76	74	86	80	80	80	82	79	
8.....					50	49	46	42	46	45	47	66	63	65	64	77	76	86	80	80	80	85	78	
9.....					50	49	46	44	45	45	48	47	66	66	64	63	77	76	86	80	80	84	74	
10.....					50	48	45	40	45	45	50	48	66	66	63	62	78	76	84	80	79	82	75	
11.....					48	48	45	42	45	45	52	50	66	66	63	62	82	78	84	82	80	79	73	
12.....					48	48	42	40	45	45	53	52	66	66	64	63	84	82	83	80	78	78	69	
13.....					48	48	41	40	45	45	54	53	66	66	65	64	84	84	85	80	77	79	69	
14.....					48	46	42	40	46	45	54	54	66	66	65	64	83	83	83	83	76	82	72	
15.....					47	45	43	42	46	46	54	54	67	66	66	65	86	83	86	83	80	79	82	73
16.....					46	44	42	38	51	49	54	53	68	64	67	66	86	84	85	77	83	78	84	73
17.....					46	44	42	40	52	50	53	52	64	62	68	67	84	82	85	83	80	83	75	
18.....					46	44	41	40	52	51	52	51	64	62	70	68	83	81	84	77	87	80	82	75
19.....					45	44	41	40	53	52	53	52	66	64	70	69	85	82	86	80	84	81	85	78
20.....					46	44	50	41	53	53	54	53	69	66	70	68	84	83	87	84	87	79	80	74
21.....					44	44	52	50	53	53	54	54	70	69	70	68	84	84	86	84	86	79	73	73
22.....					44	45	52	46	54	53	54	53	72	70	71	68	85	85	86	82	89	79	73	72
23.....					58	53	44	41	48	54	52	73	72	72	69	87	84	86	78	89	81	72	72	
24.....					54	53	44	41	45	54	52	73	73	73	70	86	83	84	76	87	81	71	70	
25.....					52	43	42	44	53	53	55	73	73	75	72	89	82	83	75	87	81	71	70	
26.....					51	44	42	46	44	53	58	55	74	73	76	73	90	82	83	74	85	81	72	71
27.....					50	50	43	42	50	46	54	53	58	58	74	74	92	83	84	74	87	80	74	72
28.....					52	49	42	42	50	48	54	54	75	74	74	86	79	83	76	87	80	74	72	72
29.....					51	48	42	41	48	47	--	61	60	74	74	85	76	84	77	91	82	74	74	
30.....					53	48	42	41	47	46	--	61	60	73	72	88	85	77	85	78	89	84	75	74
31.....					44	40	46	46	--	--	60	56	--	--	78	76	--	--	79	85	80	--	--	
Average.....					48	45	45	43	49	49	53	52	66	65	70	69	83	80	86	80	84	80	80	74

## SALT RIVER BASIN--Continued

## SALT RIVER AT SHEPHERDSVILLE, KY.--Continued

Day	Suspended sediment, water year October 1953 to September 1954								
	October Suspended sediment			November Suspended sediment			December Suspended sediment		
	Mean dis- charge (cfs)	Mean con- cen- tration (ppm)	Tons per day	Mean dis- charge (cfs)	Mean con- cen- tration (ppm)	Tons per day	Mean dis- charge (cfs)	Mean con- cen- tration (ppm)	Tons per day
1.....				0	--	0	13	45	2
2.....				0	--	0	11	27	1
3.....				0	--	0	11	33	1
4.....				0	--	0	8.8	32	1
5.....				0	--	0	7.2	19	(t)
6.....				0	--	0	12	30	1
7.....				0	--	0	12	38	1
8.....				0	--	0	108	37	s12
9.....				0	--	0	86	70	16
10.....				0	--	0	56	60	9
11.....				0	--	0	127	77	26
12.....				0	--	0	137	86	32
13.....				0	--	0	74	113	22
14.....				0	--	0	53	102	14
15.....				0	--	0	42	92	10
16.....				0	--	0	41	86	10
17.....				0	--	0	38	88	9
18.....				0	--	0	34	111	10
19.....				0	--	0	35	111	10
20.....				0	--	0	29	32	2
21.....				0	--	0	24	115	7
22.....				.1	51	(t)	23	88	5
23.....				6.1	70	1	22	77	4
24.....				82	32	7	28	67	5
25.....				102	13	4	44	60	a7
26.....				70	23	4	38	58	6
27.....				44	23	3	28	72	5
28.....				30	22	2	25	83	6
29.....				22	30	2	23	76	5
30.....				16	30	1	23	38	2
31.....				--	--	--	25	33	2
Total.	0	--	0	372.2	--	24	1,238.0	--	243
	January			February			March		
1.....	28	33	2	430	37	43	3,240	1,250	10,900
2.....	34	53	5	350	28	26	4,600	230	994
3.....	30	42	3	305	22	18	1,030	80	222
4.....	28	40	3	268	21	15	730	37	73
5.....	25	22	1	239	21	14	531	22	32
6.....	22	25	1	207	20	11	425	13	15
7.....	20	38	2	176	19	9	360	11	11
8.....	19	44	2	151	23	9	315	9	8
9.....	16	28	1	134	23	8	268	11	8
10.....	21	48	3	118	21	7	243	15	10
11.....	18	47	2	108	19	6	215	20	12
12.....	19	26	1	94	19	5	192	23	12
13.....	19	35	2	80	23	5	176	25	12
14.....	20	40	2	76	18	4	184	19	9
15.....	240	--	e550	72	15	3	176	17	8
16.....	3,860	2,170	22,600	72	15	3	151	16	6
17.....	2,350	738	s5,380	88	16	4	158	11	5
18.....	762	240	494	105	16	4	144	11	4
19.....	415	116	130	105	23	6	147	12	5
20.....	1,230	236	s1,560	111	20	6	572	24	s43
21.....	5,780	1,420	22,200	196	23	12	730	106	s197
22.....	3,240	565	4,940	219	24	14	410	214	237
23.....	1,220	310	1,020	188	22	11	320	217	187
24.....	682	181	333	172	22	10	278	114	86
25.....	486	136	178	151	24	10	273	59	43
26.....	405	90	98	130	22	8	600	52	84
27.....	1,160	102	s346	108	27	8	800	65	140
28.....	1,720	230	1,070	1,360	--	e3,110	600	87	141
29.....	1,180	141	449	--	--	--	400	58	63
30.....	794	74	159	--	--	--	600	78	126
31.....	559	46	69	--	--	--	900	138	335
Total.	26,402	--	61,606	5,813	--	3,389	16,768	--	14,028

e Estimated.

s Computed by subdividing day.

t Less than 0.5 ton.

a Computed from estimated concentration graph.

## SALT RIVER BASIN--Continued

## SALT RIVER AT SHEPHERDSVILLE, KY.--Continued

## Suspended sediment, water year October 1953 to September 1954--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.....	738	200	398	430	183	212	61	10	2
2.....	498	248	333	400	132	142	56	15	2
3.....	385	72	75	874	130	307	114	18	6
4.....	320	56	48	946	130	a 330	268	38	27
5.....	268	65	47	682	128	236	273	59	43
6.....	260	52	36	462	106	132	154	54	22
7.....	370	42	42	818	100	221	94	38	10
8.....	385	47	49	1,430	145	560	74	40	8
9.....	395	45	48	858	159	368	203	--	e 50
10.....	335	42	38	615	103	171	330	--	e 140
11.....	286	32	25	395	91	97	203	65	36
12.....	268	40	29	345	77	72	108	34	10
13.....	243	40	26	268	67	48	65	34	6
14.....	227	35	21	227	57	35	47	36	4
15.....	223	22	13	196	51	27	42	36	4
16.....	1,650	--	e 8,600	162	30	13	136	--	e 85
17.....	6,020	1,570	s 23,800	134	30	11	480	384	498
18.....	3,750	410	4,150	111	22	6	315	365	310
19.....	1,560	250	1,050	97	24	6	165	142	63
20.....	1,000	101	273	91	33	8	97	130	34
21.....	698	66	124	80	26	6	74	113	22
22.....	538	55	80	70	20	4	52	76	11
23.....	842	60	136	61	12	2	36	60	6
24.....	559	135	s 190	54	11	2	24	55	4
25.....	405	298	326	52	13	2	18	60	3
26.....	405	160	175	52	6	1	12	51	2
27.....	474	135	173	61	7	1	9.6	42	1
28.....	810	98	214	67	12	2	6.4	50	1
29.....	545	120	176	100	14	4	3.6	30	(t)
30.....	395	162	173	76	16	3	2.5	28	(t)
31.....	--	--	--	67	14	2	--	--	--
Total.	24,852	--	40,868	10,281	--	3,031	3,523.1	--	1,410
July									
1.....	2.5	28	(t)	0.1	27	(t)	11	18	1
2.....	2.5	28	(t)	28	30	a 2	6.4	10	(t)
3.....	14	70	3	358	75	s 77	4.2	10	(t)
4.....	29	28	2	939	347	s 1,100	3.0	11	(t)
5.....	21	41	2	1,090	635	1,870	2.0	11	(t)
6.....	9.6	35	1	524	539	762	1.5	10	(t)
7.....	4.9	27	(t)	291	433	340	1.0	7	(t)
8.....	7.2	43	1	176	376	179	.8	7	(t)
9.....	50	80	sa 15	247	280	187	.5	18	(t)
10.....	165	93	41	169	280	128	.4	25	(t)
11.....	105	54	15	83	266	60	.2	22	(t)
12.....	58	56	9	53	231	33	.1	8	(t)
13.....	36	84	8	42	120	14	.1	15	(t)
14.....	23	92	6	35	110	10	0	--	0
15.....	18	42	2	28	72	5	0	--	0
16.....	11	40	a 1	22	73	4	0	--	0
17.....	8.0	51	1	19	42	2	0	--	0
18.....	6.4	36	1	14	39	1	0	--	0
19.....	16	35	a 1	12	48	2	.4	1	(t)
20.....	26	40	a 3	11	67	2	8,960	2,240	s 68,600
21.....	19	40	a 2	9.6	35	1	14,500	2,200	86,100
22.....	14	45	a 2	8.0	27	1	6,480	688	s 13,900
23.....	9.6	41	1	7.2	35	a 1	895	230	556
24.....	4.9	26	(t)	4.9	39	1	390	145	153
25.....	2.5	22	(t)	4.2	36	(t)	227	113	69
26.....	1.5	20	(t)	3.6	8	(t)	147	88	35
27.....	.8	23	(t)	3.0	12	(t)	100	65	18
28.....	.4	23	(t)	3.0	17	(t)	76	44	9
29.....	.2	23	(t)	18	20	a 1	59	28	4
30.....	.1	25	(t)	21	25	a 1	61	28	5
31.....	.1	27	(t)	14	26	1	--	--	--
Total.	70.2	--	118	4,237.6	4,786	11,996.6	--	--	169.451
Total discharge for year (cfs days) .....									
Total load for year (tons) .....									

126,063.7  
298,954

e Estimated.

s Computed by subdividing day.

t Less than 0.5 ton.

a Computed from estimated concentration graph.





## SALT RIVER BASIN--Continued

## ROLLING FORK NEAR BOSTON, KY.

LOCATION.--At gaging station at bridge on U. S. Highway 62 and State Highway 61, 0.4 mile downstream from Beech Fork, and 2.3 miles southwest of Boston, Nelson County.

DRAINAGE AREA.--1,290 square miles, approximately.

RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 87°F June 22, 25, 28; minimum, freezing point on many days during December and January.

EXTREMES, 1949-54.--Water temperatures: Maximum, 87°F July 4, 1950. June 22, 25, 28, 1954; minimum, freezing point on many days during most years.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, water year October 1953 to September 1954  
 Mean of twice-daily measurements at approximately 8 a. m. and 4 p. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	58	42	35	40	42	48	72	75	81	76	73
2	66	56	40	37	41	42	50	70	75	80	69	74
3	66	51	42	35	40	41	50	68	72	82	74	74
4	65	50	44	36	42	40	49	68	70	81	--	74
5	66	48	42	38	41	40	50	66	72	81	--	78
6	64	45	47	36	41	40	50	64	73	80	--	80
7	65	44	42	35	42	42	51	60	74	80	81	79
8	52	41	44	36	42	42	50	58	76	78	80	78
9	58	41	47	40	40	44	50	61	76	76	76	78
10	58	42	46	36	40	45	50	57	78	76	76	77
11	56	42	46	33	41	45	55	56	78	76	76	71
12	56	42	44	31	38	46	60	56	78	80	76	70
13	56	42	42	31	36	47	60	56	81	82	76	68
14	37	42	39	31	35	47	60	58	80	83	76	70
15	58	43	34	31	46	44	60	57	82	82	75	72
16	56	43	34	34	52	45	50	56	82	82	76	72
17	60	44	32	32	50	46	56	58	80	81	76	74
18	59	44	31	34	44	47	60	56	80	83	78	74
19	59	46	31	36	48	49	61	58	80	82	80	73
20	59	47	33	37	50	48	64	62	84	82	81	73
21	57	46	34	36	45	44	66	63	82	82	80	68
22	56	46	34	42	50	46	68	63	94	81	79	67
23	58	48	32	39	48	48	67	64	82	80	80	67
24	56	47	32	42	49	46	64	68	82	78	82	66
25	55	48	31	40	50	48	70	70	83	84	82	67
26	56	46	31	42	50	52	71	70	82	82	82	66
27	56	44	31	42	50	50	72	70	82	80	90	68
28	53	39	33	43	46	56	70	71	82	81	80	69
29	52	40	32	44	--	52	72	72	80	82	79	70
30	52	42	34	46	--	48	71	71	80	80	80	70
31	52	--	34	42	--	46	--	72	--	80	75	--
Average	58	45	37	57	44	46	59	64	79	81	78	72

## GREEN RIVER BASIN

## GREEN RIVER AT GREENSBURG, KY.

LOCATION (revised).--At gaging station at bridge on U. S. Highway 68, 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 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 88°F on several days during June, July, and August; minimum, freezing point on many days during November to March.

EXTREMES, 1949-54.--Water temperatures: Maximum, 89°F July 1, 2, 23, Aug. 4, 1952; minimum, freezing point on many days during 1951, 1953 and 1954.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, water year October 1953 to September 1954  
 Mean of twice-daily measurements at approximately 7 a. m. and 5 p. m.<sup>7</sup>

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

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 1954.  
Water temperatures: October 1950 to September 1954.  
Sediment records: April 1951 to September 1954.  
EXTREMES, 1953-54.--Dissolved solids: Maximum, 192 ppm Oct. 14-26; minimum, 100 ppm Apr. 17-20.  
Hardness: Maximum, 163 ppm Oct. 14-26; minimum, 76 ppm Apr. 17-20.  
Specific conductance: Maximum daily, 363 micromhos Nov. 16; minimum daily, 108 micromhos Jan. 23.  
Water temperatures: Maximum, 79°F July 14-15; minimum, 34°F on several days during December and January.  
Sediment concentrations: Maximum daily, 2,330 ppm June 4; minimum daily, 1 ppm Dec. 31 to Jan. 1.  
Sediment loads: Maximum daily, 33,800 tons June 4; minimum daily, less than 0.5 ton on several days during October to January.  
EXTREMES, 1950-54.--Dissolved solids: Maximum, 200 ppm Nov. 1-10, 1952; minimum, 86 ppm Feb. 1-10, 1951.  
Hardness: Maximum, 163 ppm Oct. 14-26, 1953; minimum, 66 ppm July 9-11, 1953.  
Specific conductance: Maximum daily, 363 micromhos Nov. 16, 1953; minimum daily, 58.9 micromhos Mar. 25, 1952.  
Water temperatures: Maximum, 80°F June 28-29, 1952; minimum, 34°F on several days during December 1950, February 1951, December 1953, and January 1954.  
Sediment concentrations (1951-54): Maximum daily, 3,180 ppm June 14, 1952; minimum daily, 1 ppm Dec. 1, 1952, Jan. 5, Dec. 31, 1953, Jan. 1, 1954.  
Sediment loads (1951-54): Maximum daily, 153,000 tons Mar. 23-24, 1952; minimum daily, less than 0.5 ton on several days during October to December 1953, and January 1954.  
REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

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			
Oct. 1-18, 1953	64.7	3.5	0.01	51	8.0	8.2	1.2	175	14	14	0.2	1.7	186	161	17	333	7.3	3
Oct. 14-26	65.3	7.8	.02	52	8.2	7.6	1.1	176	13	13	.2	1.6	192	163	19	340	7.2	3
Oct. 27 - Nov. 8	86.5	8.9	.03	51	7.9	7.0	.9	176	11	12	.2	1.5	186	160	16	329	7.3	5
Nov. 9-21	94.7	7.6	.01	51	7.6	7.1	1.0	173	15	12	.0	1.6	189	159	17	337	7.3	3
Nov. 22-30	156	8.0	.01	45	7.7	8.5	1.3	155	14	13	.1	1.4	183	144	17	312	7.1	6
Dec. 1-10	125	6.8	.00	48	8.1	8.5	1.3	169	14	12	.0	1.8	188	154	15	326	7.3	5
Dec. 11-20	148	6.2	.00	47	8.0	7.0	1.3	166	14	11	1.2	1.2	187	152	14	321	7.2	4
Dec. 21-31	155	4.8	.06	45	7.3	7.3	1.6	155	16	10	3.1	.9	177	143	15	307	7.6	4
Jan. 1-11, 1954	151	5.0	.02	44	6.9	6.3	1.3	143	20	9.4	.2	1.7	170	138	21	297	7.3	0
Jan. 12-22	4,838	4.7	.02	33	5.2	3.7	1.5	97	20	6.1	1.2	4.0	127	104	24	223	7.2	5
Jan. 23-31	5,254	5.3	.00	24	4.3	2.1	1.8	72	15	3.1	.1	6.9	108	79	19	169	7.3	5
Feb. 1-10	1,124	7.7	.02	32	6.1	2.6	.2	98	17	4.0	.0	7.0	126	106	25	218	7.2	7
Feb. 11-20	720	9.0	.02	37	7.3	4.5	.9	118	21	4.8	.1	4.6	146	124	26	250	7.2	5
Feb. 21 - Mar. 2	1,274	5.2	.02	36	6.2	4.1	.6	118	20	4.8	.1	3.0	133	115	19	235	7.3	5
Mar. 3-9	2,143	6.4	.02	34	5.4	3.2	1.0	85	20	3.2	.1	3.7	110	90	22	188	7.2	10
Mar. 10-20	1,044	5.3	.03	32	5.2	2.7	.9	98	17	3.6	.1	3.3	123	101	22	212	6.9	30
Mar. 21-31	1,372	6.0	.01	32	5.9	2.8	.8	101	18	3.4	.1	2.4	120	105	21	216	7.2	15

Chemical analyses, in parts per million, water year October 1953 to September 1954

GREEN RIVER BASIN--Continued  
GREEN RIVER AT MUNFORDVILLE, KY.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--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, mg./l. nesium	Non-carbonate			
Apr. 1-8, 1954	859	5.1	0.01	34	6.1	3.2	0.8	108	18	4.1	0.1	1.7	124	110	21	227	7.3	5
Apr. 9-16	1,909	4.7	.01	36	5.5	2.9	.8	111	17	3.8	.1	1.6	127	112	21	229	7.4	17
Apr. 17-20	13,520	7.3	.03	23	4.3	1.9	1.4	73	11	2.0	.1	4.5	100	76	15	156	7.2	20
Apr. 21-30	3,339	5.6	.04	30	5.0	2.8	1.5	101	14	2.9	.2	3.5	117	96	13	201	7.2	1
May 1-7	1,341	6.6	.03	34	5.7	4.2	1.3	118	16	4.2	.5	2.9	136	110	12	234	7.3	1
May 8-12	4,488	5.8	.02	27	4.7	2.7	1.5	93	13	2.9	.2	3.0	114	88	10	186	7.3	1
May 13-23	1,065	6.7	.00	36	4.7	2.7	1.0	117	13	3.4	.1	1.7	136	110	13	229	7.4	4
May 24 - June 3	741	4.9	.00	39	5.5	3.7	1.0	126	13	4.6	.1	2.7	140	120	17	251	7.4	5
June 4-9	2,046	7.8	.04	28	5.1	3.8	1.8	94	14	3.5	.1	3.9	122	90	14	184	7.2	6
June 10-18	747	8.2	.01	36	6.0	3.5	1.6	126	13	4.2	.1	2.9	146	115	11	245	7.7	5
June 19-22	758	7.1	.05	26	4.3	4.6	1.9	86	12	4.5	.1	3.5	116	82	11	192	7.6	7
June 23-30	297	7.4	.00	36	6.6	3.6	1.5	126	7.9	4.6	.1	4.1	143	118	14	244	7.7	8
July 1-10	264	6.8	.01	41	6.8	4.5	1.4	148	13	6.2	.1	2.6	163	132	9	280	7.8	6
July 11-20	215	6.6	.01	40	6.0	5.4	1.6	141	14	7.5	.1	2.0	158	124	9	272	7.9	7
July 21-31	206	8.8	.01	40	6.4	5.1	1.5	140	12	8.0	.1	2.5	161	126	11	276	7.9	5
Aug. 1-10	251	6.4	.03	40	5.8	4.9	1.9	136	12	7.0	.1	2.8	158	124	12	261	7.8	12
Aug. 11-20	151	6.0	.01	41	6.6	5.5	1.2	140	11	8.0	.1	2.4	166	130	15	273	7.9	7
Aug. 21-31	204	5.5	.00	39	5.2	6.0	2.0	134	11	7.8	.1	3.1	151	120	9	266	8.1	5
Sept. 1-10	93.8	6.4	.00	45	6.6	6.1	1.7	154	13	9.8	.1	2.4	171	140	13	302	8.2	7
Sept. 11-21	162	9.8	.03	48	7.9	8.4	1.5	166	13	14	.1	2.5	185	152	16	328	8.0	8
Sept. 22-24	813	4.9	.11	29	5.5	4.6	3.8	a113	11	3.0	.3	2.8	131	95	2	227	8.6	--
Sept. 25-30	168	8.1	.07	37	5.9	6.6	2.7	126	13	10	.2	2.6	152	118	13	261	7.8	10
Time-weighted average	1,053	6.5	0.02	39	6.4	5.1	1.3	132	15	7.3	0.1	2.7	152	124	15	262	--	7

a Includes equivalent of 8 parts per million of carbonate (CO<sub>3</sub>).

## GREEN RIVER BASIN--Continued

## GREEN RIVER AT MUNFORDVILLE, KY.--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
 /Once-daily measurement at approximately 7 a.m./

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

## GREEN RIVER BASIN--Continued

## GREEN RIVER AT MUNFORDVILLE, KY.--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	65	10	2	86	4	1	95	5	1
2.....	65	9	2	78	3	1	91	7	2
3.....	65	7	1	78	2	(t)	95	7	2
4.....	61	9	1	74	2	(t)	104	7	2
5.....	61	9	1	74	2	(t)	108	8	2
6.....	65	10	2	91	2	(t)	130	10	4
7.....	61	9	1	82	2	(t)	156	11	5
8.....	65	8	1	91	4	1	143	10	4
9.....	65	6	1	91	4	1	156	10	4
10.....	65	4	1	86	4	1	170	10	4
11.....	69	2	(t)	86	4	1	156	10	4
12.....	69	2	(t)	91	3	1	156	9	a 4
13.....	65	2	(t)	91	2	(t)	148	8	3
14.....	65	2	(t)	91	2	(t)	152	7	3
15.....	65	4	1	95	2	1	156	6	2
16.....	65	4	1	91	2	(t)	152	3	1
17.....	65	6	1	99	2	(t)	143	2	1
18.....	65	7	1	99	2	(t)	125	3	1
19.....	65	7	1	99	3	1	138	2	1
20.....	65	7	1	104	2	1	152	2	1
21.....	61	6	1	108	3	1	148	2	1
22.....	61	7	1	156	10	4	148	3	1
23.....	65	7	1	350	25	24	152	3	1
24.....	69	6	1	188	25	13	161	3	1
25.....	69	6	1	152	40	16	170	4	2
26.....	69	7	1	130	35	12	170	4	2
27.....	82	7	2	112	41	12	170	2	1
28.....	95	6	2	108	23	7	161	4	2
29.....	104	6	2	108	20	6	143	4	2
30.....	99	5	2	99	10	3	143	2	1
31.....	91	5	1	--	--	--	143	1	(t)
Total.	2,161	--	36	3,288	--	113	4,435	--	65
		January			February			March	
1.....	148	1	(t)	1,980	46	246	2,540	221	1,570
2.....	152	2	1	1,590	117	502	4,400	140	1,660
3.....	148	2	1	1,360	68	248	4,030	78	849
4.....	143	2	1	1,210	50	163	2,980	45	362
5.....	138	2	1	1,100	108	321	2,280	50	308
6.....	138	2	1	980	28	74	1,800	86	418
7.....	134	2	1	872	36	85	1,500	70	284
8.....	148	5	2	776	11	23	1,280	50	a 170
9.....	134	8	3	716	29	56	1,130	23	70
10.....	152	9	4	662	31	55	1,020	18	50
11.....	230	9	6	620	9	15	926	51	128
12.....	332	6	5	578	15	23	854	35	81
13.....	350	5	5	542	26	38	818	15	33
14.....	464	12	15	500	15	20	1,430	47	181
15.....	884	45	s 146	476	12	15	1,490	180	a 700
16.....	4,640	672	s 9,120	482	24	31	1,240	129	432
17.....	7,150	605	11,700	746	40	s b 100	1,000	73	197
18.....	6,800	360	6,980	1,170	95	300	860	55	a 130
19.....	3,270	140	s 1,360	1,090	30	88	812	53	116
20.....	2,100	95	s a 600	998	17	46	1,030	100	s b 290
21.....	9,230	1,200	s 31,500	890	12	29	1,540	220	a 900
22.....	12,500	710	24,000	812	12	26	1,520	174	714
23.....	13,100	430	15,200	752	20	41	1,300	78	274
24.....	8,520	136	s 3,480	698	15	28	1,150	33	102
25.....	3,600	69	671	662	8	14	1,260	33	112
26.....	2,650	45	322	620	9	15	1,410	37	141
27.....	2,910	59	464	584	10	16	1,450	33	129
28.....	4,770	111	1,430	782	64	135	1,620	32	140
29.....	5,260	93	1,320	--	--	--	1,460	27	106
30.....	3,860	49	511	--	--	--	1,260	24	82
31.....	2,620	32	226	--	--	--	1,120	21	84
Total.	96,675	--	109,076	24,238	--	2,753	48,510	--	10,793

s Computed by subdividing day.

t Less than 0.5 ton.

a Computed from estimated concentration graph.

b Computed from partly estimated concentration graph.

## GREEN RIVER BASIN--Continued

## GREEN RIVER AT MUNFORDVILLE, KY.--Continued

## Suspended sediment, water year October 1953 to September 1954--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.....	1,030	25	70	1,660	81	363	445	12	14
2.....	950	45	115	1,350	55	200	1,250	98	s 368
3.....	872	24	56	1,270	47	161	2,670	1,730	s 18,500
4.....	812	38	83	1,240	52	174	4,880	2,330	s 33,800
5.....	770	16	33	1,140	59	182	2,950	610	4,860
6.....	758	33	68	1,030	52	145	1,690	361	1,650
7.....	688	52	94	1,700	80	s 498	1,110	200	599
8.....	1,010	52	142	6,490	398	6,970	848	95	218
9.....	1,740	80	376	6,470	193	3,370	800	63	136
10.....	1,740	56	263	4,600	82	1,020	896	76	184
11.....	1,610	58	252	2,840	53	406	746	78	157
12.....	1,620	38	166	2,040	25	138	602	56	91
13.....	1,590	48	206	1,610	30	a 130	494	36	48
14.....	1,420	38	146	1,370	38	140	440	30	36
15.....	1,950	--	e 5,600	1,280	48	166	428	27	31
16.....	3,600	642	s 5,210	1,230	31	103	484	36	47
17.....	13,200	620	22,100	1,090	23	68	944	--	e 2,500
18.....	16,300	335	14,700	1,030	27	75	1,690	1,250	5,700
19.....	15,800	136	5,600	974	29	76	1,180	970	3,090
20.....	8,780	54	1,280	914	20	49	824	450	1,000
21.....	3,650	55	542	836	21	47	572	118	179
22.....	2,670	43	310	728	15	29	456	78	96
23.....	2,300	58	360	656	14	25	384	69	72
24.....	5,610	621	s 10,100	590	24	38	335	68	62
25.....	5,150	178	2,480	542	27	40	296	61	49
26.....	3,880	94	985	494	26	35	270	46	34
27.....	2,770	78	583	472	24	30	240	37	24
28.....	2,550	104	716	462	18	22	220	32	19
29.....	2,670	106	778	434	11	13	201	25	14
30.....	2,140	102	589	406	8	9	191	20	10
31.....	--	--	--	384	7	7	--	--	--
Total.	109,610	--	74,203	47,332	--	14,729	28,596	--	73,588
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.....	181	15	7	105	13	4	118	25	8
2.....	176	13	6	149	12	5	114	29	9
3.....	186	10	5	484	90	s b 130	109	28	8
4.....	255	24	16	478	76	98	101	28	8
5.....	302	22	18	308	44	36	92	28	7
6.....	324	25	22	265	34	24	88	28	7
7.....	245	20	13	220	31	18	84	27	6
8.....	270	21	15	186	31	16	84	27	6
9.....	318	20	17	167	42	19	76	25	5
10.....	379	21	21	149	47	19	72	21	4
11.....	396	37	40	140	43	16	72	25	5
12.....	296	30	24	140	40	15	69	30	6
13.....	280	25	19	135	40	14	65	21	4
14.....	235	15	10	126	29	10	61	24	4
15.....	201	12	6	122	25	8	61	23	4
16.....	172	15	7	114	21	6	57	22	3
17.....	153	12	5	114	21	6	57	22	3
18.....	149	12	5	109	25	7	53	22	3
19.....	140	11	4	144	--	e 50	53	21	3
20.....	126	10	3	368	189	108	84	22	5
21.....	126	9	3	291	64	50	1,150	--	e 3,700
22.....	191	35	s b 20	230	57	35	1,460	885	s 3,610
23.....	330	60	s b 65	291	74	56	638	275	474
24.....	401	50	54	181	72	35	340	80	82
25.....	296	72	58	206	53	29	240	61	40
26.....	230	65	40	176	40	a 19	196	33	17
27.....	176	25	12	149	27	11	167	45	20
28.....	149	15	6	215	--	e 35	149	34	14
29.....	131	17	6	196	--	e 25	135	21	8
30.....	122	18	6	172	34	16	122	24	8
31.....	109	16	5	140	27	10	--	--	--
Total.	7,045	--	538	6,270	--	1,012	6,167	--	8,281
Total discharge for year (cfs-days).....									384,267
Total load for year (tons).....									295,187

e Estimated.

s Computed by subdividing day.

a Computed from estimated concentration graph.

b Computed from partly estimated concentration graph.

GREEN RIVER BASIN--Continued  
GREEN RIVER AT MUFORDVILLE, KY.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954  
(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	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								Methods of analysis		
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250			0.350
Jan. 16, 1954	10:00 a. m.	4,470		900	1,120	38	53	66	88	96	98	--	--	--	--	ESWCM
Jan. 17	2:00 p. m.	7,170		531	764	40	52	71	89	97	99	--	--	--	--	ESWCM
Jan. 21	7:00 a. m.	7,490		1,170	1,320	43	47	66	83	95	98	--	--	--	--	ESWCM
Jan. 21	1:10 p. m.	10,300		1,560	943	43	53	66	79	94	98	--	--	--	--	ESWCM
Jan. 21	1:10 p. m.	10,300		1,560	919	39	50	65	84	96	100	--	--	--	--	ESNM
Jan. 23	7:00 a. m.	13,300		522	656	50	61	74	91	99	99	--	--	--	--	ESWCM
Apr. 16	10:15 a. m.	2,350		615	746	54	63	77	86	94	94	95	97	98	98	ESWCM
Apr. 18	9:45 a. m.	16,200		430	521	47	57	73	89	97	99	--	--	--	--	ESWCM
Apr. 24	9:35 a. m.	6,480		1,490	1,730	38	54	69	87	97	99	100	100	100	100	ESWCM
Apr. 24	2:15 p. m.	6,190		746	449	58	69	78	91	96	99	99	99	99	99	ESWCM
May 8	6:55 a. m.	6,770		687	802	43	53	68	88	94	97	98	--	--	--	ESWCM
June 3	7:00 a. m.	1,260		1,270	1,450	47	62	76	91	99	100	--	--	--	--	ESWCM
June 4	7:05 a. m.	5,870		3,220	1,830	41	57	74	92	100	100	--	--	--	--	ESWCM
June 5	5:45 p. m.	2,740		565	785	56	65	82	95	98	100	--	--	--	--	ESWCM
June 18	7:00 a. m.	2,000		1,420	889	51	67	81	94	98	98	98	98	98	98	ESWCM
June 18	7:00 a. m.	2,000		1,420	847	44	58	79	93	98	99	99	99	99	99	ESNM
Sept. 22	7:00 a. m.	1,740		1,090	1,590	53	69	80	90	90	93	95	95	95	95	ESWCM



LOCATION.--At bridge on U. S. Highway 31W and 68, 400 feet upstream from gage 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, August 1952 to September 1954.  
 Sediment records: November 1952 to September 1954.  
 EXTREMES, 1953-54.--Water temperatures: Maximum, 85°F on several days during July and August; minimum, 37°F Jan. 13, 15-16.  
 Sediment concentrations: Maximum daily, 1.810 ppm June 4; minimum daily, 1 ppm Oct. 20-21, Nov. 15.  
 Sediment loads: Maximum daily, 26,700 tons Apr. 17; minimum daily, less than 0.5 ton Oct. 20-23, Nov. 15.  
 EXTREMES, 1949-50, 1952-54.--Water temperatures: Maximum, 85°F on several days during July and August 1954; minimum, 37°F Jan. 13, 15-16, 1954.  
 Sediment concentrations (1952-54): Maximum daily, 1.880 ppm June 17, 1953; minimum daily, 1 ppm on several days during November, December 1952, October, and November 1953.  
 Sediment loads (1952-54): Maximum daily, 34,200 tons June 17, 1953; minimum daily, less than 0.5 ton Oct. 20-23, Nov. 15, 1953.  
 REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, water year October 1953 to September 1954  
 /Continuous ethyl alcohol-acuated thermograph/

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

## GREEN RIVER BASIN--Continued

## BARREN RIVER AT BOWLING GREEN, KY.--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	74	7	1	98	6	2	136	13	5
2.....	72	7	1	101	5	1	126	25	8
3.....	72	9	2	101	5	1	132	35	12
4.....	71	7	1	94	10	2	139	27	10
5.....	68	4	1	92	10	2	144	16	6
6.....	66	7	1	89	5	1	179	22	11
7.....	67	9	2	86	5	1	217	26	15
8.....	67	5	1	87	8	2	380	24	25
9.....	66	5	1	86	17	4	405	24	26
10.....	65	5	1	84	12	3	311	33	28
11.....	64	5	1	86	11	2	269	40	29
12.....	64	5	1	82	7	2	244	41	27
13.....	64	5	1	84	8	2	230	45	28
14.....	65	5	1	92	6	1	225	40	24
15.....	65	5	1	96	1	(t)	219	40	24
16.....	65	5	1	98	3	1	217	35	a 20
17.....	65	5	1	105	5	1	227	28	17
18.....	66	5	1	108	14	4	227	22	13
19.....	67	5	1	105	16	4	187	15	8
20.....	65	1	(t)	105	12	3	174	18	8
21.....	65	1	(t)	105	12	3	179	25	12
22.....	65	2	(t)	232	--	e 110	152	16	6
23.....	84	2	(t)	214	20	12	156	10	4
24.....	66	3	1	314	49	42	166	10	4
25.....	64	5	1	263	41	29	169	10	4
26.....	62	5	a 1	214	36	21	166	24	11
27.....	72	6	1	185	21	10	159	25	a 11
28.....	76	7	1	166	12	5	159	24	10
29.....	81	11	2	156	20	8	156	20	a 8
30.....	86	5	1	144	22	8	156	18	a 8
31.....	94	5	1	--	--	--	166	15	7
Total.	2, 153	--	31	3, 872	--	287	6, 172	--	429
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.....	174	20	9	1,980	20	107	5,060	262	3,580
2.....	177	32	15	1,670	15	68	5,390	154	2,240
3.....	169	15	7	1,490	22	88	4,050	63	689
4.....	166	10	4	1,360	30	110	3,080	33	274
5.....	159	19	8	1,270	20	68	2,400	29	188
6.....	154	15	6	1,130	12	37	1,990	26	140
7.....	152	30	12	990	16	43	1,740	12	56
8.....	162	38	17	880	22	52	1,540	10	42
9.....	154	13	5	805	17	37	1,390	9	34
10.....	182	21	10	760	14	29	1,260	11	37
11.....	208	9	5	725	16	31	1,150	10	31
12.....	352	12	11	670	6	11	1,070	11	32
13.....	532	42	60	618	10	17	990	10	27
14.....	524	28	40	569	10	15	1,730	42	s 180
15.....	564	23	s 39	544	9	13	1,560	147	619
16.....	4, 610	333	s 5, 150	569	14	22	1, 180	490	1,560
17.....	7, 160	418	8, 080	1, 370	50	b 180	954	242	623
18.....	3, 840	172	1, 780	2, 530	44	300	840	94	213
19.....	2, 040	65	358	2, 180	45	265	800	54	117
20.....	1, 630	45	198	1, 900	53	272	840	31	70
21.....	8, 340	662	s 18, 800	4, 180	246	2, 780	1, 080	41	120
22.....	14, 100	685	26, 100	3, 260	86	757	942	24	61
23.....	11, 900	205	6, 590	2, 360	37	236	835	27	61
24.....	7, 410	103	2, 060	1, 950	21	110	880	80	190
25.....	4, 440	77	923	1, 700	15	69	3, 330	166	s 1,540
26.....	3, 410	48	402	1, 510	15	61	4, 200	135	1,530
27.....	3, 300	45	401	1, 330	12	43	3, 610	76	741
28.....	4, 640	87	1, 090	1, 880	100	s 633	3, 010	63	512
29.....	4, 040	65	709	--	--	--	2, 400	55	356
30.....	3, 110	36	302	--	--	--	2, 020	31	169
31.....	2, 440	27	178	--	--	--	1, 730	22	103
Total.	90, 239	--	73, 369	42, 180	--	6, 454	63, 051	--	16, 135

e Estimated.

s Computed by subdividing day.

t Less than 0.5 ton.

a Computed from estimated concentration graph.

b Computed from partly estimated concentration graph.

## GREEN RIVER BASIN--Continued

## BARREN RIVER AT BOWLING GREEN, KY.--Continued

Suspended sediment, water year October 1953 to September 1954--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.....	1,470	12	49	1,460	33	130	504	34	46
2.....	1,270	12	41	1,250	33	111	1,930	75	sb 40
3.....	1,100	11	33	1,190	35	112	2,620	621	s 5,340
4.....	990	9	a 25	1,430	42	162	5,240	1,810	25,600
5.....	895	10	24	1,420	86	330	2,200	997	5,920
6.....	860	20	46	1,270	85	291	1,360	460	1,690
7.....	966	43	112	1,930	89	s 495	960	158	410
8.....	1,590	190	816	5,800	520	s 8,400	770	94	195
9.....	2,290	103	637	4,950	226	3,020	655	70	124
10.....	1,930	62	323	3,150	82	697	650	55	96
11.....	1,770	86	411	2,300	46	286	578	52	81
12.....	2,890	95	741	1,840	33	164	508	41	56
13.....	2,730	75	553	1,570	33	140	460	41	51
14.....	2,300	52	323	1,510	25	102	422	38	43
15.....	2,620	41	290	1,700	31	142	391	34	36
16.....	4,700	169	s 2,950	1,540	26	108	402	36	39
17.....	14,900	664	26,700	1,330	23	82	800	51	110
18.....	18,100	358	17,500	1,180	22	70	614	86	142
19.....	18,000	145	7,050	1,150	19	59	500	117	158
20.....	9,340	62	1,560	1,030	13	36	416	58	65
21.....	4,270	75	865	906	11	27	352	48	46
22.....	3,220	51	443	815	9	20	317	47	40
23.....	2,740	41	303	730	10	20	294	52	41
24.....	3,680	123	s 1,290	660	8	14	271	52	38
25.....	3,820	544	5,610	614	8	13	252	45	31
26.....	2,650	270	1,930	569	8	12	241	35	23
27.....	2,110	82	467	540	15	22	227	31	19
28.....	1,860	56	281	520	20	28	217	29	17
29.....	1,750	44	208	508	15	20	203	30	16
30.....	1,560	42	177	504	14	19	192	30	16
31.....	--	--	--	488	13	17	--	--	--
Total.	118,371	--	71,758	45,854	--	15,179	24,546	--	40,919

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.....	185	26	13	119	17	5	85	25	6
2.....	192	24	12	162	19	8	87	25	6
3.....	440	34	40	154	10	4	85	25	6
4.....	283	30	23	134	19	7	79	27	6
5.....	233	31	20	124	24	8	74	30	6
6.....	249	33	22	144	19	7	70	25	5
7.....	211	25	14	139	19	7	68	25	4
8.....	219	37	22	169	20	9	63	26	4
9.....	605	45	74	159	17	7	60	33	5
10.....	670	47	85	142	15	6	57	22	3
11.....	440	55	65	122	15	5	55	30	4
12.....	320	65	56	109	22	6	53	38	5
13.....	257	51	35	100	12	3	51	28	4
14.....	230	41	25	95	12	3	49	21	3
15.....	208	40	22	89	7	2	48	20	2
16.....	190	38	19	87	13	3	47	29	4
17.....	172	30	14	87	7	2	46	20	2
18.....	156	27	11	85	5	1	45	20	a 2
19.....	149	27	11	91	5	1	45	19	2
20.....	139	23	9	85	15	3	55	78	12
21.....	134	25	9	87	12	3	2,230	500	sb 4,100
22.....	214	30	17	89	11	3	3,490	1,230	11,600
23.....	426	33	38	89	17	4	1,310	530	s 2,050
24.....	440	46	55	129	23	8	578	144	225
25.....	374	48	48	149	28	11	349	85	80
26.....	294	38	30	182	30	15	200	86	46
27.....	227	40	24	211	17	10	211	73	42
28.....	190	34	17	162	20	9	200	48	26
29.....	156	37	16	132	20	7	185	57	28
30.....	136	27	10	107	22	6	185	32	16
31.....	122	23	8	89	23	6	--	--	--
Total.	8,261	--	864	3,822	--	179	10,160	--	18,304

Total discharge for year (cfs-days) ..... 418,681  
 Total load for year (tons) ..... 243,908

s Computed by subdividing day.

a Computed from estimated concentration graph.

b Computed from partly estimated concentration graph.

GREEN RIVER BASIN--Continued  
 BARREN RIVER AT BOWLING GREEN, KY.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954

(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	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. 21, 1954	6:30 p. m.	11,900		1,100	1,710	41	51	66	86	97	99						BSWCM
Jan. 22	8:40	14,400		840	884	53	70	81	93	99	99						BSWCM
Mar. 1	5:00 p. m.	5,300		313	457	56	70	82	94	99	100						BSWCM
Mar. 16	8:00 a. m.	1,220		534	337	78	83	90	96	97	99						BSWCM
Apr. 17	7:00 a. m.	13,600		817	1,120	43	52	71	87	98	99						BSWCM
Apr. 18	7:00 a. m.	17,800		360	300	45	58	74	91	97	98						BSWCM
Apr. 18	7:00 p. m.	18,600		348	522	45	58	74	90	98	100						BSWCM
Apr. 25	8:00 a. m.	4,120		603	872	60	68	85	95	100	--						BSWCM
May 8	1:00 p. m.	6,420		739	1,140	40	53	72	91	99	99						BSWCM
May 8	5:00 p. m.	6,460		688	500	52	68	90	97	99	99						BSWCM
June 3	6:30 a. m.	2,050		663	662	54	74	90	98	100	--						BWCM
June 4	6:30 a. m.	6,270		2,060	1,640	45	62	79	94	100	--						BWCM
June 5	8:15 p. m.	1,780		864	666	60	78	97	99	99	100						BSWCM
June 5	8:15 p. m.	1,780		864	670	47	62	95	97	97	98						BSNM
Sept. 22	6:30 a. m.	4,320		1,100	1,060	45	66	81	93	96	100						BSWCM
Sept. 23	4:40 p. m.	1,040		379	1,150	65	87	97	99	100	--						BWCM

## GREEN RIVER BASIN--Continued

## ROUGH RIVER AT FALLS OF ROUGH, KY.

LOCATION.--At bridge on State Highway 110 at Falls of Rough, Grayson County, 150 feet upstream from gage, 50 feet upstream from Mill Dam, 1,850 feet upstream from Pleasant Run, and 3.0 miles downstream from Rock Lick Creek.

DRAINAGE AREA.--500 square miles, approximately.

RECORDS AVAILABLE.--Water temperatures: October 1952 to September 1954.

Sediment records: October 1952 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 79°F June 17; minimum, 33°F Jan. 12-13, 16-18.

Sediment concentrations: Maximum daily, 1,110 ppm Jan. 21; minimum daily, 2 ppm on several days during January and July.

Sediment loads: Maximum daily, 7,400 tons Jan. 21; minimum daily, less than 0.5 ton on many days during October to January, July to September.

EXTREMES, 1952-54.--Water temperatures: Maximum, 79°F June 17, 1954; minimum, 33°F Jan. 12-13, 16-18, 1954.

Sediment concentrations: Maximum daily, 1,600 ppm Dec. 10, 1952; minimum daily, 2 ppm on several days during November 1952, January, and July 1954.

Sediment loads: Maximum daily, 18,600 tons Mar. 3, 1953; minimum daily, less than 0.5 ton on many days during October to December 1952, August to December 1953, January, July to September 1954.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, water year October 1953 to September 1954  
(Once-daily measurement at approximately 6 a. m.)

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

## GREEN RIVER BASIN--Continued

## ROUGH RIVER AT FALLS OF ROUGH, KY.--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	23	5		11	10		19	10	1
2.....	21	5		11	11		22	12	1
3.....	18	6		11	10		15	7	(t)
4.....	8.7	5		14	8		16	6	(t)
5.....	14	12		12	10		18	5	(t)
6.....	8.7	16		11	13		69	6	1
7.....	8.0	16		11	13		118	15	5
8.....	8.0	17		11	13		94	65	15
9.....	7.4	18		11	12		73	85	17
10.....	7.4	19	(t)	10	8		56	112	17
11.....	7.4	19		8.7	8		40	81	9
12.....	7.4	15		8.7	10	(t)	26	69	5
13.....	7.4	13		9.4	12		24	54	3
14.....	7.4	14		10	8		32	35	3
15.....	7.4	15		10	6		36	22	2
16.....	7.4	15		16	5		26	12	1
17.....	8.0	15		11	8		18	14	1
18.....	8.0	14		10	9		18	15	1
19.....	16	15	1	18	7		19	12	1
20.....	10	15		12	7		19	12	1
21.....	11	11		11	7		19	12	1
22.....	16	10		11	7		20	11	1
23.....	9.4	10		25	5		19	10	1
24.....	8.0	12		59	6	1	19	10	1
25.....	8.0	14	(t)	68	7	1	19	9	
26.....	8.0	8		46	10	1	19	8	
27.....	8.0	7		33	8	1	19	8	(t)
28.....	8.0	10		28	7	1	20	8	
29.....	8.0	11		24	7	(t)	21	7	
30.....	11	12		21	7	(t)	23	7	
31.....	11	10		--	--	--	24	8	1
Total.	317.0	--	10	552.8	--	12	970	--	92
	January			February			March		
1.....	26	6		211	22	12	1,470	414	1,640
2.....	27	4		174	17	8	852	283	651
3.....	27	4		160	8	3	600	138	223
4.....	25	4		180	4	2	459	57	71
5.....	26	2		188	6	3	360	28	27
6.....	24	2		166	12	5	292	15	12
7.....	23	2	(t)	138	3	1	250	17	11
8.....	22	2		116	7	2	218	15	9
9.....	21	3		102	6	2	196	12	6
10.....	22	5		93	5	1	172	10	5
11.....	23	5		89	5	1	155	12	5
12.....	24	5		78	4	1	142	17	6
13.....	24	5		72	3	1	130	12	4
14.....	25	5		67	5	1	116	20	6
15.....	218	21	s 20	65	6	1	106	18	5
16.....	650	68	119	262	70	sa100	92	17	4
17.....	588	82	130	528	172	245	85	15	3
18.....	339	66	60	416	104	117	80	12	2
19.....	154	57	24	309	57	48	91	8	2
20.....	866	170	s 932	413	46	51	116	11	3
21.....	2,470	1,110	7,400	458	57	70	136	13	5
22.....	1,980	730	3,900	400	30	32	153	10	4
23.....	729	195	s 407	304	19	16	129	9	3
24.....	379	92	94	257	16	11	118	8	2
25.....	268	58	42	221	12	7	134	7	2
26.....	453	49	s 68	187	10	5	239	10	6
27.....	1,200	174	564	165	12	5	290	20	16
28.....	964	131	341	1,370	543	s 2,150	268	21	15
29.....	563	97	147	--	--	--	220	19	11
30.....	364	51	50	--	--	--	200	18	10
31.....	270	28	20	--	--	--	186	17	8
Total.	12,794	--	14,321	7,189	--	2,901	8,055	--	2,777

s Computed by subdividing day.

t Less than 0.5 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 1953 to September 1954--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.....	176	15	7	174	20	9	59	7	1
2.....	156	14	6	182	18	9	56	6	1
3.....	137	15	6	221	33	20	85	8	2
4.....	126	15	5	179	71	34	212	17	10
5.....	125	14	5	162	60	26	190	20	10
6.....	288	19	s 17	148	37	15	99	37	10
7.....	576	80	124	1,590	226	s 1,210	59	23	4
8.....	595	63	101	1,880	326	1,650	56	20	3
9.....	448	60	72	996	130	s 403	51	24	3
10.....	340	42	38	547	42	62	47	46	6
11.....	287	27	21	359	28	27	48	51	7
12.....	267	25	18	280	27	20	35	25	2
13.....	239	24	15	232	37	23	39	18	2
14.....	211	22	12	204	30	16	39	17	2
15.....	194	23	12	184	24	12	62	22	4
16.....	2,280	535	s 3,930	163	24	10	156	22	9
17.....	2,830	382	2,920	142	24	9	394	89	94
18.....	2,250	212	1,290	123	12	4	192	652	s 356
19.....	883	45	s 114	111	13	4	80	544	118
20.....	564	22	34	102	20	6	53	516	74
21.....	408	22	24	93	21	5	45	278	34
22.....	322	19	16	86	19	4	44	159	19
23.....	292	17	13	79	20	4	43	118	14
24.....	268	17	12	66	19	3	30	97	8
25.....	235	18	11	66	15	3	36	84	8
26.....	203	23	13	66	21	4	31	69	6
27.....	179	20	10	77	22	4	28	53	4
28.....	174	16	8	84	20	4	33	53	5
29.....	165	17	8	62	22	4	25	55	4
30.....	158	20	8	53	22	3	25	51	3
31.....	--	--	--	66	15	3	--	--	--
Total.	15,376	--	8,870	8,777	--	3,610	2,352	--	823
	July			August			September		
1.....	26	31	2	18	17	1	72	87	17
2.....	26	17	1	28	18	1	45	132	16
3.....	34	14	1	222	19	11	37	83	8
4.....	85	16	4	278	153	115	31	61	5
5.....	67	18	3	114	62	s 21	26	58	4
6.....	79	31	7	69	48	9	22	51	3
7.....	62	43	7	66	69	12	26	39	3
8.....	48	34	4	38	82	8	17	28	
9.....	38	37	4	34	60	6	17	21	1
10.....	42	43	5	30	50	4	16	18	1
11.....	35	29	3	35	45	4	16	13	1
12.....	39	22	2	22	43	2	16	19	1
13.....	29	19	1	25	40	3	16	18	1
14.....	28	13	1	20	27	1	16	18	1
15.....	31	11	1	20	17	1	16	16	1
16.....	27	15	1	20	12	1	23	7	(t)
17.....	29	12	1	19	9		14	8	(t)
18.....	23	7	(t)	19	8		24	10	1
19.....	27	7	1	19	9		14	13	(t)
20.....	21	2	(t)	18	8	(t)	48	33	s 14
21.....	21	2	(t)	19	5		1,600	821	s 3,360
22.....	21	5	(t)	30	6		1,070	558	s 1,760
23.....	27	7	1	81	7	2	334	184	s 185
24.....	86	7	2	257	60	sa 35	106	88	25
25.....	47	3		93	100	25	67	64	12
26.....	37	3		47	70	9	53	57	8
27.....	29	3		36	57	6	43	47	5
28.....	25	5	(t)	39	58	6	38	45	5
29.....	26	5		263	82	s 61	39	32	3
30.....	23	5		252	201	s 153	29	33	2
31.....	21	7		108	110	32	--	--	--
Total.	1,159	--	55	2,339	--	532	3,891	--	5,445
Total discharge for year (cfs-days).....	63,771.8								
Total load for year (tons).....	39,448								

s Computed by subdividing day.

t Less than 0.5 ton.

a Computed from partly estimated concentration graph.

GREEN RIVER BASIN--Continued  
ROUGH RIVER AT FALLS OF ROUGH, KY.--Continued

Particle-size analyses of suspended sediment, water year Oc ober 1953 to September 1954  
(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	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. 21, 1954	5:45 a. m.	2,450		1,270	1,430	49	60	73	90	99	100						BSWCM
Jan. 21	11:55 a. m.	2,440		1,270	914	50	65	75	87	93	99						BSWCM
Jan. 21	11:55 a. m.	2,440		1,270	882	48	61	77	90	99	99						BSNM
Jan. 22	12:15 p. m.	2,080		1,798	890	60	69	83	93	98	100						BSWCM
Feb. 28	12:15 p. m.	1,460		658	818	55	66	78	91	99	100						BSWCM
Feb. 28	5:30 p. m.	1,330		772	560	54	68	84	94	97	99						BSWCM
Mar. 1	5:30 p. m.	1,420		528	601	63	73	85	83	100	--						BSWCM
Mar. 2	6:05 p. m.	1,719		280	283	56	70	87	95	99	100						BSWCM
Apr. 16	8:30 a. m.	2,610		1,000	805	43	65	71	87	92	99						BSWCM
Apr. 16	3:30 p. m.	2,630		950	634	48	61	70	85	96	99						BSWCM
Apr. 16	5:30 p. m.	2,920		599	883	39	47	59	76	94	99						BSWCM
June 18	5:10 a. m.	255		976	814	78	95	--	--	--	--						BWCM
June 18	6:10 p. m.	136		471	692	86	98	99	--	--	--						BWCM
June 21	4:55 a. m.	48		348	494	89	94	95	96	98	100						BSWCM
Aug. 30	4:55 a. m.	331		395	507	89	93	95	95	97	99	100					BSWCM
Sept. 21	9:55 a. m.	1,480		1,370	1,500	57	72	86	99	--	99						BSWCM
Sept. 21	2:10 p. m.	1,350		840	1,210	62	74	85	95	100	--						BWCM



## GREEN RIVER BASIN--Continued

## ROUGH RIVER AT DUNDEE, KY.

LOCATION.--At auxiliary wire-weight gage at bridge on State Highway 69 at Dundee, Ohio County, 7.1 miles downstream from Caney Creek.

DRAINAGE AREA.--775 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 84°F July 30, 31; minimum, freezing point on many days during December and January.

EXTREMES, 1949-54.--Water temperatures: Maximum, 88°F Sept. 2, 1951, July 1, 1952; minimum, freezing point on many days during 1951, 1953 and 1954.

REMARKS.--Records of discharge for Rough River near Dundee for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, water year October 1953 to September 1954

[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	87	48	38	34	40	45	50	70	72	--	80	72
2	87	50	40	36	42	43	50	70	72	--	78	72
3	88	51	43	34	42	38	52	64	70	--	76	74
4	88	50	44	36	42	40	53	61	66	--	76	74
5	88	50	44	36	41	38	56	60	67	--	76	76
6	64	46	47	34	40	38	58	59	68	--	76	76
7	61	44	42	34	39	42	60	58	70	--	76	76
8	59	40	44	36	36	42	56	56	72	--	75	75
9	58	41	46	38	38	44	58	54	73	--	74	74
10	58	40	44	32	38	47	60	52	76	--	74	76
11	59	41	38	32	40	53	60	56	77	--	72	72
12	58	42	43	32	36	50	59	58	78	--	70	70
13	58	42	39	32	38	52	60	56	79	--	70	70
14	59	42	40	32	44	46	62	56	80	--	74	70
15	58	43	36	33	48	40	62	59	80	--	79	70
16	58	42	34	32	49	38	58	64	77	--	77	70
17	58	43	32	32	47	40	56	61	78	--	76	72
18	58	44	32	32	44	46	60	64	76	--	78	71
19	56	46	32	36	46	50	61	61	78	--	78	74
20	57	49	32	42	47	48	63	60	80	--	77	70
21	58	47	34	43	48	41	63	60	78	--	80	67
22	56	49	34	37	48	44	64	61	79	--	80	68
23	58	49	32	34	48	47	64	64	79	80	80	64
24	56	48	32	40	46	50	66	64	78	78	80	64
25	58	46	32	42	46	54	68	66	77	77	78	66
26	54	44	32	44	48	53	68	68	79	76	78	66
27	56	44	32	36	48	54	70	70	80	76	79	66
28	53	39	33	42	46	57	68	69	80	77	80	66
29	52	39	34	42	--	56	67	68	78	78	80	68
30	52	40	34	44	--	54	68	68	78	80	80	70
31	51	--	32	44	--	50	--	70	--	84	77	--
Average	59	45	37	37	43	46	61	62	76	--	77	71

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 three quarter mile upstream from mouth.  
 DRAINAGE AREA --65.4 square miles.  
 RECORDS AVAILABLE --October 1952 to September 1954.  
 REMARKS --Acidity determined to phenolphthalein end point. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	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>		Acidity (H <sup>+</sup> )		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium, magnesium	Non-carbonate	Immediate	Potential free			
Nov. 6, 1953.....		6.3	0.03	0.00	51	16	16	5.6	109	123	8.5	0.4	0.2	295	192	104	0.3	0.1	455	6.5	15
Dec. 7, 1953.....		3.7	.02	.34	19	5.4	8.9	4.0	13	71	4.7	.1	4.8	137	70	59	.3	.1	212	5.7	17
Jan. 27, 1954.....		9.8	.00	.97	13	6.6	4.0	1.7	0	60	2.5	.0	5.0	108	60	80	.3	.1	187	4.36	6
Mar. 3, 1954.....		9.5	.08	--	18	6.2	4.0	1.7	0	68	2.2	.2	1.4	129	65	65	.6	.0	196	4.35	3
Apr. 6, 1954.....		8.4	.04	.13	24	6.4	5.5	2.4	12	75	3.2	.2	6.4	142	86	76	.2	.0	221	6.6	5
May 13, 1954.....		12	.03	--	12	5.5	4.8	1.1	5	56	2.6	.2	.6	102	52	48	.1	.0	150	6.2	5
June 15, 1954.....		7.8	.01	.21	14	4.8	8.2	3.1	12	53	4.4	.2	4.5	108	54	45	.2	.0	170	6.3	8
July 20, 1954.....		4.5	.10	.13	18	6.1	18	3.4	36	66	9.9	.4	4.2	146	69	40	.1	.0	245	7.4	10
Aug. 21, 1954.....		4.6	.00	.09	16	4.3	17	4.6	63	28	8.0	.4	7.4	129	58	6	.0	.0	207	6.8	10
Sept. 29, 1954.....		6.4	.49	.24	19	8.5	9.6	4.3	7	91	5.5	.1	2.0	153	82	77	.3	.1	241	6.0	10



GREEN RIVER BASIN--Continued  
 GREEN RIVER AT LIVERMORE, KY.--Continued  
 Temperature (°F) of water, water year October 1953 to September 1954  
 /Continuous 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.....	80	76	65	63	52	51	44	43	43	43	48	47	55	55	72	71	--	--	87	86	87	86	86	86
2.....	80	75	65	63	51	51	44	44	44	44	47	46	56	55	73	72	--	--	87	86	87	86	86	86
3.....	80	75	64	63	51	51	45	44	44	44	46	45	55	55	72	71	--	--	87	86	87	86	86	86
4.....	79	76	63	63	51	51	44	43	44	44	46	45	57	56	71	70	--	--	87	86	86	86	86	86
5.....	77	74	63	61	52	51	43	43	44	44	45	44	59	56	69	68	--	--	87	86	86	87	--	--
6.....	74	71	61	60	52	51	43	42	44	44	44	43	59	58	68	68	--	--	88	86	88	87	--	--
7.....	72	70	61	60	52	51	43	42	44	44	43	43	40	58	68	65	--	--	87	86	87	86	--	--
8.....	72	70	60	59	52	51	43	42	44	44	43	43	41	60	63	60	--	--	87	86	87	86	--	--
9.....	73	69	59	56	52	51	43	43	44	44	43	43	62	61	60	60	--	--	87	85	87	87	--	--
10.....	73	69	58	57	52	51	43	42	44	44	43	43	62	62	59	59	--	--	87	86	87	85	--	--
11.....	72	69	58	56	51	51	43	42	43	43	45	45	63	63	59	58	--	--	88	86	86	85	--	--
12.....	70	69	59	57	51	51	42	42	44	43	48	45	63	63	58	58	--	--	88	86	86	85	--	--
13.....	70	69	58	56	51	50	42	42	45	43	48	48	63	63	58	58	--	--	88	86	86	85	--	--
14.....	69	68	58	56	50	49	43	42	45	44	48	48	63	63	59	58	--	--	87	86	87	86	--	--
15.....	69	68	56	55	49	49	42	42	47	45	48	48	64	63	59	58	--	--	87	86	88	86	85	83
16.....	69	68	56	55	49	48	42	41	47	47	49	48	64	64	62	59	--	--	87	85	87	86	85	83
17.....	69	68	57	55	48	47	41	40	47	46	49	47	65	62	62	61	--	--	87	85	87	86	85	83
18.....	69	68	56	55	47	46	40	37	48	47	50	47	62	61	63	62	--	--	87	85	87	86	84	83
19.....	70	68	57	56	46	46	37	35	48	48	49	48	62	62	63	63	--	--	87	86	87	86	85	84
20.....	69	68	57	56	46	46	35	33	49	48	49	48	64	62	64	62	--	--	87	86	87	86	84	83
21.....	71	68	58	56	46	46	40	35	50	49	51	49	65	64	65	63	--	--	86	85	87	86	83	83
22.....	69	68	57	56	46	46	44	40	50	50	49	49	67	65	65	64	--	--	86	85	88	86	84	82
23.....	69	67	57	56	46	45	44	43	50	50	49	48	68	67	66	64	--	--	86	85	88	86	84	82
24.....	68	67	56	56	45	45	43	43	50	49	48	49	68	68	69	65	--	--	87	85	87	86	84	82
25.....	68	66	56	55	45	45	43	43	50	50	51	49	69	68	--	--	--	--	87	85	86	85	83	82
26.....	67	65	55	54	45	45	43	43	50	50	52	51	70	69	--	--	--	--	87	85	86	85	84	82
27.....	66	65	54	53	45	44	43	43	50	50	52	51	71	70	--	--	--	--	87	85	87	85	84	82
28.....	65	64	53	52	44	44	44	43	49	48	54	52	71	71	--	--	--	--	87	86	--	--	84	82
29.....	64	63	52	51	44	44	44	44	--	--	56	54	71	71	--	--	--	--	87	86	--	--	83	81
30.....	66	63	52	51	44	44	44	44	--	--	56	56	71	71	--	--	--	--	87	86	--	--	82	81
31.....	65	63	--	--	44	44	44	43	--	--	56	55	--	--	--	--	--	--	87	86	--	--	--	--
Average.....	71	69	58	57	48	48	42	42	46	46	49	48	64	63	--	--	--	--	87	86	87	86	--	--

GREEN RIVER BASIN--Continued  
POND RIVER AT JEWEL CITY, KY.

LOCATION.--At Jewel City, Hopkins County, 200 feet upstream from Cypress Creek and three quarter mile upstream from mouth.  
DRAINAGE AREA.--790 square miles, approximately.  
RECORDS AVAILABLE.--Chemical analyses: April 1950 to September 1954.  
REMARKS.--Acidity determined to phenolphthalein end point. No discharge records available for this station.

Date of collection	Mean discharge (cfs)	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>		Acidity (ft)		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium magnesium	Non-carbonate	Immediate	Potential free			
Oct. 7, 1953.....		4.3	0.05	0.04	36	8.9	4.9	1.6	126	26	4.8	0.1	1.4	152	127	23	0.1	0.0	271	7.0	5
Nov. 11.....		4.3	.01	.00	38	6.0	3.8	2.0	126	16	5.0	.2	1.4	145	121	16	.2	.0	250	6.8	2
Jan. 5, 1954.....		2.4	.22	3.2	78	30	34	3.1	97	297	10	.5	.3	533	320	238	.1	.0	750	7.1	4
Feb. 9.....		8.5	.61	.00	49	19	12	1.8	3	210	4.2	.4	3.0	328	200	198	.2	.2	465	4.7	2
Mar. 17.....		8.3	.17	2.1	52	17	14	1.7	19	202	4.5	.3	2.2	332	202	184	.1	.0	473	6.3	1
Apr. 20.....		5.8	.54	.00	27	5.1	3.0	1.5	80	23	3.1	.2	2.7	115	88	23	.1	.0	191	6.9	20
May 18.....		8.2	.27	.65	34	8.8	6.9	1.8	30	108	2.1	.1	.4	195	122	96	.2	.0	298	6.4	10
June 29.....		6.1	.01	.34	44	14	12	2.2	59	137	3.5	.3	3.1	255	165	119	.4	.0	393	6.9	9
Aug. 4.....		5.8	.18	2.9	66	40	33	4.7	20	382	4.5	.7	2.6	582	330	313	.2	.0	807	6.3	5
Sept. 10.....		6.2	.41	.83	38	9.8	9.3	2.4	61	96	6.8	.3	1.9	205	136	85	.1	.0	325	7.5	8

Chemical analyses, in parts per million, water year October 1953 to September 1954

## WABASH RIVER BASIN

## WABASH RIVER AT LAFAYETTE, IND.

LOCATION.--Temperature recorder at gaging station on right bank 20 feet downstream from Brown Street Bridge in Lafayette, Tippecanoe County, 5.1 miles downstream from Wildcat Creek, and at mile 311.9.

DRAINAGE AREA.--7,247 square miles.

RECORDS AVAILABLE.--Water temperatures: July to September 1954.

REMARKS.--Some regulation at low stages caused by power plants above station. Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Day	July		August		September		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min
	Day		Day		Day		Day		Day		Day	
1	--	--	87	83	--	--	11	--	78	74	--	--
2	--	--	83	81	--	--	12	--	76	72	--	--
3	--	--	84	79	--	--	13	--	74	71	--	--
4	--	--	83	79	--	--	14	--	76	72	--	--
5	--	--	83	80	--	--	15	--	80	75	--	--
6	--	--	81	77	--	--	16	--	79	77	--	--
7	--	--	80	79	--	--	17	--	77	72	--	--
8	--	--	80	79	--	--	18	--	74	72	--	--
9	--	--	80	78	--	--	19	--	75	74	--	--
10	--	--	80	76	--	--	20	--	75	74	--	--
							21	85	81	75	75	--
							22	83	82	75	75	--
							23	83	79	76	74	--
							24	84	79	78	76	68
							25	85	81	79	76	68
							26	85	81	77	75	68
							27	87	81	75	75	69
							28	89	83	75	75	68
							29	88	84	75	74	69
							30	90	84	75	75	69
							31	90	86	--	--	--

Temperature (°F) of water, July to September 1954  
 Recorder with temperature attachment, continuous ethyl alcohol-actuated thermograph 7



WABASH RIVER BASIN--Continued  
VERMILION RIVER NEAR CATLIN, ILL.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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.....	69	60	54	50	39	38	36	36	36	36	45	40	50	42	71	66	74	69	87	79	82	77	79	69
2.....	70	60	54	51	40	38	36	36	36	36	43	41	50	45	70	68	69	66	87	79	82	77	82	71
3.....	73	64	55	52	46	40	36	36	36	36	41	37	48	44	68	59	68	65	85	80	84	74	81	73
4.....	69	64	53	49	46	42	36	36	37	36	39	37	51	44	59	56	65	65	83	91	79	84	76	84
5.....	66	61	49	45	44	41	36	36	36	36	40	37	52	49	60	55	67	61	88	81	82	72	87	73
6.....	61	57	46	43	45	42	36	36	36	36	39	37	58	51	57	55	73	64	88	78	82	74	86	76
7.....	60	54	44	42	42	40	36	36	37	36	42	37	64	58	61	54	75	68	84	77	82	74	85	77
8.....	59	53	43	42	42	40	36	36	37	36	44	39	62	56	59	55	75	70	84	72	78	74	81	72
9.....	60	54	43	41	44	42	36	36	37	36	46	40	58	53	56	54	75	70	83	73	81	72	77	70
10.....	62	54	43	41	42	40	36	36	36	36	45	41	58	55	55	52	76	73	85	74	81	73	73	68
11.....	63	56	45	41	40	39	36	36	39	36	47	43	58	56	60	52	81	73	86	76	76	72	71	65
12.....	62	57	45	43	40	40	36	38	38	36	46	43	57	55	64	54	83	78	90	79	78	70	72	64
13.....	61	55	45	42	40	38	36	38	37	36	44	42	58	55	64	56	86	86	94	84	84	76	74	65
14.....	61	54	46	42	39	37	36	38	43	37	42	40	59	57	68	58	84	79	95	84	80	72	76	68
15.....	63	54	48	44	37	37	36	36	50	43	42	38	63	59	71	60	85	78	89	78	86	76	77	70
16.....	63	56	48	45	37	37	36	36	50	42	44	38	63	57	67	64	86	78	87	75	84	80	77	68
17.....	62	55	48	46	37	37	36	36	45	41	46	40	58	55	70	62	88	79	87	76	80	78	79	69
18.....	62	55	50	46	37	37	36	36	45	42	49	43	57	56	68	62	87	81	92	79	85	76	82	72
19.....	63	56	54	49	37	36	36	35	47	42	49	47	59	55	66	60	90	80	90	82	82	78	79	73
20.....	63	57	56	52	36	36	36	35	49	47	48	43	64	58	67	58	91	82	90	82	80	76	77	70
21.....	64	57	52	48	36	36	36	35	49	45	47	40	67	62	68	57	89	83	84	79	80	74	72	65
22.....	65	57	48	46	36	36	36	36	45	44	45	42	66	62	71	63	81	80	82	83	77	83	74	66
23.....	62	56	48	45	36	36	36	36	47	43	43	43	60	60	72	63	84	76	84	70	85	78	68	59
24.....	58	56	46	44	36	36	36	36	46	44	43	43	60	72	68	67	86	80	87	76	89	80	68	58
25.....	59	57	44	42	36	36	36	36	46	44	57	48	74	67	74	68	89	78	84	76	89	80	72	62
26.....	58	54	42	40	36	36	35	35	44	40	54	49	75	70	71	66	92	82	86	75	82	77	72	62
27.....	56	55	41	39	36	36	35	35	43	41	53	48	74	68	70	65	91	82	86	76	80	77	73	62
28.....	56	52	39	38	36	36	35	35	44	40	56	50	68	62	73	67	87	76	88	76	83	76	69	64
29.....	53	50	39	38	36	36	36	35	---	---	54	46	65	61	74	68	88	76	89	79	84	78	73	67
30.....	52	49	40	39	36	36	36	35	---	---	48	43	68	62	75	66	88	80	82	81	77	73	70	70
31.....	52	49	---	---	36	36	36	35	---	---	48	44	---	---	50	70	80	80	82	82	77	71	---	---
Average.....	62	56	47	44	39	38	36	36	42	39	46	42	61	56	67	61	82	75	88	78	82	75	76	68



WABASH RIVER BASIN--Continued

WABASH RIVER AT RIVERTON, IND.

LOCATION.--Temperature recorder at gaging station on left bank at downstream side of Illinois Central Railroad bridge at Riverton, 0.6 mile downstream from Turtle Creek and at mile 162.0.

DRAINAGE AREA.--13,100 square miles, approximately.

RECORDS AVAILABLE.--Water temperatures: July to September 1954.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, July to September 1954  
Recorder with temperature attachment, continuous ethyl alcohol-actuated thermograph 7

Day	July		August		September		Day	July		August		September	
	max	min	max	min	max	min		max	min	max	min	max	min
1	--	--	--	--	84	80	11	84	81	83	82	--	--
2	--	--	--	--	83	80	12	84	82	82	80	--	--
3	--	--	--	--	84	80	13	85	84	80	79	--	--
4	--	--	--	--	--	--	14	87	85	--	--	--	--
5	--	--	--	--	--	--	15	88	87	--	--	--	--
6	--	--	--	--	--	--	16	88	86	--	--	--	--
7	84	82	--	--	--	--	17	88	85	--	--	--	--
8	85	81	--	--	--	--	18	90	87	--	--	--	--
9	84	81	--	--	--	--	19	90	88	--	--	--	--
10	84	81	83	80	--	--	20	91	87	--	--	--	--
							21	88	85	86	86	83	--
							22	86	84	86	83	--	--
							23	87	86	87	84	--	--
							24	87	84	88	84	--	--
							25	86	84	88	86	--	--
							26	--	--	89	86	--	--
							27	--	--	90	86	--	--
							28	--	--	90	86	--	--
							29	--	--	91	86	--	--
							30	--	--	88	84	--	--
							31	--	--	84	82	--	--

## WABASH RIVER BASIN--Continued

## WHITE RIVER NEAR NOBLESVILLE, IND.

LOCATION.--Temperature recorder at gaging station near center of span on downstream side of highway bridge, 1 mile west of Strawtown, 7 miles northeast of Noblesville, Hamilton County, and 9.5 miles upstream from Cicero Creek.

DRAINAGE AREA.--814 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1953 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 88° F July 14; minimum, freezing point on many days during December and January.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in MSP 1335.

Temperature (° F) of water, water year October 1953 to September 1954

/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	50	39	37	34	32	38	36	40	39	44	--	--	73	67	84	79	81	76	75	70		
2.....	--	54	52	38	37	36	33	38	37	41	39	46	42	--	--	66	64	83	78	76	74	75	73	
3.....	--	55	53	43	39	36	36	40	38	41	38	47	44	--	--	64	63	82	79	78	72	77	71	
4.....	--	54	51	46	43	36	35	40	38	38	35	47	44	--	--	64	61	81	76	78	74	78	73	
5.....	--	51	47	45	43	36	35	39	36	34	48	45	57	55	62	59	81	76	77	76	81	75	75	
6.....	--	47	44	45	43	36	35	38	36	34	36	34	--	57	52	66	61	75	78	72	81	77	77	
7.....	--	44	43	44	41	37	36	37	36	40	35	--	--	58	54	69	64	80	74	79	74	91	77	
8.....	--	45	43	42	40	36	35	37	36	42	38	--	--	57	54	71	68	71	78	72	77	73	77	
9.....	57	56	45	43	43	41	39	37	38	35	45	40	--	56	54	77	70	76	71	76	71	73	68	
10.....	58	54	44	42	43	41	39	35	40	36	46	42	--	54	52	80	76	78	71	78	74	70	69	
11.....	60	56	45	43	41	40	35	38	40	38	45	43	--	57	53	83	78	74	75	71	75	67	64	
12.....	60	56	45	44	41	40	33	38	39	35	44	43	--	59	54	84	80	83	76	74	68	65	62	
13.....	59	47	45	44	40	37	33	38	37	35	46	42	--	61	56	84	79	85	79	74	68	66	60	
14.....	58	56	46	44	37	36	33	32	44	47	45	42	--	61	59	83	81	83	81	75	72	68	60	
15.....	58	46	46	36	34	33	33	51	44	40	37	--	--	66	61	83	80	84	80	74	72	66	66	
16.....	60	57	49	47	34	32	33	33	52	49	42	37	--	65	63	94	81	91	77	79	79	72	67	
17.....	60	57	49	45	32	32	34	33	48	46	43	39	--	67	62	90	77	81	76	78	73	72	67	
18.....	60	57	49	47	32	32	34	33	47	45	47	41	--	65	62	80	76	81	79	77	72	75	69	
19.....	60	57	51	49	32	32	33	32	47	44	49	46	--	64	62	83	78	94	79	79	76	74	72	
20.....	61	58	53	51	32	32	36	32	49	47	42	--	--	64	60	93	78	94	79	75	74	70	69	
21.....	61	59	53	51	32	32	38	36	49	47	44	39	--	65	60	85	80	82	77	79	74	73	69	
22.....	61	59	53	48	32	32	37	34	47	45	43	41	--	66	61	83	80	79	74	80	75	68	63	
23.....	60	59	48	47	33	32	34	33	46	45	43	41	--	69	63	82	77	78	74	83	78	65	61	
24.....	59	56	47	45	32	31	35	33	45	44	46	42	--	70	65	82	76	79	73	86	80	64	60	
25.....	57	56	45	43	31	31	38	35	44	43	53	46	--	70	67	83	77	79	74	86	81	69	63	
26.....	56	54	43	41	31	31	40	38	43	40	51	48	--	68	64	84	78	80	75	83	80	68	63	
27.....	56	56	41	40	31	31	40	38	43	43	50	46	--	65	63	94	79	91	76	80	77	69	64	
28.....	56	54	40	39	33	31	38	37	43	41	52	49	--	68	64	90	75	92	77	91	78	65	65	
29.....	54	50	39	37	33	32	38	37	--	--	51	46	--	70	66	81	75	82	78	93	79	69	66	
30.....	52	49	38	37	33	32	38	37	--	--	45	43	--	70	65	83	78	85	79	92	78	69	66	
31.....	52	49	--	--	33	32	37	36	--	--	43	41	--	75	63	--	--	84	81	77	73	--	--	
Average.....	58	56	47	45	37	35	36	35	43	41	44	41	46	43	64	60	78	74	81	76	79	75	72	68

WABASH RIVER BASIN--Continued  
WHITE RIVER AT NOBLESVILLE, IND.

LOCATION.--Temperature recorder at gaging station on right bank at downstream side of Logan Street Bridge in Noblesville, Hamilton County, 1 1/2 miles upstream from Cicero Creek and 3 1/2 miles below dam at Clare.

DRAINAGE AREA.--857 square miles.

RECORDS AVAILABLE.--Water temperatures: November 1952 to September 1954.

EXTREMES, 1933-54.--Water temperatures: Maximum, 82° F July 14, 30; minimum, 36° F Mar. 5.

EXTREMES, 1952-54.--Water temperatures: Maximum, 94° F Aug. 1, 1953; minimum, 36° F Dec. 28-29, 1952, Mar. 5, 1954.

REMARKS.--Flow regulated by power plant above station. Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, November 1952 to September 1954

/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.					42	42	42	39	43	42	43	40	51	51	61	73	86	82	94	88	91	83		
2.					44	44	44	42	43	41	41	40	52	50	68	64	71	82	78	88	82	90	84	
3.					43	43	43	43	43	43	42	41	53	52	69	63	74	80	78	86	80	89	82	
4.					46	44	43	40	43	42	43	42	53	51	69	63	75	72	83	78	86	83	78	
5.					46	44	40	40	44	43	43	41	53	51	68	66	79	81	75	84	80	80	76	
6.					44	44	41	39	45	44	41	40	55	53	69	67	80	77	76	83	77	78	73	
7.					44	43	41	40	45	45	41	39	55	54	68	66	74	75	72	84	79	76	73	
8.					48	44	41	40	45	44	39	38	56	54	66	64	79	74	77	82	77	76	72	
9.					53	48	40	39	46	43	39	37	61	55	69	64	82	77	76	75	77	75	72	
10.					53	50	39	39	45	43	43	39	60	52	72	68	80	76	77	80	73	78	74	
11.					47	39	39	39	45	45	45	43	52	51	72	69	77	74	78	74	83	78	75	
12.					45	39	38	45	42	42	50	45	50	50	70	69	80	76	79	75	83	80	75	
13.					45	43	39	38	42	41	53	50	50	49	70	66	80	78	82	76	86	81	75	
14.					43	41	42	39	41	40	53	51	52	49	66	62	80	77	84	78	86	81	71	
15.					41	40	47	41	41	41	52	48	51	63	60	80	74	85	79	87	83	72	67	
16.					41	40	47	45	41	40	48	46	51	49	63	61	82	76	87	81	85	81	74	
17.					42	41	45	43	40	38	46	46	50	48	61	58	80	77	85	81	82	78	74	
18.					43	42	43	41	41	38	49	48	48	46	62	60	79	76	87	83	81	78	77	
19.					44	43	41	40	42	40	46	46	46	46	64	62	84	77	86	82	82	77	75	
20.					46	44	41	40	45	42	46	47	48	45	65	62	87	82	90	84	81	77	73	
21.					46	46	43	41	45	42	52	48	52	47	68	65	84	91	85	82	77	75	72	
22.					56	46	45	43	42	42	39	53	52	55	68	64	90	82	77	82	78	74	70	
23.					55	51	45	44	42	39	38	56	53	62	55	64	62	90	84	79	84	79	74	
24.					51	50	45	45	44	42	41	39	56	54	61	60	62	62	90	84	79	73	70	
25.					52	51	45	43	42	39	40	40	55	51	65	60	64	62	88	85	82	77	75	
26.					52	48	43	41	39	38	43	40	51	49	64	59	69	64	85	84	82	79	76	
27.					48	45	41	38	40	38	45	43	50	47	59	55	69	68	80	86	78	88	74	
28.					45	38	36	40	40	--	43	51	50	57	55	68	65	85	83	90	84	71		
29.					43	37	36	40	40	--	--	51	49	60	56	69	65	86	81	91	86	87		
30.					42	38	37	42	40	--	--	51	50	64	59	72	69	83	89	86	87	76		
31.					39	38	43	42	42	--	--	51	51	--	76	73	--	--	83	87	85	81	--	
Average					44	43	42	40	43	41	48	46	65	58	67	64	82	78	83	79	85	80	78	

WABASH RIVER BASIN--Continued  
 WHITE RIVER AT NOBLESVILLE, IND.--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
 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.....	76	74	65	62	51	48	46	42	45	40	44	43	44	40	72	67	76	71	90	84	86	83	78	74
2.....	76	73	65	63	52	50	44	41	46	43	44	42	42	46	42	70	68	73	68	90	84	83	78	76
3.....	76	74	65	63	52	51	44	42	47	44	44	42	47	44	68	63	70	66	88	86	82	78	79	77
4.....	76	70	64	62	55	52	44	42	47	45	42	38	47	44	63	58	67	64	89	83	86	82	84	76
5.....	70	68	62	57	54	53	47	45	47	44	42	36	51	46	59	55	66	62	87	82	85	81	85	77
6.....	68	67	57	56	56	54	47	45	47	44	41	37	56	50	56	53	67	61	87	78	85	80	82	77
7.....	68	66	56	55	54	50	48	46	44	43	42	38	60	54	58	54	76	64	86	82	84	80	80	76
8.....	67	64	53	54	52	50	49	46	45	42	48	39	53	56	58	54	76	72	84	76	83	77	79	76
9.....	68	64	54	51	54	52	50	46	47	46	50	45	58	54	55	54	83	75	82	74	80	75	79	75
10.....	69	66	56	53	52	48	46	43	48	46	52	46	58	55	58	52	85	78	84	79	82	78	78	75
11.....	69	66	57	55	50	48	43	42	48	46	52	48	53	56	61	55	88	80	84	80	80	78	77	73
12.....	68	64	57	56	51	49	42	40	46	45	51	45	59	54	64	55	88	84	88	82	81	76	75	71
13.....	68	66	56	55	49	48	41	40	46	45	50	47	60	55	66	59	89	84	90	87	80	76	72	69
14.....	70	66	58	55	48	46	43	42	53	46	49	44	62	57	70	61	89	82	92	88	82	78	72	70
15.....	71	67	59	57	47	44	48	45	59	53	47	41	64	60	71	65	90	86	90	85	85	78	81	72
16.....	70	68	58	56	46	41	47	42	60	58	50	44	64	59	66	65	89	85	88	83	82	78	81	77
17.....	70	67	59	56	42	40	42	41	58	52	50	46	59	56	73	64	89	83	88	82	80	76	81	76
18.....	69	67	60	58	41	41	41	38	53	49	54	48	57	54	72	66	86	78	87	82	84	77	85	79
19.....	68	65	62	60	43	42	47	41	55	50	54	50	59	54	71	65	85	78	88	84	84	78	82	80
20.....	70	66	62	61	46	44	51	47	54	52	54	48	63	58	70	64	85	81	90	85	82	80	80	76
21.....	72	68	61	59	43	42	48	39	54	51	48	44	67	61	70	64	89	80	89	83	82	79	77	73
22.....	73	71	60	58	48	43	42	39	56	50	48	43	69	64	70	65	88	83	86	83	80	75	75	69
23.....	63	69	58	53	43	39	42	41	55	50	48	44	66	63	72	64	86	82	85	80	83	76	76	72
24.....	69	67	55	53	41	40	42	41	53	50	51	44	66	60	76	66	87	81	83	79	90	82	75	70
25.....	67	66	54	51	41	41	46	41	52	49	56	50	68	64	76	71	87	81	81	76	87	84	79	73
26.....	67	62	51	49	41	38	49	46	51	48	56	51	74	66	75	69	90	85	81	76	86	84	76	72
27.....	66	65	50	48	41	40	48	42	52	49	54	50	74	69	72	68	91	86	87	79	85	82	74	69
28.....	65	65	50	48	41	39	42	40	50	44	55	51	70	66	71	68	87	81	88	82	84	78	76	70
29.....	65	62	50	48	44	42	42	39	--	--	54	49	67	62	73	70	87	80	87	84	82	78	79	76
30.....	62	60	50	48	45	42	43	41	--	--	--	44	73	67	88	83	92	86	80	86	80	76	79	78
31.....	63	60	--	--	44	42	43	40	--	--	45	42	--	--	76	69	--	--	91	87	79	76	--	--
Average.....	69	67	58	55	47	45	45	42	51	47	49	44	61	56	68	68	83	77	87	82	83	79	78	74

WABASH RIVER BASIN--Continued  
WHITE RIVER NEAR NORA, IND.

LOCATION.--Temperature recorder at gaging station on downstream side of center pier of bridge on State Highway 100, 2 miles east of Nora and 14 miles upstream from Fall Creek.  
DRAINAGE AREA.--1,200 square miles.  
RECORDS AVAILABLE.--Water temperatures: June to September 1954.  
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, June to September 1954  
Recorder with temperature attachment, continuous ethyl alcohol-actuated thermograph

Day	June		July		August		September		Day	June		July		August		September								
	max	min	max	min	max	min	max	min		max	min	max	min	max	min	max	min	max						
1	--	--	87	81	78	76	76	70	11	82	76	75	71	76	68	21	82	78	79	74	76	70		
2	--	--	87	79	77	74	76	71	12	--	85	79	76	68	76	66	22	81	76	79	74	76	67	
3	--	--	84	80	79	72	76	72	13	--	87	81	75	68	77	68	23	80	75	83	76	72	65	
4	--	--	86	80	78	74	78	71	14	--	89	82	76	71	74	69	24	81	75	84	76	72	64	
5	--	--	84	82	77	75	80	73	15	--	85	80	80	74	77	70	25	81	76	82	77	73	68	
6	--	--	84	79	79	73	82	77	16	--	85	78	79	77	78	70	26	82	75	79	77	74	67	
7	--	--	82	78	79	74	79	76	17	--	84	77	78	74	80	71	27	84	75	80	76	75	67	
8	--	--	80	75	76	74	81	72	18	--	85	78	78	74	79	74	28	84	75	81	78	72	68	
9	--	--	79	76	77	72	79	70	19	--	86	79	79	76	78	76	29	82	77	82	79	74	71	
10	--	--	79	75	77	72	75	71	20	--	86	79	78	76	79	74	30	84	78	79	77	73	72	
Average	--		--		--		--		31	--		--		--		84	--		--		--		76	70

## WABASH RIVER BASIN--Continued

## WHITE RIVER NEAR CENTERTON, IND.

LOCATION.--Temperature recorder at gaging station on right bank three-eighths of a mile downstream from highway bridge, 1 mile south of Centerton, Morgan County, 1-1/8 miles downstream from White Lick Creek, and at mile 202.6.

DRAINAGE AREA.--2,435 square miles.

RECORDS AVAILABLE.--Water temperatures: September 1953, December 1953 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 89°F July 14; minimum, 36°F January 12-15.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1335.

Temperature (°F) of water, September 1953, December 1953 to September 1954

/Recorder with temperature attachment, continuous ethyl alcohol-actuated thermograph

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

## 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 1954.

Water temperatures: October 1951 to September 1954.

Sediment records: October 1952 to September 1954.

EXTREMES, 1953-54.--Dissolved solids: Maximum, 547 ppm Jan. 13-20; minimum, 54 ppm Sept. 21-30.

Hardness: Maximum, 343 ppm Jan. 13-20; minimum, 31 ppm Sept. 21-30.

Specific conductance: Maximum, 83°F Aug. 18-19; minimum, freezing point Jan. 17-18.

Water temperatures: Maximum, 83°F Aug. 18-19; minimum, freezing point Jan. 17-18.

Sediment concentrations: Maximum daily, 1,250 microbombs Jan. 19; minimum daily, no flow on many days during October to December, August and September.

Sediment loads: Maximum daily, 1,210 tons June 5; minimum daily, no flow on many days during October to December, August and September.

EXTREMES, 1951-54.--Dissolved solids: Maximum, 547 ppm Jan. 13-20, 1954; minimum, 54 ppm Sept. 21-30, 1954.

Hardness: Maximum, 343 ppm Jan. 13-20, 1954; minimum, 31 ppm Sept. 21-30, 1954.

Specific conductance: Maximum daily, 1,250 microbombs Jan. 19, 1954; minimum daily, 51.4 microbombs Mar. 23, 1952.

Water temperatures: Maximum, 87°F June 26, 29, 1952; minimum, freezing point Dec. 19, 1951, Dec. 15, 29, 1952, Jan. 17-18, 1954.

Sediment concentrations (1952-54): Maximum daily, 764 ppm June 5, 1954; minimum daily, no flow on many days during October, November, 1952, August to December 1953, August and September 1954.

Sediment loads (1952-54): Maximum daily, 1,370 tons Mar. 6, 1953; minimum daily, no flow on many days during October, November 1952, August to December 1953, August and September 1954.

REMARKS.--Acidity determined to phenolphthalein end point. Records of specific conductance of daily samples from October 1952 to September 1954 available in district office at Columbus, Ohio. Records of discharge for water year October 1953 to September 1954 given in WSP 1335. No flow Oct. 1-Dec. 9, Aug. 14-19, Sept. 14-19.

## Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	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>		Acidity (H <sup>+</sup> )		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium	Non-magnesium carbonate	Immune	Potential free			
Oct. 1-13, 1953.....	0	5.3	0.03		77	31	12	3.8	35	299	3.5	0.4	0.2	488	321	291	0.1	0.0	653	6.7	3
Oct. 14-26.....	0	9.4	.01		76	33	12	4.0	31	299	4.0	.4	.6	486	324	300	.2	.2	647	6.3	4
Oct. 27-Nov. 8.....	0	9.5	.01		74	33	12	4.0	37	294	3.8	.4	.1	464	320	280	.2	.1	650	6.1	4
Nov. 9-21.....	0	9.0	.00		75	29	12	4.0	35	296	2.6	.3	.1	468	308	278	.2	.0	654	6.4	3
Nov. 22-30.....	0	8.2	.00		71	31	12	4.4	34	290	2.8	.3	.2	472	303	277	.2	.0	639	6.6	3
Dec. 1-12.....	4.58	6.4	.02		67	29	12	4.0	41	278	2.2	.3	.2	455	289	253	.2	.0	624	6.6	5
Dec. 13-21.....	6.88	6.8	.00		59	23	15	3.4	68	215	6.2	.4	.2	382	250	194	.3	.0	565	6.6	9
Dec. 22-31.....	1.04	6.6	.02		52	23	23	6.4	66	183	14	.3	12	376	224	169	.6	.0	561	6.5	20
Jan. 1-31, 1954.....	76.00	8.4	.02		71	32	19	3.7	44	284	1.0	.4	9.0	491	311	273	.6	.0	664	6.6	30
Jan. 15-20.....	76.1	9.5	.00		80	38	14	4.2	6	352	5.0	.4	.5	547	343	337	.4	.4	721	6.1	0
Jan. 21-31.....	854	6.0	.00		23	9.8	3.5	2.3	7	98	1.8	.2	1.6	161	97	92	1.0	.4	249	5.7	4
Feb. 1-7.....	91.1	9.5	.03		32	16	5.7	1.1	3	147	3.2	.3	3.7	226	144	143	.3	.2	340	4.7	3
Feb. 8-16.....	40.8	11	.02		45	21	9.1	1.0	4	201	3.9	.3	3.3	318	200	198	.2	.3	444	4.45	3
Feb. 17-28.....	419	8.8	.03		26	9.9	4.4	.9	12	99	3.0	.1	1.8	172	106	90	.2	.1	256	6.2	1

TRADEWATER RIVER BASIN--Continued  
 TRADEWATER RIVER AT OLNEY, KY.--Continued  
 Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	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>		Acidity (H <sub>+</sub> )		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium	Non-carbonate	Immediate	Potential free			
Mar. 1-13, 1954.....	264	8.9	0.01		25	12	4.7	0.7	12	104	2.9	0.1	1.1	178	111	102	0.2	0.1	262	6.0	1
Mar. 14-26.....	110	9.0	.00		33	15	6.5	1.5	12	139	3.5	.7	.8	227	144	134	.1	.1	336	6.4	4
Mar. 27-Apr. 3.....	252	9.0	.02		24	12	4.7	1.3	15	94	2.5	.6	.9	161	106	97	.1	.1	249	6.6	4
Apr. 4-16.....	301	9.2	.01		25	9.4	5.3	1.4	17	92	2.8	.2	.8	163	100	87	.2	.0	253	6.2	6
Apr. 17-18.....	1,031	8.4	.20		13	3.9	3.9	1.6	26	36	2.1	.2	1.4	83	50	26	.2	.0	131	6.3	7
Apr. 19-24.....	397	10	.02		20	6.7	4.9	1.7	17	66	2.9	.3	.7	136	82	57	.2	.0	207	6.4	7
Apr. 25-30.....	346	8.9	.06		21	6.7	4.2	1.4	23	87	2.1	.1	.6	130	91	59	.2	.1	200	6.4	10
May 1-7.....	574	10	.03		23	5.7	4.7	1.4	23	81	2.8	.1	.7	72	34	73	.2	.0	224	6.6	5
May 8-10.....	1,597	6.3	.06		39.3	8.1	8.6	1.4	17	36	2.8	.1	.8	137	82	72	.2	.1	204.5	6.8	20
May 9-16.....	666	9.6	.03		20	6.1	5.6	1.8	18	77	3.4	.1	1.5	192	125	111	.2	.1	269	6.0	2
May 17-24.....	57.2	11	.03		23	13	8.8	1.8	28	129	3.6	.2	.9	228	148	124	.1	.0	337	6.4	3
May 25-June 1.....	39.9	22	.01		34	13	6.8	1.8	28	129	3.6	.2	.9	228	148	124	.1	.0	337	6.4	3
June 2-6.....	325	7.6	.02		23	8.6	3.8	1.1	26	79	3.2	.2	.8	134	92	70	.2	.0	227	6.4	3
June 7-20.....	40.0	10	.06		26	8.5	4.7	1.7	28	83	2.4	.2	1.7	159	101	78	.1	.0	245	6.8	7
June 21-July 4.....	2.34	9.0	.06		25	9.3	5.2	1.6	42	70	2.9	.3	.4	151	101	66	.1	.0	238	7.1	10
July 5-9.....	32.1	7.7	.02		25	7.6	6.2	1.8	52	63	3.0	.4	.2	150	94	51	.1	.2	236	7.0	5
July 10-11.....	114.1	4.8	.37		14	2.9	3.2	2.5	43	18	2.0	.3	2.7	87	46	12	.1	.2	124	7.1	8
July 12-19.....	12.7	5.3	.06		12	2.1	2.3	2.2	30	17	1.5	.2	1.8	68	38	14	.1	.1	103	7.2	5
July 20-Aug. 2.....	2.98	4.9	.07		14	3.3	3.4	2.5	47	13	2.5	.2	1.0	82	50	10	.1	.1	125	7.2	8
Aug. 3-12.....	24	2.1	.01		15	4.3	3.1	2.5	53	18	2.6	.4	1.1	81	56	12	.1	.0	134	7.1	4
Aug. 13-22.....	5.47	2.9	.00		16	4.4	3.2	2.5	60	16	2.4	.3	1.4	80	58	9	.1	.0	138	7.2	5
Aug. 23-28.....	32.0	5.5	.00		20	5.3	4.5	2.8	56	30	3.2	.4	1.9	104	71	26	.1	.0	172	7.4	10
Aug. 29-Sept. 11.....	1.64	4.6	.00		14	3.8	3.0	2.6	48	14	2.0	.3	1.3	76	52	10	.1	.0	125	7.6	10
Sept. 12-20.....	1.70	5.2	.02		14	3.9	3.0	2.2	52	13	2.2	.2	1.0	74	52	8	.1	.1	128	7.0	5
Sept. 21-30.....	52.4	3.0	.00		8.9	2.2	2.0	2.4	28	13	1.5	.2	.6	54	31	8	.1	.1	84.1	6.9	6
Time-weighted average.....	136	7.8	0.02		37	15	7.5	2.6	32	136	3.4	0.3	1.5	243	154	128	0.2	0.1	350	--	6



TRADEWATER RIVER BASIN--Continued  
TRADEWATER RIVER AT OLNEY, KY.--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
Twice-daily measurements at approximately 8 a.m. and 5 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.....	66	68	50	52	41	43	42	40	42	40	42	45	46	49	52	66	68	71	74	--	--	77	77	73	75
2.....	66	69	50	54	41	43	40	42	40	44	44	46	49	53	63	67	71	75	79	--	--	77	76	72	75
3.....	68	70	51	53	44	47	40	42	42	43	43	42	43	51	54	63	64	70	68	80	--	76	79	72	76
4.....	67	69	51	51	46	47	39	42	41	43	43	42	52	56	59	61	65	66	80	--	--	77	81	73	77
5.....	68	66	49	44	44	47	40	42	42	44	44	44	56	59	58	60	63	65	80	82	79	81	74	78	
6.....	64	64	46	46	48	46	40	41	42	42	39	--	58	61	58	59	64	66	79	81	78	79	75	78	
7.....	60	62	44	45	43	46	38	42	39	40	40	44	61	64	57	58	66	70	80	82	76	78	74	74	
8.....	58	62	43	45	44	47	41	43	37	40	44	45	61	61	57	58	69	72	79	80	75	79	73	75	
9.....	58	60	41	43	47	46	44	42	38	41	43	47	59	62	57	58	70	74	75	75	77	72	75	75	
10.....	57	61	41	44	44	46	44	42	46	49	46	49	60	62	57	58	72	76	72	73	75	78	72	73	
11.....	57	61	41	44	42	--	38	40	41	42	48	50	61	61	57	59	74	77	71	75	74	76	71	--	
12.....	57	60	41	44	43	--	37	39	39	41	52	53	58	61	59	59	75	78	73	77	73	72	68	71	
13.....	57	60	41	45	42	44	36	38	39	42	53	54	59	61	57	58	77	79	77	79	71	75	67	72	
14.....	56	60	42	45	41	40	38	39	44	46	47	51	61	64	58	60	77	81	77	80	74	79	69	72	
15.....	56	59	42	45	39	40	39	40	39	47	49	44	64	65	59	61	77	81	78	78	75	79	69	72	
16.....	56	59	42	45	39	38	37	37	49	49	49	48	61	59	60	64	78	81	75	76	77	80	69	73	
17.....	55	58	42	45	36	37	35	32	49	48	43	50	57	57	63	64	78	81	74	75	77	81	70	74	
18.....	55	59	44	49	36	37	32	48	50	45	49	57	59	62	65	79	82	74	77	79	83	72	74	74	
19.....	55	58	46	53	36	39	35	38	46	48	50	52	60	63	62	64	79	82	76	79	83	73	76	76	
20.....	56	58	53	53	38	40	40	43	49	48	48	49	63	65	61	63	79	82	77	80	79	81	74	70	
21.....	56	59	48	51	39	40	45	45	48	50	47	51	64	67	60	63	79	82	79	79	77	--	87	69	
22.....	56	58	49	49	40	38	43	43	49	50	46	48	66	67	60	61	80	82	78	79	78	--	86	66	
23.....	57	58	47	49	34	36	39	40	49	49	47	48	63	66	59	63	79	81	79	79	78	80	63	65	
24.....	55	57	47	48	36	38	39	39	46	48	48	52	66	67	61	66	77	80	77	79	78	79	63	66	
25.....	54	57	46	46	36	38	40	42	46	50	54	58	67	69	65	67	77	81	77	78	77	80	64	66	
26.....	53	56	44	44	37	39	44	45	47	48	55	54	67	70	67	69	78	81	77	78	78	81	64	67	
27.....	56	56	44	43	38	40	45	44	48	51	53	56	69	70	68	70	80	82	75	77	79	82	64	68	
28.....	54	54	40	42	40	40	44	46	46	55	--	--	67	66	69	71	79	82	75	77	77	80	66	69	
29.....	52	53	40	43	40	38	44	44	--	--	--	57	59	66	69	71	77	81	76	80	78	81	68	70	
30.....	53	53	41	43	38	40	42	43	--	--	54	54	65	67	68	71	77	81	77	81	78	79	68	70	
31.....	50	53	--	--	37	39	40	42	--	--	50	51	--	--	70	73	--	--	77	80	74	76	--	--	
Average.....	58	60	45	47	40	41	40	41	44	46	47	50	61	62	62	64	75	77	77	78	77	79	70	72	

## TRADEWATER RIVER BASIN--Continued

## TRADEWATER RIVER AT OLNEY, KY.--Continued

Suspended sediment, water year October 1953 to September 1954

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	--	0
2.....							0	--	0
3.....							0	--	0
4.....							0	--	0
5.....							0	--	0
6.....							0	--	0
7.....							0	--	0
8.....							0	--	0
9.....							0	--	0
10.....							12	8	.2
11.....							23	9	.6
12.....							20	9	.5
13.....							14	11	.4
14.....							12	14	.4
15.....							8.8	13	.3
16.....							6.7	7	.1
17.....							5.8	6	.1
18.....							4.9	5	.1
19.....							4.0	3	
20.....							3.1	5	
21.....							2.6	5	
22.....							2.2	5	
23.....							1.8	5	
24.....							1.7	7	
25.....							1.5	6	(t)
26.....							1.3	6	
27.....							1.3	5	
28.....							1.5	5	
29.....							1.7	4	
30.....							1.7	2	
31.....							1.7	3	
Total.	0	--	0	0	--	0	133.3	--	3.0
	January			February			March		
1.....	1.7	2		152	3	1.2	820	110	244
2.....	2.0	2		114	2	.6	705	28	53
3.....	2.4	3		96	1	.2	461	8	10
4.....	2.6	3		82	1	.2	397	8	8.6
5.....	2.6	2		73	1	.2	337	7	6.4
6.....	2.2	2		64	1	.2	214	2	1.2
7.....	1.9	4	(t)	57	1	.2	163	3	1.3
8.....	1.7	4		51	2	.3	134	2	.7
9.....	1.6	4		45	2	.2	114	1	.3
10.....	2.2	5		42	2	.2	100	1	.3
11.....	2.0	4		40	1	.1	91	1	.2
12.....	1.8	4		38	3	.3	84	1	.2
13.....	1.8	5		35	2	.2	75	1	.2
14.....	2.8	5		32	2	.2	67	2	.4
15.....	7.3	6	0.1	30	1	.1	59	5	.8
16.....	50	12	1.6	54	22	s 5.4	51	5	.7
17.....	160	18	7.8	574	149	s 216	44	2	.2
18.....	156	3	1.3	866	210	491	40	1	.1
19.....	95	3	.8	738	38	76	41	1	.1
20.....	136	28	s 13	474	15	19	45	2	.2
21.....	926	230	575	460	15	19	56	2	.3
22.....	1,050	224	635	435	13	15	62	2	.3
23.....	1,130	203	619	324	3	2.6	59	4	.6
24.....	1,170	74	234	232	2	1.2	65	6	1.0
25.....	898	26	63	212	2	1.1	274	12	8.9
26.....	693	22	41	174	2	.9	567	44	67
27.....	816	77	s 179	144	2	.8	637	45	77
28.....	941	102	259	396	114	s 177	434	17	20
29.....	837	54	122	--	--	--	282	10	7.6
30.....	600	12	19	--	--	--	186	8	4.0
31.....	328	3	2.6	--	--	--	150	7	2.8
Total.	10,022.6	--	2,773.5	6,034	--	1,029.4	6,814	--	518.4

s Computed by subdividing day.  
t Less than 0.05 ton.

## TRADEWATER RIVER BASIN--Continued

## TRADEWATER RIVER AT OLNEY, KY.--Continued

## Suspended sediment, water year October 1953 to September 1954--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.....	129	5	1.7	316	32	27	40	20	2.2
2.....	107	3	.9	292	23	18	34	18	1.6
3.....	92	8	2.0	310	33	28	220	210	s 179
4.....	80	9	1.9	277	33	25	616	500	832
5.....	72	7	1.4	232	22	14	538	764	s 1,210
6.....	113	17	s 7.2	188	23	12	215	66	s 46
7.....	538	108	157	1,140	212	s 694	93	43	11
8.....	815	195	429	1,450	142	556	62	45	7.5
9.....	662	36	64	1,550	97	406	49	38	5.0
10.....	372	8	8.0	1,640	64	283	46	32	4.0
11.....	221	7	4.2	1,610	25	109	69	32	6.0
12.....	172	5	2.3	1,100	12	36	66	28	5.0
13.....	147	3	1.2	664	10	18	48	27	3.5
14.....	129	4	1.4	386	7	7.3	34	26	2.4
15.....	124	3	1.0	142	9	3.4	24	27	1.7
16.....	474	78	s 130	105	13	3.7	18	23	1.1
17.....	1,110	94	282	87	13	3.0	14	28	1.0
18.....	952	137	352	72	12	2.3	11	28	.8
19.....	734	27	54	63	12	2.0	11	17	.5
20.....	444	7	8.4	57	18	2.8	15	18	.7
21.....	219	11	6.5	52	13	1.8	12	18	.6
22.....	225	66	s 56	46	12	1.5	8.4	18	.4
23.....	372	270	271	43	12	1.4	5.6	22	.3
24.....	386	276	s 304	38	8	.8	2.9	37	.3
25.....	414	102	114	34	12	1.1	1.5	34	.1
26.....	254	67	46	33	12	1.1	.8	30	.1
27.....	176	33	16	44	7	.8	.5	33	
28.....	344	172	s 169	43	8	.9	.3	30	(t)
29.....	477	112	144	38	9	.9	.2	26	
30.....	409	69	76	42	18	2.0	.1	32	
31.....	--	--	--	45	17	2.1	--	--	--
Total.	10,763	--	2,712.1	12,139	--	2,264.9	2,255.3	--	2,322.9
		July		August			September		
1.....	0.1	22	(t)	0.8	42	0.1	1.1	36	0.1
2.....	.1	17		1.0	33	.1	.5	23	
3.....	.1	23		.7	34	.1	.3	39	
4.....	.1	25		.4	30		.2	15	
5.....	.1	30		.2	28		.2	8	
6.....	.1	16		.3	22		.2	4	
7.....	.1	12		.2	18		.2	7	
8.....	.4	22		.2	17		.2	13	(t)
9.....	160	34	s 20	.1	17	(t)	.2	17	
10.....	170	175	s 74	.1	21		.1	12	
11.....	59	540	86	.1	22		.1	24	
12.....	26	446	31	.1	28		.1	22	
13.....	12	393	13	.1	23		.1	23	
14.....	7.6	361	7.4	0	--	0	0	--	0
15.....	7.2	297	5.8	0	--	0	0	--	0
16.....	6.8	306	5.6	0	--	0	0	--	0
17.....	6.0	207	3.4	0	--	0	0	--	0
18.....	16	177	7.6	0	--	0	0	--	0
19.....	20	145	7.8	0	--	0	0	--	0
20.....	11	91	2.7	8.6	24	.6	6.1	71	s 4.4
21.....	6.4	104	1.8	20	32	1.7	38	273	28
22.....	3.2	101	.9	26	33	2.3	206	141	s 95
23.....	1.7	97	.4	72	30	5.8	172	157	73
24.....	.8	91	.2	39	37	3.9	57	226	35
25.....	.8	85	.2	22	34	2.0	25	157	10
26.....	5.2	78	1.1	18	23	1.1	12	135	4.4
27.....	5.6	68	1.0	21	18	1.0	6.8	114	2.1
28.....	2.9	56	.4	20	23	1.2	3.2	94	.8
29.....	1.3	48	.2	11	23	.7	2.0	79	.4
30.....	.6	48	.1	6.0	23	.4	2.0	77	.4
31.....	.4	47	.1	2.6	32	.2	--	--	--
Total.	531.6	--	270.8	270.5	--	21.3	533.6	--	253.7
Total discharge for year (cfs-days).....									49,496.9
Total load for year (tons).....									12,170.0

s Computed by subdividing day.

t Less than 0.05 ton.

TRADEWATER RIVER BASIN--Continued  
TRADEWATER RIVER AT OLNEY, KY.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954  
(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	Discharge (cfs)	Water temperature (°F)	Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Suspended sediment										Methods of analysis
						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. 21, 1954	10:15 a.m.	946		332	633	63	74	83	94	98	99	99				ESWCM
Jan. 23	4:30 p.m.	1,130		201	383	80	88	91	94	96	97	98				ESWCM
Feb. 18	1:30 p.m.	876		307	486	77	86	92	96	--	--	100				ESWCM
Feb. 28	5:15 p.m.	519		334	561	65	77	80	87	99	100	--				ESWCM
Apr. 8	7:15 a.m.	810		255	366	82	87	95	99	--	--	--				BWCM
Apr. 21	7:30 a.m.	369		480	540	74	85	97	98	99	100	100				ESWCM
Apr. 24	6:10 a.m.	492		340	441	37	41	51	82	99	100	100				ESWCM
Apr. 28	1:40 p.m.	354		1,980	1,520	66	66	69	83	98	100	100				ESWCM
Apr. 28	1:40 p.m.	374		173	550	68	66	69	80	98	100	100				ESWCM
Apr. 28	5:00 p.m.	378		404	326	69	81	94	97	96	99	99				ESWCM
May 7	1:05 p.m.	1,450		245	443	55	65	78	93	99	100	100				ESWCM
May 7	4:20 p.m.	1,460		236	443	42	58	72	89	99	100	100				ESWCM
June 5	6:45 p.m.	398		552	456	48	76	80	97	99	99	100				ESWCM
June 5	7:05 a.m.	693		1,051	791	76	86	86	96	99	100	100				ESWCM
June 8	6:00 p.m.	486		1,408	625	90	93	98	99	--	--	--				BWCM
July 12	8:05 a.m.	30		424	748	97	98	99	--	--	--	--				BWCM
July 12	10:25 a.m.	26		478	944	93	99	--	--	--	--	--				BWCM
July 14	7:40 a.m.	8.4		374	656	97	99	--	--	--	--	--				BWCM
July 16	7:45 a.m.	7.2		334	526	98	--	--	--	--	--	--				BWCM

## PART 3 B. CUMBERLAND AND TENNESSEE RIVER BASINS

## CUMBERLAND RIVER BASIN

## CUMBERLAND RIVER AT BARBOURVILLE, KY.

LOCATION(revised).--At gaging station at bridge on State Highway 11 at Barbourville, Knox County, and 0.4 mile upstream from Richland Creek.

DRAINAGE AREA.--972 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 87°F July 20; minimum, freezing point Dec. 18, 19, 24, 27, Jan. 13.

EXTREMES, 1949-53.--Water temperatures: Maximum, 91°F June 28, 1952; minimum, freezing point on many days during winter months.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1336.

Temperature (°F) of water, water year October 1953 to September 1954  
/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	68	52	44	39	42	41	52	70	75	82	83	74
2	70	56	44	38	42	42	52	72	76	84	82	74
3	70	53	44	41	42	40	54	69	74	84	81	76
4	70	52	46	40	42	40	53	60	68	84	80	77
5	69	52	46	40	42	40	54	58	68	84	82	78
6	68	48	48	38	42	41	56	58	68	85	82	78
7	68	48	47	38	40	42	61	60	72	82	80	78
8	62	46	46	38	39	46	62	59	74	80	80	78
9	62	45	46	44	40	46	58	58	76	82	80	78
10	62	44	46	42	41	50	58	56	78	79	80	79
11	62	44	44	38	44	48	62	59	78	82	78	76
12	62	42	44	34	41	52	60	59	80	82	76	75
13	61	45	46	34	42	54	62	62	82	83	78	74
14	62	42	44	36	43	45	60	59	80	86	76	78
15	63	43	42	37	46	45	60	60	82	86	79	76
16	62	42	42	42	47	42	62	61	81	84	80	76
17	61	44	36	42	46	44	56	64	78	84	80	76
18	62	43	34	40	47	46	58	65	76	84	80	76
19	62	44	33	40	46	49	62	64	77	84	80	78
20	62	46	34	43	48	48	63	62	77	86	80	77
21	61	46	37	47	50	46	65	60	78	84	80	74
22	61	49	40	46	50	47	66	60	80	84	81	70
23	60	50	39	42	50	48	66	62	82	83	82	68
24	60	50	36	43	50	49	66	64	80	81	83	68
25	60	48	37	44	51	53	67	67	82	81	82	71
26	58	46	36	48	48	54	68	66	82	80	83	70
27	60	44	34	48	50	54	68	71	84	80	83	70
28	58	44	37	46	48	53	66	72	82	80	84	70
29	56	42	38	44	--	56	66	73	81	82	83	70
30	49	42	40	44	--	53	69	76	80	83	82	72
31	52	--	40	41	--	54	--	76	--	81	80	--
Average	62	46	41	41	45	47	61	64	78	83	81	75

## CUMBERLAND RIVER BASIN--Continued

## CUMBERLAND RIVER AT WILLIAMSBURG, KY.

LOCATION.--At gaging station at bridge on U. S. Highway 25W and State Highway 92, at Williamsburg, Whitley County, 2.1 miles downstream from Clear Fork. DRAINAGE AREA.--1,673 square miles. RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1954.

Water temperatures: October 1951 to September 1954.

Sediment records: October 1953 to September 1954.

EXTREMES, 1953-54.--Dissolved solids: Maximum, 409 ppm Dec. 9-14; minimum, 61 ppm Mar. 1-6.

Hardness: Maximum, 126 ppm Dec. 9-14; minimum, 31 ppm Jan. 16-25, Mar. 1-6.

Specific conductance: Maximum daily, 754 microhos Dec. 11; minimum daily, 79.7 microhos Mar. 4.

Water temperatures: Maximum, 90°F July 14, 20; minimum, 33°F Jan. 13.

Sediment concentrations: Maximum daily, 787 ppm Jan. 16.

Sediment loads: Maximum daily, 34,800 tons Jan. 17; minimum daily, less than 0.5 ton on many days during October to January, and July to September.

EXTREMES, 1951-52.--Dissolved solids: Maximum, 409 ppm Dec. 9-14, 1953; minimum, 60 ppm Jan. 21-31, 1952.

Hardness: Maximum, 126 ppm Dec. 9-14, 1953; minimum, 29 ppm Dec. 11-20, 1951.

Specific conductance: Maximum daily, 754 microhos Dec. 11, 1953; minimum daily, 60.3 microhos Mar. 24-25, 1952.

Water temperatures: Maximum, 91°F on several days during June and July 1952; minimum, 33°F Jan. 13, 1954.

REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1953 to September 1954 given in WSP 1336.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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 (microhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 1-10, 1953	10.8	3.6	0.01	21	11	48	3.4	119	82	10	0.1	0.1	283	98	0	404	7.1	5
Oct. 11-23	11.2	3.2	.01	20	11	37	3.4	136	87	13	.1	.4	239	96	0	442	7.1	5
Oct. 24-Nov 5	13.6	5.6	.02	23	12	60	3.8	138	102	13	.1	.4	219	108	0	489	7.0	8
Nov. 6-18	26.4	2.1	.02	21	13	65	3.8	140	109	15	.1	.2	292	108	0	482	7.3	8
Nov. 19-28	77.9	3.2	.00	26	9.7	59	4.8	132	106	17	.1	.3	282	116	0	588	7.4	6
Nov. 29-Dec. 8	88.3	3.3	.00	26	12	81	4.7	162	123	24	.3	.1	362	116	0	588	7.4	6
Dec. 9-14	422	3.8	.00	29	13	94	3.3	170	189	18	.2	.3	409	126	0	663	7.4	5
Dec. 15-18	766	4.3	.03	30	4.9	52	3.6	114	194	9.6	.1	1.9	269	93	2	431	7.2	6
Dec. 19-31	212	4.1	.03	18	6.7	28	2.5	67	74	9.6	.1	2.1	176	75	2	290	6.6	8
Jan. 1-10, 1954	146	4.9	.03	19	7.1	29	2.3	65	67	8.2	.2	2.0	166	80	27	290	7.0	1
Jan. 11-15	1,096	5.3	.03	7	3.2	23	2.1	59	68	5.9	.2	3.2	166	74	27	276	6.9	5
Jan. 16-25	13,040	5.3	.03	7	3.2	4.8	1.5	25	35	2.5	.2	3.0	64	31	15	98.0	5.9	11
Jan. 26-Feb. 5	2,961	6.4	.10	10	4.5	10	1.5	25	39	3.2	.1	2.3	95	46	23	143	6.4	2
Feb. 6-18	841	7.8	.04	14	6.1	17	1.7	40	58	4.2	.1	2.4	131	60	27	210	7.1	5
Feb. 19-28	1,504	6.0	.04	12	5.6	15	1.6	37	47	3.8	.1	1.3	109	52	23	181	6.8	5
Mar. 1-6	11,170	5.7	.04	7	3.1	6.7	1.0	23	26	2.2	.1	1.6	61	31	15	91.5	6.6	20
Mar. 7-18	4,697	6.2	.04	8.2	3.4	7.9	1.0	23	29	2.1	.1	2.0	71	34	16	120	6.7	15
Mar. 19-25	2,033	5.6	.03	11	4.9	12	1.1	33	41	2.8	.1	1.7	92	47	21	160	6.8	7
Mar. 26-31	4,492	7.2	.03	8.2	3.9	8.9	1.2	30	27	2.7	.2	1.2	75	37	12	125	7.1	2

Apr. 1-11, 1954	1,979	6.3	.02	11	5.0	12	1.4	38	39	3.2	.2	1.0	97	48	17	162	7.1	2
Apr. 12-17	2,442	5.5	.03	10	5.0	11	1.4	36	36	3.6	.1	1.4	93	46	16	152	6.1	5
Apr. 18-25	4,161	6.3	.01	9.0	3.9	8.4	1.3	29	28	2.2	.1	2.2	82	38	16	123	6.5	5
Apr. 26-May 5	2,572	5.8	.02	9.9	4.3	10	1.3	36	30	2.8	.1	1.2	88	42	13	143	6.9	5
May 6-16	2,678	7.0	.01	9.3	4.2	9.2	1.3	34	29	2.2	.1	1.3	82	40	13	136	7.0	8
May 17-28	1,645	6.2	.02	11	4.7	12	1.4	40	35	2.6	.1	1.3	95	46	14	156	7.2	7
May 29-June 2	553	4.0	.03	13	5.4	18	1.6	49	45	3.4	.1	.8	116	54	14	196	7.0	7
June 3-15	510	4.7	.01	15	6.1	21	1.8	61	52	4.4	.1	.9	136	62	13	229	7.3	5
June 16-18	1,360	8.7	.02	17	8.0	33	2.4	92	63	8.8	.1	1.3	191	76	0	307	7.5	20
June 19-22	1,170	7.2	.07	12	4.1	13	2.0	48	34	3.2	.2	3.2	116	48	7	178	7.2	30
June 23-30	285	6.0	.07	11	4.7	15	2.1	49	34	3.6	.3	2.1	106	47	7	173	7.7	10
July 1-10	200	6.8	.03	13	6.2	21	2.3	62	49	5.0	.3	.8	135	59	7	226	7.6	8
July 11-17	213	4.0	.04	18	6.8	36	2.3	81	67	7.5	.1	.7	192	73	0	313	7.6	5
July 18-24	167	6.4	.01	19	8.3	40	2.4	102	76	8.5	.1	.8	212	82	0	349	7.9	5
July 25-27	463	2.1	.01	21	9.1	60	3.2	142	91	7.8	.1	1.0	277	90	0	443	7.8	--
July 28-Aug. 9	140	2.4	.02	19	8.4	50	3.4	123	81	9.0	.1	.7	231	81	0	367	7.8	5
Aug. 10-20	96.4	4.7	.04	14	6.2	32	3.0	86	51	7.0	.1	.4	197	61	0	267	7.7	6
Aug. 21-26	118	2.3	.06	17	7.2	32	2.4	63	60	8.9	.2	.7	170	71	2	266	7.7	4
Aug. 30-Sept. 10	48.2	1.0	.04	21	10	46	3.0	96	93	12	.2	.6	237	94	13	395	7.7	5
Sept. 11-20	53.2	3.2	.02	19	10	52	2.8	118	83	12	.4	.4	243	87	0	409	7.8	5
Sept. 21-30	99.3	3.3	.01	20	9.1	49	2.7	116	85	11	.2	.3	237	87	0	395	7.9	5
Time-weighted average	1,488	4.9	0.03	16	7.2	32	2.4	77	64	7.5	0.1	1.2	174	70	6	286	--	6

CUMBERLAND RIVER BASIN--Continued  
 CUMBERLAND RIVER AT WILLIAMSBURG, KY.--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
 /Twice-daily measurements at approximately 7:30 a. m. and 5:30 p. m.7

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



CUMBERLAND RIVER BASIN--Continued

CUMBERLAND RIVER AT WILLIAMSBURG, KY.--Continued

Suspended sediment, water year October 1953 to September 1954

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	--		19	4	(t)	110	--	
2.....	11	--		22	--		98	--	
3.....	9.6	5		21	--		85	--	
4.....	9.6	5		25	--		75	--	
5.....	10	--		28	--		63	--	
6.....	11	--		25	--		61	--	
7.....	11	--		24	--		57	--	
8.....	11	--		26	--		55	--	
9.....	11	--		28	--		70	--	
10.....	11	--		29	--		171	7	3
11.....	11	--		29	--		380	13	13
12.....	14	--	e (t)	28	--	e (t)	794	20	43
13.....	17	--		26	--		608	7	11
14.....	15	--		25	--		512	11	15
15.....	13	--		26	--		764	20	41
16.....	12	--		26	--		934	27	68
17.....	11	--		26	3		806	18	39
18.....	9.6	--		25	1		566	26	40
19.....	9.6	--		25	2		372	18	18
20.....	9.6	--		25	--		280	17	13
21.....	9.0	--		28	--		222	17	10
22.....	7.5	--		37	--		212	13	7
23.....	8.0	--		34	10	1	216	12	7
24.....	7.0	10	(t)	32	6	1	208	10	6
25.....	6.5	8	(t)	115	7	2	202	6	3
26.....	6.1	8	(t)	175	4	2	190	4	2
27.....	6.5	8	(t)	157	4	2	189	2	1
28.....	7.0	8	(t)	151	4	2	180	2	1
29.....	8.5	8	(t)	151	4	2	166	2	1
30.....	9.6	8	(t)	130	4	1	178	1	(t)
31.....	10	8	(t)	--	--	--	178	1	(t)
Total..	315.7	--	4	1,518	--	20	8,962	--	352
January									
1.....	181	2	1	2,130	8	46	9,700	204	5,340
2.....	169	3	1	1,740	8	38	12,600	94	3,200
3.....	157	3	1	1,500	8	32	12,100	53	1,730
4.....	145	3	1	1,450	7	27	13,600	63	2,310
5.....	136	3	1	1,360	7	26	11,600	60	1,880
6.....	133	1	(t)	1,210	5	16	7,440	33	663
7.....	124	1	(t)	1,070	5	14	4,870	25	329
8.....	121	3	1	927	4	10	3,800	20	205
9.....	118	5	2	842	3	7	3,620	12	117
10.....	163	--	e 1	768	2	4	4,100	14	155
11.....	316	1	1	746	3	6	4,390	16	190
12.....	878	18	s 56	698	3	6	4,000	16	173
13.....	1,400	45	170	626	4	7	3,480	33	s 315
14.....	934	41	130	548	5	7	4,760	122	1,570
15.....	1,950	166	s 1,160	506	4	5	5,590	83	1,250
16.....	12,700	797	s 29,200	524	7	10	4,540	77	944
17.....	18,900	682	34,800	976	12	32	3,380	13	119
18.....	16,500	340	15,100	1,470	20	79	2,650	7	50
19.....	10,300	87	s 2,650	1,490	23	92	2,260	8	49
20.....	3,330	60	539	1,370	11	41	2,110	8	46
21.....	10,100	388	s 11,600	1,300	14	49	2,030	8	44
22.....	18,900	238	12,100	1,240	12	40	1,840	8	40
23.....	20,000	150	8,100	1,130	6	18	1,720	7	32
24.....	15,700	125	5,300	1,200	13	42	1,780	7	34
25.....	9,640	43	1,120	1,610	10	43	2,490	17	114
26.....	4,600	22	273	1,720	11	51	4,800	66	855
27.....	2,980	20	161	1,530	8	33	7,030	55	1,040
28.....	3,200	23	199	2,450	95	s 788	5,580	32	482
29.....	3,980	24	258	--	--	--	3,700	14	140
30.....	3,580	24	232	--	--	--	3,150	8	88
31.....	2,750	13	96	--	--	--	2,690	7	51
Total..	164,085	--	123,228	34,151	--	1,569	157,360	--	23,535

e Estimated.

s Computed by subdividing day.

t Less than 0.5 ton.

CUMBERLAND AND TENNESSEE RIVER BASINS

CUMBERLAND RIVER BASIN--Continued

CUMBERLAND RIVER AT WILLIAMSBURG, KY.--Continued

Suspended sediment, water year October 1953 to September 1954--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.....	2,390	4	26	2,360	20	127	460	5	6
2.....	2,080	4	22	1,910	9	46	608	8	13
3.....	1,820	2	10	1,830	9	44	1,030	8	22
4.....	1,640	2	9	3,030	25	204	902	17	41
5.....	1,530	3	12	3,940	43	457	824	32	71
6.....	1,470	1	4	3,180	33	283	674	21	38
7.....	1,490	2	8	2,620	20	141	542	13	19
8.....	1,720	11	51	3,230	24	209	440	7	8
9.....	2,410	28	182	3,940	42	447	380	1	1
10.....	2,760	27	201	3,630	29	284	332	1	1
11.....	2,460	17	113	2,870	21	163	304	2	2
12.....	2,320	13	81	2,310	17	106	276	2	1
13.....	2,110	13	74	1,900	13	67	288	2	2
14.....	1,880	11	56	1,750	10	47	292	1	1
15.....	1,800	5	24	2,000	10	54	348	5	5
16.....	1,770	4	19	2,030	11	60	710	40	77
17.....	4,770	74	s 1,190	2,140	8	46	1,170	23	73
18.....	9,280	112	2,810	2,030	7	38	2,200	33	196
19.....	7,100	52	997	2,130	10	58	2,000	83	448
20.....	4,590	25	310	2,590	13	91	1,260	34	116
21.....	3,170	11	94	2,450	12	79	824	12	27
22.....	2,500	6	40	1,970	10	53	596	14	22
23.....	2,120	12	69	1,560	7	29	460	18	22
24.....	2,220	10	60	1,300	8	28	372	22	22
25.....	2,310	12	75	1,100	7	21	312	8	7
26.....	1,950	20	105	934	7	18	288	25	19
27.....	1,920	17	88	818	5	11	264	8	6
28.....	2,410	52	338	722	4	8	222	3	2
29.....	3,470	73	684	638	3	5	193	1	1
30.....	2,900	62	485	560	2	3	172	2	1
31.....	--	--	--	500	2	3	--	--	--
Total.	82,360	--	8,237	63,972	--	3,230	18,743	--	1,270
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.....	151	3	1	118	3	1	65	4	1
2.....	136	3	1	95	2	1	72	4	1
3.....	127	3	1	90	2	(t)	65	5	1
4.....	130	4	1	108	13	4	53	4	1
5.....	226	2	1	98	3	1	44	3	(t)
6.....	184	1	(t)	105	1	(t)	33	3	(t)
7.....	208	1	1	145	2	1	28	7	1
8.....	222	1	1	178	2	1	26	3	(t)
9.....	320	2	2	187	1	1	24	--	(t)
10.....	292	2	2	178	1	(t)	21	--	(t)
11.....	296	3	2	148	3	1	17	--	(t)
12.....	340	3	3	121	6	2	14	--	(t)
13.....	244	3	2	105	4	1	14	--	(t)
14.....	193	3	2	90	3	1	13	3	(t)
15.....	160	2	1	78	4	1	13	--	(t)
16.....	142	3	1	70	5	1	13	10	(t)
17.....	118	--	(t)	63	5	1	11	--	(t)
18.....	90	--	(t)	59	3	(t)	10	4	(t)
19.....	70	--	(t)	80	3	1	10	5	(t)
20.....	75	--	(t)	68	4	1	17	19	1
21.....	88	--	(t)	61	--	(t)	26	8	1
22.....	115	--	(t)	108	--	(t)	40	3	(t)
23.....	166	--	(t)	133	--	(t)	105	5	1
24.....	566	--	e 15	136	--	(t)	132	3	1
25.....	674	--	e 9	160	--	e 1	190	6	3
26.....	430	--	e 6	133	--	(t)	151	2	1
27.....	296	5	4	115	--	(t)	118	2	1
28.....	219	5	3	115	2	1	92	5	1
29.....	178	5	2	100	2	1	75	2	(t)
30.....	154	6	2	80	2	(t)	64	2	(t)
31.....	142	3	1	68	3	1	--	--	--
Total.	6,742	--	71	3,393	--	32	1,556	--	18
Total discharge for year (cfs-days).....									543,177.7
Total load for year (tons).....									161,566

e Estimated.  
s Computed by subdividing day.  
t Less than 0.5 ton.

CUMBERLAND RIVER BASIN--Continued  
 CUMBERLAND RIVER AT WILLIAMSBURG, KY.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954  
 (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	Discharge (cfs)	Water temperature (° F)	Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Suspended sediment								Methods of analysis			
						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. 16, 1954 . . . . .	5:30 p. m.	16,300		1,010	1,080	46	58	80	91	95	98	98	99	99	99	98	BSWCM
Jan. 17 . . . . .	6:00 p. m.	18,700		1,649	570	43	56	85	92	96	99	99	99	99	99	98	BSWCM
Jan. 21 . . . . .	5:30 p. m.	13,100		504	671	34	54	81	90	90	94	98	98	98	98	98	BSWCM

CUMBERLAND RIVER BASIN--Continued  
CUMBERLAND RIVER NEAR BURKESVILLE, KY.

LOCATION.--At Neely's Ferry on State Highway 61, half a 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.

DRAINAGE AREA.--6,050 square miles.

RECORDS AVAILABLE.--Chemical analyses: January 1952 to September 1954.

Water temperatures: January 1952 to September 1954.

EXTREMES, 1953-54.--Dissolved solids: Maximum, 104 ppm June 9-11; minimum, 70 ppm Nov. 11-20, May 25 to June 4, Sept. 1-10. Hardness: Maximum, 66 ppm Apr. 1-10; minimum, 46 ppm Sept. 1-10, 30.

Specific conductance: Maximum daily, 191 microhos Mar. 29; minimum daily, 111 microhos Oct. 30.

Water temperatures: Maximum daily, 191 microhos Mar. 29; minimum daily, 42°F on several days during January and February.

EXTREMES, 1952-54.--Dissolved solids: Maximum, 104 ppm June 9-11, 1954; minimum, 62 ppm Mar. 21-31, 1952.

Hardness: Maximum, 66 ppm Apr. 1-10, 1954; 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, 78°F July 6, 1954; minimum, 40°F Dec. 15, 1952.

REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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 (microhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 1-10, 1953		3.5	0.02	14	3.6	4.0	1.0	44	19	2.5	0.1	1.0	73	50	14	122	6.5	5
Oct. 11-20		6.7	.02	14	3.9	3.9	1.1	45	18	2.5	.1	1.4	76	50	14	121	6.6	1
Oct. 21-30		5.8	.03	14	3.8	3.6	1.1	46	17	1.9	.1	1.1	71	50	13	118	6.6	5
Nov. 1-10		5.5	.03	14	3.4	3.7	1.2	47	19	2.0	.1	.8	73	50	10	121	6.7	5
Nov. 11-20		5.5	.00	14	3.5	3.9	1.0	45	16	1.8	.1	.8	70	49	12	117	7.1	4
Dec. 1-10		6.4	.01	14	3.9	4.0	1.0	48	15	5.1	.0	.9	80	52	12	128	6.6	4
Dec. 11-20		3.8	.01	14	3.5	3.6	.8	50	14	2.4	.0	.7	75	49	8	119	7.0	3
Dec. 21-31		5.6	.01	14	3.7	3.9	1.3	49	18	2.8	.2	.9	71	51	10	129	6.9	2
Jan. 1-2, 7-10, 1954		7.1	.02	15	3.7	3.8	1.3	49	19	2.2	.2	1.3	74	52	12	126	6.9	3
Jan. 11-20		7.1	.02	19	3.7	4.3	1.2	58	19	2.5	.2	1.0	85	62	15	144	7.1	5
Jan. 21-31		6.8	.01	16	3.5	3.8	.3	50	17	2.6	.1	1.2	77	55	13	131	6.9	5
Feb. 1-10		6.3	.01	15	3.6	4.5	.5	49	19	2.9	.1	.8	79	53	12	128	6.9	5
Feb. 11-17		7.3	.02	15	4.7	5.9	1.3	53	24	2.1	.1	1.0	83	58	13	135	6.9	5
Feb. 18-27		6.8	.01	17	4.3	5.4	1.2	54	20	3.1	.1	1.0	83	59	16	139	7.1	5
Mar. 9-19		4.9	.01	17	3.5	5.8	1.0	53	20	2.5	.1	1.1	83	57	13	137	7.2	5
Mar. 20-31		15	.01	19	4.1	6.4	1.2	66	21	3.2	.1	1.0	103	65	10	165	6.9	7
Apr. 1-10		6.0	.01	20	3.9	4.6	1.2	62	21	3.0	.1	1.4	92	66	15	168	7.2	5
Apr. 11-21		6.4	.02	17	3.8	3.7	1.1	55	19	2.5	.1	1.6	83	59	13	141	7.1	20
Apr. 22-30		5.0	.03	15	4.3	5.5	1.4	48	21	3.4	.2	1.7	84	54	16	137	7.5	1
May 1-13		4.4	.04	15	3.6	5.3	1.4	46	20	2.6	.2	1.3	80	52	15	130	7.1	1
May 14-24		5.6	.00	15	3.2	4.5	1.4	46	19	2.9	.1	2.3	82	50	13	130	7.2	5
May 25-June 4		5.8	.03	13	3.4	4.0	1.1	41	20	2.6	.1	1.8	70	48	13	128	6.3	5

June 5-8, 1954	4.3	.04	15	3.7	4.7	1.2	46	21	3.2	.1	1.7	80	52	15	133	7.4	7
June 9-11	14	.08	16	4.9	7.1	1.7	58	22	3.6	.1	1.5	104	56	12	155	7.4	7
June 22-26	8.2	.03	14	3.7	4.5	1.7	47	20	3.0	.1	1.2	84	50	12	138	7.4	5
June 27-30	9.3	.03	13	3.9	5.9	.7	45	20	3.0	.1	1.5	74	49	12	130	7.4	12
July 1-10	4.1	.04	13	3.8	4.3	.7	42	21	3.0	.1	1.1	79	49	14	130	7.4	5
July 11-20	4.1	.04	13	3.5	4.4	1.0	42	18	3.1	.1	1.2	77	47	12	122	7.5	5
July 21-31	6.4	.01	14	3.0	4.4	.8	43	18	1.8	.1	1.6	75	47	12	126	7.5	5
Aug. 1-10	6.2	.01	13	3.3	4.3	.8	40	19	2.7	.1	1.6	76	47	13	123	7.6	5
Aug. 11-20	4.0	.02	14	3.7	4.8	1.0	41	24	3.2	.1	1.9	74	50	17	119	7.9	4
Aug. 21-31	5.9	.02	14	3.5	4.6	.9	40	23	3.2	.1	1.9	76	50	17	120	7.3	4
Sept. 1-10	7.2	.03	13	3.5	4.3	1.1	41	18	2.6	.1	2.0	70	46	12	121	7.4	4
Sept. 30	4.4	.03	13	3.3	4.3	1.1	43	18	3.0	.1	1.7	69	46	11	121	7.7	7
Time-weighted average a	6.3	0.02	15	3.7	4.5	1.0	46	19	2.6	0.1	1.3	79	53	13	128	--	5

a Represents 88 percent of days.

CUMBERLAND RIVER BASIN--Continued

CUMBERLAND RIVER NEAR BURKESVILLE, KY.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

(Twice-daily 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.....	60	66	55	57	52	54	46	47	43	45	--	--	49	48	51	54	52	51	57	58	58	56	54	57
2.....	61	66	56	58	53	54	46	46	44	46	--	--	47	47	52	54	51	53	58	59	58	59	53	57
3.....	63	67	55	58	53	54	--	--	44	45	--	--	47	48	52	50	52	50	54	58	58	61	53	57
4.....	60	65	54	55	54	--	--	--	43	44	--	--	49	50	46	48	51	53	58	66	59	56	55	58
5.....	62	65	53	54	53	54	--	--	46	46	--	--	57	58	47	49	49	53	60	66	54	57	57	58
6.....	61	65	53	54	54	54	--	--	44	44	--	--	58	59	48	49	53	59	66	78	55	57	54	54
7.....	59	62	53	54	50	56	46	47	42	43	--	--	58	60	48	50	56	63	70	68	54	58	60	60
8.....	57	60	49	54	50	52	46	47	42	43	--	--	60	61	48	50	63	69	58	59	68	63	63	63
9.....	55	60	50	54	51	53	47	48	42	45	43	47	58	60	48	50	68	73	56	57	60	59	54	54
10.....	55	60	50	53	50	52	48	47	42	45	45	47	49	51	48	50	62	58	56	58	54	59	54	54
11.....	55	62	50	54	49	51	43	43	44	48	46	48	55	58	48	51	54	56	57	61	55	58	--	--
12.....	55	60	50	53	50	52	44	44	42	43	48	52	53	52	49	51	54	55	62	67	56	62	--	--
13.....	57	62	50	--	50	52	42	43	42	44	50	52	50	50	50	56	59	62	59	55	60	--	--	--
14.....	57	62	50	54	49	51	43	44	45	45	48	50	51	50	51	60	68	58	59	55	55	--	--	--
15.....	55	62	50	54	48	49	44	45	47	48	45	46	50	53	50	52	53	54	57	58	55	57	--	--
16.....	57	60	50	54	48	49	43	44	49	50	43	45	52	54	50	52	52	54	55	56	56	60	--	--
17.....	54	58	50	54	45	48	44	44	48	49	46	46	49	55	52	57	56	57	55	55	58	56	--	--
18.....	55	58	50	54	45	48	42	44	47	48	45	47	51	53	53	53	52	54	56	58	57	57	--	--
19.....	55	58	50	54	45	48	47	47	43	47	47	48	52	58	51	50	53	54	60	64	57	57	--	--
20.....	56	64	55	56	46	50	47	47	47	49	47	47	55	59	48	50	55	59	66	68	55	58	--	--
21.....	55	64	54	57	50	52	47	47	47	49	44	45	50	52	48	50	58	69	60	61	56	58	--	--
22.....	57	65	54	56	50	52	45	44	51	51	43	46	51	54	49	52	51	54	57	56	58	60	--	--
23.....	60	62	--	--	50	52	43	44	46	47	45	47	49	50	50	52	52	54	57	57	55	58	--	--
24.....	56	64	--	--	46	48	44	45	46	47	46	48	49	51	52	60	54	56	55	59	58	56	--	--
25.....	54	62	--	--	45	48	45	46	46	48	48	49	49	50	50	51	52	54	56	61	55	57	--	--
26.....	57	60	--	--	45	46	46	47	46	48	50	51	49	53	51	52	53	55	59	64	55	56	--	--
27.....	57	59	--	--	44	45	45	45	46	49	50	53	50	51	50	52	56	58	63	67	55	55	--	--
28.....	58	56	--	--	46	46	--	--	--	--	50	53	51	51	50	52	59	69	60	62	56	--	--	--
29.....	53	55	--	--	46	48	--	--	--	--	53	57	49	50	51	53	52	53	60	63	54	57	--	--
30.....	52	62	--	--	48	49	--	--	--	--	56	55	51	53	52	54	52	56	60	58	57	61	--	--
31.....	--	--	--	--	45	46	--	--	--	--	52	51	--	53	52	55	56	--	55	60	59	60	--	--
Average.....	57	62	--	--	49	50	--	--	45	47	--	--	52	53	50	52	55	58	59	61	56	58	--	--

## CUMBERLAND RIVER BASIN--Continued

## CUMBERLAND RIVER AT SMITHLAND, KY.

LOCATION.--At gaging station at bridge on U. S. Highway 60 at Smithland, Livingston County, 1 mile downstream from McCormick Creek, and 2.8 miles upstream from mouth.

DRAINAGE AREA.--18,080 square miles, approximately.

RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 87°F on several days during July and August; minimum, 38°F Dec. 25.

EXTREMES, 1949-54.--Water temperatures: Maximum 88°F July 27, 1952; minimum, 34°F Feb. 3-5, 7, 1951.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1336.

Temperature (°F) of water, water year October 1953 to September 1954  
 [Mean of twice-daily measurements at approximately 8:30 a. m. and 5 p. m.]

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

## TENNESSEE RIVER BASIN

## LITTLE RIVER NEAR PENROSE, N. C.

LOCATION.--At bridge on county road 2 miles upstream from gaging station and 0.9 mile south of Little River, Transylvania County.

DRAINAGE AREA.--41.4 square miles (at gaging station).  
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.

Water temperatures: October 1953 to September 1954.

EXTREMES, 1953-54.--Dissolved solids: Maximum, 27 ppm July 11-20; minimum, 15 ppm Jan. 21-31.

Hardness: Maximum, 8 ppm July 21-31, Aug. 11-20; minimum, 3 ppm Mar. 11-20, Apr. 21-30.

Water temperatures: Maximum, 78°F Aug. 6, 11; minimum, freezing point Dec. 19.

REMARKS.--Records of specific conductance of daily samples available in district office at Raleigh, N. C. Records of suspended matter of composite samples available in district office at Raleigh, N. C. Records of discharge for water year October 1953 to September 1954 given in WSP 1336. No appreciable inflow between gaging station and sampling station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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. 11-20, 1953	49	9.0	0.01	1.5	0.2	2.3	1.5	9	1.2	1.5	0.0	0.0	22	5	0	23.6	6.5	7	2.6	2.5
Oct. 11-20	57	9.9	.05	2.0	.6	1.2	1.2	9	.9	1.1	1.1	.0	23	7	0	22.7	6.3	8	2.6	2.0
Oct. 21-31	44	11	.05	1.4	.3	2.2	2.2	8	1.2	1.0	.3	.3	28	5	0	21.1	6.6	6	2.1	1.6
Nov. 1-10	32	11	.05	1.4	.4	2.5	2.5	8	1.3	1.5	1.1	.3	26	5	0	30.4	6.4	8	2.0	1.9
Nov. 11-20	35	10	.12	1.3	.2	3.2	3.2	8	1.4	2.0	.0	.3	24	4	0	23.8	6.5	7	2.1	2.0
Nov. 21-30	95	5.8	.05	1.4	.3	2.0	2.0	6	1.6	1.5	1.1	.4	21	5	0	21.0	6.4	26	3.7	3.0
Dec. 11-20	178	6.0	.04	1.4	.2	2.0	2.0	6	1.2	1.5	1.1	.3	19	4	0	29.0	6.2	20	3.1	3.0
Dec. 11-20	225	6.7	.03	1.3	.1	1.7	1.7	4	1.2	1.0	1.1	.4	16	4	0	21.0	6.4	10	2.4	2.2
Dec. 21-31	119	8.3	.08	1.0	.3	3.9	3.9	6	3.7	2.0	1.1	.5	23	4	0	24.0	6.5	8	1.6	1.5
Jan. 1-10, 1954	66	8.4	.05	1.0	.4	2.0	1.0	8	.9	1.2	1.1	.2	20	4	0	17.4	6.5	7	1.8	1.4
Jan. 11-20	142	8.2	.04	1.1	.4	2.4	2.4	6	1.5	1.8	1.2	.2	20	4	0	21.7	6.5	9	3.0	2.2
Jan. 21-30	488	5.8	.02	1.2	.3	1.6	1.6	5	1.1	1.2	1.2	.3	15	4	0	16.8	6.3	9	2.8	2.2
Feb. 1-10	144	7.0	.05	1.1	.2	1.9	1.9	6	.9	1.0	1.1	.2	18	4	0	13.2	6.7	2	1.9	1.1
Feb. 11-10	114	9.0	.06	1.0	.3	2.3	2.3	7	1.4	.8	1.1	.3	19	4	0	14.2	6.6	3	2.1	2.0
Feb. 20-28	323	5.8	.04	1.1	.4	1.9	1.9	5	1.8	1.5	1.1	.4	18	4	0	18.5	6.4	6	2.8	2.2
Mar. 1-10	202	6.4	.02	1.2	.2	2.2	2.2	6	1.5	1.2	1.1	.3	19	4	0	14.5	6.4	6	--	2.9
Mar. 11-20	177	7.8	.03	.8	.2	2.8	2.8	5	1.2	2.0	1.1	.6	19	3	0	24.1	6.5	7	2.5	2.4
Mar. 21-31	209	7.4	.01	1.4	.1	1.3	1.3	4	1.3	1.2	1.1	.2	18	4	1	16.7	6.4	3	2.5	1.8
Apr. 1-10	205	6.4	.00	1.2	.4	1.6	1.5	6	2.1	1.0	1.1	.4	18	5	0	19.7	6.5	6	2.1	1.7
Apr. 11-20	160	5.6	.08	1.0	.3	2.3	2.3	7	1.1	1.0	1.1	.3	19	4	0	15.7	6.7	8	2.3	1.8
Apr. 21-30	152	7.8	.07	1.0	.2	2.6	2.6	7	.9	1.2	1.1	.3	18	3	0	15.0	6.7	7	2.6	2.0
May 1-10	138	7.8	.01	1.4	.1	2.3	2.3	7	1.3	1.0	1.1	.2	20	4	0	15.5	6.5	2	2.3	1.9
May 11-20	162	7.9	.02	1.2	.3	1.0	.9	5	.9	1.2	1.1	.6	19	4	0	17.1	6.2	5	--	--
May 21-31	108	6.8	.01	1.3	.9	1.9	1.9	7	.8	1.2	1.2	.0	20	4	1	18.4	6.6	2	2.2	1.8



June 1-10, 1954	83	5.7	0.03	1.3	9	1.1	8	.7	1.2	0	.5	21	7	0	16.4	6.9	8	4.2	2.0
June 11-20	71	9.3	.02	1.5	.4	1.4	7	.8	1.5	.1	.3	21	5	0	23.9	6.4	7	2.4	1.7
June 21-30	57	8.7	.02	1.6	.5	1.4	7	.9	1.5	.1	.3	22	6	0	18.8	6.4	7	3.0	1.9
July 1-10	49	8.7	.03	1.8	.1	1.8	8	1.0	1.5	.0	.4	25	5	0	21.8	6.7	8	2.7	1.9
July 11-20	42	8.4	.00	1.4	.2	1.7	8	1.4	1.5	.0	.5	27	4	0	22.7	6.4	6	3.1	2.1
July 21-31	43	7.9	.05	1.8	.9	1.8	9	1.9	2.0	.0	.5	25	8	1	21.9	6.3	7	2.8	2.5
Aug. 1-10	25	10	.04	1.5	.7	1.5	9	1.4	1.5	.0	.4	23	7	0	20.8	6.4	5	2.9	2.2
Aug. 11-20	32	7.9	.04	2.2	.7	1.5	9	.9	1.8	.0	.4	22	8	1	19.6	6.4	4	2.5	2.2
Aug. 21-31	50	8.1	.03	2.0	.6	1.5	9	1.4	1.2	.0	.5	22	7	0	19.1	6.4	4	4.2	2.6
Sept. 1-10	38	8.7	.06	1.5	.6	2.0	9	1.5	2.0	.1	.5	26	6	0	25.3	6.4	3	4.3	2.4
Sept. 11-20	19	8.8	.03	1.8	.7	1.6	8	1.4	2.0	.2	.7	24	7	0	26.9	6.4	2	2.7	2.2
Sept. 21-30	26	8.5	.01	1.5	.6	1.6	8	1.6	1.5	.1	.5	22	6	0	21.7	6.3	3	3.3	2.0
Average	116	8.0	0.04	1.4	0.4	2.2	7	1.3	1.4	0.1	0.4	21	5	0	20.4	---	7	2.7	2.1

## TENNESSEE RIVER BASIN--Continued

## LITTLE RIVER NEAR PENROSE, N. C.--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
 /Once-daily measurement at 7 a. m./

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

TENNESSEE RIVER BASIN--Continued

EAST FORK PIGEON RIVER NEAR CANTON, N. C.

LOCATION.--Temperature recorder at gaging station on right bank 800 feet upstream from U. S. Highway 276, 0.4 mile downstream from Dix Creek, 1.7 miles upstream from confluence with West Fork Pigeon River, and 5.2 miles southwest of Canton, Haywood County.

DRAINAGE AREA.--51.5 square miles.

RECORDS AVAILABLE.--Water temperatures: July to September 1954.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1336.

Temperature (°F) of water, July to September 1954  
 /Continuous ethyl alcohol-actuated thermograph 7

Day	July		August		September		Day	July		August		September	
	max	min	max	min	max	min		max	min	max	min	max	min
1	--	--	80	--	65	75	66	21	83	70	79	67	66
2	--	--	81	--	69	64	73	60	77	71	79	67	68
3	--	--	83	--	74	63	72	61	83	69	79	68	56
4	--	--	79	--	77	63	73	61	83	70	79	70	69
5	--	--	82	--	69	83	66	73	81	69	81	68	57
6	--	--	79	--	84	69	73	63	80	68	81	68	60
7	--	--	80	--	69	75	69	75	81	67	81	67	57
8	--	--	80	--	67	76	65	18	82	68	76	68	60
9	--	--	79	--	71	75	69	76	82	69	79	67	70
10	--	--	81	--	71	76	68	70	79	68	76	64	--
Average .....													73

## TENNESSEE RIVER BASIN--Continued

## CANE CREEK AT FLETCHER, N. C.

LOCATION.--At gaging station at county highway bridge, 0.5 mile upstream from Hooper Creek, 0.5 mile northeast of Fletcher, Henderson County, and 0.8 mile downstream from county line.

DRAINAGE AREA.--63.1 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.

Water temperatures: October 1953 to September 1954.

EXTREMES, 1953-54.--Dissolved solids: Maximum, 39 ppm Oct. 7, Dec. 15; minimum, 32 ppm May 17.

Hardness: Maximum, 15 ppm May 17; minimum, 10 ppm Mar. 18, June 17.

Water temperatures: Maximum, 79°F Aug. 16; minimum, 42°F Dec. 15, Feb. 15.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1336.

Chemical analyses, in parts per million, water year October 1953 to September 1954.

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. 7, 1953	17	56	13	0.07	3.8	1.1	3.3	2.3	24	1.6	1.8	0.1	0.1	39	14	0	72.4	6.6	16
Nov. 18	18	46	14	.02	3.2	.8	4.4		20	1.9	1.5	.1	.1	36	11	0	41.1	7.0	7
Dec. 18	62	42	12	.10	3.3	.9	5.4		17	4.0	2.8	.1	1.8	39	12	0	54.6	6.8	7
Jan. 23, 1954	524	46	10	.11	3.0	.8	2.8	1.3	9	5.4	2.2	.0	2.5	38	11	3	43.1	6.5	9
Feb. 15	41	42	12	.02	3.1	.9	4.0		17	2.5	2.0	.1	.7	35	11	0	39.7	6.6	7
Mar. 18	92	49	11	.03	3.2	.6	3.3		14	2.8	1.8	.1	.7	35	10	0	36.5	6.8	8
Apr. 20	72	53	10	.03	3.2	1.0	2.7	1.0	17	3.2	2.0	.1	.7	33	12	0	56.8	6.8	10
May 17	74	61	11	.02	3.6	1.4	1.1		15	2.0	1.5	.1	.5	32	15	2	37.1	6.7	5
June 17	93	64	11	.01	3.3	.4	4.6		14	4.4	2.0	.0	1.4	36	10	0	40.1	6.3	7
July 13	22	76	13	.02	4.0	.7	2.5	1.1	20	1.8	1.5	.2	.5	37	13	0	41.6	6.3	2
Aug. 16	14	79	14	.00	3.6	.6	2.3	1.2	18	2.6	1.2	.1	.6	35	11	0	42.4	6.5	3
Sept. 10	13	67	12	.00	4.0	.9	2.3	1.8	21	3.0	1.0	.1	.8	37	14	0	52.9	6.4	7

TENNESSEE RIVER BASIN--Continued

FRENCH BROAD RIVER NEAR ARDEN, N. C.

LOCATION.--At bridge on N. C. Highway 280, 2 1/2 miles upstream from gaging station at Bent Creek and 9 1/2 miles south of Asheville, Buncombe County.

DRAINAGE AREA.--676 square miles (at gaging station at Bent Creek, N. C.).

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.

Water temperatures: October 1953 to September 1954.

EXTREMES, 1953-54.--Dissolved solids: Maximum, 201 ppm Sept. 21-30; minimum, 37 ppm Jan. 21-31.

Hardness: Maximum, 23 ppm Sept. 21-30; minimum, 8 ppm Feb. 20-28, Mar. 11-20, Apr. 21-30.

Water temperatures: Maximum, 81° F. Sept. 10; minimum, freezing point Jan. 2, 12.

REMARKS.--Records of specific conductance of daily samples available in district office at Raleigh, N. C. Records of discharge for gaging station at Bent Creek, N. C. for water year October 1953 to September 1954 given in WSP 1336. No appreciable inflow between gaging station and sampling station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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	Oxygen consumed	
															Calcium	Non-carbonate				Unfiltered	Filtered
Oct. 1-10, 1953	545		12	0.12	5.8	0.7	22	2.5	32	26	7.5	0.0	0.1	105	17	0	176	6.6	37	9.8	7.5
Oct. 11-20	485		12	0.08	6.3	.8	24		33	31	7.5	0.0	.4	117	19	0	170	7.2	32	13	8.3
Oct. 21-31	497		10	0.09	4.9	1.2	22		30	30	7.0	0.0	.2	108	17	0	170	6.2	55	11	7.9
Nov. 1-10	442		13	0.14	5.8	.5	25		33	33	7.0	0.1	.1	119	16	0	170	7.3	29	11	9.1
Nov. 11-20	424		10	0.09	5.6	.5	26		33	33	7.2	0.0	.1	120	16	0	175	7.1	33	13	8.9
Nov. 21-23, 25-30	883		9.2	0.08	4.6	.7	17		21	25	5.2	0.0	1.1	80	14	0	120	6.3	21	17	7.6
Nov. 24	1,380		--	--	--	--	--	--	11	33	2.8	--	--	9	0	0	63.2	6.0	--	--	--
Dec. 1-4	751		9.9	0.10	4.8	.3	25		29	32	6.5	.1	1.0	103	13	0	145	7.3	55	--	--
Dec. 5-10	2,180		7.5	0.08	3.6	.6	8.4		12	13	3.5	1.1	1.5	50	11	2	68.1	6.6	22	--	--
Dec. 11-20	2,060		6.7	0.07	3.2	.3	9.1		13	12	3.5	1.1	1.8	50	9	0	87.7	6.1	19	11	4.5
Dec. 21-31	995		10	0.10	3.7	.4	13		15	20	3.8	0.0	1.2	64	11	0	86.9	6.4	17	9.8	4.0
Jan. 1-10, 1954	731		10	0.09	4.3	.4	15	1.5	21	26	4.5	0.0	.4	74	12	0	108	6.5	18	7.2	6.6
Jan. 11-16	1,050		9.2	0.09	3.6	.8	16		20	23	4.2	1.1	.5	74	12	0	114	6.7	26	11	4.5
Jan. 17-20	2,130		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Jan. 21-31	4,940		6.8	0.06	5.1	1.3	1.6		10	8.1	3.0	.1	.6	37	18	10	51.3	6.3	12	12	2.7
Feb. 1-10	1,330		9.0	0.09	3.0	.4	12		14	17	3.8	0.0	.6	53	9	0	74.6	6.5	22	8.8	4.6
Feb. 11-19	1,090		9.6	0.10	3.6	.3	12		16	17	3.5	0.0	.9	61	10	0	83.3	6.6	23	3.6	3.0
Feb. 20-28	2,980		7.4	0.03	2.5	.5	7.5		11	11	2.5	0.0	.8	42	8	0	55.3	6.5	31	11	4.8
Mar. 1-10	2,100		8.6	0.01	2.6	.5	7.1		11	10	2.8	0.0	.7	43	9	0	87.9	6.3	16	6.8	3.7
Mar. 11-20	2,250		8.2	0.04	2.5	.4	8.7		11	12	3.0	0.1	.9	46	8	0	60.7	6.6	16	9.1	3.7
Mar. 21-31	2,260		8.2	0.02	2.8	.7	6.2		10	10	3.0	.1	.4	45	10	2	54.9	6.5	18	6.3	3.1
Apr. 1-10	2,270		8.2	0.00	2.5	.7	7.2	1.2	10	11	3.5	.1	.8	43	9	1	75.4	5.9	16	6.4	2.6
Apr. 11-20	1,930		7.0	0.01	3.0	.4	8.2		12	12	2.8	1.1	.3	46	9	0	69.1	6.2	12	6.7	3.5
Apr. 21-30	1,610		7.0	0.13	2.8	.2	11		15	13	3.5	.1	.4	51	8	0	68.1	6.6	19	6.7	4.5

## TENNESSEE RIVER BASIN--Continued

## FRENCH BROAD RIVER NEAR ARDEN, N. C.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--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	Oxygen consumed	
															Calcium, mg-nestum	Non-carbonate				Unfiltered	Filtered
May 1-10, 1954	1,430		10	0.07	3.1	0.2	11		15	15	3.0	0.0	0.1	52	9	0	78.7	6.5	19	6.9	3.9
May 11-20	1,570		5.5	.08	3.0	.3	11		14	16	3.2	.0	.4	57	9	0	80.8	6.6	28	6.4	5.5
May 21-31	1,110		9.5	.04	3.6	.7	13		17	19	3.5	.1	.4	63	12	0	92.3	6.5	18	6.0	3.7
June 1-10	940		9.6	.04	4.2	.4	16		20	23	5.2	.0	.4	74	12	0	110	6.6	31	8.8	4.2
July 11-20	1,110		8.5	.06	3.8	.4	15	1.1	20	22	5.0	.0	.8	75	11	0	105	6.5	17	12	4.8
June 21-30	1,757		10	.08	4.2	.2	21		25	29	4.2	.0	.4	89	11	0	129	6.5	26	11	5.7
July 1-10	750		12	.08	4.8	.8	18	1.5	22	33	4.8	.0	1.0	93	15	0	131	6.5	18	14	5.2
July 11-20	622		8.2	.04	5.1	.2	23	1.5	27	33	5.2	.0	.9	101	14	0	146	6.6	30	14	6.2
July 21-31	569		8.7	.05	5.9	.1	24	1.5	26	37	6.2	.0	1.2	108	15	0	157	6.5	21	15	7.2
Aug. 1-10	505		6.3	.11	6.0	.3	25	1.9	31	41	6.5	.0	1.3	118	16	0	172	6.6	29	16	7.6
Aug. 11-20	434		11	.12	5.2	.2	32	3.2	30	49	7.5	.1	.4	130	14	0	197	6.5	27	15	6.8
Aug. 21-31	531		8.7	.17	6.0	.4	28	3.2	31	38	6.5	.1	.3	115	17	0	166	6.5	27	18	9.4
Sept. 1-2	389		--	--	5.0	.5	--	--	29	28	5.2	--	.6	--	15	0	169	6.5	--	--	--
Sept. 3-10	317		7.9	.29	7.5	.5	36	2.5	45	54	9.0	.0	.5	152	21	0	231	6.6	70	18	12
Sept. 11-20	283		7.9	.36	6.8	.4	43	2.6	45	62	10	.0	1.5	177	19	0	260	6.2	80	20	15
Sept. 21-30	259		8.8	.27	8.7	.4	52	2.2	63	70	11	.0	.5	201	23	0	305	6.6	90	26	15
Average	1,230		8.8	0.09	4.5	0.5	18		23	26	5.1	0.0	0.6	83	13	0	123	---	29	11	6.2

## TENNESSEE RIVER BASIN--Continued

## FRENCH BROAD RIVER NEAR ARDEN, N. C.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

(Once-daily measurement at 8:30 a. m.,)

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

TENNESSEE RIVER BASIN--Continued  
NOLICHUCKY RIVER AT POPLAR, N. C.

LOCATION.--At gaging station at Poplar, Mitchell County, 3.9 miles downstream from Cane River, 6.1 miles upstream from North Carolina-Tennessee State line, and at mile 106.8.

DRAINAGE AREA.--608 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.

Water temperatures: October 1953 to September 1954.

EXTREMES, 1953-54.--Dissolved solids: Maximum, 40 ppm July 1-10; minimum, 30 ppm Feb. 20-28, Apr. 1-10, May 21-31.

Hardness: Maximum, 18 ppm Oct. 1-20; minimum, 7 ppm May 21-31.

Water temperatures: Maximum, 78 F July 13; minimum, freezing point on several days during November, December, January and February.

REMARKS.--Records of specific conductance of daily samples available in district office at Raleigh, N.C. Records of suspended matter of composite samples available in district office at Raleigh, N.C. Records of discharge for water year October 1953 to September 1954 given in WSP 1336.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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, 1953	215	12	0.02	3.5	0.9	3.1	2.3	17	3.5	2.2	1.3	0.0	37	12	0	52.4	6.7	6	5.2	1.7
Oct. 11-20	197	11	.03	4.3	1.7	3.3	3.3	18	3.6	2.5	1.3	.3	39	18	4	53.3	6.5	6	3.4	1.6
Oct. 21-31	205	9.9	.02	3.8	1.6	4.1	4.1	18	3.8	1.9	1.3	.3	36	16	1	71.2	6.8	5	4.0	1.6
Nov. 1-10	197	11	.02	3.0	1.5	4.0	4.0	15	3.7	2.0	1.2	.4	38	14	1	59.2	6.7	4	3.0	1.2
Nov. 11-20	197	13	.02	3.4	1.2	4.1	4.1	14	3.7	2.2	1.3	.7	37	13	2	47.6	6.5	4	3.4	1.1
Nov. 21-30	418	12	.02	2.6	1.0	3.7	3.7	10	3.7	2.0	1.2	.8	32	11	2	39.0	6.6	3	7.2	1.5
Dec. 1-10	598	8.2	.02	2.4	1.0	4.6	4.6	13	3.6	1.8	.9	1.0	31	10	0	51.9	6.5	8	2.9	1.6
Dec. 11-20	858	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec. 21-31	419	8.5	.02	2.7	1.0	3.3	3.3	13	1.8	2.5	.4	1.2	32	11	0	55.4	6.7	8	--	--
Jan. 1-10, 1954	288	10	.02	3.0	1.3	2.7	1.4	13	3.3	2.2	.5	1.1	34	13	2	42.6	6.7	8	2.9	1.3
Jan. 11-20	1,100	9.0	.04	2.6	1.0	4.7	4.7	12	4.0	2.5	.5	2.4	33	11	1	58.0	6.6	5	5.2	1.6
Jan. 21-31	3,620	9.3	.04	3.3	.4	4.9	4.9	10	5.8	2.2	.3	2.9	34	10	2	52.1	6.4	14	8.2	2.4
Feb. 1-10	706	11	.01	2.9	1.3	2.5	2.5	11	4.3	1.5	.4	1.6	34	13	4	40.0	6.7	6	3.9	1.6
Feb. 11-19	583	11	.00	2.6	.9	3.9	3.9	11	4.0	2.0	.5	1.7	32	10	1	39.2	6.7	7	3.9	1.6
Feb. 20-28	1,570	8.5	.01	2.6	.7	2.7	2.7	9	3.6	1.5	.3	1.7	30	9	2	34.6	6.9	17	7.3	1.0
Mar. 1-10	1,930	8.8	.00	2.8	.8	3.9	3.9	11	3.8	2.2	.4	2.0	32	10	1	37.2	6.5	6	4.3	2.2
Mar. 11-20	1,380	11	.02	2.8	.3	4.5	4.5	10	3.4	3.0	.3	1.4	32	8	0	34.4	6.7	2	3.6	2.0
Mar. 21-31	2,010	11	.00	2.8	1.1	3.1	3.1	11	3.8	2.0	.4	1.7	31	12	2	38.4	6.4	7	5.6	1.8



Apr. 1-10, 1954	1,850	9.4	.00	2.7	1.0	3.3	1.1	11	3.6	2.2	.3	1.3	30	11	2	36.2	6.5	7	5.7	1.5
Apr. 11-20	1,070	9.8	.00	3.4	.9	2.5	1.1	12	2.9	2.5	.3	.6	34	12	2	36.2	6.3	4	3.7	1.8
Apr. 21-30	942	9.4	.00	2.8	1.1	2.5	1.3	13	2.8	1.5	.3	.6	31	12	1	33.9	6.6	3	3.9	1.6
May 1-10	1,180	6.3	.01	2.8	1.3	1.7	1.7	13	2.5	1.5	.2	1.2	34	13	2	37.1	6.7	7	7.2	1.6
May 11-20	1,740	10	.01	2.7	1.3	1.4	1.4	11	2.3	1.5	.3	1.1	31	12	3	38.2	6.7	7	4.8	1.6
May 21-31	1,965	11	.00	2.4	.3	4.1	4.1	12	2.5	1.2	.4	1.2	30	7	0	34.5	6.8	4	3.2	1.4
June 1-10	614	9.3	.00	3.0	.3	4.8	4.8	15	2.6	1.8	.3	1.1	31	9	0	38.7	6.7	3	2.7	1.2
June 11-20	698	12	.00	3.1	.6	4.7	4.7	16	2.7	1.5	.3	1.9	35	10	0	42.9	6.7	3	--	1.8
June 21-30	388	11	.00	3.2	.6	5.0	5.0	17	2.9	1.5	.5	1.2	35	10	0	45.4	6.6	3	6.6	1.4
July 1-10	387	10	.02	3.7	1.5	3.1	1.6	21	3.0	2.5	.4	.6	40	15	0	47.3	6.6	2	--	1.9
July 11-20	338	12	.00	3.5	1.4	2.2	1.2	17	3.1	1.8	.4	.7	38	14	1	44.4	6.7	3	6.3	1.7
July 21-31	425	9.8	.02	4.0	1.5	2.7	1.7	15	4.7	3.2	.4	.8	39	16	4	47.6	6.4	3	6.0	2.5
Aug. 1-10	271	12	.02	4.2	1.6	2.6	1.4	18	3.2	2.2	.4	.6	39	17	2	47.3	6.7	3	4.3	2.2
Aug. 11-20	182	10	.02	3.4	1.0	2.6	1.4	17	3.5	1.5	.4	.5	37	13	0	48.3	6.6	3	3.4	2.0
Aug. 21-31	381	10	.01	3.4	1.4	2.5	1.6	15	3.8	2.2	.8	1.3	38	14	2	50.2	6.3	4	6.6	1.9
Sept. 1-10	175	11	.01	3.7	1.7	2.6	1.4	18	3.9	2.2	.9	.4	39	16	2	51.1	7.4	3	4.1	2.0
Sept. 11-20	190	11	.00	3.6	1.6	2.6	1.4	15	3.7	2.2	.9	.7	38	16	3	50.7	8.6	3	3.8	2.0
Sept. 21-30	208	8.7	.00	3.6	1.7	2.6	1.8	16	3.8	2.2	.9	.7	38	16	3	49.8	6.6	4	5.3	2.2
Average	796	10	0.01	3.2	1.1	3.9	3.9	14	3.5	2.0	0.6	0.1	35	12	1	45.3	--	5	4.3	1.7

## TENNESSEE RIVER BASIN--Continued

## NOLICHUCKY RIVER AT POPLAR, N.C.--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
 /Once-daily measurement at 8 a. m. /

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



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.--402 square miles.

Water temperatures.--Chemical analyses: October 1951 to September 1954.

EXTREMES 1953-54.--Hardness: Maximum, 432 ppm Mar. 11-20.

Specific conductance: Maximum, 4,040 ppm Sept. 24; minimum, 509 micromhos Jan. 22.

Water temperatures: Maximum, 92°F July 5; minimum, freezing point Dec. 19.

EXTREMES 1951-54.--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, 200 ppm (calculated) Jan. 27, 1953.

Specific conductance: Maximum, 15,400 micromhos Sept. 14, 1951; Oct. 11, 12, 1952; minimum daily, 366 micromhos Jan. 27, 1953.

Water temperatures: Maximum, 92°F July 5, 1954; minimum, freezing point on several days during March, April and December 1953.

REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year October 1953 to September 1954 given in WSP 1336.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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, mg-nestum	Non-carbonate			
Oct. 1-10, 1953.....	51.1	3.0	0.02	1,320	117	1,040	6.0	58	104	4,400		0.5	7,020	3,770	3,730	11,900	7.2	7
Oct. 11-20.....	51.9	--	.05	1,360	85	1,060	6.1	--	56	4,310		--	--	3,760	--	12,100	6.7	--
Oct. 21-31.....	54.8	--	.10	1,260	95	965	6.0	88	88	3,950		--	--	3,950	--	11,400	6.8	--
Nov. 1-10.....	55.7	--	.07	1,380	124	1,040	6.2	--	76	4,400		--	--	3,970	--	12,400	6.9	--
Nov. 11-20.....	52.5	--	.04	1,380	80	1,020	5.9	--	52	4,200		--	--	3,790	--	12,100	7.3	--
Nov. 21-30.....	62.6	--	.03	1,320	122	980	8.3	80	77	3,960		--	--	3,900	2,730	11,300	6.9	0
Dec. 1-10.....	74.3	--	.02	1,360	53	980	8.8	68	69	3,920		--	--	3,620	3,560	11,400	7.1	0
Dec. 11-20.....	189	--	.03	792	70	668	6.1	62	63	2,270		--	--	2,510	2,440	6,890	7.1	0
Dec. 21-31.....	80.9	--	.03	868	70	780	6.2	82	56	2,650		3	6,070	2,160	3,120	10,700	7.4	5
Jan. 1-10, 1954.....	70.5	5.3	.00	1,240	17	965	6.1	62	71	3,740		--	--	3,880	831	3,010	7.4	0
Jan. 11-20.....	848	--	.04	317	22	425	3.2	62	34	880		--	--	436	372	1,330	7.3	0
Jan. 21-31.....	1,448	--	.02	144	18	330	1.9	75	23	358		--	--	1,090	1,020	3,210	7.0	0
Feb. 1-10.....	242	--	.03	354	50	458	3.0	83	28	1,020		--	--	1,030	974	3,340	7.0	0
Feb. 11-20.....	204	--	.02	376	22	480	3.3	66	28	1,050		--	--	502	502	1,760	7.0	0
Feb. 21-29.....	718	--	.03	192	17	345	1.8	57	21	508		--	--	516	462	1,640	7.1	0
Mar. 1-10.....	854	--	.03	173	20	340	2.0	63	30	460		--	--	432	386	1,600	7.5	4
Mar. 11-20.....	643	--	.02	164	5.5	111	1.7	56	20	462		--	--	451	405	1,790	7.5	7
Mar. 21-31.....	968	--	.02	171	6.0	128	2.0	57	24	530		--	--	563	504	1,890	7.5	6
Apr. 1-10.....	598	5.6	.00	212	8.2	129	2.6	72	18	548		.8	959	470	416	1,730	7.7	8
Apr. 11-20.....	735	--	.02	178	6.2	119	1.8	66	23	495		--	--	470	574	2,540	7.6	6
Apr. 21-30.....	404	--	.02	286	8.2	179	2.1	59	26	795		--	--	719	662	2,720	7.6	6
May 1-10.....	320	--	.02	274	7.0	180	2.2	70	18	840		--	--	466	434	1,970	7.5	7
May 11-20.....	644	--	.02	175	7.2	120	1.8	39	18	495		--	--	614	574	2,670	7.5	5
May 21-31.....	423	--	.02	232	8.5	202	2.0	48	23	815		--	--	614	574	2,670	7.5	5



## TENNESSEE RIVER BASIN--Continued

## NORTH FORK HOLSTON RIVER AT HOLSTON, VA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	73	52	42	40	45	45	59	73	--	90	75	78
2	71	54	42	41	42	46	59	73	--	85	76	78
3	70	55	42	41	40	45	61	70	--	82	81	79
4	71	54	43	40	45	42	61	66	--	86	84	79
5	72	51	46	39	42	40	62	64	--	92	75	80
6	67	49	45	38	39	42	64	65	--	88	76	81
7	67	44	45	38	40	50	68	64	--	85	73	83
8	64	40	44	39	43	52	67	65	--	78	76	85
9	63	39	43	45	48	49	65	68	--	81	76	82
10	63	44	45	38	47	--	66	69	--	81	76	81
11	65	42	45	37	42	58	68	70	--	88	83	83
12	61	44	47	35	40	60	67	69	--	85	75	82
13	62	44	46	43	45	58	68	66	--	87	75	79
14	63	45	48	35	48	56	69	67	--	83	72	77
15	64	43	43	39	50	53	71	66	--	86	83	78
16	63	45	41	40	52	47	60	67	67	84	77	87
17	63	47	35	45	50	48	58	66	72	85	79	81
18	63	48	35	38	49	48	56	66	73	87	79	73
19	64	50	32	40	48	49	64	67	80	85	80	79
20	65	51	37	37	--	49	72	65	82	83	76	72
21	63	55	43	47	51	50	72	65	82	81	78	74
22	63	50	40	50	50	52	72	66	82	79	83	76
23	62	51	40	48	50	52	69	67	82	78	84	70
24	60	51	39	45	48	54	70	68	81	78	79	75
25	62	49	40	50	50	55	69	68	82	78	81	72
26	60	45	38	52	48	60	70	69	82	78	79	73
27	60	43	37	54	52	56	70	--	86	83	83	71
28	68	42	37	50	49	57	71	--	82	73	80	75
29	54	41	39	48	--	58	--	--	85	75	77	77
30	54	42	41	45	--	59	72	--	83	76	78	81
31	53	--	40	45	--	58	--	--	--	78	75	--
Average	64	47	41	43	46	52	66	67	--	82	78	78

TENNESSEE RIVER BASIN--Continued  
 TENNESSEE RIVER AT KENTUCKY DAM, NEAR PADUCAH, KY.

LOCATION.--At tailrace of power plant at Kentucky Dam at Gilbertsville, Marshall County, 3,500 feet upstream 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.

RECORDS AVAILABLE.--Chemical analyses: October 1949 to August 1950, October 1951 to September 1954.

Water temperatures: October 1952 to September 1954.

EXTREMES, 1953-54.--Dissolved solids: Maximum, 121 ppm Jan. 1-10; minimum, 74 ppm May 1-10, 21-24, 26-31.

Hardness: Maximum, 86 ppm Jan. 1-10; minimum, 50 ppm Mar. 1-10.

Specific conductance: Maximum, 222 microhmhos Jan. 6; minimum, 36 F Jan. 13.

Water temperatures: Maximum, 86 F July 14; minimum, 36 F Jan. 13.

EXTREMES, 1952-54.--Dissolved solids: Maximum, 124 ppm Jan. 11-20, 1953; minimum, 63 ppm May 21-31, 1953.

Hardness: Maximum, 86 ppm Jan. 1-10, 1954; minimum, 48 ppm Mar. 11-20, Apr. 2-10, 1953.

Specific conductance: Maximum daily, 227 microhmhos Jan. 24, 1953; minimum daily, 107 microhmhos Apr. 9-10, 1953.

Water temperatures: Maximum, 86 F Aug. 2-4, 1953, July 14, 1954; minimum, 36 F Jan. 13, 1954.

REMARKS.--Chemical quality samples prior to October 1952 were collected at auxiliary gaging station 17.0 miles downstream. Records of specific conductance of daily samples from October 1952 to September 1954 available in district office at Columbus, Ohio. Records of discharge for water year October 1953 to September 1954 given in WSP 1336.

Chemical analyses, in parts per million, water year October 1953 to September 1954

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, 1953	24,360	2.6	0.03	23	4.3	5.8	1.3	76	12	9.5	0.2	0.3	101	75	13	174	7.1	3
Oct. 11-20	25,530	1.5	.02	23	4.3	5.4	1.6	79	12	10	.2	.1	98	75	10	174	7.1	3
Oct. 21-31	27,100	6.6	.01	24	4.1	6.1	1.0	78	11	9.8	.2	.0	106	77	13	182	6.9	2
Nov. 1-10	25,820	6.1	.01	24	4.7	6.4	1.4	78	13	10	.2	.4	110	80	15	188	6.8	6
Nov. 11-20	26,070	1.9	.01	25	3.7	6.1	1.4	75	18	10	.1	.4	107	78	16	196	6.8	10
Nov. 21-30	24,350	1.8	.01	25	4.0	6.5	1.5	76	13	11	.1	.4	106	78	17	193	6.9	8
Dec. 1-10	33,390	3.0	.00	26	3.4	7.0	1.6	80	12	13	.1	.5	106	78	13	191	7.1	2
Dec. 11-21, 14-20	44,620	2.8	.00	24	4.7	7.2	1.3	80	13	13	.1	.5	112	80	14	196	7.1	1
Dec. 21-31	35,530	3.3	.02	26	4.4	8.8	1.5	81	15	15	.1	.7	118	84	17	207	7.2	5
Jan. 1-10, 1954	31,010	1.3	.01	26	5.0	9.5	1.5	84	15	16	.2	.4	121	86	17	214	7.2	5
Jan. 11-20	113,300	1.7	.00	26	4.3	9.1	1.5	79	15	16	.1	.5	117	83	16	210	7.1	5
Jan. 21-31	310,800	2.4	.06	20	3.0	6.9	1.5	62	12	12	.1	1.8	96	63	11	166	7.2	3
Feb. 1-10	79,220	6.3	.08	17	3.2	5.7	.6	48	9.8	12	.1	2.2	84	56	16	142	7.2	10
Feb. 11-20	57,920	5.7	.08	16	3.0	5.5	1.4	47	12	9.8	.3	2.3	91	53	14	137	6.9	37
Feb. 21-30	87,960	5.8	.09	16	2.6	4.2	1.3	47	9.1	9.4	.3	2.8	83	52	13	131	7.0	35
Mar. 1-10	78,360	6.7	.02	16	2.4	3.5	1.2	48	8.0	6.9	.3	2.6	82	50	10	123	7.0	46
Mar. 11-20	46,310	6.7	.02	16	2.7	3.9	1.0	49	8.3	6.2	.2	2.5	76	51	11	123	7.2	49
Mar. 21-31	39,190	7.6	.04	17	2.5	3.7	1.3	52	6.1	5.2	.2	2.4	80	52	10	126	7.5	27

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 1954--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			
Apr. 1-10, 1954	42,930	6.9	0.02	17	2.7	3.5	1.1	53	9.6	5.7	0.2	2.5	76	53	10	129	7.0	1
Apr. 11-20	39,790	3.4	.02	17	2.8	4.2	1.1	56	11	4.6	.2	2.4	81	55	8	131	7.0	2
Apr. 21-30	52,520	1.6	.02	17	2.8	3.9	1.4	56	10	4.0	.2	1.7	75	55	8	129	7.0	1
May 1-10	50,610	3	.03	18	2.7	3.6	1.0	57	11	4.4	.2	1.7	74	55	9	129	7.2	2
May 11-20	46,830	3.9	.01	18	2.6	3.4	1.0	60	7.6	4.4	.1	2.8	84	56	6	132	6.9	3
May 21-24, 26-31	33,480	3.3	.02	19	2.8	3.1	.9	59	8.0	7.0	.1	1.3	74	59	11	141	6.7	3
June 1-10	40,390	2.8	.01	19	3.2	3.1	.9	61	8.9	6.8	.1	1.1	82	60	11	141	7.3	7
June 11-20	35,370	3.7	.01	18	3.2	3.6	.9	65	8.6	4.2	.1	1.2	80	59	5	138	7.4	5
June 21-30	40,710	3.8	.01	19	3.3	3.3	.4	67	8.0	4.2	.1	1.9	82	61	6	140	7.5	6
July 1-10	31,950	3.6	.03	19	3.0	3.8	.8	68	8.5	4.4	.1	1.6	85	61	4	143	7.4	6
July 11-20	30,560	2.6	.00	20	3.2	3.9	.9	71	8.3	4.2	.1	1.2	82	62	3	146	7.4	6
July 21-25	31,960	3.1	.00	21	3.1	3.7	1.0	72	8.7	3.9	.4	.9	85	66	6	146	7.6	4
Aug. 2-11	31,510	1.4	.00	21	2.6	3.5	.9	66	10	4.0	.3	.9	77	62	9	141	7.6	4
Aug. 12-22	30,560	1.6	.02	20	3.2	4.2	.6	69	8.8	4.1	.1	.9	83	63	6	145	7.5	12
Aug. 23-31	21,650	2.2	.01	19	3.5	3.6	1.1	69	10	4.2	.1	.9	82	62	7	147	7.0	5
Sept. 1-10	26,370	2.3	.00	20	3.1	4.0	1.1	66	9.9	4.5	.1	.9	82	62	7	147	7.8	5
Sept. 11-20	22,770	4.6	.02	19	3.7	4.5	1.0	70	10	5.0	.1	1.0	83	63	5	146	7.5	4
Sept. 21-30	21,400	4.1	.00	19	4.0	4.5	.9	68	10	4.8	.1	.8	82	64	8	145	7.6	5
Time-weighted average a	49,360	3.6	0.02	20	3.4	5.0	1.1	66	11	7.8	0.2	1.3	90	64	10	153	--	9

a Represents 98 percent of days and 98 percent of runoff.



TENNESSEE RIVER BASIN--Continued

TENNESSEE RIVER AT KENTUCKY DAM, NEAR PADUCAH, KY.--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
 /Once-daily measurement at approximately 8 a.m./

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

TENNESSEE RIVER BASIN--Continued  
MISCELLANEOUS ANALYSES OF STREAMS IN TENNESSEE RIVER BASIN IN VIRGINIA AND NORTH CAROLINA  
Chemical analyses, in parts per million, water year October 1953 to September 1954

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	
													Calcium-magnesium	Non-carbonate				
NORTH FORK HOLSTON RIVER NEAR SALTVILLE, VA.																		
Oct. 9, 1953	23	4.4	0.02	40	22	3.4	1.6	184	39	4.2	0.1	1.2	202	188	39	359	8.3	6
Mar. 29, 1954	462	6.3	.00	17	5.0	1.2	.7	70	6.3	1.1	0	3.1	77	62	6	133	7.8	5
Sept. 30	32	4.0	.01	32	13	1.7	1.6	159	5.5	1.9	0	1.4	142	133	3	256	7.6	5
NORTH FORK CLINCH RIVER AT DUFFIELD, VA.																		
Oct. 6, 1953	1.3	13	0.01	36	10	2.1	1.5	143	22	1.6	0.0	0.7	154	131	14	252	7.8	6
Mar. 26, 1954	164	5.8	.02	16	3.1	1.0	.7	56	8.6	.8	0	1.2	64	583	7	107	8.1	7
May 26	17	6.1	.03	18	2.1	1.1	.9	59	8.2	1.2	0	.8	70	54	5	118	7.5	5
FRENCH BROAD RIVER AT CALVERT, N. C.																		
Mar. 2, 1954	515	7.8	0.05	1.6	0.5	1.4	0.4	6	1.2	1.8	0.0	0.5	19	6	1	56.5	6.1	26
Sept. 2	32	7.6	.03	1.8	.9	1.5	1.0	8	4.2	1.0	.0	.3	22	8	2	18.9	6.4	3
DAVIDSON RIVER NEAR BEVARD, N. C.																		
Mar. 2, 1954	184	6.4	0.00	1.0	0.3	1.5	0.4	5	1.6	0.7	0.0	0.3	14	4	0	12.2	6.6	6
Sept. 3	21	6.2	.00	1.6	.2	1.5	0.4	6	2.6	.8	.1	.3	19	5	0	16.7	6.6	2
BOYLSTON CREEK NEAR HORSE SHOE, N. C.																		
Mar. 8, 1954	25	7.8	0.02	2.2	0.6	2.0	0.6	10	1.5	1.5	0.1	0.4	21	8	0	32.4	6.3	6
Sept. 3	9.5	8.1	.12	2.1	1.8	1.3	0.6	14	4.6	.8	.0	.5	27	13	1	30.2	6.2	7
CLEAR CREEK NEAR HENDERSONVILLE, N. C.																		
Mar. 18, 1954	73	12	0.02	3.2	0.3	3.0	1.0	12	2.6	2.0	0.0	0.6	35	9	0	37.3	6.5	16
Sept. 9	11	16	.11	2.2	.5	3.2	1.0	16	1.4	1.8	.1	.0	36	8	0	36.2	6.5	7

HOMINY CREEK AT CANDLER, N. C.

Mar. 15, 1954	131	9.4	0.02	2.7	1.1	3.1	13	5.1	0.5	0.1	1.4	34	11	1	40.3	6.6	5
Sept. 8	15	12	.08	3.1	1.0	2.7	1.9	3.0	2.0	.1	1.1	38	12	0	48.9	6.4	8

SANDYFUSH CREEK NEAR ALEXANDER, N. C.

Mar. 23, 1954	44	17	0.00	4.6	1.6	5.9	25	5.3	2.5	0.1	1.3	50	18	0	59.7	7.1	8
Sept. 7	5.8	12	.00	5.9	2.4	3.4	3.8	2.6	.8	.1	.0	52	25	0	71.0	6.8	14

FRENCH BROAD RIVER AT MARSHALL, N. C.

Mar. 12, 1954	2,130	11	0.05	3.5	0.8	11	15	17	3.5	6.1	-1.3	56	12	0	77.7	6.5	7
Sept. 13	3,386	8.8	.05	6.3	1.9	4.8	2.4	4.3	7.9	.0	1.5	189	24	0	296	6.6	65

PIGEON RIVER AT CANTON, N. C.

Mar. 16, 1954	546	5.8	0.02	1.1	0.4	1.8	6	2.0	0.5	0.0	0.8	17	4	0	17.4	8.5	8
Sept. 7	27	5.7	.01	1.8	.9	1.6	1.0	2.1	1.0	.0	.5	24	8	0	32.3	6.0	6

ALLEN CREEK NEAR HAZELWOOD, N. C.

Mar. 15, 1954	65	6.2	0.00	1.5	0.1	1.8	6	2.1	0.5	0.0	0.3	16	4	0	15.0	6.5	6
Sept. 10	7.9	8.7	.00	1.6	.7	1.2	0.5	1.8	.5	.0	.4	24	7	0	30.4	7.0	6

JONATHAN CREEK NEAR COVE CREEK, N. C.

Mar. 16, 1954	189	7.2	0.00	1.4	0.3	3.3	8	2.6	1.2	0.0	1.1	21	5	0	22.4	6.7	6
Sept. 10	34	10	.02	2.0	.8	1.5	1.1	2.1	1.0	.0	.0	28	8	0	29.6	6.9	7

a Discharge at time of sampling.

TENNESSEE RIVER BASIN--Continued  
 MISCELLANEOUS ANALYSES OF STREAMS IN TENNESSEE RIVER BASIN IN VIRGINIA AND NORTH CAROLINA--Continued  
 Chemical analyses, in parts per million, water year October 1953 to September 1954--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			
ELK RIVER NEAR ELK PARK, N. C.																		
Mar. 10, 1954.....	138	11	0.01	2.5	0.7	1.9	1.1	10	2.7	1.2	0.0	0.7	28	9	1	31.5	6.7	7
Aug. 23.....	11	13	.01	3.0	1.3	2.1	1.1	18	3.0	1.2	.1	.8	35	13	0	44.4	6.6	5
CULLASAJA RIVER AT CULLASAJA, N. C.																		
Mar. 8, 1954.....	228	7.0	0.01	1.5	0.3	2.1	0.9	6	2.6	1.0	0.1	0.4	18	5	0	22.5	6.5	5
Sept. 14.....	31	8.7	.02	2.3	.6	1.7	0.9	13	1.6	1.2	.0	.3	28	8	0	27.1	6.5	7
LITTLE TENNESSEE RIVER AT NEEDMORE, N. C.																		
Mar. 11, 1954.....	1,060	8.0	0.00	1.9	0.7	2.1	0.8	10	1.8	1.2	0.1	0.4	21	8	0	20.4	6.6	3
Aug. 27.....	347	7.0	.01	1.9	1.0	1.6	0.8	12	2.1	1.0	.1	.2	23	9	0	26.1	6.4	3
TUCKASEGEE RIVER AT TUCKASEGEE, N. C.																		
Mar. 9, 1954.....	334	6.9	0.01	1.2	0.5	1.8	0.4	6	2.1	1.0	0.0	0.5	18	5	0	35.0	6.5	4
Sept. 7.....	124	7.6	.06	1.9	.9	1.2	0.4	8	4.0	1.0	.1	.3	22	8	2	23.3	6.0	2

PART 4. ST. LAWRENCE RIVER BASIN  
 STREAMS TRIBUTARY TO LAKE MICHIGAN  
 BLACK RIVER NEAR GARNET, MICH.

LOCATION. --Temperature recorder at gaging station on right bank, 10 feet upstream from highway bridge, 15 feet downstream from small tributary entering from right 3 1/2 miles upstream from Lake Michigan, and 4 miles southwest of Garnet, Mackinac County.

DRAINAGE AREA. --28 square miles approximately.

RECORDS AVAILABLE. --Water temperatures: October 1951 to September 1954.

EXTREMES 1953-54. --Water temperatures: Maximum, 64° F. June 16, 17, minimum, freezing point on several days during January.

EXTREMES, 1951-54. --Water temperatures: Maximum, 68° F. July 21, 22, 1952; minimum, freezing point on many days during winter months.

REMARKS. --Records of discharge for water year October 1953 to September 1954 given in WSP 1337. River does not freeze over.

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

Temperature (°F) of water, water year October 1953 to September 1954  
 /Recorder with temperature attachment, continuous ethyl alcohol-actuated thermograph/

STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued  
PAINT RIVER NEAR ALPHA, MICH.

LOCATION.--Temperature recorder on right bank, 0.6 mile downstream from Paint River Diversion Dam, 5½ miles upstream from confluence with Brule River, and 6 miles southeast of Alpha, Iron County.

DRAINAGE AREA. 644 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1952 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 77° F July 29; minimum, freezing point on several days in November, December, January, February, March, and April.

EXTREMES, 1952-54.--Water temperatures: Maximum, 81° F Sept. 2, 1953; minimum, freezing point on many days during winter months.

REMARKS.--Stream frozen Nov. 28, Dec. 7, 9-11, Dec. 14 to Apr. 9. Temperatures given for this period are for the underflow.

Temperature (°F) of water, water year October 1953 to September 1954  
/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.	59	43	40	34	32	35	31	32	32	32	32	32	32	49	45	74	67	66	63					
2.	60	54	43	40	33	32	32	31	32	32	32	32	32	49	46	69	68	67	62					
3.	61	56	42	39	33	32	32	32	32	32	32	32	32	46	44	73	66	66	62					
4.	60	54	39	38	33	32	32	32	32	32	32	32	32			72	67	63	62					
5.	55	55	39	37	34	33	--	--	32	32	32	32	32			70	65	64	62					
6.	55	52	39	36	34	32	32	32	32	32	32	32	32			71	65	63	61					
7.	54	47	36	36	32	32	32	32	32	32	32	32	32			60	64	73	64					
8.	54	47	36	34	33	32	32	32	32	32	32	32	32			70	63	69	67					
9.	54	48	37	33	32	32	32	32	32	32	32	32	32			70	64	73	67					
10.	53	49	35	34	37	33	31	33	32	32	32	32	32			68	66	70	66					
11.	51	49	35	35	35	33	32	32	32	32	32	32	32			68	66	70	64					
12.	51	49	36	34	34	33	32	32	32	32	32	32	32			73	66	70	62					
13.	53	49	38	34	34	33	32	32	32	32	32	32	32			73	67	70	63					
14.	55	50	39	35	34	31	33	32	32	32	32	32	32			74	69	69	65					
15.	55	49	40	35	36	31	33	32	32	32	32	32	32			75	69	71	65					
16.	55	50	42	37	36	31	32	32	32	32	32	32	32			75	69	71	67					
17.	55	51	42	37	35	34	32	32	32	32	32	32	32			75	70	72	64					
18.	55	51	43	39	35	34	32	32	32	32	32	32	32			75	71	69	65					
19.	55	51	43	40	34	33	32	32	32	32	32	32	32			70	70	71	65					
20.	56	52	43	41	35	33	32	32	32	32	32	32	32			74	71	70	64					
21.	56	53	43	41	33	32	32	32	32	32	32	32	32			76	70	70	63					
22.	55	53	43	41	34	31	32	32	32	32	32	32	32			74	67	68	65					
23.	54	52	41	39	35	31	32	32	32	32	32	32	32			74	69	70	65					
24.	53	49	39	38	35	32	32	32	32	32	32	32	32			75	67	72	65					
25.	50	48	38	36	33	32	32	32	32	32	32	32	32			76	68	68	66					
26.	--	--	36	35	33	31	32	32	32	32	32	32	32			76	69	71	64					
27.	46	44	35	33	31	32	32	32	32	32	32	32	32			75	71	64	58					
28.	46	44	37	33	31	32	32	32	32	32	32	32	32			74	71	66	57					
29.	47	41	35	32	31	32	32	32	32	32	32	32	32			77	72	69	65					
30.	46	40	35	33	32	31	32	32	--	--	--	--	--			75	70	69	65					
31.	44	41	--	--	35	31	32	32	--	--	--	--	--			74	70	70	62					
Average.....	53	49	39	37	34	32	32	32	32	32	32	32	32	43	41	74	68	71	65					

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

STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued

EAST BRANCH PINE RIVER NEAR TUSTIN, MICH.

LOCATION.--Temperature recorder at gaging station on left bank 75 feet downstream from highway bridge, half a mile upstream from North Branch, 2 1/2 miles west of Tustin, Oscelota County, and 5 1/2 miles northwest of LeRoy.

DRAINAGE AREA.--63 square miles, approximately.

RECORDS AVAILABLE.--Water temperatures: July 1952 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 72°F June 15, 17, 18; minimum, 33°F Mar. 3-8, 12-16.

EXTREMES, 1952-54.--Water temperatures: Maximum, 72°F June 15, 17, 18, 1954; minimum, 33°F Mar. 3-8, 12-16, 1954.

REMARKS.--Stream frozen Dec. 15, 16, 22, 23, 26-29, Jan. 21, 22, 28, Feb. 7, 8, 18-20. Temperatures given for these periods are for the underflow.

Records of discharge for water year October 1953 to September 1954.

Temperature (°F) of water, water year October 1953 to September 1954  
 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.....	52	49	46	46	36	36	35	34	34	34	34	34	35	34	60	51	57	56	68	65	64	60	59	54
2.....	51	49	46	45	36	36	35	35	34	34	34	34	35	34	60	51	56	53	67	63	63	60	59	54
3.....	52	50	46	45	36	36	35	35	34	34	34	34	34	34	53	43	56	53	63	61	63	60	60	59
4.....	52	52	43	43	40	38	38	38	34	34	34	34	34	34	41	40	51	50	61	59	62	60	60	57
5.....	52	49	43	41	40	38	35	35	34	34	33	33	36	34	41	41	55	50	64	60	63	60	63	58
6.....	48	48	41	39	39	39	35	35	34	34	33	33	38	37	43	41	60	53	62	59	65	59	64	60
7.....	48	47	39	39	39	38	35	35	34	34	33	33	41	37	48	43	61	59	64	59	64	57	64	62
8.....	48	47	39	39	38	37	35	35	34	34	34	34	41	39	47	44	67	61	63	57	63	58	62	58
9.....	48	47	42	39	37	37	35	35	34	34	34	34	39	36	44	43	67	63	61	61	62	60	58	55
10.....	50	48	42	41	36	36	35	35	34	34	34	34	42	38	43	42	67	65	60	59	61	60	55	55
11.....	51	50	42	42	36	36	35	35	34	34	34	34	46	42	44	42	67	63	60	60	60	57	56	54
12.....	51	50	42	42	36	36	35	35	34	34	34	34	46	43	50	44	67	64	66	60	58	54	56	54
13.....	50	49	42	42	36	36	35	35	34	34	33	33	46	44	54	47	69	63	69	66	60	54	54	54
14.....	50	48	43	42	36	36	35	35	34	34	33	33	49	46	58	51	69	64	70	67	60	57	54	53
15.....	52	49	43	43	36	34	35	35	34	34	33	33	49	48	58	53	72	65	67	63	65	59	53	53
16.....	51	48	44	43	34	34	35	35	34	34	34	33	48	46	61	54	71	67	65	59	63	60	53	53
17.....	50	48	44	43	34	34	35	35	34	34	34	34	46	44	58	52	72	69	67	62	60	55	54	54
18.....	52	49	45	43	34	34	35	35	34	34	34	34	46	44	55	50	72	69	67	62	58	54	55	54
19.....	51	48	45	45	34	34	35	35	34	34	34	34	47	46	52	48	71	68	68	61	62	56	59	55
20.....	54	51	47	46	34	34	35	35	34	34	34	34	47	46	54	48	68	67	70	63	62	56	58	54
21.....	54	52	47	46	34	34	34	34	34	34	34	34	52	46	56	48	67	66	69	63	62	56	56	54
22.....	54	51	46	42	34	34	34	34	34	34	34	34	52	51	59	51	66	66	67	61	62	57	54	52
23.....	54	52	42	41	34	34	34	34	34	34	34	34	51	46	60	52	66	65	64	59	66	60	52	49
24.....	54	51	41	41	35	34	34	34	34	34	34	34	50	46	60	55	67	65	65	58	66	63	51	49
25.....	51	48	41	40	35	35	34	34	34	34	34	34	47	46	60	53	67	67	66	58	65	62	54	51
26.....	48	48	40	39	35	35	34	34	34	34	34	34	47	46	58	50	70	67	66	59	63	60	55	52
27.....	48	47	39	37	35	35	34	34	34	34	34	34	47	46	56	52	70	67	64	60	61	57	56	52
28.....	47	45	37	36	35	35	34	34	34	34	34	34	52	45	56	51	67	63	65	61	64	59	54	52
29.....	45	43	36	36	35	35	34	34	34	34	34	34	52	49	57	55	66	64	65	62	65	61	54	52
30.....	43	43	36	36	35	35	34	34	34	34	34	34	51	48	58	53	68	65	65	62	63	59	56	54
31.....	46	43	--	--	35	35	34	34	34	34	34	34	--	--	58	55	--	--	64	61	60	56	--	--
Average.....	50	48	42	41	36	35	35	35	34	34	34	34	45	42	54	49	66	62	65	61	63	58	57	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 highway bridge, 3½ miles downstream from East Branch, 5 miles northwest of Le Roy, and 5½ miles southwest of Lustin, Osceola County.

DRAINAGE AREA--118 square miles.

RECORDS AVAILABLE--water temperatures: January 1953 to September 1954.

EXTREMES, 1953-54--water temperatures: Maximum, 67° F June 17, 18; minimum, 32° F Mar. 4-7, 13, 15, 30, Apr. 4.

EXTREMES, 1953-54--water temperatures: Maximum, 69° F July 22, 1953; minimum, freezing point on several days during winter months.

REMARKS--Stream frozen Dec. 17, 21, 25, Jan. 1, 10, 11, 15, 17, 18, 21-23, 26-31, Feb. 7, 8, 12, 16-20, 27, 28, Mar. 4-7, 14. Temperature given for these periods are for the underflow. Records of discharge for water year October 1953 to September 1954 given in WSP 1337.

Temperature (°F) of water, water year October 1953 to September 1954

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



STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued  
PINE RIVER NEAR HOXEYVILLE, MICH.

LOCATION.--Temperature recorder at gaging station on right bank, 500 feet upstream from bridge on State Highway 37 bridge, 4 1/2 miles northwest of Hoxeyville, Wexford County, 7 miles east of Wellston, and 9 miles upstream from mouth.

DRAINAGE AREA.--251 square miles.

RECORDS AVAILABLE.--July 1952 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 65° F June 17; minimum, 35° F on many days during January, February, and March.

EXTREMES, 1952-54.--Water temperatures: Maximum, 66° F July 21-24, 1952; minimum, 33° F Feb. 2, 1953.

REMARKS.--Stream frozen Jan. 12, 24, 29, 30. Temperature given for these periods are for the underflow. Records of discharge for water year October 1953 to September 1954 given in WSP 1337.

Temperature (°F) of water, water year October 1953 to September 1954  
/Recorder with temperature attachment, continuous ethyl alcohol-actuated thermometer/

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

STREAMS TRIBUTARY TO LAKE HURON  
PIGEON RIVER NEAR VANDERBILT, MICH.

LOCATION--Temperature recorder at gaging station right bank at Pigeon River Fisheries Experiment Station, 10 miles east of Vanderbilt, Otsego County, and 10 1/2 miles southeast of Wolverine.  
DRAINAGE AREA--63 square miles, approximately.  
RECORDS AVAILABLE--Water temperatures: October 1950 to September 1954.  
EXTREMES, 1953-54.--Water temperatures: Maximum, 77° F June 18, minimum, freezing point on several days during January, February, and March.  
EXTREMES, 1950-54.--Water temperatures: Maximum, 78° F July 6, 7, 1952; minimum, freezing point on many days during winter months.  
REMARKS.--Stream frozen Dec. 16, 17, 23, 24, Dec. 30 to Jan. 4, Jan. 8 to Feb. 7, Feb. 11-14, Mar. 3-6, 13-17. Temperatures given for these periods are for the underflow. Records of discharge for water year October 1953 to September 1954 given in WSP 1337.

Temperature (°F) of water, water year October 1954 to September 1954  
/Recorder with temperature attachment, continuous ethyl alcohol-acetated 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.....	59	53	46	45	38	36	33	33	32	32	35	33	40	33	60	52	56	54	72	64	65	62	63	56
2.....	59	53	46	44	37	36	34	33	33	33	34	30	34	59	54	54	53	64	60	67	62	67	69	59
3.....	59	54	46	44	36	37	33	33	32	34	33	37	33	37	54	47	54	55	65	59	69	62	61	59
4.....	59	54	44	41	42	38	33	33	34	33	33	40	33	47	42	51	48	61	57	70	62	60	57	60
5.....	59	52	41	37	41	39	33	33	33	33	33	33	41	34	45	41	48	57	66	61	68	61	59	56
6.....	52	47	40	38	39	34	33	34	33	34	33	42	36	44	41	59	52	63	58	70	61	63	57	61
7.....	50	46	40	37	40	38	34	33	33	32	35	33	40	37	46	40	65	55	66	58	71	60	64	60
8.....	50	45	38	37	39	38	33	33	34	32	37	33	38	35	44	41	65	59	66	57	69	62	60	55
9.....	46	40	41	38	38	38	33	33	34	32	36	34	46	42	70	60	68	61	68	61	58	61	54	54
10.....	50	48	41	38	38	36	33	33	34	33	39	33	42	36	44	42	71	64	68	59	64	60	54	53
11.....	53	49	40	40	36	35	33	33	34	32	39	33	45	42	45	43	70	63	64	61	62	58	56	53
12.....	53	49	40	40	36	36	33	33	32	32	35	33	44	41	52	43	66	62	70	61	63	56	53	52
13.....	52	47	41	40	36	36	33	33	32	32	32	44	42	59	47	71	63	74	62	66	56	53	51	52
14.....	52	46	44	40	36	35	33	33	32	32	32	48	43	62	51	71	63	74	62	66	59	53	51	52
15.....	55	49	44	41	35	33	33	33	34	32	35	32	47	44	61	54	74	65	73	63	70	60	52	52
16.....	54	48	46	42	33	33	33	33	34	33	39	32	44	42	63	55	74	67	73	61	69	61	52	52
17.....	54	49	46	42	33	33	33	33	37	33	39	32	42	40	61	53	76	66	70	61	68	59	54	52
18.....	54	50	47	44	34	33	33	33	37	33	40	34	46	42	55	50	72	69	73	63	63	57	55	54
19.....	56	52	49	45	34	33	33	33	33	33	38	36	48	45	57	49	77	68	73	63	66	58	59	55
20.....	58	52	49	47	35	34	33	32	36	34	39	33	46	44	58	48	72	66	74	66	67	57	58	57
21.....	56	53	49	47	35	35	32	32	36	36	39	33	50	45	60	50	66	62	75	64	68	58	57	54
22.....	56	53	47	44	36	34	32	32	37	34	36	33	53	49	63	53	63	60	74	63	66	59	54	52
23.....	57	55	44	41	35	33	32	32	35	34	39	34	51	46	65	64	63	60	72	62	70	62	56	50
24.....	55	50	41	41	34	33	32	32	34	34	41	35	47	46	64	57	65	62	72	62	70	64	52	50
25.....	52	48	41	40	34	33	32	32	32	32	34	36	49	44	64	56	62	61	74	61	70	64	55	50
26.....	48	46	40	38	34	34	32	32	38	34	39	35	48	46	64	53	64	60	75	62	68	59	55	52
27.....	46	44	39	37	35	34	32	32	35	34	38	35	46	42	55	53	66	61	67	64	68	58	58	51
28.....	45	42	39	37	35	34	32	32	36	35	37	36	45	40	54	53	70	60	71	63	65	61	58	52
29.....	43	39	37	36	35	34	32	32	32	32	37	34	50	45	54	52	73	59	70	64	62	60	56	55
30.....	45	40	37	36	34	34	32	32	32	32	38	34	55	49	57	74	64	64	64	63	63	60	56	54
31.....	46	43	--	--	33	33	32	32	--	--	36	33	--	--	58	55	--	--	66	62	64	56	--	--
Average.....	53	48	43	41	36	35	33	33	35	33	37	33	45	41	55	49	66	60	70	61	67	60	57	54

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, and three quarters of a mile upstream from East Branch.  
DRAINAGE AREA 110 square miles.

RECORDS AVAILABLE.--Water temperatures: March 1953 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 77 June 27, 78; minimum, freezing point on many days during January and February.

EXTREMES, 1953-54.--Water temperatures: Maximum, 80 F June 20, 21, 1953; minimum, freezing point on many days during winter months.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1337.

Temperature (°F) of water, water year October 1953 to September 1954

/Recorder with temperature attachment, continuous ethyl alcohol-actuated thermograph/

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

STREAMS TRIBUTARY TO LAKE HURON--Continued  
AU SABLE RIVER AT MIO, MICH.

LOCATION.--Temperature recorder at gaging station on right bank 150 feet upstream from State Highway 33 bridge at Mio, Oscoda County, 10 miles downstream from Big Creek, and 80 miles upstream from mouth.  
DRAINAGE AREA.--1,100 square miles, approximately.  
RECORDS AVAILABLE.--Water temperatures: July 1952 to September 1954.  
EXTREMES, 1953-54.--Water temperatures: Maximum, 73°F June 19; minimum, 33°F on several days in February and March.  
EXTREMES, 1952-54.--Water temperatures: Maximum, 74°F July 27, 28, 1952; minimum, 32°F Jan. 8, 1953.  
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1337.

Temperature (°F) of water, water year: October 1953 to September 1954  
/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.....	55	54	44	44	38	37	36	36	34	34	35	35	37	36	54	50	59	57	70	68	69	67	64	64	
2.....	56	55	44	43	38	37	36	35	34	35	35	36	36	36	54	54	58	56	68	67	68	67	64	63	
3.....	57	55	44	44	38	37	35	35	34	36	35	36	36	36	56	54	58	55	67	65	68	67	64	63	
4.....	57	56	44	44	38	38	36	35	34	34	36	35	36	36	54	52	55	53	65	64	68	66	63	61	
5.....	56	54	44	43	39	38	35	34	34	34	35	35	36	36	52	48	53	52	64	62	67	67	63	61	
6.....	54	53	43	42	38	38	34	34	35	34	35	34	36	35	48	46	54	52	63	62	67	67	62	62	
7.....	53	52	42	42	39	38	34	34	34	35	34	34	36	35	46	44	56	53	62	61	68	67	65	62	
8.....	52	51	42	41	39	39	35	34	34	34	34	34	36	35	45	44	59	55	62	61	67	67	64	62	
9.....	51	50	41	39	39	39	37	35	34	34	34	34	36	35	45	44	63	57	63	62	69	66	62	61	
10.....	50	49	39	38	39	38	35	35	34	34	34	34	39	39	45	45	65	62	64	62	67	66	61	61	
11.....	49	49	39	38	38	37	36	35	34	34	34	35	42	39	46	45	65	64	63	62	66	64	61	59	
12.....	50	49	40	39	37	36	35	35	35	34	34	35	45	42	47	45	68	65	67	63	65	64	59	58	
13.....	51	49	40	40	36	36	35	35	34	35	35	35	46	45	48	47	70	67	65	64	64	64	58	56	
14.....	52	50	40	40	36	36	35	34	35	34	35	35	47	46	53	49	69	65	68	66	65	63	56	55	
15.....	52	51	41	40	36	36	35	34	34	34	35	34	48	47	56	51	68	66	66	66	66	66	63	55	54
16.....	52	51	43	41	36	36	35	34	34	34	34	33	48	48	58	55	69	67	69	67	66	65	64	53	
17.....	52	51	44	43	36	36	35	35	34	33	34	33	48	47	58	57	70	68	70	68	65	64	53	53	
18.....	52	51	45	44	36	36	35	35	35	33	33	33	47	46	57	56	72	69	71	69	64	63	54	53	
19.....	52	51	46	45	36	35	36	35	35	35	34	33	47	46	57	55	73	71	71	69	65	64	55	54	
20.....	52	51	46	46	35	35	35	35	34	35	35	34	47	46	56	54	72	70	71	69	65	63	56	55	
21.....	53	51	46	45	35	35	35	34	35	35	35	34	50	47	57	54	71	68	70	69	64	63	56	56	
22.....	53	51	48	46	35	35	35	35	35	35	35	35	50	49	59	53	69	67	71	69	64	63	56	56	
23.....	55	52	48	45	36	35	35	34	36	36	36	35	51	50	60	54	67	66	70	68	64	64	56	55	
24.....	54	52	45	44	36	36	35	34	34	36	36	35	51	50	60	56	68	66	71	70	67	66	55	54	
25.....	52	51	44	42	36	36	35	34	34	34	36	35	51	50	58	57	66	67	66	70	68	66	54	54	
26.....	51	51	42	41	36	35	34	34	36	36	36	35	50	48	58	56	68	66	71	69	67	65	54	54	
27.....	51	49	41	40	35	35	34	34	34	36	36	37	48	47	57	57	67	65	68	68	68	65	54	53	
28.....	49	47	40	40	35	35	34	34	36	35	37	37	47	46	58	57	66	64	69	68	67	65	54	53	
29.....	47	45	40	39	35	35	34	34	--	--	37	37	47	46	58	57	67	65	70	67	65	64	55	54	
30.....	45	44	39	38	36	35	34	34	--	--	37	37	50	47	56	69	66	67	68	64	64	64	57	55	
31.....	44	44	--	--	36	36	35	34	--	--	37	37	--	--	57	56	--	--	68	67	64	64	--	--	
Average.....	52	51	43	42	37	36	35	34	35	34	35	35	44	43	54	52	65	63	68	66	66	66	65	58	57

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 highway 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 1954.  
EXTREMES 1953-54.--Water temperatures: Maximum, 72° F June 15, 16, July 14; minimum freezing point on many days during winter months.  
EXTREMES 1951-54.--Water temperatures: Maximum, 75° F June 25, 1952; minimum freezing point on many days during winter months.  
REMARKS.--Stream frozen Dec. 16-26 Dec. 31 to Feb. 22, Mar. 4-8, 13-17. Temperatures given for these periods are for the underflow. Records of discharge for water year October 1953 to September 1954 given in WSP 1337.

Temperature (° F) of water, water year October 1953 to September 1954

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

STREAMS TRIBUTARY TO LAKE HURON--Continued  
 AU GRES RIVER NEAR NATIONAL CITY, MICH.

LOCATION.--Temperature recorder at gaging station on left bank, 1 1/2 miles upstream from Elm Creek, 4 miles southwest of National City, Iosco County, 12 1/2 miles southwest of Tawas City, and 1 1/2 miles upstream from mouth.  
 DRAINAGE AREA.--169 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1951 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 77°F July 13-15, 30, Aug. 23; minimum, freezing point on many days during December.

EXTREMES, 1951-54.--Water temperatures: Maximum, 83°F June 25, 1952; minimum, freezing point on many days during the winter months.

REMARKS.--Stream frozen Dec. 15 to Apr. 4. Temperatures given for these periods are for the underflow. Records of discharge for water year October 1953 to September 1954 given in WSP 1337.

Temperature (°F) of water, water year October 1953 to September 1954

/Recorder with temperature attachment, continuous ethyl alcohol-actuated thermograph/7

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

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 square miles approximately.  
RECORDS AVAILABLE.--Water temperatures: July 1950 to September 1954.  
EXTREMES, 1953-54.--Water temperatures: 66°F July 13, 14, 20; minimum, freezing point on several days during December and January.  
EXTREMES, 1950-54.--Water temperatures: Maximum 69°F June 25, 1952; minimum, freezing point on many days during winter months.  
REMARKS.--Stream frozen Dec. 15, 17, 23, 24, 31, Jan. 11-53, Feb. 7, 12, 13, 14, Mar. 3, 4, 7, 13, 14. Temperatures given for these periods are for the underflow. Records of discharge for water year October 1953 to September 1954 given in WSP 1337.

Temperature (°F) of water, water year October 1953 to September 1954  
Recorder with temperature attachment, continuous ethyl alcohol-actuated thermograph

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

STREAMS TRIBUTARY TO LAKE HURON--Continued  
RIFLE RIVER AT "THE RANCH" NEAR LIUPTON, 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.--54 square miles, approximately.

RECORDS AVAILABLE.--Water temperatures: July 1950 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 70° F June 30; minimum, freezing point on many days during winter months.

EXTREMES, 1950-54.--Water temperatures: Maximum, 72° F June 25, 26, 1952; minimum, freezing point on many days during winter months.

REMARKS.--Stream frozen Jan. 11-31, Feb. 7, 12, 13, Mar. 3, 4. Temperatures given for these periods are for the underflow. Records of discharge for water year October 1953 to September 1954 given in WSP 1337.

Temperature (°F) of water, water year October 1953 to September 1954  
/Recorder with temperature attachment, continuous ethyl alcohol-actuated thermometer/

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



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 1/2 miles north of Selkirk, Ogemaw County.

DRAINAGE AREA 19 square miles, approximately.

RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 70 F June 15; minimum, freezing point on many days during winter months.

EXTREMES, 1950-54.--Water temperatures: Maximum, 71 F June 26, July 13, 14, 1952, Sept. 1, 2, 1953; minimum, freezing point on many days during winter

REMARKS.--Stream frozen Dec. 15-17, 22-27, Dec. 30 to Apr. 4. Temperatures given for these periods are for the underflow. Records of discharge for the water year October 1953 to September 1954 given in WSP 1337.

Temperature (°F) of water, water year October 1953 to September 1954  
/Recorder with temperature attachment, continuous ethyl alcohol-acetated thermometer/

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

STREAMS TRIBUTARY TO LAKE HURON--Continued

RIFLE RIVER AT SELKIRK, MICH.

LOCATION--Temperature recorder at gaging station on left bank at upstream side of highway bridge at Selkirk, Ogemaw County, 1 1/2 miles downstream from Prior Creek.  
DRAINAGE AREA--110 square miles.

RECORDS AVAILABLE--Water temperatures: October 1950 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 74° F June 15; minimum, freezing point on many days during winter months.

EXTREMES, 1950-54.--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. 16-19, 23-25, Dec. 31 to Jan. 2, Jan. 4, Jan. 8 to Feb. 7, Feb. 12-14, Mar. 3-6, 14, 15. Temperatures given for these periods are for the underflow. Records of discharge for water year October 1953 to September 1954 given in WSP 1337.

Temperatures (° F) of water, water year October 1953 to September 1954

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

STREAMS TRIBUTARY TO LAKE HURON--Continued  
WEST BRANCH RIFLE RIVER NEAR SELKIRK, MICH.

LOCATION.--Temperature recorder at gaging station on left bank half a mile downstream from Campbell Creek, 3 1/4 miles upstream from mouth, 4 miles southwest of Selkirk, Ogemaw County, and 6 1/2 miles southeast of West Branch.

DRAINAGE AREA.--82 square miles, approximately.

RECORDS AVAILABLE.--Water temperatures: May 1952 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 76° F June 15; minimum, freezing point on many days during winter months.

EXTREMES, 1952-54.--Water temperatures: Maximum, 78° F June 20, 21, 1953; minimum, freezing point on many days during winter months.

REMARKS.--Stream frozen Dec. 16-19, 22-25, 27, Dec. 30 to Jan. 5, Jan. 7 to Feb. 22, Mar. 4-6, 13-22. Temperatures given for these periods are for the underflow. Records of discharge for water year October 1953 to September 1954 given in WBP 1337.

Temperature (°F) of water, water year: October 1953 to September 1954

/Recorder with temperature attachment, continuous ethyl alcohol-actuated thermograph

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

LOCATION.--At gaging station at bridge on State Highway 64 at Waterville, 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 1954.  
 Sediment records: April 1950 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 85°F July 30; minimum, 33°F on several days during February and March.  
 Sediment concentrations: Maximum daily, 2,240 ppm Mar. 26; minimum daily, 1 ppm on many days during October, November, and December.  
 Sediment loads: Maximum daily, 142,000 tons Mar. 26; minimum daily, less than 0.50 ton on several days during October, November, and December.  
 EXTREMES, 1950-54.--Water temperatures: Maximum, 90°F July 27, 1952; minimum, freezing point on many days during most winter months.  
 Sediment concentrations: Maximum daily, 2,240 ppm Mar. 26, 1954; minimum daily, 1 ppm on many days during October, November, and December 1953.  
 Sediment loads: Maximum daily, 142,000 tons Mar. 26, 1954; minimum daily, less than 0.50 ton on several days during October, November, and December 1953.  
 REMARKS.--Records of discharge for water year October 1954 given in WSP 1337. Flow affected by ice Dec. 17-20, 23-26, '31, Jan. 5-6, 9-23, Feb. 1.

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

## STREAMS TRIBUTARY TO LAKE ERIE--Continued

## MAUMEE RIVER AT WATERVILLE, OHIO--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	104	6	2	174	2	1	304	2	2
2.....	80	6	a 1	192	3	2	248	1	1
3.....	92	9	2	225	3	2	255	1	1
4.....	114	8	a 2	192	4	2	446	5	6
5.....	104	7	2	142	3	a 1	390	4	4
6.....	114	5	2	122	2	1	256	3	2
7.....	118	3	1	178	3	1	417	2	2
8.....	114	2	a 1	314	2	2	168	1	(t)
9.....	104	2	1	151	1	1	240	1	1
10.....	107	4	1	122	1	(t)	547	3	4
11.....	110	4	a 1	142	1	(t)	254	3	2
12.....	114	1	(t)	168	1	(t)	255	3	2
13.....	114	1	(t)	156	1	(t)	262	3	2
14.....	126	5	2	204	1	1	332	4	4
15.....	146	2	1	204	1	1	547	10	15
16.....	150	1	(t)	192	1	1	242	12	8
17.....	122	3	1	204	1	1	250	6	4
18.....	130	4	1	168	1	(t)	240	9	6
19.....	146	3	1	174	1	(t)	200	8	4
20.....	168	4	2	180	1	(t)	250	9	6
21.....	156	2	1	248	1	1	285	5	4
22.....	156	2	1	225	1	1	314	2	2
23.....	168	2	1	278	1	1	310	5	4
24.....	248	5	3	218	1	1	250	15	10
25.....	174	5	2	352	1	1	220	15	9
26.....	130	3	1	449	1	a 1	400	8	9
27.....	156	2	1	218	1	1	304	5	a 4
28.....	210	3	2	270	2	1	255	5	3
29.....	192	3	2	225	2	1	255	8	6
30.....	150	3	1	270	2	1	255	8	6
31.....	156	3	1	--	--	--	240	9	6
Total.	4, 273	--	41	6, 397	--	30	9, 191	--	139
		January		February		March			
1.....	232	8	5	1, 900	22	113	12, 600	212	7, 210
2.....	210	7	4	1, 330	20	144	12, 400	594	19, 900
3.....	255	6	4	904	52	127	10, 600	390	a 11, 000
4.....	2 0	9	6	937	62	157	8, 550	318	7, 340
5.....	220	8	a 5	709	68	130	5, 550	257	3, 850
6.....	200	7	4	547	60	89	5, 030	164	2, 230
7.....	240	6	a 4	484	55	72	3, 560	125	1, 209
8.....	255	7	5	827	66	147	3, 200	106	942
9.....	210	5	3	472	51	65	4, 120	109	1, 210
10.....	250	3	2	380	50	51	2, 840	71	544
11.....	210	9	5	304	50	41	3, 350	67	606
12.....	160	6	2	516	50	70	3, 170	68	582
13.....	170	7	3	361	47	46	3, 780	74	755
14.....	150	7	3	304	36	30	2, 870	75	581
15.....	160	7	3	352	32	30	1, 760	69	328
16.....	180	9	4	556	34	51	1, 760	61	290
17.....	190	8	4	4, 850	60	786	1, 360	53	197
18.....	190	9	a 5	4, 700	55	698	1, 140	46	142
19.....	190	10	a 5	3, 930	70	a 750	1, 330	43	154
20.....	180	11	5	3, 020	121	987	1, 610	40	174
21.....	300	14	a 11	3, 380	196	1, 790	2, 560	37	256
22.....	360	62	s 77	3, 200	149	1, 290	2, 280	35	215
23.....	360	34	33	2, 760	112	835	2, 480	38	254
24.....	534	12	17	2, 820	87	662	1, 780	36	173
25.....	534	4	6	1, 980	93	497	13, 600	413	s 22, 400
26.....	521	2	3	2, 120	97	555	23, 400	2, 240	142, 000
27.....	1, 270	37	s 150	2, 150	122	708	20, 600	2, 200	122, 000
28.....	2, 120	24	137	5, 180	122	1, 710	15, 600	1, 320	55, 600
29.....	2, 000	23	124	--	--	--	11, 900	968	31, 100
30.....	3, 500	44	416	--	--	--	10, 800	651	19, 000
31.....	2, 370	20	128	--	--	--	11, 700	476	15, 000
Total.	17, 661	--	1, 183	50, 973	--	12, 631	207, 300	--	467, 233

s Computed by subdividing day.

t Less than 0.5 ton.

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 1953 to September 1954  
 (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	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
Mar. 1, 1954	11:50 a. m.	12,600		188	351	--	89	96	97	98	100	--	--	--	--	--	BSWCM
Mar. 4	10:25 a. m.	8,550		320	316	77	91	98	99	--	--	--	--	--	--	--	BWCM
Mar. 25	5:20 p. m.	22,000		621	1,560	67	73	80	90	97	98	100	--	--	--	--	BSWCM
Apr. 9	5:00 p. m.	5,550		178	618	82	92	93	96	99	100	--	--	--	--	--	BSWCM
Apr. 30	4:45 p. m.	5,380		198	696	80	88	88	97	98	99	--	--	--	--	--	BSWCM
Aug. 31	10:00 a. m.	3,470		125	894	77	90	95	97	99	100	--	--	--	--	--	BSWCM

## 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: September 1952 to September 1954.

Sediment records: October 1950 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 90°F July 30; minimum, 33°F on several days during December, January, and February.

Sediment concentrations: Maximum daily, 788 ppm Mar. 25; minimum daily, 1 ppm on several days during November, December, and February.

Sediment loads: Maximum daily, 5,540 tons Mar. 25; minimum daily, less than 0.05 ton on many days during November, December, January, and February.

EXTREMES, 1950-54.--Water temperatures (1952-54): Minimum, freezing point Dec. 26-27, 1952.

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 to April, November, December 1953, February 1954.

Sediment loads: Maximum daily, 27,900 tons Mar. 12, 1952; minimum daily, less than 0.05 ton on many days during November 1951, November, December 1952, January, November 1953 to February 1954.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1337. Flow affected by ice Dec. 17-18, 24-26, Jan. 11-13, Feb. 13.

Temperature (°F) of water, water year October 1953 to September 1954  
(Once-daily measurement at approximately 4 p.m.)

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



## STREAMS TRIBUTARY TO LAKE ERIE--Continued

## PORTAGE RIVER AT WOODVILLE, OHIO--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	3.7	27	0.3	4.5	13	a 0.2	4.1	2	(t)
2.....	4.1	23	.2	3.3	13	.1	3.3	2	(t)
3.....	4.1	20	.2	3.7	16	.2	3.3	2	(t)
4.....	4.1	31	.3	3.3	12	.1	4.1	9	0.1
5.....	2.9	30	.2	2.7	6	(t)	3.7	12	a .1
6.....	3.1	20	a .2	2.5	2	(t)	7.3	10	.2
7.....	3.1	20	a .2	2.7	2	(t)	9.2	7	.2
8.....	2.9	24	.2	3.1	1	(t)	17	8	a .4
9.....	2.9	24	.2	2.9	1	(t)	9.8	11	.3
10.....	2.9	20	.2	2.9	1	(t)	6.1	6	.1
11.....	2.7	20	.1	2.9	5	(t)	5.7	1	(t)
12.....	2.5	32	.2	2.9	10	.1	4.9	1	(t)
13.....	2.3	30	a .2	2.9	9	.1	4.5	4	(t)
14.....	2.1	23	.1	3.1	9	a .1	6.1	2	(t)
15.....	2.1	22	.1	3.3	15	.1	7.9	4	a .1
16.....	2.1	28	.2	3.7	19	.2	7.3	8	.2
17.....	1.9	29	.1	3.3	19	.2	6	9	a .1
18.....	2.3	22	.1	3.3	11	.1	6	4	.1
19.....	3.1	22	.2	3.1	5	(t)	5.3	3	(t)
20.....	3.1	18	.2	3.1	8	.1	4.9	2	(t)
21.....	3.7	17	.2	3.3	25	.2	6.1	2	(t)
22.....	3.7	20	.2	4.1	24	.3	9.2	2	(t)
23.....	3.7	27	.3	4.1	9	.1	9.8	1	(t)
24.....	4.5	30	.4	3.7	2	(t)	8	1	(t)
25.....	5.3	22	.3	4.1	2	(t)	7	1	(t)
26.....	4.9	17	.2	5.3	2	(t)	7	1	(t)
27.....	5.7	18	a .3	5.3	2	(t)	7.9	1	(t)
28.....	6.9	20	.4	5.3	2	(t)	7.9	1	(t)
29.....	6.1	8	.1	5.3	2	(t)	7.3	1	(t)
30.....	6.9	9	.2	4.5	2	(t)	6.9	1	(t)
31.....	6.1	13	.2	--	--	--	5.7	2	(t)
Total.	115.5	--	6.5	108.2	--	2.6	209.3	--	2.4
	January			February			March		
1.....	6.1	4	a 0.1	48	22	2.8	1,210	302	987
2.....	6.5	6	.1	31	13	1.1	775	148	310
3.....	6.5	4	.1	22	10	.6	1,070	139	402
4.....	6.5	3	.1	20	6	.3	960	145	376
5.....	6.5	5	.1	18	8	.4	520	110	a 150
6.....	6.1	3	(t)	13	10	.4	361	100	a 95
7.....	6.1	4	.1	12	7	.2	270	100	a 70
8.....	6.1	4	.1	12	7	.2	338	98	89
9.....	7.3	3	.1	12	4	.1	464	75	94
10.....	6.9	3	.1	10	1	(t)	450	68	83
11.....	6	8	.1	9.8	1	(t)	291	54	42
12.....	6	6	.1	8.5	1	(t)	192	40	21
13.....	5	8	.1	8	1	(t)	151	35	14
14.....	4.9	6	.1	8.5	2	(t)	135	30	a 11
15.....	4.9	5	.1	10	9	.2	108	16	4.7
16.....	4.9	5	a .1	27	9	.6	79	11	a 2
17.....	5.7	3	(t)	425	304	s 478	63	13	2.2
18.....	6.5	5	.1	422	300	s 360	52	11	1.5
19.....	6.9	11	.2	180	100	49	54	7	1.0
20.....	16	20	a .9	116	47	15	79	14	a 3
21.....	31	35	a 3	170	65	s 39	183	27	13
22.....	46	25	a 3	460	351	436	158	27	12
23.....	41	12	1.3	216	142	83	120	22	7.1
24.....	29	6	a .5	137	63	23	105	20	5.7
25.....	22	4	.2	118	36	11	2,000	788	s 5,540
26.....	24	4	.2	108	27	7.9	3,220	515	4,480
27.....	82	40	a 9	118	27	8.6	1,440	220	855
28.....	212	87	50	420	170	sa 280	740	129	258
29.....	160	67	29	--	--	--	508	85	a 120
30.....	99	52	14	--	--	--	615	73	121
31.....	74	34	6.8	--	--	--	1,050	132	374
Total.	951.4	--	119.8	3,159.8	--	1,797.6	17,761	--	14,544.2

s Computed by subdividing day.

t Less than 0.05 ton.

a Computed from estimated concentration graph.

## STREAMS TRIBUTARY TO LAKE ERIE--Continued

## PORTAGE RIVER AT WOODVILLE, OHIO--Continued

## Suspended sediment, water year October 1953 to September 1954--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.....	765	92	190	116	29	9.1	20	8	0.4	
2.....	715	68	131	283	113	s92	88	12	2.8	
3.....	508	48	86	605	128	209	134	13	4.7	
4.....	289	25	a 20	765	135	279	120	11	3.5	
5.....	217	21	12	377	68	69	137	9	3.3	
6.....	195	22	12	217	42	25	95	7	a 2	
7.....	183	25	a 12	154	52	22	64	5	.9	
8.....	172	28	13	119	40	a 13	48	4	.5	
9.....	162	25	11	102	21	5.8	132	15	a 5	
10.....	139	21	7.9	89	15	3.6	102	13	3.6	
11.....	169	32	s 16	79	12	a 3	77	11	2.3	
12.....	990	--	--	77	9	1.9	49	12	1.6	
13.....	522	104	146	74	7	1.4	37	12	a 1	
14.....	320	46	40	67	5	a .9	29	14	a 1	
15.....	137	29	11	62	5	.8	24	29	1.9	
16.....	1,680	486	s 2,590	58	5	.8	310	264	s 359	
17.....	2,680	--	--	53	7	1.0	600	317	s 575	
18.....	1,780	--	--	49	10	1.3	198	85	45	
19.....	1,380	--	--	46	5	.6	104	45	13	
20.....	1,110	--	--	43	4	.5	66	40	a 7	
21.....	690	--	--	41	7	.8	48	53	6.9	
22.....	405	--	--	39	8	.8	45	52	6.3	
23.....	274	--	--	34	8	a .7	33	50	a 4	
24.....	224	--	--	26	8	.6	23	48	3.0	
25.....	186	--	--	20	11	.6	16	50	a 2	
26.....	158	--	--	16	9	.4	13	50	1.8	
27.....	290	--	--	17	8	.4	12	45	a 1	
28.....	308	--	--	16	8	.3	10	40	1.1	
29.....	188	--	--	15	8	.3	9.3	33	.8	
30.....	134	--	--	15	9	.4	7.1	37	.7	
31.....	--	--	--	15	8	.3	--	--	--	
Total.	16,970	--	s 12,800	3,689	--	745.3	2,650.4	--	1,061.1	
		July			August			September		
1.....	6.0	32	0.5	46	35	a 4	16	33	1.4	
2.....	6.0	30	.5	59	31	4.9	13	30	a 1	
3.....	8.7	30	.7	31	30	2.5	11	30	.9	
4.....	12	33	1.1	18	35	1.7	10	24	.6	
5.....	17	45	2.1	13	37	1.3	9.3	22	.6	
6.....	13	47	1.6	9.9	30	a .8	7.5	19	.4	
7.....	15	52	2.1	12	20	.6	6.4	18	.3	
8.....	67	70	a 13	10	20	.5	4.8	20	a .3	
9.....	95	42	11	8.1	24	.5	7.1	29	.6	
10.....	68	39	7.2	6.7	22	.4	7.5	33	.7	
11.....	41	60	a 7	6.0	22	.4	7.5	42	.8	
12.....	26	87	6.1	4.8	27	.3	8.1	29	.6	
13.....	17	65	3.0	4.8	14	.2	7.1	38	.7	
14.....	12	47	1.5	5.6	16	.2	6.4	39	.7	
15.....	9.9	44	1.2	6.4	15	.2	6.7	30	a .5	
16.....	8.1	37	.8	8.7	18	.4	8.1	38	.8	
17.....	6.7	27	.5	17	26	1.2	11	55	a 2	
18.....	6.0	20	a .3	19	31	1.6	14	55	2.1	
19.....	5.6	19	.3	36	33	s 3.6	14	41	1.5	
20.....	4.8	20	a .2	197	69	37	12	35	1.1	
21.....	5.2	25	.4	192	47	24	8.7	35	a .8	
22.....	46	44	s 5.8	92	40	a 10	6.4	41	.7	
23.....	40	42	4.5	53	36	5.2	7.5	35	.7	
24.....	28	45	3.4	31	36	3.0	8.1	35	.8	
25.....	19	30	1.5	29	37	2.9	9.9	36	1.0	
26.....	12	27	.9	43	29	3.4	9.9	30	a .8	
27.....	8.7	30	.7	104	36	10	9.3	23	.6	
28.....	6.4	29	.5	104	23	6.4	8.1	20	a .4	
29.....	6.4	20	a .3	62	25	a 4	6.0	30	.5	
30.....	6.4	18	.3	35	26	2.4	7.5	37	.7	
31.....	9.0	23	.6	22	33	2.0	--	--	--	
Total.	631.9	--	79.6	1,286.0	--	135.6	268.9	--	24.6	
Total discharge for year (cfs-days).....									47,801.4	
Total load for year (tons).....									31,319.3	

e Estimated.

s Computed by subdividing day.

a Computed from estimated concentration graph.

STREAMS TRIBUTARY TO LAKE ERIE--Continued  
PORTAGE RIVER AT WOODVILLE, OHIO--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954  
(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	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		
Feb. 22, 1954	4:30 p. m.	419		345	646	73	82	92	96	98	100	--	--	--	--	BSWCM
Mar. 25	8:30 p. m.	3,410		882	888	70	79	90	94	99	99	100	100	100	100	BSWCM
Mar. 25	8:30 p. m.	3,410		882	703	63	73	90	95	99	99	100	100	100	100	BSWCM
Mar. 28	4:30 a. m.	3,710		708	1,110	68	81	89	97	98	99	100	100	100	100	BSWCM
Mar. 28	9:45 a. m.	3,610		561	749	79	86	93	97	98	99	99	99	99	99	BSWCM
Mar. 27	12:45 p. m.	1,350		217	402	--	88	93	96	97	98	--	--	--	--	BSWCM
Apr. 16	4:10 p. m.	2,200		649	1,100	69	81	90	96	99	99	--	--	--	--	BSWCM
June 17	8:15 a. m.	765		402	700	80	86	89	97	98	99	--	--	--	--	BSWCM

## 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 1954.

Sediment records: October 1950 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 88°F June 12; minimum, freezing point on many days during December, January, and February.

Sediment concentrations: Maximum daily, 762 ppm Apr. 17; minimum daily, 1 ppm on many days during October, November, December, January, and September.

Sediment loads: Maximum daily, 19,900 tons Apr. 17; minimum daily, less than 0.05 ton Sept. 27-29.

EXTREMES, 1950-54.--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, October to December 1952, February, October to December 1953, January and September 1954.

Sediment loads: Maximum daily, 31,900 tons Mar. 12, 1952; minimum daily, less than 0.05 ton on several days during October 1952 and September 1954.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1337. Flow affected by ice Dec. 16-27, 31, Jan. 1-2, 11-26, 28, 31, Feb. 7-14.

Temperature (°F) of water, water year October 1953 to September 1954

Once-daily measurement at approximately 7 p. m.

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

## STREAMS TRIBUTARY TO LAKE ERIE--Continued

## SANDUSKY RIVER NEAR FREMONT, OHIO--Continued

Suspended sediment, water year October 1953 to September 1954

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.....	12	7	0.2	19	1	0.1	34	2	0.2
2.....	12	6	.2	23	2	.1	32	2	.2
3.....	10	5	.1	24	2	.1	30	1	.1
4.....	10	4	a.1	24	2	a.1	30	2	.2
5.....	10	4	a.1	24	2	.1	28	1	.1
6.....	12	3	.1	23	2	.1	34	1	.1
7.....	11	3	a.1	24	4	.2	40	4	.4
8.....	13	3	.1	26	2	.1	32	1	.1
9.....	13	3	a.1	26	5	.4	30	1	.1
10.....	13	3	a.1	24	7	.4	32	2	.2
11.....	13	3	.1	21	3	.2	34	1	.1
12.....	12	3	.1	21	1	.1	28	1	.1
13.....	13	2	.1	21	1	.1	28	1	.1
14.....	13	3	.1	21	2	.1	32	1	.1
15.....	13	3	.1	21	2	.1	49	1	.1
16.....	13	4	.1	21	1	.1	45	2	a.2
17.....	13	4	.1	21	2	.1	40	2	.2
18.....	13	6	.2	21	2	.1	35	3	.3
19.....	12	6	.2	21	2	.1	35	2	.2
20.....	10	8	.2	21	1	.1	35	1	.1
21.....	11	8	.2	21	3	.2	35	1	.1
22.....	11	4	.1	23	3	.2	40	2	.2
23.....	13	3	a.1	30	2	.2	45	2	.2
24.....	13	2	.1	32	4	.3	45	2	.2
25.....	13	3	.1	30	5	.4	40	1	.1
26.....	15	5	.2	32	3	.2	40	1	.1
27.....	17	6	.3	32	2	.2	45	2	.2
28.....	19	5	.2	40	4	.4	46	1	.1
29.....	17	2	.1	40	6	.6	43	1	.1
30.....	21	1	.1	34	3	.3	40	1	a.1
31.....	19	1	.1	--	--	--	35	2	.2
Total.	410	--	4.1	761	--	5.8	1,137	--	4.8
-----									
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.....	35	2	0.2	219	28	16	501	39	53
2.....	35	2	.2	170	25	a.11	556	38	57
3.....	32	2	.2	144	25	9.7	767	47	97
4.....	30	2	.2	117	25	a.8	1,020	47	129
5.....	34	4	.4	99	25	6.6	964	47	122
6.....	37	4	.4	87	23	5.4	744	37	74
7.....	37	3	.3	75	25	5.1	614	32	53
8.....	32	3	.2	70	23	4.3	635	44	75
9.....	32	2	.2	65	25	a.4	1,020	33	91
10.....	30	2	.2	60	22	3.6	1,360	47	172
11.....	30	3	.2	55	15	2.2	1,320	67	239
12.....	30	4	.3	50	9	1.2	978	50	132
13.....	30	3	.2	50	10	1.4	645	32	56
14.....	25	2	.1	50	7	.9	475	30	38
15.....	25	2	.1	49	10	1.3	386	28	29
16.....	25	1	.1	64	12	2.1	314	25	21
17.....	30	7	.6	91	7	1.7	260	30	21
18.....	30	6	.5	144	14	5.4	219	25	15
19.....	25	3	.2	254	17	12	196	17	9.0
20.....	40	3	.3	320	3	2.6	242	11	7.2
21.....	70	3	.6	334	7	6.3	458	24	30
22.....	65	4	.7	434	30	35	538	25	36
23.....	60	2	.3	450	26	32	519	32	45
24.....	55	1	.1	434	21	25	394	35	37
25.....	55	7	1.0	342	18	17	1,860	298	s 2,240
26.....	60	7	1.1	273	17	12	2,920	606	4,780
27.....	190	15	s.11	254	19	13	1,570	257	1,090
28.....	500	110	sb 150	327	25	a.20	992	135	362
29.....	732	74	146	--	--	--	842	98	223
30.....	614	38	63	--	--	--	1,730	220	b 1,000
31.....	350	50	47	--	--	--	3,040	176	1,440
Total.	3,375	--	425.9	5,081	--	264.8	28,079	--	12,773.2

s Computed by subdividing day.

b Computed from partly estimated concentration graph.

a Computed from estimated concentration graph.

## ST. LAWRENCE RIVER BASIN

## STREAMS TRIBUTARY TO LAKE ERIE--Continued

## SANDUSKY RIVER NEAR FREMONT, OHIO--Continued

## Suspended sediment, water year October 1953 to September 1954--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	3,270	150	a1,300	1,020	166	457	87	9	2.1
2.....	2,390	141	910	803	148	321	112	5	1.5
3.....	1,480	103	412	992	138	370	135	5	1.8
4.....	964	70	a180	1,500	130	526	112	4	1.2
5.....	710	52	100	1,170	109	344	95	7	1.8
6.....	594	52	83	868	79	185	87	8	a2
7.....	1,230	--	e700	624	66	111	72	7	a1
8.....	1,740	250	b1,200	463	60	78	68	7	1.3
9.....	2,310	288	1,800	409	46	51	64	7	1.2
10.....	2,480	365	2,440	379	40	41	58	6	.9
11.....	1,860	417	2,090	434	48	44	52	5	.7
12.....	2,920	345	2,720	434	42	49	43	5	.6
13.....	3,160	308	2,630	357	45	43	40	22	2.4
14.....	1,900	241	1,240	300	28	23	46	22	2.7
15.....	1,290	157	547	260	18	13	58	26	3.9
16.....	4,120	604	6,720	225	23	14	84	27	6.1
17.....	9,660	762	19,900	196	27	14	162	71	s 36
18.....	7,980	474	10,200	170	26	12	320	158	136
19.....	6,070	323	5,290	144	25	9.7	1,240	180	b550
20.....	3,270	220	a1,900	131	28	9.9	757	132	270
21.....	1,720	134	622	117	23	7.3	426	151	174
22.....	1,110	97	291	103	20	a6	280	140	106
23.....	842	82	186	95	19	4.9	185	75	37
24.....	732	74	146	87	22	5.2	131	56	20
25.....	1,270	92	316	84	18	4.1	99	49	13
26.....	1,020	65	a180	84	12	2.7	84	43	9.8
27.....	1,780	550	sb2,800	80	12	2.6	72	35	6.8
28.....	1,630	348	1,530	76	10	2.0	55	27	4.0
29.....	1,820	256	1,260	80	10	2.2	49	25	3.3
30.....	1,720	248	1,150	76	7	1.4	40	26	2.8
31.....	--	--	--	72	12	2.3	--	--	--
Total.	73,042	--	70,843	11,853	--	2,756.3	5,110	--	1,399.9
	July			August			September		
1.....	37	22	2.2	43	24	2.8	55	17	2.5
2.....	34	20	1.8	37	23	2.3	46	12	1.5
3.....	34	26	2.4	26	21	1.6	37	12	a1
4.....	37	23	2.3	24	18	1.2	30	13	a1
5.....	34	18	1.6	24	21	1.4	26	15	1.0
6.....	30	19	a2	34	20	1.8	32	15	1.3
7.....	43	22	2.6	34	16	1.5	28	22	1.7
8.....	64	19	3.3	34	18	1.6	23	15	.9
9.....	55	30	4.4	34	13	1.2	23	10	a.6
10.....	55	45	6.7	28	12	.9	19	10	a.5
11.....	46	25	3.1	24	8	.5	17	10	.4
12.....	43	18	2.1	24	2	.1	14	8	.3
13.....	37	17	1.7	23	2	.1	14	7	.3
14.....	30	18	1.4	24	9	.6	14	8	.3
15.....	26	20	1.4	24	11	.7	14	8	.3
16.....	26	18	1.3	32	9	.8	14	8	.3
17.....	23	19	1.2	32	10	.9	15	8	.3
18.....	23	17	1.0	32	11	1.0	15	12	.5
19.....	21	14	.8	45	16	1.9	15	5	.2
20.....	19	18	.9	366	94	s105	17	5	.2
21.....	23	37	2.3	338	61	s60	17	5	.2
22.....	34	48	4.4	159	39	17	14	5	.2
23.....	58	49	7.7	103	32	8.9	15	4	.2
24.....	64	37	6.4	87	21	4.9	13	3	.1
25.....	49	18	2.4	76	16	3.3	12	2	.1
26.....	40	15	1.6	84	14	a3	11	2	.1
27.....	32	17	1.5	87	14	3.3	10	1	(t)
28.....	26	22	1.5	140	28	10	10	1	(t)
29.....	26	25	a2	108	30	8.7	11	1	(t)
30.....	28	22	1.7	84	25	5.7	13	2	.1
31.....	26	21	1.5	68	24	4.4	--	--	--
Total.	1,123	--	77.2	2,280	--	257.1	594	--	16.2
Total discharge for year (cfs-days).....	132,845								
Total load for year (tons).....	88,828.3								

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--Continued  
 SANDUSKY RIVER NEAR FREMONT, OHIO--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954  
 (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	Discharge (cfs)	Water temperature (° F)	Suspended sediment		Percent finer than indicated size, in millimeters										Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500		1.000
Mar. 25, 1954	4:00 p. m.	2,550		464	488	--	85	91	94	96	98	--	--	--	--	--	BSWCM
Mar. 26	5:25 a. m.	3,390		828	1,320	73	87	94	96	99	100	--	--	--	--	--	BSWCM
Mar. 30	4:10 p. m.	1,880		251	491	80	90	93	96	97	100	--	--	--	--	--	BSWCM
Apr. 8	7:30 p. m.	1,960		307	595	77	87	94	98	99	99	--	--	--	--	--	BSWCM
Apr. 9	3:00 p. m.	2,410		282	881	65	83	90	96	99	100	--	--	--	--	--	BSWCM
Apr. 11	7:35 p. m.	2,000		435	868	84	88	93	98	99	100	--	--	--	--	--	BSWCM
Apr. 16	4:30 p. m.	4,500		649	691	67	78	84	95	97	100	--	--	--	--	--	BSWCM
Apr. 17	6:35 p. m.	10,200		754	766	72	78	86	83	96	99	100	--	--	--	--	BSWCM
Apr. 19	6:00 p. m.	5,540		297	572	69	80	86	90	96	99	100	--	--	--	--	BSWCM
Apr. 27	6:50 p. m.	1,880		698	668	75	90	96	98	99	99	--	--	--	--	--	BSWCM
Apr. 30	7:50 p. m.	1,430		229	472	76	86	92	96	98	100	--	--	--	--	--	BSWCM

## STREAMS TRIBUTARY TO LAKE ERIE--Continued

## HURON RIVER AT MILAN, OHIO

LOCATION.--At gaging station 45 feet downstream from bridge on U. S. Highway 250, a quarter of a mile northwest of Milan, Erie County, and 2 miles downstream from confluence of East and West Branches.

DRAINAGE AREA, 363 square miles.

RECORDS AVAILABLE.--Chemical analyses: March 1950 to February 1952.

Water temperatures: March to August 1950, July 1953 to September 1954

EXTREMES, 1930, 1953-54.--Water temperatures: Maximum 89 F June 12-14, 1954; minimum, freezing point on many days during winter months.

REMARKS.--Records of discharge for period July to September 1953 given in WSP 1337.

Temperature (°F) of water, July to September 1953  
/Continuous ethyl alcohol -actuated thermograph/

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



STREAMS TRIBUTARY TO LAKE ERIE

STREAMS TRIBUTARY TO LAKE ERIE--Continued  
HURON RIVER AT MILAN, OHIO--Continued

Temperature (°F) of water, water year October 1953 to September 1954  
Continuous ethyl alcohol-actuated thermograph

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

## STREAMS TRIBUTARY TO LAKE ERIE--Continued

## CUYAHOGA RIVER AT INDEPENDENCE, OHIO

LOCATION.--At gaging station at highway bridge on Rockside road, 1 mile northeast of Independence, Cuyahoga County, and 3 miles downstream from Tinkers Creek.

DRAINAGE AREA.--709 square miles.

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

Water temperatures: October 1948 to September 1949, August 1952 to September 1954.

Sediment records: October 1950 to September 1954.

EXTREMES, 1953-54.--Water temperatures: Maximum, 81°F June 20-21, July 14; minimum, freezing point Dec. 19, Jan. 12-13.

Sediment concentrations: Maximum daily, 1,650 ppm Mar. 25; minimum daily, 2 ppm on

several days during October, August, and September.

Sediment loads: Maximum daily, 34,000 tons Mar. 25; minimum daily, less than 0.50 ton

Aug. 3-4, 11, Sept. 3.

EXTREMES, (1948-49, 1952-54).--Water temperatures: Maximum, 88°F Aug. 18, 1949; minimum, freezing point Dec. 19, 1953, Jan. 12-13, 1954.

Sediment concentrations (1950-54): Maximum daily, 1,650 ppm Mar. 25, 1954; minimum

daily, 2 ppm on several days during August 1951, October 1953, August and September 1954.

Sediment loads (1950-54): Maximum daily, 34,000 tons Mar. 25, 1954; minimum daily,

less than 0.50 ton Aug. 3-4, 11, Sept. 3, 1954.

REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1337.

Temperature (°F) of water, water year October 1953 to September 1954  
/Once-daily measurement at approximately 5 p.m. /

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

## STREAMS TRIBUTARY TO LAKE ERIE--Continued

## CUYAHOGA RIVER AT INDEPENDENCE, OHIO--Continued

Suspended sediment, water year October 1953 to September 1954.

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.....	75	9	2	82	5	1	108	10	3
2.....	73	12	2	72	4	1	96	15	4
3.....	70	10	2	84	3	1	96	17	4
4.....	70	9	2	86	5	1	99	12	3
5.....	66	8	1	89	10	2	102	10	3
6.....	78	7	1	89	8	2	120	7	2
7.....	101	9	2	84	10	2	142	9	3
8.....	86	10	2	133	18	6	110	23	7
9.....	83	10	2	120	22	7	101	30	8
10.....	80	9	2	116	14	4	165	14	6
11.....	78	8	2	106	6	2	138	12	4
12.....	67	9	2	101	6	2	114	10	3
13.....	77	8	2	96	5	1	96	6	2
14.....	78	6	1	84	7	2	119	15	5
15.....	79	7	1	79	7	1	240	52	34
16.....	82	7	2	70	6	1	176	21	10
17.....	82	6	1	83	5	1	126	10	3
18.....	79	5	1	83	5	1	108	8	2
19.....	68	5	1	80	5	1	101	14	4
20.....	82	5	1	79	5	1	89	20	5
21.....	80	5	1	82	5	1	105	22	6
22.....	80	5	1	83	4	1	470	230	sa 320
23.....	82	6	1	113	14	4	513	172	s 268
24.....	84	8	2	104	5	1	205	46	25
25.....	90	7	2	124	11	4	160	21	10
26.....	77	4	1	135	21	8	106	14	4
27.....	92	4	1	89	6	1	108	13	4
28.....	97	3	1	99	10	3	87	11	2
29.....	97	2	1	90	16	4	101	11	3
30.....	96	2	1	77	14	3	114	12	4
31.....	89	4	1	--	--	--	99	12	3
Total	2,518	--	45	2,822	--	70	4,514	--	764
	January			February			March		
1.....	104	12	3	623	32	54	3,260	--	e 7,000
2.....	84	15	3	587	35	55	2,260	--	e 1,000
3.....	83	10	2	498	37	50	2,260	--	e 800
4.....	84	6	1	398	26	28	1,850	80	a 400
5.....	92	6	1	321	21	18	1,560	120	505
6.....	96	6	2	281	15	11	1,340	104	376
7.....	99	8	2	229	20	12	1,260	70	238
8.....	96	9	2	210	13	7	1,420	63	242
9.....	96	9	2	219	10	6	1,850	85	sa 450
10.....	126	12	4	204	16	9	2,380	150	a 650
11.....	92	14	3	278	18	13	2,050	97	537
12.....	101	10	3	213	19	11	1,900	74	380
13.....	97	9	2	174	30	14	1,900	71	364
14.....	99	25	7	174	27	13	1,650	59	263
15.....	104	35	10	878	160	sa 400	1,420	44	169
16.....	135	23	8	957	114	294	1,380	46	171
17.....	110	16	5	1,950	394	s 2,240	1,380	45	168
18.....	101	10	3	1,470	168	667	1,220	41	135
19.....	96	9	2	1,220	90	296	1,110	42	126
20.....	821	1,120	s 4,600	1,070	80	231	1,600	124	536
21.....	1,300	479	s 2,050	1,150	87	270	1,520	71	291
22.....	439	102	121	995	57	153	1,340	32	116
23.....	255	47	32	788	50	106	1,300	31	109
24.....	207	32	18	641	43	74	1,150	32	99
25.....	185	15	7	569	32	49	6,410	1,650	s 34,000
26.....	237	16	s 13	534	25	36	3,570	451	s 4,570
27.....	2,860	--	e 17,000	464	17	21	2,650	273	1,950
28.....	1,340	248	s 943	422	10	11	2,210	189	1,130
29.....	881	106	252	--	--	--	2,160	185	1,080
30.....	770	68	141	--	--	--	2,430	182	1,190
31.....	678	46	84	--	--	--	2,100	133	754
Total	11,877	--	25,326	17,517	--	5,149	61,890	--	60,099

e Estimated.

s Computed by subdividing day.

a Computed from partly estimated concentration graph.

## STREAMS TRIBUTARY TO LAKE ERIE--Continued

## CUYAHOGA RIVER AT INDEPENDENCE, OHIO--Continued

Suspended sediment, water year October 1953 to September 1954--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.....	1,600	106	458	2,000	150	810	157	14	6
2.....	1,300	92	323	1,900	175	898	318	--	e 35
3.....	1,150	95	295	1,950	165	869	242	24	16
4.....	957	73	189	1,750	114	539	392	55	sa 65
5.....	826	53	118	1,420	96	368	341	23	21
6.....	938	--	e 300	1,260	79	269	288	16	12
7.....	1,300	--	e 600	1,260	71	242	262	9	6
8.....	1,700	308	s 1,640	1,380	66	246	258	6	4
9.....	1,300	73	256	1,220	50	165	268	6	4
10.....	1,110	48	144	1,030	47	131	219	3	2
11.....	2,710	420	s 4,210	900	46	112	216	10	6
12.....	2,650	218	1,560	862	45	105	242	12	8
13.....	2,000	119	643	733	44	87	331	17	s 16
14.....	1,560	82	345	659	32	57	255	15	10
15.....	1,420	66	253	551	28	42	235	24	s 18
16.....	2,430	470	sa 5,400	464	38	48	258	33	23
17.....	5,020	524	s 8,000	426	18	21	328	31	27
18.....	2,540	190	1,300	498	19	26	235	12	8
19.....	2,260	114	696	328	14	12	278	13	10
20.....	1,800	91	442	239	10	6	344	13	12
21.....	1,600	71	307	226	8	5	358	11	11
22.....	1,560	--	e 400	210	8	4	351	13	12
23.....	3,090	231	1,930	191	8	4	481	--	e 100
24.....	2,100	111	629	157	7	3	324	25	22
25.....	1,560	66	278	182	6	3	268	16	12
26.....	1,870	251	s 2,220	171	8	4	213	11	6
27.....	5,260	908	12,900	162	9	4	185	11	5
28.....	4,530	384	4,700	185	10	5	127	10	3
29.....	2,870	228	1,770	275	--	e 20	127	8	3
30.....	2,260	158	964	194	9	5	108	12	3
31.....	--	--	--	136	6	2	--	--	--
Total.	63,271	--	53,270	22,919	--	5,112	8,009	--	486

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.....	118	10	3	116	7	2	77	12	2
2.....	116	10	3	86	4	1	84	5	1
3.....	100	9	2	81	2	(t)	84	2	(t)
4.....	90	7	2	74	2	(t)	79	5	1
5.....	72	7	1	93	3	1	73	8	2
6.....	60	7	1	127	7	2	70	8	2
7.....	81	6	1	87	5	1	75	8	2
8.....	136	7	2	75	5	1	83	8	2
9.....	100	7	2	65	7	1	100	9	2
10.....	114	5	2	82	7	2	96	11	3
11.....	79	4	1	79	2	(t)	100	10	3
12.....	77	4	1	72	3	1	87	10	2
13.....	82	3	1	71	4	1	74	10	2
14.....	76	3	1	73	5	1	82	7	2
15.....	77	5	1	173	--	e 20	93	9	2
16.....	76	7	1	134	10	4	145	--	e 30
17.....	70	6	1	192	14	7	106	8	2
18.....	60	5	1	110	3	1	212	122	s 89
19.....	65	7	1	159	8	3	285	--	e 80
20.....	75	8	2	156	10	4	136	20	7
21.....	100	12	3	110	5	1	144	29	11
22.....	82	8	2	87	3	1	166	55	a 25
23.....	74	10	2	77	7	1	112	22	7
24.....	72	12	2	91	8	2	94	10	2
25.....	70	8	2	205	--	e 25	84	18	4
26.....	70	5	1	191	9	5	79	10	2
27.....	70	6	1	144	9	3	72	12	2
28.....	70	8	2	112	10	3	88	12	3
29.....	75	8	2	96	9	2	82	6	1
30.....	82	7	2	82	7	2	141	--	e 60
31.....	82	5	1	92	15	4	--	--	--
Total.	2,571	--	50	3,392	--	103	3,203	--	353

Total discharge for year (cfs-days) ..... 204,503

Total load for year (tons) ..... 150,827

e Estimated.

t Less than 0.50 ton

s Computed by subdividing day.

a 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 1953 to September 1954

(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	Dis-charge (cfs)	Water temperature (° F)	Suspended sediment										Methods of analysis		
				Concentration of sample (ppm)	Concentration of suspended 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. 17, 1954	3:55 p.m.	2,260		467	905	45	51	66	81	92	96	98	--	--		BSWCM
Mar. 25	8:00 a.m.	7,450		4,370	1,880	42	54	68	83	93	97	98	--	--		BSWCM
Mar. 25	8:00 a.m.	7,450		4,370	2,070	30	44	59	84	94	97	98	--	--		BSNM
Mar. 25	12:40 p.m.	9,180		2,180	1,640	50	56	70	86	94	98	99	99	99		BSWCM
Mar. 25	4:55 p.m.	8,720		1,260	1,020	42	57	71	84	93	97	--	--		BSWCM	
Apr. 8	12:35 p.m.	2,320		806	768	41	52	63	77	86	92	96	98	98		BSWCM
Apr. 11	7:45 p.m.	3,980		718	1,300	33	45	56	72	82	94	97	99	99		BSWCM
Apr. 16	4:50 p.m.	2,260		806	782	42	47	60	75	86	93	97	--	--		BSWCM
Apr. 17	11:30 a.m.	5,500		458	820	41	50	63	75	87	93	96	98	98		BSWCM
Apr. 27	7:55 a.m.	5,340		1,220	2,180	39	53	66	81	90	95	97	98	98		BSWCM
Apr. 28	7:55 a.m.	5,260		422	775	46	57	66	74	85	91	98	--	--		BSWCM



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