Quality of Surface Waters of the United States 1947

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INTRODUCTION

This volume is the seventh in a series of reports giving chemical analyses, concentrations and loads of suspended sediment, and temperatures of the surface waters of the United States. The samples for which data are given were collected between October 1, 1946, and September 30, 1947. In addition, some suspended-sediment data for streams in the Missouri River Basin are included for the period November 1945 to October 1946. Descriptive statements are given for each sampling station for which regular series of chemical analyses or sediment determinations have been made. These statements include the location of the stream-sampling station, drainage area, length of time for which records are available, extremes of dissolved solids, total hardness, sediment loads, water temperature, and other pertinent data. Records of water discharge of the streams at, or near, the sampling point for the sampling period are included in most tables of analyses. The records are arranged by drainage basins, according to Geological Survey practice in reporting records of stream flow.

During the year ended September 30, 1947, 101 daily sampling stations for the study of the chemical character of surface waters were maintained by the Geological Survey. Samples were collected less frequently during the year at many other points. Water temperatures were measured daily at 80 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 consultation at the district offices listed under Division of Work, on page 19.

Quantities of suspended sediment are reported for 50 stations during the year ended September 30, 1947, and for 22 stations in the Missouri River Basin for the period November 1945 to October 1946. The sediment samples were collected from one to five times daily at most stations, depending on the rate of flow. Sediment samples were collected less frequently during the year at many other points. In connection with measurements of sediment discharge, sizes of the sediment particles were determined at 31 of the stations. As noted under "Remarks" in the table headings,

suspended-sediment concentrations were also determined from the samples collected for chemical analysis in some parts of the country. Records of these determinations are available for consultation in the district offices listed. 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.

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 includes the major part of the total sediment load. At the present time no reliable methods have been developed for determining bed load on a routine basis.

The records given on the following pages serve as a basis for determining the suitability of the waters examined for industrial, agricultural, and for 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 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.

COLLECTION AND EXAMINATION OF SAMPLES

CHEMICAL QUALITY

Samples for chemical analysis were usually collected daily at, or near, points on streams where gaging stations are maintained for measurement of water discharge. Most of the analyses were made on 10-day composites of daily samples collected for a period of a year at each sampling point. Three composite samples were usually prepared each month by mixing together equal quantities 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, samples were composited for shorter periods on the basis of the concentration of dissolved solids indicated by measments of specific conductance of the daily samples.

For streams in the Missouri River Basin the 10-day composite samples were prepared by taking from each daily sample a quantity proportionate to the mean daily water discharge.

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. Pub. 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. Eng. Office, 1948, pp. 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. During periods of subfreezing temperatures, samples in the Missouri Basin were collected by observers with the modified Colorado River sampler. At intervals throughout the year, suspended-sediment samples, consisting of depth-integrated samples at three or more verticals in the cross section were made 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 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 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 periods when no samples were taken, some daily sediment loads were estimated on the basis of water discharge, sediment concentrations or loads for adjacent days and similar periods, weather records, and comparison with records 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. Estimated sediment loads for missing periods 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 also are included. The particle sizes of the suspended sediments were determined periodically for many of the stations. Since much of the material carried in suspension can pass through the finest sieves, the bottom-withdrawal tube method (U. S. Eng. Office, 1943, pp. 82-90) was used in most of the analyses. Generally sieves were used in the determination of sizes in excess of 0.062 millimeter. Native or distilled water, as noted in the tables of analyses, was used as the settling medium. In some instances, chemical dispersing agents were added to the settling medium. As settling diameters of the clay and colloidal fractions are often affected by the chemical character of the settling medium, analyses made using native water more nearly simulate particle sizes existing in the stream. Results of analyses using distilled water or using a settling medium containing dispersing agents approximate ultimate particle sizes of the finer fractions. The concentration of sediment suspension for analysis was reduced to less than 10,000 parts per million, where necessary, by means of a sample splitter, in order to meet the limits recommended for the bottom-withdrawal tube method. The concentration of suspended sediment used in the bottom-withdrawal tube was often different from the concentration in the original suspension. The weight of sediment used is indicated in the tables of analyses.

TEMPERATURE

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

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 though 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 constituents. For convenience in making this conversion the reciprocals of chemical combining weights of the most commonly reported constituents are given in the following table:

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

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

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

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

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Specific conductance values are expressed in reciprocal ohms (mhos $\times 10^5$ at 25° C). For convenience the "mhos" are represented by "K" in the headings of the tables of analyses. The discharge of the streams is reported in second-feet (see Stream flow, p. 19) and the temperature in degrees Fahrenheit. Color is expressed in units of the platinum-cobalt scale proposed by Hazen (1892, pp. 427-428). Hydrogen-ion concentration (pH) is given as the negative logarithm of the number of moles of ionized hydrogen per liter of water.

Average analyses (arithmetical or weighted) for the water year are given for most daily sampling stations. An arithmetical-average analysis 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 analysis 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 analysis 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. The weighted-average analysis shows less concentrated water 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 except for streams in the Colorado River and Rio Grande Basins which are expressed in percent by weight because of the frequency of concentrations in excess of 10 percent. One percent is equivalent to 10,000 parts per million.

Daily sediment loads are expressed in tons per day, usually obtained by multiplying mean daily sediment concentration in parts per million by the mean daily discharge, and the conversion factor 0.0027.

Results of miscellaneous suspended-sediment discharge measurements are expressed in tons per day, obtained by multiplying instantaneous sediment concentration in parts per million, by the instantaneous discharge in second-feet, and the conversion factor 0.0027. Use of the same weight and time units in expressing both instantaneous rates and daily loads facilitates comparison.

Particle-size analyses are expressed in percentages finer than indicated sizes in millimeters. Other data included as pertinent to the size analyses for many streams are the date of collection, the stream discharge and sediment concentration, 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, and dissolved solids. Aluminum, manganese, color, pH, acidity, oxygen consumed, and borate are reported for certain streams. The source and significance of the different constituents and properties of natural waters are discussed in the following paragraphs.

MINERAL CONSTITUENTS IN SOLUTION

Silica (SiO_2)

Silica is dissolved from practically all rocks. Some natural surface waters contain less than 5 parts per million of silica and few contain more than 50 parts, but the more common range is from 10 to 30 parts per million. Silica affects the usefulness of a water because it contributes to the formation of boiler scales; 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 in fabrics and on porcelain fixtures. Appreciable quantities of manganese are often found in waters containing objectionable quantities of iron.

Iron (Fe)

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

Calcium (Ca)

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

Magnesium (Mg)

Magnesium is dissolved from many rocks, particularly from dolomitic rocks. Its effect in water is similar to that of calcium. The magnesium in soft waters may amount to only 1 or 2 parts per

million, but water in areas that contain large quantities of dolomite or other magnesium-bearing rocks may contain from 20 to 100 parts per million or more of magnesium.

Sodium and potassium (Na and K)

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

Carbonate and bicarbonate (CO_3 and HCO_3)

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

Sulfate (SO_4)

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

Chloride (Cl)

Chloride is dissolved from rock materials in all parts of the country. Surface waters in the humid regions are usually low in chloride, whereas streams in arid or semiarid regions may contain several hundred parts per million of chloride leached from soils and rocks, especially where the streams receive return drainage from irrigated lands. 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. 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. This condition becomes noticeable as the quantity of fluoride in water increases above 1 part per million. 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.

Nitrate (NO_3)

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

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

Borate (BO_3)

Boron has been found essential for plant growth, but in large quantities it is detrimental to citrus and other crops. Boron, as borate, is reported in analyses of surface waters in arid and semiarid regions of the Southwest and West where irrigation is practiced or contemplated, but few of the surface waters analyzed have harmful concentrations of boron.

Dissolved solids

The reported quantity of dissolved solids--the residue on evaporation--consists mainly of the dissolved mineral constituents in the water. It may also contain some organic matter and water of crystallization. Waters with less than 500 parts per million of dissolved solids are usually satisfactory for domestic and some industrial uses. Waters containing several thousands 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 a rough indication of the oxidizable matter in the unfiltered and filtered samples and gives a partial measure of polluting materials such as sewage and oxidizable industrial wastes. Naturally highly colored waters may have relatively high oxygen consumed, although waters that are not noticeably colored may contain oxidizable material.

Color

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

Hydrogen-ion concentration (pH)

The degree of acidity or alkalinity of water, as indicated by the hydrogen-ion concentration, expressed as pH, is related to the corrosive properties of water, and is useful in determining the proper treatment for coagulation that may be necessary at water-

treatment plants. A pH value of 7.0 indicates that the water is neither acid nor alkaline. Values progressively lower than 7.0 denote increasing acidity, whereas values progressively higher than 7.0 denote increasing alkalinity. The pH of water indicates its activity towards metal surfaces. As the pH increases the corrosive activity of the water decreases. 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 values less than 4.5.

Specific conductance ($Kx10^5$ 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 following changes in concentration of the total quantity of dissolved minerals in surface waters.

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. Hard water is also objectionable because of 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 are considered hard, and in the upper ranges laundries and industries may profitably soften the supply. 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. Besides the trouble caused by iron in water, 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. 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, pp. 8-9; Wilcox, 1948, p. 6).

SEDIMENT

Fluvial sediment is generally regarded as that sediment which is transported by, suspended in, or deposited by water. Suspended sediment is that sediment which remains in suspension in water owing to the upward components of turbulent currents or by colloidal suspension. Most fluvial sediment results from the normal process of erosion, which in turn is part of the geologic cycle of rock transformation. In some instances, this normal process may have been accelerated by agricultural practices. Sediment

also results from a number of industrial activities. In certain sections, waste materials from mining, logging, oil-field, and other industrial operations introduce large quantities of suspended as well as dissolved material.

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

PUBLICATIONS

Annual reports giving chemical analyses, suspended-sediment loads, and water temperatures of samples of surface water made by the Geological Survey have been published since 1941. Records for the years ended September 30, 1941, 1942, 1943, 1944, 1945, and 1946, for many of the stations listed in this report are given in Water-Supply Papers 942, 950, 970, 1022, 1030, and 1050.

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 in the following list 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 I, 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 waters of Georgia, 1944.
998. Suspended sediment in the Colorado River, 1925-41, 1947.

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 AND DIVISION OF WORK

The quality-of-water investigations in the States in the different drainage basins were made under cooperative agreements with the organizations listed on pages 16-18. The work 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 the district chemists and engineers as follows: In Arkansas, G. A. Billingsley; in Florida, S. K. Love; in Georgia, North Carolina, South Carolina and Virginia, W. L. Lamar; in Iowa, L. C. Crawford and P. C. Benedict; in New Mexico, C. S. Howard; in Ohio and Pennsylvania, W. F. White; in Oklahoma, I. W. Walling; in Texas, W. W. Hastings. Any additional analytical data for the sampling stations can be obtained by writing the responsible Survey district office shown.

Investigations of the quality of water and of suspended-sediment loads in the Colorado River Basin in Arizona, Colorado, Nevada, New Mexico, and Utah have been carried on as a continuing Federal project since 1925. The work was under the direction of C. S. Howard, district chemist, Albuquerque, N. Mex.

The chemical quality and sediment investigations in the Missouri River Basin in Colorado, Iowa, Kansas, Montana, Nebraska, North Dakota, South Dakota, and Wyoming were initiated in 1945. The studies were made as a part of the program of the Interior Department for development of the Missouri River Basin through funds provided directly to the Geological Survey for this purpose. The studies were made under the direction of P. C. Benedict, district engineer, Lincoln, Nebr. A few analyses of streams in the Hudson Bay Basin in North Dakota were made in connection with this program.

Financial assistance was furnished by the Bureau of Reclamation for quality-of-water studies in the Rio Grande Basin in New Mexico, the Lower Rio Grande Basin in Texas, and at Lake Mead, Ariz.-Nev., and by the Corps of Engineers, U. S. Army, for the investigations in the vicinity of Conchas Dam, N. Mex., on Arkansas River near John Martin Dam, Colo., and on the Trinity River in Texas.

State	Cooperating agency	Drainage basin	District office
Arkansas	Arkansas Bureau of Research, C. O. Brannen, director.	Lower Mississippi River	c/o Institute of Science and Technology, University of Arkansas, Fayetteville, Ark.
Florida	Cities of Miami and Miami Beach, Fla.	South Atlantic slope and Eastern Gulf of Mexico.	Water Resources Division, Washington, D. C.
Georgia	Georgia Department of Mines, Mining, and Geology, Garland Peyton, director.	South Atlantic slope and Eastern Gulf of Mexico Ohio River.	203 State Laboratory of Hygiene Building, Raleigh, N. C.
Iowa	Iowa Geological Survey, A. C. Trowbridge, director.	Upper Mississippi River	508 Hydraulic Building, Iowa City, Iowa.
New Mexico	New Mexico Interstate Stream Commission, John H. Bliss, secretary, and Colfax County Board of Commissioners, J. Dudley Hickman, chairman.	Lower Mississippi River, Western Gulf of Mexico.	918 West Park Avenue, Albuquerque, N. Mex.

State	Cooperating agency	Drainage basin	District office
North Carolina	North Carolina Department of Conservation and Development, R. Bruce Etheridge, director.	South Atlantic slope and Eastern Gulf of Mexico, Ohio River.	203 State Laboratory of Hygiene Building, Raleigh, N. C.
Ohio	Ohio Water Resources Board, C. E. McQuigg, chairman.	Ohio River, St. Lawrence River.	Water Resources Division, Washington, D. C.
Oklahoma	Oklahoma Planning and Resources Board, Clarence Burch, chairman, and Oklahoma A. & M. College Engineering Experiment Station.	Lower Mississippi River	1203 West Sixth St., Stillwater, Okla.
Pennsylvania	Pennsylvania Department of Commerce, O. J. Matthews, secretary.	North Atlantic slope, Ohio River, St. Lawrence River.	Water Resources Division, Washington, D. C.
South Carolina	South Carolina Research, Planning, and Development Board, R. M. Cooper, director.	South Atlantic slope and Eastern Gulf of Mexico.	203 State Laboratory of Hygiene Building, Raleigh, N. C.

State	Cooperating agency	Drainage basin	District office
Texas	Texas State Board of Water Engineers, consisting of C. S. Clark, (replaced by E. V. Spence) chairman, J. W. Pritchett, and H. A. Beckwith; Texas Red Bluff Water Power Control District. Lower Colorado River Authority, Brazos River Conservation and Reclamation District, and other local groups.	Lower Mississippi River and Western Gulf of Mexico.	302 W. 15th Street., Austin, Tex.
Virginia	Virginia Conservation Commission, W. A. Wright, chairman.	North Atlantic slope, South Atlantic slope.	203 State Laboratory of Hygiene Building, Raleigh, N. C.

STREAM FLOW

Records of stream discharge, used in conjunction with the chemical analyses and determinations of sediment concentrations in this volume, are published in Geological Survey reports on the surface-water supply of the United States. The discharge reported for a composite sample is usually the average of the mean daily discharges for the normal composite period. For analyses in which the composite periods differ from the normal 10- or 11-day period, the discharges reported are the averages of the mean daily discharges for the days indicated. The discharges reported in the tables of single analyses either are mean daily discharges or are instantaneous discharges for the particular times when the samples were collected.

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CHEMICAL ANALYSES, WATER TEMPERATURES, AND SUSPENDED SEDIMENT

NORTH ATLANTIC SLOPE BASINS

DELAWARE RIVER BASIN

DELAWARE RIVER AT BELVIDERE, N. J.

LOCATION.--At bridge approximately 50 feet upstream from Pequest River.
DRAINAGE AREA.--4,535 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1947.
Water temperatures: October 1944 to September 1947.
EXTREMES, 1946-47.--Specific conductance ($Kx10^5$ at 25° C.): Maximum, 7.75 July 1-10; minimum, 5.47 Apr. 1-10.
Water temperatures: Maximum, 81° F. Aug. 15; minimum, freezing point Jan. 10, 22.
EXTREMES, 1944-47.--Dissolved solids (1944-46): Maximum, 51 parts per million Sept. 1-10, 1945; minimum, 33 parts per million Mar. 21-31, 1945.
Total hardness (1944-46): Maximum, 35 parts per million Nov. 1-10, 1944; minimum, 20 parts per million Mar. 21-31, 1945, Mar. 1-10, 1946, May 21-31, 1946.
Specific conductance ($Kx10^5$ at 25° C.): Maximum, 8.23 July 11-20, 1946; minimum, 5.11 Mar. 21-31, 1945.
Water temperatures: Maximum, 81° F. Aug. 15, 1947; minimum, freezing point on many days in winter months.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1081. Records of specific conductance of daily samples are available in district office at Washington, D. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																Total	Noncarbonate
Oct. 1-10, 1946	3,549	60	12	7.3	7.15	2.5	0.05	8.0	2.0	2.6	22	12	2.1	0.3	50	28	10
Oct. 11-20	3,527	59	7	7.0	6.94	--	--	--	--	--	22	--	--	--	--	--	--
Oct. 21-31	3,769	57	8	7.1	7.00	--	--	--	--	--	23	--	--	--	--	--	--
Nov. 1-10	3,265	55	6	7.0	7.13	--	--	--	--	--	23	--	--	--	--	--	--
Nov. 11-20	3,041	47	6	7.1	7.44	--	--	--	--	--	26	--	--	--	--	--	--
Nov. 21-30	2,688	41	4	7.2	6.98	--	--	--	--	--	22	--	--	--	--	--	--
Dec. 1-10	2,592	37	5	7.1	7.37	--	--	--	--	--	22	--	--	--	--	--	--
Dec. 11-20	2,750	36	5	6.9	7.45	--	--	--	--	--	22	--	--	--	--	--	--
Dec. 21-31	3,415	34	5	7.0	7.23	3.1	.02	8.0	2.1	3.5	22	13	2.2	1.9	45	29	11
Jan. 1-10, 1947	4,466	34	4	6.7	7.43	--	--	--	--	--	15	--	--	--	--	--	--
Jan. 11-20	5,795	34	4	6.7	6.48	--	--	--	--	--	20	--	--	--	--	--	--
Jan. 21-31	14,680	35	7	6.5	6.03	--	--	--	--	--	13	--	--	--	--	--	--
Feb. 1-10	13,710	34	5	6.7	6.02	--	--	--	--	--	16	--	--	--	--	--	--
Feb. 11-20	6,093	34	4	6.7	6.70	--	--	--	--	--	18	--	--	--	--	--	--
Feb. 21-28	4,364	33	4	6.8	7.17	--	--	--	--	--	20	--	--	--	--	--	--
Mar. 1-10	4,253	35	5	6.8	7.25	--	--	--	--	--	22	--	--	--	--	--	--
Mar. 11-20	19,000	38	7	6.7	6.65	3.7	.01	7.2	1.9	2.2	17	12	2.0	1.6	43	26	12
Mar. 21-31	16,940	39	7	6.5	6.05	--	--	--	--	--	20	--	--	--	--	--	--

Apr. 1-10	32,240	46	7	6.4	5.47	--	--	--	--	--	15	--	--	--	--	--	--
Apr. 11-20	14,340	53	7	6.6	6.03	--	--	--	--	--	18	--	--	--	--	--	--
Apr. 21-30	11,450	50	5	6.6	6.30	--	--	--	--	--	18	--	--	--	--	--	--
May 1-10	23,300	53	7	6.4	6.17	--	--	--	--	--	17	--	--	--	--	--	--
May 11-20	13,190	57	5	6.4	6.38	--	--	--	--	--	19	--	--	--	--	--	--
May 21-31	23,080	66	7	6.0	6.08	--	--	--	--	--	16	--	--	--	--	--	--
June 1-10	10,540	66	7	6.1	6.77	--	--	--	--	--	22	--	--	--	--	--	--
June 11-20	9,135	68	7	6.3	7.06	--	--	--	--	--	23	--	--	--	--	--	--
June 21-30	5,896	71	7	6.3	7.36	--	--	--	--	--	26	--	--	--	--	--	--
July 1-10	9,425	74	7	6.7	7.75	--	--	--	--	--	27	--	--	--	--	--	--
July 11-20	12,920	73	15	6.4	6.07	3.1	0.01	6.4	1.8	3.5	20	11	1.5	1.2	42	23	7
July 21-31	15,010	72	15	6.5	5.80	--	--	--	--	--	18	--	--	--	--	--	--
Aug. 1-10	5,660	74	7	6.7	6.75	--	--	--	--	--	22	--	--	--	--	--	--
Aug. 11-20	7,737	76	15	7.1	6.63	--	--	--	--	--	19	--	--	--	--	--	--
Aug. 21-31	4,567	76	13	7.5	7.04	--	--	--	--	--	22	--	--	--	--	--	--
Sept. 1-10	3,834	75	5	7.0	7.40	--	--	--	--	--	24	11	--	--	--	--	--
Sept. 11-20	2,847	76	4	7.1	7.40	--	--	--	--	--	25	11	--	--	--	--	--
Sept. 21-30	2,396	61	6	7.1	7.52	--	--	--	--	--	25	11	--	--	--	--	--
Average	9,116	54	7	--	6.79	--	--	--	--	--	21	--	--	--	--	--	--

DELAWARE RIVER BASIN--Continued

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

Temperature (°F.) of water, water year October 1946 to September 1947

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

DELAWARE RIVER AT TRENTON, N. J.

LOCATION.--At Trenton Water Works, raw-water intake, Calhoun Street.
DRAINAGE AREA.--6,780 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1947.
Water temperatures: October 1944 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 116 parts per million Sept. 11-20; minimum, 52 parts per million Apr. 1-10.
Total hardness: Maximum, 74 parts per million Sept. 21-30; minimum, 32 parts per million Apr. 1-10.
Water temperatures: Maximum, 83° F. July 6; minimum, 33° F. Feb. 22.
EXTREMES, 1944-47.--Dissolved solids: Maximum, 117 parts per million Sept. 11-20, 1945; minimum, 44 parts per million Mar. 21-31, 1945.
Total hardness: Maximum, 85 parts per million Sept. 11-20, 1945; minimum, 28 parts per million Mar. 21-31, 1946.
Water temperatures: Maximum, 83° F. July 6, 1947; minimum, 33° F. Dec. 20, 22, 23, 1944, Feb. 22, 1947.
REMARKS.--Temperature records furnished by the City of Trenton, N. J. Records of water discharge for the water year October 1946 to September 1947 are given in Water-Supply Paper 1081. Records of specific conductance, alkalinity, and pH of daily samples are available in district office at Washington, D. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																Total	Noncarbonate
Oct. 1-10, 1946	5,600	62	--	7.4	15.4	3.0	0.08	16	5.1	5.1	43	25	5.6	3.3	91	61	26
Oct. 11-20	5,398	60	4	7.3	15.6	3.0	.04	16	5.4	6.1	44	27	6.0	3.5	93	62	26
Oct. 21-31	5,847	58	6	7.3	14.4	3.0	.05	16	5.0	4.6	42	25	5.2	3.3	85	60	26
Nov. 1-10	5,188	59	7	7.3	14.5	2.4	.04	16	5.1	4.6	42	25	5.6	3.1	88	61	26
Nov. 11-20	4,664	50	5	7.2	14.6	2.0	.04	16	5.4	4.0	42	25	5.5	3.2	86	62	28
Nov. 21-30	4,132	47	4	7.2	16.0	1.8	.04	17	5.8	5.5	47	27	6.2	3.6	95	66	28
Dec. 1-10	3,981	40	6	7.2	15.6	1.6	.05	17	5.6	3.8	46	24	5.8	3.4	91	65	28
Dec. 11-20	4,053	44	3	7.1	16.6	3.0	.03	17	5.9	5.3	45	27	7.0	4.3	96	67	30
Dec. 21-31	5,534	37	5	7.3	15.4	4.6	.04	16	5.2	5.5	39	29	5.5	4.2	92	61	29
Jan. 1-10, 1947	6,051	37	4	7.1	14.1	4.6	.03	15	5.8	2.9	37	25	5.5	4.2	84	61	31
Jan. 11-20	8,809	38	5	6.9	13.2	3.6	.04	14	4.2	4.3	33	26	2.6	4.8	81	52	25
Jan. 21-31	20,270	37	4	6.9	9.59	5.4	.02	11	3.3	3.9	24	20	4.0	4.3	66	41	21
Feb. 1-10	19,710	37	6	6.9	9.43	4.6	.03	13	3.3	1.7	22	19	3.2	3.0	64	41	23
Feb. 11-20	9,583	36	3	7.0	12.4	4.8	.03	13	3.9	5.2	32	23	4.5	4.0	81	48	22
Feb. 21-28	6,800	34	4	7.1	14.4	4.0	.05	16	4.4	4.8	38	25	5.5	4.2	94	58	27
Mar. 1-10	8,149	38	4	6.9	13.8	4.6	.04	14	5.1	4.8	35	26	5.2	4.0	86	56	27
Mar. 11-20	26,320	41	5	6.9	11.2	4.6	.05	12	4.1	3.5	28	22	3.8	4.0	72	47	24
Mar. 21-31	22,300	43	5	6.8	8.76	4.5	.02	9.2	2.8	2.7	20	17	2.8	2.8	55	34	18

DELAWARE RIVER BASIN--Continued

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

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																Total	Non-carbonate
Apr. 1-10, 1947	38,280	47	7	6.8	8.17	4.8	0.03	8.6	2.6	2.9	18	17	2.6	2.9	52	32	17
Apr. 11-20	20,330	53	4	6.9	9.08	4.4	.03	9.8	2.9	3.2	23	18	2.8	2.3	57	36	18
Apr. 21-30	15,860	52	5	6.9	9.74	3.9	.03	11	3.1	2.9	26	18	3.4	2.0	60	40	19
May 1-10	33,450	56	6	7.2	9.04	4.6	.03	9.8	3.0	3.3	22	20	2.4	2.2	61	37	19
May 11-20	18,950	57	5	7.3	9.74	3.8	.08	10	3.3	4.8	27	20	3.0	2.1	63	38	16
May 21-31	35,220	65	8	6.8	9.06	4.6	.12	9.9	3.0	2.7	23	18	2.5	2.1	63	37	18
June 1-10	18,040	66	6	7.0	11.0	5.2	.12	12	3.8	3.2	30	20	3.5	2.8	75	46	21
June 11-20	15,290	70	8	6.7	12.3	5.0	.08	13	4.4	4.3	35	23	3.4	3.0	74	51	22
June 21-30	9,516	72	4	7.1	13.8	3.4	.09	15	5.4	3.6	42	24	4.2	2.8	89	60	25
July 1-10	14,120	79	5	7.0	14.3	4.0	.09	15	5.6	4.4	44	25	3.8	3.2	94	60	24
July 11-20	22,730	73	8	6.6	9.62	4.0	.02	10	3.2	2.3	24	17	2.8	2.3	57	38	18
July 21-31	21,680	74	13	6.7	8.99	3.6	.04	9.4	2.8	3.4	24	17	2.8	1.4	59	35	15
Aug. 1-10	9,097	74	5	6.7	12.5	3.0	.09	14	4.5	3.5	35	23	4.9	2.0	85	53	25
Aug. 11-20	10,840	78	8	6.6	11.9	3.0	--	14	4.4	3.0	35	22	4.1	2.8	84	53	24
Aug. 21-31	7,430	77	6	6.7	13.3	4.2	--	14	4.8	4.5	37	23	5.6	2.8	93	55	24
Sept. 1-10	6,020	75	3	6.8	15.3	4.0	.04	16	5.4	5.2	43	27	5.1	3.6	112	62	27
Sept. 11-20	4,724	77	4	7.0	16.5	3.0	.06	17	6.0	5.6	48	27	6.5	3.3	116	67	28
Sept. 21-30	4,188	64	4	7.4	17.4	4.0	.03	19	6.4	3.9	52	26	6.9	3.4	103	74	31
Average	13,390	56	5	--	12.7	3.8	0.05	14	4.4	3.9	35	23	4.4	3.2	80	53	24

Temperature (° F.) of water, water year October 1946 to September 1947

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

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT CATASAUQUA, PA.

LOCATION.--At Race Street bridge.
DRAINAGE AREA.--1,012 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1947.
Water temperatures: October 1944 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 115 parts per million Dec. 11-20; minimum, 52 parts per million Apr. 1-10.
Total hardness: Maximum, 68 parts per million Sept. 11-20, 21-30; minimum, 28 parts per million Apr. 1-10.
Water temperatures: Maximum, 75° F. Aug. 16, Sept. 14; minimum, freezing point on many days in December, January, February, and March.
EXTREMES, 1944-47.--Dissolved solids: Maximum, 169 parts per million Oct. 1-10, 1944; minimum, 47 parts per million Mar. 11-20, 1946.
Total hardness: Maximum, 106 parts per million Oct. 1-10, 1944; minimum, 26 parts per million Mar. 11-20, 1946.
Water temperatures: Maximum, 77° F. July 2, 1945; minimum, freezing point on many days in winter months.
REMARKS.--Records of water discharge were computed on the basis of records for Lehigh River at Bethlehem, Pa. Records of specific conductance and pH of daily samples are available in district office at Washington, D. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1946	1,058	56	--	7.2	16.5	5.2	0.04	16	5.0	7.2	21	50	3.0	--	3.3	103	60	43
Oct. 11-20	1,120	55	5	6.8	15.1	3.6	.07	14	4.9	5.7	14	47	3.2	--	3.3	94	55	44
Oct. 21-31	1,256	54	4	6.7	12.8	3.8	.06	12	4.5	4.2	12	41	2.5	--	2.0	80	48	39
Nov. 1-10	1,034	54	4	6.8	14.0	4.6	.04	13	4.9	4.7	11	46	3.0	--	2.1	86	53	44
Nov. 11-20	837	45	4	6.9	15.0	4.2	.06	13	5.1	6.3	15	47	3.0	--	2.1	91	53	41
Nov. 21-30	735	40	3	6.8	16.5	4.2	.03	16	5.5	6.0	14	56	2.8	--	2.2	105	62	51
Dec. 1-10	632	36	3	6.8	17.9	4.4	.02	17	5.9	6.8	14	60	3.5	--	3.2	112	67	55
Dec. 11-20	621	37	3	7.0	18.4	3.6	.03	17	5.9	8.7	17	62	3.5	--	2.6	115	67	53
Dec. 21-31	1,003	33	2	7.1	14.6	4.4	.03	14	4.7	6.4	14	48	3.2	--	2.8	92	54	43
Jan. 1-10, 1947	869	32	3	6.7	13.8	5.4	.03	13	4.9	4.3	12	43	2.8	--	4.1	87	53	43
Jan. 11-20	1,479	34	3	6.7	12.6	4.6	.04	12	3.9	6.1	12	41	2.8	--	3.4	80	46	36
Jan. 21-31	3,207	36	3	6.4	9.84	5.5	.06	10	3.1	3.1	9	30	2.4	--	3.1	63	38	30
Feb. 1-10	2,827	34	4	6.7	9.97	5.5	.05	9.7	3.1	4.0	10	30	2.6	--	3.3	62	37	29
Feb. 11-20	1,394	32	2	6.7	11.6	4.2	.03	11	3.9	5.0	12	37	2.4	--	3.3	75	44	34
Feb. 21-28	1,014	32	2	6.7	13.9	4.2	.04	13	4.5	6.0	15	44	2.5	--	2.8	88	51	39
Mar. 1-10	1,101	33	2	6.7	13.9	4.8	.04	13	4.6	5.4	14	44	2.6	--	2.7	86	51	40
Mar. 11-20	4,210	36	4	6.5	10.1	5.3	.05	10	3.0	4.0	10	31	2.2	--	2.9	68	37	29
Mar. 21-31	2,845	38	4	6.5	8.33	4.6	.04	7.8	2.6	3.3	7	26	2.1	--	2.0	54	30	24

Apr. 1-10	3,947	44	8	6.4	7.78	4.7	.14	7.3	2.4	3.2	7	24	2.0	--	1.8	52	26	22
Apr. 11-20	2,805	49	3	6.5	8.77	4.2	.05	8.2	2.9	3.7	9	26	2.0	--	1.5	58	32	25
Apr. 21-30	2,466	47	4	6.4	8.60	3.8	.07	7.6	2.9	3.6	8	27	2.1	--	1.9	57	31	25
May 1-10	5,122	51	7	6.4	8.28	3.9	.08	8.2	2.7	2.8	9	25	1.6	--	2.2	56	22	24
May 11-20	2,739	54	3	6.4	9.20	3.6	.04	8.4	3.1	3.7	9	29	1.9	--	1.9	61	34	26
May 21-31	6,805	80	8	6.5	8.78	4.0	.12	9.2	2.7	2.4	10	26	1.8	--	1.9	60	34	26
June 1-10	3,194	80	5	8.4	10.5	5.3	--	9.6	3.6	3.5	9	33	2.4	--	2.1	74	39	32
June 11-20	2,519	65	4	6.7	11.3	5.6	--	11	3.7	3.7	13	33	2.5	--	2.8	76	42	32
June 21-30	1,447	66	3	6.2	13.6	5.2	--	13	4.8	4.4	14	42	3.0	--	3.0	87	52	41
July 1-10	3,530	70	4	6.5	13.4	4.2	.05	12	4.6	5.7	13	43	2.5	--	2.7	94	49	38
July 11-20	5,458	66	7	5.6	8.92	4.4	.11	7.8	3.1	3.6	4	32	1.5	--	1.6	64	32	29
July 21-31	3,440	66	4	6.1	9.10	4.2	.04	8.1	3.2	4.1	6	32	2.0	--	1.5	64	33	28
Aug. 1-10	1,553	69	3	6.5	12.4	4.7	.04	11	4.4	5.5	10	42	2.8	--	2.0	86	46	37
Aug. 11-20	1,474	72	5	6.2	11.7	4.6	--	11	4.3	3.7	10	39	2.0	--	2.0	83	45	37
Aug. 21-31	1,107	71	3	6.3	13.5	4.6	.09	13	4.8	4.8	12	45	2.6	--	2.8	99	52	42
Sept. 1-10	964	70	2	6.6	14.5	4.2	.05	14	5.1	4.8	14	47	3.0	--	2.2	107	56	44
Sept. 11-20	767	71	3	6.7	17.7	5.2	.03	17	6.2	6.4	17	58	3.2	0.0	3.6	114	68	54
Sept. 21-30	719	57	2	6.8	17.8	4.6	.03	17	6.1	5.6	17	56	3.4	.1	3.6	111	68	54
Average	2,161	51	4	--	12.5	4.5	0.05	12	4.2	4.6	12	40	2.6	--	2.6	62	47	37

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT CATASAUQUA, PA.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

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

LEHIGH RIVER AT GLENDON, PA.

LOCATION.--At bridge, 2.3 miles upstream from Delaware River.
DRAINAGE AREA.--1,370 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
REMARKS.--Analyses are of composites of samples collected from three points in cross section. Water discharge computed on basis of records for Lehigh River at Bethlehem.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	Color	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Hardness as $CaCO_3$	
													Total	Non-carbonate
Oct. 9, 1946	959	6	7.1	26.2	--	--	--	--	65	55	8	11	113	--
Nov. 4	1,390	3	7.0	20.1	--	--	--	--	--	--	--	--	--	--
Dec. 4	801	6	6.8	25.4	--	--	--	--	--	--	--	--	--	--
Jan. 9, 1947	1,110	10	7.2	22.2	--	--	--	--	--	--	--	--	--	--
Feb. 14	1,850	4	7.4	17.2	0.28	17	6.9	6.1	38	39	6	4.7	71	40
Mar. 19	4,220	8	7.2	11.8	.29	12	4.8	1.1	22	25	3	4.4	50	32
Apr. 25	3,020	10	7.1	13.1	.29	14	5.3	2.1	26	29	5	3.4	57	35
May 31	5,370	8	6.8	11.4	.14	13	4.3	1.7	22	29	2	3.6	50	32
July 5	1,330	8	7.2	21.6	.18	23	9.4	4.1	56	45	5	6.3	96	50
Aug. 11	1,960	3	7.1	16.7	.13	16	7.4	3.7	34	39	4	5.4	70	43
Sept. 15	1,020	3	7.0	25.4	--	25	11	9.6	66	57	6	8.3	108	54

NESHAMINY CREEK NEAR LANGHORNE, PA.

LOCATION.--At bridge on State Highway 213, half a mile downstream from Mill Creek.
DRAINAGE AREA.--210 square miles.
RECORDS AVAILABLE.--Chemical analyses: November 1946 to September 1947.
REMARKS.--Analyses are of composites of samples collected at three points in cross section. Water discharge based on records for Neshaminy Creek near Langhorne.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	Color	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Hardness as $CaCO_3$	
													Total	Non-carbonate
Nov. 15, 1946	34	8	7.8	23.3	--	--	--	--	79	21	13	1.7	93	28
Dec. 16	28	7	8.0	24.1	--	--	--	--	73	30	14	7.4	92	32
Jan. 24, 1947	190	25	7.2	19.2	--	--	--	--	34	40	6	8.6	81	53
Feb. 28	74	8	7.3	19.4	0.08	17	7.0	8.4	44	30	10	9.9	71	35
May 9	358	12	7.3	16.6	.12	15	5.8	9.1	37	35	7	5.6	61	31
June 12	172	10	--	17.2	.12	16	5.9	8.0	44	31	6	6.0	64	28
July 18	85	7	6.9	21.3	.10	17	7.4	11	60	27	11	5.0	73	24
Aug. 16	54	7	7.3	19.9	.10	17	6.9	11	56	29	12	1.9	71	25
Sept. 26	55	12	7.0	20.3	--	--	--	--	59	26	12	4.6	--	--

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT POTTSTOWN, PA.

LOCATION.--At Hanover Street bridge, 70 feet from west bank of river.
DRAINAGE AREA.--1,147 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1947.
Water temperatures: October 1944 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 360 parts per million Aug. 21-31; minimum, 138 parts per million Mar. 21-31.
Total hardness: Maximum, 225 parts per million Aug. 21-31; minimum, 81 parts per million May 1-10.
Water temperatures: Maximum, 81° F. July 30, Aug. 16; minimum, freezing point on several days in February.
EXTREMES, 1944-47.--Dissolved solids: Maximum, 393 parts per million Oct. 11-20, 1944; minimum, 119 parts per million Mar. 1-10, 1945.
Total hardness: Maximum, 258 parts per million Oct. 11-20, 1944; minimum, 79 parts per million Mar. 1-10, 1945.
Water temperatures: Maximum, 83° F. July 2, 1945; minimum, freezing point on many days in winter months.
REMARKS.--Records of water discharge for the water year October 1946 to September 1947 are given in Water-Supply Paper 1081. Records of specific conductance and pH of daily samples are available in district office at Washington, D. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1946	713	62	--	7.3	44.0	8.2	0.05	44	18	16	48	154	11	--	5.5	292	184	144
Oct. 11-20	730	58	6	6.9	42.4	7.0	.06	42	17	15	40	148	11	--	5.9	283	175	142
Oct. 21-31	1,083	59	7	6.8	38.4	7.0	.10	38	15	17	38	138	9.5	--	5.8	259	156	125
Nov. 1-10	856	58	5	6.9	40.4	8.2	.06	40	16	14	36	141	10	--	5.8	267	166	136
Nov. 11-20	672	47	5	7.0	43.3	8.2	.06	42	17	17	51	142	12	--	6.8	286	175	133
Nov. 21-30	635	48	3	6.8	47.9	6.4	.05	47	19	19	45	167	13	--	8.7	332	195	158
Dec. 1-10	541	38	4	7.0	49.1	6.0	.06	49	21	15	45	174	13	--	7.1	330	209	172
Dec. 11-20	531	41	5	6.8	50.3	5.2	.06	50	21	19	43	183	14	--	9.0	344	211	176
Dec. 21-31	1,215	37	5	6.9	34.8	6.4	.03	34	14	11	33	117	8.0	--	6.3	225	142	115
Jan. 1-10, 1947	949	35	3	6.7	35.8	7.4	.04	35	14	14	41	116	10	--	8.0	236	145	111
Jan. 11-20	1,549	39	4	6.8	29.1	6.8	.05	30	11	11	43	89	7.9	--	5.4	194	120	85
Jan. 21-31	3,099	40	3	6.6	22.6	8.0	.03	23	8.3	6.9	26	71	5.4	--	4.6	143	92	70
Feb. 1-10	2,914	35	3	6.7	23.8	7.4	.03	24	6.7	7.8	28	73	5.6	--	7.1	154	96	73
Feb. 11-20	1,243	36	3	6.7	33.5	7.4	.07	34	13	11	38	107	8.2	--	9.0	222	138	107
Feb. 21-28	945	34	4	6.8	35.5	7.2	.05	35	14	14	45	110	12	--	9.8	238	145	108
Mar. 1-10	1,254	38	4	6.8	32.9	7.0	.05	33	13	9.0	44	99	9.0	--	4.4	219	136	100
Mar. 11-20	3,799	42	3	6.7	21.5	7.0	.03	22	7.9	6.7	29	64	5.8	--	4.2	141	87	64
Mar. 21-31	2,105	43	4	6.7	27.1	7.0	.03	26	11	8.1	26	89	6.5	--	5.7	178	110	89

SCHUYLKILL RIVER AT POTTSTOWN, PA.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Noncarbonate
Apr. 1-10, 1947	2,367	48	3	6.8	26.3	7.2	0.04	26	10	7.5	28	83	6.2	--	5.1	174	106	83
Apr. 11-20	2,232	53	3	6.9	26.2	7.0	.05	26	9.8	8.8	30	84	6.0	--	4.6	173	105	81
Apr. 21-30	2,157	51	3	6.8	26.6	7.2	.03	26	10	8.6	28	87	6.0	--	3.2	191	106	83
May 1-10	4,449	53	4	6.8	20.1	7.4	.05	20	7.6	6.2	26	63	3.9	--	2.7	141	81	60
May 11-20	2,416	58	2	6.7	27.4	6.2	.05	27	11	7.7	26	93	5.5	--	4.2	182	113	91
May 21-31	6,257	62	4	6.5	20.4	6.6	.07	20	8.0	5.2	19	68	3.8	--	3.1	138	83	67
June 1-10	3,208	65	3	6.6	28.5	9.2	.25	28	12	6.3	20	102	5.2	--	3.6	189	119	103
June 11-20	2,887	66	2	6.7	29.3	9.4	.33	29	12	7.6	20	107	5.2	--	3.8	205	122	105
June 21-30	1,429	72	2	6.8	38.0	9.6	.36	38	17	7.0	24	141	6.8	--	4.8	263	165	145
July 1-10	3,068	74	5	6.5	33.3	6.4	.27	32	15	8.7	20	128	5.5	--	3.9	241	142	125
July 11-20	5,221	72	1	6.0	27.1	7.4	.08	25	12	6.8	6	111	3.1	--	2.1	199	112	107
July 21-31	3,012	73	2	5.9	35.6	7.6	.05	33	17	8.8	6	152	4.1	--	2.9	266	152	147
Aug. 1-10	1,212	75	1	6.1	47.0	8.4	.33	44	23	13	8	203	7.2	--	4.4	356	204	198
Aug. 11-20	985	77	2	6.3	47.0	6.4	.11	46	23	13	18	197	9.0	--	7.0	339	209	195
Aug. 21-31	796	76	3	6.6	49.8	6.0	--	49	25	10	19	205	8.5	--	8.4	360	225	210
Sept. 1-10	992	75	2	6.5	43.9	8.0	.12	45	21	8.3	30	168	8.5	--	6.6	343	199	174
Sept. 11-20	756	73	6	6.6	50.7	8.0	.11	50	22	14	37	185	12	--	7.3	339	215	185
Sept. 21-30	672	59	4	7.7	50.1	6.8	.06	50	22	16	42	184	12	0.2	7.7	342	215	181
Average	1,932	55	4	--	35.5	7.3	0.09	35	15	11	31	126	6.1	--	5.7	244	149	124

Temperature (° F.) of water, water year October 1946 to September 1947

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

SCHUYLKILL RIVER AT BELMONT FILTERS, PHILADELPHIA, PA.

LOCATION.--At Belmont Filters, Philadelphia, 1.6 miles upstream from gaging station at Fairmount Dam.
DRAINAGE AREA.--1,890 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1947.
Water temperatures: October 1945 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 333 parts per million Dec. 11-20; minimum, 133 parts per million May 21-31.
Total hardness: Maximum, 198 parts per million Aug. 21-31; minimum, 77 parts per million May 1-10.
Water temperatures: Maximum, 83° F. Aug. 16, 18; minimum, freezing point Feb. 11.
EXTREMES, 1945-47.--Dissolved solids: Maximum, 333 parts per million Dec. 11-20, 1946; minimum, 131 parts per million Mar. 1-10, 1946.
Total hardness: Maximum, 198 parts per million Aug. 21-31, 1947; minimum, 77 parts per million May 1-10, 1947.
Water temperatures: Maximum, 83° F. Aug. 16, 18, 1947; minimum, freezing point Jan. 22, 24, 25, 1946, Feb. 11, 1947.
REMARKS.--Records of water discharge are based on records for Schuylkill River at Philadelphia, Pa. Samples collected at raw water intake on west side of river at Belmont Filters by City of Philadelphia. Records of specific conductance of daily samples are available in district office at Washington, D. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																Total	Noncarbonate
Oct. 1-10, 1946	692	65	4	7.4	39.5	9.6	0.06	39	16	15	63	117	12	6.9	259	163	112
Oct. 11-20	708	62	6	7.6	40.8	9.2	.07	39	17	15	66	118	13	6.9	268	167	113
Oct. 21-31	1,075	59	3	7.1	38.9	8.2	.05	38	16	15	59	118	12	6.4	253	161	112
Nov. 1-10	892	62	5	7.0	36.7	8.6	.06	35	15	14	55	111	11	4.6	241	149	104
Nov. 11-20	657	51	4	6.9	43.4	8.8	.08	42	17	17	61	131	13	8.0	287	175	125
Nov. 21-30	563	48	4	6.9	46.1	8.6	.05	44	19	17	58	144	14	8.8	307	188	140
Dec. 1-10	429	41	3	6.8	46.5	8.4	.05	44	19	17	62	140	15	9.1	306	188	137
Dec. 11-20	416	43	5	6.7	49.8	9.2	.07	46	20	21	60	154	18	8.9	333	197	148
Dec. 21-31	1,572	38	7	6.9	34.1	7.8	.06	32	13	13	48	96	11	7.5	220	133	94
Jan. 1-10, 1947	1,102	36	4	6.9	33.5	10	.03	31	13	13	53	91	10	8.5	212	131	87
Jan. 11-20	2,330	36	6	6.9	31.2	9.6	.04	29	12	11	50	81	10	8.7	196	122	81
Jan. 21-31	4,305	38	4	6.8	22.8	9.0	.04	22	8.3	8.2	36	60	6.6	6.9	141	89	60
Feb. 1-10	3,668	38	3	6.9	23.8	9.4	.03	24	8.6	7.4	36	63	7.1	7.7	147	95	66
Feb. 11-20	1,387	34	2	7.0	31.2	9.4	.05	31	12	11	47	87	9.1	11	211	127	88
Feb. 21-28	900	33	3	6.8	34.2	8.6	.04	33	13	12	58	90	9.8	9.0	223	136	88
Mar. 1-10	1,854	34	4	6.9	30.9	8.6	.05	30	12	11	56	79	10	6.8	199	124	78
Mar. 11-20	5,490	41	3	6.9	21.0	7.0	.06	21	8.0	5.6	36	53	6.2	5.0	134	85	56
Mar. 21-31	2,548	43	3	6.9	25.5	7.6	.05	24	9.9	9.3	38	70	9.0	5.0	162	101	69

Apr. 1-10	3,308	48	4	7.0	25.2	8.4	.06	25	9.4	8.3	39	70	7.2	5.0	168	101	69
Apr. 11-20	2,660	56	3	6.9	25.4	8.6	.05	25	9.4	8.7	40	70	7.4	4.9	166	101	68
Apr. 21-30	2,403	53	2	7.1	25.8	7.6	.04	25	9.7	9.3	40	73	7.1	4.6	171	102	70
May 1-10	6,394	57	7	7.0	19.5	8.2	.10	19	7.3	7.0	34	53	4.9	3.4	134	77	50
May 11-20	3,101	59	5	7.1	24.3	8.6	.05	23	9.4	8.5	36	71	6.0	3.3	171	96	67
May 21-31	8,290	64	6	7.1	20.1	8.0	.12	20	7.5	6.2	29	59	4.5	3.4	133	81	57
June 1-10	4,138	65	3	7.0	26.3	8.4	.10	26	10	8.5	31	84	6.2	3.5	168	106	81
June 11-20	3,862	71	3	6.4	26.1	9.2	.14	25	10	9.4	32	81	7.0	4.5	165	104	77
June 21-30	1,563	71	3	6.5	34.0	9.0	--	32	14	12	43	107	8.0	5.6	217	137	102
July 1-10	2,992	76	5	6.5	34.7	8.6	--	34	15	11	43	114	8.5	6.4	225	147	111
July 11-20	5,558	76	2	6.6	25.6	5.6	.08	24	11	5.2	17	91	4.2	2.3	173	105	91
July 21-31	3,234	72	2	6.7	31.1	4.4	.08	29	14	8.1	18	118	5.5	2.8	210	130	115
Aug. 1-10	1,130	75	4	6.7	41.9	8.4	.05	37	19	16	25	162	8.9	4.9	286	170	150
Aug. 11-20	976	79	4	6.6	41.7	8.4	.05	39	18	14	34	149	10	6.2	283	171	143
Aug. 21-31	674	77	8	6.3	45.8	7.2	--	43	22	13	36	166	12	7.5	320	198	168
Sept. 1-10	972	77	5	6.7	40.0	7.8	.12	39	18	11	41	137	10	6.9	270	171	138
Sept. 11-20	694	78	7	6.8	43.5	8.0	.06	39	19	15	48	139	13	7.2	297	175	136
Sept. 21-30	579	69	4	7.0	44.7	8.4	.10	40	19	20	58	141	15	7.5	304	178	130
Average	2,332	56	4	--	33.5	8.3	0.06	32	14	11	44	102	9.5	6.3	221	137	101

DELAWARE RIVER BASIN--Continued

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

Temperature (° F.) of water, water year October 1946 to September 1947

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

PERKIOMEN CREEK AT RAHNS, PA.

LOCATION.--At bridge on State Highway 113, one mile below gaging station at Graters Ford.
DRAINAGE AREA.--279 square miles above gaging station.
RECORDS AVAILABLE.--Chemical analyses: November 1946 to September 1947.
REMARKS.--Analyses are of composites of samples collected at three points in cross section. Water discharge computed on basis of records for Perkiomen Creek at Graters Ford.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Hardness as $CaCO_3$	
													Total	Non-carbonate
Nov. 4, 1946	69	10	7.6	23.0	--	--	--	--	91	25	9	0.7	104	30
Jan. 9, 1947	150	13	7.4	21.4	--	--	--	--	60	35	7	6.7	95	46
Feb. 14	175	7	7.6	19.5	0.10	21	8.0	5.1	60	32	6	6.8	85	36
Mar. 19	281	8	7.5	15.8	.17	17	6.6	1.7	38	29	4.5	6.9	70	38
Apr. 25	206	12	7.6	16.7	.16	17	6.7	5.0	54	26	5.5	2.3	70	26
May 31	294	12	7.3	16.3	.10	18	6.2	4.9	56	26	4	3.1	70	25
July 5	70	7	7.9	19.1	.12	22	7.8	4.3	76	22	7.5	.5	87	25
Aug. 11	61	7	7.6	22.0	.06	23	8.9	7.2	88	25	8	.4	94	22
Sept. 16	198	12	--	20.8	--	21	9.2	9.9	82	33	6	2.1	90	23

DELAWARE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN SCHUYLKILL RIVER BASIN IN PENNSYLVANIA

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	Color	pH	Specific conductance (K×10 ^{6} at 25° C.)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																		Total	Non-carbonate	
SCHUYLKILL RIVER AT MIDDLEPORT																				
Sept. 10, 1947--	10	3	4.00	101	17	26	1.9	6.0	49	37	33	0	466	19	0.1	0.4	801	440	440	230
MILL CREEK AT PORT CARBON																				
Sept. 10, 1947--	19	1	--	137	15	15	0.87	12	138	95	12	0	828	3.8	0.3	0.4	1,260	843	843	133
SCHUYLKILL RIVER AT POTTSVILLE																				
Sept. 10, 1947--	37	3	--	100	15	10	1.1	7.5	98	60	23	0	583	3.8	0.2	0.6	877	563	563	88
NORWEGIAN CREEK AT POTTSVILLE																				
Sept. 10, 1947--	1.0	3	7.2	37.3	7.6	--	0.03	0.00	40	14	14	78	103	4.6	0.8	11	239	157	93	--
WEST BRANCH SCHUYLKILL RIVER AT MINERSVILLE																				
Sept. 11, 1947--	15	2	4.40	167	16	13	0.59	10	152	116	43	0	994	3.5	0.4	1.2	1,500	949	949	116
WEST WEST BRANCH SCHUYLKILL RIVER AT LLEWELLYN																				
Sept. 11, 1947--	10	1	7.6	207	9.0	--	0.76	0.00	173	111	194	194	1,100	3.0	0.6	3.0	1,870	888	729	--
WEST WEST BRANCH SCHUYLKILL RIVER AT CRESSONA																				
Sept. 11, 1947--	28	1	5.6	128	11	--	0.25	6.0	119	81	63	2	731	2.0	0.3	1.5	1,080	630	628	--
SCHUYLKILL RIVER AT PORT CLINTON																				
Sept. 11, 1947--	125	2	4.6	84.8	13	4.4	0.37	4.0	76	45	35	0	440	17	0.3	1.4	676	407	407	46
LITTLE SCHUYLKILL RIVER AT TAMAQUA																				
Sept. 10, 1947--	24	1	3.90	25.1	8.0	6.2	0.07	1.0	14	5.9	3.0	0	93	6.0	0.3	0.2	147	102	102	58

PANTHER CREEK AT TAMAQUA																			
Sept. 10, 1947--	40	2	3.70	184	23	77	0.83	15	139	94	16	0	1,170	12	0.3	1.0	1,750	1,200	1,200	580
LITTLE SCHUYLKILL RIVER AT NEW RINGGOLD																			
Sept. 10, 1947--	83	2	4.5	93.4	19	27	0.49	4.0	76	44	9.2	0	521	3.9	0.3	0.8	811	529	529	192
LITTLE SCHUYLKILL RIVER AT DREHERSVILLE																			
Sept. 10, 1947--	110	1	4.40	93.4	17	25	3.0	5.0	72	42	21	0	512	15	0.3	1.0	795	510	510	198
SCHUYLKILL RIVER AT BERNE																			
Sept. 11, 1947--	255	1	4.5	89.5	16	17	0.30	5.0	70	47	3.7	0	456	3.0	0.2	1.0	727	472	472	122
MAIDEN CREEK NEAR LENHARDTSVILLE																			
Sept. 11, 1947--	22	3	8.3	10.4	4.6	--	0.05	0.00	12	3.2	5.2	44	11	2.5	0.5	2.4	64	43	7	--
SACONY CREEK AT VIRGINVILLE																			
Sept. 10, 1947--	13	5	7.4	21.7	7.2	--	0.01	0.00	30	6.1	5.2	96	17	5.0	0.1	9.3	131	100	21	--
MAIDEN CREEK NEAR READING																			
Sept. 10, 1947--	47	4	7.7	20.8	6.7	--	0.01	0.00	28	8.2	1.3	103	14	3.1	0.1	3.6	121	104	19	--
SCHUYLKILL RIVER NEAR READING																			
Sept. 10, 1947--	363	1	4.2	63.8	12	7.2	0.08	3.3	55	32	4.2	0	293	15	0.2	0.7	464	318	318	60
TULPEHOCKEN CREEK NEAR BERNVILLE																			
Sept. 10, 1947--	89	4	7.9	39.4	6.4	--	0.02	0.00	58	15	2.0	197	27	4.6	0.1	18	235	206	45	--

DELAWARE RIVER BASIN--Continued

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

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Discharge (second-feet)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																		Total	Noncarbonate	
NORTHKILL CREEK NEAR BERNVILLE																				
Sept. 10, 1947--	12	5	7.5	13.7	6.7	--	0.02	0.00	17	4.5	4.1	64	9.1	2.8	0.1	4.6	82	61	8	--
TULPEHOCKEN CREEK AT WEST BRIDGEPORT																				
Sept. 10, 1947--	134	4	7.7	34.8	7.2	--	0.02	0.00	50	13	3.0	170	26	4.8	0.1	14	209	178	39	--
SCHUYLKILL RIVER AT BIRDSBORO																				
Sept. 11, 1947--	700	2	6.5	53.9	9.2	--	0.02	0.02	53	25	14	29	205	16	0.3	6.8	372	235	211	--
HAY CREEK AT BIRDSBORO																				
Sept. 11, 1947--	11	4	7.1	10.6	13	--	0.02	0.00	11	3.6	4.0	37	13	3.2	0.1	2.8	71	42	12	--
MONOCACY CREEK NEAR MONOCACY																				
Sept. 11, 1947--	18	4	7.8	35.4	11	--	0.03	0.00	53	13	2.8	185	25	4.2	0.2	9.6	216	186	34	--
MANATAWNY CREEK NEAR MANATAWNY																				
Sept. 11, 1947--	31	10	7.6	17.1	17	--	0.03	0.00	18	7.9	4.7	84	11	3.1	0.1	3.3	108	77	9	--
MANATAWNY CREEK AT POTTSTOWN																				
Sept. 11, 1947--	78	12	7.4	23.0	14	--	0.04	0.00	27	9.6	5.0	104	18	6.2	0.2	5.4	140	107	22	--
SCHUYLKILL RIVER AT POTTSTOWN																				
Sept. 11, 1947--	780	4	6.6	49.0	10	--	0.07	0.00	49	23	11	36	181	11	0.3	8.6	334	217	187	--
FRENCH CREEK AT PHOENIXVILLE																				
Sept. 10, 1947--	22	9	6.9	14.7	15	--	--	0.00	16	4.2	9.5	54	19	5.9	0.2	6.6	100	58	13	--

PICKERING CREEK NEAR PHOENIXVILLE																			
Sept. 10, 1947--	4.4	7	7.1	12.7	14	--	--	0.00	14	4.0	6.9	52	17	4.0	0.1	0.5	87	52	9	--
PERKIOMEN CREEK NEAR GREENLANE																			
Sept. 10, 1947--	24	7	8.3	18.3	13	--	--	--	21	6.9	7.9	1/88	18	4.0	0.1	2.5	116	82	9	--
PERKIOMEN CREEK AT GRATERS FORD																			
Sept. 10, 1947--	57	11	7.7	20.9	12	--	--	0.00	22	7.9	8.9	86	26	6.4	0.2	2.2	131	89	19	--
SKIPPACK CREEK NEAR COLLEGEVILLE																			
Sept. 10, 1947--	5.4	9	7.4	26.9	5.4	--	--	0.00	22	8.6	21	95	28	19	0.3	1.2	158	90	13	--
WISSAHICKON CREEK AT PHILADELPHIA																			
Sept. 10, 1947--	28	4	7.4	36.2	7.4	--	--	0.00	30	20	15	154	37	13	0.1	7.2	209	158	31	--
SCHUYLKILL RIVER AT PHILADELPHIA																			
Sept. 10, 1947--	635	10	7.0	41.3	8.8	--	--	0.10	40	18	14	50	137	13	0.2	6.0	275	177	136	--

1/ Includes equivalent of 6 parts per million of carbonate (CO_3).

SUSQUEHANNA RIVER BASIN

SUSQUEHANNA RIVER AT FALLS, PA.

LOCATION.--At bridge on State Highway 92, 400 feet upstream from Buttermilk Creek.
DRAINAGE AREA.--9,440 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1947.
Water temperatures: October 1944 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 143 parts per million Sept. 21-30; minimum, 62 parts per million Mar. 21-31.
Total hardness: Maximum, 99 parts per million Sept. 21-30; minimum, 40 parts per million Mar. 21-31, Apr. 1-10.
Water temperatures: Maximum, 82° F. Aug. 15; minimum, freezing point on many days in December, January, February, and March.
EXTREMES, 1944-47.--Dissolved solids: Maximum, 143 parts per million Sept. 21-30, 1947; minimum, 58 parts per million May 21-31, 1946.
Total hardness: Maximum, 105 parts per million Sept. 11-20, 1946; minimum, 36 parts per million May 21-31, 1946.
Water temperatures: Maximum, 82° F. Aug. 15, 1947; minimum, freezing point on many days in winter months.
REMARKS.--Records of water discharge were computed on basis of records for Susquehanna River at Wilkes-Barre. Records of specific conductance of daily samples are available in district office at Washington, D. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																Total	Non-carbonate
Oct. 1-10, 1946	7,018	60	11	7.7	15.9	2.8	0.04	20	4.0	5.5	62	19	4.6	1.4	97	66	16
Oct. 11-20	6,928	56	9	7.5	16.1	1.6	.04	21	4.2	5.9	65	20	4.8	2.0	96	70	16
Oct. 21-31	8,745	55	10	7.4	15.1	1.2	.07	19	4.1	5.4	60	19	4.2	1.5	91	64	15
Nov. 1-10	6,179	52	8	7.5	16.3	1.6	.03	22	4.3	4.3	66	20	3.9	1.9	93	73	18
Nov. 11-20	4,896	47	8	7.8	18.1	.6	.05	25	4.6	5.2	76	21	5.1	1.7	102	81	19
Nov. 21-30	4,145	43	4	7.8	19.0	.8	.05	26	4.7	4.9	79	20	6.0	1.0	107	84	19
Dec. 1-10	3,830	36	5	7.7	19.7	.6	.05	25	4.7	7.1	78	21	7.0	1.9	111	82	18
Dec. 11-20	4,030	36	7	7.6	20.2	.8	.07	26	4.8	7.2	80	22	7.5	1.5	112	85	19
Dec. 21-31	3,760	31	7	7.7	18.9	.2	.03	25	4.5	6.6	75	21	7.0	2.6	106	81	19
Jan. 1-10, 1947	6,855	--	4	7.2	16.5	1.4	.04	22	3.8	6.4	68	21	6.1	2.9	98	70	19
Jan. 11-20	14,530	--	8	7.1	13.0	3.2	.06	17	3.1	5.2	46	19	4.4	3.3	81	55	17
Jan. 21-31	27,350	35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 1-10	20,990	34	10	7.0	12.1	4.7	.08	16	3.0	3.7	42	18	3.4	3.0	75	52	18
Feb. 11-20	7,404	33	4	7.4	16.4	4.4	.04	22	4.0	4.3	62	19	4.6	4.6	101	71	21
Feb. 21-28	4,085	32	5	7.5	18.6	3.6	.05	25	4.4	5.7	74	20	5.9	3.9	115	80	20
Mar. 1-10	4,138	33	2	7.5	19.9	3.6	.05	27	4.5	7.1	82	21	6.5	3.8	118	86	19
Mar. 11-20	25,430	34	8	7.0	12.5	3.2	.07	16	3.3	3.4	44	16	4.0	3.2	77	53	17
Mar. 21-31	34,640	37	9	6.9	9.69	3.9	.08	12	2.4	3.2	31	15	2.6	2.5	62	40	14

Apr. 1-10	64,030	42	15	7.0	9.64	5.0	.11	12	2.5	1.8	31	14	2.4	1.0	63	40	15
Apr. 11-20	27,040	48	6	7.2	12.3	4.2	.03	17	2.7	2.8	45	16	3.0	2.2	75	54	17
Apr. 21-30	27,170	48	7	7.2	12.0	4.3	.06	16	2.9	3.4	44	17	2.9	1.8	74	52	16
May 1-10	40,440	52	10	7.2	10.2	3.7	.13	13	2.5	3.5	36	16	2.1	1.5	65	43	13
May 11-20	25,080	56	8	7.1	11.8	3.7	.06	16	2.9	2.9	43	17	2.8	1.5	74	52	17
May 21-31	39,330	64	14	7.2	11.0	3.0	.12	14	2.9	3.5	42	15	2.2	1.7	74	47	12
June 1-10	29,300	65	20	7.6	12.5	6.2	.41	18	3.3	1.9	51	15	2.5	2.1	83	58	17
June 11-20	15,170	68	10	7.6	14.6	3.4	.06	20	3.6	3.3	60	16	3.2	1.9	90	65	16
June 21-30	7,213	77	6	7.8	17.6	1.4	.31	25	4.1	4.5	77	17	5.1	1.2	108	79	16
July 1-10	11,670	74	7	7.0	16.7	2.2	.10	22	3.8	6.2	70	18	4.8	1.4	95	70	13
July 11-20	14,180	73	8	7.2	13.5	3.2	.12	17	3.5	5.2	54	16	4.0	2.0	88	57	13
July 21-31	14,160	72	10	7.2	13.3	3.4	.15	18	3.2	3.8	54	15	3.5	1.8	86	58	14
Aug. 1-10	6,692	76	6	7.5	16.2	2.4	.05	22	3.5	5.7	72	15	4.5	1.0	94	69	10
Aug. 11-20	6,462	78	8	6.9	17.0	1.8	--	23	4.5	4.9	72	17	5.4	2.8	101	76	17
Aug. 21-31	6,866	75	20	6.8	15.8	5.2	--	23	4.6	2.0	64	19	4.2	3.1	103	76	24
Sept. 1-10	6,637	75	14	7.0	16.9	4.0	--	22	4.6	6.1	67	22	5.4	2.0	114	74	19
Sept. 11-20	3,061	75	7	7.5	20.2	1.0	.04	27	5.2	6.4	83	22	7.9	.7	126	89	21
Sept. 21-30	2,546	59	3	7.0	22.9	.2	.05	30	5.8	7.0	96	21	8.9	1.2	143	99	20
Average	15,200	52	8	--	15.4	2.8	0.08	20	3.8	4.9	60	18	4.6	2.1	94	66	16

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT FALLS, PA.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

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

SUSQUEHANNA RIVER AT DANVILLE, PA.

LOCATION.--At bridge on State Highway 54 at Danville, three-quarters of a mile upstream from Mahoning Creek.
DRAINAGE AREA.--11,200 square miles.
RECORDS AVAILABLE.--Chemical analyses: September 1906 to September 1907, October 1945 to September 1947.
Water temperatures: October 1945 to September 1947.
REMARKS.--Samples collected daily at midstream 1906-07, and at point 465 feet from north end of bridge, 1945-47. Due to cross-sectional differences in concentration of dissolved solids, water samples were also collected three times a month at points 120, 660, 880, and 1180 feet from north end of bridge, 1945-47. Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1081. Records of specific conductance of daily samples, October 1945 to September 1947, are available in district office at Washington, D. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																Total	Non-carbonate
Oct. 1-10, 1946	7,615	62	--	7.3	24.6	3.4	0.14	26	8.9	7.7	42	72	5.1	1.9	158	101	67
Oct. 11-20	7,390	59	6	7.1	27.3	1.0	.09	30	10	8.1	40	88	5.0	2.6	177	116	83
Oct. 21-31	9,768	58	8	7.1	22.5	1.8	.11	25	7.7	6.5	44	61	4.8	2.3	139	94	58
Nov. 1-10	7,225	55	6	7.3	23.0	2.6	.05	26	7.7	6.2	45	63	4.2	2.1	140	96	60
Nov. 11-20	5,421	48	4	7.4	26.4	1.4	.07	30	9.2	7.2	55	71	5.1	2.8	159	113	68
Nov. 21-30	4,460	43	3	7.1	28.8	1.4	.12	33	10	7.8	56	81	5.9	2.3	179	123	78
Dec. 1-10	4,296	38	6	7.3	30.3	1.6	.14	33	10	10	55	86	7.1	2.0	186	123	78
Dec. 11-20	4,436	38	4	7.3	30.7	1.2	.19	34	10	11	57	85	8.0	3.2	188	126	79
Dec. 21-31	4,445	35	8	7.2	29.0	1.4	.12	31	10	11	49	85	7.4	3.3	182	118	78
Jan. 1-10, 1947	8,593	35	4	7.0	24.1	3.0	.05	27	7.8	8.3	53	59	6.8	3.8	142	99	56
Jan. 11-20	15,660	35	3	7.0	15.0	1.4	.03	16	4.4	6.3	30	38	4.2	2.1	90	58	33
Jan. 21-31	30,350	37	8	6.8	12.2	3.4	.11	14	3.7	3.3	24	30	3.0	2.8	78	50	30
Feb. 1-10	25,000	32	7	6.8	14.1	5.2	.09	16	4.1	4.4	28	35	3.2	3.0	86	57	34
Feb. 11-20	8,934	34	5	7.0	21.8	5.8	.07	25	7.0	7.2	46	57	5.0	3.5	132	91	54
Feb. 21-28	5,025	--	3	7.1	26.4	4.6	.06	30	9.0	7.5	46	76	5.8	3.8	170	112	74
Mar. 1-10	5,014	33	4	7.3	28.5	4.0	.07	33	9.5	8.9	54	80	7.2	3.8	180	121	77
Mar. 11-20	29,570	33	7	6.8	18.4	3.4	.08	21	5.9	4.8	36	46	4.8	3.6	114	77	47
Mar. 21-31	38,430	35	10	6.7	11.9	3.8	.12	14	3.7	2.3	24	29	2.5	2.1	76	50	30

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT DANVILLE, PA.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																Total	Non-carbonate
Apr. 1-10, 1947	69,220	36	13	6.7	11.5	4.8	0.13	13	3.4	2.6	26	25	2.5	1.5	76	46	25
Apr. 11-20	31,130	44	4	6.9	14.9	4.4	.06	18	4.2	4.1	35	34	3.0	3.3	93	62	33
Apr. 21-30	29,820	44	6	7.0	15.2	4.4	.11	18	4.3	5.2	35	37	3.5	2.2	96	63	34
May 1-10	47,200	45	7	6.8	12.8	4.0	.10	15	4.1	3.4	28	33	2.2	1.5	86	54	31
May 11-20	29,050	50	8	6.9	15.2	4.2	.11	18	4.9	3.5	32	40	2.6	1.4	101	65	39
May 21-31	47,960	58	10	6.8	14.2	4.0	.20	16	4.7	4.6	30	38	2.5	2.0	95	59	35
June 1-10	33,910	62	18	7.2	16.2	4.4	.21	20	5.2	4.0	40	40	2.6	2.3	108	71	38
June 11-20	18,490	69	6	7.3	19.7	3.8	.16	24	6.5	4.8	48	49	3.4	2.3	124	87	47
June 21-30	9,088	73	4	6.6	25.5	2.6	.15	28	9.1	7.4	47	74	4.5	1.8	155	107	69
July 1-10	13,940	75	5	6.6	26.4	2.8	.25	29	9.2	7.5	48	75	5.4	1.9	160	110	71
July 11-20	20,870	74	5	6.8	18.2	4.0	.11	20	6.5	3.8	30	52	3.2	2.2	122	77	52
July 21-31	19,740	71	7	6.9	18.9	4.0	.17	21	6.9	3.1	32	53	3.2	2.1	128	81	55
Aug. 1-10	9,100	75	3	6.8	26.4	3.2	.05	28	9.7	8.0	32	90	4.1	1.9	177	110	84
Aug. 11-20	8,147	78	4	6.8	27.6	3.4	.07	28	10	9.5	31	94	4.8	2.1	184	111	86
Aug. 21-31	8,286	75	5	6.6	25.9	4.2	--	28	9.9	7.1	34	85	5.1	3.1	170	111	83
Sept. 1-10	7,554	76	3	6.8	26.2	3.4	--	29	10	5.4	43	77	5.2	3.0	167	113	78
Sept. 11-20	3,600	77	2	6.9	34.6	2.6	.04	36	14	9.4	34	125	5.6	2.3	236	147	120
Sept. 21-30	2,917	64	2	7.1	40.3	1.2	.10	40	11	11	34	146	8.0	2.1	281	170	142
Average	17,710	52	6	--	22.4	3.2	0.11	25	7.7	6.4	40	64	4.6	2.5	143	94	61

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT DANVILLE, PA.--Continued

Chemical analyses of cross-section samples, in parts per million, water year October 1946 to September 1947

Date	Discharge (second-feet)	Station	Time	Temperature (° F.)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Bicarbonate (HCO_3)	Sulfate (SO_4)
Oct. 4, 1946	9,300	1180	4:00 p. m.	62	6.7	22.0	31	61
		880		--	6.8	21.4	39	50
		650		60	6.9	20.8	41	37
		465		61	7.0	20.7	--	--
		120		61	6.9	19.7	40	31
Oct. 14	6,860	1180	4:00 p. m.	58	5.9	36.1	9	152
		880		58	6.3	35.7	16	143
		650		58	6.6	34.7	26	126
		465		58	--	34.5	--	--
		120		58	6.7	24.2	29	71
Oct. 24	6,780	1180	4:00 p. m.	57	6.6	26.5	27	78
		880		57	6.7	25.4	34	69
		650		57	6.9	24.5	41	67
		465		58	--	24.4	--	--
		120		56	7.0	20.8	44	47
Nov. 4	8,000	1180	4:30 p. m.	58	6.6	25.4	22	93
		880		--	6.9	24.1	40	81
		650		58	7.0	22.6	42	71
		465		56	--	21.8	--	--
		120		56	6.9	20.4	43	57
Nov. 14	5,250	1180	4:00 p. m.	49	6.7	29.2	26	112
		880		48	6.9	29.2	39	101
		650		42	6.9	28.3	52	92
		465		48	--	27.6	--	--
Nov. 24	4,370	880	2:00 p. m.	39	6.8	29.0	48	114
		650		38	6.9	30.2	38	108
		465		39	--	28.0	--	--
Dec. 4	4,370	1180	4:30 p. m.	33	7.0	29.4	41	93
		880		36	7.0	30.4	46	95
		650		35	7.0	29.9	52	90
		465		35	--	29.3	--	--
		120		35	7.0	24.4	52	64
Dec. 15	4,540	1180	10:00 a. m.	34	7.0	32.3	34	111
		880		34	7.1	33.1	40	111
		650		33	7.0	32.3	48	101
		465		34	--	31.6	--	--
		120		36	6.9	25.4	49	69
Dec. 25	4,720	1180	3:30 p. m.	37	6.9	28.8	23	105
		880		34	7.0	30.4	33	106
		650		34	7.1	30.4	42	95
		465		33	--	29.3	--	--
		120		34	7.1	22.1	38	65
Jan. 4, 1947	6,390	1180	2:00 p. m.	34	6.7	29.1	30	95
		880		34	6.5	30.9	45	89
		650		33	7.0	29.6	53	78
		465		33	--	28.8	--	--
		120		34	7.0	23.6	50	56
Jan. 15	8,640	1180	4:00 p. m.	35	6.5	20.9	21	67
		880		35	6.7	22.5	29	70
		650		35	6.8	21.8	36	62
		465		34	--	20.6	--	--
		120		35	6.8	18.5	37	46
Jan. 24	28,600	1180	10:30 a. m.	35	6.5	12.9	17	38
		880		34	6.7	12.5	22	32
		650		35	6.6	12.1	24	28
		465		35	--	11.6	--	--
		120		35	6.6	10.5	22	23

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT DANVILLE, PA.--Continued

Chemical analyses of cross-section samples, in parts per million, water year October 1946 to September 1947--Continued

Date	Discharge (second-feet)	Station	Time	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Bicarbonate (HCO_3)	Sulfate (SO_4)
Feb. 4, 1947	29,300	1180	4:00 p.m.	33	6.4	12.7	18	36
		880		32	6.6	11.8	22	30
		650		32	6.7	11.3	24	26
		465		33	--	11.2	--	--
		120		32	6.5	10.3	22	27
Feb. 15	10,200	1180	2:00 p.m.	34	6.6	21.8	26	70
		880		33	6.7	21.6	36	66
		650		33	6.8	21.1	46	57
		465		33	--	21.6	--	--
		120		30	6.9	18.5	40	47
Feb. 24	4,600	1180	4:00 p.m.	31	6.7	25.4	34	86
		880		--	6.9	26.1	30	83
		830		29	7.0	26.5	40	83
		465		--	--	26.3	--	--
Mar. 4	4,600	1180	4:30 p.m.	30	6.5	26.7	24	97
		880		22	7.3	27.3	38	88
		650		29	6.8	27.3	48	80
		465		--	--	26.3	--	--
Mar. 14	12,200	1180	4:30 p.m.	36	5.5	12.8	6	46
		880		36	6.0	21.5	17	73
		650		37	6.5	25.5	40	78
		465		37	--	23.5	--	--
		120		35	6.2	9.97	16	25
Mar. 24	20,800	1180	4:00 p.m.	35	6.3	15.9	18	55
		880		35	6.6	15.2	27	46
		650		35	6.6	14.7	30	38
		465		34	--	14.3	--	--
		120		34	6.6	13.0	30	33
Apr. 5	47,300	1180	1:30 p.m.	37	6.5	12.8	26	35
		880		34	6.6	12.7	30	31
		650		34	6.6	12.4	32	30
		465		35	--	12.0	--	--
		120		34	6.6	11.4	31	26
Apr. 14	33,000	1180	4:00 p.m.	44	6.5	14.6	26	42
		880		44	6.7	14.5	34	37
		650		44	6.8	14.1	36	34
		465		43	--	13.8	--	--
		120		42	6.6	12.6	32	30
Apr. 24	34,600	1180	4:00 p.m.	44	6.6	14.3	26	40
		830		43	6.7	14.3	31	36
		650		42	6.8	13.9	34	33
		465		43	--	13.6	--	--
		120		42	6.8	12.2	32	26
May 4	43,800	1180	1:00 p.m.	46	6.3	13.8	22	37
		880		46	6.5	13.9	26	36
		650		47	6.5	13.6	32	34
		465		47	--	13.2	--	--
		120		47	6.5	11.9	28	28
May 16	36,200	1180	4:00 p.m.	47	6.4	15.1	26	43
		880		47	6.6	14.9	32	35
		650		46	6.6	14.6	35	35
		465		46	--	14.2	--	--
		120		46	6.6	13.4	35	28
May 24	68,100	1180	4:00 p.m.	55	6.1	12.3	21	37
		880		55	6.3	12.4	24	35
		650		57	6.4	12.1	26	32
		465	11:00 a.m.	56	--	11.8	--	--
		120		55	6.4	11.2	28	25

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT DANVILLE, PA.--Continued

Chemical analyses of cross-section samples, in parts per million, water year October 1946 to September 1947--Continued

Date	Discharge (second-feet)	Station	Time	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Bicarbonate (HCO_3)	Sulfate (SO_4)
June 4, 1947	31,600	1180	1:00 p. m.	63	6.1	19.6	14	69
		880		63	6.4	19.3	27	62
		650		64	6.7	18.6	36	53
		465		64	--	18.3	--	--
		120		63	6.7	15.9	34	42
June 14	13,800	1180	2:00 p. m.	69	6.4	21.4	20	77
		880		69	6.6	22.4	34	71
		650		69	6.8	22.1	45	62
		465		70	--	22.1	--	--
		120		69	6.8	19.6	46	51
June 24	9,520	1180	2:00 p. m.	73	6.3	25.4	20	95
		880		73	6.6	26.0	31	88
		650		73	6.8	25.6	43	76
		465		73	--	25.0	--	--
		120		73	6.7	21.4	41	60
July 4	7,580	1180	10:30 a. m.	76	6.3	29.1	24	112
		880		77	6.6	29.9	38	104
		650		75	6.7	29.3	48	98
		465		76	--	29.1	--	--
		120		74	6.8	25.5	45	78
July 14	17,300	1180	10:00 a. m.	69	4.4	17.8	0	72
		880		70	5.4	20.1	6	84
		650		71	6.3	18.5	20	65
		465		71	--	17.5	--	--
		120		70	6.4	14.6	27	49
July 24	22,900	1180	1:00 p. m.	65	5.8	17.3	8	68
		880		66	6.4	18.6	22	63
		650		67	6.5	18.3	32	54
		465		67	--	17.7	--	--
		120		65	6.6	13.5	31	37
Aug. 4	9,740	1180	12:15 p. m.	72	6.0	23.8	10	97
		880		72	6.5	25.3	18	95
		650		72	6.7	24.7	26	88
		465		73	--	24.2	--	--
		120		72	6.8	20.7	32	65
Aug. 14	7,180	1180	1:00 p. m.	80	6.7	27.1	25	98
		880		80	6.9	28.3	34	100
		650		80	7.0	28.3	46	89
		465		80	--	27.9	--	--
		120		80	7.1	24.9	52	66
Aug. 24	15,800	1180	1:00 p. m.	75	6.7	21.9	32	69
		880		75	6.8	21.2	44	57
		650		75	6.9	20.9	48	52
		465	9:30 a. m.	75	--	20.4	--	--
		120	1:00 p. m.	75	6.9	20.3	46	52
Sept. 4	12,400	1180	4:00 p. m.	76	6.5	29.8	32	100
		880		75	6.8	28.8	45	83
		650		75	6.8	27.9	54	77
		465		76	--	27.2	--	--
		120		76	6.9	27.4	52	78
Sept. 14	3,420	1200	10:00 a. m.	78	6.4	32.7	10	133
		880		78	6.6	34.0	16	136
		650		78	6.7	34.0	24	127
		465		78	--	33.8	--	--
		120		78	6.8	30.4	37	99
Sept. 24	2,950	1180	4:00 p. m.	61	6.3	36.3	9	147
		880		61	6.5	39.3	17	160
		650		61	6.7	39.9	24	156
		465		61	--	39.9	--	--
		120		61	7.0	34.5	39	119

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT HARRISBURG, PA.

LOCATION.--At Walnut Street bridge.
DRAINAGE AREA.--24,100 square miles.
RECORDS AVAILABLE.--Chemical analyses: Composites of daily samples, east channel station 1180, October 1944 to September 1946, cross-section samples, one to three times monthly, October 1944 to September 1947.
Water temperatures: East channel station 1180, October 1944 to September 1946.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1081.

Chemical analyses of cross-section samples, in parts per million, water year October 1946 to September 1947

Date	Discharge (second-feet)	Sampling point		Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Total hardness as $CaCO_3$
		Channel	Station									
Oct. 5, 1946	16,900	East	120	59	2	6.4	28.4	25	106	6	2.9	124
			600	60	3	6.8	20.1	41	58	5	3.0	72
			1180	59	4	6.7	18.2	33	50	4	2.4	72
		West	600	69	4	6.7	16.9	24	51	4	2.0	62
			1100	59	5	7.0	24.0	66	51	6	2.6	90
			1320	59	5	7.4	25.8	123	21	4	6.6	104
Oct. 15	22,200	East	120	54	2	5.8	38.4	4	170	5	3.1	171
			600	55	3	6.8	26.6	30	92	6	3.2	99
			1180	55	10	6.8	22.3	76	46	8	4.1	84
		West	600	55	15	7.0	23.2	83	35	6	4.5	90
			1100	54	7	7.3	26.2	126	26	4	6.8	104
			1320	54	5	7.3	29.3	146	25	4	9.0	117
Oct. 25	20,700	East	120	55	2	6.7	29.9	25	112	6	3.2	117
			600	55	2	7.1	21.3	38	63	5	2.1	80
			1180	55	2	6.5	13.1	8	47	3	1.4	57
		West	600	55	2	6.5	12.7	20	38	2	1.9	54
			1100	55	5	7.3	23.5	83	45	6	3.8	96
			1320	56	5	7.5	22.6	102	21	3	7.2	102
Nov. 5	20,500	East	120	54	2	6.5	28.5	12	116	4	2.9	114
			600	54	2	7.3	21.6	40	61	4	2.0	80
			1180	53	2	7.1	12.3	17	37	2	1.2	50
		West	600	52	2	7.0	12.5	26	35	3	2.0	57
			1100	52	7	7.4	21.1	77	32	2	3.6	90
			1320	51	5	7.9	26.3	126	21	4	7.0	112

Nov. 15	12,300	East	120	44	4	6.3	33.5	14	149	7	3.3	144
			600	45	3	7.0	24.6	38	78	6	2.4	111
			1180	45	4	6.9	15.3	19	46	4	1.8	68
		West	600	44	5	7.3	16.2	36	39	6	2.2	60
			1100	44	5	7.5	24.2	90	39	6	7.0	93
			1320	43	4	7.5	26.7	130	21	5	5.1	114
Nov. 25	10,200	East	120	--	3	6.5	37.5	14	158	7	4.3	118
			600	41	4	6.9	29.4	45	92	7	3.1	114
			1180	42	4	7.0	19.6	22	59	5	2.2	70
		West	600	41	3	7.1	19.1	35	58	6	2.5	75
			1100	41	5	7.5	28.3	98	49	8	4.9	99
			1320	41	3	7.5	30.1	148	26	6	9.0	135
Dec. 16	11,400	East	120	33	3	6.3	38.8	26	143	9	3.2	144
			600	33	2	7.2	23.0	40	60	6	2.4	98
			1180	34	4	6.6	16.5	20	44	6	2.2	62
		West	600	32	3	6.8	17.0	28	41	5	1.7	63
			1100	32	4	6.8	24.5	71	42	8	4.2	88
			1320	32	5	7.1	31.0	138	27	7	7.2	128
Jan. 15, 1947	21,500	East	120	33	2	6.3	23.1	16	79	5	3.5	87
			600	34	1	6.5	19.8	30	56	1	2.8	72
			1180	34	2	6.3	12.0	8	38	1	1.7	38
		West	600	33	3	6.6	12.4	19	35	1	2.3	42
			1100	33	1	7.1	17.8	55	30	1	3.3	68
			1320	34	2	7.5	22.2	101	20	2	7.4	93
Jan. 27	53,600	East	120	35	4	6.7	18.0	19	60	3	4.2	60
			600	35	4	6.3	12.8	22	32	2	2.3	52
			1100	36	4	6.1	9.66	13	25	4	2.7	34
		West	600	35	4	6.2	8.55	8	26	2	2.5	32
			1100	37	5	7.0	13.9	44	22	3	3.2	56
			1320	40	4	7.4	18.3	74	19	3	6.8	78

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SUSQUEHANNA RIVER AT HARRISBURG, PA.--Continued

Chemical analyses of cross-section samples, in parts per million, water year October 1946 to September 1947--Continued

Date	Discharge (second-feet)	Sampling point		Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Total hardness as $CaCO_3$
		Channel	Station									
Feb. 3, 1947	91,600	East	120	34	4	6.4	14.1	16	48	4	3.8	54
			600	34	3	6.4	12.7	29	33	2	4.6	52
			1180	34	2	6.4	11.1	23	31	3	2.0	46
		West	600	35	2	6.0	8.74	9	34	3	1.5	42
			1100	36	1	6.7	12.2	32	30	2	4.4	45
			1320	35	3	7.3	16.8	64	23	3	7.1	69
Mar. 17	112,000	East	140	34	3	5.7	14.1	14	48	4	3.3	54
			300	34	5	5.9	13.8	--	--	--	--	--
			500	34	5	6.1	13.1	--	--	--	--	--
			690	33	5	6.2	12.6	28	31	2	1.6	51
			920	33	4	6.2	12.3	--	--	--	--	--
			1220	33	6	6.1	11.8	24	29	3	3.2	46
		West	300	33	6	6.1	11.6	--	--	--	--	--
			600	33	5	6.2	12.6	20	37	3	2.2	51
			900	33	5	6.1	11.4	--	--	--	--	--
			1100	34	5	6.5	12.5	32	28	1	3.7	54
			1300	33	7	6.6	13.4	44	27	1	4.5	60
Mar. 26	65,400	East	120	36	8	5.5	20.4	7	79	1	1.6	80
			600	35	6	6.4	15.6	26	47	1	1.8	64
			1180	36	5	6.1	13.5	26	36	2	2.3	57
		West	600	36	6	6.0	11.1	16	35	2	2.0	48
			1100	37	6	6.6	13.7	42	25	2	3.5	62
			1320	37	7	6.7	15.2	55	23	3	3.4	68
Apr. 8	194,000	East	120	43	9	5.9	11.0	20	34	3	2.7	42
			600	44	22	6.4	9.35	29	31	1	.6	40
			1180	45	22	6.4	9.85	34	34	2	.2	36
		West	600	44	17	6.0	8.66	16	32	1	2.4	36
			1100	45	10	6.2	8.11	16	28	1	1.8	38
			1320	45	7	6.3	9.48	22	26	1	2.4	39

Apr. 15	50,500	East	120	54	5	6.3	18.4	20	67	2	3.0	74
			600	53	5	6.5	15.0	32	45	2	1.8	57
			1180	53	5	6.5	13.9	33	40	2	2.1	54
		West	600	54	3	6.5	10.5	18	37	2	2.0	45
			1320	57	3	7.1	18.3	74	33	3	2.9	74
May 1	61,500	East	120	55	5	6.1	16.5	14	59	2	2.6	69
			600	54	8	6.5	14.1	33	36	3	2.2	62
			1180	54	6	6.2	9.85	15	30	2	1.7	42
		West	600	54	2	5.9	8.41	10	26	2	1.4	30
			1100	57	3	6.6	12.6	38	26	1	2.2	57
			1320	61	5	7.1	22.5	109	17	3	5.5	94
May 13	53,600	East	120	56	5	6.0	17.4	10	65	2	2.1	74
			600	55	5	6.6	13.5	28	36	2	1.9	58
			1180	55	5	6.7	11.6	26	30	2	1.6	51
		West	600	55	3	6.5	9.58	14	28	2	1.4	42
			1100	57	5	6.5	11.4	28	30	3	2.0	51
			1320	60	5	7.1	20.5	91	23	3	5.2	92
June 5	66,100	East	120	62	6	5.6	25.8	4	116	2	2.0	96
			600	63	7	6.2	18.4	35	64	3	2.2	74
			1180	62	5	6.8	14.8	24	50	1	1.7	56
		West	600	63	5	6.6	11.0	19	40	2	1.4	42
			1100	62	6	7.0	11.5	28	40	1	1.3	46
			1320	63	8	7.1	17.1	78	26	1	6.0	74
June 16	42,000	East	120	64	4	5.7	25.2	4	109	1	3.4	93
			600	66	5	6.9	20.8	42	68	2	2.6	78
			1180	66	3	6.9	13.8	24	49	2	1.9	52
		West	600	65	4	6.8	10.6	18	37	1	1.5	40
			1100	65	6	7.1	14.1	50	35	2	3.1	56
			1320	63	10	7.3	20.2	96	24	1	7.0	86

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT HARRISBURG, PA.--Continued

Chemical analyses of cross-section samples, in parts per million, water year October 1946 to September 1947--Continued

Date	Discharge (second-feet)	Sampling point		Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Total hardness as $CaCO_3$
		Channel	Station									
June 26, 1947	17,900	East	120	69	4	5.3	35.2	4	154	2	2.1	146
		West	600	71	2	6.2	13.1	24	35	2	1.4	54
			1100	71	2	7.1	17.7	54	34	2	1.2	72
			1320	69	3	7.8	29.2	148	17	3	7.0	138
July 8	15,300	East	120	70	2	5.2	36.6	2	163	2	1.8	162
			600	71	2	6.2	29.0	32	98	3	1.7	126
			1180	71	3	6.2	20.6	32	58	2	1.6	81
		West	600	70	3	6.3	17.4	36	49	2	1.4	66
			1100	70	4	7.2	18.0	50	37	3	1.0	78
			1320	69	3	7.4	27.2	128	26	4	4.8	120
July 15	31,700	East	120	74	4	4.5	32.1	0	146	1	2.4	117
			600	75	2	6.1	18.7	10	75	2	2.3	66
			1180	76	2	6.5	14.6	21	47	2	2.0	54
		West	600	76	3	6.2	13.6	17	41	2	2.1	51
			1100	77	3	6.9	17.5	42	44	3	2.0	62
			1300	77	4	7.0	24.7	100	37	4	5.8	105
July 24	43,300	East	120	63	3	4.8	19.7	4	79	1	2.4	69
			600	68	2	6.0	20.9	8	79	1	2.3	78
			1180	68	4	6.5	14.5	22	52	2	2.5	52
		West	600	60	3	6.2	11.9	16	40	1	2.2	45
			1100	69	4	6.8	15.6	41	32	2	2.1	56
			1320	66	5	7.0	22.0	98	35	3	6.6	93
Aug. 5	17,700	East	120	72	2	4.40	43.1	0	201	1	1.6	183
			600	71	2	6.6	23.3	22	89	2	2.2	90
			1180	71	2	6.8	17.1	32	51	4	1.8	72
		West	600	71	2	6.9	14.0	25	46	3	1.6	54
			1100	73	2	7.0	21.6	68	48	5	1.5	87
			1320	70	2	7.0	29.4	142	30	6	4.2	129

Aug. 25	25,100	East	120	65	2	4.6	45.2	2	212	2	1.6	186
			600	79	2	6.4	27.3	24	103	3	2.9	111
			1180	78	3	7.0	20.3	26	64	3	3.1	84
		West	600	79	3	6.6	17.7	26	59	2	2.4	66
			1100	79	3	6.9	21.2	58	48	4	3.6	90
			1320	78	3	7.2	26.3	106	41	6	6.0	114
Sept. 5	23,700	East	120	--	1	5.4	41.8	0	185	4	2.6	192
			600	74	1	6.7	27.9	32	100	4	3.3	114
			1180	74	2	6.4	17.1	18	60	3	2.2	63
		West	600	73	2	6.6	16.1	19	53	4	2.0	60
			1100	72	3	7.1	19.7	68	34	5	5.5	87
			1320	72	3	7.4	26.3	120	25	4	9.2	117
Sept. 16	8,400	East	120	72	1	4.7	50.4	0	233	5	2.0	210
			600	72	0	6.4	33.0	28	124	5	2.4	141
			1180	70	2	6.7	19.5	28	61	5	1.6	81
		West	800	72	2	6.9	19.4	45	52	5	1.4	76
			1100	71	3	7.3	23.7	75	42	8	.4	87
			1320	70	3	7.6	28.5	140	21	5	8.0	123
Sept. 26	6,920	East	120	56	0	4.5	55.9	8	263	7	1.8	225
			600	55	0	6.7	38.6	26	149	6	1.4	162
			1180	55	1	6.7	22.4	28	73	7	1.8	102
		West	600	56	1	6.9	20.7	36	62	5	1.6	87
			1100	57	1	7.5	27.4	90	52	8	1.0	126
			1320	58	1	7.9	33.5	172	19	7	9.8	162

SUSQUEHANNA RIVER BASIN--Continued

WEST BRANCH SUSQUEHANNA RIVER AT LOCK HAVEN, PA.

LOCATION.--In north channel at bridge on U. S. Highway 220 on northeast side of Great Island, 2 miles downstream from Lock Haven.
DRAINAGE AREA.--3,337 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1947.
Water temperatures: October 1945 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 223 parts per million Aug. 21-31; minimum, 53 parts per million May 21-31.
Total hardness: Maximum, 132 parts per million Aug. 21-31; minimum, 31 parts per million May 1-10, 21-31.
Water temperatures: Maximum, 76° F. Aug. 14, 16; minimum, freezing point on many days in December, January, February, and March.
EXTREMES, 1945-47.--Dissolved solids: Maximum, 262 parts per million Sept. 21-30, 1946; minimum, 51 parts per million Mar. 1-10, 1946.
Total hardness: Maximum, 177 parts per million Sept. 21-30, 1946; minimum, 29 parts per million Mar. 1-10, 1946.
Water temperatures: Maximum, 78° F. July 12, 1946; minimum, freezing point on many days in winter months.
REMARKS.--Records of water discharge are based on records for Susquehanna River at Renovo, Pa. Records of specific conductance and pH of daily samples are available in district office at Washington, D. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																			Total	Non-carbonate	
Oct. 1-10, 1946 -	1,468	56	4	3.85	27.1	5.7	2.4	0.06	0.68	18	6.4	5.8	0	96	3.4	0.2	0.4	144	93	93	27
Oct. 11-20 -----	3,365	55	4	3.80	25.7	5.9	2.2	.06	.60	16	5.8	5.0	0	88	2.8	.1	.6	132	85	85	27
Oct. 21-31 -----	6,857	52	4	4.25	14.1	5.6	1.1	.02	.45	9.8	3.6	2.5	0	48	2.0	.1	.9	78	48	48	14
Nov. 1-10 ------	3,209	52	4	4.00	17.7	6.4	1.6	.02	.38	11	4.2	2.5	0	59	2.0	.1	.5	93	59	59	20
Nov. 11-20 -----	1,958	42	3	3.75	26.5	6.5	2.5	.04	.52	16	5.9	2.9	0	87	2.5	.1	.3	131	88	88	32
Nov. 21-30 -----	2,194	37	7	3.70	26.6	5.8	2.3	.03	.53	17	6.4	3.0	0	91	2.6	--	1.1	139	93	93	28
Dec. 1-10 ------	2,014	33	8	3.95	20.8	5.0	1.4	.02	.41	14	5.3	4.1	0	72	2.5	--	1.0	111	70	70	19
Dec. 11-20 -----	3,116	35	6	4.00	19.8	4.8	1.4	.02	.47	14	4.9	2.4	0	67	2.4	--	1.2	104	69	69	18
Dec. 21-31 -----	3,670	32	5	4.00	19.1	4.6	1.1	.02	.49	13	4.7	3.7	0	65	2.4	--	1.2	100	64	64	17
Jan. 1-10, 1947 -	9,630	33	1	4.20	12.3	4.9	.9	.02	.14	8.5	3.3	.6	0	39	1.9	--	1.5	67	43	43	13
Jan. 11-20 -----	8,740	33	2	4.00	14.7	5.2	1.2	.02	.22	9.5	3.6	.2	0	46	1.5	--	1.3	75	51	51	17
Jan. 21-31 -----	13,050	35	1	4.20	11.2	5.0	.8	.02	.10	7.4	2.7	.8	0	35	1.2	--	1.2	59	37	37	14
Feb. 1-10 ------	6,793	34	2	4.05	14.5	5.4	1.1	.02	.23	9.2	3.4	1.4	0	45	1.8	--	1.4	74	48	48	16
Feb. 11-20 -----	3,060	32	4	3.90	25.3	6.6	2.4	.04	.35	14	5.6	4.0	0	79	2.4	--	1.6	128	78	78	27
Feb. 21-28 -----	1,995	32	3	3.90	29.6	7.2	2.9	.04	.55	19	7.7	2.4	0	98	3.1	--	1.6	154	102	102	30
Mar. 1-10 ------	1,622	32	1	3.80	33.1	7.8	3.1	.04	.58	20	8.0	5.0	0	110	3.2	--	1.6	175	109	109	34
Mar. 11-20-----	5,981	32	2	4.10	20.3	5.4	1.4	.03	.21	14	4.7	3.3	0	67	2.2	--	1.2	104	67	67	21
Mar. 21-31-----	8,739	36	1	4.35	11.4	4.3	.5	.02	.10	8.6	2.8	1.7	0	37	.9	--	1.2	60	37	37	12

Apr. 1-10	13,990	44	1	4.45	10.1	4.4	4	.03	.19	7.8	2.7	2.3	0	35	1.4	--	1.0	56	34	34	10
Apr. 11-20	6,728	49	3	4.10	13.2	4.7	.9	.02	.19	9.0	3.0	1.1	0	41	2.2	--	1.0	67	44	44	13
Apr. 21-30	10,930	47	2	4.35	10.4	4.4	.5	.02	.20	8.2	2.7	1.5	0	35	1.2	--	1.0	58	36	36	10
May 1-10	10,460	50	3	4.50	9.85	4.3	.4	.01	.03	7.4	2.6	2.8	2	32	1.5	--	.7	54	31	30	11
May 11-20	10,630	55	4	4.30	12.7	4.2	.7	.08	.07	8.8	3.3	1.1	0	40	1.4	--	.8	66	42	42	13
May 21-31	16,040	59	3	4.6	9.74	4.4	.4	.01	.05	7.2	2.6	3.0	2	32	1.4	--	.8	53	31	29	11
June 1-10	8,873	61	5	4.50	12.2	4.6	.7	.02	.19	9.0	3.2	2.6	0	41	1.6	--	.6	67	40	40	11
June 11-20	6,765	64	3	4.40	12.2	5.0	.7	.13	.08	9.2	3.3	1.6	0	41	1.6	--	.6	68	42	42	13
June 21-30	2,286	70	3	4.05	21.6	4.9	1.5	.03	.40	14	5.9	3.1	0	73	2.0	--	.6	117	72	72	22
July 1-10	1,821	72	2	3.95	26.6	4.8	2.0	.08	.45	18	6.8	5.9	0	95	2.5	--	.6	148	90	90	28
July 11-20	3,158	70	3	4.40	17.8	3.9	1.2	.03	.35	14	5.0	3.6	0	66	2.0	--	.4	105	64	64	18
July 21-31	2,166	71	2	4.25	18.2	4.0	1.2	.03	.45	14	4.9	3.3	0	66	2.0	--	.5	106	65	65	19
Aug. 1-10	1,255	72	2	4.10	24.2	4.2	1.7	.08	.50	17	6.4	5.9	0	88	3.0	--	.5	140	83	83	27
Aug. 11-20	1,011	74	5	4.20	30.7	4.4	2.3	.03	.74	21	8.1	7.3	0	114	3.8	--	.6	184	109	109	40
Aug. 21-31	1,981	74	1	4.10	36.4	6.2	3.4	.07	.70	25	9.4	9.4	0	140	4.0	--	.9	223	132	132	49
Sept. 1-10	2,569	73	3	4.30	23.5	5.2	1.6	.04	.76	17	6.0	4.3	0	82	3.4	--	.8	138	82	82	28
Sept. 11-20	1,530	73	2	4.10	29.4	5.6	2.4	.09	.76	20	7.5	6.2	0	105	4.8	--	.6	169	103	103	36
Sept. 21-30	857	61	5	4.00	32.5	5.8	2.6	.12	.78	22	7.9	6.5	0	114	4.4	--	.8	177	112	112	38
Average	5,351	51	3	--	20.0	5.2	1.5	0.04	0.39	14	5.0	3.3	0	69	2.4	--	0.9	109	69	69	22

SUSQUEHANNA RIVER BASIN--Continued

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

Temperature (° F.) of water, water year October 1946 to September 1947

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

WEST BRANCH SUSQUEHANNA RIVER AT LEWISBURG, PA.

LOCATION.--At Market Street Bridge, 560 feet from east bank of river.
DRAINAGE AREA.--6,847 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1947.
Water temperatures: October 1944 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 120 parts per million Sept. 21-30; minimum, 48 parts per million May 1-10.
Total hardness: Maximum, 70 parts per million Sept. 21-30; minimum, 29 parts per million May 21-31.
Water temperatures: Maximum, 81° F. Aug. 14; minimum, freezing point on many days in December, January, February, and March.
EXTREMES, 1944-47.--Dissolved solids: Maximum, 219 parts per million Oct. 1-10, 1944; minimum, 46 parts per million May 1-10, 1945.
Total hardness: Maximum, 133 parts per million Oct. 1-10, 1944; minimum, 26 parts per million May 21-31, 1946.
Water temperatures: Maximum, 81° F. Aug. 14, 1947; minimum, freezing point on many days in winter months.
REMARKS.--Records of water discharge for the water year October 1946 to September 1947 are given in Water-Supply Paper 1081. Records of specific conductance and pH of daily samples are available in district office in Washington, D. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1946	3,922	60	1	6.8	17.1	4.6	0.01	0.04	18	5.2	4.6	12	57	4.2	1.6	105	66	64
Oct. 11-20	6,704	57	1	6.7	15.1	4.4	.01	.02	16	4.4	3.3	13	46	3.8	1.7	90	58	47
Oct. 21-31	12,380	54	1	6.4	11.9	5.2	.01	.12	12	3.6	2.3	7	38	2.5	1.0	72	45	39
Nov. 1-10	6,678	53	7	6.7	12.1	4.7	.01	.08	12	3.7	3.7	10	38	3.0	1.5	73	45	37
Nov. 11-20	3,913	45	6	6.7	15.9	5.2	.01	.22	15	4.9	6.3	12	52	4.0	1.9	96	58	48
Nov. 21-30	3,775	40	5	6.7	17.4	5.1	.01	.23	17	5.6	5.3	10	59	4.2	1.8	108	65	57
Dec. 1-10	3,714	36	1	6.4	15.8	3.6	.01	.19	15	5.0	5.2	12	53	2.1	1.8	95	58	48
Dec. 11-20	4,327	34	1	6.5	15.8	3.5	.01	.21	15	4.9	7.6	16	53	3.1	1.8	96	58	44
Dec. 21-31	4,768	33	1	6.5	13.9	4.3	.02	.17	13	4.3	4.2	10	44	2.5	2.1	84	50	42
Jan. 1-10, 1947	12,360	32	1	5.6	11.3	4.3	.01	.18	10	3.5	3.3	2	39	2.4	1.0	68	39	38
Jan. 11-20	14,240	34	4	5.9	11.1	4.8	.01	.10	10	4.8	2.9	4	36	2.5	1.2	68	39	36
Jan. 21-31	24,560	37	4	5.9	8.59	4.7	.01	.13	8.1	2.5	3.7	6	29	1.8	1.1	53	30	26
Feb. 1-10	16,670	34	5	6.3	9.71	5.0	.01	.14	9.3	2.8	2.3	4	31	2.2	1.4	58	35	31
Feb. 11-20	6,276	33	5	6.4	14.0	2.6	.01	.11	13	4.3	5.2	8	47	3.4	1.4	85	50	44
Feb. 21-28	3,862	32	6	6.5	16.9	3.8	.01	.08	16	5.1	5.6	8	57	4.1	1.6	101	61	54
Mar. 1-10	3,410	33	6	6.0	18.1	5.4	.01	.21	18	5.7	5.4	9	61	5.0	2.6	112	68	61
Mar. 11-20	14,660	35	7	5.7	13.1	4.4	.02	.14	13	4.1	3.5	6	44	3.2	2.1	81	49	44
Mar. 21-31	16,270	39	7	5.8	9.04	4.6	.02	.05	9.2	2.6	2.9	9	26	3.0	1.6	55	34	26

SUSQUEHANNA RIVER BASIN--Continued

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

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance (K×10⁶ at 25 ° C.)	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Noncarbonate
Apr. 1-10, 1947 --	25,820	45	8	5.7	7.86	4.7	0.05	0.09	8.0	2.4	3.1	8	25	2.0	1.4	52	30	23
Apr. 11-20 --------	13,390	50	6	5.9	9.30	4.6	.03	.11	9.2	2.9	3.6	9	30	2.2	1.2	58	35	28
Apr. 21-30 --------	19,570	48	4	6.2	8.57	4.4	.01	.07	8.4	2.6	3.0	8	27	1.9	1.0	53	32	25
May 1-10 ----------	24,750	51	3	6.4	7.81	4.5	.02	.03	9.0	2.5	1.5	9	24	2.0	1.1	48	33	25
May 11-20 ---------	17,440	56	4	6.3	9.26	4.5	.01	.04	9.2	2.8	3.6	9	30	2.1	1.0	57	34	27
May 21-31 ---------	30,730	62	4	6.3	7.43	4.6	.01	.03	7.8	2.3	2.2	7	24	1.6	.9	50	29	23
June 1-10 ---------	16,000	64	5	6.5	9.63	4.9	.02	.05	9.8	3.0	3.3	11	30	2.1	.9	59	37	28
June 11-20 --------	14,170	67	3	6.3	10.0	6.1	.01	.05	9.6	3.0	2.8	8	31	1.9	1.1	62	36	30
June 21-30 --------	5,285	73	1	6.5	13.3	6.8	.01	.00	6.8	4.0	3.4	12	40	2.8	.9	81	49	39
July 1-10 ----------	5,612	74	5	6.6	14.7	6.7	.01	.00	14	4.3	5.1	14	45	3.2	1.2	90	53	41
July 11-20 ---------	9,735	72	2	6.7	11.1	6.7	.02	.00	11	3.3	2.0	9	33	1.9	1.2	66	41	34
July 21-31 ---------	7,878	71	1	6.8	11.1	6.8	.02	.00	11	3.3	2.8	10	33	2.6	1.1	66	41	33
Aug. 1-10 ---------	3,909	76	1	7.0	13.3	7.0	.02	.00	13	4.0	3.7	14	38	3.6	1.1	78	49	37
Aug. 11-20 --------	3,016	79	1	6.7	16.7	4.4	.00	.00	17	4.9	6.3	18	51	4.8	2.2	106	63	48
Aug. 21-31 --------	4,821	76	0	6.4	17.7	5.0	.00	.05	18	5.2	5.7	11	60	4.0	2.0	112	66	57
Sept. 1-10 ---------	5,397	76	0	6.4	15.7	5.0	.00	.15	16	4.5	4.4	8	53	3.4	1.8	98	58	52
Sept. 11-20 --------	3,058	75	0	6.6	16.7	4.4	.00	.00	17	5.0	5.8	13	55	4.8	1.1	102	63	52
Sept. 21-30 --------	2,118	61	5	6.7	19.2	4.4	.01	.05	19	5.6	7.0	12	64	5.8	1.2	120	70	61
Average -------	10,520	53	3	--	13.0	4.6	0.01	0.09	13	3.9	4.4	10	42	3.0	1.4	79	48	40

Temperature (° F.) of water, water year October 1946 to September 1947

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

SUSQUEHANNA RIVER BASIN--Continued

JUNIATA RIVER AT NEWPORT, PA.

LOCATION.--At bridge on State Highway 34, 230 feet from west bank of river.
DRAINAGE AREA.--3,354 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1947.
Water temperatures: October 1944 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 194 parts per million Sept. 21-30; minimum, 86 parts per million Apr. 1-10, May 1-10.
Total hardness: Maximum, 133 parts per million Sept. 21-30; minimum, 60 parts per million May 1-10.
Water temperatures: Maximum, 81° F. Aug. 17, 26; minimum, freezing point on many days in December, January, February, and March.
EXTREMES, 1944-47.--Dissolved solids: Maximum, 282 parts per million Oct. 1-10, 1944; minimum, 78 parts per million Mar. 1-10, 1945, May 21-31, 1946.
Total hardness: Maximum, 167 parts per million Oct. 1-10, 1944; minimum, 50 parts per million May 21-31, 1946.
Water temperatures: Maximum, 83° F. July 2, 26, 1945; minimum, freezing point on many days in winter months.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1081. Records of specific conductance and pH of daily samples are available in district office at Washington, D. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance (K×10 5 at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1946	1,255	60	26	7.5	31.7	3.4	0.05	36	10	13	109	54	8.0	0.2	3.1	189	131	42
Oct. 11-20	2,527	57	29	7.4	25.7	4.2	.07	31	8.0	8.5	90	40	6.6	.2	4.2	153	110	36
Oct. 21-31	5,019	56	30	7.3	22.3	5.0	.10	28	7.2	5.5	78	36	4.5	.2	3.8	134	99	36
Nov. 1-10	2,435	55	17	7.4	23.4	6.0	.05	29	7.3	5.7	84	34	5.2	--	3.8	139	102	34
Nov. 11-20	1,526	45	12	7.5	27.6	5.6	.01	33	8.9	8.8	101	41	6.8	--	3.7	165	119	36
Nov. 21-30	1,292	40	12	7.7	29.6	3.7	.05	34	9.5	13	108	46	8.6	--	4.3	177	124	35
Dec. 1-10	1,086	36	12	7.8	30.3	3.0	.04	34	9.7	14	109	48	8.4	--	3.9	180	125	35
Dec. 11-20	1,212	36	25	8.1	31.3	2.7	.07	34	10	15	108	52	9.0	--	4.1	188	126	37
Dec. 21-31	2,340	32	25	7.4	25.6	4.2	.06	30	8.5	9.6	93	40	6.6	--	4.3	152	110	34
Jan. 1-10, 1947	4,447	33	6	6.8	17.7	5.5	.07	21	5.7	3.4	53	30	3.8	--	4.0	107	76	32
Jan. 11-20	5,035	36	6	7.2	17.3	5.8	.09	20	5.6	4.5	55	28	3.6	--	4.3	104	73	28
Jan. 21-31	6,667	37	7	7.1	15.4	5.8	.10	18	5.0	4.0	49	25	3.1	--	4.5	93	65	25
Feb. 1-10	3,830	34	6	7.3	17.9	5.4	.09	21	5.9	4.2	60	27	3.9	--	3.7	106	77	28
Feb. 11-20	2,474	34	4	7.1	20.7	4.8	.06	23	7.2	6.7	71	32	4.8	.1	3.8	122	87	29
Feb. 21-28	1,783	32	3	7.2	23.3	4.0	.06	26	7.9	8.4	81	36	5.8	.1	4.2	137	97	31
Mar. 1-10	1,914	33	4	7.1	23.2	4.6	.06	26	7.7	8.6	81	36	6.0	.1	3.4	137	96	30
Mar. 11-20	6,942	37	8	6.9	16.3	4.2	.04	18	5.1	5.2	50	27	3.6	.1	3.3	98	66	25
Mar. 21-31	5,175	39	6	7.0	15.0	4.5	.06	17	5.0	5.0	49	25	3.6	.1	2.9	90	63	23

Apr. 1-10 ----------	4,026	47	5	7.4	14.8	4.5	.04	18	4.5	3.3	46	24	4.1	--	2.5	86	63	26
Apr. 11-20 ---------	3,372	54	5	7.4	18.1	2.8	.03	22	5.4	5.6	62	29	4.6	--	2.2	104	77	26
Apr. 21-30 ---------	5,025	52	4	7.3	15.8	4.7	.03	19	4.7	5.7	54	26	4.2	--	2.5	92	67	23
May 1-10 ----------	6,596	55	6	7.3	14.2	6.3	.08	17	4.2	4.4	47	23	3.4	--	2.5	86	60	21
May 11-20 ---------	5,061	58	5	7.5	15.5	5.3	.06	18	4.6	6.1	55	24	3.8	--	2.1	91	64	19
May 21-31 ---------	5,418	67	8	7.5	15.3	4.6	.03	18	4.5	3.9	50	23	3.4	--	2.6	91	63	22
June 1-10----------	3,997	68	10	7.6	18.0	2.5	.03	21	5.4	5.6	64	26	4.2	--	1.6	106	75	22
June 11-20---------	3,752	70	7	7.5	18.0	4.8	.03	22	5.5	5.4	65	27	4.0	--	2.7	108	78	24
June 21-30---------	1,708	73	5	7.6	23.1	2.2	.01	27	7.1	8.1	81	36	6.4	--	1.6	135	97	33
July 1-10 ----------	1,939	74	5	7.6	24.9	2.0	.02	29	7.7	8.6	88	37	7.5	--	1.8	148	104	32
July 11-20 ---------	3,480	74	6	7.6	22.7	4.4	.07	25	6.7	8.4	72	38	5.5	--	2.4	132	90	31
July 21-31 ---------	2,359	74	4	7.5	22.9	4.2	.02	27	6.8	7.1	76	36	6.2	--	2.7	134	95	33
Aug. 1-10 ---------	1,262	76	8	7.6	27.8	3.2	.01	33	8.4	11	100	43	8.6	--	2.0	170	117	35
Aug. 11-20 --------	1,363	78	10	7.5	29.1	3.2	.02	34	8.7	13	100	48	11	--	1.5	175	121	39
Aug. 21-31 --------	3,418	76	22	7.3	25.8	6.2	.12	31	7.9	8.8	78	49	7.8	--	3.8	161	110	46
Sept. 1-10 ---------	3,039	73	25	7.4	21.9	7.6	.14	27	6.4	6.4	74	34	6.2	--	3.4	143	94	33
Sept. 11-20 --------	1,128	75	10	7.8	28.9	3.8	.02	34	8.8	13	104	46	10	--	1.6	174	121	31
Sept. 21-30 --------	836	60	7	7.6	33.1	1.2	.01	37	10	15	107	58	12	--	2.1	194	133	46
Average -------	3,217	54	11	--	22.3	4.3	0.05	26	7.0	7.9	76	36	6.0	--	3.1	183	94	31

SUSQUEHANNA RIVER BASIN--Continued

JUNIATA RIVER AT NEWPORT, PA.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

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

RAYSTOWN BRANCH JUNIATA RIVER NEAR HUNTINGDON, PA.

LOCATION.--At Hawn Bridge, a quarter of a mile below Pennsylvania Electric Company power dam.
DRAINAGE AREA.--957 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 168 parts per million Aug. 11-20; minimum, 64 parts per million Apr. 11-20.
Total hardness: Maximum, 125 parts per million Aug. 11-20; minimum, 41 parts per million Apr. 11-20.
Water temperatures: Maximum, 80° F. July 30, 31, Aug. 1, 5; minimum, freezing point on many days in December, January, February, and March.
REMARKS.--Flow is regulated by dam a quarter of a mile upstream from gaging station. Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1081. Records of specific conductance and pH of daily samples are available in district office at Washington, D. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																			Total	Noncarbonate
Oct. 1-10, 1946 ---	258	60	8	7.7	24.4	2.8	0.01	0.00	30	10	3.7	2.8	84	45	2.6	0.1	3.5	147	116	47
Oct. 11-20 -------	378	60	6	7.5	23.9	2.6	.01	.00	29	9.8	2.8	3.3	84	42	2.6	.1	3.5	142	113	44
Oct. 21-31 -------	1,237	57	12	6.7	19.3	4.6	.02	.00	23	7.3	3.6	3.2	65	35	2.8	.1	3.4	115	87	34
Nov. 1-10 -------	458	56	10	7.5	16.8	6.5	.02	.00	20	5.9	2.7	2.6	55	28	2.5	.1	4.2	99	74	29
Nov. 11-20 -------	314	49	6	7.7	21.1	5.6	.02	.00	26	8.1	3.5	2.7	75	36	2.6	.1	3.9	125	98	37
Nov. 21-30 -------	261	44	5	7.8	22.7	3.0	.02	.00	28	9.4	3.8	2.2	80	41	2.5	.1	4.2	134	108	43
Dec. 1-10 --------	218	40	10	7.3	23.4	4.2	.01	.00	30	9.3	2.7	2.0	83	41	2.8	.0	3.0	136	113	45
Dec. 11-20 -------	286	38	12	7.3	23.9	4.2	.01	.00	30	9.7	2.6	1.8	84	42	2.8	.0	3.2	136	115	46
Dec. 21-31 -------	786	35	25	7.2	21.8	4.4	.03	.00	27	8.3	2.9	2.0	72	39	2.8	.0	3.3	124	102	42
Jan. 1-10, 1947 ---	1,417	33	8	6.9	12.7	6.5	.03	.00	15	4.3	2.6	1.3	36	24	2.2	.0	3.7	78	55	26
Jan. 11-20 -------	1,277	36	8	7.0	13.8	6.5	.03	.00	16	4.8	2.4	1.3	40	26	2.5	.0	3.3	83	60	27
Jan. 21-31 -------	1,691	37	10	7.1	11.3	7.1	.05	.00	13	3.8	2.6	1.2	31	21	2.1	.0	3.5	69	48	23
Feb. 1-10 --------	910	36	8	7.1	13.5	6.3	.07	.00	16	4.9	2.4	1.4	40	26	2.1	.0	3.0	82	60	27
Feb. 11-20 -------	556	33	4	6.5	16.6	7.0	.02	.00	19	6.4	2.3	1.5	47	32	2.2	.1	4.4	100	74	35
Feb. 21-28 -------	366	32	5	6.8	17.7	4.8	.02	.00	21	6.9	2.4	1.4	53	35	2.0	.1	4.1	108	81	37
Mar. 1-10 --------	466	34	9	6.4	12.2	5.8	.04	.00	13	4.5	2.4	1.3	32	24	2.0	.1	3.8	85	51	25
Mar. 11-20 ------	2,027	37	5	7.0	11.6	5.7	.05	.00	12	4.2	2.5	1.5	29	23	3.2	.1	3.6	72	47	23
Mar. 21-31 ------	1,607	39	6	7.0	12.2	5.4	.06	.00	14	4.2	2.3	1.5	31	23	3.8	.0	3.4	75	52	27

SUSQUEHANNA RIVER BASIN--Continued

RAYSTOWN BRANCH JUNIATA RIVER NEAR HUNTINGDON, PA.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																			Total	Non-carbonate
Apr. 1-10, 1947---	1,058	41	5	7.0	11.0	5.7	0.04	0.00	12	4.0	2.4	1.5	30	22	1.9	0.0	2.1	66	46	22
Apr. 11-20 -------	614	48	3	6.9	10.2	5.9	.02	.00	10	3.9	2.1	1.7	26	22	1.8	.1	1.6	64	41	20
Apr. 21-30 -------	879	54	3	7.1	13.0	4.6	.03	.00	15	4.6	2.2	1.6	39	27	1.6	.1	1.5	79	56	24
May 1-10 ---------	1,319	61	1	6.9	11.2	5.2	.03	.00	12	3.8	2.0	1.5	32	23	1.5	.1	1.5	68	46	19
May 11-20 --------	1,121	61	5	7.1	11.4	5.7	.04	.00	13	3.7	2.0	1.6	34	22	1.6	.1	2.0	70	48	20
May 21-31 --------	1,315	64	2	6.9	13.2	4.7	.02	.00	15	4.6	1.8	1.6	38	26	1.8	.1	1.6	82	56	25
June 1-10 --------	808	71	3	7.0	13.0	5.4	.03	.00	15	4.4	1.9	1.8	39	24	1.8	.1	2.0	80	56	24
June 11-20 -------	716	71	8	7.1	15.4	7.0	.02	.00	18	5.4	2.4	1.4	49	29	1.9	.1	2.0	93	67	27
June 21-30 -------	284	73	8	7.1	16.4	5.2	.02	.00	19	5.9	2.5	1.4	50	33	2.4	.1	2.0	101	72	31
July 1-10 ---------	328	73	7	7.2	20.8	3.4	.02	.00	24	8.0	2.7	1.4	62	44	2.0	.1	1.7	125	93	42
July 11-20 -------	678	74	22	7.3	17.2	6.3	.03	.00	21	5.9	2.3	1.7	53	33	2.0	.1	2.4	106	77	33
July 21-31 -------	388	76	10	7.5	18.4	4.8	.03	.00	23	6.2	2.6	1.5	60	34	2.0	.1	1.7	111	83	34
Aug. 1-10 --------	237	78	5	7.2	21.6	4.7	.02	.00	27	8.3	2.6	2.2	63	48	2.4	.1	2.3	133	102	50
Aug. 11-20 -------	322	78	3	7.2	26.8	3.8	.01	.00	32	11	2.3	1.9	63	72	2.6	.1	1.8	168	125	74
Aug. 21-31 -------	776	76	7	7.0	17.0	8.0	.02	.00	21	5.9	2.4	2.0	58	30	2.1	.2	2.6	105	77	29
Sept. 1-10 --------	275	78	3	7.1	16.6	6.4	.02	.00	20	5.7	2.5	2.2	51	33	2.1	.1	2.7	103	73	32
Sept. 11-20 -------	176	78	5	7.4	21.6	6.0	.02	.00	27	7.8	2.5	2.1	64	46	2.8	.1	2.3	139	99	47
Sept. 21-30 -------	125	76	6	7.3	24.8	4.3	.02	.00	30	10	2.8	2.3	76	52	2.9	.0	1.8	147	116	54
Average ------	730	55	7	--	17.2	5.3	0.03	0.00	20	6.4	2.6	1.9	53	33	2.3	0.1	2.8	104	76	33

Temperature (° F.) of water, water year October 1946 to September 1947

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

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POTOMAC RIVER BASIN

SOUTH BRANCH POTOMAC RIVER NEAR PETERSBURG, W. VA.

LOCATION.--At Potomac Edison Power plant, 1,000 feet upstream from gaging station, and 2½ miles west of Petersburg, Grant County.
DRAINAGE AREA.--642 square miles.
RECORDS AVAILABLE.--Water temperatures: January to September 1947.
EXTREMES, 1946-47.--Water temperatures: Maximum, 82° F. Aug. 14-15; minimum, freezing point on many days in January, February, and March.

Temperature (° F.) of water, water year October 1946 to September 1947

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

CACAPON RIVER AT GREAT CACAPON, W. VA.

LOCATION.--At the Potomac Edison power plant, 4 miles downstream from gaging station, and 2½ miles upstream from mouth.
DRAINAGE AREA.--681 square miles above power plant (677 square miles above gaging station).
RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47--Water temperatures: Maximum, 79° F. Aug. 13-14, 25, 28, 31; minimum, freezing point on many days in December, February, and March.

Temperature (° F.) of water, water year October 1946 to September 1947

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

SOUTH ATLANTIC SLOPE AND EASTERN GULF OF MEXICO BASINS

JAMES RIVER BASIN

APPOMATTOX RIVER AT FARMVILLE, VA.

LOCATION.--At gaging station at highway bridge 1,000 feet north of town limits of Farmville, Prince Edward County, and 1¼ miles downstream from Buffalo Creek.
DRAINAGE AREA.--306 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1082.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
Oct. 7, 1946	108	4	7.1	22	0.07	6.1	2.5	6.0	40	2.1	2.4	0.0	0.2	63	26
Nov. 19	443	15	7.3	16	.01	4.9	2.8	4.2	27	4.8	3.5	.1	.6	56	24
Dec. 16	719	5	7.1	21	.06	6.1	3.0	5.7	40	2.8	3.0	.1	.4	62	28
Jan. 17, 1947	--	10	6.6	15	.13	4.7	2.5	4.8	27	5.5	3.0	.0	.4	55	22
Feb. 12	191	3	7.3	18	.06	5.6	2.6	4.3	32	3.6	2.5	.1	.3	55	25
Mar. 17	586	8	7.1	14	.14	3.9	2.0	5.2	21	5.1	4.5	.0	.4	47	18
Apr. 15	416	10	7.2	16	.22	5.9	2.4	4.9	32	4.2	3.2	.0	.3	58	25
May 13	160	5	7.1	18	.09	7.2	2.8	4.9	41	2.2	2.8	.0	.2	58	29
June 16	174	20	6.7	18	.02	6.0	2.7	4.4	34	2.7	3.0	.1	.7	60	26
July 8	114	10	6.9	17	.01	5.4	2.9	4.1	32	2.8	3.2	.1	.5	58	25
Sept. 17	68	8	7.2	20	.16	6.5	3.0	4.2	38	2.4	2.8	.0	.2	60	29

APPOMATTOX RIVER AT MATTOAX, VA.

LOCATION.--At gaging station at Southern Railway bridge at Mattoax, Amelia County, half a mile upstream from Skinquarter Creek.
DRAINAGE AREA.--729 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1082.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
Oct. 11, 1946	585	12	7.5	--	--	5.7	2.9	3.8	33	2.5	3.0	0.1	0.3	58	26
Nov. 14	258	7	6.9	29	0.04	7.6	3.4	10	57	2.2	4.0	.0	.1	89	33
Dec. 13	266	8	7.1	22	.34	6.4	3.0	5.8	40	3.0	3.2	.1	.2	64	28
Jan. 10, 1947	585	7	6.9	16	.11	3.7	2.0	3.6	22	2.6	2.8	.0	.8	47	17
Feb. 13	415	5	7.1	19	.04	5.8	2.8	4.5	34	3.7	2.8	.0	.2	58	26
Apr. 16	1,708	7	6.9	19	.01	6.1	3.1	5.1	38	2.1	3.5	.1	.5	63	28
May 13	343	10	7.1	18	.33	7.1	3.6	3.4	40	2.6	3.0	.0	.2	61	32
July 8	160	5	7.2	20	.05	7.0	3.8	3.2	40	2.3	3.2	.1	.2	65	33
Aug. 21	136	6	7.5	23	.02	6.8	3.0	6.3	42	3.2	3.2	.1	.6	66	29
Sept. 18	88	7	7.4	20	.04	7.9	3.1	6.5	47	2.4	3.5	.2	.2	66	32

JAMES RIVER BASIN--Continued

BUFFALO CREEK NEAR HAMPDEN SIDNEY, VA.

LOCATION.--At gaging station at bridge on State Highway 626, 0.8 mile upstream from Locket Creek, 2 miles northwest of Hampden Sidney, Prince Edward County, and 6 miles southwest of Farmville.
DRAINAGE AREA.--70 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1082.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
Oct. 7, 1946	29	6	7.3	23	0.16	6.5	2.2	6.2	40	2.0	2.4	0.1	0.1	64	25
Nov. 19	85	7	7.3	18	.03	5.5	3.0	4.0	30	4.4	3.5	.1	.3	59	26
Dec. 16	38	8	7.4	22	.12	5.8	2.6	5.6	38	1.0	3.5	.0	.2	60	25
Jan. 17, 1947	110	8	7.1	18	.24	5.0	2.3	3.6	27	3.7	2.5	.0	.4	55	22
Feb. 12	52	5	7.1	20	.04	5.4	2.4	4.6	33	3.0	2.1	.0	.2	55	23
Mar. 17	118	8	7.3	16	.10	4.2	2.0	3.7	23	4.1	2.0	.2	.4	48	19
Apr. 15	103	10	7.3	17	.06	5.6	2.3	6.2	37	3.0	2.2	.0	.4	57	23
May 12	40	9	7.1	18	.15	6.6	2.2	4.6	37	1.8	2.2	.0	.2	58	26
June 16	40	16	6.9	20	.01	5.9	2.8	4.9	37	2.0	2.8	.1	.3	62	26
July 7	25	3	7.1	23	.01	5.8	2.8	5.4	38	1.6	3.2	.1	.2	64	26
Aug. 20	20	5	7.5	19	.03	7.0	2.5	6.3	42	2.3	2.8	.2	.2	67	28
Sept. 18	13	5	7.3	21	.04	6.0	2.7	5.2	37	1.8	3.5	.1	.1	60	26

NOTTOWAY RIVER NEAR BURKEVILLE, VA.

LOCATION.--At gaging station at bridge on State Highway 49, 2¾ miles upstream from Modest Creek, 6 miles north of Victoria, and 7¼ miles south of Burkeville, Nottoway County.
DRAINAGE AREA.--38 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES.--Dissolved solids: Maximum, 88 parts per million May 11-20; minimum, 46 parts per million Mar. 11-20.
Total hardness: Maximum, 42 parts per million Sept. 1-10; minimum, 19 parts per million Mar. 11-20.
Water temperatures: Maximum, 78° F. June 11, Aug. 19, 20, 24-26; minimum, freezing point Dec. 4-6.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1082. Records of quantities of suspended matter are available in district office at Charlottesville, Va.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Oct. 1-10, 1946 ---	9.61	57	3.3	2.4	15	6.7	24	0.06	7.2	3.5	5.2	1.3	45	4.5	3.2	0.1	0.2	73	32
Oct. 11-20 --------	10.4	57	3.6	2.4	20	6.8	26	.18	7.6	4.0	6.0		48	4.0	3.2	.1	.2	78	35
Oct. 21-31 --------	12.6	55	2.6	1.9	27	7.1	27	.21	7.9	3.9	6.9		50	3.7	4.0	.1	.2	80	36
Nov. 1-10 --------	10.7	57	2.6	2.0	27	7.3	28	.33	8.4	4.2	7.1		54	3.3	4.0	.1	.1	82	38
Nov. 11-20 -------	48.3	47	3.4	2.8	33	7.3	25	.55	7.2	3.7	5.6		44	3.4	3.8	.1	.2	77	33
Nov. 21-30 -------	15.1	44	2.4	1.8	26	7.3	24	.36	7.1	3.6	6.0		44	3.9	3.5	.1	.2	74	32
Dec. 1-10 --------	9.96	36	2.0	1.6	22	7.4	26	.28	7.6	3.9	6.1		48	3.5	3.5	.1	.1	76	35
Dec. 11-20 -------	11.4	41	1.7	1.2	7	7.1	25	.17	7.8	4.0	5.8		48	3.4	3.5	.2	.1	74	36
Dec. 21-31 -------	26.8	39	2.4	1.8	12	6.9	21	.05	6.0	3.3	4.8	1.1	36	5.8	3.5	.3	.2	67	28
Jan. 1-10, 1947 ---	59.3	39	3.7	2.8	22	7.1	20	.02	5.8	2.7	5.8		32	5.9	3.8	.1	.3	63	26
Jan. 11-20 -------	158	41	4.8	3.3	22	6.8	20	.08	5.3	2.4	4.1		26	6.1	2.8	.1	.2	58	23
Jan. 21-31 -------	50.8	39	2.9	2.5	16	6.7	20	.09	4.8	2.5	5.0		28	5.3	3.0	.1	.2	57	22
Feb. 1-10 --------	20.2	36	2.0	1.9	10	6.9	24	.02	6.3	3.1	5.3		38	4.1	3.0	.1	.2	66	28
Feb. 11-19 -------	17.6	34	--	--	5	7.0	22	.03	6.3	3.1	6.5		40	3.7	4.0	.1	.1	67	28
Feb. 20-28 -------	18.3	33	--	1.9	15	7.1	22	.20	6.1	3.5	6.4		41	4.1	3.8	.1	.2	71	30
Mar. 1-10 --------	53.8	34	--	2.7	17	6.8	18	.04	4.8	2.9	5.0		28	6.5	3.2	.1	.3	65	24
Mar. 11-20 -------	141	42	3.8	3.1	15	6.6	15	.02	3.8	2.2	3.2		20	4.4	2.8	.1	.3	46	19
Mar. 21-31 -------	33.3	43	--	3.4	8	7.3	19	.08	5.2	2.6	5.0		30	5.1	3.0	.1	.2	58	24

CHOWAN RIVER BASIN--Continued

NOTTOWAY RIVER NEAR BURKEVILLE, VA.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Apr. 1-10, 1947	27.1	52	--	3.2	5	7.3	20	0.24	6.3	2.9	6.2		38	4.9	3.2	0.1	0.2	65	28
Apr. 11-20	94.2	56	7.0	5.0	15	7.3	18	.02	5.0	2.6	4.4		28	5.3	2.8	.1	.2	57	23
Apr. 21-30	20.7	60	8.0	6.6	22	6.9	21	.28	6.6	3.0	6.1		40	4.0	3.5	.0	.1	71	29
May 1-10	16.0	61	4.6	2.4	18	7.0	22	.12	6.6	3.4	7.3		46	4.1	3.0	.0	.1	75	30
May 11-20	9.62	67	12	4.6	5	7.1	24	--	8.6	3.8	8.5		56	3.8	4.0	--	.1	88	37
May 21-31	15.0	71	8.0	6.6	24	6.9	24	.44	7.9	3.5	6.7		48	3.1	3.2	.1	1.6	84	34
June 1-10	5.70	70	5.2	4.4	16	6.9	24	.11	8.1	3.6	8.0		54	2.5	3.2	.1	1.0	84	35
June 11-20	4.42	73	4.8	4.2	9	6.9	25	.04	8.0	3.5	7.1		52	2.1	3.0	.1	.5	86	34
June 21-30	7.95	70	4.8	5.0	10	6.9	22	.07	7.1	3.1	6.0		44	2.7	3.0	.1	.2	78	30
July 1-10	3.84	72	4.8	3.2	18	7.3	22	.02	7.3	3.3	5.8		44	3.3	3.0	.1	.3	77	32
July 11-20	4.74	73	5.3	3.6	16	7.4	22	.01	7.4	3.3	6.6		45	4.3	3.0	.2	.1	79	32
July 21-31	63.7	71	7.2	5.8	12	7.3	22	.01	6.0	2.8	4.9		36	3.0	2.9	.1	.1	73	26
Aug. 1-10	3.70	73	4.4	3.8	20	7.2	23	.03	7.7	3.2	7.8		50	3.2	3.0	.2	.3	77	32
Aug. 11-20	1.55	77	2.4	2.1	10	7.4	24	.21	9.5	4.2	7.1		58	2.6	3.8	.2	.2	86	41
Aug. 21-31	.79	76	3.2	1.7	15	7.4	24	.20	9.2	4.0	6.5	2.0	58	2.3	4.0	.1	.1	87	39
Sept. 1-10	.62	71	3.9	3.0	20	7.3	23	.01	9.3	4.6	6.3		58	2.3	3.8	.1	.2	84	42
Sept. 11-20	.70	69	3.6	3.1	10	7.3	24	.44	8.9	4.3	5.8	1.9	58	2.2	3.2	.1	.2	86	40
Sept. 21-30	319	65	4.9	4.0	25	6.7	18	.05	6.0	3.0	4.1	1.4	34	4.8	3.0	.1	.2	66	27
Average	36.3	56	4.4	3.2	16	--	22	0.14	7.0	3.4	6.1		43	3.9	3.3	0.1	0.3	73	31

Temperature (° F.) of water, water year October 1946 to September 1947

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

CHOWAN RIVER BASIN--Continued

NOTTOWAY RIVER NEAR SEBRELL, VA.

LOCATION.--At gaging station 1.1 miles downstream from Three Creek, 2.5 miles southwest of Sebrell, Southampton County, and 5.3 miles upstream from Assamoosick Swamp.
DRAINAGE AREA.--1,451 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES.--Dissolved solids: Maximum, 70 parts per million June 1-10; minimum, 44 parts per million Mar. 21-31.
Total hardness: Maximum, 27 parts per million Sept. 1-10; minimum, 14 parts per million Jan. 21-31.
Water temperatures: Maximum, 84° F. June 14; minimum, 33° F. Feb. 24.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1082. Records of quantities of suspended matter are available in district office at Charlottesville, Va.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Oct. 1-10, 1946 ---	419	59	4.4	3.1	23	6.5	14	0.05	5.3	1.8	4.4	1.6	27	4.2	4.1	0.1	0.4	56	21
Oct. 11-20--------	1,145	60	6.8	5.2	33	6.1	14	.01	4.4	1.6	3.1	1.4	18	5.0	4.0	.0	.3	52	18
Oct. 21-31--------	558	59	5.9	3.8	25	6.3	17	.02	5.0	1.9	4.5	1.4	25	4.0	4.1	.0	.3	59	20
Nov. 1-10 --------	649	60	5.3	4.6	40	6.7	17	.09	5.9	2.0	4.9	1.2	30	3.3	4.8	.1	.2	65	23
Nov. 11-20 -------	608	--	--	--	28	--	18	.01	5.5	2.1	5.0	1.7	30	2.5	5.0	.2	.4	62	22
Nov. 21-30 -------	955	--	--	--	38	6.9	18	.24	4.8	2.5	4.3	2.0	26	4.4	5.0	.2	.6	59	22
Dec. 1-10 --------	544	41	4.6	4.4	24	6.5	17	.30	5.6	1.7	4.6	1.6	27	3.8	4.6	.1	.3	60	21
Dec. 11-20 -------	516	45	4.3	4.3	14	6.2	17	.01	5.3	1.7	5.5	1.4	28	3.5	4.5	.1	.4	57	20
Dec. 21-31 --------	1,369	42	5.2	5.1	16	6.3	16	.01	4.2	1.5	4.4	1.6	20	5.1	4.6	.1	.4	53	17
Jan. 1-10, 1947 ---	1,529	44	4.8	4.2	18	--	16	.02	4.7	1.5	4.4	.9	21	4.9	4.1	.1	.1	56	18
Jan. 11-20--------	2,574	45	6.4	4.9	21	--	13	.02	4.2	1.2	3.5	1.3	15	5.5	3.5	.2	.5	50	15
Jan. 21-31--------	3,044	44	6.6	5.7	28	--	12	.01	3.6	1.2	3.3	1.2	14	5.0	3.5	.3	.2	48	14
Feb. 1-10 --------	1,381	35	--	--	15	--	14	.02	4.0	1.2	3.6	1.6	18	4.7	3.2	.3	.2	49	15
Feb. 11-19 -------	950	38	3.5	3.1	20	7.0	16	.26	4.2	1.8	4.2		20	4.2	4.2	.0	.4	54	18
Feb. 20-28 -------	1,532	35	3.5	3.4	20	6.7	14	.18	4.0	1.6	4.1		18	4.6	4.0	.0	.5	49	17
Mar. 1-10 --------	1,430	36	2.8	2.9	10	6.9	15	.02	3.8	1.5	4.9		20	4.1	3.8	.0	.3	50	16
Mar. 11-20 -------	2,905	43	4.2	3.6	15	6.6	12	.01	3.6	1.5	4.0		16	5.1	3.5	.0	.5	46	15
Mar. 21-31 -------	1,632	46	3.6	3.3	15	6.8	12	.01	3.9	1.4	3.7		16	4.3	4.0	.0	.5	44	16

Apr. 1-10	1,343	56	5.9	4.0	15	7.1	12	.02	4.3	1.7	4.2	20	4.1	4.0	.1	.5	46	18
Apr. 11-20	2,105	60	--	7.1	25	7.2	12	.01	4.6	1.6	4.5	22	4.1	3.5	.1	.4	50	18
Apr. 21-30	1,479	60	6.5	5.0	50	6.4	13	.16	4.6	1.8	4.6	24	2.8	4.2	.0	.5	59	19
May 1-10	953	63	--	5.1	30	6.5	13	.03	4.7	2.0	4.8	26	2.8	4.2	.0	.4	58	20
May 11-20	453	65	5.4	4.0	40	6.7	15	.34	5.6	2.0	6.4	31	2.8	5.2	.0	.5	62	22
May 21-31	573	73	5.0	4.3	20	6.6	15	.02	6.4	2.1	5.2	32	3.3	3.8	.1	.8	62	25
June 1-10	298	72	4.8	4.5	23	--	15	.20	6.5	2.2	7.2	37	2.9	4.8	.1	.8	70	25
June 11-20	461	76	5.0	3.8	23	--	14	.01	6.1	1.9	6.8	34	3.8	3.5	.1	.9	61	23
June 21-30	369	70	6.3	5.5	25	--	13	.01	6.0	1.9	5.3	29	4.8	3.5	.1	.5	59	23
July 1-10	339	74	6.4	4.7	18	7.1	14	.03	5.6	1.8	4.9	28	4.0	3.0	.1	.5	58	21
July 11-20	291	75	3.8	2.5	15	7.0	14	.01	5.8	2.0	5.2 | 1.8	30	4.6	4.0	.2	.8	61	23
July 21-31	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 1-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 11-20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 21-31	193	77	4.7	4.3	25	7.2	10	.11	6.4	2.2	6.8	31	7.6	4.0	.1	.8	65	25
Sept. 1-10	112	78	3.5	3.3	25	7.3	9.8	.17	7.2	2.3	7.9	40	5.1	4.2	.1	.5	68	27
Sept. 11-20	196	74	5.4	4.7	25	7.2	11	.17	5.6	2.1	6.5	29	5.3	4.8	.1	.5	65	23
Sept. 21-30	909	65	6.4	4.9	20	7.1	13	.01	5.2	2.1	4.9 | 1.4	28	5.3	3.5	.1	.5	59	22
Average	969	58	5.0	4.3	24	--	14	0.08	5.0	1.8	5.3	25	4.3	4.1	0.1	0.5	57	20

CHOWAN RIVER BASIN--Continued

NOTTOWAY RIVER NEAR SEBRELL, VA.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

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

CHOWAN RIVER BASIN--Continued

BLACKWATER RIVER AT ZUNI, VA.

LOCATION.--At gaging station at bridge on U. S. Highway 460 at Zuni, Isle of Wight County, 1.6 miles downstream from Pope Swamp and 3.4 miles upstream from Antioch Swamp.
DRAINAGE AREA.--448 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 100 parts per million Sept. 1-10; minimum, 45 parts per million Mar. 11-20.
Total hardness: Maximum, 44 parts per million Aug. 11-20; minimum, 19 parts per million Jan. 21-31, Mar. 1-10.
Water temperatures: Maximum, 78° F. July 19, Aug. 17, 27; minimum, freezing point Feb. 11, 12, 14.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1082. Records of quantities of suspended matter are available in district office at Charlottesville, Va.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Oct. 1-10, 1946 ---	51.2	61	7.7	6.6	45	6.4	11	0.03	11	1.6	3.1	1.5	32	6.6	5.2	0.0	0.6	69	34
Oct. 11-20--------	176	59	8.3	6.6	45	6.2	11	.02	9.2	1.3	2.7	1.0	18	11	5.2	.0	.5	67	28
Oct. 21-31--------	94.6	58	8.3	7.2	45	6.2	12	.02	9.9	1.6	2.2	1.0	26	7.2	5.8	.0	.4	69	31
Nov. 1-10 --------	96.4	61	7.6	7.9	48	6.5	12	.01	13	2.0	2.7	1.8	40	4.0	6.8	.2	.2	82	41
Nov. 11-20 -------	115	50	7.1	6.7	48	6.7	12	.01	11	1.9	3.4	2.0	36	5.2	6.2	.2	.2	77	35
Nov. 21-30 -------	229	49	7.6	6.4	48	6.3	12	.02	8.6	1.5	3.2	1.4	22	5.5	6.8	.2	.4	66	28
Dec. 1-10 --------	157	39	8.3	7.8	55	6.3	13	.37	9.2	1.2	2.9	1.7	26	4.8	6.2	.0	.2	65	28
Dec. 11-20 -------	113	44	7.6	7.7	48	6.5	12	.42	9.6	1.2	3.2	1.6	29	3.8	6.4	.0	.2	66	29
Dec. 21-31 -------	268	41	7.6	6.6	40	6.3	11	.10	8.0	1.0	3.5	1.4	22	5.7	6.4	.0	.2	59	24
Jan. 1-10, 1947 ---	344	41	7.4	7.6	35	6.8	7.5	.24	7.2	1.0	2.4	1.8	18	5.9	5.0	.0	.1	58	22
Jan. 11-20 -------	640	43	7.6	6.8	36	--	8.6	.03	6.6	.9	2.7	1.4	17	6.3	5.0	.0	.3	54	20
Jan. 21-31 -------	898	42	7.6	6.6	48	--	7.6	.01	6.3	.8	2.4	1.1	15	5.6	4.6	.0	.3	50	19
Feb. 1-10 --------	461	34	--	--	40	--	8.0	.50	7.4	.7	2.1	.8	18	5.4	4.5	.0	.4	56	21
Feb. 11-19 -------	274	35	--	--	25	6.6	8.9	.02	6.9	1.3	3.0		20	4.9	5.2	.0	.4	52	23
Feb. 20-28 -------	385	34	--	--	28	6.5	8.4	.06	7.1	1.2	3.5		20	5.8	5.2	.0	.5	48	23
Mar. 1-10 --------	443	34	5.2	5.0	30	6.4	7.1	.16	6.3	.9	3.0		16	5.4	4.8	.1	.4	47	19
Mar. 11-20 -------	533	41	5.2	6.6	28	6.4	5.7	.02	6.4	.9	2.9		16	5.5	4.8	.0	.3	45	20
Mar. 21-31 -------	502	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--	--

CHOWAN RIVER BASIN--Continued

BLACKWATER RIVER AT ZUNI, VA.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Apr. 1-10, 1947 ---	439	55	6.8	6.6	35	6.5	2.9	0.01	7.2	1.0	3.7		22	4.8	4.8	0.0	0.4	46	22
Apr. 11-20 -------	603	59	12	9.0	55	7.1	3.4	.24	8.4	1.2	2.6		25	3.9	4.8	.0	.3	58	26
Apr. 21-30 -------	576	59	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--	--
May 1-10 ---------	272	61	12	10	48	7.2	3.8	.04	9.6	1.2	2.2		28	3.0	5.2	.0	.3	60	29
May 11-20 --------	119	63	11	8.8	40	6.7	6.1	.04	10	1.7	3.2		34	2.7	5.5	.0	.5	66	32
May 21-31 --------	57.4	71	12	8.0	100	6.7	7.5	.60	12	1.4	2.4		36	3.5	5.2	.0	.5	76	36
June 1-10 ---------	63.5	68	9.2	6.4	40	--	8.9	.22	11	1.4	2.8		33	4.3	5.0	.0	.9	75	33
June 11-20 --------	82.4	73	10	5.8	40	--	8.1	.01	10	1.4	3.1		30	5.1	5.0	.0	.6	67	31
June 21-30 --------	55.9	68	11	6.6	35	--	9.2	.01	10	1.4	3.7		30	6.0	5.2	.0	.8	70	31
July 1-10 ---------	30.3	73	--	8.6	42	6.4	10	.66	11	1.3	3.8		35	4.5	5.1	.0	.5	73	33
July 11-20 --------	32.6	75	--	8.0	46	6.3	12	.19	11	1.2	2.6		31	5.3	4.8	.0	.4	72	32
July 21-31 --------	29.4	71	12	9.6	48	6.2	9.1	.03	10	1.2	4.1		32	5.9	4.2	.1	.5	67	30
Aug. 1-10 --------	19.8	73	12	10	50	6.3	9.2	.64	11	1.2	3.4		32	6.0	4.8	.1	.4	70	32
Aug. 11-20 -------	4.75	76	4.9	4.8	20	7.3	9.1	.09	15	1.6	4.2	1.5	46	7.4	5.0	.1	.6	82	44
Aug. 21-31 -------	27.0	76	5.1	5.0	20	7.0	8.5	.09	14	1.3	3.6	1.5	38	10	5.0	.1	.5	79	40
Sept. 1-10 --------	41.3	75	7.1	6.6	30	7.1	15	.05	15	1.4	3.1	1.2	20	27	4.5	.1	.4	100	43
Sept. 11-20 ------	15.1	74	7.4	6.1	35	7.1	12	.30	14	1.6	5.1		30	20	4.8	.1	.4	94	42
Sept. 21-30 ------	48.5	65	9.0	8.0	30	7.0	13	.22	14	1.6	2.6	1.2	30	15	5.0	.1	.3	89	42
Average ------	231	58	8.4	7.2	41	--	9.3	0.16	9.9	1.3	3.5		27	6.9	5.2	0.0	0.4	67	30

Temperature (° F.) of water, water year October 1946 to September 1947

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

CHOWAN RIVER BASIN--Continued

BLACKWATER RIVER NEAR FRANKLIN, VA.

LOCATION.--At gaging station half a mile south of town of Burdette, half a mile upstream from Black Creek, 3½ miles downstream from Corrowaugh Swamp, and 6 miles north of Franklin, Southampton County.
DRAINAGE AREA.--613 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1082.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
Oct. 10, 1946	144	34	7.3	11	0.11	11	1.2	3.2	31	6.2	4.8	0.1	0.5	66	32
Nov. 21	235	55	7.1	14	.39	5.4	1.7	4.9	12	6.5	9.8	.1	.6	72	20
Dec. 19	140	28	7.1	12	.02	8.6	1.4	3.0	25	2.9	7.0	.0	.4	62	27
Jan. 14, 1947	768	54	6.3	8.9	.52	6.2	1.1	3.2	14	5.9	6.0	.2	.5	57	20
Feb. 7	480	23	6.1	9.0	.02	4.4	1.2	5.7	8	9.0	8.1	--	1.2	48	16
Mar. 20	704	30	7.0	4.9	.11	5.1	1.2	5.8	15	5.8	8.0	.0	.6	46	18
Apr. 9	472	40	6.9	2.9	.03	6.8	1.1	2.9	18	4.2	6.0	.0	.4	50	21
June 18	350	40	6.9	3.6	.01	4.5	1.0	2.4	14	4.6	2.8	.0	.4	43	15
July 15	52	50	--	7.2	.04	7.0	1.5	3.2	19	6.3	5.5	.0	.8	64	24
Aug. 28	216	56	7.2	7.1	.22	10	1.8	4.0	32	6.1	5.8	.0	.5	67	32
Sept. 18	17	57	7.2	11	.08	12	1.9	4.7	27	8.3	5.5	.0	.4	81	38

SEACOCK CREEK AT UNITY, VA.

LOCATION.--At gaging station at highway bridge 0.7 mile northeast of Unity, Southampton County, 1 mile upstream from mouth, and 4.2 miles downstream from Round Hill Swamp.
DRAINAGE AREA.--102 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1082.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
Oct. 10, 1946	5.8	25	--	7.6	0.04	7.4	1.1	4.0	11	15	4.8	--	0.4	59	23
Nov. 21	58	60	6.1	12	.39	4.4	1.2	4.2	6	7.6	8.2	0.1	.7	64	16
Dec. 19	11	60	6.9	11	.42	4.1	1.1	3.7	7	5.5	7.5	.1	.5	57	15
Jan. 15, 1947	237	44	5.9	6.4	.02	4.0	1.1	3.0	6	6.8	6.0	.1	.5	50	14
Feb. 10	64	45	6.1	7.9	.20	4.2	1.0	4.1	8	6.9	6.8	--	.2	50	15
Mar. 20	--	35	6.7	5.7	.02	4.0	.9	4.0	8	5.9	6.5	.1	.3	44	14
Apr. 9	61	50	6.9	2.3	.01	5.0	1.0	3.3	12	4.1	6.5	.1	.4	48	17
June 18	56	60	6.9	7.3	.01	5.6	1.3	2.3	10	9.2	4.2	.1	.4	60	19
July 15	2.6	40	--	11	.05	5.8	1.7	3.3	15	7.9	5.2	.1	.6	70	21
Aug. 28	1.6	40	6.1	6.0	.02	7.9	2.1	3.2	14	15	5.5	.0	.5	64	28

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CHOWAN RIVER BASIN--Continued

NORTH MEHERRIN RIVER NEAR LUNENBURG, VA.

LOCATION.--At gaging station at bridge on State Highway 40, half a mile downstream from Tusekiah Creek, and 5 miles northwest of Lunenburg, Lunenburg County.
DRAINAGE AREA.--60 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 79 parts per million Nov. 1-10; minimum, 51 parts per million Mar. 11-20.
Total hardness: Maximum, 39 parts per million Nov. 1-10; minimum, 19 parts per million Mar. 11-20.
Water temperatures: Maximum, 81° F. Aug. 23; minimum, freezing point Dec. 19.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1082. Records of quantities of suspended matter are available in district office at Charlottesville, Va.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Oct. 1-10, 1946 ---	11.6	60	2.2	1.8	18	7.0	23	0.25	7.8	3.7	5.1	1.3	49	2.9	3.2	0.1	0.1	73	35
Oct. 11-20 -------	10.1	57	--	--	15	7.0	24	.22	8.1	4.1	6.5		53	2.8	3.2	.1	.1	75	37
Oct. 21-31 -------	14.2	58	2.2	1.7	22	7.3	26	.10	8.0	4.2	6.5		53	2.6	3.5	.0	.2	77	37
Nov. 1-10 --------	13.3	53	2.4	2.0	17	7.3	27	.13	8.4	4.3	6.4		55	2.3	3.5	.0	.2	79	39
Nov. 11-20 -------	27.2	47	3.1	2.3	23	7.3	22	.15	7.2	3.8	5.9		46	3.4	3.5	.0	.2	71	34
Nov. 21-30 -------	18.8	44	2.1	1.6	15	7.3	23	.08	7.0	4.3	5.7		48	3.0	3.5	.0	.1	71	35
Dec. 1-10 --------	14.6	38	2.1	1.6	12	7.3	25	.05	7.8	4.0	6.0		50	2.6	3.5	.1	.1	71	36
Dec. 11-20 -------	16.4	40	1.4	1.2	7	7.2	24	.08	7.6	3.7	6.7		50	2.5	3.2	.2	.1	72	34
Dec. 21-31 -------	35.2	41	2.6	1.6	18	--	21	.17	6.8	3.6	5.0	1.3	40	4.5	3.8	.2	.1	69	32
Jan. 1-10, 1947 ---	59.6	41	3.7	4.0	22	6.8	20	.17	6.3	3.0	5.3		34	6.1	3.5	.1	.2	70	28
Jan. 11-20 -------	162	43	5.2	4.2	25	6.6	16	.02	5.2	2.6	4.4		28	5.5	3.0	.1	.2	60	24
Jan. 21-31 -------	52.6	42	2.7	--	15	7.0	20	.02	5.7	2.9	5.4		34	4.4	3.5	.1	.2	60	26
Feb. 1-10 --------	29.9	39	2.2	--	15	7.2	25	.18	6.8	3.3	5.4		41	3.6	3.2	.1	.1	68	30
Feb. 11-19 -------	21.1	36	--	1.7	8	7.2	34	.09	7.1	3.3	6.3		44	3.1	3.8	.1	.1	78	31
Feb. 20-28 -------	34.3	34	--	--	5	7.1	22	.05	6.5	3.6	5.5		43	3.0	3.2	.0	.1	68	31
Mar. 1-10 --------	62.2	36	--	2.7	6	7.0	17	.05	5.2	3.1	5.0		32	4.9	3.5	.1	.2	60	26
Mar. 11-20 -------	179	40	--	2.7	7	6.8	14	.02	4.0	2.3	4.1		23	4.9	2.8	.1	.2	51	19
Mar. 21-31 -------	41.5	42	3.5	2.9	7	6.7	18	.04	5.8	2.9	5.5		35	4.7	3.0	.1	.1	58	26

Apr. 1-10	34.3	51	3.2	2.7	4	7.2	20	.03	6.2	3.0	5.7		38	4.3	5.0	.1	.1	62	28
Apr. 11-20	87.8	55	5.3	4.2	10	7.3	17	.02	6.0	2.9	4.5		32	4.8	3.5	.1	.3	60	27
Apr. 21-30	34.4	59	2.5	2.6	5	7.1	20	.09	6.2	3.2	5.6		40	3.3	3.1	.2	.1	68	29
May 1-10	38.5	63	3.6	3.6	9	7.1	21	.16	7.1	3.7	5.4		45	2.6	3.1	.2	.1	72	33
May 11-20	17.5	69	2.6	2.0	8	7.2	23	.07	7.2	3.6	6.4		48	2.2	2.9	.3	.1	74	33
May 21-31	32.4	74	4.4	3.6	10	7.1	21	.04	7.2	3.6	5.7		47	2.8	2.8	.1	.1	73	33
June 1-10	10.9	73	4.4	2.5	10	7.2	21	.18	7.3	3.8	6.6		48	2.1	2.8	1.0	.1	76	34
June 11-20	9.32	71	9.2	3.5	16	7.2	22	.20	7.9	3.7	6.2		52	1.7	2.6	.1	.1	76	35
June 21-30	7.11	70	3.8	2.3	6	7.1	24	.07	7.6	3.5	6.6		50	2.2	2.9	.1	.2	75	33
July 1-10	10.0	74	6.6	3.6	24	6.9	19	.03	6.5	2.9	5.0		39	2.9	2.5	.1	.3	67	28
July 11-20	9.15	77	3.0	1.6	40	7.2	19	.02	7.0	3.3	4.8	1.6	45	3.2	3.2	.1	.4	67	31
July 21-31	19.0	71	5.4	2.4	50	7.3	18	.01	6.0	2.8	4.4	1.5	38	3.6	3.0	.1	.2	66	26
Aug. 1-10	19.9	73	3.2	1.8	25	7.3	19	.01	7.0	2.5	4.8	1.5	39	4.5	3.2	.1	.2	68	28
Aug. 11-20	6.52	78	1.8	1.2	5	7.2	22	.08	7.5	3.5	5.6	1.8	49	2.8	3.2	.1	.2	74	33
Aug. 21-31	4.23	77	3.8	2.5	8	7.4	20	.15	7.4	3.6	5.4		46	2.4	3.2	.1	.1	69	33
Sept. 1-10	4.57	71	3.4	2.8	6	7.3	23	.30	8.6	3.6	7.0		51	3.8	3.8	.1	.1	76	36
Sept. 11-20	3.27	71	2.7	2.6	6	7.3	18	.28	7.8	3.6	6.6		50	2.3	3.5	.1	.1	72	34
Sept. 21-30	204	68	--	3.6	15	7.1	16	.01	6.0	2.9	4.8		36	3.1	3.0	.1	.1	61	27
Average	37.6	57	3.5	2.5	14	--	21	0.10	6.9	3.4	5.8		43	3.4	3.2	0.1	0.2	69	31

CHOWAN RIVER BASIN--Continued

NORTH MEHERRIN RIVER NEAR LUNENBURG, VA.--Continued.

Temperature (° F.) of water, water year October 1946 to September 1947

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

CHOWAN RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN CHOWAN RIVER BASIN IN VIRGINIA

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
NOTTOWAY RIVER NEAR MCKENNEY															
Oct. 11, 1946	291	13	7.4	18	0.13	4.6	2.3	5.1	28	3.3	3.5	0.1	0.5	55	21
Aug. 29, 1947	60	15	7.3	17	.06	5.4	2.1	6.4	33	2.4	4.0	.2	.3	59	22
NOTTOWAY RIVER NEAR STONY CREEK															
Oct. 11, 1946	504	30	6.5	16	0.40	4.2	1.5	5.6	23	4.1	3.5	0.2	0.4	56	17
Aug. 29, 1947	61	22	7.1	17	.05	5.4	2.4	16	48	4.2	9.0	.2	.1	80	23
STONY CREEK NEAR DINWIDDIE															
Oct. 11, 1946	48	20	7.1	20	0.45	4.3	1.7	7.1	30	2.3	3.9	0.2	0.2	59	18
Nov. 13	28	13	6.4	28	.28	5.4	2.6	8.7	43	1.3	4.5	.0	.2	80	24
Aug. 29, 1947	6.5	25	7.1	15	.33	5.2	2.2	5.9	34	1.4	3.5	.1	.4	62	22
BLACKWATER RIVER NEAR DENDRON															
Oct. 10, 1946	118	22	--	9.2	0.02	7.9	1.4	3.1	18	9.5	5.0	0.0	0.5	61	25
Feb. 10, 1947	220	40	6.3	8.0	.04	6.6	1.0	3.3	20	4.7	4.8	--	.2	49	21
Mar. 20	389	30	6.9	3.9	.01	6.0	.9	2.5	15	4.2	5.0	.0	.4	41	19
June 19	35	80	6.7	9.6	.16	11	1.4	3.2	35	4.5	4.5	.0	.4	75	33
July 16	25	42	--	9.3	.01	10	1.3	2.9	30	4.2	5.0	.0	.6	67	30
Aug. 28	121	55	7.2	13	.05	13	1.8	2.4	11	28	4.5	.1	.4	92	40
Sept. 18	5.2	55	7.2	12	.11	13	2.0	6.6	38	15	5.5	.1	.4	84	41

CHOWAN RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN CHOWAN RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
CHOWAN RIVER AT WINTON															
Jan. 22, 1947 -------	--	56	6.0	7.7	0.02	4.0	1.4	4.3	13	7.2	4.8	0.0	0.2	53	16
CHOWAN RIVER AT COLERAIN															
Jan. 22, 1947--------	--	45	6.5	10	0.02	4.6	1.4	7.2	17	6.6	8.5	0.0	0.2	60	17
MEHERRIN RIVER NEAR MARGARETSVILLE															
Jan. 22, 1947--------	--	35	6.1	11	0.02	3.4	1.6	4.4	16	5.8	3.8	0.0	0.3	48	15
MEHERRIN RIVER NEAR SEVERN															
Jan. 22, 1947--------	--	35	6.1	13	0.04	3.5	1.5	5.7	18	5.6	4.5	0.0	0.3	51	15
MEHERRIN RIVER AT MURFREESBORO															
Jan. 22, 1947--------	--	38	6.1	9.3	0.02	4.1	1.5	4.5	16	6.3	4.5	0.0	0.2	50	16
POTECASI CREEK NEAR WOODLAND															
Jan. 22, 1947--------	--	75	5.3	5.1	0.02	3.2	1.2	4.0	9	5.3	6.2	0.0	0.2	1/51	13
POTECASI CREEK NEAR WINTON															
Jan. 22, 1947--------	--	--	5.6	6.7	0.05	3.1	1.2	4.9	9	6.5	6.4	0.0	0.2	2/57	13
RAMSEY CREEK AT JACKSON															
Jan. 22, 1947--------	--	45	5.7	7.6	0.25	3.0	1.0	5.9	10	6.0	6.9	0.0	0.2	51	12
WICCACON RIVER NEAR HARRELLSVILLE															
Jan. 22, 1947--------	--	90	5.6	7.0	0.01	3.8	1.5	4.1	9	7.2	6.8	0.0	0.2	2/62	16

AHOSKIE CREEK AT AHOSKIE

Jan. 22, 1947	--	90	5.5	6.6	0.01	3.2	1.6	3.7	9	6.5	6.0	0.0	0.2	4/59	15

1/ Large proportion of organic matter; sum of mineral constituents 31 parts per million.
2/ Large proportion of organic matter; sum of mineral constituents 33 parts per million.
3/ Large proportion of organic matter; sum of mineral constituents 35 parts per million.
4/ Large proportion of organic matter; sum of mineral constituents 32 parts per million.

ROANOKE RIVER BASIN

MISCELLANEOUS ANALYSES OF STREAMS IN ROANOKE RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
ROANOKE RIVER AT ROANOKE RAPIDS															
July 22, 1947	8,140	34	6.4	14	0.02	6.6	2.5	9.0	37	7.7	4.8	0.2	0.9	67	27
ROANOKE RIVER AT WELDON															
July 22, 1947	--	34	6.8	12	0.01	12	2.2	8.9	53	7.7	4.0	0.2	1.0	81	39
ROANOKE RIVER NEAR SCOTLAND NECK															
July 22, 1947	6,240	30	6.6	14	0.03	7.5	2.1	10	42	7.1	4.2	0.2	1.0	68	27
ROANOKE RIVER AT WILLIAMSTON															
July 22, 1947	--	28	7.1	14	0.05	8.5	2.6	9.8	44	8.1	4.9	0.2	1.4	71	32
DAN RIVER NEAR FRANCISCO															
July 21, 1947	169	26	5.9	8.7	0.03	2.2	1.0	4.0	17	2.1	1.2	0.1	0.4	28	10
DAN RIVER NEAR WALNUT COVE															
Feb. 28, 1947	--	36	7.2	10	0.03	2.3	1.0	4.4	16	3.0	1.8	0.2	0.2	31	10
DAN RIVER AT LEAKSVILLE															
July 21, 1947	895	22	6.2	12	0.03	3.0	1.3	4.3	20	2.8	1.5	0.1	0.8	36	13
MAYO RIVER AT STONEVILLE															
July 21, 1947	--	22	6.3	12	0.03	2.9	1.4	3.9	20	2.4	1.1	0.2	0.6	37	13
SMITH RIVER AT SPRAY															
July 21, 1947	298	26	6.3	13	0.03	4.9	2.1	4.5	28	3.5	1.9	0.1	1.3	46	21

CHOCKYOTT CREEK AT WELDON

July 22, 1947 -------	--	74	5.1	6.5	0.08	3.0	1.2	4.2	10	7.9	3.6	0.0	0.2	1/51	12

CASHIE RIVER AT WINDSOR

July 22, 1947 -------	--	80	5.6	12	0.46	3.9	1.3	4.9	13	6.8	4.2	0.0	0.0	2/70	15

1/ Large proportion of organic matter; sum of mineral constituents 32 parts per million.
2/ Large proportion of organic matter; sum of mineral constituents 42 parts per million.

PAMLICO RIVER BASIN

MISCELLANEOUS ANALYSES OF STREAMS IN PAMLICO RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
TAR RIVER NEAR TAR RIVER															
Jan. 6, 1947 -------	95	35	6.7	9.6	0.04	5.0	2.4	5.9	24	4.7	6.8	0.3	0.2	68	22
TAR RIVER AT LOUISBURG															
Jan. 6, 1947 -------	--	20	6.8	15	0.07	4.8	2.1	7.0	24	6.7	6.0	0.2	0.4	62	22
TAR RIVER AT SPRING HOPE															
Jan. 6, 1947	--	20	6.6	10	0.05	4.6	1.9	6.9	23	6.0	5.4	0.5	0.4	60	19
TAR RIVER AT ROCKY MOUNT															
Jan. 6, 1947 -------	--	25	6.7	16	0.06	4.8	2.2	7.5	27	4.8	5.9	0.5	0.4	61	21
TAR RIVER AT TARBORO															
Jan. 6, 1947 -------	2,350	27	6.7	16	0.03	4.6	2.5	6.1	26	4.3	5.6	0.4	0.4	58	22
TAR RIVER AT GREENVILLE															
Jan. 6, 1947 -------	2,560	27	6.0	9.0	0.03	4.5	1.8	7.1	22	5.5	6.2	0.4	0.5	58	19
TAR RIVER AT WASHINGTON															
Jan. 6, 1947 -------	--	32	6.4	14	0.06	5.7	2.6	17	25	7.8	23	0.4	0.5	92	25
FISHING CREEK NEAR WOOD															
Jan. 7, 1947 -------	--	10	7.0	16	0.06	4.8	2.2	6.3	30	3.7	3.9	0.2	0.2	54	21
FISHING CREEK NEAR ENFIELD															
Jan. 6, 1947 -------	531	23	6.9	15	0.04	4.8	2.1	6.0	27	4.0	4.8	0.2	0.2	59	21

FISHING CREEK NEAR LAWRENCE															
Jan. 6, 1947 -------	--	20	7.0	16	0.06	4.5	2.1	8.0	29	4.6	5.4	0.4	0.2	66	29
TRANTERS CREEK ABOVE WASHINGTON 1/															
Apr. 7, 1947 -------	--	110	5.9	2.5	0.31	3.0	1.3	6.1	13	5.9	6.5	0.1	0.0	2/54	13
TRANTERS CREEK NEAR WASHINGTON 3/															
Apr. 7, 1947 -------	--	110	6.0	4.0	0.45	3.2	1.0	5.9	10	6.4	6.9	0.1	0.0	4/56	12

1/ Sample collected near Wharton.
2/ Large proportion of organic matter; sum of mineral constituents 32 parts per million.
3/ Sample collected near the Highway and Public Works Commission prison camp.
4/ Large proportion of organic matter; sum of mineral constituents 33 parts per million.

NEUSE RIVER BASIN

MISCELLANEOUS ANALYSES OF STREAMS IN NEUSE RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
ENO RIVER AT HILLSBORO															
Feb. 10, 1947 -----	31	32	7.4	17	0.03	5.2	2.2	6.1	32	3.3	3.8	0.1	0.2	54	22
ENO RIVER NEAR GORMAN															
Feb. 10, 1947 -----	--	30	7.4	16	0.02	5.2	2.3	6.5	29	4.1	5.8	0.1	0.1	54	22
NEUSE RIVER NEAR NORTHSIDE															
Feb. 10, 1947 -----	250	40	7.1	15	0.03	5.8	2.1	8.7	33	5.8	6.0	0.1	0.2	60	23
NEUSE RIVER NEAR CLAYTON															
Feb. 10, 1947 -----	634	30	7.2	16	0.03	5.0	1.2	10	31	5.1	6.2	0.1	0.6	60	17
NEUSE RIVER NEAR GOLDSBORO															
Feb. 10, 1947 -----	1,680	30	7.0	12	0.30	3.6	0.4	10	22	4.8	6.5	0.1	0.8	55	11
NEUSE RIVER AT KINSTON															
Feb. 11, 1947 -----	1,920	40	6.6	11	0.02	4.0	1.3	7.3	18	5.0	6.8	0.2	1.4	48	15
NEUSE RIVER AT NEW BERN															
Feb. 11, 1947 -----	--	52	6.5	7.5	0.05	11	16	128	23	36	222	0.2	0.8	457	93
FLAT RIVER AT BAHAMA															
Feb. 10, 1947 -----	46	24	7.4	16	0.03	4.6	2.1	5.9	28	3.6	4.2	0.1	0.1	50	20
FLAT RIVER AT DAM NEAR BAHAMA															
Feb. 10, 1947 -----	42	64	7.2	9.7	0.03	4.0	1.6	5.2	19	6.7	3.6	0.0	0.5	44	17

DIAL CREEK NEAR BAHAMA 1/															
Aug. 7, 1946 ------	0.73	6	--	21	0.02	4.4	1.6	5.8	28	2.4	3.0	0.1	0.2	60	18
DIAL CREEK NEAR BAHAMA															
Feb. 10, 1947 -----	2.30	6	7.3	17	0.02	4.1	1.9	5.6	25	3.6	4.0	0.1	0.1	49	18
CRABTREE CREEK NEAR RALEIGH															
Feb. 10, 1947 -----	--	8	7.2	14	0.04	4.6	1.0	9.2	28	3.8	5.8	0.1	0.2	53	16
SWIFT CREEK NEAR SMITHFIELD															
Feb. 10, 1947 -----	--	22	6.7	15	0.03	3.4	1.6	7.9	25	2.7	6.0	0.1	0.4	50	15
MIDDLE CREEK NEAR CLAYTON															
Feb. 10, 1947 -----	59	22	7.1	12	0.05	2.8	0.2	7.0	17	2.6	4.2	0.1	0.3	38	8
BLACK CREEK NEAR FOUR OAKS															
Feb. 10, 1947 -----	--	24	6.5	5.3	0.02	2.0	0.9	4.5	9	2.8	5.5	0.0	0.6	31	9
LITTLE RIVER NEAR PRINCETON															
Feb. 10, 1947 ------	140	40	6.5	12	0.03	2.7	1.0	6.6	16	2.8	5.8	0.3	0.4	43	11
CONTENTNEA CREEK NEAR WILSON															
Feb. 10, 1947 -----	191	40	6.9	11	0.03	2.8	1.2	6.7	19	3.0	5.2	0.0	0.6	41	12
CONTENTNEA CREEK AT HOOKERTON															
Feb. 11, 1947 ------	494	32	6.1	9.5	0.02	3.1	1.1	6.5	10	5.7	7.0	0.5	1.4	45	12

1/ Unpublished analyses for preceding water year.

NEUSE RIVER BASIN--Continued

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

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
LITTLE CONTENTNEA CREEK NEAR ATHEN															
Feb. 11, 1947	—	38	6.4	5.1	0.02	7.2	1.3	6.8	20	7.0	9.2	0.3	0.7	60	23
SWIFT CREEK NEAR WINTERBORO															
Feb. 11, 1947	—	50	6.6	3.3	0.04	10	1.2	6.3	28	11	8.6	0.3	0.8	72	30
TRENT RIVER AT POLLOCKSVILLE															
Feb. 11, 1947	—	20	6.8	4.3	0.02	19	1.1	5.8	59	6.3	6.5	0.0	0.7	87	52

CAPE FEAR RIVER AT LOCK 3 NEAR TARHEEL, N. C.

LOCATION.--At Tolars Landing 300 feet below dam, 450 feet downstream from gaging station, 1 mile downstream from county line, and 7 miles north of Tarheel, Bladen County.
DRAINAGE AREA.--4,810 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 71 parts per million July 1-10; minimum, 41 parts per million Feb. 1-10.
Total hardness: Maximum, 21 parts per million July 1-10; minimum, 10 parts per million Aug. 21-31.
Water temperatures: Maximum, 85° F. June 18, Sept. 4; minimum, 38° F. Mar. 3, 4.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1082. Records of quantities of suspended matter are available in district office at Raleigh, N. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Oct. 1-10, 1946 --	2,334	69	9.7	7.4	37	6.4	9.1	0.07	3.4	1.3	6.3	1.3	16	4.7	6.8	0.0	0.7	54	14
Oct. 11-20 -------	5,205	65	12	10	55	6.7	8.4	.02	3.2	1.3	5.0		14	4.9	5.2	.0	.4	50	13
Oct. 21-31 -------	2,853	65	8.5	7.2	59	6.6	8.7	.30	3.4	1.4	6.7		17	5.3	6.2	.0	.7	56	14
Nov. 1-10 -------	2,430	60	8.9	7.2	46	6.4	8.9	.19	3.4	1.5	5.7		16	4.1	6.2	.2	.5	50	15
Nov. 11-20 ------	3,462	58	8.7	5.9	32	6.6	8.9	.05	3.7	1.6	5.9		19	3.9	6.2	.0	.5	49	16
Nov. 21-30 ------	5,373	56	10	8.4	49	6.1	9.6	.08	3.2	1.4	5.4		14	5.1	6.0	.0	.4	50	14
Dec. 1-10 -------	2,761	49	9.1	7.3	47	6.3	9.5	.10	3.1	1.4	5.3		14	4.6	6.0	.0	.4	48	14
Dec. 11-20 ------	2,886	50	5.3	4.6	20	6.1	9.5	.05	3.0	1.4	5.1		20	4.4	6.6	.0	.6	45	13
Dec. 21-31 ------	4,198	45	7.7	5.4	27	6.2	9.5	.06	3.6	1.6	7.4		19	5.5	6.9	.1	.5	52	16
Jan. 1-10, 1947 --	5,471	48	11	6.4	70	6.4	8.0	.09	3.6	1.6	6.5	1.0	18	5.4	6.1	.1	.5	51	16
Jan. 11-20 ------	17,110	48	9.3	8.1	70	6.7	5.4	.04	3.2	1.5	5.0		14	5.9	4.6	.2	.5	45	14
Jan. 21-31 ------	14,000	48	7.2	5.9	42	6.6	7.7	.04	3.2	1.6	4.3		14	8.2	4.1	.0	.2	43	15
Feb. 1-10 -------	3,559	46	5.3	4.0	34	7.0	9.9	.03	2.8	1.2	5.7		14	4.7	4.9	.2	.7	41	12
Feb. 11-19 ------	2,541	42	4.4	3.0	22	7.0	10	.03	3.3	1.5	6.6		18	4.8	5.6	.2	.8	46	14
Feb. 20-28 ------	4,177	42	4.4	3.6	32	6.9	6.4	.02	3.2	1.6	7.7		19	5.3	6.4	.3	.7	47	15
Mar. 1-10 -------	5,680	41	5.3	3.8	34	6.9	6.1	.03	3.4	1.6	8.0		19	6.0	6.4	.3	1.0	48	15
Mar. 11-20 ------	9,735	46	7.4	5.2	56	6.9	7.1	.05	3.5	1.4	5.2		14	6.5	4.9	.1	.6	45	14
Mar. 21-31 ------	4,589	50	5.0	4.2	32	6.8	5.3	.02	2.7	1.3	6.6		10	4.9	5.2	.1	.7	42	12

CAPE FEAR RIVER BASIN--Continued

CAPE FEAR RIVER AT LOCK 3 NEAR TARHEEL, N. C.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Apr. 1-10, 1947 --	5,667	56	5.8	4.9	32	6.8	8.5	0.04	3.5	1.3	5.5	1.1	16	4.9	5.5	0.2	0.5	43	14
Apr. 11-20 ------	11,410	64	9.2	7.8	37	7.1	8.0	.05	3.4	1.5	8.3		20	4.7	7.6	.1	.6	49	15
Apr. 21-30 ------	4,399	66	8.4	7.2	27	6.5	6.1	.04	3.7	1.6	6.5		18	4.4	4.8	.2	4.0	45	16
May 1-10 --------	2,578	89	8.0	5.0	25	6.6	6.4	.03	3.9	1.5	5.4		19	4.2	4.9	.2	.4	42	16
May 11-20 -------	1,389	72	7.8	4.1	17	6.8	3.2	.04	4.2	1.7	7.2		24	4.1	5.8	.2	.7	45	16
May 21-31 -------	1,764	78	5.4	4.7	30	7.0	5.8	.02	3.6	1.6	6.0		23	4.4	6.1	.2	.4	45	16
June 1-10 --------	1,196	79	7.6	5.2	30	6.8	7.3	.04	4.4	1.6	6.8		22	4.0	6.2	.2	1.2	49	18
June 11-20 -------	1,052	62	6.2	4.3	28	6.6	8.0	.02	3.6	1.6	9.5		24	5.0	7.4	.4	1.0	55	16
June 21-30 -------	1,086	79	5.4	4.2	24	6.7	9.4	.03	3.8	1.7	9.9		25	4.6	7.5	.4	1.0	58	16
July 1-10 --------	1,344	82	4.8	4.1	24	6.6	8.2	.02	4.6	2.1	12	2.0	31	7.4	9.1	.5	2.2	71	21
July 11-20 -------	1,511	81	5.6	4.0	24	6.5	6.7	.02	3.4	1.4	6.9		18	4.9	5.2	.3	1.7	47	14
July 21-31 -------	1,395	80	7.3	5.5	32	6.6	6.5	.04	3.3	1.5	7.5		18	5.8	6.0	.3	.9	52	14
Aug. 1-10 -------	1,037	82	7.1	5.3	32	6.3	7.3	.02	2.8	1.2	5.7		14	4.6	4.9	.2	.8	42	12
Aug. 11-20 ------	1,930	82	7.9	6.9	32	6.3	7.0	.02	3.0	1.3	7.7		16	5.8	6.6	.3	.4	49	13
Aug. 21-31 ------	1,821	82	9.4	7.9	55	6.2	6.3	.02	2.0	1.1	5.7		12	4.2	4.8	.2	.4	44	10
Sept. 1-10 -------	1,125	83	8.0	5.6	34	6.5	4.0	.03	2.8	1.3	6.8		17	4.6	5.1	.2	.8	48	12
Sept. 11-20 ------	1,492	60	8.4	6.4	44	6.5	7.3	.03	2.3	1.2	8.0		14	5.1	7.2	.2	.7	50	11
Sept. 21-30 ------	11,600	68	11	7.6	44	6.4	7.0	.03	2.4	1.2	6.5		12	5.5	5.9	.2	.7	49	11
Average ------	4,232	64	7.6	5.8	37	--	7.6	0.05	3.3	1.5	6.9		18	5.0	6.0	0.2	0.8	46	14

Temperature (° F.) of water, water year October 1946 to September 1947

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

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CAPE FEAR RIVER BASIN--Continued

DEEP RIVER AT RAMSEUR, N. C.

LOCATION.--At bridge at Columbia Manufacturing Company in Ramseur, Randolph County, 750 feet downstream from diversion dam, a quarter of a mile upstream from gaging station, and 1½ miles downstream from Sandy Creek.
DRAINAGE AREA.--346 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 144 parts per million Sept. 11-20; minimum, 58 parts per million Jan. 11-20.
Total hardness: Maximum, 38 parts per million Sept. 11-20; minimum, 23 parts per million Jan. 11-20, 21-31.
Water temperatures: Maximum, 82° F. Aug. 12; minimum, 33° F. Feb. 10, 28.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1082. Records of quantities of suspended matter are available in district office at Raleigh, N. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Oct. 1-10, 1946 --	154	65	6.0	4.6	23	6.7	16	0.02	6.7	3.1	23	2.7	47	7.9	29	0.0	1.9	125	34
Oct. 11-20 -------	114	62	6.6	5.4	28	6.8	14	.03	7.0	2.8	16		37	6.9	17	.0	1.5	92	29
Oct. 21-31 -------	80.4	62	4.9	4.0	17	6.5	16	.03	7.6	3.1	13		42	6.8	12	.0	1.0	87	32
Nov. 1-10 --------	88.7	63	4.0	3.8	16	6.7	17	.02	7.6	3.2	16		46	6.2	16	.1	1.0	95	33
Nov. 11-20 -------	201	55	5.2	4.2	18	6.7	16	.02	8.4	3.4	21		47	6.3	24	.1	1.1	109	35
Nov. 21-30 -------	140	53	5.6	4.4	24	6.5	16	.05	7.1	2.8	14		37	6.9	14	.2	1.3	87	29
Dec. 1-10 --------	89.9	--	4.4	3.6	22	6.7	18	.10	7.7	3.1	15		43	7.0	14	.2	1.3	93	32
Dec. 11-20 -------	87.6	47	3.4	2.9	13	6.5	18	.11	7.6	3.3	16		46	6.5	16	.0	2.2	97	33
Dec. 21-31 -------	155	43	4.2	3.4	14	6.6	18	.09	7.9	3.3	19		45	7.1	19	.2	2.4	105	33
Jan. 1-10, 1947 --	291	44	5.7	5.2	17	6.6	13	.04	7.2	2.8	9.0	1.4	36	6.7	6.4	.1	.9	76	29
Jan. 11-20 -------	2,033	45	9.3	5.2	40	7.0	13	.04	5.5	2.2	6.4		34	7.9	5.5	.1	1.1	58	23
Jan. 21-31 -------	534	45	6.0	3.8	24	6.8	12	.03	5.4	2.2	8.5		22	7.9	6.5	.2	.8	60	23
Feb. 1-10 -------	179	41	3.6	3.2	16	7.1	17	.02	6.4	2.8	10		33	7.2	9.5	.2	1.3	75	27
Feb. 11-19 ------	150	41	3.7	3.2	16	7.2	18	.02	6.6	2.9	12		37	6.9	11	.2	1.4	61	28
Feb. 20-28 ------	274	37	3.7	3.1	36	7.0	12	.02	6.3	2.7	12		35	6.9	10	.3	1.5	76	27
Mar. 1-10 -------	480	39	4.2	3.1	54	7.0	12	.03	5.6	2.6	11		32	7.5	8.6	.1	1.7	71	25
Mar. 11-20 ------	626	44	5.1	3.4	24	6.9	10	.03	5.8	2.4	6.7		26	8.3	5.4	.2	1.0	61	24
Mar. 21-31 ------	244	48	3.4	2.5	22	7.1	10	.03	6.2	2.6	8.5		32	6.4	7.6	.1	1.1	68	26

Apr. 1-10	338	57	4.3	3.2	22	7.0	12	.03	6.2	2.8	8.6	1.4	33	5.6	8.1	.1	1.3	70	26
Apr. 11-20	462	62	7.0	4.9	24	7.2	14	.03	6.6	2.7	7.1		34	6.9	4.8	.1	1.2	73	28
Apr. 21-30	256	65	9.2	3.2	5	6.9	16	.04	7.2	2.8	9.1		39	6.2	6.6	.2	1.0	71	29
May 1-10	119	66	4.1	3.4	6	6.9	12	.04	6.4	2.7	13		44	5.5	9.2	.1	.8	73	27
May 11-20	98.5	69	3.4	3.0	4	6.9	15	.03	7.6	2.8	14		46	5.7	11	.1	1.0	82	30
May 21-31	110	75	4.2	2.9	12	7.0	15	.06	8.4	3.2	14		48	5.7	13	.0	1.8	91	34
June 1-10	106	73	5.3	3.6	14	7.0	8.9	.05	7.8	3.0	12		44	3.5	11	.1	3.0	88	32
June 11-20	62.6	76	4.6	3.7	20	6.8	17	.02	7.2	2.8	12		42	5.3	10	.2	1.7	84	29
June 21-30	48.3	73	7.1	3.6	22	6.6	15	.02	8.4	3.1	17		51	6.9	14	.2	1.2	97	34
July 1-10	39.8	76	4.6	3.3	16	6.6	16	.03	8.4	3.3	16	2.0	50	6.5	16	.2	1.1	102	34
July 11-20	42.7	76	4.2	3.6	12	6.6	16	.03	9.2	3.4	24		52	7.8	26	.2	1.3	119	37
July 21-31	40.3	75	4.0	3.4	12	6.8	18	.04	9.3	3.4	22		51	7.5	24	.1	1.6	117	37
Aug. 1-10	33.2	77	4.4	3.4	14	6.8	16	.04	8.8	3.3	18		51	6.6	18	.2	.9	104	36
Aug. 11-20	48.4	78	5.0	4.2	12	6.8	13	.02	7.8	3.0	18		45	6.3	18	.2	1.1	97	32
Aug. 21-31	62.7	78	5.0	4.1	24	7.0	10	.03	8.7	3.2	31		55	9.1	33	.2	1.2	130	35
Sept. 1-10	23.3	78	5.0	3.6	24	8.8	8.5	.03	8.0	3.1	24		50	8.6	24	.2	1.2	113	33
Sept. 11-20	52.0	77	6.6	5.0	22	6.9	13	.03	9.6	3.5	34		57	11	37	.2	.9	144	38
Sept. 21-30	1,950	65	8.5	5.5	24	6.5	9.4	.03	6.4	2.3	17		21	15	19	.2	1.8	92	25
Average	270	61	5.2	3.8	20	--	14	0.04	7.4	2.9	15		41	7.1	15	0.1	1.4	91	30

CAPE FEAR RIVER BASIN--Continued

DEEP RIVER AT RAMSEUR, N. C.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

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

CAPE FEAR RIVER BASIN--Continued

LOWER LITTLE RIVER AT LINDEN, N. C.

LOCATION.--At bridge on State Highway 217 at Linden, Cumberland County, half a mile downstream from Stewart Creek, and 2½ miles downstream from gaging station.
DRAINAGE AREA.--474 square miles (460 square miles above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 47 parts per million Sept. 21-30; minimum, 24 parts per million Feb. 11-19, Mar. 21-31, May 11-20.
Total hardness: Maximum, 10 parts per million Sept. 21-30; minimum, 5 parts per million Feb. 1-Apr. 10, May 11-20, Sept. 1-20.
Water temperatures: Maximum, 85° F. June 9-11, 28, July 31, Aug. 1, 7, 17; minimum, 36° F. Feb. 9, Mar. 2.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1082. Records of quantities of suspended matter are available in district office at Raleigh, N. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Oct. 1-10, 1946 --	344	65	8.6	6.6	37	6.1	5.3	0.03	1.4	0.6	2.9	0.8	5	2.9	3.5	0.0	0.7	32	6
Oct. 11-20 ------	666	63	12	9.5	50	6.2	5.6	.03	1.8	.5	2.5		5	3.0	3.2	.0	.4	33	7
Oct. 21-31 ------	403	62	9.3	7.2	37	5.8	4.3	.03	1.4	.6	2.4		4	2.7	3.2	.0	.6	30	6
Nov. 1-10 -------	404	62	9.0	7.1	47	5.8	5.3	.04	1.6	.7	2.6		4	2.4	3.8	.2	.9	32	7
Nov. 11-20 ------	516	53	8.8	6.1	37	6.0	5.5	.03	1.5	.6	2.6		4	2.3	3.8	.1	.7	30	6
Nov. 21-30 ------	718	52	9.9	7.9	53	5.5	4.6	.05	1.6	.7	1.9		4	2.9	3.2	.0	.3	33	7
Dec. 1-10 -------	404	46	7.5	6.1	37	5.8	4.8	.04	1.5	.7	2.7		4	3.0	3.8	.2	.3	30	7
Dec. 11-20 ------	333	48	5.6	4.8	26	5.5	5.7	.04	2.2	.6	2.9		7	2.7	3.6	.0	.6	30	8
Dec. 21-31 ------	538	45	8.1	7.6	49	5.4	4.7	.04	1.8	.8	2.6		7	2.9	3.1	.0	.5	29	8
Jan. 1-10, 1947 --	565	48	8.1	6.1	53	5.5	4.9	.04	1.7	.7	3.0	.8	7	3.0	3.4	.1	.2	29	7
Jan. 11-20 ------	1,260	49	9.7	7.2	52	6.0	4.7	.03	1.8	.8	2.0		5	3.2	3.1	.1	.2	30	8
Jan. 21-31 ------	1,050	49	7.0	5.8	32	5.9	4.5	.03	1.7	.9	2.3		5	3.1	3.9	.0	.2	28	8
Feb. 1-10 -------	542	43	6.7	5.1	24	6.0	4.7	.03	1.4	.4	3.5		5	2.7	3.4	.2	.7	26	5
Feb. 11-19 ------	390	43	6.8	4.6	22	6.4	4.9	.02	1.2	.4	3.8		5	2.6	3.6	.2	.5	24	5
Feb. 20-28 ------	461	42	4.9	4.0	24	6.0	4.1	.03	1.2	.6	3.7		5	3.4	3.4	.0	1.3	26	5
Mar. 1-10 -------	613	41	5.2	4.4	34	6.1	3.6	.04	1.2	.6	3.3		5	3.7	2.9	.0	.7	26	5
Mar. 11-20 ------	767	47	5.3	4.6	34	6.0	3.6	.02	1.2	.6	3.0		5	3.1	3.0	.0	.5	26	5
Mar. 21-31 ------	643	47	5.4	4.6	34	6.1	3.1	.02	1.2	.6	3.3		6	2.8	3.2	.0	.4	24	5

CAPE FEAR RIVER BASIN--Continued

LOWER LITTLE RIVER AT LINDEN, N. C.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Apr. 1-10, 1947-	677	63	6.3	5.0	34	6.1	3.8	0.03	1.5	0.4	3.5	0.8	8	2.4	3.8	0.0	0.5	29	5
Apr. 11-20 ------	1,550	--	6.6	5.7	34	6.1	8.2	.03	1.5	1.0	5.8		10	3.5	5.5	.0	1.0	37	8
Apr. 21-30 ------	676	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--	--
May 1-10 --------	525	66	11	10	37	5.6	5.0	.03	2.6	.5	2.5		8	2.4	3.2	.1	.2	32	9
May 11-20 -------	217	70	6.7	4.8	32	6.2	3.9	.02	1.0	.5	3.7		6	2.3	3.6	.0	.4	24	5
May 21-31 -------	394	76	8.4	6.2	35	6.0	4.7	.03	1.8	.8	3.1		9	2.3	2.8	.0	1.0	30	8
June 1-10 --------	193	76	7.6	5.6	30	6.1	5.7	.03	2.4	.8	3.4		10	2.3	3.5	.1	1.2	31	9
June 11-20 -------	154	78	5.8	4.4	26	5.6	5.6	.02	1.8	.9	4.2		7	3.2	4.4	.1	2.2	35	8
June 21-30 -------	104	77	5.4	3.8	24	5.8	3.6	.02	1.8	.8	4.3		6	3.3	4.4	.2	2.4	31	8
July 1-10 --------	138	78	8.3	4.6	24	5.8	4.0	.04	1.7	.7	3.5	1.1	8	2.8	4.2	.1	.9	30	7
July 11-20 -------	189	78	9.7	5.2	26	5.6	3.1	.02	1.6	.7	2.7		6	3.0	2.8	.1	.6	27	7
July 21-31 -------	261	78	8.9	6.7	26	5.7	4.7	.04	1.3	.7	2.8		5	3.0	3.2	.0	.7	31	6
Aug. 1-10 -------	251	81	9.1	6.5	24	5.7	4.4	.02	1.6	.6	3.7		6	3.2	4.0	.0	.7	30	6
Aug. 11-20 ------	420	80	12	9.7	36	5.5	4.7	.02	1.3	.6	3.1		5	2.8	3.4	.1	.5	32	6
Aug. 21-31 ------	334	79	9.8	6.9	34	5.7	5.1	.03	1.2	.7	2.5		5	2.4	3.0	.0	.6	32	6
Sept. 1-10 -------	231	80	9.1	5.8	34	5.8	3.8	.04	1.2	.6	2.6		5	2.2	3.0	.0	.7	29	5
Sept. 11-14, 16-20	1/413	78	11	8.1	46	5.9	5.6	.04	1.0	.6	3.2		5	2.2	3.4	.1	.7	33	5
Sept. 21-30 ------	847	67	9.8	6.4	44	6.2	6.0	.03	2.2	1.1	6.4		9	6.5	6.4	.0	.9	47	10
Average ------	506	62	8.1	6.1	35	--	4.7	0.03	1.6	0.7	3.3		6	2.9	3.6	0.1	0.7	30	7

1/ Includes discharge for Sept. 15.

Temperature (° F.) of water, water year October 1946 to September 1947

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

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

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
HAW RIVER NEAR BENAJA															
Mar. 20, 1947 ------	167	10	7.3	13	0.02	3.8	1.7	5.2	24	4.1	2.5	0.1	0.2	45	16
HAW RIVER AT HAW RIVER															
Mar. 20, 1947 ------	653	16	7.2	12	0.03	5.2	2.2	7.9	28	9.4	4.2	0.1	0.4	64	22
HAW RIVER NEAR PITTSBORO															
Mar. 20, 1947 ------	1,270	15	7.6	12	0.02	4.5	2.1	8.3	29	6.4	4.8	0.3	0.4	54	20
CAPE FEAR RIVER AT LILLINGTON															
Mar. 20, 1947 ------	3,610	15	6.8	7.7	0.02	4.3	1.8	5.9	20	5.5	5.6	0.2	0.6	50	18
CAPE FEAR RIVER AT ELIZABETHTOWN															
Mar. 21, 1947 ------	[illegible]	30	6.4	5.7	0.02	2.8	1.2	4.2	9	6.2	4.5	0.0	0.5	42	11
CAPE FEAR RIVER AT WILMINGTON															
Mar. 27, 1947 ------	--	77	6.9	3.4	0.01	4.0	1.2	4.0	11	5.3	6.2	0.0	0.4	1/50	15
REEDY FORK NEAR GIBSONVILLE															
Mar. 20, 1947 ------	222	14	7.0	9.6	0.02	4.2	1.6	4.5	23	4.4	2.2	0.1	0.1	44	17
HORSEPEN CREEK AT BATTLE GROUND															
Mar. 20, 1947 ------	13	5	7.1	16	0.04	6.8	3.1	8.4	41	8.3	3.4	0.1	0.8	71	30
BUFFALO CREEK NEAR GREENSBORO															
Mar. 20, 1947 ------	34	32	4.7	23	0.30	12	4.7	9.0	12	24	0.9	--	0.9	2/160	49

NORTH BUFFALO CREEK NEAR GREENSBORO															
Mar. 20, 1947 ------	46	50	7.1	11	0.15	16	5.0	50	125	32	23	0.2	0.3	3/250	60
NEW HOPE RIVER NEAR MERRY OAKS															
Mar. 20, 1947 ------	--	15	6.8	11	0.02	5.1	2.1	6.3	22	5.7	7.2	0.1	0.8	54	21
WEST FORK DEEP RIVER NEAR HIGH POINT															
Mar. 20, 1947 ------	27	14	7.3	17	0.02	5.5	2.4	6.4	32	4.8	3.4	0.5	0.2	58	24
DEEP RIVER NEAR RANDLEMAN															
Mar. 20, 1947 ------	104	17	7.0	15	0.02	6.8	3.0	16	37	10	16	0.0	0.7	87	29
DEEP RIVER AT MONCURE															
Mar. 20, 1947 ------	--	20	7.0	9.3	0.03	3.8	1.8	6.8	21	6.3	5.2	0.1	0.3	49	17
EAST FORK DEEP RIVER NEAR HIGH POINT															
Mar. 20, 1947 ------	12	15	7.6	9.6	0.02	6.5	3.0	5.0	38	4.3	2.5	0.0	0.2	64	29
BEAR CREEK AT ROBBINS															
Mar. 20, 1947 ------	299	27	7.0	7.9	0.04	3.2	1.4	5.0	20	2.6	3.8	0.0	0.2	41	14
ROCKY RIVER NEAR PITTSBORO															
Mar. 20, 1947 ------	--	12	7.2	6.0	0.04	4.5	2.0	5.2	24	3.5	5.1	0.0	0.2	44	19
UPPER LITTLE RIVER NEAR LILLINGTON															
Mar. 20, 1947 ------	--	30	6.2	5.3	0.02	1.8	0.9	3.6	9	3.0	3.9	0.0	0.2	32	8

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 1946 to September 1947—Continued

Date of collection	Mean discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
LOWER LITTLE RIVER AT MANCHESTER															
Mar. 20, 1947	644	27	5.7	4.1	0.02	1.6	0.8	1.8	5	2.9	2.8	0.0	0.2	25	7
BIG ROCKFISH CREEK NEAR HOPE MILLS															
Mar. 21, 1947	--	30	5.4	2.7	0.02	0.9	0.5	3.0	6	1.9	2.5	0.0	0.4	21	4
LITTLE ROCKFISH CREEK NEAR HOPE MILLS															
Mar. 21, 1947	--	17	5.7	2.8	0.01	1.2	0.7	3.3	7	2.2	3.0	0.1	0.7	20	6
BIG COHARIE CREEK NEAR INGOLD															
Mar. 22, 1947	--	54	5.5	3.8	0.02	1.8	1.0	4.5	8	3.9	5.4	0.0	0.2	36	9
BLACK RIVER AT CLEAR RUN															
Mar. 21, 1947	--	57	5.9	3.9	0.02	2.0	0.9	3.5	6	4.2	4.9	0.0	0.2	38	9
LITTLE COHARIE CREEK NEAR INGOLD															
Mar. 22, 1947	--	57	5.3	5.4	0.02	1.7	1.1	2.2	8	3.3	2.4	0.0	0.2	37	9
SIX RUNS NEAR DELWAY															
Mar. 22, 1947	--	54	6.1	3.8	0.02	3.3	0.8	3.2	8	4.5	5.0	0.0	0.3	41	12
SOUTH RIVER NEAR TOMAHAWK															
Mar. 21, 1947	--	91	5.2	2.7	0.02	1.7	0.9	3.0	5	3.2	5.0	0.0	0.1	39	8
NORTHEAST CAPE FEAR RIVER NEAR CHINQUAPIN															
Mar. 21, 1947	1,290	78	5.9	2.0	0.05	3.2	1.0	4.3	8	4.6	7.1	0.0	0.2	4/45	12

NORTHEAST CAPE FEAR RIVER NEAR CASTLE HAYNE															
Mar. 21, 1947 ———	—	110	5.9	2.5	0.02	4.2	1.0	3.7	10	4.2	6.9	0.1	0.2	5/55	15
ROCKFISH CREEK NEAR WALLACE															
Mar. 21, 1947	—	45	6.5	3.3	0.02	3.0	0.9	3.6	6	4.8	6.2	0.0	0.4	40	11

1/ Large proportion of organic matter; sum of mineral constituents 30 parts per million.
2/ Organic matter present; sum of mineral constituents 104 parts per million.
3/ Organic matter present; sum of mineral constituents 199 parts per million.
4/ Large proportion of organic matter; sum of mineral constituents 26 parts per million.
5/ Large proportion of organic matter; sum of mineral constituents 28 parts per million.

LOCKWOOD FOLLY, SHALLOTTE, AND WACCAMAW RIVER BASINS

MISCELLANEOUS ANALYSES OF STREAMS IN LOCKWOOD FOLLY, SHALLOTTE, AND WACCAMAW RIVER BASINS IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
LOCKWOOD FOLLY RIVER AT SUPPLY															
May 14, 1947 ------	--	75	7.3	6.7	0.10	23	1.9	7.0	80	1.9	9.0	0.0	0.2	100	65
SHALLOTTE RIVER AT SHALLOTTE															
May 14, 1947 ------	--	220	6.8	5.3	0.10	13	11	1/89	32	20	160	0.0	0.2	372	78
WACCAMAW RIVER AT FREELAND															
May 14, 1947 ------	221	230	6.0	2.5	0.02	4.2	1.2	3.9	14	2.0	7.2	0.0	0.2	2/73	15

1/ Includes equivalent of 3.4 parts per million of potassium (K).
2/ Large proportion of organic matter; sum of mineral constituents 28 parts per million.

PEE DEE RIVER NEAR ROCKINGHAM, N. C.

LOCATION.--At gaging station at bridge on U. S. Highway 74, 1 mile upstream from Falling Creek, 4 miles downstream from Blewett Falls hydroelectric plant, and 6 miles west of Rockingham, Richmond County.
DRAINAGE AREA.--6,870 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES,1946-47.--Dissolved solids: Maximum, 57 parts per million Jan. 1-10; minimum, 44 parts per million Mar. 1-10.
Total hardness: Maximum, 21 parts per million Dec. 21-Jan. 10, May 21-June 10; minimum, 16 parts per million Mar. 1-20, Apr. 11-20, Sept. 21-30.
Water temperatures: Maximum, 83° F. Aug. 25-27; minimum, 39° F. Feb. 9.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1082. Records of quantities of suspended matter are available in district office at Raleigh, N. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Oct. 1-10, 1946 --	5,530	67	5.0	3.2	12	6.7	10	0.02	4.2	1.7	6.9	1.8	27	5.2	5.0	0.0	0.8	53	18
Oct. 11-20 -------	4,725	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oct. 21-31 -------	3,412	67	5.0	2.8	13	6.7	9.5	.03	4.2	1.7	6.9		25	4.5	4.5	.1	.8	51	18
Nov. 1-10 --------	2,576	67	3.7	2.8	13	6.7	11	.03	4.6	1.9	8.0		29	4.6	5.2	.1	.7	55	19
Nov. 11-20 -------	3,763	61	4.0	2.6	17	6.7	11	.05	4.8	1.8	8.5		28	4.7	6.5	.1	.7	53	19
Nov. 21-30 -------	4,638	59	4.2	3.2	18	6.7	12	.09	4.8	1.9	7.2		28	5.0	4.4	.2	.8	55	20
Dec. 1-10 --------	3,915	54	3.3	2.8	9	6.4	12	.02	4.6	1.9	8.2		28	4.7	5.6	.2	.9	54	19
Dec. 11-20 -------	4,606	52	3.2	3.0	26	7.2	11	.09	4.5	1.8	7.4		27	4.4	5.1	.1	.7	52	19
Dec. 21-31 -------	4,062	47	4.8	4.8	12	6.6	12	.03	5.0	2.0	7.8		29	4.9	5.8	.0	.7	56	21
Jan. 1-10, 1947 --	7,507	48	5.2	4.7	17	6.5	9.9	.03	5.0	2.0	6.4	1.4	25	5.8	5.6	.1	.6	57	21
Jan. 11-20 -------	17,310	48	8.6	4.4	34	6.8	7.4	.04	4.2	2.0	6.1		21	6.5	4.6	.2	.9	49	19
Jan. 21-31 -------	15,550	48	6.0	4.2	40	6.9	9.1	.03	4.2	1.9	4.9		19	5.6	4.5	.2	.9	47	18
Feb. 1-10 --------	5,696	44	4.2	3.6	16	7.1	11	.02	4.0	1.7	5.4		21	4.8	4.2	.0	.9	48	17
Feb. 11-19 -------	5,857	43	3.7	2.7	34	7.1	8.4	.02	4.0	1.8	6.2		23	5.0	4.2	.1	.8	47	17
Feb. 20-28 -------	8,167	42	4.0	2.8	34	7.1	8.1	.04	4.0	1.8	6.2		22	5.3	4.2	.2	1.0	46	17
Mar. 1-10 -------	10,250	43	5.4	3.4	46	6.9	6.9	.03	3.8	1.6	5.2		18	5.5	4.1	.1	1.0	44	16
Mar. 11-20 ------	11,550	46	4.6	3.6	30	6.9	7.5	.03	3.8	1.7	5.7		19	5.9	4.4	.1	.8	46	16
Mar. 21-31 ------	7,591	48	3.8	2.8	22	7.1	8.7	.02	4.3	1.8	5.7		22	5.0	4.6	.1	.7	48	18

PEE DEE RIVER BASIN--Continued

PEE DEE RIVER NEAR ROCKINGHAM, N. C.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Apr. 1-10, 1947 --	8,500	57	4.4	3.0	18	7.1	12	0.04	4.4	2.1	5.9	1.4	24	5.1	5.1	0.1	0.8	51	20
Apr. 11-20 -------	10,950	60	7.1	5.8	52	6.9	4.7	.04	3.8	1.6	5.6		20	4.7	4.6	.0	.5	47	16
Apr. 21-30 -------	5,580	64	4.4	3.8	11	6.8	11	.04	4.4	1.8	5.5		22	5.3	4.2	.1	.7	47	18
May 1-10 --------	3,980	66	3.4	2.9	24	7.1	11	.02	4.1	1.8	6.7		25	4.7	4.5	.0	.5	47	18
May 11-20 -------	3,171	69	3.4	2.6	30	7.1	11	.02	4.4	1.9	6.8		27	4.3	4.5	.1	.4	48	19
May 21-31 -------	3,757	73	3.3	2.8	7	7.1	9.5	.05	5.1	2.1	7.2		30	4.9	4.8	.0	.6	56	21
June 1-10 --------	3,282	74	3.8	3.2	3	7.2	12	.05	5.2	1.9	6.6		28	4.8	4.5	.1	.6	54	21
June 11-20 -------	6,763	77	3.4	2.7	14	6.8	12	.02	4.5	1.9	6.5		28	4.0	3.9	.1	.5	49	19
June 21-30 -------	4,845	77	3.7	2.4	12	6.8	10	.02	4.2	1.7	6.1		25	3.9	3.8	.1	.7	48	18
July 1-10 --------	5,329	77	3.8	2.4	16	6.7	7.4	.02	4.3	1.8	5.5	1.4	25	4.9	4.1	.2	1.4	50	18
July 11-20 -------	5,948	77	5.2	3.1	12	6.9	13	.03	4.1	1.7	5.8		22	4.6	3.9	.1	1.7	50	17
July 21-31 -------	5,275	78	5.3	2.8	12	6.8	10	.04	4.2	1.7	5.5		22	4.8	3.6	.1	1.3	47	18
Aug. 1-10 -------	4,007	80	3.6	2.9	8	6.8	10	.02	4.1	1.6	5.6		23	4.2	3.1	.2	1.1	46	17
Aug. 11-20 ------	4,196	81	4.2	3.0	8	6.7	9.9	.02	4.4	1.7	5.8		24	4.3	3.6	.2	1.1	46	18
Aug. 21-31 ------	3,706	82	3.4	2.6	24	7.0	12	.02	4.0	1.8	6.6		25	4.2	3.6	.2	1.4	53	17
Sept. 1-10 -------	3,230	80	3.0	2.4	24	7.0	11	.02	4.1	1.7	6.4		25	3.8	3.8	.2	1.0	49	17
Sept. 11-20 ------	3,234	79	3.6	2.4	18	7.1	9.7	.02	4.1	1.6	9.8		25	4.2	8.8	.1	.9	54	17
Sept. 21-30 ------	6,920	68	4.5	2.6	18	7.1	6.4	.03	3.8	1.6	6.7		24	4.1	4.0	.1	1.0	45	16
Average ------	6,091	63	4.3	3.2	20	--	9.9	0.03	4.3	1.8	6.6		24	4.8	4.6	0.1	0.9	50	18

Temperature (° F.) of water, water year October 1946 to September 1946

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

DROWNING CREEK NEAR HOFFMAN, N. C.

LOCATION.--At bridge on U. S. Highways 15 and 501, 0.9 mile downstream from Big Muddy Creek, 4 miles downstream from gaging station, and 6½ miles east of Hoffman, Richmond County.
DRAINAGE AREA.--243 square miles (178 square miles above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1946, January to September 1947.
Water temperatures: October 1946, January to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 37 parts per million Aug. 1-10, Jan. 1-10; minimum, 19 parts per million Feb. 11-19.
Total hardness: Maximum, 9 parts per million Jan. 11-20; minimum, 3 parts per million Feb. 11-19, Sept. 1-10.
Water temperatures: Maximum, 77° F. June 9, 11, 12, 30, Aug. 23; minimum, 37° F. Mar. 3.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1082. Records of quantities of suspended matter are available in district office at Raleigh, N. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Oct. 1-10, 1946 --	221	62	10	7.7	49	6.1	5.0	0.03	1.2	0.6	2.6	0.6	6	2.1	2.8	0.0	0.2	27	5
Oct. 11-20 -------	337	60	12	9.3	59	6.1	4.7	.04	1.1	.5	2.6		5	2.1	2.8	.0	.3	29	5
Oct. 21-31 -------	255	60	12	9.1	67	6.0	4.4	.03	1.4	.6	2.4		6	2.2	2.5	.1	.2	30	6
Nov. 1-10 --------	235	60	9.9	6.2	43	6.0	3.2	.03	1.0	.5	2.8		5	1.8	3.2	.0	.2	24	5
Jan. 1-10, 1947 --	321	47	12	6.2	75	5.2	4.1	.05	1.8	.7	2.8	.7	8	2.3	3.2	.1	.1	37	7
Jan. 11-20 -------	454	48	12	12	80	6.2	5.0	.03	2.4	.7	1.8		7	2.7	2.8	.1	.1	32	9
Jan. 21-31 -------	416	48	10	7.9	64	5.8	3.4	.02	1.1	.6	2.6		5	2.5	2.8	.0	.2	25	5
Feb. 1-10 --------	265	42	7.2	5.8	34	6.1	3.6	.03	1.3	.4	2.9		6	1.9	2.9	.0	.2	22	5
Feb. 11-19 ------	225	44	5.8	5.5	28	6.3	3.4	.02	.8	.3	3.5		6	1.6	2.9	.0	.2	19	3
Feb. 20-28 ------	266	41	6.4	5.1	36	6.1	3.0	.03	.8	.4	4.0		5	2.2	4.0	.1	.2	21	4
Mar. 1-10 -------	306	41	6.6	5.8	36	6.1	2.8	.03	.9	.5	3.0		5	2.2	2.8	.1	.2	21	4
Mar. 11-20 ------	365	47	7.5	5.8	58	6.1	2.1	.02	1.3	.5	2.4		5	2.6	2.6	.0	.2	22	5
Mar. 21-31 ------	300	49	6.3	5.4	52	6.2	1.4	.02	.8	.4	3.4		6	1.9	2.8	.0	.2	20	4
Apr. 1-10 -------	323	61	9.3	7.5	56	6.0	1.3	.02	.8	.4	2.7	.7	5	2.0	3.0	.0	.2	22	4
Apr. 11-20 ------	576	64	13	12	88	6.0	2.2	.03	1.0	.5	2.5		5	1.9	2.6	.0	.2	28	5
Apr. 21-30 ------	308	65	9.1	8.9	50	5.9	1.8	.03	2.0	.7	2.3		8	1.9	3.0	.0	.2	21	8
May 1-10 --------	227	65	9.9	6.6	56	6.1	2.9	.02	.9	.4	3.7		7	1.9	2.9	.0	.2	23	4
May 11-20 -------	145	66	9.9	5.0	34	6.2	4.4	.02	1.4	.7	2.8		8	1.7	2.9	.0	.2	22	6
May 21-31 -------	236	70	13	8.3	56	5.9	4.3	.03	1.3	.6	2.7		7	1.8	2.5	.0	.6	29	6

June 1-10 --------	112	73	8.7	6.6	36	6.3	3.8	.03	1.0	.4	3.0	6	1.5	2.8	.0	.4	23	4
June 11-20 -------	135	74	9.5	6.4	34	5.7	4.7	.02	1.0	.5	2.7	6	1.3	2.9	.0	.2	24	5
June 21-30 -------	106	72	8.5	5.2	32	5.8	4.6	.02	.8	.4	3.7	7	1.4	3.1	.0	.2	23	4
July 1-10 --------	130	72	10	6.5	36	5.8	4.2	.02	1.0	.6	2.9 | .6	6	1.9	3.0	.0	.3	26	5
July 11-20 -------	148	73	9.5	7.2	34	6.0	5.3	.05	1.4	.7	3.0	7	2.2	3.2	.0	.5	29	6
July 21-31 -------	161	72	8.5	6.1	34	6.0	4.4	.06	.8	.5	2.7	5	1.3	3.0	.0	.3	24	4
Aug. 1-10 -------	142	75	13	13	58	5.7	6.4	.03	1.6	.6	2.6	6	2.7	2.9	.1	.2	37	6
Aug. 11-20 ------	166	74	11	7.0	38	5.8	5.0	.03	1.0	.4	3.1	6	1.4	2.9	.1	.2	25	4
Aug. 21-31 ------	114	74	7.4	5.7	34	5.9	3.5	.04	.9	.6	3.0	6	1.8	2.9	.1	.2	25	5
Sept. 1-10 -------	98	74	8.4	6.2	44	6.1	3.5	.03	.7	.4	3.4	6	1.4	2.9	.1	.2	23	3
Sept. 11-20 ------	146	74	9.9	8.0	54	5.9	5.2	.03	.7	.5	3.0	5	1.6	3.0	.0	.3	28	4
Sept. 21-30 ------	205	67	12	11	66	5.7	6.8	.04	1.0	.7	2.1	5	2.0	2.5	.0	.2	35	5
Average ------	1/240	62	9.6	7.5	49	--	3.9	0.03	1.1	0.5	2.9	6	1.9	2.9	0.0	0.2	26	5

1/Mean discharge for water year 1946-47 was 241 second-feet.

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PEE DEE RIVER BASIN--Continued

DROWNING CREEK NEAR HOFFMAN, N. C.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

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

PEE DEE RIVER BASIN--Continued

LUMBER RIVER AT BOARDMAN, N. C.

LOCATION.--At gaging station at bridge on U. S. Highway 74, 1 mile downstream from Atlantic Coast Line Railroad bridge at Boardman, Columbus County.
DRAINAGE AREA.--1,220 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 59 parts per million Sept. 21-30; minimum, 28 parts per million Mar. 1-10.
Total hardness: Maximum, 11 parts per million Nov. 21-30, Aug. 21-31; minimum, 6 parts per million Feb. 11-28, Apr. 21-30, May 11-20, June 11-July 10.
Water temperatures: Maximum, 82° F. June 11; minimum, 36° F. Feb. 11.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1082. Records of quantities of suspended matter are available in district office at Raleigh, N. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Oct. 1-10, 1946 --	564	64	15	12	85	6.0	6.5	0.05	1.4	0.8	3.3	0.8	5	2.9	5.0	0.0	0.2	38	7
Oct. 11-20 -------	1,065	62	24	22	110	5.7	8.9	.04	2.2	1.2	2.9		5	5.9	4.5	.0	.2	57	10
Oct. 21-31 -------	786	63	18	15	110	5.7	7.5	.05	1.8	.8	3.1		5	3.5	4.5	.1	.2	49	8
Nov. 1-10 --------	958	63	21	17	150	5.4	7.3	.05	1.6	.9	2.8		4	2.8	5.2	.0	.2	55	8
Nov. 11-20 -------	782	55	18	17	110	5.5	7.5	.04	2.0	.9	2.3		4	2.5	5.0	.2	.2	48	9
Nov. 21-30 -------	1,002	54	18	17	110	5.1	8.7	.16	2.3	1.2	2.9		7	3.0	5.2	.2	.2	50	11
Dec. 1-10 --------	1,155	45	18	16	115	5.0	7.2	.16	1.9	.8	3.5		5	3.1	5.2	.1	.2	49	8
Dec. 11-20 -------	827	51	14	12	85	5.1	6.6	.11	1.6	.7	4.0		5	3.0	5.8	.0	.2	42	7
Dec. 21-31 -------	923	46	16	13	95	5.1	6.2	.11	2.3	.9	2.1		4	2.9	5.2	.1	.2	42	9
Jan. 1-10, 1947 --	983	47	24	14	114	5.3	4.5	.05	1.8	.7	3.9	.8	7	3.0	5.1	.0	.1	46	7
Jan. 11-20 -------	1,358	51	20	20	130	5.8	4.4	.04	2.0	.8	4.0		5	3.3	6.5	.1	.2	49	8
Jan. 21-31 -------	1,903	48	20	14	150	5.5	5.2	.03	2.2	.8	4.0		8	3.6	5.0	.0	.2	45	9
Feb. 1-10 --------	1,316	46	17	17	130	5.9	3.6	.15	2.0	.8	3.8		7	3.4	5.0	.0	.2	42	8
Feb. 11-19 -------	913	43	11	9.0	76	5.9	2.8	.03	1.4	.7	3.9		6	2.8	4.9	.0	.2	32	6
Feb. 20-28 -------	828	42	10	8.4	76	5.9	1.7	.02	1.3	.7	3.8		6	2.7	4.5	.1	.2	30	6
Mar. 1-10 -------	982	42	10	8.1	76	6.0	1.7	.03	1.6	.7	3.0		5	3.4	4.0	.0	.1	28	7
Mar. 11-20 ------	1,992	48	14	13	90	5.7	1.9	.02	1.8	.8	3.8		6	4.0	4.9	.0	.2	41	8
Mar. 21-31 ------	1,896	51	14	13	110	5.8	.8	.02	1.4	.8	4.0		6	3.2	5.0	.0	.1	38	7

PEE DEE RIVER BASIN--Continued

LUMBER RIVER AT BOARDMAN, N. C.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Apr. 1-10, 1947	2,317	63	17	13	125	5.8	1.8	0.02	2.1	0.7	4.3	0.9	8	3.5	5.0	0.0	0.2	39	8
Apr. 11-20	3,075	67	19	19	170	5.9	2.4	.02	2.2	1.0	3.5		8	3.3	5.0	.0	.2	46	10
Apr. 21-30	2,885	67	21	19	165	5.5	2.0	.04	1.6	.6	5.4		10	3.0	4.8	.0	.2	48	6
May 1-10	1,255	67	21	21	155	5.7	3.2	.03	1.4	1.0	4.2		8	2.9	4.8	.1	.2	43	8
May 11-20	587	70	16	12	88	5.8	3.7	.05	1.2	.7	3.5		6	2.5	4.1	.0	.4	34	6
May 21-31	791	76	14	12	55	5.6	5.2	.03	1.6	.8	4.1		6	3.6	4.8	.0	1.0	43	7
June 1-10	726	76	17	14	105	5.4	5.9	.02	2.0	1.1	4.2		10	3.0	4.6	.2	.3	46	10
June 11-20	330	79	11	7.0	60	5.5	6.0	.02	1.6	.6	4.6		8	2.6	4.6	.1	.5	36	6
June 21-30	310	75	10	7.0	54	5.7	5.9	.02	1.4	.6	4.0		8	2.6	3.6	.0	.3	32	6
July 1-10	351	77	9.9	7.0	52	5.6	4.7	.07	1.4	.6	3.0	.7	5	3.6	3.4	.0	.6	33	6
July 11-20	473	76	12	9.6	54	5.6	7.0	.07	2.2	1.1	4.0		6	6.7	4.6	.0	.3	46	10
July 21-31	871	76	14	12	74	5.5	8.3	.08	2.0	.9	4.0		5	6.4	4.6	.0	.3	51	9
Aug. 1-10	1,107	78	28	20	88	5.4	7.6	.05	2.3	1.0	3.7		6	5.4	4.9	.1	.3	55	10
Aug. 11-20	438	79	15	15	75	5.9	7.9	.04	1.8	.8	3.6		6	3.6	4.8	.0	.3	43	8
Aug. 21-31	781	79	19	19	110	5.5	9.1	.04	2.6	1.2	2.3		6	4.7	4.5	.0	.3	57	11
Sept. 1-10	754	79	16	15	110	5.3	7.0	.36	1.7	1.0	3.6		6	4.2	4.5	.1	.4	53	8
Sept. 11-20	1,015	77	21	21	110	5.6	8.5	.12	1.5	.9	4.4		7	3.8	4.9	.1	.3	58	7
Sept. 21-30	1,675	68	24	23	130	5.6	8.2	.13	1.6	.9	3.9		6	3.5	5.1	.1	.2	59	8
Average	1,112	63	17	15	103	--	5.5	0.07	1.8	0.8	3.7		6	3.6	4.8	0.0	0.3	45	8

Temperature (° F.) of water, water year October 1946 to September 1947

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

PEE DEE RIVER BASIN--Continued

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

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
YADKIN RIVER AT WILKESBORO															
June 17, 1947 -------	806	16	6.3	12	0.12	2.2	1.0	4.6	16	2.3	2.0	0.1	1.3	37	10
YADKIN RIVER AT ELKIN															
June 17, 1947 -------	--	8	6.6	11	0.03	2.3	1.0	3.6	15	2.0	1.5	0.1	1.2	31	10
YADKIN RIVER NEAR WINSTON-SALEM															
June 18, 1947 -------	--	24	5.9	10	0.32	2.2	0.9	.8	16	3.3	1.5	0.1	1.0	36	9
YADKIN RIVER IMPOUNDED IN IDOLS LAKE, NEAR CLEMMONS															
Mar. 1, 1947 -------	--	32	7.1	11	0.04	2.6	1.1	5.3	20	2.7	2.1	0.1	0.1	35	11
Mar. 7, 1947 -------	--	38	7.1	11	.24	2.5	1.4	5.3	19	3.4	3.0	.0	.1	39	12
YADKIN RIVER AT YADKIN COLLEGE															
June 17, 1947 -------	5,820	24	5.5	8.9	0.04	2.1	0.9	4.3	12	3.7	1.9	0.1	2.0	32	9
YADKIN RIVER NEAR SPENCER															
June 17, 1947 -------	--	24	5.1	5.8	0.08	2.0	0.9	4.0	10	4.2	1.5	0.2	2.7	29	9
PEE DEE RIVER NEAR ALBEMARLE															
June 18, 1947 -------	--	10	6.9	9.7	0.03	4.8	2.0	5.5	28	3.5	3.1	0.1	1.2	47	20
PEE DEE RIVER NEAR WADESBORO															
June 17, 1947 -------	--	26	6.3	11	0.12	5.1	2.3	10	36	4.3	6.1	0.2	1.0	60	22

PEE DEE RIVER NEAR ROCKINGHAM 1/															
1946-47	6,091	20	6.9	9.9	0.03	4.3	1.8	6.6	24	4.8	4.6	0.1	0.9	50	18
REDDIES RIVER AT NORTH WILKESBORO															
June 17, 1947	116	24	6.4	10	0.12	1.8	0.9	3.6	14	2.2	1.0	0.1	0.8	31	8
ROARING RIVER AT ROARING RIVER															
June 17, 1947	--	8	6.7	9.7	0.01	1.8	0.7	2.4	11	1.5	1.2	0.0	0.4	26	7
MITCHELL RIVER NEAR ELKIN															
June 18, 1947	--	8	6.8	8.3	0.03	2.4	1.1	2.8	13	2.3	1.9	0.1	0.6	28	10
FISHER RIVER NEAR COPELAND															
June 18, 1947	209	6	6.6	8.8	0.02	2.0	1.0	2.4	12	1.9	1.2	0.1	0.6	27	9
DEEP CREEK NEAR YADKINVILLE															
June 18, 1947	--	8	6.6	11	0.03	2.8	1.2	2.3	15	1.8	1.5	0.0	0.8	34	12
MUDDY CREEK NEAR WINSTON-SALEM															
June 18, 1947	--	12	7.1	19	0.03	7.0	3.3	5.0	44	1.6	2.5	0.1	0.5	62	31
DUTCHMANS CREEK NEAR MOCKSVILLE															
June 17, 1947	--	26	6.3	19	0.06	7.2	3.1	5.3	42	3.5	2.0	0.2	1.1	68	31
SOUTH YADKIN RIVER NEAR MOCKSVILLE															
June 17, 1947	712	28	5.8	9.4	0.02	2.6	1.2	4.3	16	3.5	1.8	0.1	1.7	36	11

PEE DEE RIVER BASIN--Continued

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

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
HUNTING CREEK NEAR MOCKSVILLE															
June 17, 1947 -------	--	4	6.3	9.5	0.02	1.9	0.8	3.5	13	2.1	1.5	0.0	0.8	30	8
SECOND CREEK NEAR SALISBURY															
June 17, 1947 -------	--	8	6.6	24	0.02	8.3	3.0	5.8	46	3.7	2.4	0.1	0.6	75	33
ABBOTTS CREEK AT LEXINGTON															
June 18, 1947 -------	24	10	6.8	9.3	0.04	5.2	2.1	7.9	32	4.4	4.8	0.1	1.2	54	22
UWHARRIE RIVER NEAR ASHEBORO															
June 17, 1947 -------	--	22	6.9	16	0.02	7.8	3.6	6.5	48	3.4	3.4	0.1	0.6	66	34
UWHARRIE RIVER NEAR ELDORADO															
June 18, 1947 -------	56	12	7.6	16	0.03	7.3	3.3	6.4	46	3.0	3.0	0.1	0.4	66	32
ROCKY RIVER NEAR CONCORD															
June 18, 1947 -------	--	10	7.2	25	0.03	11	4.3	38	70	9.4	42	0.2	2.0	180	45
ROCKY RIVER NEAR LOCUST															
June 19, 1947 -------	--	10	6.8	17	0.02	9.2	4.0	18	57	8.8	14	0.2	2.0	111	39
DUTCH BUFFALO CREEK AT MOUNT PLEASANT															
June 18, 1947 -------	--	12	6.5	15	0.02	9.7	4.2	5.3	50	5.4	4.0	0.1	0.6	76	41
RICHARDSON CREEK NEAR MARSHVILLE															
June 19, 1947 -------	--	34	7.0	4.7	0.02	9.4	3.1	23	47	8.8	26	0.2	2.6	110	36

BROWNS CREEK NEAR POLKTON															
June 19, 1947 -------	.76	46	6.2	7.5	0.69	7.9	3.6	9.1	42	2.1	12	0.1	0.7	71	34
LITTLE RIVER NEAR STEEDS 2/															
Aug. 20, 1946 -------	--	19	--	19	0.10	5.0	2.5	4.4	32	1.3	2.9	0.2	0.2	57	23
LITTLE RIVER NEAR TROY															
June 18, 1947 -------	--	30	6.9	15	0.03	3.9	1.6	5.7	27	1.6	2.8	0.2	0.6	52	16
GUM SWAMP CREEK NEAR LAURINBURG															
May 14, 1947 --------	--	45	5.6	1.4	0.02	0.6	0.3	3.3	4	0.7	4.0	0.0	0.2	19	3
LUMBER RIVER NEAR LUMBERTON															
May 14, 1947 --------	--	65	5.8	2.6	0.02	1.2	0.8	9.8	6	1.4	15	0.0	0.2	36	6
LUMBER RIVER AT BOARDMAN 3/															
1946-47 ----------	1,112	110	5.6	2.6	0.07	1.8	0.8	3.7	6	3.6	4.8	0.0	0.3	4/ 45	8
DROWNING CREEK NEAR HOFFMAN 5/															
1946-47 ----------	240	52	6.0	3.9	0.03	1.1	0.5	2.9	6	1.9	2.9	0.0	0.2	26	5
SHOE HEEL CREEK NEAR MAXTON															
May 14, 1947 -------	--	67	5.8	3.5	0.04	1.1	0.4	3.4	6	1.0	4.0	0.0	0.4	26	4

1/ Average of analyses of composites of daily samples (see pp. 113-114).
2/ Unpublished analyses for preceding water year.
3/ Average of analyses of composites of daily samples (see pp. 119-120).
4/ Large proportion of organic matter; sum of mineral constituents 24 parts per million.
5/ Average of analyses of composites of daily samples (see pp. 116-117).

SANTEE RIVER BASIN

WATEREE RIVER NEAR CAMDEN, S. C.

LOCATION.--At gaging station at new bridge on U. S. Highway 1, 1,500 feet downstream from Twentyfivemile Creek, 4,000 feet upstream from Seaboard Air Line Railway bridge, 2.2 miles west of Camden, Kershaw County, and 7.4 miles downstream from Wateree Dam.
DRAINAGE AREA.--5,070 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 56 parts per million June 11-20; minimum, 44 parts per million Feb. 1-10, Sept. 1-10.
Total hardness: Maximum, 21 parts per million June 21-30; minimum, 15 parts per million Feb. 1-19, Sept. 21-30.
Water temperatures: Maximum, 80° F. Aug. 27; minimum, 37° F. Feb. 26, Mar. 3, 4.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1082. Records of quantities of suspended matter are available in district office at Raleigh, N. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Oct. 1-10, 1946 --	5,722	69	2.2	1.3	16	7.0	9.7	0.08	4.1	1.9	5.1	1.6	26	4.3	3.2	0.0	0.3	46	18
Oct. 11-20 -------	6,081	67	3.2	3.3	7	7.0	9.1	.04	4.0	1.6	6.8		25	4.5	4.0	.1	.3	47	17
Oct. 21-31 -------	4,796	65	3.7	3.4	10	7.0	9.0	.02	3.7	1.7	7.1		24	4.5	4.8	.1	.4	46	16
Nov. 1-10 --------	4,576	65	3.8	4.0	9	7.2	12	.02	4.1	1.8	6.0		25	4.7	3.5	.1	.2	50	18
Nov. 11-20 -------	4,277	58	4.2	3.6	10	7.1	9.1	.03	3.8	1.7	6.5		23	4.6	4.8	.1	.3	45	16
Nov. 21-30 -------	4,810	57	3.1	2.0	8	6.9	12	.07	4.2	1.6	7.0		25	5.7	3.8	.0	.6	49	17
Dec. 1-10 --------	3,193	49	2.7	--	9	7.1	12	.06	4.2	1.6	7.4		25	5.6	4.5	.0	.6	49	17
Dec. 11-20 -------	3,706	51	3.2	2.0	5	7.1	12	.07	4.2	1.6	7.2		25	5.7	4.1	.0	.5	48	17
Dec. 21-31 -------	1,953	48	3.1	2.0	5	7.1	11	.01	3.9	1.6	8.3		25	5.5	5.5	.0	.5	47	16
Jan. 1-10, 1947 --	5,756	48	3.3	2.7	7	7.0	11	.01	4.1	1.7	6.1	1.6	25	5.5	4.2	.2	.3	49	17
Jan. 11-20 -------	10,280	47	3.2	2.4	8	7.1	11	.03	4.2	1.9	6.6	1.5	26	5.8	4.2	.2	.3	49	18
Jan. 21-31 -------	19,290	44	4.6	3.2	16	6.9	10	.04	3.8	1.6	5.2		20	5.2	3.5	.1	.4	46	16
Feb. 1-10 --------	4,216	42	4.1	3.2	22	7.0	10	.04	3.6	1.5	4.9		19	5.0	3.2	.1	.4	44	15
Feb. 11-19 -------	4,615	40	3.7	3.0	26	7.1	11	.02	3.6	1.5	5.8		20	5.2	3.8	.1	.4	45	15
Feb. 20-28 -------	5,077	39	--	--	17	7.1	13	.09	4.4	2.0	4.9		22	6.4	3.5	.0	.4	49	19
Mar. 1-10 --------	6,214	39	--	--	8	7.2	11	.03	4.0	1.7	4.3		20	5.1	3.0	.1	.2	47	17
Mar. 11-20 ------	9,684	41	4.7	2.1	10	6.9	12	.02	3.8	1.9	6.3		21	5.0	5.5	.1	.6	48	17
Mar. 21-31 ------	5,431	47	--	2.6	10	6.8	11	.09	3.7	1.9	5.5		20	5.6	4.0	.2	.6	48	17

Apr. 1-10 --------	6,656	55	4.8	3.4	15	6.7	11	.02	3.6	1.6	4.3 | .9	18	5.5	3.6	.1	.4	47	16
Apr. 11-20 ------	7,684	59	4.1	3.2	12	6.8	12	.05	3.9	1.8	4.9	20	5.3	3.8	.1	.4	49	17
Apr. 21-30 ------	5,688	62	4.2	3.0	8	7.0	12	.12	4.3	1.9	5.9	24	5.5	3.9	.1	.3	53	19
May 1-10 --------	4,383	63	4.0	3.0	9	7.1	12	.06	4.4	2.1	5.4	25	5.1	3.6	.1	.3	54	20
May 11-20 -------	2,275	67	4.0	3.2	9	7.1	12	.02	4.7	2.0	5.4	25	5.0	3.9	.1	.2	54	20
May 21-31 -------	2,910	73	3.8	3.5	10	7.1	14	.08	4.4	2.2	5.3	24	5.2	3.6	.5	.1	54	20
June 1-10 --------	3,212	72	5.1	2.8	11	7.1	12	.09	4.3	2.2	6.0	26	5.3	3.9	.1	.4	53	20
June 11-20 -------	6,180	74	2.8	2.5	15	7.1	12	.08	4.8	2.0	6.4	27	5.6	4.0	.1	.4	56	20
June 21-30 -------	3,759	74	2.8	2.7	10	7.2	11	.04	5.3	2.0	6.9	30	5.1	4.0	.2	.5	53	21
July 1-10 --------	3,212	74	2.8	2.4	10	7.3	11	.04	5.0	1.9	5.5 | 1.8	27	5.0	4.0	.2	.5	52	20
July 11-20 -------	3,386	74	3.5	2.6	10	7.0	10	.04	4.8	1.9	6.1	28	4.7	3.4	.1	.2	49	20
July 21-31 -------	3,484	75	2.9	2.3	10	7.0	11	.02	5.0	1.9	5.8	27	4.7	3.8	.1	.4	51	20
Aug. 1-10 -------	3,065	77	4.1	3.3	24	6.9	9.7	.01	4.0	1.6	5.7	24	4.4	3.0	.1	.4	45	17
Aug. 11-20 ------	4,569	77	2.0	1.1	14	--	6.9	.05	4.6	1.9	7.2	29	4.9	3.8	.1	.5	48	19
Aug. 21-31 ------	3,553	77	2.1	1.4	18	7.1	6.6	.04	4.4	1.7	6.0	24	4.6	4.2	.1	.5	46	18
Sept. 1-10 -------	3,327	77	2.8	2.0	10	7.1	9.9	.02	4.1	1.4	6.1	24	4.6	3.0	.1	.3	44	16
Sept. 11-20 ------	3,482	76	3.7	1.9	6	7.1	10	.02	4.2	1.6	5.3 | 1.6	25	4.7	3.0	.1	.2	45	17
Sept. 21-30 ------	3,568	69	4.8	4.6	14	6.8	8.3	.16	3.8	1.4	6.0	21	6.3	2.8	.1	.3	45	15
Average ------	5,130	61	3.5	2.7	12	--	11	0.05	4.2	1.8	6.1	24	5.2	3.8	0.1	0.4	49	18

SANTEE RIVER BASIN--Continued

WATEREE RIVER NEAR CAMDEN, S. C.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

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

SALUDA RIVER AT CHAPPELLS, S. C.

LOCATION.--At gaging station at bridge on State Highway 39 at Chappells, Newberry County, 7 miles downstream from dam at Lake Greenwood, and 8½ miles upstream from Little River.
DRAINAGE AREA.--1,350 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 62 parts per million Dec. 1-10, 21-31; minimum, 39 parts per million Feb. 20-28.
Total hardness: Maximum, 17 parts per million Nov. 11-20, Dec. 21-31, Aug. 1-10, 21-31, Sept. 1-10; minimum, 12 parts per million Feb. 11-19, Mar. 1-20.
Water temperatures: Maximum, 82° F. Aug. 25; minimum, 40° F. Feb. 10, Mar. 3.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1082. Records of quantities of suspended matter are available in district office at Raleigh, N. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Oct. 1-10, 1946 --	1,613	68	3.3	2.0	15	6.9	13	0.06	3.4	1.5	7.2	2.1	28	4.3	3.2	0.1	0.4	51	15
Oct. 11-20 -------	1,150	66	2.8	2.4	5	7.0	12	.05	3.8	1.5	8.4		28	5.1	3.5	.1	.6	52	16
Oct. 21-31 -------	1,423	65	2.4	2.0	5	7.0	13	.17	3.5	1.4	9.2		29	4.8	3.5	.1	.6	54	14
Nov. 1-10 --------	1,267	64	2.7	2.4	5	7.1	14	.13	3.9	1.5	9.7		31	5.3	3.8	.1	.5	58	16
Nov. 11-20 -------	1,530	60	2.2	2.2	20	7.0	15	.14	4.4	1.5	7.2		30	5.7	4.5	.1	.8	60	17
Nov. 21-30 -------	1,767	58	2.4	2.2	14	6.9	16	.14	3.7	1.3	11		31	5.8	4.5	.1	.8	61	15
Dec. 1-10 --------	1,678	53	2.4	1.9	19	7.2	18	.16	3.7	1.5	11		31	6.4	4.1	.1	.9	62	15
Dec. 11-20 -------	1,666	53	2.4	1.6	16	7.1	16	.15	3.8	1.4	11		30	6.7	4.5	.1	.8	60	15
Dec. 21-31 -------	932	49	2.8	1.7	6	6.9	16	.07	4.0	1.6	11		33	6.5	4.5	.0	.8	62	17
Jan. 1-10, 1947 --	2,057	48	4.0	2.8	18	6.9	16	.16	3.8	1.5	9.6		26	6.6	4.4	.0	.7	60	16
Jan. 11-20 -------	2,800	48	5.5	4.4	20	6.7	13	.01	3.7	1.5	7.4	2.2	26	5.8	3.9	.2	.5	53	16
Jan. 21-31 -------	3,932	47	3.6	2.5	10	6.7	12	.01	3.0	1.3	7.6	2.1	24	5.1	3.6	.1	.8	49	13
Feb. 1-10 --------	2,480	45	4.2	3.2	10	6.9	12	.16	3.0	1.3	7.5		22	4.6	3.8	.1	.8	49	13
Feb. 11-19 -------	2,026	43	4.8	2.9	20	6.9	11	.01	2.8	1.1	6.0		20	4.3	2.2	.1	.4	42	12
Feb. 20-28 -------	1,934	42	--	--	18	6.9	10	.01	3.2	1.3	5.1		18	4.9	2.8	.1	.4	39	13
Mar. 1-10 -------	2,401	42	4.3	3.2	14	7.1	10	.02	2.7	1.2	4.8		16	4.2	2.8	.1	.5	40	12
Mar. 11-20 ------	2,477	44	2.5	2.6	5	6.6	12	.04	2.3	1.5	6.3		18	4.4	4.2	.1	.2	45	12
Mar. 21-31 ------	2,227	47	3.7	1.9	5	6.6	13	.03	3.0	1.6	7.3		22	4.2	4.5	.1	1.1	49	14

SANTEE RIVER BASIN--Continued

SALUDA RIVER AT CHAPPELLS, S. C.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Apr. 1-10, 1947---	1,995	53	3.2	2.1	4	6.7	13	0.01	3.3	1.4	6.5	1.5	23	4.7	3.8	0.2	0.6	51	14
Apr. 11-20 -------	1,914	58	3.6	2.2	3	6.8	13	.02	3.7	1.5	6.7		24	4.3	3.4	.2	.7	52	15
Apr. 21-30 -------	1,771	61	3.0	1.6	4	6.9	13	.04	3.6	1.4	7.1		24	4.4	3.4	.2	.6	50	15
May 1-10---------	1,761	64	2.5	2.0	3	6.9	12	.05	3.4	1.4	7.2		23	4.4	3.9	.2	.5	51	14
May 11-20 -------	1,230	65	2.6	1.8	3	6.9	12	.02	3.2	1.4	7.9		25	4.4	3.6	.1	.6	50	14
May 21-31 -------	1,386	69	2.3	2.3	5	6.9	13	.08	3.2	1.6	7.3		25	4.1	3.4	.2	.5	53	15
June 1-10 --------	1,209	71	2.3	1.9	5	6.9	13	.09	3.0	1.5	7.7		25	3.9	3.5	.1	.7	51	14
June 11-20 -------	1,451	73	3.5	2.0	10	6.7	14	.05	3.6	1.5	7.7		26	4.6	3.5	.1	.8	54	15
June 21-30 -------	1,282	73	3.6	2.6	12	7.0	13	.03	3.8	1.6	7.9		27	4.4	3.9	.2	.6	54	16
July 1-10 --------	1,187	74	3.2	1.9	10	7.2	14	.05	3.8	1.5	7.0	1.8	28	4.2	3.5	.2	.4	54	16
July 11-20 -------	1,369	76	2.3	2.4	4	6.9	14	.03	3.7	1.5	8.6		29	4.4	3.5	.2	.4	54	15
July 21-31 -------	1,520	76	3.0	2.4	10	6.9	13	.03	3.4	1.6	8.8		30	4.0	3.4	.2	.2	54	15
Aug. 1-10 -------	1,216	78	2.9	1.9	10	6.9	14	.05	4.0	1.6	8.2		30	4.1	3.4	.2	.4	55	17
Aug. 11-20 -------	1,276	76	3.5	2.2	14	7.1	14	.01	4.1	1.5	8.3		30	4.1	3.4	.2	.3	54	16
Aug. 21-31 -------	1,253	79	2.7	1.8	16	7.1	14	.03	4.1	1.7	8.0		30	4.5	3.2	.2	.4	51	17
Sept. 1-10 -------	1,301	79	2.7	2.4	9	6.7	14	.07	4.2	1.5	9.5		33	4.5	3.4	.2	.4	54	17
Sept. 11-20 ------	1,200	78	2.5	2.3	10	6.9	14	.07	3.7	1.4	9.9		31	4.7	3.8	.2	.3	55	15
Sept. 21-30 ------	1,189	70	2.7	2.1	8	7.1	14	.08	3.8	1.4	8.4	2.3	31	4.5	4.0	.2	.2	55	15
Average -----	1,691	62	3.8	2.3	10	--	13	0.06	3.5	1.5	8.2		27	4.8	3.7	0.1	0.6	53	15

Temperature (° F.) of water, water year October 1946 to September 1947

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

SANTEE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN SANTEE RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
NORTH FORK CATAWBA RIVER AT SEVIER															
Jan. 23, 1947 ------	--	7	7.4	3.3	0.07	4.2	2.3	1.5	22	3.0	1.1	0.1	0.4	30	20
ARMSTRONG CREEK AT SEVIER															
Jan. 23, 1947 ------	--	6	7.3	7.3	0.05	2.6	1.1	1.7	12	2.9	1.0	0.1	0.3	24	11
LOWER LITTLE RIVER NEAR TAYLORSVILLE															
Mar. 2, 1947 ------	--	24	7.1	9.1	0.03	2.0	0.9	2.4	12	2.3	1.1	0.0	0.1	26	9
LITTLE SUGAR CREEK NEAR CHARLOTTE 1/															
Aug. 11, 1946 ------	--	15	--	16	0.03	16	4.7	30	95	13	18	0.4	8.0	167	59
BROAD RIVER NEAR HARRIS															
Apr. 9, 1947 -------	--	4	6.9	12	0.05	2.2	0.9	3.4	16	1.4	1.2	0.1	0.2	30	9
FLOYDS CREEK AT HARRIS															
Apr. 9, 1947 -------	--	17	6.5	8.3	0.29	2.4	1.0	8.1	14	3.4	8.6	0.1	0.5	44	10
SECOND BROAD RIVER NEAR FOREST CITY															
Jan. 30, 1947 ------	--	44	7.2	14	0.02	2.5	1.3	14	39	4.4	3.2	0.3	1.0	68	12

1/ Unpublished analyses for preceding water year.

CHATTOOGA RIVER AT TRION, GA.

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LOCATION.--At Trion, Chattooga County, 1,000 feet downstream from Reigal Textile Corporation dam, 1,000 feet upstream from Central of Georgia Railway bridge, 1 mile downstream from Cane Creek, and 7 miles upstream from gaging station at Summerville.
DRAINAGE AREA.--167 square miles (193 square miles above gaging station)
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 122 parts per million Nov. 1-10, July 11-20; minimum, 52 parts per million Jan. 11-20.
Total hardness: Maximum, 118 parts per million July 11-20, Sept. 1-10, 21-30; minimum, 42 parts per million Jan. 11-20.
Water temperatures: Maximum, 74° F. Aug. 24, Sept. 7; minimum, 45° F. Feb. 23.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1082. Records of quantities of suspended matter are available in district office at Raleigh, N. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Oct. 1-10, 1946 --	128	61	1.8	1.8	18	7.5	8.9	0.03	32	7.8	2.3		133	3.1	2.5	0.0	1.3	120	112
Oct. 11-20 -------	119	59	1.8	1.0	14	7.6	7.4	.03	32	8.5	1.8		134	3.3	3.0	.0	1.5	121	115
Oct. 21-31 -------	138	60	2.2	1.5	24	7.5	6.6	.03	30	7.6	3.4		127	3.5	3.5	.0	1.0	116	106
Nov. 1-10 --------	118	61	2.0	1.2	16	7.5	7.3	.03	33	8.4	1.7		137	3.5	2.8	.0	1.0	122	117
Nov. 11-20 -------	964	56	3.2	1.7	38	7.2	6.3	.03	18	3.6	.9		68	3.5	1.1	.0	1.0	72	60
Nov. 21-30 -------	252	56	1.9	1.5	8	7.5	7.9	.02	25	5.5	4.0		104	3.6	2.5	.1	1.2	98	85
Dec. 1-10 --------	166	51	1.5	1.5	8	7.6	7.4	.02	30	6.8	1.7		120	3.0	2.8	.1	1.2	110	103
Dec. 11-20 -------	197	53	2.3	1.4	10	7.7	6.8	.03	30	6.9	1.7		121	3.2	2.5	.0	1.1	111	103
Dec. 21-31 -------	566	52	2.6	1.8	36	7.5	7.0	.23	20	3.6	1.6		74	3.5	2.0	.1	.9	78	65
Jan. 1-10, 1947 --	693	50	2.4	1.6	26	7.5	6.9	.10	19	3.3	2.1		71	3.7	2.0	.0	.9	75	61
Jan. 11-20 -------	3,360	53	3.7	2.3	7	7.4	5.5	.04	13	2.4	1.5		47	3.8	1.5	.0	1.2	52	42
Jan. 21-31 -------	1,133	53	1.9	1.5	7	7.2	--	.10	17	3.5	2.5		64	3.5	3.2	.3	1.0	71	57
Feb. 1-10 --------	384	49	1.3	1.0	2	7.3	--	.03	23	4.7	2.8		90	3.2	3.0	.2	1.2	89	77
Feb. 11-19 -------	342	51	1.2	1.0	3	7.5	--	.02	27	5.9	1.1		105	3.0	2.4	.2	1.0	101	92
Feb. 20-28 -------	452	48	1.6	1.1	4	7.4	--	.03	21	4.2	3.5		85	3.4	2.2	.1	1.0	81	70
Mar. 1-10 -------	615	50	1.7	1.1	3	7.4	3.8	.02	21	4.1	1.8	1.1	81	3.6	1.8	.1	1.0	82	69
Mar. 11-20 ------	574	52	1.5	1.3	4	7.4	--	.07	20	3.7	1.1		73	3.8	1.8	.2	.8	75	65
Mar. 21-31 ------	411	53	1.3	1.3	3	7.4	--	.02	23	4.4	1.0		86	3.3	1.8	.2	.8	83	76

MOBILE RIVER BASIN--Continued

CHATTOOGA RIVER AT TRION, GA.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Oxygen consumed		Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
			Unfiltered	Filtered															
Apr. 1-10, 1947 --	286	61	1.5	1.2	2	7.5	--	0.02	26	5.4	1.6	1.1	102	2.7	1.8	0.1	0.8	94	87
Apr. 11-20 ------	727	61	2.2	1.4	3	7.4	--	.02	19	3.6	1.8		73	3.0	1.6	.2	.6	74	62
Apr. 21-30 ------	331	62	--	1.2	5	7.5	6.8	.05	25	5.1	.9		96	2.6	2.4	.0	.7	92	83
May 1-10 -------	240	62	--	1.2	7	7.5	6.6	.04	27	6.2	1.7		110	2.7	2.0	.0	1.0	102	93
May 11-20 -------	186	65	--	1.2	7	7.5	7.3	.04	29	6.9	1.6		120	2.1	2.0	.0	.9	109	101
May 21-31 -------	167	67	--	1.2	5	7.4	7.8	.03	29	7.4	1.1		121	2.5	1.8	.0	1.1	112	103
June 1-10 --------	140	68	1.8	1.7	6	7.5	7.4	.02	30	7.6	2.0		126	2.7	2.5	.0	1.2	115	106
June 11-20 -------	126	69	2.2	1.8	8	7.7	8.5	.02	30	8.4	1.8		130	2.6	2.1	.0	1.3	118	109
June 21-30 -------	161	67	2.6	1.7	8	7.6	8.2	.01	29	7.1	2.1		120	3.0	2.4	.0	1.5	111	102
July 1-10 --------	125	68	2.4	1.6	4	7.3	8.0	.03	30	8.4	.9		128	2.7	2.0	.0	1.1	118	109
July 11-20 -------	108	69	2.2	1.4	6	7.5	7.5	.03	32	9.3	.9		138	2.6	2.2	.0	1.4	122	118
July 21-31 -------	104	68	1.8	1.3	6	7.5	7.9	.02	31	9.1	1.4		136	2.3	2.0	.1	1.2	120	115
Aug. 1-10 -------	98.2	70	1.9	1.3	4	7.7	7.5	.01	31	9.2	1.7		138	2.3	1.9	.0	1.0	121	115
Aug. 11-20 ------	125	69	2.6	1.4	10	7.5	7.4	.02	28	8.7	1.5		125	2.6	1.9	.1	.9	110	106
Aug. 21-31 ------	87.2	71	1.5	.7	13	--	4.0	.02	26	8.1	4.2		122	2.8	2.2	.1	1.4	112	98
Sept. 1-10 -------	93.4	70	1.4	1.2	3	7.5	7.1	.03	32	9.4	.6		138	2.5	2.5	.0	.8	121	118
Sept. 11-20 ------	84.9	69	3.6	1.4	4	7.4	7.2	.04	29	8.9	2.1		130	2.7	2.2	.1	1.1	113	109
Sept. 21-30 ------	73.5	65	1.4	1.4	5	7.5	7.2	.03	31	10	2.0		142	2.5	2.0	.1	.9	120	118
Average -----	385	60	2.0	1.4	9	--	7.1	0.04	26	6.5	1.9		109	3.0	2.2	0.1	1.1	101	92

Temperature (° F.) of water, water year October 1946 to September 1947

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

OHIO RIVER MAIN STEM

ALLEGHENY RIVER AT KITTANNING, PA.

LOCATION.--At city raw-water intake, about 1,000 feet upstream from bridge on U. S. Highway 422 at Kittanning, Armstrong County.
DRAINAGE AREA.--8,973 square miles.
RECORDS AVAILABLE.--Chemical analyses: September 1906 to September 1907, October 1944 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 304 parts per million Oct. 11-20; minimum, 66 parts per million Apr. 1-10.
Total hardness: Maximum, 135 parts per million Oct. 1-20; minimum, 35 parts per million Apr. 1-10.
EXTREMES, 1906-07, 1944-47.--Dissolved solids: Maximum, 304 parts per million Oct. 11-20, 1946; minimum, 54 parts per million Jan. 7-15, 1907.
Total hardness: Maximum, 135 parts per million Oct. 1-20, 1946; minimum, 29 parts per million Jan. 7-15, 1907.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1083. Records of specific conductance and pH of daily samples for 1944-47 available in district office at Washington, D. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
															Total	Noncarbonate
Oct. 1-10, 1946	1,537	16	7.3	49.3	1.6	0.02	40	8.5	43	59	73	73	0.2	288	135	86
Oct. 11-20	3,566	26	7.4	52.1	1.6	.10	40	8.5	48	59	72	82	.2	304	135	86
Oct. 21-31	6,212	12	7.0	37.1	3.8	.06	31	6.5	29	42	59	50	.4	224	104	70
Nov. 1-10	3,629	10	7.1	32.8	1.8	.02	27	6.1	26	40	51	44	.2	195	92	60
Nov. 11-20	4,445	15	7.2	32.9	1.8	.09	28	6.2	28	53	48	45	.3	192	95	52
Nov. 21-30	6,840	10	7.2	32.3	2.9	.09	27	5.9	27	50	48	42	.8	184	92	51
Dec. 1-10	6,122	10	7.1	24.9	3.8	.07	21	4.9	18	36	41	28	1.3	140	73	43
Dec. 11-20	14,070	6	6.8	22.5	3.4	.06	20	4.8	14	30	39	24	1.2	130	70	45
Dec. 21-31	14,920	4	7.0	22.1	4.4	.10	19	4.8	13	29	39	22	1.0	128	67	43
Jan. 1-10, 1947	30,940	4	6.7	13.7	4.1	.07	12	3.4	7.5	16	28	12	1.5	81	44	31
Jan. 11-20	25,210	5	6.8	15.6	4.2	.10	14	3.8	7.3	18	31	13	1.4	91	51	36
Jan. 21-31	29,820	4	6.7	12.4	4.1	.09	11	3.2	5.8	14	27	9.0	1.3	76	41	29
Feb. 1-10	29,300	6	6.8	12.6	4.3	.12	12	3.3	5.4	15	28	9.0	1.3	76	44	31
Feb. 11-20	9,646	4	6.7	19.8	5.0	.06	18	4.3	11	27	41	14	1.6	119	63	40
Feb. 21-28	5,854	3	6.8	22.8	4.6	.06	21	5.4	14	33	46	20	1.5	137	75	48
Mar. 1-10	5,437	3	6.8	25.2	4.6	.06	24	5.9	14	38	49	22	1.2	149	84	53
Mar. 11-20	23,210	4	6.6	21.1	3.4	.08	19	4.8	12	27	39	20	1.3	124	67	45
Mar. 21-31	37,130	4	6.5	12.6	4.1	.05	12	2.9	6.2	18	24	10	1.6	76	42	27

Apr. 1-10	70,090	10	6.9	10.6	5.4	.12	10	2.4	5.6	16	20	8.2	2.0	66	35	22
Apr. 11-20	33,780	9	6.9	11.6	4.5	.07	12	2.7	5.4	21	21	8.9	1.4	70	41	24
Apr. 21-30	40,970	10	7.0	12.3	4.7	.08	12	2.9	6.6	22	23	9.5	1.0	76	42	24
May 1-10	35,830	12	7.0	12.6	4.8	.06	12	3.0	7.1	22	24	10	.7	76	42	24
May 11-20	27,700	9	7.1	14.1	4.0	.11	13	3.3	9.2	24	29	11	.8	83	46	26
May 21-31	40,220	10	7.0	12.6	3.2	.08	12	3.1	6.6	26	22	8.5	.9	76	43	21
June 1-10	43,730	12	7.1	12.0	3.4	0.15	12	2.7	7.4	28	20	9.0	0.8	74	41	18
June 11-20	22,750	17	7.1	14.0	3.6	.08	14	3.2	6.6	28	24	9.8	.8	84	48	25
June 21-30	6,381	8	7.3	19.2	1.7	.04	18	4.2	12	39	31	16	.5	111	62	30
July 1-10	3,719	7	7.3	25.3	1.2	.03	24	5.4	16	46	40	26	.4	151	82	44
July 11-20	5,154	8	7.2	30.6	2.4	.01	28	6.3	21	54	47	34	.4	177	96	52
July 21-31	8,899	10	7.1	24.0	5.2	.01	24	4.8	14	50	31	25	.8	143	80	39
Aug. 1-10	3,506	9	7.1	23.0	2.2	.01	24	4.9	12	46	35	23	.7	139	80	42
Aug. 11-20	2,394	10	7.2	29.0	2.0	.01	28	5.7	22	67	39	32	.6	167	93	38
Aug. 21-31	4,710	8	7.1	32.5	3.2	.02	29	6.1	24	50	50	40	.6	192	97	56
Sept. 1-10	4,938	10	7.2	34.7	2.8	.12	29	6.2	29	50	48	50	.4	208	98	57
Sept. 11-20	3,576	7	7.1	32.8	2.4	.01	28	6.0	24	51	43	43	.5	190	94	53
Sept. 21-30	2,953	10	7.1	33.2	2.2	.06	29	6.3	24	45	50	43	.4	194	98	61
Average	17,620	9	--	23.5	3.4	0.07	21	4.8	16	36	38	26	0.9	139	72	43

OHIO RIVER MAIN STEM--Continued

OHIO RIVER AT SEWICKLEY, PA.

LOCATION.--At highway bridge, 0.5 mile upstream from Narrows Run, in Allegheny County.
DRAINAGE AREA.--19,500 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1083. Records of specific conductance of daily samples available in district office at Wahington, D. C.

Chemical analyses of cross-section samples, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	Station	Time	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Total hardness as $CaCO_3$	Total acidity as H_2SO_4
Oct. 16, 1946	6,450	1,150	6:10 p. m.	64	2	3.65	89.1	0	333	48	8.0	276	31
		850	6:05	64	5	3.60	89.6	0	330	45	7.7	282	33
		600	6:00	64	4	3.60	89.6	0	330	48	7.2	267	31
		370	5:55	64	4	3.60	89.4	0	330	48	7.6	270	30
		140	5:50	65	3	3.60	88.9	0	326	49	7.2	264	31
Nov. 15	8,860	1,150	12:35	57	3	3.95	66.0	0	237	34	5.4	192	24
		850	12:40	57	2	3.85	66.7	0	239	34	5.3	195	25
		600	12:45	58	2	3.90	65.2	0	231	34	5.5	192	22
		370	12:50	56	3	4.70	62.3	0	237	36	5.8	192	15
		140	12:55	57	1	4.95	61.9	0	224	34	7.2	186	10
Dec. 17	25,600	1,150	1:00	42	4	6.6	40.6	40	131	24	5.0	123	--
		850	1:10	42	4	5.0	35.0	8	117	22	3.8	99	--
		600	1:15	41	3	6.0	33.1	14	100	22	2.9	93	--
		370	1:20	41	4	6.0	30.5	17	93	23	2.8	90	--
		140	1:23	41	3	5.9	30.5	14	85	24	3.2	84	--
Jan. 16, 1947	68,800	1,150	9:45 a. m.	44	1	5.8	32.4	14	125	9	7.8	87	--
		850	9:50	44	1	5.8	32.1	16	120	9	6.2	90	--
		600	10:00	42	1	5.6	29.4	12	107	10	5.9	87	--
		370	10:05	39	1	5.6	24.1	8	79	14	4.0	63	--
		140	10:10	39	1	5.6	23.3	10	74	16	4.0	69	--

Feb. 24	12,800	1,150	2:05 p.m.	32	1	4.30	35.5	0	127	16	3.6	99	17
		850	2:00	32	1	4.35	34.9	0	126	16	3.5	102	17
		600	1:55	32	1	4.30	34.2	0	124	16	3.0	102	18
		370	1:50	32	1	4.35	33.8	0	123	16	4.1	96	17
		140	1:45	32	1	4.15	34.5	0	122	15	3.2	90	20
Mar. 18	67,000	1,150	4:22	36	2	5.3	19.6	4	69	7	3.5	57	--
		850	4:13	34	4	5.1	19.0	6	68	9	3.2	57	--
		600	4:08	35	3	5.6	18.5	8	56	13	2.9	54	--
		370	4:03	34	3	6.0	19.3	18	42	18	3.1	57	--
		140	3:55	34	4	6.2	19.1	22	39	18	2.6	52	--
Apr. 14	43,400	1,150	9:50 a.m.	52	3	6.2	19.0	7	59	9	2.6	64	--
		850	9:55	52	3	6.3	17.3	6	53	8	2.9	63	--
		600	10:05	51	3	6.5	16.2	10	43	9	2.8	58	--
		370	10:10	51	5	6.8	16.9	11	36	15	2.4	60	--
		140	10:15	50	5	6.6	14.2	12	33	10	2.6	54	--
May 19	75,800	1,150	12:40 p.m.	64	3	6.3	28.7	6	107	10	3.7	90	--
		850	12:45	63	3	6.2	26.5	6	96	9	3.8	81	--
		600	12:50	62	4	6.6	22.1	10	70	9	3.5	80	--
		370	12:55	60	4	6.6	19.4	13	53	11	2.7	74	--
		140	1:05	60	4	6.7	18.6	16	51	11	2.8	68	--
June 17	38,700	1,150	10:55 a.m.	69	4	6.2	26.1	6	91	10	2.7	87	--
		850	10:50	69	4	6.3	24.6	10	83	10	2.7	84	--
		600	10:45	69	4	6.3	23.5	8	77	10	2.7	81	--
		370	10:40	69	4	6.5	22.3	9	71	10	2.6	81	--
		140	10:35	69	4	6.5	21.8	8	68	10	2.6	80	--
July 15	11,400	1,150	3:35 p.m.	77	2	3.95	53.6	0	207	1	3.7	156	28
		850	3:33	77	0	3.85	53.0	0	201	5	3.7	153	34
		600	3:30	76	0	3.90	52.2	0	198	15	3.6	150	26
		370	3:28	76	0	3.90	52.1	0	196	15	3.4	150	30
		140	3:25	77	1	4.10	49.9	0	189	17	3.4	153	26

OHIO RIVER MAIN STEM--Continued

OHIO RIVER AT SEWICKLEY, PA.--Continued

Chemical analyses of cross-section samples, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Discharge (second-feet)	Station	Time	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Total hardness as $CaCO_3$	Total acidity as H_2SO_4
Aug. 11, 1947	9,970	1,150	7:00 a.m.	80	0	4.20	45.8	0	173	17	6.7	138	18
		850	7:00	80	2	4.00	47.1	0	175	15	6.4	144	20
		600	6:55	80	3	4.50	44.5	0	172	13	4.8	144	16
		370	6:48	80	0	4.10	45.7	0	177	13	6.4	144	16
		140	6:30	80	1	4.30	44.9	0	173	14	6.1	141	16
Sept. 16	12,200	1,150	1:25 p.m.	79	0	4.20	52.8	0	190	25	6.6	138	16
		850	1:20	79	1	4.15	53.2	0	195	25	6.2	144	18
		600	1:15	79	1	4.25	53.2	0	192	27	7.2	156	14
		370	1:10	80	1	4.25	52.8	0	191	26	6.2	150	16
		140	1:05	80	1	4.10	53.4	0	194	26	6.2	150	18

OHIO RIVER AT SOUTH HEIGHTS, PA.

LOCATION.--At raw-water intake of Frank R. Phillips Power Station of the Duquesne Light Company at South Heights, Beaver County, approximately one mile upstream from bridge on State Highway 930 at Ambridge.
DRAINAGE AREA.--19,560 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1947.
Water temperatures: October 1945 to September 1947.
EXTREMES, 1946-47.--Specific conductance: Maximum, 90.3 Oct. 11-20; minimum 17.0 Apr. 1-10.
Water temperatures: Maximum, 85° F. Aug. 20-21; minimum, freezing point Feb. 18.
EXTREMES, 1945-47.--Dissolved solids, 1945-46: Maximum, 602 parts per million Oct. 11-20, 1946; minimum, 127 parts per million Jan. 11-20, 1946.
Total hardness, 1945-46: Maximum, 296 parts per million Oct. 11-20, 1946; minimum, 62 parts per million Jan. 11-20, 1946.
Specific conductance: Maximum, 90.3 Oct. 11-20, 1946; minimum 17.0 Apr. 1-10, 1947.
Water temperatures: Maximum, 85° F. Aug. 20-21, 1947; minimum, freezing point Feb. 18, 1947.
REMARKS.--Records of water discharge based on records for Ohio River at Sewickley, Pa. Samples collected by the Duquesne Light Company. Records of specific conductance and pH of daily samples available in district office at Washington, D. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na+K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																		Total	Non carbonate	
Oct. 3, 1946	1/4,100	--	3	3.70	94.3	8.0	--	--	--	80	21	--	0	366	40	--	602	296	296	32
Oct. 11-20	6,295	63	4	3.80	90.3	8.8	1.3	0.06	1.4	74	19	67	0	337	49	7.4	583	281	281	25
Oct. 21-31	12,410	60	2	5.4	65.6	6.2	--	.02	1.2	56	14	53	4	222	53	3.6	423	197	194	--
Nov. 1-10	7,352	60	3	4.7	54.7	6.8	.5	.02	.90	47	12	38	1	191	36	3.2	352	171	170	10
Nov. 11-20	7,701	55	2	4.30	61.6	6.6	.7	.03	.90	53	13	41	0	222	35	3.5	394	193	193	14
Nov. 21-30	11,390	49	6	4.6	56.4	4.8	.0	.04	.91	47	12	44	5	194	38	4.2	366	168	164	3
Dec. 1-10	10,690	43	5	5.7	46.0	4.4	--	.01	.65	40	10	33	10	150	32	3.2	292	141	133	--
Dec. 11-20	24,620	42	4	4.30	42.0	5.2	.0	.04	.77	35	9.3	26	0	145	22	3.8	265	129	129	7
Dec. 21-31	29,710	38	3	5.5	32.0	5.0	--	.02	.18	28	7.3	20	4	108	17	3.6	202	100	97	--
Jan. 1-10, 1947	59,480	37	3	5.4	21.2	--	--	--	--	--	--	--	6	69	8.9	4.0	--	--	--	--
Jan. 11-20	50,920	38	5	5.4	23.5	--	--	--	--	--	--	--	5	80	9.8	3.9	--	--	--	--
Jan. 21-31	73,840	39	5	5.2	20.3	--	--	--	--	--	--	--	4	70	6.5	3.9	--	--	--	--
Feb. 1-10	48,660	36	5	5.4	21.5	--	--	--	--	--	--	--	4	73	8.5	4.0	--	--	--	--
Feb. 11-20	19,920	34	5	4.6	30.7	--	--	--	--	--	--	--	0	109	14	4.1	--	--	--	11
Feb. 21-28	13,440	34	7	4.15	35.0	--	--	--	--	--	--	--	0	120	16	4.0	--	--	--	15
Mar. 1-10	15,030	36	7	3.93	44.3	--	--	--	--	--	--	--	0	154	18	5.2	--	--	--	17
Mar. 11-20	55,240	36	5	4.5	30.5	--	--	--	--	--	--	--	0	109	9.9	4.2	--	--	--	16
Mar. 21-31	69,710	38	5	5.1	20.2	--	--	--	--	--	--	--	2	70	7.6	3.8	--	--	--	--

OHIO RIVER MAIN STEM--Continued

OHIO RIVER AT SOUTH HEIGHTS, PA.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na+K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																		Total	Non-carbonate	
Apr. 1-10, 1947	98,130	43	6	5.1	17.0	--	--	--	--	--	--	--	3	58	6.2	3.0	--	--	--	--
Apr. 11-20	46,330	51	5	5.8	19.0	--	--	--	--	--	--	--	9	60	8.5	2.4	--	--	--	--
Apr. 21-30	54,350	51	5	5.8	21.2	--	--	--	--	--	--	--	8	69	9.8	1.8	--	--	--	--
May 1-10	55,960	54	2	5.7	22.4	--	--	--	--	--	--	--	6	76	8.9	2.5	--	--	--	--
May 11-20	50,000	53	2	6.0	24.6	--	--	--	--	--	--	--	7	84	9.2	3.0	--	--	--	--
May 21-31	66,110	64	2	6.1	22.0	--	--	--	--	--	--	--	10	73	8.0	2.5	--	--	--	--
June 1-10	72,660	64	3	6.1	22.1	--	--	--	--	--	--	--	12	71	8.5	2.6	--	--	--	--
June 11-20	44,040	68	1	6.0	24.2	--	--	--	--	--	--	--	9	84	8.2	2.4	--	--	--	--
June 21-30	11,560	71	2	6.0	29.6	--	--	--	--	--	--	--	8	104	13	2.9	--	--	--	--
July 1-10	8,802	77	0	4.20	46.3	--	--	--	--	--	--	--	0	173	16	2.7	--	--	--	16
July 11-20	16,700	78	0	4.10	50.3	--	--	--	--	--	--	--	0	190	17	2.8	--	--	--	24
July 21-31	17,990	75	1	5.8	38.1	--	--	--	--	--	--	--	8	133	21	2.8	--	--	--	--
Aug. 1-10	13,950	76	0	5.9	35.8	--	--	--	--	--	--	--	6	134	12	2.6	--	--	--	--
Aug. 11-20	8,305	83	0	5.2	45.6	--	--	--	--	--	--	--	2	182	15	1.1	--	--	--	--
Aug. 21-31	15,480	82	2	4.05	48.0	--	--	0.06	--	--	--	--	0	178	20	5.2	--	--	--	24
Sept. 1-10	10,430	79	2	4.30	43.1	--	--	.06	--	--	--	--	0	147	27	5.1	--	--	--	18
Sept. 11-20	9,408	79	2	4.10	51.3	--	--	.04	--	--	--	--	0	176	30	4.7	--	--	--	20
Sept. 21-30	7,007	72	3	3.95	52.8	--	--	.05	--	--	--	--	0	184	29	5.5	--	--	--	22
Average	2/31,610	56	3	--	39.0	--	--	--	--	--	--	--	--	138	19	3.6	--	--	--	--

1/Mean discharge for Oct. 1-10, 3,454 second-feet.
2/Mean discharge for Oct. 1-10 included in computing mean for year.

OHIO RIVER AT AMBRIDGE, PA.

LOCATION.--At bridge on State Highway 930 at Ambridge, Beaver County, 1.2 miles downstream from Sewickley Creek and approximately 5 miles below gaging station at Sewickley, Allegheny County.
DRAINAGE AREA.--19,560 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1947.
Water temperatures: October 1945 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 600 parts per million Oct. 1-10; minimum, 79 parts per million Apr. 1-10.
Total hardness: Maximum, 302 parts per million Oct. 1-10; minimum, 43 parts per million Apr. 1-10.
Water temperatures: Maximum, 86° F. Aug. 20, 21; minimum, freezing point Feb. 8-9.
EXTREMES, 1945-47.--Dissolved solids: Maximum, 600 parts per million Oct. 1-10, 1946; minimum, 79 parts per million Apr. 1-10, 1947.
Total hardness: Maximum, 302 parts per million Oct. 1-10, 1946; minimum, 43 parts per million Apr. 1-10, 1947.
Water temperatures: Maximum, 86° F. Aug. 20-21, 1947; minimum, freezing point Feb. 8-9, 1947.
REMARKS.--Discharge records based on records for Ohio River at Sewickley. Samples collected daily from the highway bridge at point 400 feet from east bank of river. Due to cross-sectional differences in concentration of dissolved solids water samples also collected once a month at points 625, 870, 1,090, and 1,380 feet from east bank of river. Records of specific conductance and pH of daily samples available in district office at Washington, D. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Total acidity as H_2SO_4
Oct. 1-10, 1946---	3,454	68	3	3.70	92.1	10	2.4	0.08	1.8	79	19	59	0	353	40	--	8.8	600	302	302	33
Oct. 11-20--------	6,295	65	5	3.80	89.9	9.4	1.4	.05	1.8	76	19	63	0	337	48	--	7.5	589	287	287	27
Oct. 21-31--------	12,410	61	4	5.4	65.9	6.0	--	.03	1.1	57	14	51	2	221	54	--	3.6	426	200	198	--
Nov. 1-10 --------	7,352	61	5	5.0	54.9	6.6	.6	.02	1.1	48	12	37	4	190	36	--	3.4	356	174	171	11
Nov. 11-20 -------	7,701	56	5	4.7	60.3	7.2	.6	.02	1.0	52	13	43	5	218	34	--	3.7	393	188	184	12
Nov. 21-30 -------	11,390	50	5	4.5	56.4	4.0	.0	.03	.84	48	12	42	2	193	39	--	5.0	365	171	169	5
Dec. 1-10 --------	10,690	43	5	6.0	44.7	3.6	--	.01	.50	39	9.3	31	14	137	33	--	3.5	278	136	124	--
Dec. 11-20 -------	24,620	42	6	5.8	37.4	4.4	--	.02	.52	33	8.3	26	12	121	24	--	3.4	234	116	107	--
Dec. 21-31 -------	29,710	38	5	5.3	33.2	5.2	--	.02	.65	29	7.2	19	4	108	17	--	3.6	203	102	99	--
Jan. 1-10, 1947 ---	59,480	35	5	6.2	17.8	5.0	--	.01	.03	16	3.9	10	11	45	14	--	2.9	107	56	47	--
Jan. 11-20--------	50,920	38	5	6.1	21.7	5.8	--	.02	.22	20	5.2	11	7	64	14	--	3.0	141	71	66	--
Jan. 21-31--------	73,840	37	6	6.3	15.6	5.7	--	.02	.30	14	3.6	8.4	10	42	10	--	2.5	96	50	42	--
Feb. 1-10 --------	48,660	34	7	6.1	16.2	5.6	--	.02	.10	15	3.8	8.5	9	46	10	--	2.6	101	53	46	--
Feb. 11-20 -------	19,920	35	5	4.5	29.9	6.6	.4	.02	.22	27	7.3	13	1	104	12	--	3.2	188	100	99	9
Feb. 21-28 -------	13,440	34	6	4.45	33.8	6.6	.6	.02	.49	29	7.9	18	0	118	16	--	3.6	212	110	110	12
Mar. 1-10 --------	15,030	37	7	3.85	43.5	6.8	.6	.03	.92	35	9.9	20	0	150	17	--	4.8	270	140	140	14
Mar. 11-15-------	40,780	37	6	4.10	38.2	5.6	.8	.03	.82	33	9.4	14	0	133	14	--	4.6	239	131	131	13
Mar. 16-20-------	69,700	35	6	6.5	19.8	4.4	--	.05	.12	19	4.7	8.4	16	48	14	--	2.8	117	67	54	--
Mar. 21-31-------	69,710	35	7	6.3	16.2	4.9	--	.08	.08	15	3.9	8.3	14	42	10	--	2.8	101	54	42	--

OHIO RIVER MAIN STEM--Continued

OHIO RIVER AT AMBRIDGE, PA.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																			Total	Non-carbonate	
Apr. 1-10, 1947----	98,130	42	12	6.2	12.8	5.0	--	0.11	0.02	12	3.2	6.3	13	32	7.8	--	2.2	79	43	32	--
Apr. 11-20---------	46,330	51	12	6.4	15.0	4.9	--	.07	.00	14	3.5	7.7	14	40	8.0	--	2.2	91	49	38	--
Apr. 21-30---------	54,350	50	7	6.4	15.8	4.9	--	.07	.06	15	3.8	7.9	14	42	9.5	--	2.0	98	53	42	--
May 1-10----------	55,960	53	3	6.6	17.0	3.9	--	.04	.04	16	4.1	9.3	16	47	9.5	--	2.0	105	57	44	--
May 11-20 ---------	50,000	56	6	6.2	19.9	8.9	--	.01	.10	18	4.8	12	15	60	10	--	2.2	127	65	52	--
May 21-31 ---------	66,110	64	6	6.3	16.9	6.2	--	.05	.01	16	4.1	8.5	16	47	8.2	--	1.9	101	57	44	--
June 1-10----------	72,660	63	7	6.2	16.9	6.3	--	.08	.01	16	4.0	8.3	15	46	8.8	--	2.1	101	56	44	--
June 11-20---------	44,040	69	5	6.2	20.6	5.8	--	.03	.08	20	5.2	9.4	13	65	8.2	--	2.4	126	71	61	--
June 21-30---------	11,560	73	3	5.8	30.3	7.6	--	.02	.15	28	7.4	15	8	103	12	--	3.1	188	100	94	--
July 1-10 ----------	8,802	77	3	4.7	45.6	6.4	1.4	.01	1.2	42	11	22	3	172	18	--	1.6	303	160	158	15
July 11-20 ---------	16,700	78	4	4.6	48.3	6.6	2.1	.01	1.3	42	12	25	3	186	18	--	1.4	320	168	166	18
July 21-31 ---------	17,990	75	3	5.9	38.3	6.4	--	.01	.61	36	8.8	23	11	128	23	--	2.6	247	126	117	--
Aug. 1-10----------	13,950	77	5	5.8	35.3	6.4	--	.01	.50	34	8.5	18	7	128	13	--	2.4	230	120	114	--
Aug. 11-20---------	8,305	84	3	5.0	46.0	7.0	1.1	.01	1.4	42	11	25	5	178	16	--	1.9	309	159	155	11
Aug. 21-31---------	15,480	82	3	4.15	46.3	6.8	.3	.04	.80	41	11	25	0	171	19	0.1	3.6	290	154	154	15
Sept. 1-10 ---------	10,430	80	5	4.6	42.2	5.8	.2	.03	.68	37	9.4	26	2	144	25	.0	3.5	464	133	132	12
Sept. 11-20 --------	9,408	80	4	4.25	50.8	6.0	.3	.03	.88	42	11	34	0	179	29	.1	3.1	318	155	155	20
Sept. 21-30 --------	7,007	72	6	4.30	51.5	7.2	.5	.04	.88	43	11	34	0	184	28	.2	2.4	323	159	159	17
Average --------	31,610	56	5	--	36.7	6.1	--	0.03	0.58	32	8.3	--	--	125	20	--	3.2	233	--	--	--

OHIO RIVER AT AMBRIDGE, PA.--Continued

Chemical analyses of cross-section samples, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	Station	Time	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Total hardness as $CaCO_3$	Total acidity as H_2SO_4
Oct. 16, 1946	6,450	1,380	2:40 p. m.	65	3	3.50	91.8	0	335	50	8.2	264	26
		1,090	2:45	64	4	3.50	93.3	0	335	49	8.7	267	29
		870	2:50	64	2	3.50	93.5	0	335	50	8.6	264	30
		625	2:55	64	3	3.50	93.5	0	339	49	8.6	273	27
		340	3:00	64	2	3.55	93.0	0	342	50	8.8	279	32
Nov. 15	8,860	1,380	2:10	--	2	4.05	64.6	0	233	34	5.4	186	19
		1,090	2:05	--	2	4.15	64.1	0	234	34	5.6	198	16
		870	2:00	--	3	4.00	64.7	0	230	34	5.5	186	17
		625	1:50	--	4	4.45	63.3	0	229	34	4.8	195	13
		340	1:45	--	3	4.35	63.4	0	225	34	4.9	192	14
Dec. 17	25,600	1,380	1:50	42	3	5.3	35.7	5	119	23	4.6	102	--
		1,090	1:55	42	2	5.6	34.0	8	106	22	4.5	88	--
		870	2:00	42	2	5.7	33.1	6	102	24	5.8	104	--
		625	2:05	42	3	5.7	31.9	8	92	24	3.1	93	--
		340	2:10	41	2	5.9	31.1	9	92	25	3.2	98	--
Jan. 16	68,800	1,380	11:10 a. m.	43	1	6.2	30.2	10	108	12	7.5	78	--
		1,090	11:05	42	1	5.5	29.4	10	105	11	7.3	78	--
		870	11:00	41	1	5.7	27.6	10	95	12	5.5	78	--
		625	10:55	40	1	5.6	25.2	10	84	13	4.0	81	--
		340	10:50	39	1	5.6	23.6	8	80	15	3.9	66	--
Feb. 24	12,800	1,380	2:15 p. m.	32	1	4.6	35.6	0	122	16	2.9	87	21
		1,090	2:20	32	1	4.10	34.9	0	121	14	2.7	87	19
		870	2:25	32	1	4.20	34.9	0	124	14	2.7	90	18
		625	2:30	32	1	4.10	35.4	0	125	16	2.9	90	20
		340	2:35	32	1	4.6	33.2	0	123	15	3.4	102	20
Mar. 18, 1947	67,000	1,380	5:10 p. m.	36	3	5.6	18.7	9	81	8	3.2	58	--
		1,090	5:16	35	4	5.7	18.6	8	56	10	3.5	57	--
		870	5:22	34	3	5.8	18.9	11	52	13	3.1	57	--
		625	5:29	34	2	6.1	18.6	19	53	15	2.8	56	--
		340	5:35	33	3	6.2	18.7	18	47	17	2.8	60	--

OHIO RIVER MAIN STEM--Continued

OHIO RIVER AT AMBRIDGE, PA.--Continued

Chemical analyses of cross section samples, in parts per million, water year October 1946 to September 1947--Continued

Day of collection	Discharge (second-feet)	Station	Time	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Total hardness as $CaCO_3$	Total acidity as H_2SO_4
Apr. 14, 1947	43,400	1,380	12:30 p.m.	52	3	5.9	17.3	5	54	8	2.7	62	--
		1,090	12:25	51	3	6.0	20.4	7	50	19	2.4	78	--
		870	12:20	51	3	6.1	16.0	8	43	8	2.7	52	--
		625	12:15	50	3	6.6	14.8	10	39	8	2.7	57	--
		340	12:10	50	3	6.8	14.2	13	34	8	2.7	54	--
May 19	75,800	1,380	2:25	63	4	6.2	27.0	7	97	9	2.8	96	--
		1,090	2:20	62	4	6.5	25.6	9	90	9	3.1	84	--
		870	2:15	61	4	6.5	23.0	8	76	10	2.9	80	--
		625	2:10	61	4	6.7	20.3	13	61	12	2.7	72	--
		340	2:05	60	4	6.8	18.9	15	51	12	2.6	69	--
June 17	38,700	1,380	12:20	70	4	6.2	25.2	8	86	10	2.6	87	--
		1,090	12:15	70	4	6.3	24.6	8	83	9	2.6	84	--
		870	12:10	70	4	6.3	23.7	8	79	10	2.5	81	--
		625	12:05	69	4	6.4	23.5	10	73	10	2.7	87	--
		340	12:00	69	4	6.4	22.1	9	72	10	2.8	80	--
July 15	11,400	1,090	3:03	76	1	3.95	54.1	0	203	15	4.0	153	20
		870	3:01	76	1	3.90	54.4	0	205	17	4.9	150	28
		625	2:56	76	2	3.85	54.8	0	207	16	7.0	150	28
		340	2:53	76	1	3.95	53.8	0	205	16	3.4	141	32
Aug. 11	9,970	1,380	12:30	82	2	4.10	45.8	0	172	13	6.2	129	24
		1,090	12:35	82	3	4.00	45.6	0	174	15	6.4	147	20
		870	12:32	82	3	4.10	45.9	0	174	15	6.2	138	18
		625	12:30	83	1	4.00	46.1	0	173	13	6.0	141	20
		340	12:25	82	3	4.10	45.7	0	174	14	5.7	132	18
Sept. 16	12,200	1,380	2:00	79	1	4.45	51.9	0	188	27	5.8	153	14
		1,090	2:05	79	2	4.30	52.5	0	189	27	6.1	156	12
		870	2:10	79	1	4.30	52.2	0	188	27	6.1	150	16
		625	2:15	79	1	5.4	51.4	8	188	27	6.0	156	--
		340	2:20	80	0	4.20	52.3	0	185	29	6.2	150	12

FRENCH CREEK AT FRANKLIN, PA.

LOCATION.--At raw-water intake at Franklin filter plant 1½ miles upstream from Franklin, Venango County.
DRAINAGE AREA.--1,200 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 156 parts per million Nov. 1-10; minimum, 59 parts per million Apr. 1-10.
Total hardness: Maximum, 117 parts per million Nov. 1-10; minimum, 37 parts per million Apr. 1-10.
REMARKS.--Records of water discharge based on records for French Creek at Utica and Sugar Creek at Sugar Creek. Records of specific conductance and pH of daily samples available in district office at Washington, D. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1946	115	8	7.7	25.2	0.4	0.01	34	6.9	8.4	2.9	112	23	12	0.1	0.6	145	113	21
Oct. 11-20	369	6	7.5	24.5	2.0	.01	32	6.5	6.9	3.1	105	24	7.4	.1	1.2	139	107	21
Oct. 21-31	386	8	7.5	23.5	1.4	.01	32	6.1	5.8	2.8	88	34	5.9	.1	.7	138	105	33
Nov. 1-10	233	11	7.6	26.6	1.2	.01	35	7.2	6.9	5.3	105	37	7.5	.1	.8	156	117	31
Nov. 11-20	636	16	7.6	23.2	5.2	.01	31	6.1	4.6	6.1	88	36	5.8	.1	1.4	141	102	30
Nov. 21-30	1,200	14	7.9	20.3	4.2	.02	27	5.3	5.5	2.9	67	37	5.2	.1	1.6	123	89	34
Dec. 1-10	676	22	7.1	20.1	5.6	.03	27	5.1	5.4	2.4	64	35	5.2	.1	1.4	122	88	36
Dec. 11-20	2,224	30	7.0	15.6	7.1	.02	20	4.0	3.3	1.6	44	30	3.9	.1	1.8	98	66	30
Dec. 21-31	2,775	30	7.0	16.0	5.8	.03	21	4.0	3.6	1.4	50	28	4.1	.1	2.0	97	69	28
Jan. 1-10, 1947	3,188	32	7.0	13.3	5.4	.01	17	3.4	3.0	1.5	36	26	3.5	.1	2.0	82	56	27
Jan. 11-20	3,588	13	6.9	12.8	5.1	.02	18	3.6	3.1	1.2	42	25	3.2	.0	2.0	83	60	25
Jan. 21-31	5,893	15	6.8	11.5	4.5	.02	15	3.1	2.4	1.0	32	23	2.8	.0	2.3	71	50	30
Feb. 1-10	3,589	15	6.3	13.6	5.3	.04	17	4.1	3.0	1.3	39	24	3.2	.1	2.6	85	59	27
Feb. 11-20	1,399	8	6.4	16.4	6.5	.03	22	4.3	3.6	1.4	55	24	4.0	.1	3.0	100	73	28
Feb. 21-28	940	11	6.6	17.6	6.3	.03	24	4.6	4.2	1.2	63	25	4.5	.1	2.6	107	79	27
Mar. 1-10	828	10	6.6	18.3	6.5	.03	24	4.8	4.5	1.3	67	24	4.2	.1	2.9	109	80	25
Mar. 11-20	4,316	10	7.0	13.0	5.1	.04	16	3.4	3.0	1.3	41	21	3.1	.1	3.2	80	54	20
Mar. 21-31	5,638	12	6.9	11.1	5.1	.06	14	2.9	2.6	1.1	34	19	2.9	.0	3.2	70	47	19
Apr. 1-10	12,420	25	6.8	8.98	4.9	.20	11	2.3	2.0	1.2	25	16	2.1	.0	2.3	59	37	16
Apr. 11-20	4,703	25	7.0	12.2	4.7	.05	16	3.1	2.6	1.3	40	20	2.9	.1	2.2	76	53	20
Apr. 21-30	5,524	8	7.4	11.6	3.7	.02	15	3.1	2.2	.9	37	19	2.1	.1	1.4	72	50	20
May 1-10	3,950	9	7.7	12.9	3.7	.02	17	3.5	2.3	.9	47	19	2.4	.1	1.2	78	57	18
May 11-20	2,870	9	7.8	13.9	2.9	.02	18	3.8	3.0	.8	52	19	2.8	.1	1.1	83	60	18
May 21-31	6,218	20	6.9	11.7	3.8	.04	16	3.0	1.9	1.5	46	16	2.0	.1	1.0	74	52	15

ALLEGHENY RIVER TRIBUTARIES--Continued

FRENCH CREEK AT FRANKLIN, PA.--Continued

Chemical anlyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
June 1-10, 1947	8,080	30	7.0	11.0	3.9	0.13	15	2.8	1.7	1.5	45	14	1.5	0.1	1.2	72	49	12
June 11-20	3,423	32	7.1	13.7	4.0	.16	19	3.5	2.3	1.6	59	15	2.2	.1	1.1	87	62	13
June 21-30	853	14	7.7	19.1	3.3	.04	27	6.0	4.0	1.5	85	19	3.9	.1	.8	113	88	18
July 1-10	436	8	7.8	22.9	1.6	.02	31	5.7	6.4	1.3	104	23	5.8	.1	.6	130	101	16
July 11-20	896	10	7.5	20.4	3.5	.03	28	5.1	5.0	1.3	87	20	6.5	.1	1.0	118	91	20
July 21-31	1,290	22	7.5	16.4	4.2	.03	23	4.0	3.2	1.1	73	18	2.0	.1	1.0	100	74	14
Aug. 1-10	339	10	7.6	21.8	2.1	.02	30	5.5	5.7	1.6	99	22	5.8	.2	.5	125	97	16
Aug. 11-20	318	9	7.5	23.1	2.1	.01	32	.7	6.4	1.7	104	22	6.5	.1	.8	131	103	18
Aug. 21-31	270	8	7.8	23.5	3.1	.02	31	5.7	7.6	1.7	102	26	7.1	.1	.8	135	101	17
Sept. 1-10	490	10	7.9	22.0	3.3	.02	30	5.7	5.6	1.8	98	24	5.9	.1	.8	128	98	18
Sept. 11-20	253	13	8.1	23.7	2.1	.02	32	5.8	7.3	1.5	101	27	7.0	.1	.2	137	104	21
Sept. 21-30	282	5	7.6	25.0	3.3	.02	33	6.5	8.1	1.8	109	25	7.5	.1	.4	143	109	20
Average	2,537	15	--	17.7	4.0	0.04	24	4.6	4.4	1.8	68	24	4.6	0.1	1.5	106	79	23

CLARION RIVER NEAR PINEY, PA.

LOCATION.--At hydroelectric plant of the Pennsylvania Electric Company 2½ miles from Piney, Clarion County.
DRAINAGE AREA.--951 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 317 parts per million Sept. 11-20; minimum, 59 parts per million Apr. 1-10.
Total hardness: Maximum, 142 parts per million Sept. 11-20; minimum, 28 parts per million Apr. 1-10.
REMARKS.--Samples collected by the Pennsylvania Electric Company. Records of specific conductance and pH of daily samples available in district office at Washington, D. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Non-carbonate
Oct. 1-10, 1946	276	65	6.9	40.9	2.8	0.14	0.00	39	6.8	29	2.9	40	79	50	0.1	1.3	257	125	92
Oct. 11-20	1,027	70	6.7	40.1	2.6	.13	.00	38	6.4	27	3.4	41	77	49	.1	1.6	251	121	88
Oct. 21-31	1,183	35	7.0	30.8	5.0	.02	.00	30	4.9	18	6.9	33	61	35	.1	.3	191	95	68
Nov. 1-10	594	30	6.7	23.6	4.4	.04	.00	22	4.3	10	7.9	22	52	24	.1	.3	150	73	55
Nov. 11-20	627	31	6.5	22.5	4.4	.05	.00	21	4.3	14	2.7	20	52	23	.1	.3	142	70	54
Nov. 21-30	857	32	6.6	26.7	5.4	.19	.03	26	4.7	18	1.5	28	58	30	.2	.2	170	84	61
Dec. 1-10	636	50	6.8	24.2	5.4	.15	.06	24	4.3	15	1.9	24	51	27	.2	.4	157	78	58
Dec. 11-20	1,475	45	6.5	22.6	5.2	.04	.03	23	3.8	13	2.0	22	48	25	.2	.4	142	73	55
Dec. 21-31	1,623	42	6.4	16.8	5.3	.12	.03	16	3.1	9.5	1.4	17	39	14	.2	.4	105	53	39
Jan. 1-10, 1947	3,857	10	6.0	11.1	4.6	.09	.03	11	2.5	4.7	1.3	11	27	8.6	.1	.6	67	38	29
Jan. 11-20	2,906	10	6.0	11.5	4.8	.07	.05	11	2.7	5.1	1.2	11	29	8.6	.1	.6	70	39	30
Jan. 21-31	4,183	9	5.9	10.1	4.6	.02	.07	9.0	2.8	4.3	1.0	5	27	7.0	.1	.6	82	34	30
Feb. 1-10	2,348	10	5.8	9.97	4.7	.07	.11	9.0	2.6	4.1	1.0	6	26	7.2	.1	.4	62	33	28
Feb. 11-20	962	10	5.2	13.0	5.0	.06	.15	11	3.3	5.9	1.4	6	34	10	.1	.4	81	41	36
Feb. 21-28	608	25	5.5	17.3	5.6	.22	.06	16	3.9	8.4	1.4	10	44	15	.1	.5	113	56	48
Mar. 1-10	505	28	5.5	20.1	5.4	.26	.00	18	4.2	11	1.5	13	49	18	.1	.4	130	62	52
Mar. 11-20	2,177	27	6.2	21.4	4.4	.04	--	20	4.2	12	2.4	16	49	21	.2	.4	141	67	54
Mar. 21-31	3,355	9	6.1	11.0	4.2	.02	--	9.8	2.4	5.0	1.5	9.0	26	9.0	.1	.5	71	34	27
Apr. 1-10	5,192	10	6.1	9.10	4.5	.10	.09	7.8	2.2	4.0	1.3	5	24	6.6	.0	.6	59	28	24
Apr. 11-20	2,033	15	6.1	10.8	4.8	.16	.07	9.4	2.6	4.8	1.2	7	28	8.1	.1	.4	74	34	28
Apr. 21-30	3,745	12	6.2	11.6	4.7	.23	.08	10	2.7	5.5	1.3	7	29	9.6	.1	.4	76	36	30
May 1-10	4,286	8	6.8	9.54	4.0	.12	.22	8.3	2.8	3.8	1.0	5	26	6.8	.1	.4	62	32	28
May 11-20	2,945	7	6.7	11.2	3.9	.22	.23	10	3.1	4.9	1.0	6	30	9.2	.1	.4	77	38	33
May 21-31	3,724	9	6.4	10.6	3.8	.15	.08	9.2	2.6	4.7	1.0	5	27	8.6	.1	.2	71	34	30

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ALLEGHENY RIVER TRIBUTARIES--Continued

CLARION RIVER NEAR PINEY, PA.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Non-carbonate
June 1-10, 1947	3,721	20	6.1	12.2	4.6	0.24	0.12	10	2.7	6.4	1.5	6	29	11	0.1	0.2	79	36	31
June 11-20	2,264	20	6.1	11.5	4.6	.18	.00	10	2.6	5.7	1.5	7	28	9.6	.1	.2	75	36	30
June 21-30	703	22	6.3	14.1	5.5	.26	.00	12	3.1	8.1	1.5	11	32	13	.1	.1	90	43	34
July 1-10	443	30	6.4	17.7	5.3	.30	.08	16	3.6	7.8	1.3	13	39	18	.1	.1	113	55	44
July 11-20	493	54	6.5	26.3	5.6	.83	.60	22	5.3	16	1.8	20	56	31	.1	.2	172	77	60
July 21-30	425	65	6.6	34.3	4.4	.99	.12	30	6.0	23	1.7	26	68	45	.2	.4	223	100	78
Aug. 1-10	237	60	6.3	34.8	4.6	.70	.20	30	6.2	25	2.3	25	65	46	.2	.5	225	100	80
Aug. 11-20	211	60	6.3	35.6	4.6	.54	.00	31	6.1	26	2.3	27	65	49	.2	.5	230	102	80
Aug. 21-31	523	65	6.4	39.2	4.8	.61	.55	34	6.8	29	3.0	32	71	55	.1	.5	254	113	87
Sept. 1-10	459	70	6.6	46.5	4.6	.67	.60	42	7.6	35	2.7	40	84	66	.1	.8	310	136	103
Sept. 11-20	604	80	6.7	47.7	4.2	.82	.80	44	7.8	35	3.2	45	83	69	.2	.8	317	142	105
Sept. 21-30	335	50	6.4	40.2	4.6	.52	.00	37	5.9	30	2.3	39	63	59	.2	1.1	247	117	85
Average	1,729	33	--	22.1	4.6	0.26	0.13	20	4.2	14	2.1	18	47	25	0.1	0.5	142	67	52

KISKIMINETAS RIVER AT LEECHBURG, PA.

LOCATION.--At private bridge to West Leechburg plant of Allegheny-Ludlum Steel Corporation, 0.2 mile below Brady Run, in Armstrong County.
DRAINAGE AREA.--1,860 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 786 parts per million Oct. 1-10; minimum, 183 parts per million Jan. 1-10.
Total hardness: Maximum, 514 parts per million Oct. 1-10; minimum, 119 parts per million Jan. 1-10.
Water temperatures: Maximum, 84° F. Aug. 11; minimum, freezing point Feb. 20-24.
REMARKS.--Records of water discharge computed on basis of records for Kiskiminetas River at Vandegrift. Records of specific conductance and pH of daily samples available in district office at Washington, D. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
Oct. 1-10, 1946-----	460	62	4	2.90	149	19	14	2.50	3.1	90	31	33	4.8	0	574	13	0.2	0.9	786	514	514	196
Oct. 11-20 ---------	891	58	5	3.00	125	16	9.1	2.50	2.8	76	26	32	5.1	0	474	13	.2	1.0	659	415	415	154
Oct. 21-31 ---------	1,759	57	4	3.30	74.2	12	9.2	.23	1.8	46	17	14	2.9	0	274	8.5	.1	1.5	398	267	267	92
Nov. 1-10----------	949	55	4	3.15	87.6	13	7.2	.26	1.8	52	18	19	4.6	0	308	4.5	.3	1.4	456	288	288	108
Nov. 11-20---------	804	46	3	3.05	108	15	7.9	.43	2.6	63	22	25	4.8	0	383	12	.3	1.4	555	347	347	132
Nov. 21-30---------	894	42	2	3.10	98.7	13	7.4	.42	2.4	58	20	24	4.6	0	350	11	.3	1.4	508	318	318	116
Dec. 1-10----------	741	38	4	3.15	91.5	13	6.6	.23	1.8	57	20	23	4.1	0	340	8	.3	1.4	490	305	305	106
Dec. 11-20---------	1,960	38	3	3.50	54.9	11	5.1	.07	2.0	40	14	14	3.3	0	222	6.8	.2	2.8	322	206	206	62
Dec. 21-31---------	2,589	36	3	3.45	54.1	10	4.2	.07	1.8	38	13	13	2.8	0	202	3.6	.2	3.1	298	193	193	58
Jan. 1-10, 1947-----	4,491	36	4	3.65	35.1	8.1	2.9	.03	1.2	23	7.8	6.6	1.7	0	119	2	.2	3.7	183	119	119	42
Jan. 11-20 ---------	4,046	40	4	3.70	37.4	7.8	3.6	.03	1.0	27	9.9	6.5	2.2	0	132	6	--	3.8	203	140	140	44
Jan. 21-31 ---------	5,055	39	5	3.60	38.4	8.4	3.7	.05	1.0	25	8.7	7.1	1.6	0	138	4.4	.2	3.9	202	133	133	44
Feb. 1-10----------	2,863	--	1	3.50	50.0	8.4	3.8	.10	1.0	33	12	11	3.0	0	175	3.2	.2	4.6	268	171	171	54
Feb. 11-20---------	1,902	--	2	3.40	63.4	10	5.3	.78	1.2	43	16	17	3.5	0	237	6.6	.3	3.1	359	228	228	72
Feb. 21-28---------	1,344	32	6	5.20	44.1	7.4	1.0	.67	.80	38	12	24	3.8	9	174	9.2	.2	5.2	295	144	137	--
Mar. 1-10----------	1,541	33	2	3.35	69.3	11	5.4	.16	1.3	48	18	19	3.7	0	259	7.4	.2	3.5	394	251	251	77
Mar. 11-20---------	5,186	37	2	3.50	42.5	8.7	3.3	.06	1.0	28	10	7.7	2.4	0	142	5.0	.2	3.4	219	148	148	46
Mar. 21-31---------	5,485	38	2	3.55	38.1	8.2	3.3	.05	.60	26	9.4	6.1	2.0	0	129	4.4	.2	3.4	201	138	138	44

ALLEGHENY RIVER TRIBUTARIES--Continued

KISKIMINETAS RIVER AT LEECHBURG, PA.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
Apr. 1-10, 1947-----	4,550	48	2	3.60	43.9	8.7	3.7	0.08	0.85	26	9.7	7.3	2.2	0	151	4.0	0.1	2.9	223	139	139	53
Apr. 11-20---------	1,948	55	2	3.45	69.8	12	6.2	.21	1.7	44	15	13	3.4	0	250	6.4	.2	2.1	369	228	228	86
Apr. 21-30---------	4,221	55	2	3.60	53.3	9.4	4.6	.12	1.5	33	12	10	2.6	0	192	5.0	.1	2.3	283	173	173	64
May 1-10-----------	4,359	54	2	3.65	42.3	8.8	3.5	.07	1.0	27	9.4	7.2	2.2	0	148	4.1	.2	2.2	223	139	139	50
May 11-20----------	5,639	60	2	3.75	39.5	8.5	3.2	.05	.80	26	9.3	6.7	2.2	0	139	3.8	.2	2.2	213	132	132	46
May 21-31----------	4,641	65	2	3.60	48.0	9.7	4.2	.11	1.0	29	10	7.4	2.0	0	165	4.5	.1	2.1	253	151	151	56
June 1-10 ----------	6,807	68	1	3.50	60.6	11	5.8	.22	1.8	36	13	11	3.7	0	214	4.8	.2	3.2	320	196	196	76
June 11-20 ---------	3,792	68	0	3.50	58.2	11	5.8	.21	2.1	35	13	11	3.0	0	206	3.8	.2	2.8	314	194	194	76
June 21-30 ---------	1,137	75	2	3.20	120.0	17	13	1.10	4.0	68	23	20	4.7	0	448	8.5	.3	1.9	637	382	382	178
July 1-10----------	932	75	3	3.20	133	18	16	1.80	4.8	79	28	25	5.2	0	512	11	.3	1.8	729	451	451	198
July 11-20----------	1,738	78	1	3.30	97.4	14	11	1.20	3.3	57	21	17	4.2	0	356	12	.3	2.5	509	326	326	134
July 21-31----------	1,668	73	0	3.20	76.0	12	6.6	.29	2.6	44	17	14	4.5	0	269	5.8	.1	3.9	377	258	258	90
Aug. 1-10----------	1,339	79	0	3.20	82.9	13	7.0	.22	3.8	50	19	17	5.1	0	303	5.5	.1	2.6	424	285	285	102
Aug. 11-20---------	795	81	1	3.10	123	18	11	1.40	6.5	77	28	25	7.9	0	476	9.2	.1	3.0	669	429	429	160
Aug. 21-31---------	1,906	79	0	3.30	74.0	13	7.0	.34	3.8	46	18	13	5.4	0	272	5.8	.2	3.9	393	263	263	92
Sept. 1-10----------	951	77	0	3.15	97.7	15	9.2	1.20	4.0	58	22	19	6.0	0	361	6.0	.1	3.3	512	337	337	126
Sept. 11-20---------	750	77	0	3.25	113	16	11	1.30	3.4	70	25	23	6.6	0	432	18	.3	1.5	607	380	380	156
Sept. 21-30---------	503	63	0	3.20	129	17	11	1.70	4.3	84	29	30	7.1	0	507	18	.4	1.4	712	438	438	178
Average ----------	2,545	56	2	--	75.6	12	6.7	0.56	2.2	47	17	16	3.9	0	279	7.4	0.2	2.6	405	251	251	--

Temperature (° F.) of water, water year October 1946 to September 1947

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

MONONGAHELA RIVER BASIN

TYGART RIVER AT ELKINS, W. VA.

LOCATION.--At city water plant at Elkins, Randolph County, 2½ miles upstream from gaging station.
DRAINAGE AREA.-- 268 square miles above water plant (272 square miles above gaging station).
RECORDS AVAILABLE.--Water temperatures: January to September 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1083. 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.

Temperature (° F.) of water, water year October 1946 to September 1947

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

MONONGAHELA RIVER AT CHARLEROI, PA.

LOCATION.--At Mercantile Bridge Co. toll bridge, approximately one mile downstream from lock 4, Washington County.
DRAINAGE AREA.--5,213 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1947.
Water temperatures: October 1944 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 682 parts per million Oct. 11-20; minimum, 101 parts per million Apr. 1-10.
Total hardness: Maximum, 356 parts per million Oct. 11-20; minimum, 52 parts per million Apr. 1-10.
Water temperatures: Maximum, 81° F. Aug. 19-20; minimum, freezing point on several days in February and March.
EXTREMES, 1944-47.--Dissolved solids: Maximum, 749 parts per million Sept. 11-20, 1946; minimum, 99 parts per million Feb. 11-20, 1946.
Total hardness: Maximum, 399 parts per million Sept. 11-20, 1946; minimum, 52 parts per million Apr. 1-10, 1947.
Water temperatures: Maximum, 81° F. Aug. 19-20, 1947; minimum, freezing point on many days in December, January, and February each year.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1083. Records of specific conductance and pH of daily samples available in district office at Washington, D. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																			Total	Noncarbonate	
Oct. 1-10, 1946	553	64	6	3.25	109	10	8.3	0.29	2.0	64	23	67	0	433	20	0.6	0.6	644	336	336	104
Oct. 11-20	700	61	5	3.25	112	12	9.3	.33	2.4	66	25	68	0	460	16	.6	.6	682	356	356	110
Oct. 21-31	1,656	59	6	3.25	110	12	9.4	.23	2.5	67	24	66	0	456	16	.4	.6	674	355	355	104
Nov. 1-10	1,270	58	5	3.20	101	10	8.4	.33	1.7	57	20	55	0	394	14	.4	.6	568	311	311	110
Nov. 11-20	1,188	50	5	3.40	82.4	8.8	5.6	.19	1.6	49	17	51	0	329	10	.4	.7	484	248	248	70
Nov. 21-30	1,818	46	2	3.60	81.0	8.2	4.8	.08	1.1	53	16	59	0	328	18	--	1.0	494	239	239	56
Dec. 1-10	1,798	44	2	3.55	78.7	7.6	4.8	.11	1.3	53	17	44	0	300	20	--	1.7	466	246	246	62
Dec. 11-20	4,710	44	2	3.70	48.6	5.2	2.3	.06	.75	35	10	21	0	172	12	--	4.2	273	153	153	33
Dec. 21-31	8,386	42	3	4.10	31.5	5.2	1.0	.03	.45	22	6.8	17	0	103	14	--	3.3	179	93	93	18
Jan. 1-10, 1947	13,800	40	3	4.7	19.0	4.8	.4	.03	.13	16	4.4	9.1	3	64	6.0	--	3.5	113	61	58	11
Jan. 13-15, 18	12,310	40	2	4.40	51.4	5.5	1.0	.05	.23	19	6.1	62	0	79	92	--	3.1	272	80	80	11
Jan. 11-12, 16-17, 19-20	17,020	42	2	4.40	23.3	5.8	.8	.04	.22	20	5.4	7.6	0	72	12	--	3.4	133	78	78	11
Jan. 21-31	18,930	40	1	4.30	19.8	4.8	1.0	.03	.20	15	4.6	6.4	0	63	7.2	--	3.2	110	64	64	14
Feb. 1	17,200	--	--	4.6	53.7	--	--	--	--	--	--	--	--	99	--	--	--	--	--	--	20
Feb. 2-10	7,839	37	2	4.10	29.1	5.8	2.3	.03	.21	20	5.9	13	0	88	19	--	2.9	165	92	92	17
Feb. 11-20	4,951	33	3	3.75	36.1	6.2	4.4	.35	.35	24	7.8	5.1	0	128	2.6	--	3.0	201	128	128	32
Feb. 21-28	3,315	32	1	3.60	48.3	7.4	5.9	.05	.47	33	10	9.8	0	176	3.6	--	3.0	272	170	170	40
Mar. 1-10	5,442	32	2	3.70	42.5	6.4	5.5	.07	.40	28	8.9	8.3	0	150	5.5	--	3.0	234	148	148	36
Mar. 11-15	16,160	.34	1	4.10	32.1	6.4	1.5	.03	.50	24	7.4	11	0	116	3.5	--	3.5	190	104	104	17
Mar. 16-20	18,740	35	1	4.8	16.5	2.8	.2	.02	.24	15	4.1	6.9	3	59	3.2	--	3.3	102	56	53	4
Mar. 21-31	16,280	39	3	4.45	19.2	4.2	.5	.01	.25	14	4.0	10	0	63	6.8	--	3.2	114	56	56	7

MONONGAHELA RIVER BASIN--Continued

MONONGAHELA RIVER AT CHARLEROI, PA.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																			Total	Non-carbonate	
Apr. 1-10, 1947	14,020	46	2	4.30	18.3	3.8	0.7	0.02	0.20	12	3.7	8.7	0	60	4.0	--	3.0	101	52	52	12
Apr. 11-20	4,763	57	2	4.25	25.5	5.0	1.5	.03	.29	18	5.7	11	0	92	3.8	--	3.1	151	79	79	15
Apr. 21-30	3,321	56	1	4.15	33.8	4.8	1.8	.03	.45	24	7.9	15	0	123	5.8	--	3.2	203	106	106	19
May 1-10	7,869	56	3	4.20	33.0	5.2	2.1	.03	.15	24	7.2	12	0	118	3.9	--	2.2	188	105	105	26
May 11-20	7,349	58	2	4.6	29.7	5.0	1.2	.03	.16	26	7.2	12	1	114	4.1	--	2.1	184	102	101	17
May 21-31	10,080	65	2	5.2	24.5	4.8	--	.02	.11	24	6.6	9.6	4	93	4.5	--	1.8	154	87	84	--
June 1-10	10,230	66	2	5.9	26.9	5.8	--	.07	.13	25	7.0	14	7	103	4.8	--	2.1	171	91	85	--
June 11-20	8,940	69	1	5.5	21.5	4.8	--	.02	.12	20	5.6	10	6	82	3.2	--	1.2	132	73	68	--
June 21-30	1,675	72	3	6.0	32.0	5.0	--	.02	.50	26	8.3	22	6	127	5.8	--	2.4	208	99	94	6
July 1-10	2,708	74	3	4.15	43.0	5.8	2.6	.04	.50	32	10	27	0	179	7.0	--	1.2	278	139	139	28
July 11-20	6,489	75	3	3.90	45.2	6.6	3.9	.09	.75	32	11	19	0	179	6.0	--	1.3	272	154	154	41
July 21-31	3,815	75	3	4.9	35.2	5.6	1.1	.03	.55	32	9.1	19	4	147	6.2	--	1.5	232	124	121	14
Aug. 1-10	4,222	75	2	3.95	45.0	6.2	3.1	.07	.55	33	11	22	0	180	7.0	--	1.0	275	151	151	38
Aug. 11-20	2,908	79	1	3.80	51.4	6.8	2.9	.05	1.1	38	12	22	0	197	8.1	--	2.5	316	171	171	40
Aug. 21-31	4,220	79	1	3.70	43.3	6.4	3.0	.14	.75	27	8.7	17	0	153	5.8	--	1.1	236	132	132	46
Sept. 1-10	2,699	78	0	3.80	49.5	6.6	2.9	.38	.91	32	10	25	0	183	7.2	--	.9	284	148	148	46
Sept. 11-20	3,478	76	0	3.70	49.9	6.6	3.2	.30	.80	29	9.7	23	0	175	6.8	--	.8	263	142	142	50
Sept. 21-30	2,348	73	2	3.80	49.5	6.0	2.6	.16	.81	32	10	24	0	179	7.9	--	1.0	281	145	145	42
Average	6,383	55	2	--	46.0	6.3	--	0.10	0.68	31	10	--	--	172	11	--	2.1	271	--	--	--

Temperature (° F.) of water, water year October 1946 to September 1947

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

MONONGAHELA RIVER BASIN--Continued

SHAVERS FORK AT PARSONS, W. VA.

LOCATION.--At Armour Leather Co. plant at Parsons, Tucker County.
DRAINAGE AREA--214 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Water temperatures: Maximum, 80° F. July 1; minimum, freezing point on many days in January, February, and March.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1083.

Temperature (° F.) of water, water year October 1946 to September 1947

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

MAHONING RIVER AT WARREN, OHIO

LOCATION.--Raw water intake at Ohio Public Service Company power station, west bank of river.
DRAINAGE AREA.--599 square miles.
RECORDS AVAILABLE.--Chemical analyses: July 1946 to September 1947.
Water temperatures: July 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 281 parts per million Dec. 21-31; minimum, 122 parts per million Apr. 1-10.
Total hardness: Maximum, 186 parts per million Dec. 21-31; minimum, 77 parts per million Apr. 1-10.
Water temperatures: Maximum, 81° F. Aug. 14; minimum, 33° F. Feb. 27.
EXTREMES, July 1946-October 1947.--Dissolved solids: Maximum, 281 parts per million Dec. 21-31; minimum, 122 parts per million Apr. 1-10.
Total hardness: Maximum, 186 parts per million Dec. 21-31; minimum, 77 parts per million Apr. 1-10.
Water temperatures: Maximum, 82° F. July 20, 1946; minimum, 33° F. Feb. 27.
REMARKS --Records of water discharge are based on records for gaging station at Mahoning River at Leavittsburg, Ohio.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance (K×10 ^{6} at 25° C.)	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																			Total	Non-carbonate
Oct. 1-10, 1946 -----	238	63	10	7.2	32.1	2.0	0.01	0.00	38	10	8.5	3.1	85	73	7.8	0.3	1.4	198	136	66
Oct. 11-20 ---------	245	61	12	7.4	36.6	3.4	.01	.00	43	12	9.8	3.7	100	83	8.6	.3	1.2	230	157	75
Oct. 21-31 ---------	209	60	10	7.3	36.9	3.7	.01	.00	44	12	9.8	3.7	96	86	9.5	.3	1.4	233	159	80
Nov. 1-10 ----------	199	61	10	7.4	37.3	3.8	.01	.00	46	12	11	3.4	102	85	9.8	.2	1.2	230	164	80
Nov. 11-20 ---------	211	50	10	7.5	39.5	3.6	.01	.00	48	13	13	2.9	109	89	10	.3	1.4	245	173	84
Nov. 21-30 ---------	265	46	9	7.3	40.3	2.8	.02	.00	48	14	13	3.5	103	96	11	.3	3.8	254	177	93
Dec. 1-10 ----------	194	43	4	7.3	42.3	3.5	.02	.00	49	14	12	3.6	98	102	12	.3	6.7	263	180	100
Dec. 11-20 ---------	469	40	10	7.2	36.9	7.1	.05	.00	42	12	9.7	3.7	69	95	10	.2	7.6	234	154	98
Dec. 21-31 ---------	241	39	6	7.2	44.5	6.5	.03	.00	50	15	13	3.4	92	104	14	.3	12	281	186	111
Jan. 1-10, 1947 -----	533	36	8	7.2	31.7	6.7	.04	.00	36	10	8.2	3.1	56	83	9.0	.2	7.4	200	131	85
Jan. 11-20 ---------	810	37	8	7.1	32.0	6.6	.05	.00	36	11	7.2	2.6	54	84	9.0	.2	8.2	202	135	91
Jan. 21-31 ---------	1,596	37	8	7.0	26.9	7.8	.07	.00	32	9.4	6.1	3.0	42	75	7.1	.2	9.4	184	118	64
Feb. 1-10 ----------	1,276	37	5	7.1	34.5	8.8	.07	.00	40	11	8.9	3.0	59	94	9.1	.1	10	231	145	97
Feb. 11-20 ---------	377	36	8	6.8	36.7	5.6	.04	.00	41	12	11	3.4	51	93	10	.2	22	236	152	110
Feb. 21-28 ---------	298	36	8	6.9	35.7	5.6	.02	.00	41	12	10	3.6	56	92	10	.1	19	232	152	106
Mar. 1-10 ----------	300	35	6	6.7	38.9	8.0	.07	.03	41	11	9.3	3.1	44	88	10	.3	45	241	148	112
Mar. 11-20 ---------	460	37	8	7.0	32.1	7.7	.26	.07	35	9.5	8.6	1.5	48	77	8.9	.2	25	202	126	87
Mar. 21-31 ---------	996	38	8	6.8	25.6	7.3	.12	.03	29	7.3	5.8	2.4	32	65	7.4	.2	14	166	102	76

BEAVER RIVER BASIN--Continued

MAHONING RIVER AT WARREN, OHIO--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																			Total	Non-carbonate
Apr. 1-10, 1947	1,687	48	20	6.8	18.5	6.2	0.22	0.00	22	5.4	3.8	2.6	26	48	4.9	0.4	10	122	77	56
Apr. 11-20	496	53	15	6.9	27.5	5.5	.07	.00	31	8.8	6.5	2.6	50	67	7.4	.2	13	178	114	73
Apr. 21-30	1,356	51	27	6.7	21.0	5.5	.13	.00	24	6.2	4.7	2.2	38	55	4.6	.2	8.4	139	85	54
May 1-10	660	56	12	7.1	25.6	5.0	.04	.00	29	7.9	6.1	2.3	48	61	5.5	.1	9.0	165	105	60
May 11-20	569	60	16	7.1	28.0	4.7	.05	.00	32	9.0	6.7	2.4	51	66	5.8	.1	14	180	117	75
May 21-31	2,434	64	18	7.0	20.7	5.1	.07	.00	24	6.8	4.5	2.1	44	53	4.4	.5	6.1	137	88	52
June 1-10	3,401	67	27	7.1	20.9	5.7	.13	.00	25	6.5	4.2	2.2	43	54	4.4	.5	5.3	137	89	54
June 11-20	1,386	70	17	7.1	25.5	5.9	.07	.00	30	8.0	3.2	2.3	54	61	5.4	.5	12	166	108	64
June 21-30	475	73	12	7.2	28.1	6.9	.04	.00	34	9.1	5.7	2.4	55	68	5.6	.4	24	165	122	77
July 1-10	442	74	7	7.3	28.6	4.4	.04	.00	33	8.8	6.5	2.2	56	67	6.4	.5	18	184	119	73
July 11-20	397	75	10	7.2	30.9	4.5	.04	.00	36	9.6	7.3	2.2	56	68	7.4	.3	28	202	129	83
July 21-31	381	73	18	7.1	29.0	3.6	.05	.00	35	8.9	7.9	2.4	58	69	7.2	.2	15	186	124	76
Aug. 1-10	319	77	7	7.5	28.8	5.1	.02	.00	35	9.1	6.8	2.5	60	67	5.9	.3	13	185	125	81
Aug. 11-20	474	79	10	7.3	27.7	5.4	.03	.00	32	8.9	6.8	2.9	58	66	5.9	.4	14	176	116	69
Aug. 21-31	554	77	7	7.1	26.4	5.1	.04	.00	32	8.1	5.9	2.7	50	60	5.6	.4	23	168	113	72
Sept. 1-10	494	76	8	7.1	26.9	4.1	.02	.00	32	8.8	5.7	2.6	49	58	5.8	.4	24	166	116	76
Sept. 11-20	448	76	3	7.2	26.7	3.1	.02	.00	31	8.4	5.8	2.9	48	60	5.8	.2	21	166	112	73
Sept. 21-30	417	66	7	7.0	28.0	2.4	.01	.00	33	8.7	6.0	3.0	52	62	6.4	.2	22	169	118	76
Average	709	56	11	--	30.8	5.2	0.08	0.00	36	9.8	7.8	2.8	61	74	7.7	0.3	13	196	130	80

Temperature (° F.) of water, water year October 1946 to September 1947

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

BEAVER RIVER AT NEW BRIGHTON, PA.

LOCATION.--At head of intake canal of Beaver Falls Municipal Authority, 3 miles upstream from mouth, and 2.5 miles downstream from gaging station at Beaver Falls, Beaver County.
DRAINAGE AREA.--3,112 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1947.
Water temperatures: October 1945 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 362 parts per million Nov. 21-30; minimum, 136 parts per million Apr. 1-10.
Total hardness: Maximum, 199 parts per million Nov. 11-30; minimum, 86 parts per million Apr. 1-10.
Water temperatures: Maximum, 86° F. Aug. 14, 22; minimum, freezing point Feb. 11.
EXTREMES, 1945-47.--Dissolved solids: Maximum, 362 parts per million Nov. 21-30, 1946; minimum, 136 parts per million Apr. 1-10, 1947.
Total hardness: Maximum, 199 parts per million Nov. 11-30, 1946; minimum, 85 parts per million Mar. 1-10, 1946.
Water temperatures: Maximum, 86° F. July 10-11, 1946, Aug. 14, 22, 1947; minimum, freezing point Feb. 11, 1947.
REMARKS.--Discharge is based on records for Beaver River at Beaver Falls. Intake canal is located on the east bank of river. Samples collected by Beaver Falls Municipal Authority. Records of specific conductance and pH of daily samples available in district office at Washington, D. C.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 1-10, 1946 ---	692	66	5	6.7	51.5	3.2	0.01	0.00	56	10	39	40	171	32	0.5	9.8	341	181	148
Oct. 11-20--------	1,268	66	3	6.7	51.3	3.8	.01	.11	55	11	27	44	144	34	.5	8.7	333	182	146
Oct. 21-31--------	1,250	60	2	6.7	48.5	5.6	.01	.00	52	11	24	47	130	33	.4	6.2	316	175	136
Nov. 1-10 --------	789	60	3	6.4	53.2	6.2	.02	.00	54	11	25	37	156	23	.8	10	342	180	150
Nov. 11-20 -------	925	53	4	6.6	55.8	3.4	.01	.00	60	12	26	42	158	33	.6	11	355	199	165
Nov. 21-30 -------	1,180	47	3	6.6	57.0	5.0	.02	.00	60	12	32	42	162	39	.6	10	362	199	165
Dec. 1-10 --------	871	42	3	6.7	47.1	5.0	.03	.00	48	11	26	54	119	32	.4	8.0	291	165	121
Dec. 11-20 -------	2,843	44	5	6.7	40.1	5.2	.07	.00	42	9.6	19	42	104	26	.4	7.6	246	144	110
Dec. 21-31 -------	2,336	39	4	6.4	42.7	6.0	.04	.03	43	9.6	22	26	121	28	.4	8.5	268	147	125
Jan. 1-10, 1947 ---	5,760	38	7	6.2	28.0	5.6	.05	.00	29	6.9	11	27	73	15	.2	6.1	171	101	79
Jan. 11-20--------	6,179	39	8	6.2	31.0	6.2	.16	.06	34	7.5	12	30	84	17	.3	7.0	182	116	91
Jan. 21-31--------	9,505	41	12	6.3	25.9	5.2	.34	.06	30	6.6	8.5	36	68	11	.3	4.8	161	102	72
Feb. 1-10 --------	6,563	36	9	6.4	29.7	5.2	.08	.00	33	8.1	10	41	79	12	.2	6.3	183	116	82
Feb. 11-20 -------	3,040	38	8	6.8	34.1	5.4	.02	.03	38	8.3	12	34	92	16	.2	9.4	213	129	101
Feb. 21-28 -------	1,871	38	8	6.8	39.0	6.4	.02	.06	41	9.0	15	26	110	20	.4	9.4	243	139	118
Mar. 1-10 --------	1,740	41	7	6.6	43.2	6.2	.02	.05	45	9.8	19	28	120	26	.4	11	270	153	130
Mar. 11-20 -------	4,613	40	10	6.4	29.3	5.4	.06	.07	31	7.3	11	25	78	16	.3	9.0	187	107	87
Mar. 21-31 -------	6,978	42	9	6.5	26.8	5.4	.05	.02	30	6.7	8.8	29	71	13	.2	6.2	168	102	79

Apr. 1-10	11,160	48	12	6.7	21.4	5.2	.07	.07	25	5.8	5.9	34	54	8.1	.3	3.4	136	86	58
Apr. 11-20	5,703	54	14	6.6	26.2	4.6	.07	.00	30	6.6	8.4	34	70	11	.3	4.1	170	102	74
Apr. 21-30	10,080	52	20	6.7	23.6	5.4	.08	.00	28	6.1	6.8	37	61	8.8	.2	3.7	153	95	65
May 1-10	7,777	57	8	6.9	24.9	4.8	.04	.03	29	6.5	6.7	36	64	10	.2	3.7	151	99	70
May 11-20	6,872	60	6	6.8	26.2	5.0	.05	.03	30	6.8	10	42	69	11	.2	3.5	164	103	68
May 21-31	11,810	65	8	6.7	22.6	6.2	.06	.00	28	6.2	5.6	44	55	7.6	.2	3.7	139	95	59
June 1-10	15,970	65	18	6.9	21.0	4.4	.14	.00	27	5.8	6.0	48	51	6.4	.2	2.7	137	91	52
June 11-20	7,715	70	16	6.9	24.0	5.0	.15	.00	29	6.3	7.2	45	59	8.0	.3	4.5	154	98	61
June 21-30	2,740	75	8	6.7	31.1	4.2	.03	.00	36	7.5	11	42	83	12	.5	6.9	192	121	86
July 1-10	1,662	77	8	6.8	38.3	4.0	.01	.00	43	8.9	15	52	100	16	.5	6.9	238	144	101
July 11-20	2,143	76	2	6.9	37.4	3.6	.03	.00	42	8.8	13	50	94	18	.4	6.2	233	141	100
July 21-31	1,554	76	4	6.7	38.8	4.2	.04	.00	43	8.7	15	40	105	19	.4	8.2	248	143	110
Aug. 1-10	1,369	81	4	6.8	39.4	3.2	.04	.00	43	8.2	17	38	106	21	.5	6.2	251	141	110
Aug. 11-20	1,377	85	7	6.5	38.7	4.0	.02	.05	44	8.0	17	32	114	18	.7	9.8	261	143	116
Aug. 21-31	2,702	83	8	6.7	39.8	5.2	.02	.00	45	8.2	17	40	107	22	.4	9.4	266	146	113
Sept. 1-10	2,527	77	10	6.6	32.2	6.6	.04	.00	37	6.9	12	39	83	16	.4	7.2	215	121	89
Sept. 11-20	1,291	78	8	6.7	39.8	4.4	.04	.07	46	8.5	18	33	117	21	.6	9.8	268	150	123
Sept. 21-30	1,201	69	7	6.5	44.0	5.4	.02	.00	48	9.7	19	30	126	24	.6	13	289	160	135
Average	4,309	58	8	--	36.2	5.0	0.05	0.02	40	8.4	14	38	99	19	0.4	7.3	230	134	103

BEAVER RIVER BASIN--Continued

BEAVER RIVER AT NEW BRIGHTON, PA.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

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

TUSCARAWAS RIVER AT NEWCOMERSTOWN, OHIO

989735 O - 52 - 12

LOCATION.--At bridge on U. S. Highway 36, 2 miles upstream from Buckhorn Creek in Tuscarawas County.
DRAINAGE AREA.--2,436 square miles.
RECORDS AVAILABLE.--Chemical analyses: July 1946 to September 1947.
Water temperatures: July 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 2,980 parts per million Oct. 1-10; minimum, 345 parts per million May 21-31.
Total hardness: Maximum, 1,500 parts per million Oct. 1-10; minimum, 191 parts per million June 1-10.
Water temperatures: Maximum, 79° F. Aug. 13-15, 21, 22; minimum, freezing point on many days in December, January, February, and March.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1083. Records of specific conductance of daily samples available in district office at Columbus, Ohio.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																			Total	Non-carbonate
Oct. 1-10, 1946 ----	307	58	7	7.4	523	--	0.20	0.14	558	25	472	6.7	119	216	1,600	1.1	2.3	2,980	1,500	1,400
Oct. 11-20---------	856	55	4	7.2	455	8.0	.16	.25	484	23	397	7.2	85	230	1,320	1.1	2.9	2,630	1,300	1,230
Oct. 21-31---------	1,025	55	5	7.1	210	7.0	.16	.00	209	16	170	5.4	70	152	550	.5	2.7	1,170	587	530
Nov. 1-10----------	515	54	7	7.2	336	8.6	.10	.00	346	21	283	5.8	97	202	925	1.0	2.9	1,950	950	870
Nov. 11-20---------	697	45	5	7.1	347	6.4	.06	.00	377	24	285	5.9	88	199	975	.8	7.2	2,120	1,040	967
Nov. 21-30---------	963	42	5	7.2	334	4.4	.04	.15	354	22	247	3.4	90	178	920	.7	9.0	1,890	974	900
Dec. 1-10----------	792	39	5	7.2	223	4.4	.03	.13	234	18	165	4.3	89	154	560	.6	7.5	1,270	658	586
Dec. 11-13---------	1,470	46	5	7.2	291	5.6	.04	.00	312	22	237		96	177	790	.6	6.6	1,670	869	790
Dec. 14-20---------	2,181	37	7	7.2	120	5.6	.03	.00	131	15	74		76	120	252	.4	6.0	717	389	326
Dec. 21-31---------	1,534	35	7	7.1	209	8.4	.02	.12	216	16	160	4.4	76	140	535	.5	4.3	1,180	605	542
Jan. 1-10, 1947 ----	4,181	34	7	7.2	83.9	7.0	.05	.00	92	11	50	3.4	62	91	164	.3	4.2	537	275	224
Jan. 11-20---------	3,589	37	6	7.0	119	7.6	.04	.00	123	13	82	3.8	64	112	262	.4	4.2	692	360	308
Jan. 21-31---------	6,588	38	5	7.0	68.8	7.2	.04	.00	74	11	39	3.7	54	92	118	.3	5.4	430	230	186
Feb. 1-10----------	5,273	34	3	7.3	67.9	8.0	.10	.00	77	11	40	3.9	60	94	124	.1	7.7	476	237	188
Feb. 11-20---------	1,920	32	2	7.3	135	8.8	.02	.10	145	15	89	3.4	84	122	300	.2	7.2	952	424	355
Feb. 21-28---------	1,489	31	2	7.4	144	9.0	.05	.00	157	15	95	4.2	95	129	322	.2	6.7	1,020	453	376
Mar. 1-10 ---------	1,165	33	2	7.3	247	8.2	.13	.60	270	18	185	6.0	96	156	640	.6	6.0	1,660	748	669
Mar. 11-20 --------	1,726	36	2	7.3	165	8.0	.14	.20	175	15	117	4.6	84	127	392	.4	5.7	1,150	498	430
Mar. 21-31 --------	2,745	37	2	7.3	120	7.6	.07	.00	128	12	78	3.6	82	106	260	.4	8.4	871	369	302

MUSKINGUM RIVER BASIN--Continued

TUSCARAWAS RIVER AT NEWCOMERSTOWN, OHIO--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																			Total	Noncarbonate
Apr. 1-10, 1947---	4,228	48	7	7.2	81.2	4.4	0.02	0.00	96	10	45	5.1	90	90	150	0.3	8.6	545	281	207
Apr. 11-20--------	2,954	51	5	7.1	132	4.0	.02	.00	142	11	91	4.5	74	114	305	.4	5.0	857	400	339
Apr. 21-30--------	6,006	51	3	8.1	64.5	4.0	.02	.00	71	9.5	37	3.4	62	93	108	.3	3.6	430	216	165
May 1-10 ---------	4,054	54	5	7.2	77.5	3.2	.04	.00	85	11	48	3.4	75	100	140	.3	3.3	532	257	196
May 11-20 --------	4,855	58	5	7.2	88.6	2.8	.03	.00	100	10	51	5.4	72	96	175	.3	3.4	625	291	232
May 21-31 --------	9,058	62	6	7.3	56.3	6.0	.12	.00	63	9.4	29	2.6	58	77	87	.2	2.7	345	196	148
June 1-10 ---------	7,715	64	9	7.3	55.8	6.0	.12	.00	61	9.4	28	2.5	53	79	91	.2	2.4	363	191	149
June 11-20 --------	9,176	68	9	7.4	60.3	5.0	.08	.00	65	9.3	31	2.7	58	71	105	.2	2.2	395	200	158
June 21-30 --------	6,164	69	4	7.3	71.5	6.4	.04	.00	80	13	37	3.5	70	98	118	.2	2.4	472	253	196
July 1-10 ---------	2,103	70	1	7.5	142	6.2	.03	.00	162	16	84	4.5	113	117	320	.3	8.2	869	470	377
July 11-20 --------	1,699	70	3	7.5	186	6.6	.04	.00	210	17	126	4.2	111	133	450	.4	2.8	1,080	594	503
July 21-31 --------	1,407	70	2	7.4	143	6.4	.06	.00	162	16	94	4.0	106	130	325	.4	3.1	864	470	383
Aug. 1-10---------	831	75	2	7.5	265	2.8	.04	.00	294	20	200	6.6	126	162	695	.7	--	1,570	816	713
Aug. 11-20--------	1,727	77	2	7.2	224	8.0	.05	.00	234	17	175	4.3	110	140	570	.6	4.8	1,270	654	564
Aug. 21-31--------	1,229	77	3	7.3	221	11	.06	.00	238	19	161	4.9	96	158	560	.5	5.6	1,240	672	593
Sept. 1-10 --------	1,153	74	3	7.3	210	8.4	.06	.00	213	19	166	4.8	90	163	520	.6	5.6	1,200	610	536
Sept. 11-20 -------	704	72	5	7.6	305	9.2	.05	.00	308	22	268	4.2	119	180	830	.7	5.5	1,750	859	761
Sept. 21-30 -------	723	64	3	7.5	376	7.4	.06	.32	398	24	324	4.5	107	181	1,080	.7	6.1	2,170	1,090	1,000
Average ---------	2,882	53	4	--	188	6.6	0.07	0.05	201	16	141	4.4	85	135	477	0.5	5.1	1,130	567	498

Temperature (° F.) of water, water year October 1946 to September 1947

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

LITTLE KANAWHA RIVER BASIN

LITTLE KANAWHA RIVER AT GLENVILLE, W. VA.

LOCATION.--At water plant at Glenville, Gilmer County, half a mile upstream from bridge on State Highway 5, and half a mile upstream from gaging station.
DRAINAGE AREA.--Approximately 386 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1946 to 1947.
EXTREMES, 1946-47.--Water temperatures: Maximum, 86° F. Aug. 22; minimum, freezing point on many days in December, January, February, and March.
REMARKS.--Record of water temperatures furnished by West Virginia Water Service Co. Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1083.

Temperature (° F.) of water, water year October 1946 to September 1947

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

NEW RIVER AT HINTON, W. VA.

LOCATION.--At water plant at Hinton, Summers County, 500 feet upstream from bridge on State Highway 3, and 500 feet upstream from gaging station.
DRAINAGE AREA.--6,257 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Water temperatures: Maximum, 82° F. Aug. 11, 12, 14, 15, 21, 22; minimum, 33° F. Feb. 27.
REMARKS.--Records of water temperatures furnished by West Virginia Water Service Co. Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1083.

Temperature (° F.) of water, water year October 1946 to September 1947.

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

KANAWHA RIVER BASIN--Continued

GREENBRIER RIVER AT ALDERSON, W. VA.

LOCATION.--At city water plant at Alderson, Monroe County, 900 feet upstream from bridge on State Highway 3, and 500 feet upstream from gaging station.
DRAINAGE AREA.--1,357 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1947.
EXTREMES,1946-47.--Water temperatures: Maximum, 80° F. Sept. 16; minimum, 33° F. Dec. 2-5.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1083.

Temperature (° F.) of water, water year October 1946 to September 1947

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

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.--Approximately 108 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Water temperatures: Maximum, 76° F. Aug. 15, 17; minimum freezing point on many days in December, January, February and March.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1083.

Temperature (° F.) of water, water year October 1946 to September 1947

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

BIG SANDY RIVER BASIN

TUG FORK AT KERMIT, W. VA.

LOCATION.-- At city water plant at Kermit, Mingo County, three-quarters of a mile downstream from Wolf Creek, and 3 miles downstream from gaging station.
DRAINAGE AREA.--1,274 square miles above water plant (1,185 square miles above gaging station).
RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Water temperatures: Maximum, 86° F. Aug. 1; minimum, freezing point Feb. 12.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1083.

Temperature (° F.) of water, water year October 1946 to September 1947

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

OLENTANGY RIVER NEAR DELAWARE, OHIO

LOCATION.--At Stone Mill Bridge, 4 miles downstream from gaging station and 1¾ miles north of Delaware, Delaware County.
DRAINAGE AREA.--387 square miles above gaging station.
RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Maximum, 85° F. Aug. 5, 7; minimum, freezing point on many days during winter months.
REMARKS.--Records of discharge for water year October 1946 to September 1947 published in Water-Supply Paper 1083.

Temperature (° F.) of water, water year October 1946 to September 1947

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

MIAMI RIVER BASIN

MIAMI RIVER ABOVE STILLWATER RIVER AT DAYTON, OHIO

LOCATION.--At bridge on U. S. Highway 25, 1 mile above Stillwater River.
DRAINAGE AREA.--1,182 square miles.
RECORDS AVAILABLE.--Chemical analyses: July 1946, October 1946 to September 1947.
Water temperatures: July 1946, October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 417 parts per million Dec. 1-10; minimum, 301 parts per million May 21-31.
Total hardness: Maximum, 354 parts per million Dec. 1-10; minimum, 250 parts per million Mar. 11-20.
Water temperatures: Maximum, 85° F. Aug. 14, 23; minimum, freezing point on many days in December, January, and February.
REMARKS.--Records of water discharge are based on record for gaging station at Miami River at Taylorsville.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Non-carbonate
Oct. 1-10, 1946	66.5	62	11	7.7	65.6	6.0	0.02	74	36	17	4.7	329	61	17	0.6	6.2	390	333	63
Oct. 11-20	98.2	60	16	7.7	65.2	4.2	.02	73	35	17	5.2	327	61	17	.5	6.0	383	326	58
Oct. 21-31	117	59	20	7.7	63.9	6.5	.02	74	33	16	4.5	311	64	16	.6	4.9	383	320	60
Nov. 1-10	105	57	12	7.8	66.8	7.4	.02	77	34	17	4.0	330	65	18	.5	5.8	403	332	61
Nov. 11-20	137	46	15	7.8	66.4	7.8	.04	80	34	15	3.7	330	70	14	.5	6.4	405	339	69
Nov. 21-30	156	42	16	7.8	66.9	4.2	.02	80	35	14	3.5	322	77	15	.4	4.4	410	344	80
Dec. 1-10	138	42	7	8.0	68.5	2.0	.03	84	35	14	3.8	318	87	15	.4	7.6	417	354	93
Dec. 11-20	713	--	17	8.0	64.2	8.4	.02	85	30	8.3	3.2	264	97	11	.4	17	409	335	119
Dec. 21-31	619	--	7	7.7	63.5	5.6	.02	82	31	9.8	3.0	286	86	11	.4	8.6	394	332	98
Jan. 1-10, 1947	1,183	35	8	7.7	65.0	6.2	.02	83	30	9.2	3.4	294	87	9.5	.4	12	402	330	90
Jan. 11-20	1,349	32	15	7.8	54.2	6.0	.04	71	25	6.0	3.0	236	72	7.2	.3	12	335	280	87
Jan. 21-31	3,519	--	15	7.8	50.0	7.8	.09	67	23	4.2	3.3	210	68	6.6	.3	19	321	262	90
Feb. 1-10	1,874	33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 11-20	547	--	7	7.5	60.8	6.6	.01	83	30	8.4	2.9	285	77	9.2	.3	11	379	330	96
Feb. 21-28	391	32	8	7.7	62.2	5.6	.02	82	31	9.4	2.7	290	78	10	.3	10	387	332	94
Mar. 1-10	350	38	7	7.7	61.0	6.4	.12	81	28	9.3	2.6	288	77	10	.5	22	380	317	81
Mar. 11-20	755	43	8	7.7	50.2	6.0	.04	64	22	6.8	3.3	218	64	8.1	.4	29	312	250	72
Mar. 21-31	1,791	44	8	7.7	50.7	6.8	.10	67	22	5.7	3.0	221	65	7.2	.3	32	316	258	76
Apr. 1-10	2,209	54	7	7.8	46.2	7.1	.09	70	23	4.8	1.7	236	68	8.0	.4	27	333	269	76
Apr. 11-20	1,838	58	18	7.5	48.9	7.2	.05	66	22	5.1	1.9	219	60	6.5	.2	13	307	255	76
Apr. 21-30	4,079	58	17	7.6	48.2	6.1	.04	66	22	4.3	2.3	221	59	5.4	.2	12	302	255	74
May 1-10	3,546	58	15	7.8	55.9	5.8	.05	74	25	8.1	3.0	257	60	9.5	.2	15	337	287	77
May 11-20	1,987	65	17	7.9	51.2	6.2	.09	67	24	6.1	2.7	245	54	6.8	.2	8.5	308	266	65
May 21-31	3,461	64	20	7.6	47.5	7.5	.06	65	22	4.6	2.0	234	50	5.5	.4	13	301	253	61

June 1-10	7,776	69	17	7.8	52.5	7.6	.04	72	26	6.0	2.3	272	54	7.6	.5	9.6	332	287	64
June 11-20	1,814	70	18	7.8	54.6	6.8	.02	72	25	5.4	3.4	272	55	7.1	.5	10	331	282	60
June 21-30	995	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 1-10	880	75	10	7.9	57.9	7.2	.05	80	29	6.6	2.6	312	56	7.4	.4	12	360	319	63
July 11-20	1,291	74	7	8.0	60.2	5.9	.03	80	31	7.4	2.7	316	58	9.0	.4	8.5	368	327	68
July 21-31	453	75	7	8.0	62.3	4.9	.03	83	33	8.4	2.5	326	61	10	.4	6.8	380	343	76
Aug. 1-10	276	81	6	8.0	60.9	6.1	.02	78	32	8.6	2.6	316	61	10	.4	6.7	372	326	67
Aug. 11-20	1,039	83	17	7.8	51.9	8.5	.06	69	27	7.2	3.0	273	50	8.1	.4	4.5	311	283	59
Aug. 21-31	606	81	17	7.6	50.2	8.6	.02	69	24	6.3	4.6	248	53	7.4	.3	6.2	303	271	68
Sept. 1-10	648	80	8	7.7	54.5	7.0	.02	71	27	7.3	3.0	270	59	8.1	.3	6.0	328	288	67
Sept. 11-20	365	78	8	7.7	55.6	6.3	.01	71	28	7.6	3.2	273	60	9.4	.3	6.3	335	292	69
Sept. 21-30	411	63	7	7.7	55.9	6.5	.02	72	27	7.0	3.2	275	60	9.0	.3	5.9	334	291	65
Average	1,322	56	12	--	57.6	6.4	0.04	74	28	8.8	3.1	277	66	9.9	0.4	11	355	300	73

MIAMI RIVER BASIN--Continued

MIAMI RIVER ABOVE STILLWATER RIVER AT DAYTON, OHIO--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

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

MIAMI RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN MIAMI RIVER BASIN IN OHIO

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																Total	Non-carbonate
MIAMI RIVER NEAR RUSSELLS POINT																	
June 26, 1947 -------	116	8	7.5	3.2	0.06	60	20	4.1	1.9	195	63	3.6	0.3	3.4	269	232	72
MIAMI RIVER AT QUINCY																	
June 26, 1947 -------	278	14	7.7	5.4	0.07	78	27	3.0		272	73	6.1	0.3	4.8	356	306	83
MIAMI RIVER AT SIDNEY																	
June 26, 1947 -------	366	12	8.0	5.4	0.07	80	28	3.0		283	72	6.0	0.6	5.2	362	315	83
MIAMI RIVER NEAR TROY																	
June 26, 1947 -------	446	11	7.8	5.0	0.05	80	28	6.5		290	69	8.4	0.5	7.6	368	315	77
WOLF CREEK NEAR RUSSELLS POINT																	
June 26, 1947 -------	22	9	7.9	4.4	0.06	93	30	5.2	1.4	293	101	4.2	0.3	6.2	409	355	115
BOKENGEHALAS CREEK AT DEGRAFF																	
June 26, 1947 -------	39	17	7.9	4.8	0.06	95	36	18	2.4	343	95	18	0.3	8.0	473	385	104
TAWAWA CREEK AT SIDNEY																	
June 26, 1947 -------	22	8	7.9	4.2	0.04	71	28	4.4	1.4	290	47	4.2	0.2	3.8	316	292	54
LORAMIE CREEK BELOW LAKE LORAMIE NEAR FORT LORAMIE																	
June 26, 1947 -------	5.9	35	7.3	6.4	0.19	40	12	4.2	1.8	140	32	3.2	0.3	2.4	192	149	34
LORAMIE CREEK AT LOCKINGTON DAM																	
June 26, 1947 -------	44	7	7.9	8.6	0.04	79	31	7.6	1.6	302	72	4.8	0.3	4.3	376	325	77
HONEY CREEK NEAR TIPP CITY																	
June 26, 1947 -------	72	6	8.0	5.4	0.06	79	33	4.1	1.6	330	45	5.1	0.3	8.4	359	333	62

TENNESSEE RIVER BASIN

CATHEYS CREEK NEAR BREVARD, N. C.

LOCATION.--At bridge on U. S. Highway 64, 0.9 mile downstream from gaging station, 1.1 miles downstream from Kuykendall Creek, 1.2 miles upstream from mouth, and 3½ miles southwest of Brevard, Transylvania County.
DRAINAGE AREA.--12.1 square miles (11.7 square miles above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1946 to February 1947, April to September 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1083.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet) 1/	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
Oct. 3, 1946	14	7	6.6	7.3	0.01	0.9	0.5	1.9		7	1.3	0.5	0.2	0.0	17	4
Nov. 1	16	14	6.8	6.0	.01	.9	.4	1.8		6	1.7	.6	.1	.0	17	4
Dec. 3	17	6	6.3	7.0	.02	1.2	.4	1.3		6	1.5	.6	.0	.1	17	5
Jan. 3, 1947	43	16	6.2	5.5	.05	1.0	.5	1.1	0.8	7	1.3	.6	.1	.1	15	5
Feb. 6	37	2	6.9	5.3	.02	1.3	.5	2.1		7	1.7	1.2	.2	.1	16	5
Apr. 4	31	5	6.5	6.4	.02	1.0	.3	1.0	.5	6	.8	.5	.0	.1	15	4
May 2	36	7	7.3	6.4	.02	.9	.3	2.6		8	.9	.9	.1	.1	16	4
June 6	22	12	6.2	7.6	.04	1.4	.2	1.8		7	1.1	.8	.0	.1	16	4
July 11	18	6	6.3	7.7	.04	.6	.4	1.2	.5	6	.9	.8	.0	.2	16	3
Aug. 4	13	8	5.9	8.0	.03	.8	.4	1.5		6	1.2	.5	.0	.1	17	4
Sept. 8	14	13	6.2	8.2	.01	.8	.5	2.0		8	.9	.6	.0	.1	20	4

1/ Mean discharge for 1946-47 water year was 28.1 second-feet.

MILLS RIVER AT MILLS RIVER, N. C.

LOCATION.--At bridge on State Highways 191 and 280 at Mills River, Henderson County, 2.2 miles downstream from gaging station, and 3.6 miles downstream from confluence of North and South Forks.
DRAINAGE AREA.--70.9 square miles at gaging station (66.7 square miles at gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1946 to February 1947, April to September 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1083.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet) 1/	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
Oct. 3, 1946	53	12	6.7	7.0	0.01	1.0	0.6	2.5		9	1.3	0.8	0.2	0.0	18	5
Nov. 1	91	13	6.2	6.8	.02	1.5	.6	1.7		7	1.7	1.1	.3	.2	18	6
Dec. 5	87	12	6.4	6.9	.04	1.1	.6	1.7		7	1.6	.8	.1	.1	16	5
Jan. 7, 1947	142	12	6.5	5.9	.05	1.0	.5	1.3	0.6	7	1.4	.9	.0	.1	15	5
Feb. 13	145	4	6.6	5.1	.02	1.2	.5	1.8		7	1.4	.8	.1	.1	15	5
Apr. 7	132	7	6.3	5.8	.03	.9	.4	1.1	.5	6	.9	.5	.1	.1	15	4
May 9	124	15	7.1	5.2	.03	1.1	.4	2.4		8	1.0	1.2	.1	.1	18	4
June 6	82	4	6.4	6.5	.06	1.1	.4	2.3		9	.8	.8	.0	.2	16	4
July 11	60	11	6.3	5.4	.06	1.0	.5	1.4	.6	8	.9	.8	.0	.2	16	5
Aug. 7	60	12	6.3	7.3	.01	.9	.5	2.3		8	1.1	.8	.1	.2	19	4
Sept. 12	52	15	6.6	7.3	.02	1.1	.6	2.3		9	1.2	.8	.1	.1	19	5

1/ Mean discharge for 1946-47 water year was 124 second-feet.

HIWASSEE RIVER BELOW CHATUGE DAM NEAR HAYESVILLE, N. C.

LOCATION.--At gaging station 0.4 mile upstream from Hyatt Mill Creek, 1.6 miles downstream from Chatuge Dam, and 1.7 miles southeast of Hayesville, Clay County.
DRAINAGE AREA.--190 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1083.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet) 1/	Color	pH	Silica (SiO_3)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
Oct. 22, 1946	2.0	8	6.7	8.4	0.05	2.4	1.1	3.0		15	2.2	1.2	0.2	0.1	26	10
Nov. 14	57	7	6.5	6.5	.03	1.6	.9	1.9		10	1.6	.9	.1	.7	19	8
Dec. 16	59	4	6.3	6.6	.03	1.5	.7	1.7		9	1.3	.8	.1	.3	19	7
Jan. 21, 1947	11	2	7.1	4.3	.03	2.8	1.1	1.8	0.8	13	2.4	1.4	.0	1.2	24	12
Feb. 11	184	8	6.7	5.5	.03	1.7	.8	2.5		11	1.6	1.1	.1	.7	20	8
Mar. 7	225	9	7.2	4.6	.04	1.8	.8	2.4		11	1.6	1.1	.1	.6	19	8
Apr. 9	571	13	7.0	6.4	.10	2.0	.9	1.4	.8	11	1.2	1.0	.1	.4	20	9
May 27	496	5	6.5	6.2	.06	1.6	.7	2.3		11	1.4	.8	.0	.5	19	7
June 4	2.5	3	6.9	8.3	.05	2.4	.9	2.8		15	1.6	.9	.0	.6	25	10
July 15	1,020	9	6.1	4.7	.06	1.9	.7	1.4	.7	11	1.1	1.1	.0	.8	20	8
Aug. 13	661	10	6.2	7.3	.02	1.8	1.0	2.4		12	1.0	1.4	.0	1.1	23	9
Sept. 29	96	12	6.4	4.9	.06	1.6	1.0	2.2		12	1.3	.8	.1	.9	21	9

1/ Mean discharge for 1946-47 water year was 433 second-feet.

HIWASSEE RIVER ABOVE MURPHY, N. C.

LOCATION.--At gaging station on U. S. Highway 64, 600 feet upstream from Will Scott Creek, and 2 miles east of Murphy, Cherokee County.
DRAINAGE AREA.--406 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1083.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet) 1/	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
Oct. 22, 1946	128	23	6.7	9.5	0.23	2.0	1.0	3.7		16	2.0	1.0	0.2	0.0	28	9
Nov. 14	241	7	6.7	7.8	.03	2.0	1.0	2.1		11	2.3	1.0	.3	.1	22	9
Dec. 16	200	7	6.5	7.8	.08	1.9	.8	2.3		12	1.7	.9	.1	.0	22	8
Jan. 21, 1947	2,870	3	7.0	4.1	.03	1.6	.6	1.4	0.6	8	1.9	.9	.0	.4	15	6
Feb. 12	539	2	7.4	5.9	.02	1.7	.7	2.2		10	1.8	1.0	.1	.4	19	7
Mar. 7	833	14	6.9	5.4	.02	1.6	.7	2.3		10	1.8	1.0	.1	.4	19	7
Apr. 2	379	11	7.0	6.9	.08	1.4	.7	1.5	.7	10	1.3	.8	.0	.1	19	6
May 26	1,880	3	6.6	6.5	.06	1.4	.6	2.9		11	1.5	1.0	.0	.5	19	6
June 11	1,820	11	6.5	6.8	.12	1.4	.6	2.5		10	1.4	.9	.0	.6	20	6
July 15	1,260	6	6.2	5.5	.05	1.6	.8	1.5	.6	10	1.3	.9	.0	.7	20	7
Aug. 8	840	18	6.5	7.1	.01	1.8	.9	2.0		11	1.1	1.1	.0	.9	22	8
Sept. 29	169	12	6.8	7.6	.06	1.8	.9	2.6		13	1.7	.8	.1	.2	22	8

1/ Mean discharge for 1946-47 water year was 780 second-feet.

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TENNESSEE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN TENNESSEE RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
	NORTH FORK MILLS RIVER NEAR MILLS RIVER														
Feb. 25, 1947 ------	31.7	7	6.9	5.3	0.02	0.7	0.4	2.6	7	1.5	0.8	0.2	0.0	14	3
	REEMS CREEK AT WOODFIN														
Oct. 9, 1946 -------	--	13	7.2	8.1	0.04	1.4	0.7	2.9	11	1.8	1.0	0.1	0.1	22	6
	REEMS CREEK NEAR WEAVERVILLE														
Feb. 25, 1947 ------	25.7	13	7.2	14	0.08	2.6	1.4	4.6	18	3.8	1.5	0.2	1.1	39	12
	SPRING CREEK AT HOT SPRINGS														
Feb. 25, 1947 ------	46.8	12	7.2	12	0.05	2.8	1.0	3.7	13	4.0	1.5	0.3	1.8	36	11
	RICHLAND CREEK AT LAKE JUNALUSKA														
Mar. 28, 1947 ------	--	3	7.1	8.0	0.02	2.6	1.0	2.9	14	2.2	1.5	0.1	1.0	28	11
	ALLEN CREEK NEAR HAZELWOOD														
Mar. 28, 1947 ------	--	6	6.1	6.9	0.02	1.6	0.6	1.4	8	1.6	0.6	0.1	0.4	18	6
	BEAVER CREEK NEAR SPRUCE PINE														
Jan. 22, 1947 ------	--	14	6.9	6.9	0.06	1.8	1.0	0.6	7	2.2	0.8	0.1	0.6	19	9
	CRYSTAL FALLS CREEK NEAR SPRUCE PINE														
Feb. 3, 1947 -------	--	5	7.1	8.1	0.05	1.4	0.9	2.5	9	2.3	2.0	0.0	0.0	21	7
	CANE RIVER NEAR BURNSVILLE														
Feb. 27, 1947 ------	1/ 61.0	7	6.8	7.0	0.04	1.6	0.8	2.3	9	2.6	0.8	0.1	1.0	21	7

DUTCH CREEK AT VALLE CRUCIS														
Feb. 26, 1947 ------	3.49	7	7.0	7.1	0.02	2.2	1.1	2.4	13	1.9	0.9	0.1	1.3	23	10
COVE CREEK NEAR SUGAR GROVE														
Mar. 11, 1947 ------	--	5	6.9	10	0.06	4.7	1.8	2.6	18	4.0	1.4	0.1	4.6	43	19
CARTOOGECHAYE CREEK NEAR FRANKLIN														
Apr. 18, 1947 ------	253	11	6.8	9.0	0.08	1.8	1.0	2.1	13	1.1	0.9	0.0	0.2	23	9
EAST FORK TUCKASEGEE RIVER AT TUCKASEGEE														
Apr. 9, 1947 -------	182	11	6.7	5.9	0.05	1.0	0.4	1.8	7	1.0	0.8	0.0	0.1	16	4
WEST FORK TUCKASEGEE RIVER AT TUCKASEGEE														
Apr. 9, 1947 -------	35.0	8	7.1	7.4	0.04	2.2	0.3	1.8	10	1.4	0.6	0.0	0.2	22	7
SOCO CREEK AT CHEROKEE														
Apr. 10, 1947 ------	83.3	9	7.0	7.0	0.05	1.2	0.5	2.0	9	1.1	0.6	0.0	0.1	19	5

TENNESSEE RIVER BASIN--Continued

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

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Discharge (second-feet)	Color	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
DEEP CREEK AT BRYSON CITY															
Apr. 17, 1947 ------	1/207	7	6.7	4.7	0.03	1.0	0.4	1.5	7	1.1	0.2	0.0	0.2	13	4
ALARKA CREEK NEAR BRYSON CITY															
Apr. 24, 1947 ------	54.0	14	7.0	8.0	0.06	1.2	0.4	2.2	9	1.0	0.6	0.0	0.1	19	5
TWENTYMILE CREEK NEAR FONTANA															
Feb. 24, 1947 ------	45.5	8	6.8	4.6	0.01	0.8	0.3	1.9	6	1.6	0.4	0.1	0.0	13	3
CHEOAH RIVER AT TAPOCO															
Feb. 24, 1947 ------	136	9	6.6	5.8	0.02	1.2	0.4	2.3	7	2.5	0.6	0.1	0.2	17	5
TULULA CREEK AT ROBBINSVILLE															
Mar. 24, 1947 ------	72.7	12	6.6	4.9	0.03	1.2	0.5	1.4	6	1.5	0.8	0.1	0.2	15	5
TUSQUITEE CREEK NEAR HAYESVILLE															
Mar. 7, 1947 ------	141	13	6.7	5.3	0.05	1.0	0.5	1.6	5	2.3	0.6	0.2	0.1	16	5
BRASSTOWN CREEK AT BRASSTOWN															
Mar. 7, 1947 ------	172	13	7.4	7.4	0.03	1.8	0.8	1.9	10	1.7	1.0	0.1	0.5	23	8
VALLEY RIVER AT ANDREWS															
Mar. 7, 1947 ------	2/144	10	6.8	5.5	0.03	1.6	0.6	1.1	6	2.5	0.4	0.2	0.2	17	6

1/ Measured discharge.
2/ Mean discharge.

STREAMS TRIBUTARY TO LAKE ERIE

CUYAHOGA RIVER AT BOTZUM, OHIO

LOCATION.--One mile above Yellow Creek and 2½ miles below gaging station at highway bridge at Old Portage, Summit County.
DRAINAGE AREA.--405 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 501 parts per million Oct. 1-10; minimum, 139 parts per million Apr. 1-10.
Total hardness: Maximum, 293 parts per million Oct. 1-10; minimum, 87 parts per million Apr. 1-10.
Water temperatures: Maximum, 93° F. Aug. 19, 21; minimum, 33° F. Jan. 21.
REMARKS.--Records of water discharge are those for gaging station at Old Portage.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																			Total	Non-carbonate
Oct. 1-10, 1946 --	62.4	70	12	7.5	82.3	8.0	0.03	0.00	86	19	56	3.3	208	123	83	0.1	4.0	501	293	122
Oct. 11-20 ------	152	70	11	7.5	69.6	7.4	.03	.00	72	17	39	3.1	186	98	63	.1	5.1	416	250	97
Oct. 21-31 ------	112	68	14	7.5	55.9	6.8	.02	.00	64	14	31	3.6	156	91	39	.1	4.7	338	217	89
Nov. 1-10 -------	75.9	67	15	7.5	59.8	7.2	.02	.00	70	16	31	3.8	177	97	39	.2	4.0	372	240	95
Nov. 11-20 ------	80.7	59	16	7.5	66.6	7.8	.10	.00	75	17	37	3.9	186	106	49	.2	5.0	409	257	105
Nov. 21-30 ------	140	56	10	7.5	62.3	7.4	.02	.00	71	16	34	2.9	170	102	47	.2	6.0	380	243	104
Dec. 1-10 -------	133	53	10	7.5	53.9	6.0	.05	.00	63	15	25	3.8	144	94	33	.3	4.8	323	219	101
Dec. 11-20 ------	345	46	12	7.3	48.6	6.4	.04	.00	58	14	20	3.5	123	92	26	.2	5.0	296	202	101
Dec. 21-31 ------	175	43	12	7.3	53.5	7.0	.04	.00	61	15	25	3.2	130	96	35	.2	4.8	325	214	107
Jan. 1-10, 1947 --	429	39	12	7.3	40.5	7.6	.04	.05	49	12	14	3.1	96	83	20	.2	5.2	249	172	93
Jan. 11-20 -------	505	42	12	7.2	41.4	7.4	.04	.00	50	12	16	3.3	91	86	22	.2	5.4	254	174	100
Jan. 21-31 -------	1,146	39	22	7.1	30.6	5.8	.14	.05	38	8.3	8.7	2.9	62	68	12	.2	6.1	190	129	78
Feb. 1-10 -------	834	37	18	6.8	31.5	--	.06	--	35	8.1	12	3.1	65	65	16	.3	3.8	194	121	67
Feb. 11-20 ------	290	42	8	7.0	40.0	7.6	.04	--	46	10	15	3.9	97	75	22	.2	4.2	248	156	76
Feb. 21-28 ------	214	42	8	7.0	41.2	8.0	.07	--	47	10	17	4.8	99	77	26	.2	4.9	266	158	77
Mar. 1-10 -------	153	47	9	7.1	51.3	9.2	.14	--	55	12	24	5.3	119	85	41	.2	6.5	325	187	89
Mar. 11-20 ------	552	42	6	7.1	36.7	7.6	.06	--	43	9.5	12	3.4	95	65	20	.2	4.9	227	146	68
Mar. 21-31 ------	930	41	8	6.8	30.2	6.2	.04	--	35	7.4	9.8	3.1	66	59	17	.2	4.3	187	118	64

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CUYAHOGA RIVER AT BOTZUM, OHIO--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																			Total	Non-carbonate
Apr. 1-10, 1947--	2,071	46	8	7.0	22.0	5.0	0.06	0.00	26	5.3	5.3	3.1	50	49	8.5	0.3	7.2	139	87	46
Apr. 11-20 ------	694	55	22	7.3	28.6	5.8	.19	.00	35	6.9	9.2	2.9	76	56	13	.4	3.8	180	116	53
Apr. 21-30 ------	1,347	54	23	7.0	26.2	4.6	.03	.00	32	6.8	7.1	1.2	65	54	8.8	.1	2.2	161	108	55
May 1-10 --------	842	58	15	7.1	30.5	4.4	.02	.00	36	7.8	10	2.8	73	58	16	.2	3.3	190	122	62
May 11-20 -------	703	64	25	7.1	35.8	4.6	.24	.05	41	8.9	15	2.6	91	63	22	.2	2.0	222	139	64
May 21-31 -------	1,661	66	35	7.1	26.1	4.8	.09	.00	31	6.8	8.3	2.5	71	47	12	.1	2.5	170	105	47
June 1-10 --------	2,213	68	40	7.0	23.4	5.0	.18	.00	29	6.0	7.9	2.3	66	42	11	.1	2.0	155	97	43
June 11-20 -------	786	74	35	7.2	31.0	5.8	.10	.05	39	8.2	9.6	3.0	93	52	14	.1	2.9	206	131	55
June 21-30 -------	250	82	18	7.5	47.5	6.0	.01	.00	56	12	19	2.6	127	82	31	.4	5.6	299	189	85
July 1-10 --------	146	80	8	7.6	59.7	6.2	.04	.00	68	15	30	3.5	148	104	47	.3	3.6	369	231	110
July 11-20 -------	191	80	6	7.6	59.0	6.0	.01	.00	66	15	27	3.3	154	92	47	.3	2.9	361	226	100
July 21-31 -------	208	78	10	7.6	49.7	5.4	.04	.00	60	13	21	3.3	139	79	35	.3	3.2	309	203	89
Aug. 1-10 -------	98.5	84	6	7.7	63.5	5.8	.01	.00	74	16	29	4.0	165	109	51	.3	3.4	398	250	115
Aug. 11-20 ------	198	86	10	7.3	67.7	8.8	.08	.00	79	18	38	4.3	156	132	57	.4	1.9	439	271	143
Aug. 21-31 ------	312	86	12	7.4	53.5	8.4	.06	.00	63	14	26	4.2	138	93	35	.4	2.7	330	215	102
Sept. 1-10 -------	413	80	14	7.6	45.3	7.8	.02	.00	56	12	18	3.1	133	74	25	.4	6.0	280	189	80
Sept. 11-20 ------	155	84	9	7.5	61.0	7.6	.02	.00	68	15	28	3.8	159	92	47	.3	5.0	369	231	101
Sept. 21-30 ------	123	74	7	7.5	64.7	8.2	.02	.00	76	16	32	4.1	148	113	55	.3	5.9	395	255	139
Average ------	525	61	14	--	47.0	6.7	0.06	--	54	12	21	3.4	120	82	32	0.2	4.3	291	184	86

Temperature (° F.) of water, water year October 1946 to September 1947

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	64	68	48	37	38	46	39	64	63	85	83	77
2	71	74	47	42	35	44	41	64	65	83	77	77
3	67	70	48	39	37	44	42	62	65	86	80	79
4	73	66	51	38	38	47	42	58	67	75	81	82
5	75	69	52	37	37	48	47	56	67	78	87	80
6	68	61	54	37	37	48	49	57	69	79	88	80
7	67	68	54	37	38	49	48	56	69	79	88	78
8	71	62	57	39	37	49	48	53	69	79	89	82
9	76	--	57	40	36	46	52	56	72	76	84	85
10	72	--	59	40	37	46	54	57	76	81	81	84
11	73	60	57	43	40	49	54	58	78	79	85	90
12	67	61	59	43	41	48	56	63	77	82	90	88
13	70	62	52	42	42	46	53	63	77	83	86	81
14	65	60	47	48	46	46	56	63	74	80	84	84
15	72	60	41	47	45	44	59	66	67	80	81	82
16	73	61	39	42	43	37	55	66	72	80	86	80
17	72	59	42	39	40	37	55	64	73	85	85	82
18	70	49	41	39	43	37	56	63	74	84	88	85
19	72	58	41	37	40	40	55	69	73	78	93	88
20	67	59	42	41	39	40	49	69	75	74	83	81
21	66	60	44	33	41	40	50	66	76	75	93	80
22	66	57	43	35	41	45	50	66	76	69	90	77
23	67	56	42	36	39	44	55	69	--	75	88	78
24	68	58	43	39	37	46	56	68	78	77	86	79
25	66	54	39	39	--	40	54	63	78	82	89	76
26	68	56	41	39	42	39	56	64	84	76	83	76
27	67	62	42	39	44	42	52	66	87	78	86	63
28	69	57	49	39	47	41	54	67	85	78	87	67
29	72	52	45	40	--	40	56	66	85	81	85	73
30	74	50	42	45	--	37	59	63	85	83	81	69
31	70	--	40	42	--	39	--	64	--	84	78	--
Average	70	60	47	40	40	43	52	62	74	79	85	79

HUDSON BAY AND UPPER MISSISSIPPI RIVER BASINS
RED RIVER OF THE NORTH BASIN
RED RIVER OF THE NORTH AT FARGO, N. DAK.

LOCATION.--At city water plant, half a mile upstream from gaging station, which is located at lat. 46°52'10", long. 96°47'00", in sec. 7 T. 139 N., R. 48 W., just upstream from Island Park Dam in Fargo, and 10 miles upstream from Sheyenne River.
DRAINAGE AREA.--6,800 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1947. Unpublished records for January 1932 to September 1946 are on file at the Fargo Water Works Department.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1085. Records of water temperature were furnished by City of Fargo, Water Works Department.

Temperature (° F.) of water, water year October 1946 to September 1947

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	57	45	--	33	33	33	33	54	--	72	77	70
2	57	45	33	33	--	--	33	55	57	72	79	72
3	59	--	33	33	33	33	33	57	59	72	--	72
4	57	43	33	33	33	33	33	--	61	73	79	72
5	57	43	33	--	33	33	33	55	63	73	81	72
6	--	43	33	33	33	33	--	55	63	--	79	72
7	55	43	33	33	33	33	33	55	63	77	79	--
8	52	43	--	33	33	33	33	54	--	77	77	72
9	52	43	33	33	--	--	33	54	66	77	79	72
10	52	--	33	33	33	33	33	55	64	77	--	72
11	50	41	33	33	33	33	33	--	63	77	79	70
12	46	41	33	--	33	33	33	57	63	77	79	68
13	--	41	33	33	33	33	--	57	59	--	79	68
14	46	39	33	33	33	33	37	55	63	79	77	--
15	48	37	--	33	33	33	41	57	--	79	75	63
16	45	37	33	33	--	--	43	59	68	81	75	63
17	45	--	33	33	33	33	45	61	68	81	--	63
18	45	36	33	33	33	33	45	--	70	77	75	63
19	45	36	33	--	33	33	45	63	70	77	77	63
20	--	33	33	33	33	33	--	63	70	--	77	63
21	46	33	33	33	33	33	48	63	70	73	77	--
22	48	33	--	33	33	33	48	63	--	72	79	61
23	48	33	33	33	--	--	48	61	70	72	79	59
24	48	--	33	33	33	33	48	61	70	73	--	59
25	48	33	--	33	33	33	48	--	68	73	77	59
26	48	33	33	--	33	33	50	59	70	75	75	57
27	--	33	33	33	33	33	--	61	70	--	73	55
28	48	33	33	33	33	33	52	59	70	77	72	--
29	46	33	--	33	--	33	54	57	--	79	72	54
30	46	33	33	33	--	--	57	57	72	79	72	54
31	45	--	33	33	--	33	--	57	--	77	--	--
Average	50	38	33	33	33	33	41	58	66	76	77	65

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER OF THE NORTH BASIN IN NORTH DAKOTA

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
SOURIS RIVER NEAR VERENDRY																				
Oct. 21, 1946	9.9	8.6	89.7	16	0.04	60	30	100	14	1/413	115	28	0.2	7.0	1.6	558	0.76	273	0	43
Nov. 20	85	8.0	99.2	13	.05	57	34	103	8.8	422	126	30	.2	12	1.5	614	.84	282	0	43
Apr. 22, 1947	663	7.3	62.7	17	.02	40	24	64		282	85	12	.2	.0	.6	448	.61	198	0	41
May 22	310	8.8	49.6	11	.02	36	17	50		2/214	71	10	.1	4.6	.5	304	.41	160	0	40
Aug. 28	300	7.8	44.7	14	.02	34	16	38		198	53	8.0	.1	4.2	.0	282	.38	151	0	35
DES LACS RIVER AT FOXHOLM																				
Oct. 23, 1946	0.6	8.0	188	7.0	0.10	42	55	336		682	399	60	0.4	1.0	0.8	1,240	1.69	331	0	69
Nov. 23	.5	8.5	169	11	.05	61	59	287		3/713	367	36	.4	2.0	--	1,180	1.60	395	0	61
Apr. 4, 1947	183	7.5	25.7	7.0	.02	15	9.8	38		96	75	.5	.0	3.9	.0	198	.27	78	0	52
May 13	6.6	7.5	143	13	.02	62	37	226		562	285	26	.1	3.9	--	974	1.32	307	0	62
May 23	4.8	7.6	143	12	.02	62	41	231		582	296	27	.0	3.0	.8	980	1.33	323	0	61
Aug. 27	1.5	7.6	158	4.0	.02	69	43	246		612	317	35	.3	3.1	.6	1,030	1.40	349	0	61

1/ Includes equivalent of 27 parts per million of carbonate (CO_3).
2/ Includes equivalent of 12 parts per million of carbonate (CO_3).
3/ Includes equivalent of 10 parts per million of carbonate (CO_3).

IOWA RIVER BASIN

IOWA RIVER AT IOWA CITY, IOWA

LOCATION.--At Benton Street bridge.
DRAINAGE AREA.--3,230 square miles.
RECORDS AVAILABLE.--Chemical analyses: January 1944 to September 1947.
Water temperatures: January 1944 to September 1947.
Sediment records: October 1943 to September 1946.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 382 parts per million Jan. 1-10; minimum, 137 parts per million June 16-19.
Total hardness: Maximum, 330 parts per million Jan. 1-10; minimum, 101 parts per million June 16-19.
Water temperatures: Maximum, 87° F. Aug. 24; minimum, freezing point on many days in December, January, and February.
EXTREMES, 1943-47.--Dissolved solids, 1944-47: Maximum, 402 parts per million Jan. 11-20, 1944; minimum, 96 parts per million Jan. 5-10, 1946.
Total hardness, 1944-47: Maximum, 345 parts per million Dec. 21-31, 1944; minimum, 54 parts per million Jan. 5-10, 1946.
Water temperatures, 1944-47: Maximum, 87° F. Aug. 24, 1947; minimum, freezing point on many days in winter months.
Sediment loads, 1943-46: Maximum, 177,000 tons per day May 23, 1944; minimum, 3 tons per day Jan. 24, 1945.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1085. Records of specific conductance of daily samples are available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance [5] (K×10 at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1946 -	981	64	7.8	51.9	14	0.04	69	23	6.9		268	48	4.8	0.3	4.8	0.2	314	0.42	832	266	46	5
Oct. 11-20 -----	1,290	55	7.7	48.2	10	.04	64	22	3.7		242	45	5.5	.3	4.2	.2	287	.39	1,000	250	52	3
Oct. 21-31 -----	2,270	57	7.3	43.8	16	.12	58	19	6.9		225	40	4.0	.3	6.2	--	271	.37	1,660	222	38	6
Nov. 1-10 ------	2,420	50	7.6	52.6	19	.01	72	23	7.8		276	48	4.9	.2	8.8	--	332	.45	2,060	274	48	6
Nov. 11-20 -----	1,950	40	7.6	53.8	18	.01	74	24	6.7		284	49	4.2	.2	8.8	--	338	.46	1,780	283	50	5
Nov. 21-30 -----	1,490	39	7.7	56.3	18	.01	79	25	8.0		304	51	4.8	.2	8.8	--	353	.48	1,420	300	51	5
Dec. 1-10 ------	1,160	39	7.7	56.2	17	.02	78	24	5.3		296	51	4.8	.2	8.2	--	352	.48	1,100	298	55	5
Dec. 11-20 -----	788	36	7.7	56.7	15	.01	76	26	8.7		302	52	5.0	.2	8.2	--	348	.47	741	296	48	6
Dec. 21-31 -----	744	33	7.8	57.5	15	.01	79	26	7.6		302	55	5.4	.2	8.4	--	352	.48	707	304	56	5
Jan. 1-10, 1947 -	472	32	7.7	62.4	17	.01	86	28	7.6		328	59	6.1	.2	8.2	--	382	.52	487	330	61	5
Jan. 11-20 -----	928	33	7.4	50.0	14	.02	66	23	4.8		248	48	6.1	.2	9.2	--	303	.41	759	259	56	4
Jan. 21-31 -----	7[illegible]	33	7.6	50.6	13	.02	68	23	4.1		254	47	6.0	.2	8.6	--	307	.42	647	264	56	3
Feb. 1-10 ------	552	32	7.8	51.1	14	.02	69	23	7.1		264	48	5.8	.2	8.5	--	316	.43	471	266	50	5
Feb. 11-20 -----	1,890	33	7.5	42.5	12	.05	54	18	8.5		207	40	5.2	.2	10	--	262	.36	1,340	208	38	8
Feb. 21-28 -----	1,860	33	7.6	41.5	13	.03	54	18	5.3		201	38	4.5	.1	11	--	258	.35	1,300	208	43	5
Mar. 1-10 ------	1,000	33	7.6	47.0	15	.02	62	21	7.1		240	43	5.0	.1	9.2	--	289	.39	858	241	44	6
Mar. 11-20 -----	2,870	34	7.2	33.5	11	.08	43	14	4.1		148	32	4.8	.2	14	--	209	.28	1,620	165	44	5
Mar. 21-31 -----	3,310	39	7.4	41.6	13	.03	55	17	7.6		206	38	4.2	.3	10	--	258	.35	2,310	207	38	7

Apr. 1-10-------	4,730	45	7.5	40.7	13	.07	55	17	5.1		198	40	4.4	.2	10	--	253	.34	3,230	207	45	5
Apr. 11-20------	7,190	48	7.5	38.2	13	.05	50	16	3.9		175	37	3.8	.2	14	--	242	.33	4,700	191	47	4
Apr. 21-30------	6,020	54	7.7	46.4	14	.03	63	20	5.8		226	46	4.1	.2	15	--	301	.41	4,890	239	54	5
May 1-10 -------	3,160	59	7.7	50.5	13	.02	69	22	6.0		253	48	4.1	.2	14	--	326	.44	2,780	262	55	4
May 11-20 ------	2,070	64	7.7	50.6	11	.02	68	23	6.2		256	49	5.8	.2	10	--	310	.42	1,730	264	54	5
May 21-31 ------	2,860	60	7.7	48.1	13	.00	64	22	6.2		246	44	4.4	.2	12	--	295	.40	2,280	250	48	5
June 1-10-------	15,900	65	7.2	26.4	12	.23	34	11	4.1		122	26	2.0	.3	9.8	--	169	.23	7,260	130	30	6
June 16-19------	27,700	61	7.8	19.2	18	--	28	7.6	--		88	18	--	--	7.0	--	137	.19	10,200	101	29	0
June 11-15, 20 --	12,800	62	7.7	35.4	15	.06	48	15	3.0		172	31	3.0	.3	12	--	230	.31	7,950	182	41	3
June 21-20------	14,800	72	7.8	34.7	14	.13	45	14	6.2		172	28	2.5	.2	12	--	227	.31	9,070	170	29	7
July 1-3 --------	13,800	74	8.5	33.6	23	.08	49	13	2.5		1/169	28	2.0	.4	12	--	222	.30	8,390	176	37	3
July 4-7 --------	10,600	75	9.0	37.1	24	.08	55	15	5.2		2/192	36	2.0	.4	14	--	248	.34	7,100	199	42	5
July 8-12 -------	7,410	76	8.6	43.6	28	.10	64	18	4.8	3.2	3/241	35	3.2	.4	13	--	292	.40	5,840	234	36	4
July 13-14 ------	7,100	76	8.5	38.6	20	.07	60	15	12		1/196	59	2.6	.4	12	--	262	.36	5,020	211	50	11
July 15 ---------	5,370	79	8.6	43.5	29	.00	66	18	4.3	2.4	3/239	38	3.5	.3	12	--	289	.39	4,190	239	43	4
July 16-17 ------	4,620	84	7.5	47.6	30	.00	62	20	11		234	53	3.0	.4	12	--	310	.42	3,620	237	45	10
July 18-31 ------	2,180	75	8.5	50.9	22	.08	73	21	11	1.2	4/278	44	4.5	.3	12	--	329	.45	1,940	268	40	8
Aug. 1-19 ------	825	82	8.6	50.7	20	.10	75	22	6.7	.4	5/277	58	6.5	.2	8.5	--	329	.45	733	278	51	5
Aug. 20-31 -----	439	83	8.5	46.4	21	.08	62	22	11	4.8	4/240	58	2.5	.4	1.8	--	293	.40	347	245	48	9
Sept. 1-15 ------	369	77	8.6	47.0	18	.08	62	21	12	2.8	4/241	58	13	.2	2.1	--	294	.40	293	241	43	10
Sept. 16-24 -----	277	69	8.6	49.3	15	.08	65	23	9.0	.8	6/254	58	9.8	.3	1.6	--	312	.42	233	257	49	7
Sept. 25-30 -----	251	63	8.3	46.1	13	.15	59	24	3.3	1.6	7/236	55	8.0	.4	.8	--	286	.39	206	246	61	3
Weighted average	3,399	--	--	38.3	16	0.09	52	16	5.3		190	36	3.3	0.3	11	--	245	0.33	2,250	196	40	5

1/ Includes equivalent of 8 parts per million carbonate (CO_3).
2/ Includes equivalent of 12 parts per million carbonate (CO_3).
3/ Includes equivalent of 18 parts per million carbonate (CO_3).
4/ Includes equivalent of 13 parts per million carbonate (CO_3).
5/ Includes equivalent of 16 parts per million carbonate (CO_3).
6/ Includes equivalent of 15 parts per million carbonate (CO_3).
7/ Includes equivalent of 10 parts per million carbonate (CO_3).

IOWA RIVER BASIN--Continued

IOWA RIVER AT IOWA CITY, IOWA--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

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

IOWA RIVER BASIN--Continued

IOWA RIVER AT IOWA CITY, IOWA--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	1,320	215	--	2,040	190	--	1,270	62	--
2	1,200	115	--	2,210	224	--	1,200	59	--
3	1,120	94	--	3,280	742	--	1,140	51	--
4	1,040	83	--	3,140	804	--	1,080	58	--
5	967	80	--	2,660	445	--	1,120	49	--
6	903	74	--	2,370	283	--	1,080	49	--
7	861	73	--	2,230	195	--	1,140	54	--
8	825	78	--	2,130	160	--	1,190	38	--
9	795	75	--	2,040	140	--	1,190	62	--
10	778	71	--	2,100	152	--	1,170	68	--
11	801	72	--	2,130	138	--	1,130	53	--
12	807	45	--	2,140	182	--	1,160	49	--
13	825	38	--	2,000	170	--	993	58	--
14	915	38	--	1,940	142	--	1,010	43	--
15	922	35	--	1,880	122	--	960	34	--
16	960	38	--	1,880	142	--	948	44	--
17	986	42	--	1,920	154	--	520	33	--
18	2,350	502	--	1,950	147	--	320	28	--
19	2,270	522	--	1,840	128	--	380	31	--
20	2,050	267	--	1,780	104	--	460	23	--
21	1,600	234	--	1,720	104	--	718	22	--
22	1,410	146	--	1,650	95	--	807	28	--
23	1,310	85	--	1,580	79	--	954	28	--
24	1,460	85	--	1,540	79	--	825	33	--
25	2,840	619	--	1,480	67	--	773	30	--
26	3,800	1,840	--	1,490	64	--	790	41	--
27	3,090	850	--	1,410	66	--	795	42	--
28	2,710	540	--	1,370	64	--	915	30	--
29	2,440	415	--	1,320	58	--	762	23	--
30	2,210	290	--	1,310	59	--	506	27	--
31	2,100	230	--	--	--	--	340	18	--
Total load (tons)	--	--	--	--	--	--	--	--	--
	January			February			March		
1	340	26	--	535	14	--	1,130	25	--
2	400	28	--	482	8	--	1,050	23	--
3	460	19	--	482	9	--	1,000	15	--
4	480	21	--	527	5	--	1,010	17	--
5	480	29	--	539	4	--	870	21	--
6	490	30	--	580	5	--	891	17	--
7	500	37	--	600	7	--	954	19	--
8	510	34	--	600	6	--	1,140	34	--
9	530	36	--	570	7	--	1,360	46	--
10	530	28	--	600	13	--	1,620	93	--
11	530	30	--	530	13	--	1,760	127	--
12	530	32	--	550	10	--	1,850	136	--
13	580	26	--	592	12	--	2,210	230	--
14	1,310	76	--	980	24	--	2,970	578	--
15	1,350	116	--	1,680	95	--	3,180	522	--
16	1,220	73	--	2,700	272	--	3,300	459	--
17	1,030	94	--	2,940	344	--	3,250	498	--
18	960	71	--	2,900	347	--	3,240	540	--
19	897	49	--	3,120	294	--	3,500	564	--
20	873	26	--	2,900	230	--	3,430	635	--
21	784	18	--	2,520	157	--	3,480	1,140	--
22	750	16	--	2,220	98	--	3,630	1,360	--
23	760	16	--	2,160	65	--	3,020	930	--
24	760	12	--	2,210	41	--	3,630	1,330	--
25	762	12	--	1,780	38	--	4,050	1,810	--
26	795	19	--	1,460	32	--	3,900	2,720	--
27	873	17	--	1,300	30	--	3,550	1,760	--
28	915	14	--	1,210	30	--	3,160	1,370	--
29	922	15	--	--	--	--	2,860	705	--
30	680	15	--	--	--	--	2,650	505	--
31	587	13	--	--	--	--	2,520	410	--
Total load (tons)	--	--	--	--	--	--	--	--	--

IOWA RIVER BASIN--Continued

IOWA RIVER AT IOWA CITY, IOWA--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	2,460	340	--	4,270	698	--	5,480	975	--
2	2,370	295	--	4,100	625	--	6,610	951	--
3	2,200	220	--	3,870	726	--	7,070	680	--
4	2,670	460	--	3,490	566	--	12,900	1,660	--
5	6,000	3,810	--	3,140	358	--	17,700	1,190	--
6	7,580	2,450	--	2,850	269	--	17,000	803	--
7	6,420	1,440	--	2,700	210	--	24,200	1,410	--
8	6,010	850	--	2,520	189	--	27,400	1,270	--
9	5,860	750	--	2,370	171	--	23,000	905	--
10	5,750	1,090	--	2,270	156	--	17,700	690	--
11	6,220	1,850	--	2,140	135	--	13,200	331	--
12	5,960	1,140	--	2,020	118	--	10,800	238	--
13	6,340	829	--	1,940	130	--	11,100	760	--
14	7,170	843	--	1,910	119	--	10,900	746	--
15	7,580	699	--	1,900	122	--	15,700	1,390	--
16	7,430	462	--	1,900	110	--	29,500	1,880	--
17	7,360	416	--	1,960	119	--	32,600	1,650	--
18	7,220	361	--	2,170	130	--	27,900	1,070	--
19	7,250	344	--	2,400	189	--	20,700	716	--
20	9,330	754	--	2,360	221	--	15,400	478	--
21	8,720	500	--	2,340	198	--	13,800	428	--
22	7,710	369	--	2,260	208	--	14,200	458	--
23	7,760	346	--	2,190	178	--	16,300	555	--
24	7,250	287	--	2,090	157	--	17,200	558	--
25	6,350	273	--	2,080	151	--	15,800	497	--
26	5,180	350	--	2,040	137	--	16,500	493	--
27	4,450	516	--	1,930	129	--	15,900	528	--
28	4,060	673	--	2,200	161	--	13,600	408	--
29	3,810	464	--	4,740	1,680	--	12,100	369	--
30	4,890	2,260	--	4,710	1,610	--	12,700	1,030	--
31	--	--	--	4,870	1,240	--	--	--	--
Total load (tons)	--	--	--	--	--	--	--	--	--

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	13,600	742	--	1,240	128	--	404	47	--
2	15,200	828	--	1,200	110	--	421	54	--
3	12,700	539	--	1,150	115	--	424	48	--
4	10,500	376	--	1,090	111	--	398	53	--
5	9,850	391	--	1,060	117	--	387	44	--
6	12,000	1,220	--	1,000	131	--	404	37	--
7	10,200	584	--	946	148	--	376	41	--
8	8,650	370	--	898	115	--	342	48	--
9	7,880	330	--	830	116	--	340	50	--
10	7,250	321	--	781	111	--	331	51	--
11	6,600	320	--	742	117	--	354	74	--
12	6,680	714	--	694	126	--	359	64	--
13	7,630	1,540	--	673	106	--	340	47	--
14	6,580	724	--	657	109	--	323	52	--
15	5,370	432	--	594	108	--	334	52	--
16	4,910	451	--	559	119	--	300	56	--
17	4,330	499	--	555	114	--	248	53	--
18	3,640	419	--	527	110	--	309	53	--
19	3,170	385	--	486	76	--	289	46	--
20	3,010	369	--	493	74	--	282	51	--
21	2,700	337	--	480	85	--	309	56	--
22	2,340	319	--	465	99	--	255	51	--
23	2,160	262	--	459	115	--	247	43	--
24	2,050	200	--	453	66	--	254	40	--
25	1,930	183	--	444	60	--	276	43	--
26	1,810	165	--	410	66	--	245	45	--
27	1,730	151	--	401	61	--	250	45	--
28	1,620	120	--	421	52	--	298	45	--
29	1,540	105	--	441	48	--	218	46	--
30	1,410	104	--	407	42	--	221	50	--
31	1,340	119	--	401	43	--	--	--	--
Total load (tons)	--	--	--	--	--	--	--	--	--

CEDAR RIVER AT CEDAR RAPIDS, IOWA

LOCATION.--At 8th Avenue bridge, 500 feet downstream from gaging station and 2.6 miles upstream from Prairie Creek.
DRAINAGE AREA.--6,640 square miles.
RECORDS AVAILABLE.--Chemical analyses: January 1944 to September 1947.
Water temperatures: January 1944 to September 1947.
Sediment records: October 1943 to September 1946.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 367 parts per million Jan. 1-10; minimum, 121 parts per million June 14-16.
Total hardness: Maximum, 300 parts per million Jan. 1-10; minimum, 74 parts per million June 14-16.
Water temperatures: Maximum, 87° F. Aug. 22, 23; minimum, freezing point Jan. 4.
EXTREMES, 1943-47.--Dissolved solids, 1944-47: Maximum, 374 parts per million Jan. 11-20, 1944; minimum, 120 parts per million Jan. 5-10, 1946.
Total hardness, 1944-47: Maximum, 300 parts per million Dec. 21, 23-31, 1944, Jan. 1-10, 1947; minimum, 74 parts per million June 14-16, 1947.
Water temperatures, 1944-47: Maximum, 87° F. Aug. 22, 23, 1947; minimum, freezing point on many days in winter months.
Sediment loads, 1943-46: Maximum, 78,700 tons per day June 17, 1944; minimum, 1.6 tons per day Jan. 21, 1944.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1085. Records of specific conductance of daily samples are available in district office at Lincoln, Neb.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1946	1,990	62	7.6	42.5	9.4	0.26	50	20	8.0		208	39	8.5	0.3	0.5	0.1	243	0.33	1,310	207	37	8
Oct. 11-20 -----	2,540	54	7.7	45.6	10	.04	58	20	7.1		225	40	9.0	.3	3.2	.1	267	.36	1,830	226	42	6
Oct. 21-31 -----	3,920	57	7.4	43.5	14	.04	60	17	7.8		222	38	7.2	.2	5.7	--	270	.37	2,860	220	38	7
Nov. 1-10 ------	4,040	49	7.5	48.3	14	.02	66	19	9.0		244	42	7.8	.3	8.2	--	299	.41	3,260	242	42	7
Nov. 11-20 -----	3,690	42	7.6	52.3	13	.01	73	21	8.5		268	45	9.0	.2	8.8	--	324	.44	3,230	268	48	6
Nov. 21-30 -----	2,820	38	7.6	54.3	13	.02	76	21	8.3		273	46	10	.2	9.4	--	335	.46	2,550	276	52	6
Dec. 1-10 ------	2,130	40	7.7	54.6	12	.01	74	21	13		276	46	12	.2	9.8	--	335	.46	1,930	286	60	9
Dec. 11-20 -----	1,500	36	7.7	55.5	10	.01	75	22	15		280	46	16	.2	11	--	333	.45	1,350	278	48	10
Dec. 21-31 -----	1,540	34	7.6	57.9	9.8	.02	77	23	14		288	47	15	.2	12	--	346	.47	1,440	286	50	9
Jan. 1-10, 1947	1,100	34	7.6	60.8	11	.02	81	24	13		298	49	17	.2	12	--	367	.50	1,090	300	56	9
Jan. 11-20 -----	1,510	35	7.5	53.2	10	.01	70	20	12		248	43	17	.2	12	--	318	.43	1,300	256	53	9
Jan. 21-31 -----	1,660	35	7.4	47.4	10	.02	60	18	12		219	38	14	.2	12	--	285	.39	1,280	224	44	10
Feb. 1-10 ------	1,160	34	7.5	52.7	11	.18	67	20	16		251	41	18	.1	12	--	320	.44	1,000	249	43	12
Feb. 11-20 -----	2,560	35	7.3	44.4	9.8	.02	57	16	12		205	36	14	.2	9.5	--	270	.37	1,870	208	40	11
Feb. 21-28 -----	2,520	35	7.4	43.4	10	.02	55	16	11		201	35	13	.2	9.0	--	266	.36	1,810	203	38	11
March 1-10 -----	1,840	35	7.4	46.2	10	.02	61	17	9.9		220	36	12	.2	10	--	278	.38	1,380	222	42	9
March 11-20 ----	5,170	35	7.3	34.8	8.2	.06	44	12	9.4		156	29	10	.2	9.2	--	215	.29	3,000	160	32	12
March 21-31 ----	5,880	38	7.5	38.2	10	.07	51	14	6.7		182	31	8.1	.2	7.0	--	238	.32	3,780	184	35	7

CEDAR RIVER AT CEDAR RAPIDS, IOWA--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
April 1-10, 1947-	7,360	44	7.4	41.2	11	0.02	57	15	6.9		197	37	7.5	0.2	9.0	--	253	0.34	5,030	204	42	7
April 11-20 -----	13,890	47	7.5	38.0	12	.06	53	14	4.4		175	36	5.1	.2	13	--	242	.33	9,080	190	46	5
April 21-30 -----	7,490	55	7.6	47.6	12	.02	66	19	4.6		232	42	6.4	.2	12	--	301	.41	6,090	242	52	4
May 1-10 -------	4,820	59	7.6	49.4	11	.02	69	20	5.5		246	43	8.4	.2	8.4	--	306	.42	3,980	254	52	4
May 11-20 ------	3,750	64	8.0	44.0	8.2	.08	48	20	16		216	42	9.6	.2	2.1	--	266	.36	2,690	202	25	15
May 21-31 ------	4,930	60	7.8	43.4	9.2	.02	56	19	6.7		216	38	8.4	.2	3.9	--	266	.36	3,540	218	41	6
June 1-10 ------	24,200	65	7.7	25.8	13	.37	36	9.0	4.8		128	21	3.4	.3	5.4	--	167	.23	10,900	127	22	8
June 14-16 -----	49,600	55	7.6	14.7	19	--	21	5.2	1.2		72	13	.0	.4	3.9	--	121	.16	16,200	74	15	3
June 11-13, 17-20	21,400	63	8.0	33.2	12	.14	46	12	5.1		159	29	4.9	.2	10	--	216	.29	12,500	164	34	6
June 21-30 -----	16,100	72	8.0	39.2	13	.07	56	15	3.4		196	30	5.0	.2	11	--	252	.34	11,000	201	40	4
July 1 ----------	11,400	76	7.4	39.5	19	.00	48	15	30		183	53	24	.2	9	--	260	.35	8,000	181	31	26
July 2-10 -------	15,000	75	8.1	34.6	16	.10	50	16	1.5		186	25	5.0	.4	3.9	--	223	.30	9,030	191	39	2
July 11-12 ------	10,800	77	8.1	40.6	19	.14	58	18	0.9	0.8	216	27	4.0	.6	8.5	--	262	.36	7,640	219	42	1
July 13-18, 20-Aug. 2 -------	4,890	78	7.8	43.1	16	.05	64	20	1.7		238	34	6.0	.3	7.3	.2	275	.37	3,630	242	47	2
July 19 ----------	7,480	76	7.4	37.2	15	.00	46	14	18		159	54	6.0	.2	7.3	--	238	.32	4,810	172	42	18
Aug. 3-6 -------	2,430	84	8.4	38.8	14	.05	49	21	.7		1/204	31	6.0	.3	1.8	--	251	.34	1,650	209	42	1
Aug. 7-22 ------	1,770	83	7.7	35.9	7.0	.05	36	20	7.5		166	32	12	.2	3.1	.1	219	.30	1,050	172	36	9
Aug. 15 2/ ------	1,720	79	7.0	43.0	6.5	.00	47	19	22		137	76	32	.2	4.2	--	264	.36	1,230	193	81	20
Aug. 23-Sept. 12	1,520	80	7.5	35.2	7.0	.05	32	19	10		152	31	14	.2	3.4	.0	197	.27	808	158	33	12
Sept. 13-30 -----	1,310	66	7.3	36.6	7.0	.05	33	19	15		160	35	16	.2	3.8	.2	207	.28	732	160	29	17
Weighted average	5,430	--	--	37.5	13	0.10	51	15	6.4		185	32	6.8	0.3	7.6	--	237	0.32	3,460	188	37	6

1/ Includes equivalent of 6 parts per million carbonate (CO_3).

2/ Not included in weighted average.

Temperature (° F.) of water, water year October 1946 to September 1947

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

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IOWA RIVER BASIN--Continued

CEDAR RIVER AT CEDAR RAPIDS, IOWA--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	2,420	33	--	3,860	84	--	2,370	17	--
2	2,330	25	--	4,770	155	--	2,090	18	--
3	2,220	29	--	5,110	146	--	1,940	16	--
4	2,110	33	--	4,670	130	--	1,920	18	--
5	2,020	38	--	4,050	72	--	2,110	18	--
6	1,900	38	--	3,770	51	--	2,110	16	--
7	1,820	39	--	3,650	50	--	2,220	22	--
8	1,740	39	--	3,590	53	--	2,260	40	--
9	1,680	40	--	3,500	42	--	2,150	31	--
10	1,700	42	--	3,440	41	--	2,150	28	--
11	1,780	36	--	3,470	42	--	2,040	18	--
12	1,860	22	--	3,470	40	--	2,040	20	--
13	1,880	21	--	3,440	39	--	2,020	15	--
14	2,240	17	--	3,710	39	--	1,880	16	--
15	2,560	29	--	3,830	42	--	1,820	18	--
16	2,840	36	--	4,050	53	--	1,450	16	--
17	2,860	38	--	4,050	39	--	1,280	17	--
18	3,160	40	--	3,830	39	--	900	15	--
19	3,190	43	--	3,590	39	--	620	28	--
20	3,000	36	--	3,500	35	--	987	33	--
21	2,860	33	--	3,380	29	--	1,330	28	--
22	2,660	40	--	3,190	35	--	1,570	19	--
23	2,370	77	--	3,100	28	--	1,760	16	--
24	3,600	359	--	2,940	17	--	1,840	18	--
25	6,400	492	--	2,780	17	--	1,720	22	--
26	4,410	162	--	2,760	17	--	1,520	18	--
27	3,800	90	--	2,610	19	--	1,560	11	--
28	4,240	116	--	2,490	22	--	1,740	19	--
29	4,410	106	--	2,470	24	--	1,650	8	--
30	4,310	95	--	2,490	22	--	1,350	8	--
31	4,020	80	--	--	--	--	950	13	--
Total load (tons)	--	--	--	--	--	--	--	--	--

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	950	8	--	850	10	--	1,730	4	--
2	1,020	9	--	870	9	--	1,660	6	--
3	1,080	14		960	10	--	1,580	5	--
4	1,100	23	--	1,080	8	--	1,550	2	--
5	1,120	14	--	1,180	6	--	1,520	7	--
6	1,140	12	--	1,280	7	--	1,570	8	--
7	1,150	12	--	1,330	6	--	1,780	24	--
8	1,160	13	--	1,350	4	--	2,020	22	--
9	1,160	13	--	1,340	5	--	2,300	25	--
10	1,170	36	--	1,310	4	--	2,680	29	--
11	1,180	22	--	1,270	1	--	3,020	33	--
12	1,230	7	--	1,280	2	--	3,350	44	--
13	1,300	11	--	1,310	3	--	3,770	64	--
14	1,360	28	--	1,480	3	--	4,810	129	--
15	1,440	26	--	2,640	45	--	5,660	118	--
16	1,520	15	--	3,410	68	--	5,420	93	--
17	1,600	9	--	3,470	47	--	5,910	92	--
18	1,700	17	--	3,470	33	--	6,400	109	--
19	1,860	11	--	3,650	38	--	6,920	109	--
20	1,940	11	--	3,650	38	--	6,400	114	--
21	2,070	14	--	3,560	40	--	5,840	173	--
22	1,800	15	--	3,420	35	--	5,150	152	--
23	1,280	13	--	2,980	16	--	4,340	74	--
24	1,430	7	--	2,500	9	--	4,540	85	--
25	1,650	7	--	2,030	9	--	5,010	112	--
26	1,800	8	--	1,950	15	--	5,600	126	--
27	1,940	11	--	1,890	12	--	6,440	138	--
28	1,980	12	--	1,820	7	--	7,310	246	--
29	1,880	13	--	--	--	--	7,730	280	--
30	1,420	15	--	--	--	--	6,720	221	--
31	1,060	9	--	--	--	--	6,050	166	--
Total load (tons)	--	--	--	--	--	--	--	--	--

IOWA RIVER BASIN--Continued

CEDAR RIVER AT CEDAR RAPIDS, IOWA--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	5,520	140	--	6,050	138	--	10,900	1,040	--
2	5,080	115	--	5,840	135	--	26,100	1,340	--
3	4,770	96	--	5,490	100	--	35,400	1,150	--
4	5,150	124	--	5,080	99	--	32,900	914	--
5	7,760	670	--	4,600	70	--	32,500	885	--
6	8,600	533	--	4,540	65	--	35,400	1,080	--
7	7,340	248	--	4,500	62	--	25,500	646	--
8	7,660	228	--	4,340	59	--	19,700	469	--
9	8,920	252	--	4,020	57	--	13,300	419	--
10	12,800	951	--	3,770	60	--	10,600	374	--
11	16,200	781	--	3,590	55	--	9,520	290	--
12	14,500	362	--	3,470	41	--	8,960	228	--
13	12,500	340	--	3,350	48	--	17,800	956	--
14	13,600	341	--	3,350	44	--	43,800	1,610	--
15	16,300	322	--	3,350	49	--	53,300	1,700	--
16	17,800	242	--	3,410	45	--	51,800	1,060	--
17	15,300	167	--	3,900	57	--	38,700	468	--
18	11,700	124	--	4,370	63	--	30,100	408	--
19	10,400	120	--	4,410	67	--	24,100	382	--
20	10,600	137	--	4,340	75	--	20,700	336	--
21	9,160	125	--	4,280	76	--	21,900	265	--
22	8,500	102	--	4,120	60	--	22,100	252	--
23	7,730	112	--	3,830	64	--	19,200	239	--
24	7,400	104	--	3,800	59	--	16,600	245	--
25	7,060	102	--	3,740	50	--	15,700	263	--
26	7,310	141	--	3,770	47	--	15,500	235	--
27	7,380	184	--	3,620	45	--	14,300	191	--
28	7,140	168	--	3,650	77	--	12,700	180	--
29	6,780	125	--	8,360	531	--	11,900	272	--
30	6,400	119	--	8,180	320	--	11,500	291	--
31	--	--	--	6,920	190	--	--	--	--
Total load (tons)	--	--	--	--	--	--	--	--	--

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	11,400	466	--	2,640	75	--	1,700	47	--
2	13,000	467	--	2,640	63	--	1,820	49	--
3	15,400	420	--	2,560	68	--	1,940	51	--
4	17,300	270	--	2,470	65	--	1,880	52	--
5	18,800	273	--	2,390	67	--	1,740	48	--
6	17,800	443	--	2,300	65	--	1,610	54	--
7	15,600	390	--	2,240	72	--	1,540	49	--
8	12,800	323	--	2,130	77	--	1,480	42	--
9	12,000	274	--	2,020	63	--	1,400	66	--
10	12,300	233	--	1,880	70	--	1,330	63	--
11	11,600	207	--	1,920	76	--	1,330	49	--
12	9,900	213	--	1,840	63	--	1,380	46	--
13	8,360	166	--	1,840	63	--	1,540	47	--
14	7,000	125	--	1,780	57	--	1,500	50	--
15	6,540	134	--	1,720	54	--	1,430	57	--
16	6,360	129	--	1,700	66	--	1,330	53	--
17	6,640	146	--	1,680	70	--	1,430	47	--
18	6,960	172	--	1,630	65	--	1,470	44	--
19	7,480	241	--	1,610	51	--	1,420	44	--
20	6,440	180	--	1,430	42	--	1,470	45	--
21	5,770	151	--	1,450	36	--	1,400	47	--
22	5,210	156	--	1,480	50	--	1,220	37	--
23	4,740	104	--	1,450	46	--	1,350	32	--
24	4,410	101	--	1,420	60	--	1,200	37	--
25	4,150	95	--	1,380	86	--	1,180	39	--
26	3,900	101	--	1,380	55	--	1,230	33	--
27	3,530	93	--	1,400	52	--	1,060	44	--
28	3,380	80	--	1,350	38	--	1,140	36	--
29	3,240	82	--	1,360	41	--	1,040	47	--
30	3,020	92	--	1,520	40	--	1,100	34	--
31	2,890	81	--	1,610	48	--	--	--	--
Total load (tons)	--	--	--	--	--	--	--	--	--

DES MOINES RIVER BASIN

DES MOINES RIVER BELOW RACCOON RIVER AT DES MOINES, IOWA

LOCATION.--At Fourteenth Avenue bridge, 1 miles below gaging station.
DRAINAGE AREA.--9,770 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1945.
Water temperatures: October 1944 to September 1945.
Sediment records: October 1944 to September 1945.
EXTREMES, 1946-47.--Sediment loads: Maximum, 590,000 tons per day June 13; minimum, 49 tons per day Sept. 25.
EXTREMES, 1944-47.--Dissolved solids, 1944-45: Maximum, 574 parts per million Jan. 13, 15-20, 1945; minimum, 294 parts per million Mar. 11, 13-20, 1945.
Total hardness, 1944-45: Maximum, 486 parts per million Jan. 7-8, 10, 1945; minimum, 228 parts per million Mar. 11, 13-20, 1945.
Water temperatures, 1944-45: Maximum, 81° F. Aug. 3, 1945; minimum, freezing point on many days in winter months.
Sediment loads: Maximum, 590,000 tons per day June 13, 1947; minimum, 16 tons per day Jan. 1, 1946.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1085.

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	1,480	450	1,670	2,980	155	1,180	2,340	86	524
2	1,220	180	563	2,890	140	1,050	1,900	91	451
3	1,140	118	348	2,850	154	1,120	1,660	120	515
4	1,080	96	271	2,770	154	1,090	1,600	100	419
5	1,010	83	221	2,610	154	1,030	1,900	107	534
6	935	57	141	2,500	154	986	2,080	88	477
7	911	58	140	2,500	157	1,010	2,160	93	525
8	1,030	68	186	2,460	155	976	2,300	81	491
9	983	56	146	2,380	156	951	2,300	67	410
10	1,240	360	1,130	2,420	162	1,010	2,270	57	343
11	1,630	309	1,290	2,690	168	1,160	2,230	56	331
12	1,830	385	1,790	2,690	175	1,210	2,000	56	297
13	2,080	533	2,790	2,650	172	1,170	1,700	53	239
14	2,120	489	2,600	2,690	165	1,140	1,400	43	163
15	2,040	254	1,330	2,730	164	1,150	1,000	63	167
16	2,080	152	809	2,810	151	1,080	800	52	110
17	2,190	155	869	2,810	113	819	700	42	79
18	5,390	2,940	32,500	2,810	95	698	525	45	64
19	5,280	4,010	47,500	2,850	96	716	692	55	101
20	3,920	1,280	11,200	3,060	92	735	983	70	183
21	3,360	600	5,010	3,180	106	884	1,200	97	305
22	2,980	350	2,650	3,060	102	818	1,250	103	338
23	2,770	250	1,780	2,940	108	833	1,300	73	253
24	4,210	409	4,360	2,810	96	706	1,400	52	193
25	6,320	1,960	24,400	2,730	98	700	1,350	43	157
26	4,800	1,160	12,900	2,610	102	698	1,000	30	81
27	4,010	536	5,390	2,340	87	531	700	44	83
28	3,440	289	2,550	2,230	83	488	600	92	144
29	3,360	226	1,950	2,190	97	556	500	114	147
30	3,230	204	1,690	2,270	94	558	450	70	84
31	3,100	167	1,330	--	--	--	500	53	70
Total load (tons)	--	--	171,504	--	--	27,053	--	--	8,278

DES MOINES RIVER BASIN--Continued

DES MOINES RIVER BELOW RACCOON RIVER AT DES MOINES, IOWA--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	550	62	91	900	28	68	1,950	28	147
2	600	64	102	880	26	62	1,900	22	113
3	800	64	136	850	22	50	1,850	29	145
4	1,000	52	138	880	38	90	1,850	32	160
5	1,150	54	165	900	64	153	1,850	55	270
6	1,150	50	155	950	60	151	1,870	63	313
7	1,000	49	132	1,000	124	321	1,900	87	431
8	900	37	90	1,000	125	324	1,940	65	335
9	700	32	60	1,110	54	159	2,040	52	281
10	790	35	75	1,300	30	105	2,460	60	392
11	850	63	142	1,400	30	113	3,140	118	958
12	1,000	26	70	1,500	30	122	3,920	2,600	20,300
13	1,160	38	119	1,600	45	194	6,940	3,540	53,000
14	1,190	33	106	1,800	152	700	7,200	3,120	46,700
15	1,240	31	104	2,250	266	1,540	7,050	1,480	22,300
16	1,150	29	90	2,500	275	1,760	6,890	732	12,400
17	1,080	33	96	2,750	272	1,920	6,890	754	12,600
18	1,100	27	80	3,100	286	2,280	6,580	818	13,100
19	1,200	24	78	3,480	159	1,420	6,110	650	9,870
20	1,200	21	68	3,530	126	1,150	5,620	491	6,930
21	1,150	20	62	3,600	98	923	5,620	533	7,530
22	1,200	28	91	3,500	67	624	5,910	516	7,660
23	1,240	24	80	3,300	53	463	5,710	872	12,000
24	1,240	16	54	3,000	50	405	6,470	1,010	15,500
25	1,240	18	60	2,700	44	321	6,940	1,180	18,700
26	1,420	22	84	2,400	42	272	7,470	1,200	20,600
27	1,400	20	76	2,200	39	232	7,050	939	15,900
28	1,270	28	96	2,000	35	189	6,420	529	8,530
29	1,150	33	102	--	--	--	6,060	481	7,310
30	1,050	20	57	--	--	--	5,660	350	5,030
31	1,000	25	68	--	--	--	5,320	310	4,220
Total load (tons)	--	--	2,927	--	--	16,111	--	--	323,725

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	4,990	253	3,230	10,000	1,450	31,300	10,700	2,660	56,900
2	4,610	220	2,600	9,900	795	19,100	17,000	3,500	129,000
3	4,420	200	2,270	9,810	698	16,800	22,600	3,150	148,000
4	5,420	1,590	17,700	9,200	460	10,600	26,300	1,240	73,900
5	6,520	3,460	48,800	8,500	384	8,280	31,200	3,260	414,000
6	6,600	1,620	21,700	7,600	383	7,390	35,200	1,850	128,000
7	6,800	1,320	20,200	7,000	370	6,580	27,300	880	57,700
8	7,200	790	13,800	6,600	314	5,260	20,800	995	49,200
9	8,000	1,560	25,900	6,500	271	4,510	16,900	1,000	40,200
10	11,000	5,330	147,000	6,420	260	4,280	14,200	1,060	35,300
11	14,000	5,180	180,000	5,800	242	3,600	10,400	920	23,000
12	16,700	4,740	190,000	5,600	235	3,370	18,800	1,080	34,700
13	17,000	2,040	68,400	5,500	270	3,800	54,100	4,590	590,000
14	16,700	1,680	56,800	5,600	242	3,480	45,400	2,150	191,000
15	15,600	1,290	45,100	6,000	384	5,850	37,700	660	61,200
16	14,500	1,030	35,500	6,500	1,240	18,300	34,000	630	53,200
17	13,400	968	31,200	7,400	3,070	30,200	29,600	480	35,600
18	12,100	740	22,000	7,700	2,060	31,200	25,500	510	32,600
19	11,700	880	24,700	8,200	1,260	23,500	25,000	835	50,800
20	14,300	2,180	61,400	7,900	898	17,000	26,300	780	49,800
21	12,400	1,680	42,200	7,300	606	11,000	27,000	922	59,900
22	11,000	786	21,000	6,700	524	8,810	29,000	2,220	127,000
23	10,200	593	15,000	6,600	753	12,100	34,000	1,970	132,000
24	9,870	525	13,000	6,500	708	11,300	33,200	1,730	115,000
25	9,870	468	11,600	6,400	700	11,000	46,300	2,480	226,000
26	10,000	450	11,300	6,580	577	9,430	74,000	1,660	248,000
27	9,870	413	10,300	6,470	384	6,310	61,100	985	143,000
28	9,400	455	10,700	8,730	1,100	22,600	48,300	590	70,800
29	9,010	2,140	38,000	14,100	3,530	107,000	38,600	690	65,500
30	11,400	4,730	130,000	12,000	1,520	38,600	29,300	695	50,000
31	--	--	--	10,700	1,510	34,100	--	--	--
Total load (tons)	--	--	1,321,400	--	--	526,650	--	--	3,304,300

DES MOINES RIVER BASIN--Continued

DES MOINES RIVER BELOW RACCOON RIVER AT DES MOINES, IOWA--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	23,600	650	38,100	2,400	88	551	600	60	96
2	23,100	710	40,300	2,300	115	683	600	56	89
3	25,900	575	37,000	2,200	61	356	570	60	91
4	25,600	395	25,600	2,100	60	335	550	65	95
5	25,000	645	40,000	2,000	52	275	540	59	85
6	24,600	2,540	125,000	1,900	55	277	520	61	84
7	20,500	1,210	57,000	1,800	49	238	480	58	74
8	18,200	640	28,900	1,700	45	207	460	58	71
9	17,100	570	24,200	1,600	46	199	450	62	74
10	16,000	494	19,800	1,500	49	198	457	62	75
11	14,200	468	16,700	1,400	45	170	550	73	107
12	12,400	463	14,400	1,350	40	146	630	89	146
13	9,750	445	10,900	1,250	46	155	712	84	156
14	8,400	425	9,070	1,190	59	186	559	73	109
15	7,690	429	8,370	1,080	58	166	508	70	95
16	7,050	400	7,160	1,030	63	172	508	76	101
17	6,520	399	6,600	983	56	146	491	77	99
18	6,420	530	8,550	911	57	138	426	69	78
19	6,000	425	6,480	887	60	141	457	65	79
20	5,400	408	5,600	863	52	119	370	65	64
21	4,900	314	3,900	794	59	124	384	70	72
22	4,600	288	3,400	754	68	136	412	53	58
23	4,400	263	2,970	794	67	141	356	56	53
24	4,200	231	2,480	800	66	140	342	55	50
25	4,100	206	2,170	850	65	147	328	56	49
26	4,060	195	2,030	900	97	228	328	63	55
27	3,600	144	1,340	850	114	250	314	61	51
28	3,100	160	1,270	750	68	136	314	70	58
29	2,900	125	940	700	66	123	314	70	58
30	2,700	107	758	640	67	114	328	70	61
31	2,500	97	634	620	70	116	--	--	--
Total load (tons)	--	--	551,622	--	--	6,513	--	--	2,433
Total load for year									6,262,516

RACCOON RIVER AT DES MOINES, IOWA

LOCATION.--At 18th Street bridge.
DRAINAGE AREA.--3,590 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to January 1947.
Water temperatures: October 1945 to January 1947.
EXTREMES, 1945-47.--Dissolved solids: Maximum, 500 parts per million Jan. 1-10, 1947; minimum, 141 parts per million Sept. 8-10, 1945.
Total hardness: Maximum, 423 parts per million Dec. 21-31, 1945; minimum, 110 parts per million Jan. 6-10, 1946.
Water temperatures: Maximum, 83° F. July 10, 1946; minimum, freezing point on many days in winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, October 1946 to January 1947

Date of collection	Temperature (° F.)	Color	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1946 ---	58	15	8.1	58.9	18	0.02	82	27	9.2	3.1	319	57	5.1	0.4	7.0	372	0.51	316	54	6
Oct. 11-20 -------	50	15	8.0	54.9	19	.02	72	24	7.9	3.3	278	50	4.9	.3	9.4	331	.45	278	50	6
Oct. 21-31 -------	--	12	7.9	57.0	20	.02	79	25	7.3	3.0	302	52	3.9	.4	12	356	.48	300	52	5
Nov. 1-3 ---------	--	3	8.2	63.3	21	.02	89	29	9.0	3.3	344	62	4	.3	14	402	.55	341	58	5
Nov. 18-20 -------	--	3	8.3	63.8	21	.02	90	30	7.9	2.4	352	57	3	.3	16	407	.55	348	59	5
Nov. 21-30 -------	34	3	8.1	65.5	19	.04	90	30	9.7	1.6	347	66	4.9	.4	16	416	.57	348	64	6
Dec. 1-10 --------	36	3	8.0	67.0	20	.04	92	31	9.0	1.8	349	67	4.8	.3	16	420	.57	357	71	5
Dec. 11-20 -------	37	2	8.0	66.7	19	.05	90	33	10	1.6	350	69	5.5	.3	13	417	.57	360	73	6
Dec. 21-31 -------	32	3	8.0	69.5	17	.04	96	34	9.8	1.7	369	68	5.5	.3	16	421	.57	380	77	5
Jan. 1-10, 1947 ---	32	3	7.8	78.3	21	.04	108	36	12	1.8	414	79	6.1	.3	17	500	.68	418	78	6
Jan. 11-17 --------	--	3	8.0	65.0	18	.06	89	29	9.6	1.7	335	66	5.4	.3	13	401	.55	341	66	6

YELLOWSTONE RIVER BASIN

WIND RIVER NEAR DUBOIS, WYO.

LOCATION.--At gaging station 7 miles northwest of Dubois, Fremont County, at U. S. Highway 287, 1.8 miles upstream from mouth of Warm Springs Creek, and 1 mile downstream from mouth of Bench Creek.
DRAINAGE AREA.--233 square miles.
RECORDS AVAILABLE.--Chemical analyses: April to September, 1947.
Water temperatures: May to September, 1947.
EXTREMES, 1947.--Dissolved solids: Maximum, 163 parts per million Apr. 1-30; minimum, 94 parts per million July 1-Aug. 1.
Total hardness: Maximum, 120 parts per million Apr. 1-30; minimum, 58 parts per million May 5-June 30.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086. Records of specific conductance of daily samples available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Apr. 1-30, 1947	85	--	8.2	26.1	12	0.00	30	11	4.5		132	18	2.0	0.3	0.4	--	163	0.22	37	120	12	7
May 1-4	238	53	7.7	22.8	16	.00	26	7.9	6.6		118	14	1.0	.1	.3	--	146	.20	94	97	0	13
May 5-31	584	50	7.2	13.9	24	.00	17	3.7	18	0.8	72	35	1.0	.2	.5	0.3	105	.14	166	58	0	40
June 1-30	600	52	7.2	14.0	26	.01	16	4.7	8.0	2.0	72	17	1.0	.2	.5	.3	98	.13	159	58	0	22
July 1-Aug. 1	414	56	7.9	13.3	28	.05	15	8.5	5.2		80	14	.6	.2	.5	.0	94	.13	105	72	6	12
Aug. 2-11	290	64	7.7	14.4	29	.02	17	8.5	4.3		80	18	.5	.2	.5	.0	107	.15	84	77	11	10
Aug. 12-31	172	63	7.8	14.7	30	.10	19	9.0	4.8		89	19	.6	.1	.5	.2	106	.14	49	84	11	10
Sept. 1-30	113	59	7.8	17.1	28	.01	20	10	4.2		90	23	.9	.2	.5	.0	114	.16	35	81	7	9
Weighted average	1/329	--	--	14.7	26	0.02	17	6.3	9.6		79	22	0.9	0.2	0.5	--	104	0.14	92	68	3	22

1/ Mean discharge for water year October 1946 to September 1947 was 198 second-feet.

Temperature (° F.) of water, water year October 1946 to September 1947

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

WIND RIVER AT RIVERTON, WYO.

LOCATION.--At gaging station three-quarters of a miles east of Riverton, Fremont County, at bridge on State Highway 320, three-quarters of a mile upstream from confluence with Popo Agie River.
DRAINAGE AREA.--2,320 square miles.
RECORDS AVAILABLE.--Chemical analyses: March to September, 1947.
Water temperatures: April to September, 1947.
EXTREMES, 1947.--Dissolved solids: Maximum, 358 parts per million Apr. 22-29; minimum, 106 parts per million July 1-31.
Total hardness: Maximum, 216 parts per million March 31-Apr. 10; minimum, 72 parts per million Aug. 1-9.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086. Records of specific conductance available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Mar. 31-Apr. 10, 1947-	363	--	8.1	53.3	11	0.00	57	18	29		192	105	11	0.2	0.6	0.3	327	0.44	320	216	59	22
Apr. 11-21----------	410	--	8.1	53.8	18	.00	54	17	29		184	103	9.0	.3	.5	.4	327	.44	362	205	54	23
Apr. 22-29----------	517	45	8.0	57.1	19	.00	54	17	39		186	119	11	.2	.8	.3	358	.49	500	205	52	29
Apr. 30-May 31-------	2,590	50	8.0	27.4	19	.00	33	9.0	9.4		114	36	5.0	.2	1.5	.2	174	.24	1,220	119	26	15
June 1-11----------	2,390	54	8.1	22.0	19	.00	26	9.4	4.8		94	25	7.0	.2	.4	--	141	.19	910	104	27	11
June 12-13----------	3,560	48	8.3	34.0	24	.00	51	6.6	1.7		122	53	1.5	.1	.8	--	222	.30	2,130	154	54	2
June 14-30----------	5,390	55	7.9	20.9	9.0	.00	22	8.3	4.6		86	24	2.0	.1	.6	.3	130	.18	1,890	89	18	10
June 1-31----------	3,594	62	8.1	17.3	4.0	.00	23	7.2	.1		78	19	2.0	.1	.5	--	106	.14	1,030	87	23	1
Aug. 1-9----------	1,610	64	7.8	24.5	15	.01	20	5.5	9.1	1.2	78	27	2.0	.2	1.0	.1	126	.17	548	72	8	24
Aug. 10-14----------	2,020	62	7.7	24.5	17	.01	22	4.8	12		80	28	2.5	.3	1.5	--	126	.17	687	75	9	26
Aug. 11----------	2,450	60	8.0	22.4	19	.05	41	5.0	9.2		94	58	3.0	.1	1.2	--	166	.23	1,100	123	46	14
Aug. 15-20----------	995	62	7.7	28.4	16	.01	28	6.1	14	1.2	102	38	3.5	.2	2.0	.5	160	.22	430	95	11	27
Aug. 21-26----------	490	62	7.6	29.4	18	.01	32	8.3	19		110	54	5.0	.2	2.0	.3	190	.26	251	114	24	27
Aug. 27-Sept. 8 -------	363	65	8.1	32.4	14	.01	34	8.1	25		122	60	5.7	.2	1.8	.0	220	.30	216	116	16	32
Sept. 9-29 ----------	443	62	7.8	33.0	14	.01	38	13	21		136	70	6.3	.2	1.5	.1	238	.32	285	148	36	24
Sept. 30 ----------	886	55	8.1	30.2	21	.01	37	10	13		130	44	4.4	.3	2.5	--	202	.27	483	133	26	17
Weighted average-----	1/2,065	--	--	23.6	12	0.00	27	8.3	6.6		96	31	3.5	0.1	0.9	--	147	0.20	814	102	24	11

1/ Mean discharge for water year October 1946 to September 1947 was 1,262 second-feet.

Temperature (° F.) of water, water year October 1946 to September 1947

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	--	--	--	--	--	--	--	47	54	56	63	63
2	--	--	--	--	--	--	--	52	53	59	65	--
3	--	--	--	--	--	--	--	55	54	60	67	69
4	--	--	--	--	--	--	--	52	53	59	65	68
5	--	--	--	--	--	--	--	52	53	59	62	68
6	--	--	--	--	--	--	--	51	54	62	64	68
7	--	--	--	--	--	--	--	51	55	62	64	67
8	--	--	--	--	--	--	--	50	59	63	65	63
9	--	--	--	--	--	--	--	52	57	61	66	64
10	--	--	--	--	--	--	--	51	51	62	64	64
11	--	--	--	--	--	--	--	47	49	62	60	64
12	--	--	--	--	--	--	--	47	44	60	61	65
13	--	--	--	--	--	--	--	49	51	62	60	60
14	--	--	--	--	--	--	--	50	56	63	64	59
15	--	--	--	--	--	--	--	50	56	63	62	61
16	--	--	--	--	--	--	--	52	57	62	62	62
17	--	--	--	--	--	--	--	52	57	62	64	59
18	--	--	--	--	--	--	--	52	57	61	62	59
19	--	--	--	--	--	--	--	50	58	62	62	60
20	--	--	--	--	--	--	--	49	57	64	62	60
21	--	--	--	--	--	--	--	50	50	63	64	59
22	--	--	--	--	--	--	--	51	50	63	64	62
23	--	--	--	--	--	--	40	58	52	61	60	64
24	--	--	--	--	--	--	42	50	54	62	61	65
25	--	--	--	--	--	--	45	53	55	63	60	65
26	--	--	--	--	--	--	45	55	57	62	60	63
27	--	--	--	--	--	--	48	53	57	64	62	63
28	--	--	--	--	--	--	--	45	54	64	63	62
29	--	--	--	--	--	--	50	42	54	65	62	60
30	--	--	--	--	--	--	52	45	53	65	64	58
31	--	--	--	--	--	--	--	54	--	65	63	--
Average	--	--	--	--	--	--	--	51	54	62	63	63

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT THERMOPOLIS, WYO.

LOCATION.--At Broadway Street bridge in Thermopolis, Hot Springs County.
DRAINAGE AREA.--8,080 square miles.
RECORDS AVAILABLE.--Chemical analyses: April to September 1947.
Water temperatures: April to September 1947.
Sediment records: March 1946 to September 1947.
EXTREMES, March-September 1946.--Sediment loads: Maximum, 203,000 tons per day June 19; minimum, 1,160 tons per day Apr. 13.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 726 parts per million Apr. 1-10; minimum, 176 parts per million July 7-15.
Total hardness: Maximum, 346 parts per million Apr. 1-20; minimum, 107 parts per million July 7-15.
Water temperatures: Maximum, 71° F. Aug. 10; minimum, 44° F. Apr. 16.
Sediment loads: Maximum, 137,000 tons per day May 5; minimum, 33 tons per day Jan. 2.
EXTREMES, March 1946-September 1947.--Sediment loads: Maximum, 203,000 tons per day June 19, 1946; minimum, 33 tons per day Jan. 2, 1947.
REMARKS.--Records of water discharge for water year October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086. Records of specific conductance of daily samples available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Apr. 1-10, 1947 ----	879	--	8.3	102	9.0	0.06	86	32	96	14	212	355	19	0.5	2.5	0.3	726	0.99	1,720	346	172	36
Apr. 11-20---------	942	47	8.1	100	9.0	.06	86	32	96	8.8	216	347	18	.4	2.0	.3	709	.96	1,800	346	169	37
Apr. 21-30---------	1,370	51	8.3	100	10	.06	82	32	95	15	208	349	17	.4	2.8	.3	710	.97	2,630	336	165	37
May 1-10----------	4,640	59	8.2	49.6	14	.08	52	16	30	7.2	158	126	6.0	.3	.8	.9	335	.46	4,200	196	66	24
May 11-20---------	5,810	56	8.3	35.0	11	.06	35	11	19	8.8	117	79	3.9	.2	2.0	.9	234	.32	3,670	133	37	23
May 21-31---------	4,490	55	8.1	33.3	9.0	.05	34	11	10	14	106	74	4.0	.2	.5	.9	222	.30	2,690	130	43	13
June 1-9 ----------	4,370	59	8.1	34.1	21	.05	33	10	22	8.0	114	75	4.0	.2	.4	.5	234	.32	2,760	123	30	26
June 10-12 --------	6,420	54	7.6	30.6	17	.10	34	9.2	15	8.8	110	66	5.0	.2	1.1	--	214	.29	3,710	123	33	20
June 13-14 --------	8,430	52	7.7	61.2	20	.10	44	18	56	15	144	188	7.0	.2	.8	--	422	.57	9,610	184	66	38
June 15-16 --------	8,190	59	7.9	42.7	20	.08	42	16	26	6.4	144	110	2.0	.2	1.5	--	298	.41	6,590	171	53	24
June 17-21 --------	10,500	60	7.9	34.0	16	.06	34	12	15	5.2	118	66	2.0	.3	.5	--	226	.31	6,410	134	37	19
June 22-24 --------	15,800	54	8.3	46.2	18	.02	49	13	32		133	120	6.7	.4	1.2	--	309	.42	13,200	176	67	29
June 25-27 --------	11,400	60	8.2	32.9	16	.02	39	12	16	.8	118	71	4.8	.3	.0	--	213	.29	6,560	147	50	19
June 28-July 6 ------	8,720	60	8.3	40.5	21	.02	40	13	21	1.6	127	92	5.3	.2	.3	--	261	.35	6,140	153	49	23
July 7-15----------	7,790	67	8.1	27.3	16	.02	31	7.9	14	3.2	100	53	3.8	.2	.0	.5	176	.24	3,700	107	25	21
July 16-21---------	5,360	68	8.2	33.8	18	.02	38	9.8	19	3.6	110	78	5.0	.2	.0	--	220	.30	3,180	135	45	23
July 22-23---------	6,240	68	8.0	39.1	24	.02	45	10	27	3.2	83	124	5.7	.4	.4	--	266	.36	4,480	153	85	27
July 24------------	5,970	67	8.1	54.6	24	.04	63	9.0	60		150	181	6.0	.4	3.9	--	394	.54	6,350	194	71	40
July 25-Aug. 1------	3,880	68	8.3	37.0	17	.08	42	10	27	3.6	106	107	5.8	.2	.0	.6	242	.33	2,540	146	59	28

Aug. 2 ----------	2,980	68	7.9	64.2	18	.04	70	11	68		160	212	10	.4	.5	--	504	.69	4,060	220	89	40
Aug. 3-10 ----------	2,990	69	8.3	50.5	18	.02	48	12	46	3.2	119	151	8.7	.3	.1	.8	337	.46	2,720	169	71	37
Aug. 11-15 ----------	3,660	--	8.4	50.2	15	.02	50	12	45	3.2	121	149	7.5	.3	.2	.1	336	.46	3,320	174	75	35
Aug. 16-21 ----------	2,060	--	8.3	62.4	16	.08	52	15	54	3.2	127	194	12	.3	.2	--	416	.57	2,310	191	87	38
Aug. 22-Sept. 30----	1,100	61	8.3	85.6	10	.20	72	22	91	3.6	1/172	302	15	.3	1.6	.8	604	.82	1,790	270	129	42
Weighted average -	2/4,068	--	--	44.3	16	0.05	44	13	31	5.7	127	118	6.2	0.3	0.7	--	299	0.41	3,280	163	59	26

1/ Includes equivalent of 7 parts per million of carbonate (CO_3).
2/ Mean discharge for water year October 1946 to September 1947 was 2,464 second-feet.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT THERMOPOLIS, WYO.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	--	--	--	--	--	--	--	54	56	57	69	63
2	--	--	--	--	--	--	--	56	58	60	68	63
3	--	--	--	--	--	--	--	61	59	64	70	64
4	--	--	--	--	--	--	--	62	60	60	70	63
5	--	--	--	--	--	--	--	61	57	64	67	64
6	--	--	--	--	--	--	--	59	56	64	67	65
7	--	--	--	--	--	--	--	58	58	66	68	64
8	--	--	--	--	--	--	--	58	63	67	70	63
9	--	--	--	--	--	--	--	58	63	68	70	63
10	--	--	--	--	--	--	--	58	58	66	71	61
11	--	--	--	--	--	--	--	55	55	66	65	56
12	--	--	--	--	--	--	--	58	50	65	65	--
13	--	--	--	--	--	--	--	54	49	66	--	59
14	--	--	--	--	--	--	--	50	55	67	--	54
15	--	--	--	--	--	--	48	55	59	68	--	54
16	--	--	--	--	--	--	44	56	59	69	--	56
17	--	--	--	--	--	--	48	58	61	67	--	56
18	--	--	--	--	--	--	48	58	60	67	--	57
19	--	--	--	--	--	--	48	56	62	67	--	58
20	--	--	--	--	--	--	52	58	63	69	--	55
21	--	--	--	--	--	--	52	56	55	67	68	55
22	--	--	--	--	--	--	48	55	51	67	68	56
23	--	--	--	--	--	--	45	55	52	68	63	58
24	--	--	--	--	--	--	48	55	58	67	64	60
25	--	--	--	--	--	--	49	58	59	67	62	61
26	--	--	--	--	--	--	51	59	61	66	63	62
27	--	--	--	--	--	--	53	59	69	67	64	60
28	--	--	--	--	--	--	54	51	59	68	64	59
29	--	--	--	--	--	--	55	48	59	68	63	60
30	--	--	--	--	--	--	55	49	55	69	67	58
31	--	--	--	--	--	--	--	--	--	--	64	--
Average	--	--	--	--	--	--	--	56	58	66	--	60

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT THERMOPOLIS, WYO.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--
8	--	--	--	--	--	--	--	--	--
9	--	--	--	--	--	--	--	--	--
10	--	--	--	--	--	--	--	--	--
11	--	--	--	--	--	--	--	--	--
12	--	--	--	--	--	--	--	--	--
13	--	--	--	--	--	--	--	--	--
14	--	--	--	--	--	--	--	--	--
15	--	--	--	--	--	--	1,160	1,270	3,970
16	--	--	--	--	--	--	1,140	1,480	4,540
17	--	--	--	--	--	--	1,060	1,250	3,590
18	--	--	--	--	--	--	1,000	1,460	3,940
19	--	--	--	--	--	--	970	2,160	5,660
20	--	--	--	--	--	--	970	1,820	4,770
21	--	--	--	--	--	--	1,080	1,870	5,460
22	--	--	--	--	--	--	1,030	1,500	4,170
23	--	--	--	--	--	--	1,020	1,560	4,290
24	--	--	--	--	--	--	934	1,270	3,210
25	--	--	--	--	--	--	855	1,050	2,420
26	--	--	--	--	--	--	830	1,020	2,300
27	--	--	--	--	--	--	810	1,300	2,850
28	--	--	--	--	--	--	806	1,480	3,220
29	--	--	--	--	--	--	895	1,860	4,500
30	--	--	--	--	--	--	1,030	2,510	6,980
31	--	--	--	--	--	--	1,070	2,610	7,530
Total load (tons)	--	--	--	--	--	--	--	--	73,400

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	976	2,060	5,430	2,080	1,620	9,160	2,270	2,810	17,300
2	928	1,640	4,110	1,810	1,500	7,350	2,180	2,340	13,800
3	880	1,650	3,920	1,390	1,280	4,800	2,260	2,390	14,600
4	820	1,320	2,920	1,090	1,240	3,640	2,390	2,610	16,800
5	778	1,020	2,150	1,110	1,490	4,550	3,060	4,860	43,700
6	742	1,060	2,110	1,540	2,720	11,300	4,800	6,550	85,000
7	742	968	1,940	1,760	2,600	12,400	6,610	10,500	187,000
8	738	929	1,850	1,600	2,290	9,930	5,750	4,500	70,000
9	734	886	1,760	1,700	2,330	10,700	4,620	4,550	56,600
10	714	833	1,600	2,030	3,070	16,800	4,740	4,150	53,100
11	714	708	1,370	2,160	3,620	21,200	5,220	4,160	58,700
12	702	718	1,360	2,000	2,880	15,600	4,950	4,100	53,800
13	698	616	1,160	1,830	2,640	13,100	4,610	2,920	36,400
14	730	918	1,810	1,690	2,000	9,140	4,080	2,130	23,400
15	928	1,750	4,380	1,590	1,520	6,560	4,140	1,980	22,000
16	1,020	1,800	4,970	1,360	1,670	6,140	4,510	2,500	30,400
17	964	1,530	3,990	1,200	1,950	6,330	4,780	2,350	30,300
18	1,340	2,330	8,740	1,020	2,330	6,420	5,220	3,100	43,700
19	1,660	2,710	12,200	958	2,090	5,420	7,110	10,600	203,000
20	1,760	2,710	12,900	1,410	3,040	11,600	5,090	5,560	76,500
21	1,980	2,750	14,700	1,380	2,700	10,100	4,270	2,810	32,400
22	2,070	2,220	12,400	1,230	2,250	7,500	4,030	2,480	27,000
23	1,810	1,740	8,490	1,420	2,620	10,100	4,300	2,970	34,500
24	1,380	1,280	4,780	1,760	3,330	15,800	4,670	3,540	44,600
25	1,550	2,460	10,300	2,120	3,710	21,200	4,130	2,200	24,600
26	1,950	2,990	15,700	1,970	2,700	14,400	3,790	1,770	18,100
27	2,300	3,070	19,100	1,920	2,480	12,900	3,740	2,220	22,400
28	2,500	2,670	18,000	2,250	3,730	22,700	3,560	2,260	21,700
29	2,320	2,300	14,400	2,310	4,470	27,900	3,760	2,710	27,600
30	2,200	2,030	12,000	2,740	5,100	37,700	3,860	2,690	28,000
31	--	--	--	2,570	3,950	28,000	--	--	--
Total load (tons)	--	--	210,500	--	--	400,400	--	--	1,417,000

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT THERMOPOLIS, WYO.--Continued

Suspended sediment, water year October 1945 to September 1946--Continued

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	3,740	2,990	30,200	860	2,910	6,760	1,360	3,800	14,000
2	4,130	7,860	94,000	880	2,820	6,710	1,270	2,600	8,920
3	3,700	4,620	46,200	890	2,860	6,870	1,220	2,300	7,590
4	3,960	3,110	33,200	802	2,670	5,780	1,180	2,150	6,850
5	3,960	4,270	45,700	730	2,450	4,830	1,130	1,980	6,050
6	3,720	4,440	44,600	680	2,520	4,620	1,060	1,750	5,010
7	3,600	4,160	40,500	652	2,430	4,280	1,180	2,000	6,380
8	3,480	4,220	39,700	620	2,450	4,100	1,540	4,730	25,400
9	3,200	3,670	31,700	587	2,480	3,930	2,710	19,700	148,000
10	2,730	3,340	24,600	617	2,900	4,840	1,820	9,250	45,500
11	2,350	3,270	20,700	686	2,510	4,650	1,440	4,100	16,000
12	2,080	3,160	17,800	669	2,650	4,790	1,280	2,750	9,520
13	1,990	3,600	19,400	666	2,600	4,680	1,150	2,300	7,150
14	1,960	3,520	18,600	690	2,850	5,310	1,110	2,010	6,030
15	2,140	4,100	23,900	686	2,900	5,380	1,040	1,920	5,390
16	2,360	4,590	29,200	658	2,350	4,170	970	1,780	4,660
17	2,190	3,770	22,300	614	2,350	3,900	964	1,820	4,740
18	2,100	3,400	19,300	584	2,320	3,660	970	1,870	4,790
19	1,920	2,860	14,800	599	2,280	3,690	1,230	2,440	7,850
20	1,780	2,950	14,200	596	2,200	3,540	1,340	2,490	8,730
21	1,660	3,150	14,100	596	2,200	3,540	1,300	2,210	7,450
22	1,540	2,940	12,200	652	2,700	4,750	1,290	2,170	7,250
23	1,380	2,860	10,700	734	2,700	5,350	1,310	2,080	6,980
24	1,290	2,690	9,360	802	2,850	6,170	1,260	1,890	6,060
25	1,380	2,970	11,100	815	2,600	5,720	1,180	1,720	5,160
26	1,500	3,820	15,500	845	2,520	5,750	1,160	1,640	4,760
27	1,290	3,140	10,900	976	4,400	11,600	1,110	1,540	4,290
28	1,200	2,800	9,090	1,170	4,600	14,600	1,050	1,490	3,890
29	1,110	2,570	7,710	1,350	5,400	19,700	1,010	1,420	3,580
30	1,020	2,320	6,390	1,540	4,300	17,900	982	1,380	3,340
31	910	2,440	6,000	1,720	5,100	23,700	--	--	--
Total load (tons)	--	--	743,600	--	--	215,300	--	--	401,300
Total load for period Mar. 15 to Sept. 30 (tons)									3,462,000

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT THERMOPOLIS, WYO.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	975	1,280	3,370	1,010	722	1,970	825	643	1,430
2	2,120	6,340	36,400	930	602	1,510	810	614	1,340
3	2,220	3,380	20,200	920	592	1,470	760	422	865
4	2,250	3,230	19,600	870	447	1,050	725	360	705
5	2,340	3,120	19,700	835	414	935	705	285	543
6	2,440	4,370	28,800	880	512	1,220	800	611	1,320
7	2,420	3,540	23,200	915	530	1,310	845	714	1,630
8	2,200	3,770	22,400	950	547	1,410	820	707	1,570
9	1,450	1,730	6,780	1,010	846	2,310	785	662	1,400
10	1,340	1,800	6,510	975	708	1,870	720	446	866
11	1,250	1,540	5,200	835	391	881	681	382	703
12	1,190	1,270	4,080	780	246	518	760	531	1,090
13	1,060	972	2,780	780	300	632	740	472	945
14	920	837	2,080	745	279	561	780	625	1,320
15	985	981	2,610	805	387	841	765	625	1,290
16	990	1,030	2,750	965	720	1,880	760	609	1,250
17	1,060	1,160	3,320	895	574	1,390	705	275	525
18	1,100	1,110	3,300	780	381	803	488	139	183
19	1,150	1,110	3,450	830	490	1,100	396	77	82
20	1,090	967	2,850	950	745	1,920	452	155	189
21	1,060	809	2,310	930	956	2,400	536	280	406
22	1,060	757	2,160	830	534	1,200	600	409	664
23	1,070	790	2,280	730	378	745	700	580	1,100
24	1,030	780	2,170	835	572	1,290	740	581	1,160
25	1,050	770	2,180	885	776	1,860	715	480	926
26	1,020	831	2,290	780	446	945	705	466	887
27	1,010	826	2,250	770	485	1,010	710	400	767
28	1,040	758	2,130	840	698	1,580	715	362	699
29	1,080	874	2,540	870	749	1,760	568	161	247
30	1,080	969	2,820	840	581	1,320	410	40	44
31	1,100	931	2,770	--	--	--	315	49	42
Total load (tons)	--	--	245,300	--	--	39,700	--	--	26,190
	January			February			March		
1	420	39	44	677	244	445	560	117	177
2	360	34	33	636	276	475	560	109	165
3	428	46	53	645	276	480	560	138	209
4	459	141	174	681	242	445	600	174	282
5	480	95	123	690	318	592	690	319	593
6	480	104	135	710	343	657	725	400	783
7	480	130	168	735	349	694	705	369	703
8	564	148	225	715	233	450	690	340	633
9	560	226	342	659	180	320	715	391	755
10	540	474	691	627	182	308	830	1,550	3,890
11	556	631	948	632	163	278	800	1,320	2,850
12	576	370	575	649	200	350	795	845	1,820
13	576	372	580	705	332	632	795	757	1,620
14	572	336	518	735	362	718	795	733	1,570
15	536	207	300	795	498	1,070	785	710	1,510
16	508	123	169	800	512	1,110	860	1,140	2,630
17	512	118	163	785	400	850	1,040	2,030	5,700
18	536	165	239	790	379	810	1,070	1,930	5,570
19	572	220	340	770	377	784	1,150	2,070	6,430
20	588	215	342	740	377	753	1,270	2,490	8,680
21	618	185	308	710	346	663	1,430	3,880	15,200
22	622	371	623	685	350	647	1,490	3,870	15,600
23	645	387	675	710	342	655	1,570	4,650	19,700
24	672	444	805	760	558	1,150	1,310	3,270	11,600
25	700	484	915	730	371	730	1,240	2,970	9,950
26	730	587	1,160	672	271	492	1,030	2,850	7,930
27	720	495	962	604	158	258	865	2,110	4,930
28	750	513	1,040	556	107	161	825	2,010	4,480
29	745	532	1,070	--	--	--	810	1,680	3,670
30	710	350	671	--	--	--	805	1,780	3,870
31	681	244	450	--	--	--	825	2,090	4,650
Total load (tons)	--	--	15,740	--	--	16,980	--	--	148,200

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT THERMOPOLIS, WYO.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	925	2,900	7,240	1,870	3,870	19,500	4,340	2,060	24,100
2	965	2,990	7,800	1,650	3,100	13,800	4,330	1,920	22,500
3	915	2,450	6,050	1,920	3,400	17,600	4,130	1,740	19,400
4	960	2,600	6,740	3,270	9,490	83,500	4,340	1,950	22,900
5	996	3,230	8,690	4,690	10,800	137,000	4,580	1,930	23,900
6	920	2,130	5,290	5,490	8,120	120,000	4,280	1,510	17,400
7	845	1,600	3,650	6,030	6,480	106,000	4,120	1,290	14,300
8	780	1,520	3,200	6,700	5,380	97,500	4,130	1,250	13,900
9	765	1,390	2,870	7,060	4,060	77,500	5,040	1,860	25,300
10	720	1,280	2,480	7,700	3,920	81,500	6,620	4,090	73,100
11	710	1,280	2,450	8,050	3,340	72,600	6,210	3,140	52,700
12	700	1,220	2,310	8,120	3,920	86,000	7,610	4,710	97,100
13	725	1,240	2,620	7,180	3,750	72,700	8,900	5,210	125,000
14	800	1,880	4,090	5,890	4,040	64,200	7,960	3,810	82,000
15	905	2,870	7,090	5,030	3,690	50,100	8,010	2,490	54,000
16	885	2,810	6,710	4,770	3,090	39,800	8,370	2,190	49,500
17	1,190	4,970	16,000	4,770	2,790	35,900	8,780	2,040	48,400
18	1,170	2,670	8,440	5,040	2,880	39,200	9,530	2,290	59,000
19	1,130	2,330	7,130	4,840	2,420	31,600	10,300	2,420	67,400
20	1,220	2,790	9,200	4,390	2,140	25,400	11,000	2,120	63,000
21	1,330	3,310	11,900	4,420	2,010	23,900	12,800	2,840	98,200
22	1,630	5,260	23,200	4,340	2,130	24,900	15,300	2,990	124,000
23	1,590	4,160	17,900	4,500	2,370	28,800	16,900	2,110	96,400
24	1,380	2,680	10,000	4,200	1,980	22,400	15,200	1,390	57,000
25	1,240	2,470	8,270	4,050	1,820	19,900	12,600	1,530	52,000
26	1,070	2,120	6,130	4,100	1,890	20,900	10,900	1,730	51,000
27	1,070	1,740	5,030	4,310	2,470	28,700	10,700	1,580	45,600
28	1,160	1,740	5,450	4,750	3,860	49,500	11,000	1,350	40,100
29	1,430	2,900	11,200	5,530	4,420	66,000	11,600	1,200	37,600
30	1,780	4,110	19,800	4,690	2,950	37,400	10,200	1,370	37,800
31	--	--	--	4,450	2,290	27,500	--	--	--
Total load (tons)	--	--	238,900	--	--	1,621,000	--	--	1,595,000
	July			August			September		
1	8,120	1,780	39,000	3,020	2,270	18,500	948	1,580	4,050
2	6,860	2,010	37,200	2,980	3,640	29,300	948	1,710	4,370
3	6,600	1,800	32,100	3,060	2,730	22,600	942	1,740	4,420
4	7,020	1,780	33,700	3,140	2,610	22,100	915	1,540	3,810
5	8,330	2,090	47,000	3,120	2,600	21,900	900	1,350	3,280
6	8,730	1,810	42,700	3,170	2,550	21,800	920	1,470	3,650
7	8,460	1,800	41,200	3,000	2,240	18,200	942	1,560	3,960
8	8,290	1,620	36,200	2,780	2,050	15,400	936	1,520	3,840
9	8,830	1,720	41,000	2,700	1,930	14,100	966	1,590	4,150
10	8,760	1,550	36,600	2,940	2,230	17,700	1,030	1,690	4,700
11	8,580	1,670	38,700	3,870	9,720	102,000	1,050	1,530	4,340
12	7,910	1,500	32,100	4,180	5,950	67,200	1,100	1,470	4,370
13	7,100	1,430	27,400	3,890	3,790	39,800	1,140	1,400	4,310
14	6,400	1,600	27,700	3,380	3,140	28,700	1,110	1,340	4,020
15	5,740	1,580	24,500	3,000	2,870	23,200	1,060	1,160	3,320
16	5,280	1,520	21,700	2,720	2,320	17,100	1,030	1,160	3,230
17	5,360	1,690	24,500	2,490	2,350	15,800	1,020	1,190	3,280
18	5,560	1,980	29,800	2,220	2,110	12,600	1,080	1,240	3,620
19	5,480	1,680	24,900	1,970	1,790	9,550	1,140	1,190	3,670
20	5,180	1,500	21,000	1,620	1,490	6,520	1,390	1,610	6,050
21	5,310	1,710	24,500	1,350	1,430	5,220	1,490	1,570	6,320
22	5,680	4,100	63,200	1,160	1,360	4,260	1,350	1,040	3,800
23	6,790	5,630	104,000	1,110	1,440	4,280	1,290	1,060	3,690
24	5,970	4,760	76,800	1,150	1,530	4,750	1,260	1,050	3,570
25	5,380	3,050	44,400	1,150	1,580	4,900	1,260	1,070	3,640
26	4,910	2,340	31,000	1,110	1,780	5,330	1,230	1,060	3,520
27	4,290	2,020	23,400	1,060	1,570	4,500	1,180	990	3,160
28	3,820	1,850	19,100	1,030	1,570	4,370	1,160	980	3,070
29	3,420	1,790	16,500	1,010	1,420	3,880	1,160	1,010	3,160
30	3,170	1,860	15,900	972	1,500	3,940	1,380	1,460	5,440
31	3,080	1,830	15,000	960	1,440	3,740	--	--	--
Total load (tons)	--	--	1,093,000	--	--	573,200	--	--	119,800
Total load for year (tons)									5,733,000

BIGHORN RIVER AT THERMOPOLIS, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Instantaneous discharge (second-feet)	Suspended sediment													
		Concentration at time of sampling (p.p.m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p.p.m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)									
						0.00195	0.0039	0.0078	0.0156	0.0312	0.0625	0.125	0.250	0.500	1.000	2.000
June 20, 1946	5,240	6,370	90,100	18,700	BN	30	40	50	59	68	79	89	95	98	99	--
Sept. 6	1,060	1,730	4,950	3,310	BN	--	3	19	41	58	79	93	98	99	100	--
June 13, 1947	9,050	4,480	109,000	13,300	BN	25	30	37	46	56	66	74	87	92	95	--
June 21	12,800	2,630	90,900	2,990	BN	9	15	32	54	61	69	77	87	92	94	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT MANDERSON, WYO.--Continued

LOCATION.--At bridge on U. S. Highway 20 at Manderson, Big Horn County.
DRAINAGE AREA.--11,900 square miles.
RECORDS AVAILABLE.--Sediment records: March 1946 to September 1947.
EXTREMES, April-September 1946.--Sediment loads: Maximum, 581,000 tons per day June 24; minimum, 218 tons per day Aug. 23.
EXTREMES, 1946-47.--Sediment loads: Maximum, 357,000 tons per day June 21; minimum, 60 tons per day Dec. 31.
EXTREMES, April 1946-September 1947.--Sediment loads: Maximum, 581,000 tons per day June 24, 1946; minimum, 60 tons per day Dec. 31. 1946.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Mar. 26, 1947	1/1,460	--	7.6	112	18	0.02	105	33	108	220	399	23	0.5	3.5	801	1.09	398	218	37
May 6	5,480	64	8.2	50.9	26	.02	59	19	23	167	120	6.5	.3	1.3	335	.46	225	88	18
June 3	1/3,980	--	8.0	43.3	15	.02	46	13	26	125	107	7.2	.3	1.1	274	.37	168	66	25
June 25	1/12,900	59	8.1	52.3	15	.05	52	17	36	137	147	6.5	.3	1.8	335	.46	200	88	28
July 2	7,620	65	7.7	44.9	14	.02	54	16	18	147	106	5.5	.2	1.4	283	.38	201	80	16
Aug. 19	1/1,600	70	7.6	76.2	13	.05	71	21	68	154	250	16	.4	1.8	518	.70	264	138	36

1/ Mean.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT MANDERSON, WYO.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	1,300	3,930	13,800	2,230	2,710	16,300	2,280	4,400	27,100
2	1,190	2,970	9,560	1,890	2,380	12,200	1,970	3,040	16,200
3	1,140	2,520	7,770	1,380	1,760	6,560	1,770	2,550	12,200
4	1,060	2,220	6,360	928	1,250	3,130	1,700	2,520	11,600
5	1,000	1,980	5,350	704	960	1,820	1,750	2,500	11,800
6	940	1,840	4,670	675	990	1,800	3,420	7,020	61,000
7	858	1,680	3,890	1,100	1,990	5,910	5,170	7,400	103,000
8	904	1,820	4,440	1,190	2,100	6,750	5,930	6,300	101,000
9	904	1,870	4,560	1,050	2,040	5,790	4,880	4,320	57,100
10	869	1,620	3,800	1,520	3,100	12,700	4,140	3,360	37,500
11	814	1,470	3,230	1,960	5,640	29,800	4,730	3,700	47,200
12	825	1,370	3,050	1,830	3,610	17,800	5,060	9,750	133,000
13	792	1,290	2,760	1,490	2,590	10,400	4,530	3,530	43,200
14	814	1,370	3,010	1,300	2,330	8,190	3,670	3,150	31,200
15	814	1,520	3,340	1,160	2,090	6,550	3,120	2,850	24,000
16	952	1,770	4,550	1,050	1,620	4,600	3,250	2,820	24,700
17	1,050	1,990	5,650	836	1,450	3,280	3,500	2,880	27,200
18	904	1,610	3,930	732	1,680	3,320	4,880	8,440	117,000
19	1,300	2,690	9,450	639	1,580	2,720	7,080	22,200	405,000
20	1,520	3,440	14,100	577	1,380	2,150	6,170	13,700	234,000
21	1,730	3,460	16,200	928	2,180	5,460	4,180	6,500	73,400
22	2,040	3,750	20,700	880	1,860	4,420	3,650	4,180	41,200
23	2,090	3,040	17,100	760	1,900	3,900	3,000	3,430	27,800
24	1,660	1,900	8,510	1,190	6,390	20,500	9,950	20,900	581,000
25	1,110	1,350	4,050	1,320	5,740	20,400	4,930	16,300	266,000
26	1,300	1,750	6,150	1,640	4,080	18,100	3,610	3,690	35,900
27	1,370	3,200	11,800	1,460	3,140	12,400	2,940	2,850	22,600
28	2,170	3,900	22,800	2,040	19,400	104,000	2,780	2,600	19,500
29	2,230	3,240	19,500	1,990	10,300	55,400	2,660	2,700	19,400
30	2,200	2,540	15,100	2,230	6,230	37,500	2,720	2,960	21,800
31	--	--	--	2,600	5,480	38,400	--	--	--
Total load (tons)	--	--	259,200	--	--	482,200	--	--	2,634,000
	July			August			September		
1	2,770	2,650	19,800	537	2,560	3,720	1,000	4,290	11,600
2	2,870	2,950	22,800	479	2,280	2,950	836	3,800	8,580
3	3,300	8,660	77,200	466	1,810	2,280	751	3,490	7,080
4	3,140	9,230	78,200	505	2,010	2,740	760	2,060	4,220
5	3,140	5,170	43,800	434	1,830	2,140	694	2,380	4,450
6	3,400	8,680	79,600	380	1,250	1,280	639	6,130	10,600
7	3,070	5,500	45,600	325	1,040	914	712	7,310	43,900
8	2,800	3,400	25,700	292	945	746	3,440	31,400	292,000
9	2,770	3,290	24,600	260	822	578	2,280	17,500	108,000
10	2,360	3,210	20,400	230	988	615	2,530	14,200	97,100
11	1,930	2,730	14,200	216	749	437	1,490	11,900	47,900
12	1,450	2,440	9,550	240	691	449	1,240	5,320	17,800
13	1,220	2,580	8,500	225	711	431	1,130	3,370	10,300
14	1,120	2,850	8,630	235	670	425	1,020	2,680	7,390
15	1,130	3,160	9,650	235	673	427	1,020	2,610	7,200
16	1,220	3,420	11,300	255	816	561	904	2,580	6,290
17	1,220	3,740	12,300	240	1,020	661	1,830	18,100	112,000
18	1,190	3,140	10,100	230	717	446	1,070	11,500	33,200
19	1,140	2,770	8,540	225	616	374	858	3,100	7,180
20	1,100	2,550	7,580	220	555	330	1,070	2,820	8,130
21	976	2,370	6,250	210	500	283	1,140	2,440	7,520
22	880	2,400	5,700	213	480	276	1,320	11,200	62,900
23	892	2,600	6,260	213	380	218	1,220	7,520	27,400
24	751	2,360	4,790	260	673	474	1,160	2,910	9,150
25	713	2,620	5,050	308	1,150	958	1,130	2,550	7,790
26	751	4,450	9,030	358	1,690	1,630	1,060	2,210	6,330
27	751	3,130	6,350	386	2,100	2,190	1,070	2,130	6,160
28	704	4,140	7,860	453	3,430	4,190	1,020	2,090	5,760
29	648	3,100	5,420	657	4,630	8,240	1,100	2,100	6,240
30	639	2,970	5,120	770	5,000	10,400	964	1,800	4,730
31	585	2,210	3,480	976	4,250	11,200	--	--	--
Total load (tons)	--	--	603,400	--	--	62,560	--	--	988,900
Total load for period Mar. 25 to Sept. 30 (tons)									5,098,000

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT MANDERSON, WYO.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	958	1,640	4,240	1,200	1,810	5,860	1,040	3,870	10,800
2	1,000	1,630	4,400	1,130	1,890	5,770	1,030	3,220	8,960
3	1,590	5,310	22,800	1,060	1,750	5,010	1,010	3,230	8,820
4	1,780	5,140	24,700	1,040	1,850	5,190	986	3,180	8,470
5	2,820	11,800	90,300	1,020	1,750	4,820	986	1,610	4,290
6	3,170	15,300	131,000	1,010	1,740	4,750	986	1,550	4,130
7	2,750	7,800	58,000	1,060	1,820	5,210	1,040	2,610	7,340
8	2,530	4,550	31,100	1,090	2,140	6,300	1,050	4,570	12,900
9	2,140	3,920	22,700	1,090	2,230	6,560	1,040	1,610	4,530
10	1,570	2,750	11,700	1,130	2,310	7,060	1,010	1,540	4,210
11	1,450	2,720	10,600	1,090	2,490	7,340	958	951	2,460
12	1,360	2,490	9,150	1,020	1,820	5,010	937	994	2,520
13	1,320	2,320	8,270	979	1,690	4,460	993	943	2,530
14	1,130	1,920	5,860	972	2,560	6,960	986	1,140	3,040
15	1,120	1,770	5,350	1,000	3,640	9,840	1,020	1,150	3,170
16	1,270	2,190	7,520	1,040	5,010	14,100	1,020	1,320	3,640
17	1,300	2,110	7,410	1,120	10,400	31,500	950	1,090	2,790
18	1,280	2,120	7,330	1,060	5,160	14,800	900	706	1,720
19	1,310	2,240	7,930	1,030	2,670	7,430	700	392	741
20	1,340	2,420	8,760	1,070	3,580	10,400	500	180	243
21	1,240	1,880	6,300	1,060	3,440	9,850	600	331	536
22	1,220	1,950	6,420	1,000	3,000	8,110	700	792	1,500
23	1,190	2,320	7,460	900	3,380	8,220	750	842	1,710
24	1,200	2,060	6,670	850	3,010	6,910	850	806	1,850
25	1,170	1,860	5,870	950	4,260	10,900	900	1,550	3,770
26	1,180	1,710	5,450	1,040	2,860	8,040	870	1,310	3,080
27	1,150	1,600	4,970	1,000	2,970	8,030	840	1,230	2,790
28	1,200	1,610	5,220	1,010	3,070	8,370	840	63	143
29	1,200	1,710	5,540	1,050	1,980	5,620	750	43	87
30	1,200	2,040	6,610	1,060	3,390	9,710	600	43	70
31	1,200	2,200	7,130	--	--	--	500	--	60
Total load (tons)	--	--	546,800	--	--	252,100	--	--	112,900
	January			February			March		
1	480	--	--	750	--	--	700	--	--
2	560	--	--	740	708	1,410	710	571	1,090
3	520	--	--	720	--	--	720	--	--
4	550	--	--	760	--	--	720	--	--
5	560	348	526	770	--	--	770	--	--
6	560	--	--	780	--	--	800	--	--
7	560	--	--	800	--	--	820	--	--
8	640	--	--	820	--	--	800	1,430	3,090
9	620	--	--	800	676	1,460	780	415	874
10	600	--	--	750	--	--	950	--	--
11	620	--	--	750	--	--	1,000	--	--
12	650	614	1,080	800	--	--	980	--	--
13	650	--	--	850	--	--	960	--	--
14	600	--	--	900	--	--	950	--	--
15	560	--	--	930	1,340	3,360	950	--	--
16	560	500	756	950	1,040	2,670	1,000	5,060	13,700
17	570	--	--	920	--	--	1,200	15,700	50,900
18	600	--	--	900	--	--	1,400	17,100	64,600
19	640	444	767	900	--	--	1,640	10,800	47,900
20	660	--	--	880	--	--	1,550	5,920	24,800
21	660	--	--	850	--	--	1,660	5,650	25,300
22	700	--	--	820	--	--	1,670	6,710	30,300
23	740	--	--	820	1,330	2,940	1,920	7,000	36,300
24	770	324	674	830	--	--	2,020	6,860	37,400
25	800	--	--	860	--	--	1,570	5,640	23,900
26	850	476	1,090	840	--	--	1,460	4,280	16,900
27	820	--	--	780	--	--	1,280	3,600	12,400
28	840	--	--	740	--	--	1,150	4,540	14,100
29	840	--	--	--	--	--	1,130	3,060	9,340
30	800	--	--	--	--	--	1,130	3,190	9,750
31	750	--	--	--	--	--	1,190	4,320	13,900
Total load (tons)	--	--	1/27,400	--	--	1/83,400	--	--	1/480,000

1/ Includes estimated load for missing days.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT MANDERSON, WYO.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	1,240	5,180	17,400	1,860	7,230	36,300	4,000	3,820	41,300
2	1,260	4,700	16,000	1,740	6,530	30,600	3,960	5,100	54,600
3	1,260	4,020	13,700	1,610	5,140	22,400	3,980	3,170	34,000
4	1,400	4,730	17,900	2,420	9,580	62,600	3,960	3,160	33,800
5	1,320	4,900	17,500	4,190	15,600	176,000	4,140	2,900	32,400
6	1,270	5,410	18,600	5,000	12,800	173,000	3,960	2,520	26,900
7	1,230	4,350	14,500	5,320	9,120	131,000	3,470	2,100	19,700
8	1,130	3,350	10,200	5,920	8,260	132,000	3,140	1,860	15,800
9	1,090	3,060	9,000	6,400	8,800	152,000	3,090	1,880	15,700
10	1,080	2,810	8,200	6,730	7,150	130,000	4,740	3,880	49,700
11	1,020	2,630	7,250	7,480	6,940	140,000	6,250	5,800	98,000
12	1,010	2,170	5,920	7,720	10,300	215,000	5,960	4,950	79,700
13	1,010	2,150	5,860	7,410	6,920	138,000	8,440	7,810	178,000
14	972	1,750	4,590	6,180	5,550	92,600	7,840	7,010	149,000
15	1,200	6,100	20,400	5,160	3,630	50,600	6,540	4,950	87,500
16	1,550	14,800	62,300	4,520	3,120	38,100	6,980	3,690	69,600
17	1,220	5,720	18,800	4,100	2,890	32,000	7,240	3,280	64,100
18	1,350	5,670	20,600	4,280	2,860	33,100	8,320	5,110	115,000
19	1,350	6,540	23,800	4,540	3,250	39,900	9,410	4,520	115,000
20	1,250	4,640	15,700	4,420	3,280	39,100	10,600	4,980	143,000
21	1,400	4,800	18,200	3,960	2,780	29,700	13,400	9,860	357,000
22	1,780	8,020	38,600	3,600	2,660	25,900	15,100	8,020	327,000
23	1,890	8,070	41,200	3,620	2,710	26,500	16,900	6,080	278,000
24	1,600	6,430	27,800	3,780	2,760	28,200	16,500	5,460	243,000
25	1,370	4,670	17,300	3,330	2,600	23,400	12,900	5,630	196,000
26	1,200	3,840	12,500	3,020	2,130	17,400	10,500	4,730	134,000
27	1,070	3,340	9,660	3,240	2,750	24,100	9,720	4,250	112,000
28	1,040	3,230	9,090	5,260	22,800	324,000	9,950	4,130	111,000
29	1,210	4,190	13,700	5,180	8,860	124,000	10,200	4,030	111,000
30	1,630	6,830	30,000	5,320	5,000	71,800	10,400	3,550	99,900
31	--	--	--	4,420	3,820	45,600	--	--	--
Total load (tons)	--	--	546,300	--	--	2,605,000	--	--	3,392,000

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	8,710	3,180	74,800	2,820	1,760	13,400	610	690	1,140
2	7,410	2,780	55,700	2,930	2,230	17,600	610	708	1,220
3	6,820	2,910	53,500	2,900	3,320	26,100	568	695	1,170
4	6,890	3,260	60,600	3,050	2,670	22,000	564	722	1,100
5	7,740	2,940	61,500	3,090	2,690	22,400	560	708	1,070
6	8,560	3,130	72,400	3,090	2,380	19,900	542	653	957
7	8,460	2,760	63,100	3,100	2,390	20,000	537	614	890
8	8,080	2,490	54,300	2,870	2,590	20,100	564	722	1,100
9	8,100	2,500	54,700	2,680	1,410	10,200	568	957	1,470
10	8,490	2,720	62,400	2,700	1,390	10,100	700	1,620	3,060
11	8,200	2,710	60,000	3,690	2,980	29,700	1,130	15,300	49,200
12	7,820	2,560	54,100	4,180	5,260	59,400	774	3,310	6,920
13	7,110	2,490	47,700	4,270	4,100	47,300	768	1,520	3,150
14	6,430	2,010	34,800	3,820	2,680	27,600	804	1,510	3,280
15	5,620	2,510	38,100	3,100	2,150	18,000	816	1,240	2,730
16	4,980	2,450	32,900	2,610	1,560	11,000	774	1,070	2,230
17	4,820	5,770	75,000	2,190	1,260	7,450	768	1,020	2,120
18	5,240	5,790	81,900	1,860	1,340	6,740	768	1,100	2,280
19	5,260	4,060	57,700	1,600	1,440	6,220	846	2,240	5,120
20	5,000	2,680	36,200	1,330	1,040	3,740	930	10,300	25,800
21	4,820	2,810	36,500	1,110	1,060	3,180	1,060	2,250	6,440
22	5,060	3,260	44,700	930	878	2,210	1,200	1,830	5,930
23	5,880	6,370	101,000	822	950	2,110	1,070	1,340	4,250
24	6,670	7,160	129,000	780	1,350	2,840	1,050	1,070	3,030
25	5,440	5,190	76,300	780	1,090	2,300	1,090	977	2,880
26	4,960	3,250	43,500	768	1,000	2,070	1,100	903	2,680
27	4,400	3,900	46,300	725	906	1,780	1,090	890	2,620
28	3,830	3,440	35,600	680	933	1,710	1,070	808	2,340
29	3,420	2,650	24,500	645	835	1,450	1,070	700	2,020
30	3,100	1,990	16,700	640	880	1,520	1,080	711	2,080
31	2,920	1,910	15,100	610	746	1,230	--	--	--
Total load (tons)	--	--	1,701,000	--	--	421,400	--	--	150,300

Total load for year (tons) ---------- 1/10,320,000

1/ Includes estimated load for missing days.

BIGHORN RIVER AT MANDERSON, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date	Instantaneous discharge (second-feet)	Suspended sediment												
		Concentration at time of sampling (p.p.m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p.p.m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)										
						0.00195	0.0039	0.0078	0.0156	0.312	0.625	0.125	0.250	0.500	1.000	2.000
Sept. 6, 1946 -------	675	5,680	10,300	15,500	BN	3	18	76	78	83	86	90	96	98	99	--
May 4, 1947 --------	3,740	14,900	150,000	12,900	BN	8	16	27	36	49	71	87	94	97	98	--
June 13----------	8,730	8,120	191,000	5,430	BN	--	3	15	38	45	62	80	96	99	100	--
June 23 ----------	17,600	5,630	268,000	3,450	BN	--	7	23	45	50	65	79	89	94	96	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

BIGHORN RIVER AT KANE, WYO.

LOCATION.--At gaging station at bridge on State Highway 14, half a mile east of Kane, Big Horn County.
DRAINAGE AREA.--15,900 square miles.
RECORDS AVAILABLE.--Sediment records: March 1946 to September 1947.
EXTREMES, March-September 1946.--Sediment loads: Maximum, 972,000 tons per day June 25; minimum, 966 tons per day Aug. 17.
EXTREMES, 1946-47.--Sediment loads: Maximum, 514,000 tons per day May 12; minimum, 396 tons per day Dec. 20.
EXTREMES, March 1946-September 1947.--Sediment loads: Maximum, 972,000 tons per day June 25, 1946; minimum, 396 tons per day Dec. 20, 1946.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids		Hardness as $CaCO_3$		Percent sodium
																Parts per million	Tons per acre-foot	Total	Non-carbonate	
Mar. 26, 1947	1/2,260	--	7.8	99.7	17	0.05	98	31	107	227	375	19	0.5	0.0	0.8	766	1.04	372	186	38
May 3	1,680	--	8.3	69.1	21	.05	71	24	67	185	239	12	.5	2.5	1.2	542	.74	276	124	34
June 3	1/6,170	--	8.0	48.3	15	.05	51	13	66	153	123	14	.4	.2	1.2	360	.49	181	56	52
June 25	1/20,200	61	8.3	51.9	14	.05	49	16	49	145	153	10	.3	1.6	1.0	374	.51	188	69	36
July 2	11,400	63	8.3	40.2	20	.05	50	12	27	140	104	5.5	.3	1.2	1.0	298	.41	174	59	25
Aug. 16	1/3,200	70	7.8	62.3	13	.05	56	17	59	141	196	12	.3	.8	.6	454	.62	210	94	38

1/ Mean.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT KANE, WYO.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--
8	--	--	--	--	--	--	--	--	--
9	--	--	--	--	--	--	--	--	--
10	--	--	--	--	--	--	--	--	--
11	--	--	--	--	--	--	--	--	--
12	--	--	--	--	--	--	--	--	--
13	--	--	--	--	--	--	--	--	--
14	--	--	--	--	--	--	--	--	--
15	--	--	--	--	--	--	--	--	--
16	--	--	--	--	--	--	2,370	2,510	16,000
17	--	--	--	--	--	--	2,070	1,870	10,400
18	--	--	--	--	--	--	1,890	1,700	8,680
19	--	--	--	--	--	--	1,750	1,650	7,800
20	--	--	--	--	--	--	2,000	1,900	10,200
21	--	--	--	--	--	--	2,370	8,250	52,800
22	--	--	--	--	--	--	2,770	4,820	36,000
23	--	--	--	--	--	--	2,820	8,700	66,200
24	--	--	--	--	--	--	2,600	15,200	107,000
25	--	--	--	--	--	--	2,250	7,850	47,700
26	--	--	--	--	--	--	1,960	4,900	25,900
27	--	--	--	--	--	--	1,870	2,400	12,100
28	--	--	--	--	--	--	1,900	2,000	10,300
29	--	--	--	--	--	--	1,930	1,740	9,070
30	--	--	--	--	--	--	1,970	1,700	9,050
31	--	--	--	--	--	--	2,070	3,650	20,400
Total load (tons)	--	--	--	--	--	--	--	--	449,600

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	2,140	2,500	14,400	4,140	2,650	29,600	4,670	4,390	55,300
2	2,130	2,130	12,300	3,790	1,990	20,400	4,340	3,800	44,600
3	1,980	2,080	11,100	3,350	2,350	21,300	4,020	3,000	32,600
4	1,890	1,770	9,040	3,070	2,040	16,900	4,160	2,970	33,400
5	1,820	1,730	8,510	2,980	1,990	16,100	5,040	3,550	48,400
6	1,890	1,400	7,150	3,000	1,730	14,000	7,060	5,990	114,000
7	1,820	1,190	5,850	2,840	1,600	12,300	9,230	8,780	219,000
8	1,790	1,260	6,090	2,820	1,800	13,700	10,300	5,940	165,000
9	1,790	1,270	6,150	2,870	1,810	14,000	9,160	5,170	128,000
10	1,750	1,200	5,670	2,930	2,130	16,900	8,620	4,210	98,200
11	1,630	1,610	7,090	3,270	3,050	26,900	8,400	5,260	119,000
12	1,550	1,280	5,360	3,530	4,070	38,800	10,500	10,400	295,000
13	1,470	1,700	6,750	3,350	2,940	26,600	7,060	7,100	135,000
14	1,470	1,400	5,550	3,030	2,060	16,900	7,920	3,550	75,900
15	1,580	1,950	8,330	2,820	2,030	15,400	7,030	3,280	62,300
16	1,680	2,310	10,500	2,620	2,340	16,500	7,210	3,470	67,600
17	1,900	2,840	14,600	2,580	1,730	12,000	7,660	3,830	79,200
18	2,180	2,550	15,000	2,400	1,360	8,820	7,880	5,560	118,000
19	2,380	2,790	17,900	2,250	1,480	9,000	10,100	12,300	335,000
20	2,700	2,800	20,400	2,140	1,700	9,820	10,800	13,300	388,000
21	3,020	4,000	32,600	1,910	2,570	13,200	7,980	9,220	199,000
22	3,180	4,150	35,600	2,180	2,460	14,500	6,370	5,300	91,300
23	3,220	3,200	27,800	2,870	2,680	20,800	6,010	3,820	62,000
24	3,120	2,500	21,100	2,770	3,560	26,600	7,760	7,120	149,000
25	2,840	2,050	15,700	3,220	4,090	35,600	13,700	25,400	972,000
26	2,600	2,490	17,500	3,530	3,990	37,900	7,420	8,700	174,000
27	3,140	3,650	30,900	3,610	3,960	38,600	5,860	4,100	64,900
28	3,790	3,850	39,400	4,530	11,600	153,000	5,390	3,350	48,800
29	4,070	3,890	42,700	6,460	16,600	258,000	5,470	3,150	46,600
30	4,070	3,800	41,800	4,880	10,900	144,000	5,000	3,500	47,300
31	--	--	--	4,820	6,530	85,000	--	--	--
Total load (tons)	--	--	502,800	--	--	1,183,000	--	--	4,468,000

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT KANE, WYO.--Continued

Suspended sediment, water year October 1945 to September 1946--Continued

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	5,180	2,500	35,000	1,210	2,460	8,040	1,740	5,000	23,500
2	5,360	4,200	60,800	1,070	2,480	7,170	1,710	4,400	20,400
3	5,580	6,900	104,000	850	2,010	4,610	1,570	3,150	13,400
4	5,670	7,200	110,000	829	3,050	6,820	1,570	2,600	11,000
5	5,560	6,400	96,200	798	2,400	5,170	1,540	2,600	10,800
6	5,420	5,300	77,600	776	1,730	3,620	1,600	5,000	21,600
7	5,100	4,350	59,900	715	1,850	3,570	2,740	3,200	30,900
8	4,620	4,250	53,100	586	890	1,410	8,780	25,700	626,000
9	4,430	3,280	39,200	492	950	1,260	5,830	18,400	277,000
10	3,900	3,000	31,600	454	1,250	1,530	4,100	15,200	168,000
11	3,320	2,800	25,100	433	1,400	1,640	3,360	17,500	159,000
12	2,920	3,400	26,800	412	1,000	1,110	2,570	13,300	94,800
13	2,460	3,900	25,900	375	1,300	1,320	2,260	4,950	30,200
14	2,270	3,200	19,600	399	3,020	3,250	2,170	2,940	17,200
15	2,260	2,680	16,400	461	3,140	3,910	2,050	2,260	12,500
16	2,690	3,800	27,600	433	2,640	3,080	1,970	5,350	28,400
17	2,260	4,750	29,000	393	910	966	2,660	9,310	66,900
18	2,230	3,800	22,900	363	1,550	1,520	2,900	16,000	125,000
19	2,100	2,670	15,100	332	2,400	2,150	2,100	11,700	66,400
20	1,990	3,020	16,200	318	1,850	1,590	1,980	5,100	27,300
21	1,800	1,980	9,620	309	1,200	1,000	2,090	5,460	30,800
22	1,620	1,620	7,090	280	1,650	1,250	2,150	3,050	17,700
23	1,510	1,190	4,860	272	1,900	1,400	2,660	7,260	52,200
24	1,470	1,700	6,750	268	1,520	1,100	2,190	6,360	37,600
25	1,470	2,000	7,940	309	1,250	1,040	2,170	1,960	11,500
26	1,470	1,250	4,960	454	1,500	1,840	2,140	2,920	16,900
27	1,510	1,600	6,530	665	2,150	3,860	2,050	1,640	9,080
28	1,570	2,000	8,480	818	3,050	6,740	1,970	1,380	7,340
29	1,480	2,450	9,790	982	5,040	13,400	1,910	1,170	6,040
30	1,390	2,140	8,040	1,290	5,730	20,000	1,890	1,730	8,830
31	1,300	1,700	5,970	1,670	4,150	18,700	--[a]	--	--
Total load (tons)	--	--	972,000	--	--	134,100	--	--	2,028,000
Total load for period Mar. 16 to Sept. 30 (tons)									9,738,000

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT KANE, WYO.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	1,880	1,160	5,890	1,820	612	3,010	1,810	700	3,420
2	1,900	998	5,120	1,800	683	3,320	1,650	1,530	6,820
3	2,180	2,260	13,300	1,720	663	3,080	1,570	1,300	5,410
4	2,790	3,020	22,800	1,650	636	2,840	1,520	840	3,450
5	3,500	8,150	77,000	1,620	610	2,670	1,470	660	2,620
6	5,000	13,100	177,000	1,650	586	2,610	1,440	580	2,260
7	4,000	11,100	120,000	1,650	636	2,840	1,490	570	2,290
8	3,500	5,640	53,300	1,690	820	3,740	1,580	875	3,730
9	3,380	3,700	33,800	1,760	880	4,190	1,570	1,000	4,240
10	2,630	--	--	1,770	910	4,360	1,500	420	1,700
11	2,190	--	--	1,770	1,060	5,070	1,440	270	1,050
12	2,080	--	--	1,700	600	2,760	1,410	210	800
13	2,040	--	--	1,560	490	2,060	1,420	200	767
14	1,970	--	--	1,510	550	2,240	1,470	370	1,470
15	1,790	--	--	1,530	720	2,980	1,490	540	2,170
16	1,820	--	--	1,510	--	4,000	1,500	500	2,020
17	1,820	--	--	1,530	1,200	4,960	1,510	350	1,430
18	1,800	--	--	1,620	1,500	6,560	1,270	220	755
19	1,840	--	--	1,600	1,400	6,060	912	200	493
20	1,880	--	--	1,550	530	2,220	700	210	396
21	1,920	--	--	1,380	820	3,060	800	--	--
22	1,910	--	--	988	810	2,160	900	--	--
23	1,880	--	--	900	710	1,730	1,000	--	--
24	1,850	925	4,620	1,100	520	1,540	1,200	--	--
25	1,790	905	4,380	1,500	580	2,350	1,300	--	--
26	1,740	998	4,690	1,680	900	4,090	1,400	--	--
27	1,760	1,130	5,370	1,580	1,120	4,780	1,350	770	2,810
28	1,790	1,100	5,320	1,550	940	3,930	1,350	--	--
29	1,850	1,190	5,950	1,800	770	3,740	1,350	--	--
30	1,860	690	3,470	1,880	660	3,260	1,150	1,740	5,400
31	1,850	653	3,260	--	--	--	850	--	--
Total load (tons)	--	--	1/680,000	--	--	102,200	--	--	1/74,000

Day	January			February			March		
1	600	--	--	1,000	--	--	1,000	--	--
2	750	--	--	1,000	--	--	1,000	--	--
3	650	--	--	1,000	--	--	1,000	--	--
4	720	--	--	1,000	--	--	1,000	--	--
5	760	--	--	1,100	--	--	1,200	--	--
6	760	--	--	1,100	--	--	1,250	--	--
7	820	--	--	1,100	--	--	1,300	--	--
8	860	--	--	1,100	--	--	1,300	--	--
9	880	--	--	1,100	--	--	1,250	--	--
10	800	--	--	1,200	--	--	1,400	1,080	4,080
11	800	--	--	1,300	806	2,830	1,500	--	--
12	820	--	--	1,300	--	--	1,500	--	--
13	840	--	--	1,300	--	--	1,500	--	--
14	860	--	--	1,400	--	--	1,500	--	--
15	800	--	-	1,500	850	3,440	1,500	--	--
16	780	485	1,020	1,500	--	--	1,600	--	--
17	760	--	--	1,500	--	--	1,800	--	--
18	760	--	--	1,450	--	--	2,000	--	--
19	780	--	--	1,420	--	--	2,500	--	--
20	800	--	--	1,400	--	--	3,500	8,920	84,200
21	850	--	--	1,350	--	--	3,360	8,790	81,500
22	900	1,200	2,920	1,300	--	--	3,020	6,030	49,100
23	950	--	--	1,200	--	--	3,210	4,080	35,400
24	1,000	--	--	1,200	--	--	3,400	4,560	41,900
25	1,100	--	--	1,220	--	--	2,630	3,700	26,300
26	1,100	--	--	1,250	--	--	2,260	3,850	23,500
27	1,120	--	--	1,100	--	--	2,010	2,310	12,500
28	1,100	--	---	1,000	--	--	1,740	2,480	11,700
29	1,100	--	--	--	--	--	1,600	2,060	8,900
30	1,100	--	--	--	--	--	1,700	1,660	7,620
31	1,080	--	--	--	--	--	1,910	2,700	13,900
Total load (tons)	--	--	1/35,000	--	--	1/79,000	--	--	1/480,000

1/ Includes estimated load for missing days.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT KANE, WYO.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	1,980	2,760	14,800	3,250	4,990	43,800	5,030	4,060	55,200
2	2,040	3,550	19,600	3,540	5,300	50,600	5,130	4,690	64,900
3	2,080	3,130	17,600	3,300	4,820	43,000	6,170	4,160	69,400
4	2,120	2,500	14,300	4,570	11,400	142,000	6,480	5,240	91,500
5	2,200	--	20,000	6,880	14,600	271,000	6,510	5,270	92,800
6	2,180	--	19,000	8,800	13,100	311,000	6,370	4,410	76,000
7	2,010	3,720	20,200	9,830	14,300	379,000	5,980	3,740	60,400
8	1,780	4,570	22,000	10,700	11,300	326,000	5,620	3,620	54,900
9	1,590	3,350	14,400	12,100	12,100	396,000	6,650	4,990	89,500
10	1,490	2,780	11,200	13,100	10,000	354,000	8,120	6,770	148,000
11	1,440	2,360	9,180	13,400	9,820	355,000	9,470	6,720	172,000
12	1,370	2,010	7,430	13,400	14,200	514,000	8,770	5,460	129,000
13	1,320	1,830	6,520	11,700	9,250	292,000	8,920	9,350	225,000
14	1,340	1,860	6,730	10,600	6,920	198,000	10,500	8,970	254,000
15	1,590	3,080	13,200	8,710	5,430	128,000	9,540	9,310	240,000
16	2,320	5,100	31,900	7,540	4,180	85,000	9,190	6,760	168,000
17	2,180	7,010	41,300	6,990	4,640	87,500	10,600	5,200	149,000
18	2,040	4,860	26,800	6,880	4,090	76,000	11,900	5,150	166,000
19	2,160	3,360	19,600	7,020	3,150	59,700	12,700	4,900	168,000
20	2,060	3,430	19,100	6,790	4,320	79,200	14,400	6,480	252,000
21	2,240	3,110	18,800	6,310	4,210	71,800	17,600	8,940	425,000
22	2,740	3,520	26,300	5,760	4,260	66,300	19,000	8,670	445,000
23	3,150	6,040	51,400	5,440	3,330	48,900	19,200	7,650	396,000
24	2,910	6,780	53,300	5,420	3,330	48,700	20,000	5,500	297,000
25	2,320	5,130	32,100	5,310	3,100	44,500	20,200	4,930	269,000
26	2,060	3,660	20,400	5,030	3,260	44,200	16,600	5,300	238,000
27	1,820	2,810	13,800	4,960	3,590	48,100	15,900	5,200	224,000
28	1,710	2,620	12,100	6,620	6,450	115,000	16,800	5,200	236,000
29	1,970	2,940	15,600	6,650	15,300	289,000	15,600	4,530	191,000
30	2,600	3,930	27,600	6,480	6,550	115,000	14,900	4,200	169,000
31	--	--	--	5,570	4,470	67,400	--	--	--
Total load (tons)	--	--	626,300	--	--	5,150,000	--	--	5,616,000

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	12,900	4,350	152,000	3,260	1,670	14,700	1,020	723	1,990
2	10,600	4,400	126,000	3,310	2,030	18,200	992	666	1,790
3	9,580	3,680	95,400	3,480	2,180	20,500	974	588	1,550
4	9,850	3,210	85,400	3,390	3,180	29,100	956	549	1,420
5	10,600	3,140	89,900	3,580	3,280	31,700	932	507	1,270
6	11,400	3,710	114,000	3,440	2,030	18,800	944	539	1,360
7	11,400	3,530	109,000	3,420	1,870	17,300	950	489	1,250
8	11,100	3,200	96,000	3,310	2,040	18,200	962	432	1,120
9	10,700	2,790	80,600	3,080	1,890	15,700	1,030	470	1,310
10	11,100	3,340	100,000	3,010	1,880	15,300	1,050	479	1,360
11	10,900	3,460	102,000	3,220	2,190	19,000	1,740	6,440	31,300
12	10,000	2,590	69,900	3,860	4,310	45,000	1,630	7,730	34,000
13	9,170	2,720	67,200	4,340	5,060	59,300	1,340	5,850	21,200
14	7,900	2,480	52,900	4,140	3,010	33,600	1,290	1,890	6,580
15	7,140	2,750	53,000	3,720	2,580	25,900	1,330	1,410	5,060
16	6,390	1,870	32,000	3,200	1,940	16,800	1,390	1,370	5,140
17	6,130	2,700	44,700	2,860	1,720	13,300	1,400	1,160	4,380
18	6,420	4,040	70,000	2,540	1,720	11,800	1,380	1,100	4,100
19	6,480	3,580	62,600	2,200	1,350	8,020	1,580	1,330	5,670
20	6,330	2,850	48,700	1,990	1,470	7,900	1,840	3,350	16,700
21	6,270	2,300	39,000	1,790	1,420	6,860	1,680	5,260	23,800
22	6,360	2,640	45,400	1,490	1,360	5,480	1,700	2,740	12,600
23	6,990	4,140	78,000	1,380	1,620	6,050	1,940	1,580	8,270
24	7,740	4,640	96,900	1,270	1,070	3,700	1,820	1,310	6,440
25	7,140	5,260	101,000	1,190	987	3,170	1,800	1,050	5,100
26	5,990	3,740	60,500	1,200	1,080	3,500	1,800	1,090	5,290
27	5,520	3,060	45,600	1,240	913	3,050	1,830	1,300	6,420
28	5,000	2,460	33,200	1,210	1,080	3,530	1,830	1,420	7,020
29	4,390	2,390	28,300	1,170	863	2,730	1,840	1,050	5,220
30	3,900	1,950	20,500	1,100	630	1,870	1,910	1,110	5,720
31	3,570	1,730	16,700	1,050	735	2,080	--	--	--
Total load (tons)	--	--	2,216,000	--	--	482,100	--	--	234,400

Total load for year (tons) ---------- 1/15,780,000

1/ Includes estimated load for missing days.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT KANE, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Instantaneous discharge (second-feet)	Suspended sediment													
		Concentration at time of sampling (p. p. m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p. p. m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)									
						0.00195	0.0039	0.0078	0.0156	0.0312	0.0625	0.125	0.250	0.500	1.000	2.000
June 20, 1946 --------	10,300	12,900	359,000	17,800	BN	4	20	66	71	79	86	93	98	99	100	--
June 25----------	16,500	28,900	1,290,000	36,800	BN	3	18	65	71	78	91	96	99	100	--	--
June 14, 1947 --------	10,600	6,510	186,000	10,400	BN	--	3	14	50	59	72	89	95	97	99	--
June 23----------	19,800	6,090	326,000	4,350	BN	--	5	20	41	49	61	74	89	95	98	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

BIGHORN RIVER NEAR CUSTER, MONT.

LOCATION.--At bridge on U. S. Highway 10, 3 miles downstream from gaging station, 1¼ miles southwest of Bighorn, Treasure County, and 4½ miles east of Custer, Yellowstone County.
RECORDS AVAILABLE.--Sediment records: July to September 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	Temperature (° F.)	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 31, 1946	1/3,130	--	8.0	107	--	0.10	102	38	93		240	377	15	0.4	1.7	--	830	1.13	411	214	33
Apr. 1, 1947	3,940	48	8.1	109	17	.10	95	32	133		235	425	14	.4	2.2	1.6	853	1.16	369	176	44
May 3	5,170	60	7.8	92.1	18	.05	82	29	97		222	319	12	.3	3.0	1.1	668	.91	324	142	39
June 2	8,150	--	7.9	57.1	20	.02	47	19	49	4.0	155	159	7.5	.4	2.0	--	394	.54	195	68	34
June 25	24,200	60	8.2	51.8	16	.08	36	13	60		140	142	6.0	.5	1.9	1.0	352	.48	143	28	48
Aug. 16	4,880	70	7.5	80.6	14	.10	74	21	83		186	261	10	.3	3.0	.8	568	.77	271	119	40

1/ Mean.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER NEAR CUSTER, MONT.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	--	--	--	5,020	1,130	15,400	2,230	367	2,210
2	--	--	--	4,740	1,090	14,000	2,160	339	1,980
3	--	--	--	4,740	1,030	13,200	2,160	296	1,730
4	--	--	--	5,020	1,150	15,600	2,080	372	2,090
5	--	--	--	5,170	1,030	14,400	2,080	256	1,440
6	--	--	--	5,170	1,310	18,300	2,080	237	1,330
7	--	--	--	5,170	1,400	19,600	2,010	202	1,100
8	--	--	--	4,880	1,060	14,000	2,080	241	1,350
9	--	--	--	4,740	1,040	13,300	2,010	248	1,350
10	--	--	--	4,460	970	11,700	2,080	296	1,660
11	--	--	--	4,200	1,030	11,700	2,160	281	1,640
12	--	--	--	4,460	1,000	12,000	2,310	277	1,730
13	--	--	--	5,020	1,200	16,300	2,840	713	5,470
14	--	--	--	5,470	1,360	20,100	2,560	987	6,830
15	--	--	--	5,170	1,990	27,800	2,480	2,480	16,700
16	--	--	--	4,740	2,200	28,200	2,650	2,490	17,800
17	--	--	--	4,330	1,350	15,800	2,650	1,080	7,730
18	10,700	3,160	91,300	3,940	1,010	10,800	2,650	725	5,190
19	10,700	2,290	66,200	3,580	931	9,000	2,740	685	5,070
20	10,700	3,490	101,000	3,350	776	7,020	2,930	581	4,600
21	10,300	3.280	91,300	3,130	730	6,170	3,030	628	5,140
22	9,960	2,250	60,400	2,930	702	5,580	3,030	866	7,080
23	9,960	2,030	54,500	2,650	614	4,400	2,930	1,540	12,200
24	10,300	1,940	53,900	2,560	596	4,170	3,030	2,250	18,400
25	11,100	2,480	74,300	2,480	568	3,810	2,930	1,330	10,500
26	9,960	3,540	95,000	2,310	503	3,140	2,930	770	6,090
27	8,690	3,710	87,000	2,310	483	3,020	2,930	734	5,810
28	7,980	2,450	52,800	2,390	407	2,630	2,930	575	4,550
29	6,940	1,600	30,000	2,310	354	2,210	2,930	595	4,720
30	5,940	1,410	22,600	2,310	347	2,170	2,930	520	4,120
31	5,470	1,410	20,800	2,230	382	2,300	--	--	--
Total load (tons)	--	--	901,100	--	--	347,800	--	--	167,600

Total load for period July 18 to Sept. 30 (tons) ---------- 1,416,000

Periodic determinations of suspended-sediment discharge, water year October 1946 to September 1947

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Instantaneous discharge (tons per day)
May 7, 1946	3,940	948	10,000
June 7	8,510	3,570	82,000
June 14	14,600	6,520	257,000
June 17	13,400	3,680	133,000
July 9	7,280	3,960	77,800
July 12	5,020	1,480	20,100
July 28	3,030	897	7,340
Aug. 6	2,080	442	2,480
Sept. 5	2,560	1,160	8,030
Sept. 8	3,130	1,700	14,400
Sept. 30	3,350	808	7,310
Oct. 22	3,350	500	4,520
Oct. 31	3,130	498	4,210
Dec. 5	2,650	388	2,780
Mar. 25, 1947	5,320	3,360	48,300
Apr. 1	3,940	1,480	15,700
Apr. 22	3,700	1,960	19,600
May 3	5,170	2,780	38,800
May 17	9,230	3,430	85,400
June 2	8,150	2,370	52,100
June 12	12,600	6,070	206,000
June 26	26,200	4,130	292,000

BIGHORN RIVER NEAR CUSTER, MONT.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Instantaneous discharge (second-feet)	Suspended sediment													
		Concentration at time of sampling (p.p.m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p.p.m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)									
						0.00195	0.0039	0.0078	0.0156	0.312	0.0625	0.125	0.250	0.500	1.000	2.000
June 14, 1946	14,600	6,520	257,000	1,170	BN	--	39	45	54	66	80	92	97	99	--	--
Sept. 5	2,560	1,160	8,030	3,770	BN	--	3	21	--	--	83	89	92	--	--	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

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YELLOWSTONE RIVER BASIN--Continued

SHOSHONE RIVER BELOW BUFFALO BILL RESERVOIR, WYO.

LOCATION.--At bridge on U. S. Highway 20, 3½ miles west of Cody, Park County, and 3 miles downstream from Buffalo Bill Reservoir.
DRAINAGE AREA.--1,520 square miles.
RECORDS AVAILABLE.--Chemical analyses: April to September 1947.
Water temperatures: April to September 1947.
Total hardness: Maximum, 108 parts per million Apr. 1-10; minimum, 40 parts per million Sept. 1-18.
REMARKS.--Records of discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086. Records of specific conductance of daily samples available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Apr. 1-10, 1947	502	39	8.0	30.5	10	0.06	27	9.8	15	16	117	58	2.2	0.1	0.4	0.7	196	0.27	266	108	12	20
Apr. 11-20	538	41	7.9	25.8	10	.08	24	8.7	14	11	104	47	1.8	.2	.2	.7	167	.23	243	93	8	22
Apr. 21-30	647	43	8.3	26.3	20	.06	25	7.0	20	3.2	100	47	2.2	.2	.5	.4	166	.23	290	91	9	31
May 1-10	1,280	47	8.2	24.5	18	.05	22	6.4	23	1.6	93	44	2.4	.2	.6	.3	155	.21	535	81	5	38
May 11-20	1,430	46	8.4	22.6	18	.09	20	6.1	19	1.2	87	41	2.3	.2	.4	.3	147	.20	568	75	4	35
May 21-31	1,330	48	8.2	20.6	16	.08	18	5.9	18	3.6	80	40	1.7	.2	.4	.4	135	.18	485	69	3	35
June 1-10	1,320	50	8.2	19.0	18	.09	16	5.5	18	2.0	75	30	1.6	.1	.3	.4	129	.18	462	62	0	37
June 11-20	3,610	51	8.0	16.7	20	.10	15	4.8	16	1.6	67	29	2.0	.1	.8	.3	112	.15	1,090	57	2	37
June 21-30	5,420	54	8.0	14.9	17	.11	14	4.4	14	2.0	63	26	1.6	.1	.3	.4	105	.14	1,540	53	1	36
July 1-10	5,250	58	8.2	15.0	19	.13	12	4.4	12	3.2	54	22	1.6	.1	.4	.3	98	.13	1,390	48	4	33
July 11-20	4,790	59	8.0	13.1	19	.13	11	4.4	12	1.2	48	22	5.0	.1	1.0	.4	95	.13	1,230	45	5	36
July 21-31	3,040	61	7.9	11.9	21	.16	11	5.0	10	2.8	49	19	2.0	.1	.3	.4	91	.12	748	48	8	30
Aug. 1-10	2,040	62	8.0	12.4	18	.05	13	3.0	12	.4	53	18	.7	.1	.5	.2	81	.11	446	45	2	37
Aug. 11-20	1,600	58	7.9	12.9	20	.10	12	4.2	11	1.2	58	19	.8	.1	.5	.2	85	.12	367	47	0	33
Aug. 21-31	1,540	54	7.9	13.1	20	.08	13	4.4	8.1	1.6	58	19	1.0	.1	.5	.1	86	.12	358	51	3	25
Sept. 1-18	1,240	56	7.2	13.4	18	.10	10	3.6	8.3	7.2	56	20	1.0	.2	.4	.0	94	.13	315	40	0	27
Sept. 19-30	813	56	7.4	15.7	18	.05	12	3.6	9.8	6.0	60	22	1.0	.2	.1	.3	97	.13	213	45	0	29
Weighted average	1/2,084	--	--	15.8	18	0.11	14	4.7	13	2.3	62	26	2.0	0.1	0.5	0.3	107	0.14	602	54	3	33

1/ Mean discharge for water year October 1946 to September 1947 was 1,314 second-feet.

Temperature (° F.) of water, water year October 1946 to September 1947

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

YELLOWSTONE RIVER BASIN--Continued

SHOSHONE RIVER AT BYRON, WYO.

LOCATION.--At bridge on State Highway 14 at Byron, Big Horn County, 750 feet upstream from gaging station.
DRAINAGE AREA.--2,300 square miles.
RECORDS AVAILABLE.--Chemical analyses: March to September 1947.
Water temperatures: April to September 1947.
EXTREMES, 1947.--Dissolved solids: Maximum, 678 parts per million May 8-10; minimum, 165 parts per million July 1-10.
Total hardness: Maximum, 294 parts per million Apr. 20-30; minimum, 82 parts per million July 1-10.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086. Records of specific conductance of daily samples available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Mar. 24, Apr. 1-7, 1947	616	43	8.4	87.5	23	0.10	85	18	100	2.8	250	252	27	0.6	1.2	0.8	616	0.84	1,020	286	81	43
Apr. 8-19	601	51	8.3	78.2	20	.07	78	17	70	3.2	234	202	11	.5	1.5	.8	519	.71	842	264	72	36
Apr. 20-30	491	50	8.4	98.4	21	.07	90	17	107	4.0	260	288	12	.6	2.2	--	667	.91	884	294	31	44
May 1-7	379	57	8.3	81.7	22	.05	58	10	105	3.2	206	223	9.0	.6	2.5	.7	539	.73	551	186	17	54
May 8-10	266	58	8.4	100	26	.03	68	9.2	148	4.0	252	293	12	.8	3.5	--	678	.92	487	206	1	60
May 11-June 1	735	59	8.3	69.8	21	.03	52	14	81	2.4	200	180	8.0	.6	2.2	.6	448	.61	889	187	23	48
June 2-15	1,100	59	8.3	48.7	21	.05	46	6.6	45	2.0	154	104	5.0	.6	.2	.8	312	.42	927	142	16	41
June 16-21	4,920	60	8.3	36.7	23	.05	43	4.8	28	3.2	160	53	2.0	.4	2.0	.1	238	.32	3,160	127	0	32
June 22-24	6,250	63	8.3	32.2	36	.05	34	5.2	23	3.2	112	61	3.0	.2	1.0	--	214	.29	3,610	106	14	31
June 25-30	3,910	60	8.3	28.7	9.0	.05	29	3.1	26	2.8	110	44	6.0	.2	1.0	.3	207	.28	2,190	85	0	39
July 1-10	4,520	64	8.3	29.3	19	.02	24	5.5	19	8.0	96	47	2.0	.2	1.2	.2	165	.22	2,010	82	3	31
July 11-13	5,970	66	8.3	27.9	22	.00	32	5.7	22	6.8	113	58	2.0	.2	1.1	--	188	.26	3,030	103	10	30
July 14-21	3,790	68	8.4	31.7	17	.00	28	5.9	18	7.2	100	56	.0	1.0	2.0	.2	175	.24	1,790	94	12	27
July 22-31	2,080	69	8.5	45.6	16	.00	30	6.8	24	4.0	1/111	66	2.0	.2	1.4	.1	202	.27	1,130	102	11	33
Aug. 1	1,200	70	7.0	37.0	15	.00	38	8.5	34		128	89	3.2	.2	.6	--	244	.33	791	130	25	36
Aug. 2	1,230	70	8.2	41.0	21	.13	35	9.0	32		128	79	3.0	.4	2.8	--	248	.34	823	124	19	36
Aug. 3-15	1,040	70	8.2	55.0	16	.00	34	10	47	4.4	140	110	4.0	.4	2.2	.1	294	.40	826	126	11	44
Aug. 16-20, 22-24	599	67	8.6	56.9	16	.02	42	13	57	3.2	2/160	147	4.0	.4	3.0	.0	359	.49	580	158	27	43
Aug. 21	540	66	7.7	72.8	24	.13	53	16	84		200	192	7.0	.6	6.0	--	492	.67	717	198	34	48
Aug. 25-Sept. 21	774	58	8.5	69.0	17	.02	47	14	55	4.0	3/171	145	6.0	.4	2.7	.3	373	.51	780	175	35	40
Sept. 22-27, 29-30	567	57	8.6	86.7	17	.00	59	18	65	1.2	4/199	185	8.0	.4	3.4	.5	464	.63	710	221	58	39
Sept. 28	469	57	7.3	79.1	14	.09	54	17	91		198	186	2.8	.5	7.0	--	508	.69	643	205	43	49
Weighted average	5/1,550	--	--	44.3	19	0.03	38	7.8	37	4.6	137	89	4.1	0.4	1.6	--	264	0.36	1,150	126	14	35

1/ Includes equivalent of 6 parts per million of carbonate (CO_3).
2/ Includes equivalent of 7 parts per million of carbonate (CO_3).
3/ Includes equivalent of 8 parts per million of carbonate (CO_3).
4/ Includes equivalent of 15 parts per million of carbonate (CO_3).
5/ Mean discharge for water year October 1946 to September 1947 was 1,086 second-feet.

YELLOWSTONE RIVER BASIN--Continued

SHOSHONE RIVER AT BYRON, WYO.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

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

YELLOWSTONE RIVER BASIN--Continued

TONGUE RIVER AT MILES CITY, MONT.

LOCATION.--At gaging station, 4 miles south of Miles City, Custer County, and 8 miles upstream from mouth.
RECORDS AVAILABLE.--Sediment records: June 1946 to September 1947.
EXTREMES, June-September 1946.--Sediment loads: Maximum, 55,400 tons per day Aug. 13; minimum, 2 tons per day Aug. 30-31, Sept. 3-6.
EXTREMES, 1946-47.--Sediment loads: Maximum, 31,700 tons per day June 27; minimum, 0.1 ton per day Aug. 14-15.
EXTREMES, June 1946-September 1947.--Sediment loads: Maximum, 55,400 tons per day Aug. 13, 1946; minimum, 0.1 ton per day Aug. 14-15, 1947.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086.

Suspended sediment, water year October 1945 to September 1946

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--
8	--	--	--	--	--	--	--	--	--
9	--	--	--	--	--	--	--	--	--
10	--	--	--	--	--	--	--	--	--
11	--	--	--	--	--	--	--	--	--
12	--	--	--	--	--	--	--	--	--
13	--	--	--	--	--	--	--	--	--
14	--	--	--	--	--	--	2,710	1,440	10,500
15	--	--	--	--	--	--	2,650	1,290	9,240
16	--	--	--	--	--	--	2,590	1,020	7,140
17	--	--	--	--	--	--	2,230	670	4,040
18	--	--	--	--	--	--	1,730	540	2,520
19	--	--	--	--	--	--	1,570	470	1,990
20	--	--	--	--	--	--	1,570	450	1,910
21	--	--	--	--	--	--	1,950	700	3,680
22	--	--	--	--	--	--	2,710	960	7,030
23	--	--	--	--	--	--	2,170	1,010	5,920
24	--	--	--	--	--	--	1,680	1,140	5,170
25	--	--	--	--	--	--	1,620	785	3,440
26	--	--	--	--	--	--	1,570	1,180	5,340
27	--	--	--	--	--	--	2,710	2,330	16,800
28	--	--	--	--	--	--	2,830	1,050	8,030
29	--	--	--	--	--	--	2,100	610	3,750
30	--	--	--	--	--	--	1,330	400	1,440
31	--	--	--	--	--	--	--	--	--
Total load (tons)	--	--	--	--	--	--	--	--	97,940

YELLOWSTONE RIVER BASIN--Continued

TONGUE RIVER AT MILES CITY, MONT.--Continued

Suspended sediment, water year October 1945 to September 1946--Continued

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	1,330	350	1,260	90	48	12	17	74	3
2	1,470	400	1,590	80	12	3	17	58	3
3	1,520	596	2,440	98	910	300	17	40	2
4	1,470	520	2,060	144	698	286	17	37	2
5	1,020	300	838	128	150	52	17	52	2
6	1,330	400	1,440	100	170	46	17	53	2
7	1,470	959	3,920	80	112	24	67	128	23
8	1,330	1,890	6,720	70	68	13	190	2,810	2,490
9	1,120	1,850	5,760	70	70	13	1,010	15,800	47,000
10	1,010	830	2,260	70	60	11	1,280	7,900	27,300
11	940	920	2,340	70	43	8	1,040	3,160	8,880
12	880	1,030	2,450	150	29	12	676	1,820	3,320
13	754	285	580	765	18,900	55,400	460	1,000	1,240
14	676	170	311	730	15,700	30,000	388	500	524
15	520	120	168	535	6,600	11,300	360	300	292
16	470	100	127	246	840	558	352	220	219
17	432	103	120	197	251	134	356	1,400	1,350
18	545	2,840	4,570	182	117	58	368	1,570	1,560
19	565	3,540	5,590	177	88	42	376	656	666
20	408	1,160	1,290	182	72	35	376	420	426
21	324	147	128	190	70	36	380	424	435
22	282	71	54	187	67	34	388	471	493
23	249	57	38	90	51	12	396	850	909
24	229	58	36	80	73	16	408	604	667
25	229	37	23	80	1,220	817	416	383	429
26	184	38	19	240	1,880	1,230	424	365	417
27	169	27	12	90	300	73	428	223	259
28	148	27	11	40	252	27	432	165	193
29	132	45	16	17	66	3	436	155	183
30	119	99	32	17	51	2	440	157	187
31	100	33	9	17	41	2	--	--	--
Total load (tons)	--	--	46,210	--	--	100,600	--	--	99,480

Total load for period June 14 to Sept. 30 (tons) ---------- 344,200

YELLOWSTONE RIVER BASIN--Continued

TONGUE RIVER AT MILES CITY, MONT.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	445	171	205	718	188	365	600	--	--
2	450	157	191	706	140	267	550	44	65
3	455	158	194	688	106	197	500	--	--
4	460	154	191	676	85	155	500	50	68
5	480	178	231	635	66	113	500	47	63
6	718	2,550	4,940	600	52	84	500	40	54
7	940	4,310	10,900	580	45	70	500	35	47
8	910	3,890	9,560	565	45	68	500	30	40
9	910	5,820	14,300	560	52	79	500	28	38
10	980	5,310	14,000	560	34	51	500	36	49
11	1,010	4,020	11,000	560	35	53	500	43	58
12	980	1,310	3,470	555	30	45	400	38	41
13	910	1,420	3,490	560	30	45	350	20	19
14	820	772	1,710	575	29	45	300	14	11
15	736	369	733	570	32	49	300	11	9
16	682	192	354	575	73	113	200	10	5
17	652	133	234	600	109	177	150	9	4
18	630	122	208	615	135	224	150	8	3
19	610	96	158	600	150	243	200	5	3
20	540	71	104	500	83	112	250	7	5
21	445	52	62	350	54	51	300	11	10
22	400	34	37	300	--	--	300	20	16
23	376	26	26	350	--	--	300	45	36
24	364	19	19	400	--	--	350	80	76
25	372	49	49	450	--	--	400	--	--
26	470	812	1,030	550	--	--	350	--	--
27	605	1,980	3,230	650	--	--	250	--	--
28	688	1,990	3,700	650	--	--	200	50	27
29	718	1,740	3,370	650	--	--	150	--	--
30	724	1,160	2,270	650	--	--	150	--	--
31	724	356	697	--	--	--	150	18	7
Total load (tons)	--	--	90,660	--	--	1/3,200	--	--	1/1,060
	January			February			March		
1	150	--	--	250	34	23	250	--	--
2	150	--	--	200	--	--	300	--	--
3	150	--	--	150	--	--	350	--	--
4	200	--	--	150	--	--	350	--	--
5	250	23	15	150	--	--	350	--	--
6	300	--	--	150	--	--	350	--	--
7	350	--	--	150	--	--	350	50	47
8	400	29	31	150	--	--	350	27	26
9	400	--	--	150	114	46	350	--	--
10	400	--	--	200	--	--	350	--	--
11	400	--	--	200	54	29	350	--	--
12	350	--	--	650	--	--	350	45	43
13	350	--	--	950	41	105	350	--	--
14	250	--	--	1,000	--	--	350	--	--
15	150	20	8	1,000	--	--	400	--	--
16	200	--	--	900	--	--	2,000	89	480
17	250	--	--	650	294	516	2,650	300	215
18	300	--	--	350	--	--	2,800	--	--
19	300	22	18	300	--	--	2,950	525	4,170
20	300	--	--	250	382	258	3,100	1,230	10,300
21	350	--	--	200	--	--	4,800	2,050	26,600
22	550	--	--	150	--	--	3,750	2,800	28,400
23	650	30	53	150	--	--	2,890	3,070	24,000
24	750	464	940	150	--	--	3,010	3,400	27,700
25	800	546	1,180	150	22	9	2,350	2,410	15,300
26	800	411	886	150	--	--	2,000	1,650	8,920
27	750	294	595	150	--	--	1,900	1,640	8,430
28	650	380	666	200	--	--	1,900	1,870	9,620
29	550	428	636	--	--	--	1,730	2,830	13,200
30	450	--	--	--	--	--	1,570	1,270	5,380
31	350	--	--	--	--	--	1,520	1,250	5,130
Total load (tons)	--	--	1/5,900	--	--	1/1,600	--	--	1/188,300

1/ Includes estimated load for missing days.

YELLOWSTONE RIVER BASIN--Continued

TONGUE RIVER AT MILES CITY, MONT.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	1,470	1,070	4,240	555	59	88	1,010	143	390
2	1,420	907	3,480	565	54	82	980	161	427
3	1,380	1,060	3,950	560	54	82	940	169	429
4	1,420	1,140	4,370	560	43	65	940	235	597
5	1,330	884	3,180	570	48	74	910	447	1,100
6	1,010	320	870	585	54	85	980	285	753
7	940	230	584	590	43	69	1,080	305	892
8	940	301	764	595	62	99	1,080	286	836
9	980	3,510	9,310	670	235	425	1,080	484	1,420
10	1,040	5,620	15,800	742	586	1,170	1,120	400	1,210
11	1,080	4,050	11,800	820	762	1,680	1,040	277	779
12	980	1,380	3,660	1,010	1,740	4,760	1,160	399	1,250
13	820	381	846	1,520	1,730	7,110	1,770	726	3,470
14	724	355	694	1,780	1,910	9,180	1,750	503	2,380
15	688	228	423	2,200	2,220	13,200	1,780	455	2,190
16	658	126	224	2,650	1,720	12,300	1,780	520	2,500
17	640	89	154	2,600	1,440	10,100	1,680	398	1,800
18	615	76	126	2,550	1,450	9,980	1,380	230	858
19	520	55	77	2,530	1,090	7,450	1,200	213	692
20	450	74	90	2,530	946	6,470	1,120	230	697
21	515	66	92	2,530	779	5,330	1,040	1,180	3,310
22	500	34	46	1,680	445	2,020	1,040	7,560	21,200
23	480	25	32	1,420	604	2,310	1,080	4,650	13,600
24	475	28	36	1,620	447	1,960	1,200	872	2,820
25	475	34	44	1,680	365	1,660	2,170	1,470	8,620
26	465	20	25	1,680	361	1,640	2,000	2,200	11,800
27	470	24	30	1,680	343	1,560	3,010	3,890	31,700
28	480	28	36	1,680	292	1,320	3,010	1,640	13,400
29	515	37	51	1,620	299	1,310	2,890	1,050	8,200
30	540	46	67	1,380	286	1,070	2,950	750	5,980
31	--	--	--	1,120	167	506	--	--	--
Total load (tons)	--	--	65,100	--	--	105,200	--	--	145,300

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	2,650	605	4,330	200	10	5	155	8	3
2	1,420	382	1,470	182	11	5	152	7	3
3	1,900	413	2,130	179	14	7	150	8	3
4	1,900	320	1,650	160	12	5	148	6	2
5	1,620	280	1,220	138	11	4	145	7	3
6	1,420	230	882	119	9	3	145	6	2
7	1,200	172	557	110	5	1	146	9	4
8	1,200	202	653	102	6	2	126	6	2
9	1,280	260	900	90	4	1	152	7	3
10	1,280	375	1,300	86	3	.7	157	9	4
11	1,240	302	1,010	74	3	.6	164	9	4
12	1,200	213	692	51	6	.8	174	16	8
13	1,040	170	478	39	9	.9	179	13	6
14	880	150	357	35	1	.1	184	27	13
15	880	117	279	32	1	.1	169	27	12
16	760	117	240	32	10	.9	172	10	5
17	652	92	162	32	10	.9	187	15	7
18	535	65	94	34	14	1	177	10	5
19	490	52	69	35	7	.7	172	8	4
20	470	49	62	35	5	.5	172	8	4
21	455	51	63	35	4	.4	174	8	4
22	440	54	64	57	7	1	172	7	3
23	424	50	57	200	14	8	169	6	3
24	412	47	52	180	7	4	164	9	4
25	380	48	49	170	6	3	167	9	4
26	340	44	40	165	7	3	169	8	4
27	290	25	20	165	5	2	174	6	3
28	276	26	19	160	6	3	164	4	2
29	249	23	15	160	9	4	157	6	3
30	255	21	14	160	11	5	157	7	3
31	240	17	11	160	11	5	--	--	--
Total load (tons)	--	--	18,940	--	--	79	--	--	130

Total load for year (tons) ---------- 1/625,500

1/ Includes estimated load for missing days.

POWDER RIVER AT ARVADA, WYO.

LOCATION.--At bridge on highway at Arvada, Sheridan County.
DRAINAGE AREA.--6,050 square miles.
RECORDS AVAILABLE.--Sediment records: April 1946 to September 1947.
EXTREMES, April-September 1946.--Sediment loads: Maximum, 533,000 tons per day June 20; minimum, 0 tons per day Aug. 7-Sept. 1.
EXTREMES, 1946-47.--Sediment loads: Maximum, 300,000 tons per day July 6; minimum, 0 tons per day Aug. 23-Sept. 10.
EXTREMES, April 1946-September 1947.--Sediment loads: Maximum, 533,000 tons per day June 20, 1946; minimum, 0 tons per day Aug. 7-Sept. 1, 1946, Aug. 23-Sept. 10, 1947.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids		Hardness as $CaCO_3$		Percent sodium
															Parts per million	Tons per acre-foot	Total	Non-carbonate	
Oct. 2, 1946	1/90	8.2	152	--	0.10	165	58	153	208	676	75	0.8	1.0	--	1,230	1.68	650	479	34
Apr. 4, 1947	1/26	8.2	161	12	.10	149	47	168	184	682	46	.4	4.0	1.0	1,200	1.63	565	414	39
May 1	1/814	8.2	158	17	.05	153	51	193	196	756	42	.4	4.4	1.6	1,310	1.78	591	430	42
June 4	1/1,040	8.1	108	14	.08	106	30	120	154	462	26	.5	4.0	1.5	818	1.11	388	262	40
June 29	9.7	8.2	115	14	.10	99	30	127	143	477	21	.8	4.0	1.1	872	1.19	370	253	43
Aug. 20	1/1.5	8.4	250	14	.04	253	101	288	2/213	1,240	146	.4	.6	1.8	2,150	2.92	1,050	870	37

1/ Mean.
2/ Includes equivalent of 10 parts per million of carbonate (CO_3).

YELLOWSTONE RIVER BASIN--Continued

POWDER RIVER AT ARVADA, WYO.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	544	10,700	15,800	530	12,400	17,800
2	--	--	--	518	11,300	15,900	640	14,200	24,500
3	--	--	--	500	10,300	13,900	586	13,800	21,800
4	338	7,060	6,440	464	11,000	13,800	518	9,500	13,300
5	346	8,180	7,660	482	13,100	17,100	482	7,940	10,300
6	333	10,500	9,460	488	13,800	18,200	470	8,100	10,300
7	315	12,800	10,900	470	11,600	14,700	452	9,190	11,200
8	279	9,880	7,470	452	11,000	13,400	446	7,390	8,900
9	272	6,800	5,010	428	10,600	12,300	446	5,630	6,780
10	291	7,310	5,740	422	9,260	10,600	440	4,410	5,240
11	320	8,190	7,080	434	11,700	13,700	428	11,500	13,300
12	324	6,480	5,680	512	12,600	17,400	1,310	42,200	149,000
13	311	6,620	5,570	558	11,400	17,200	506	30,100	42,700
14	295	5,790	4,630	544	10,800	15,900	780	26,300	55,400
15	275	4,920	3,660	518	8,590	12,000	512	30,000	41,500
16	295	6,050	4,830	500	9,130	12,300	400	24,200	26,200
17	346	7,060	6,600	482	14,600	19,000	342	13,400	12,400
18	360	6,410	6,230	476	10,200	13,100	380	12,100	12,400
19	380	9,070	9,300	488	9,550	12,600	579	39,600	93,300
20	470	14,400	18,200	500	9,440	12,700	2,530	78,000	533,000
21	[illegible]	17,800	26,300	500	7,770	10,500	1,050	44,200	125,000
22	664	25,500	45,700	476	6,820	8,770	512	28,400	39,300
23	716	21,600	41,800	458	6,860	8,500	416	19,200	21,600
24	672	18,800	34,100	470	7,920	10,100	698	38,900	113,000
25	616	15,500	25,800	446	6,380	7,690	1,320	22,500	80,300
26	558	36,300	54,800	446	12,400	14,900	385	8,970	9,330
27	530	34,400	49,300	464	10,400	13,000	390	17,400	18,600
28	537	15,400	22,300	428	11,100	12,800	291	9,450	7,430
29	579	13,800	21,600	416	8,290	9,320	224	6,860	4,160
30	586	12,600	19,900	428	10,400	12,000	224	4,680	2,840
31	--	--	--	464	9,380	11,800	--	--	--
Total load (tons)	--	--	466,100	--	--	411,000	--	--	1,531,000

Day	July			August			September		
1	244	6,650	4,380	50	546	74	0	--	0
2	247	8,330	5,570	38	334	34	72	17,800	4,000
3	488	16,600	21,900	24	202	13	90	10,000	2,430
4	537	16,800	24,400	17	143	7	90	5,100	1,240
5	2,890	45,700	374,000	8	99	2	90	1,800	437
6	1,980	40,300	216,000	4	--	1	77	1,300	270
7	830	31,300	70,100	0	0	0	416	42,100	47,300
8	385	42,500	44,200	0	--	0	351	34,600	34,500
9	227	24,900	15,300	0	--	0	230	42,400	26,300
10	187	17,000	8,590	0	--	0	283	64,200	49,100
11	160	12,100	5,230	0	--	0	395	66,000	70,400
12	133	7,800	2,800	0	--	0	342	51,600	47,600
13	118	9,700	3,090	0	--	0	258	37,100	25,800
14	250	46,700	36,200	0	--	0	202	26,400	14,400
15	224	33,300	20,200	0	--	0	175	18,100	8,550
16	664	58,600	105,000	0	--	0	148	14,000	5,600
17	291	23,900	18,800	0	--	0	124	9,300	3,120
18	202	16,800	9,170	0	--	0	112	5,210	1,580
19	181	13,300	6,500	0	--	0	98	3,950	1,050
20	184	15,300	7,610	0	--	0	90	3,270	795
21	139	10,000	3,750	0	--	0	82	3,200	709
22	112	6,800	2,060	0	--	0	93	5,290	1,330
23	87	5,240	1,230	0	--	0	121	8,640	2,820
24	80	2,960	640	0	--	0	121	5,600	1,830
25	80	2,300	497	0	--	0	118	4,650	1,480
26	72	1,400	272	0	--	0	121	3,910	1,280
27	64	1,010	175	0	--	0	124	3,570	1,200
28	64	778	134	0	--	0	121	3,310	1,080
29	54	663	97	0	--	0	112	2,820	853
30	47	697	88	0	--	0	101	2,500	682
31	47	769	98	0	--	0	--	--	--
Total load (tons)	--	--	1,008,000			131	--	--	357,700

Total load for period Apr. 4 to Sept. 30 (tons) ---------- 3,774,000

YELLOWSTONE RIVER BASIN--Continued

POWDER RIVER AT ARVADA, WYO.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	93	2,480	623	169	5,120	2,340	139	3,750	1,410
2	90	2,600	632	175	4,680	2,210	157	3,250	1,380
3	85	2,110	484	151	3,900	1,590	154	2,900	1,210
4	82	2,200	487	121	4,660	1,520	151	2,950	1,200
5	90	4,550	1,110	145	4,470	1,750	163	2,850	1,250
6	118	10,600	3,380	154	3,430	1,430	178	4,300	2,070
7	139	14,200	5,330	163	4,550	2,000	175	5,100	2,410
8	166	9,320	4,180	178	5,460	2,620	166	4,500	2,020
9	181	7,920	3,870	187	4,500	2,270	151	3,900	1,590
10	190	10,700	5,500	190	5,230	2,680	139	4,400	1,650
11	187	11,000	5,560	166	6,830	3,060	142	4,150	1,590
12	184	8,440	4,200	160	6,660	2,880	120	8,300	2,690
13	175	7,000	3,310	166	4,100	1,840	110	--	--
14	172	5,620	2,610	157	3,050	1,290	120	--	--
15	169	4,620	2,110	181	7,100	3,470	150	--	--
16	160	3,940	1,700	199	5,890	3,160	90	--	--
17	160	4,460	1,930	205	5,990	3,320	86	--	--
18	163	4,540	2,000	208	5,430	2,980	88	--	--
19	160	3,210	1,390	187	5,620	2,840	100	--	--
20	157	3,180	1,350	139	2,140	804	130	--	--
21	151	2,740	1,120	82	378	84	125	--	--
22	124	2,810	941	96	615	159	135	--	--
23	133	3,120	1,120	118	714	227	130	--	--
24	133	3,530	1,270	264	8,330	5,910	135	--	--
25	136	3,840	1,410	157	4,990	2,120	140	--	--
26	133	4,510	1,620	154	4,180	1,740	110	--	--
27	136	4,320	1,590	124	5,000	1,670	85	--	--
28	139	4,050	1,520	107	4,100	1,180	70	--	--
29	145	4,050	1,590	148	4,570	1,830	60	--	--
30	169	6,760	3,080	154	4,180	1,740	66	--	--
31	172	5,720	2,660	--	--	--	68	--	--
Total load (tons)	--	--	69,680	--	--	62,710	--	--	1/33,000
	January			February			March		
1	67	--	--	72	--	--	160	--	--
2	66	--	--	80	--	--	170	--	--
3	74	--	--	76	--	--	190	--	--
4	90	--	--	78	--	--	180	--	--
5	88	--	--	80	--	--	170	--	--
6	88	--	--	78	--	--	180	--	--
7	90	--	--	76	--	--	190	--	--
8	92	--	--	74	--	--	220	--	--
9	96	--	--	76	--	--	280	--	--
10	105	--	--	78	--	--	290	--	--
11	120	--	--	90	--	--	310	--	--
12	110	--	--	115	--	--	400	--	--
13	90	--	--	150	--	--	600	--	--
14	76	--	--	160	--	--	1,200	--	--
15	69	--	--	200	--	--	2,000	1,560	8,420
16	76	--	--	300	--	--	4,500	6,720	81,600
17	94	--	--	500	3,900	5,260	5,480	10,500	155,000
18	92	--	--	450	2,600	3,160	3,810	9,320	95,800
19	92	--	--	350	--	1,800	2,320	8,670	72,700
20	85	--	--	250	--	330	1,480	19,300	77,100
21	80	--	--	300	--	1,000	1,410	20,300	77,400
22	86	--	--	290	1,400	1,100	979	22,000	58,200
23	98	--	--	270	1,650	1,200	680	28,000	51,500
24	110	--	--	240	1,500	972	537	24,600	35,700
25	105	--	--	220	--	--	458	18,900	23,400
26	100	--	--	200	--	--	295	17,500	14,000
27	96	--	--	160	--	--	221	11,300	6,750
28	92	--	--	150	--	--	193	12,000	6,250
29	84	--	--	--	--	--	181	10,800	5,280
30	78	--	--	--	--	--	169	8,550	3,900
31	74	--	--	--	--	--	178	7,340	3,530
Total load (tons)	--	--	1/3,500	--	--	1/20,000	--	--	1/796,000

1/ Includes estimated load for missing days.

YELLOWSTONE RIVER BASIN--Continued

POWDER RIVER AT ARVADA, WYO.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	199	8,160	4,380	814	20,000	44,000	648	10,400	18,200
2	234	9,150	5,780	1,380	28,000	104,000	648	9,270	16,200
3	258	7,140	4,970	891	20,300	48,800	716	9,880	19,100
4	261	5,900	4,160	1,210	19,400	63,400	1,040	11,700	32,900
5	264	6,320	4,500	2,260	30,400	186,000	814	12,900	28,400
6	268	6,550	4,740	2,380	32,200	207,000	680	15,400	28,300
7	268	7,490	5,420	2,710	31,000	227,000	608	11,000	18,100
8	272	6,050	4,440	2,640	27,600	197,000	544	8,520	12,500
9	264	7,110	5,070	2,090	24,500	138,000	524	7,180	10,200
10	261	6,610	4,660	2,020	20,900	114,000	558	6,930	10,400
11	254	8,070	5,530	2,310	21,200	132,000	565	6,080	9,280
12	247	7,080	4,720	1,990	22,200	119,000	572	6,380	9,860
13	247	7,200	4,800	2,670	30,700	221,000	586	6,320	10,000
14	227	7,120	4,360	1,960	20,200	107,000	707	7,610	14,500
15	205	5,500	3,040	1,380	13,400	49,900	689	8,310	15,500
16	208	5,720	3,210	1,160	11,700	36,600	632	7,870	13,400
17	211	5,640	3,210	1,030	10,000	27,800	593	6,840	11,000
18	247	7,220	4,820	924	8,780	21,900	734	12,800	25,400
19	244	7,100	4,680	847	8,400	19,200	1,700	21,400	98,200
20	234	7,030	4,440	836	8,720	19,700	1,270	18,400	63,100
21	258	7,180	5,000	869	7,370	17,300	814	32,100	70,500
22	342	7,690	7,100	924	6,880	17,200	586	22,800	36,100
23	458	12,400	15,300	880	7,600	18,100	1,990	41,100	189,000
24	579	15,500	24,200	847	7,720	17,700	1,280	36,000	124,000
25	624	19,300	32,500	825	6,610	14,700	825	22,200	49,500
26	698	23,000	43,400	761	6,730	13,800	656	17,900	31,700
27	672	23,800	43,200	761	6,310	13,000	672	16,600	30,100
28	600	18,200	29,500	836	7,260	16,400	624	13,600	22,900
29	512	14,800	20,500	1,010	11,200	30,500	494	11,300	15,100
30	422	13,500	15,400	1,510	12,600	51,400	464	8,320	10,400
31	--	--	--	825	12,100	27,000	--	--	--
Total load (tons)	--	--	327,000	--	--	2,320,000	--	--	1,044,000

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	422	6,930	7,900	33	1,940	173	0	--	0
2	385	6,260	6,510	31	1,480	124	0	--	0
3	365	5,720	5,640	25	807	55	0	--	0
4	333	4,580	4,120	20	649	35	0	--	0
5	324	4,070	3,560	19	493	25	0	--	0
6	2,370	50,500	300,000	15	353	14	0	--	0
7	990	42,500	114,000	13	299	10	0	--	0
8	551	33,400	49,700	11	241	7	0	--	0
9	458	23,000	28,400	8.1	205	4	0	--	0
10	365	19,900	19,600	7.1	184	4	.2	--	0
11	307	8,200	6,800	9.7	227	6	2.4	--	--
12	275	6,500	4,830	8.1	200	4	.4	--	--
13	254	4,710	3,230	7.1	236	5	.3	--	--
14	254	5,300	3,640	5.0	133	2	15	1,470	60
15	476	33,400	43,000	3.4	121	1	42	4,200	476
16	221	11,400	6,810	2.2	103	.6	35	3,750	354
17	202	5,700	3,110	1.4	119	.4	46	18,600	2,310
18	205	4,300	2,380	1.9	88	.5	40	17,800	1,920
19	190	3,980	2,040	2.9	74	.6	33	6,750	601
20	154	3,000	1,250	1.5	68	.3	33	3,720	331
21	148	2,390	955	.4	51	.1	30	2,170	176
22	160	3,070	1,330	.1	24	0	35	2,100	197
23	154	2,240	932	0	--	0	38	2,210	227
24	151	4,640	1,890	0	--	0	32	1,690	146
25	184	7,110	3,540	0	--	0	28	1,270	96
26	148	10,700	4,280	0	--	0	27	1,040	76
27	121	11,700	3,820	0	--	0	28	916	69
28	96	9,800	2,540	0	--	0	30	844	68
29	93	6,470	1,630	0	--	0	30	750	61
30	64	6,990	1,210	0	--	0	33	729	65
31	48	3,580	464	0	--	0	--	--	--
Total load (tons)	--	--	639,100	--	--	472	--	--	1/7,240
Total load for year (tons)									1/5,323,000

1/ Includes estimated load for missing days.

POWDER RIVER AT ARVADA, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date	Instantaneous discharge (second-feet)	Suspended sediment													
		Concentration at time of sampling (p.p.m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p.p.m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)									
						0.00195	0.0039	0.0078	0.0156	0.0312	0.0625	0.125	0.250	0.500	1.000	2.000
June 1, 1946	544	12,760	18,700	9,890	BN	--	4	31	44	51	70	84	93	97	98	--
June 21	979	39,200	104,000	7,370	BN	--	6	48	78	81	88	91	96	99	100	--
Mar. 18, 1947	3,360	8,210	74,500	6,170	BN	--	3	6	34	--	56	63	84	93	97	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

LITTLE MISSOURI RIVER BASIN

LITTLE MISSOURI RIVER AT MEDORA, N. DAK.

LOCATION.--At bridge on U. S. Highway 10, a quarter of a mile west of Medora, Billings County, and 1 mile upstream from Andrews Creek.
DRAINAGE AREA.--6,190 square miles.
RECORDS AVAILABLE.--Chemical records: October 1946 to September 1947.
Water temperatures: March to September 1947.
Sediment records: March 1946 to September 1947.
EXTREMES, March-September 1946.--Sediment loads: Maximum, 332,000 tons per day June 25; minimum, 2.4 tons per day Aug. 29.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 1,470 parts per million Sept. 9-30; minimum, 233 parts per million Mar. 24.
Total hardness: Maximum, 384 parts per million Sept. 9-30; minimum, 90 parts per million Mar. 24.
Water temperatures: Maximum, 92° F. Aug. 2, 9; minimum, freezing point on several days in March.
Sediment loads: Maximum, 438,000 tons per day June 24; minimum, 0.2 ton per day Jan. 3-4, 9-15, Feb. 8-12.
EXTREMES, March 1946-September 1947.--Sediment loads: Maximum, 438,000 tons per day June 24, 1947; minimum, 0.2 ton per day Jan. 3-4, 9-15, Feb. 8-12, 1947.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086. Records of specific conductance of daily samples available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 7, 1946 1/	379	--	7.5	96.4	--	0.10	38	14	155		198	308	2.0	0.3	4.0	--	670	0.91	686	152	0	69
Mar. 11-20, 1947	113	34	7.4	55.0	4.0	.10	47	13	47	16	128	161	13	.2	1.2	0.6	355	.48	108	171	66	35
Mar. 24 1/	38,000	--	7.2	35.4	5.2	.30	25	6.6	41	3.2	124	72	3.8	.4	.5	.7	233	.32	23,900	90	0	49
Mar. 21-31	9,740	36	7.4	42.6	4.0	.40	40	10	31	15	148	98	2.5	.1	1.6	.6	279	.38	8,070	141	20	30
Apr. 1-10	2,420	37	7.5	57.1	8.0	.20	46	13	53	16	152	170	1.0	.2	1.2	1.0	384	.52	2,500	168	43	36
Apr. 11-20	4,720	42	7.7	64.1	6.0	.16	50	14	67	17	158	207	1.5	.2	1.6	1.0	438	.60	5,590	182	52	42
Apr. 21-30	570	53	7.9	98.4	5.0	.10	64	22	118	22	190	359	3.5	.4	.2	1.0	690	.94	1,060	250	94	48
May 1-10	249	51	7.9	121	6.0	.10	72	26	167	15	272	421	4.5	.4	.2	1.4	855	1.16	575	287	64	54
May 11-20	170	56	8.0	134	5.0	.10	77	27	197	19	302	478	6.5	.5	.2	1.4	957	1.30	439	303	55	57
May 21-31	137	56	8.1	143	5.0	.05	72	28	224	17	318	506	7.0	.5	.8	1.4	1,020	1.39	377	291	30	61
June 1-10	470	59	8.0	134	7.0	.05	67	26	201	21	252	504	3.0	.4	1.6	1.8	966	1.31	1,230	274	67	59
June 11-20	302	65	8.1	136	7.0	.10	60	24	218	18	286	483	5.0	.3	1.6	1.8	964	1.31	786	248	13	64
June 13 1/	198	--	7.9	115	12	.01	52	23	180		240	395	3.2	.3	2.6	--	812	1.10	434	224	27	64
June 21-22	2,100	55	8.6	134	20	.14	61	26	190	6.4	2/222	473	.6	.4	1.6	--	906	1.23	5,140	259	77	61
June 23 (7:00 p.m.)	6,160	--	7.5	127	16	.02	76	26	179		256	447	3.8	.4	5.2	--	924	1.26	15,400	296	86	57

1/ Not included in weighted average.
2/ Includes equivalent of 14 parts per million of carbonate (CO_3).

June 23 (5:00 a. m.)	6,160	52	7.6	103	35	.06	64	18	170		285	353	.0	.6	.2	--	780	1.06	13,000	234	0	61
June 24	7,830	52	7.4	94.0	21	.04	59	17	147		272	295	.0	.6	7.2	--	684	.93	14,500	217	0	60
June 25 1/	5,740	--	7.7	84.6	15	.01	42	16	122		192	265	1.0	.3	.4	1.5	562	.76	8,700	171	14	61
June 25-28	6,500	65	8.4	82.6	16	.16	45	16	105	6.8	3/190	235	4.0	.5	1.2	--	548	.75	9,620	178	22	55
June 29-30	3,860	62	8.3	97.0	18	.16	70	24	110	4.0	4/154	363	3.0	.5	1.6	--	694	.94	7,240	273	147	46
July 1	3,900	61	7.4	89.0	18	.06	86	20	102		196	339	.0	.6	3.5	--	672	.91	7,080	297	136	43
July 2-6	1,220	70	8.3	107	17	.14	60	26	142	8.0	5/154	426	5.4	.6	.9	1.6	754	1.03	2,490	257	131	54
July 7-12	460	81	8.3	115	15	.11	64	28	151	10	4/188	444	5.2	.5	1.0	2.5	824	1.12	1,020	275	121	53
July 13	1,310	75	7.5	123	18	.06	89	22	185		246	488	.0	.6	5.3	--	934	1.27	3,300	312	110	56
July 14-15	945	77	8.5	107	17	.24	52	21	156	14	2/242	356	.8	.6	1.9	--	756	1.03	1,930	216	18	59
July 16-22	302	73	8.4	137	19	.12	64	30	205	11	5/228	535	7.6	.5	1.2	1.7	980	1.33	799	337	150	78
July 23	188	67	7.4	147	13	.00	84	32	236		262	606	4.0	.6	.6	--	1,110	1.51	563	341	126	60
July 24-Aug. 9	114	78	8.3	162	16	.11	74	37	253	9.2	5/256	662	6.9	.5	2.5	3.1	1,190	1.62	366	337	127	61
Aug. 10-12	342	68	8.5	166	17	.08	78	34	259	3.2	6/265	653	6.0	.6	1.8	--	1,180	1.60	1,090	334	117	62
Aug. 13-15	1,060	66	8.5	119	14	.06	53	21	180	4.8	5/254	391	2.0	.8	1.8	--	824	1.12	2,360	219	11	64
Aug. 16-19	234	75	8.4	126	14	.06	53	24	192	5.2	4/172	487	4.0	.8	1.8	--	896	1.22	566	231	90	64
Aug. 20-Sept. 4	48	68	8.4	184	17	.04	74	38	305	6.0	2/284	750	9.0	.6	3.1	1.8	1,340	1.82	174	341	108	66
Aug. 27 1/	40	--	8.6	193	16	.01	84	40	320		7/286	786	8.5	.5	5.2	2.6	1,400	1.90	151	374	139	65
Sept. 5-8	23	65	8.4	194	16	.05	78	42	321	6.8	8/320	765	8.0	.5	2.4	--	1,400	1.90	87	367	105	65
Sept. 9-30	24	55	8.5	198	12	.07	83	43	334	9.2	2/326	813	9.0	.5	.4	2.0	1,470	2.00	95	384	150	65
Weighted average	9/1,360	--	--	70.4	8.8	0.24	50	15	80	14	175	221	2.6	0.3	1.7	--	484	0.66	1,780	186	42	42

1/ Not included in weighted average.
2/ Includes equivalent of 14 parts per million of carbonate (CO_3).
3/ Includes equivalent of 10 parts per million of carbonate (CO_3).
4/ Includes equivalent of 6 parts per million of carbonate (CO_3).
5/ Includes equivalent of 8 parts per million of carbonate (CO_3).
6/ Includes equivalent of 9 parts per million of carbonate (CO_3).
7/ Includes equivalent of 18 parts per million of carbonate (CO_3).
8/ Includes equivalent of 11 parts per million of carbonate (CO_3).
9/ Mean discharge for water year October 1946 to September 1947 was 954 second-feet.

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LITTLE MISSOURI RIVER BASIN--Continued

LITTLE MISSOURI RIVER AT MEDORA, N. DAK.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	--	--	--	--	--	--	41	46	55	61	79	64
2	--	--	--	--	--	--	--	48	51	66	92	64
3	--	--	--	--	--	--	38	55	60	70	78	51
4	--	--	--	--	--	--	36	66	63	69	75	62
5	--	--	--	--	--	--	33	51	58	72	84	71
6	--	--	--	--	--	--	33	46	62	74	89	65
7	--	--	--	--	--	--	38	50	52	--	81	58
8	--	--	--	--	--	--	33	46	66	83	71	65
9	--	--	--	--	--	--	37	47	61	79	92	56
10	--	--	--	--	--	--	48	49	51	82	71	57
11	--	--	--	--	--	32	40	--	--	82	69	69
12	--	--	--	--	--	32	38	49	--	78	64	77
13	--	--	--	--	--	32	44	64	73	75	68	61
14	--	--	--	--	--	32	40	56	62	73	62	53
15	--	--	--	--	--	32	38	63	--	80	68	42
16	--	--	--	--	--	32	40	54	63	74	75	55
17	--	--	--	--	--	34	41	67	69	--	78	50
18	--	--	--	--	--	35	41	62	63	77	78	51
19	--	--	--	--	--	39	47	51	61	78	69	51
20	--	--	--	--	--	40	51	47	66	74	85	53
21	--	--	--	--	--	39	--	50	56	63	68	--
22	--	--	--	--	--	39	45	45	53	77	83	49
23	--	--	--	--	--	34	41	49	52	67	76	54
24	--	--	--	--	--	35	42	--	52	71	75	52
25	--	--	--	--	--	36	52	56	70	86	57	48
26	--	--	--	--	--	--	51	49	58	72	63	59
27	--	--	--	--	--	--	67	54	65	72	73	52
28	--	--	--	--	--	36	53	54	65	74	68	--
29	--	--	--	--	--	34	69	58	63	71	65	52
30	--	--	--	--	--	35	56	72	60	65	60	54
31	--	--	--	--	--	37	--	70	--	82	69	--
Average	--	--	--	--	--	--	44	54	60	74	74	57

LITTLE MISSOURI RIVER BASIN--Continued

LITTLE MISSOURI RIVER AT MEDORA, N. DAK.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--
8	--	--	--	--	--	--	--	--	--
9	--	--	--	--	--	--	--	--	--
10	--	--	--	--	--	--	350	1,850	1,750
11	--	--	--	--	--	--	400	2,630	2,840
12	--	--	--	--	--	--	500	--	4,500
13	--	--	--	--	--	--	550	3,800	5,640
14	--	--	--	--	--	--	550	3,700	5,490
15	--	--	--	--	--	--	500	2,550	3,440
16	--	--	--	--	--	--	450	1,800	2,190
17	--	--	--	--	--	--	425	1,710	1,960
18	--	--	--	--	--	--	400	1,790	1,930
19	--	--	--	--	--	--	352	--	1,600
20	--	--	--	--	--	--	308	1,470	1,220
21	--	--	--	--	--	--	268	1,180	854
22	--	--	--	--	--	--	219	820	485
23	--	--	--	--	--	--	196	626	331
24	--	--	--	--	--	--	202	525	286
25	--	--	--	--	--	--	159	880	378
26	--	--	--	--	--	--	159	445	191
27	--	--	--	--	--	--	186	600	301
28	--	--	--	--	--	--	237	2,800	1,790
29	--	--	--	--	--	--	268	3,600	2,600
30	--	--	--	--	--	--	287	3,600	2,790
31	--	--	--	--	--	--	375	6,650	6,730
Total load (tons)	--	--	--	--	--	--	--	--	49,300

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	452	7,650	9,340	48	66	8.6	1,270	5,900	20,200
2	790	9,700	20,700	52	65	9.1	1,590	9,000	38,600
3	910	10,100	24,800	100	--	110	1,320	10,100	36,000
4	830	9,200	20,600	358	5,050	4,880	830	10,500	23,500
5	510	7,450	10,300	511	14,500	20,000	1,080	11,500	33,500
6	400	6,100	6,590	244	14,100	9,290	1,270	7,000	24,000
7	352	--	4,000	234	14,500	9,160	1,370	6,600	24,400
8	287	2,850	2,210	226	14,500	8,850	910	4,650	11,400
9	287	2,000	1,550	205	10,400	5,760	750	4,100	8,300
10	216	1,640	956	145	6,000	2,350	640	3,150	5,440
11	189	1,500	765	123	2,400	797	510	2,200	3,030
12	167	--	500	112	--	470	375	1,680	1,700
13	132	820	292	99	1,310	350	270	2,620	1,910
14	130	--	260	87	760	179	1,260	20,800	70,800
15	120	--	200	81	620	136	510	17,800	24,500
16	110	--	150	67	350	63	1,300	--	85,000
17	105	350	99	65	250	44	2,090	16,300	92,000
18	97	251	66	74	220	44	3,500	--	170,000
19	87	250	59	116	2,080	652	2,640	11,800	84,100
20	99	222	59	140	10,800	4,080	1,590	6,900	29,600
21	97	184	48	170	5,600	2,570	1,080	4,800	14,000
22	93	185	46	216	3,300	1,920	1,540	6,000	24,900
23	83	172	39	173	9,800	4,580	2,940	7,700	61,100
24	78	153	32	150	10,900	4,410	4,980	14,900	247,000
25	72	153	30	142	9,100	3,490	5,550	21,200	332,000
26	60	171	28	112	--	2,000	1,900	17,400	89,300
27	48	110	14	142	5,100	1,960	1,370	12,300	45,500
28	48	58	7.5	1,910	28,300	162,000	1,120	6,400	19,400
29	49	57	7.5	3,570	23,300	225,000	750	5,300	10,700
30	46	52	6.5	3,410	12,500	115,000	605	--	8,500
31	--	--	--	2,090	7,600	42,900	--	--	--
Total load (tons)	--	--	103,800	--	--	633,100	--	--	1,640,000

LITTLE MISSOURI RIVER BASIN--Continued

LITTLE MISSOURI RIVER AT MEDORA, N. DAK.--Continued

Suspended sediment, water year October 1945 to September 1946--Continued

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	425	4,250	4,880	60	--	500	8	--	3
2	480	13,000	16,800	54	1,500	219	12	--	3
3	600	--	26,000	46	1,050	130	13	90	3.2
4	600	--	13,000	41	750	83	12	100	3.2
5	452	3,500	4,270	36	650	63	12	90	2.9
6	425	3,300	3,790	36	--	70	15	75	3.0
7	400	--	3,600	34	1,150	106	13	85	3.0
8	329	2,500	2,220	40	--	430	15	--	70
9	1,030	2,680	9,970	107	2,400	693	37	6,250	624
10	1,170	17,400	49,000	126	14,600	5,180	42	6,950	788
11	425	20,400	23,400	142	13,700	5,610	44	6,050	719
12	375	16,000	16,200	35	--	700	98	5,470	1,710
13	287	9,900	7,670	30	--	290	186	15,800	7,930
14	248	--	4,800	30	--	130	219	15,900	9,400
15	196	5,300	2,800	30	--	36	268	16,400	11,900
16	148	2,600	1,040	30	155	13	452	15,700	19,200
17	130	--	400	29	170	13	540	12,300	17,900
18	121	--	150	32	--	18	452	12,000	14,600
19	112	200	60	44	270	32	308	8,200	6,820
20	338	13,900	18,400	39	205	22	248	4,950	3,310
21	510	22,900	31,500	30	125	10	202	3,250	1,770
22	308	--	15,000	25	620	42	164	--	950
23	202	13,600	7,420	23	95	5.9	140	1,600	605
24	150	9,800	3,970	23	65	4.0	132	1,170	417
25	121	--	2,600	24	--	7	123	905	301
26	99	6,200	1,660	24	450	29	114	725	223
27	85	3,700	849	24	520	34	114	--	180
28	85	--	550	21	105	6.0	114	535	165
29	81	2,300	503	18	50	2.4	112	--	170
30	74	10,400	2,080	11	100	3.0	107	1,020	295
31	67	6,500	1,180	8	--	3	--	--	--
Total load (tons)	--	--	275,800	--	--	14,480	--	--	100,100

Total load for period Mar. 10 to Sept. 30 (tons) ---------- 2,817,000

LITTLE MISSOURI RIVER BASIN--Continued

LITTLE MISSOURI RIVER AT MEDORA, N. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	90	1,280	311	1,090	4,420	13,000	40	8	0.9
2	80	--	220	1,540	6,470	26,900	40	8	.9
3	70	--	110	1,500	--	22,000	40	8	.9
4	66	350	62	1,430	4,080	15,800	40	8	.9
5	100	--	700	1,090	2,590	7,620	40	6	.9
6	234	7,260	4,590	797	1,690	3,640	50	5	.7
7	379	7,750	7,930	647	1,350	2,360	100	60	16
8	716	13,100	25,300	521	900	1,270	300	1,850	1,500
9	709	12,100	23,200	423	620	708	300	1,000	810
10	1,070	13,200	38,100	343	--	410	300	250	202
11	1,970	17,000	90,400	298	342	275	300	760	616
12	2,340	13,600	65,900	250	250	169	400	1,420	1,530
13	2,040	9,800	54,000	200	210	113	450	550	668
14	1,780	6,620	31,800	150	187	76	400	430	464
15	1,640	5,200	23,000	120	142	46	300	189	153
16	1,290	4,100	14,300	90	--	22	200	161	87
17	1,010	3,500	9,540	70	--	11	120	178	58
18	830	2,830	6,340	60	46	7.5	90	148	36
19	748	2,230	4,500	50	--	5	70	93	18
20	670	1,940	3,510	45	--	4	60	52	6.4
21	625	1,580	2,670	40	--	3	50	49	8.6
22	575	1,380	2,140	35	25	2.4	40	53	5.7
23	435	1,180	1,390	35	36	3.4	35	85	8.0
24	338	1,120	1,020	35	52	5.0	30	173	14
25	260	800	562	35	43	4.1	25	92	6.2
26	245	550	364	35	18	1.7	22	187	11
27	240	--	260	35	12	1.1	20	136	7.3
28	246	360	241	35	10	.9	16	55	2.7
29	316	630	538	35	9	.9	16	89	3.8
30	458	1,510	1,870	40	7	.8	14	42	1.6
31	655	2,180	3,860	--	--	--	12	19	.6
Total load (tons)	--	--	438,700	--	--	94,460	--	--	6,239
	January			February			March		
1	11	15	0.4	10	35	0.9	350	13	12
2	10	12	.3	8	30	.6	300	19	15
3	9	10	.2	7	29	.5	250	29	20
4	8	8	.2	6	26	.4	220	41	24
5	8	18	.4	5	27	.4	200	29	16
6	7	79	1.5	5	29	.4	190	50	26
7	7	17	.3	4	24	.3	180	470	228
8	7	34	.6	4	23	.2	170	670	308
9	7	10	.2	4	19	.2	160	640	276
10	7	8	.2	4	21	.2	150	440	178
11	8	8	.2	5	17	.2	140	540	204
12	10	9	.2	7	12	.2	130	300	105
13	10	9	.2	10	12	.3	120	250	81
14	9	9	.2	25	290	20	120	420	136
15	8	10	.2	1,500	780	3,160	110	320	95
16	8	15	.3	3,000	1,670	13,500	110	1,140	339
17	8	21	.5	4,000	1,190	12,900	100	600	162
18	10	17	.5	5,000	1,100	14,800	100	250	68
19	15	11	.4	3,000	1,230	9,960	100	140	38
20	15	10	.4	1,500	720	2,920	100	425	115
21	15	8	.3	3,500	450	4,250	200	2,780	1,500
22	15	7	.3	2,500	290	1,960	2,000	1,080	5,830
23	20	77	4.2	2,000	220	1,190	10,000	1,000	27,000
24	50	65	8.8	1,500	140	567	38,000	3,670	377,000
25	70	305	58	850	44	101	17,000	4,970	228,000
26	100	165	45	700	35	66	12,000	5,130	166,000
27	300	300	243	550	22	33	6,300	4,500	76,500
28	400	202	218	400	21	23	5,270	3,930	55,900
29	150	78	32	--	--	--	5,860	5,910	93,500
30	60	74	12	--	--	--	5,800	6,200	97,100
31	30	40	3.2	--	--	--	4,680	6,410	81,000
Total load (tons)	--	--	632	--	--	65,450	--	--	1,212,000

LITTLE MISSOURI RIVER BASIN--Continued

LITTLE MISSOURI RIVER AT MEDORA, N. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	4,160	5,500	61,800	320	213	184	112	31	9.4
2	3,860	4,810	50,100	311	207	174	104	20	5.6
3	3,920	5,700	60,300	298	181	146	100	17	4.6
4	2,730	4,410	32,500	268	141	102	117	49	15
5	2,140	4,540	26,200	252	111	76	159	1,180	507
6	1,500	2,750	11,100	241	91	59	465	17,400	38,100
7	1,770	2,570	12,300	230	74	46	1,320	27,200	96,900
8	1,110	3,390	10,200	205	59	33	1,220	13,900	45,800
9	1,050	4,780	13,600	188	48	24	658	5,050	9,680
10	1,920	10,000	53,500	178	47	23	440	3,100	3,680
11	5,140	14,600	203,000	175	39	16	320	1,650	1,430
12	8,310	14,400	323,000	178	31	15	162	--	500
13	8,360	10,800	244,000	159	25	11	198	600	321
14	8,240	10,300	229,000	169	20	9.1	195	600	316
15	5,920	8,120	130,000	184	25	12	208	1,520	854
16	3,850	6,250	65,000	208	76	43	195	1,240	653
17	2,700	4,100	29,900	166	62	28	205	2,200	1,220
18	1,910	2,680	13,600	159	63	27	234	3,340	2,110
19	1,530	2,150	8,880	150	61	25	542	4,000	5,850
20	1,290	--	5,600	147	110	44	764	5,650	11,700
21	1, [illegible]	--	3,500	147	400	159	1,380	15,000	59,400
22	614	1,000	2,200	133	231	83	2,820	16,600	147,000
23	678	850	1,560	142	143	55	6,160	25,300	421,000
24	589	790	1,260	150	130	53	7,830	20,700	438,000
25	528	630	898	150	168	68	5,740	12,600	195,000
26	483	444	579	144	166	65	6,890	9,600	179,000
27	435	387	455	136	137	50	6,670	7,450	134,000
28	406	323	354	139	84	32	6,710	7,300	132,000
29	353	281	268	128	65	22	3,810	7,700	79,200
30	343	226	209	117	58	18	3,920	10,000	106,000
31	--	--	--	120	44	14	--	--	--
Total load (tons)	--	--	1,595,000	--	--	1,718	--	--	2,110,000

Day	July			August			September		
1	3,900	12,800	135,000	88	136	32	28	23	1.7
2	1,830	9,600	48,400	86	52	12	27	35	2.6
3	1,280	6,350	21,900	75	26	5.3	26	40	2.8
4	1,030	4,700	13,100	67	29	5.2	25	73	4.9
5	1,080	3,220	9,390	71	32	6.1	24	45	2.9
6	890	1,590	3,820	67	49	6.9	23	30	1.9
7	625	1,620	3,070	64	79	14	22	18	1.1
8	483	1,070	1,400	58	65	10	22	26	1.5
9	400	650	702	64	250	43	21	13	.7
10	369	460	458	222	3,350	2,010	21	12	.7
11	379	1,330	1,360	356	14,700	14,200	21	10	.6
12	502	4,200	5,690	446	14,900	17,900	19	10	.5
13	1,310	9,120	32,900	699	23,000	55,800	17	19	.9
14	1,350	15,700	58,200	1,340	21,900	79,800	19	45	2.3
15	540	10,100	16,000	944	16,700	44,400	20	34	1.8
16	343	3,320	3,070	353	11,200	10,700	22	23	1.4
17	320	3,980	3,440	245	7,200	4,760	26	17	1.2
18	338	3,220	2,940	195	4,300	2,260	28	19	1.4
19	353	1,700	1,620	144	2,000	776	27	20	1.5
20	311	760	638	107	750	217	27	46	3.4
21	245	380	251	88	184	44	31	58	4.9
22	205	248	137	75	139	28	30	53	4.3
23	188	450	228	56	158	25	27	30	2.2
24	215	1,280	743	60	120	19	27	26	1.9
25	175	1,260	595	56	54	6.2	24	25	1.6
26	169	660	301	45	43	5.2	27	26	1.9
27	156	330	139	40	40	4.3	26	36	2.5
28	162	330	144	40	42	4.5	26	46	3.2
29	181	850	415	34	30	2.8	26	54	3.8
30	122	320	105	32	19	1.6	25	54	3.6
31	110	177	53	30	20	1.6	--	--	--
Total load (tons)	--	--	366,200	--	--	233,100	--	--	66

Total load for year (tons) ---------- 6,124,000

LITTLE MISSOURI RIVER AT MEDORA, N. DAK.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Instantaneous discharge (second-feet)	Suspended sediment												
		Concentration at time of sampling (p.p.m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p.p.m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)									
						0.00195	0.0039	0.0078	0.0156	0.0312	0.0625	0.125	0.250	0.500	1.000	2.000
May 31, 1946	2,060	7,930	44,100	12,100	BN	28	43	56	66	74	81	88	94	98	99	--
June 25	5,220	18,600	262,000	12,000	BN	42	50	60	71	81	88	90	91	94	97	--
June 26	1,810	16,700	81,600	4,540	BN	56	69	82	86	89	90	91	96	98	99	--
July 29	80.4	1,990	432	2,910	BN	20	30	--	97	100	--	--	--	--	--	--
Mar. 24, 1947	32,000	4,210	364,000	5,720	BN	32	40	47	53	64	74	82	90	96	98	--
Mar. 27	6,560	4,150	73,500	5,830	BN	10	18	48	60	65	80	86	95	98	99	--
Apr. 2	3,780	4,600	46,900	5,190	BN	7	9	28	67	71	77	83	87	95	98	--
Apr. 11	5,800	14,700	230,000	4,590	BN	2	4	10	83	85	94	98	99	99	100	--
June 25	6,050	11,700	191,000	3,700	BN	63	71	77	81	88	91	96	98	99	100	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

LITTLE MISSOURI RIVER BASIN--Continued

LITTLE MISSOURI RIVER NEAR WATFORD CITY, N. DAK.

LOCATION.--At bridge on U. S. Highway 85, 17½ miles south of Watford City, McKenzie County, and 18 miles upstream from Cherry Creek.
DRAINAGE AREA.--8,490 square miles.
RECORDS AVAILABLE.--Sediment records: May to September 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids		Hardness as $CaCO_3$		Percent sodium
																Parts per million	Tons per acre-foot	Total	Non-carbonate	
Mar. 26, 1947	25,400	7.7	41.7	7.8	0.60	42	8.7	25	3.8	172	69	3.8	0.1	3.0	0.6	260	0.35	141	0	34
May 1	288	7.4	104	13	.02	66	22	140		220	358	3.8	.2	.0	--	704	.96	255	75	54
May 27	220	8.5	136	19	.02	52	28	231		1/ 276	481	5.2	.3	14	.8	944	1.28	245	19	67
May 28	237	7.6	142	15	.02	71	29	220		332	479	6.0	.2	.0	--	994	1.35	296	24	61
June 24	8,490	7.9	118	16	.02	59	20	187		260	405	.5	.4	.7	.9	842	1.15	229	16	64
July 7	1,060	8.2	122	12	.02	66	24	151		132	504	4.2	.4	1.9	.8	880	1.20	268	160	51

1/Includes equivalent of 12 parts per million of carbonate (CO_3).

LITTLE MISSOURI RIVER BASIN--Continued

LITTLE MISSOURI RIVER NEAR WATFORD CITY, N. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	208	120	67
2	--	--	--	--	--	--	208	107	60
3	--	--	--	--	--	--	206	101	56
4	--	--	--	--	--	--	204	80	44
5	--	--	--	--	--	--	201	157	85
6	--	--	--	--	--	--	239	1,800	1,160
7	--	--	--	--	--	--	578	16,100	26,200
8	--	--	--	--	--	--	1,360	33,200	122,000
9	--	--	--	--	--	--	984	22,100	58,700
10	--	--	--	--	--	--	959	18,400	47,600
11	--	--	--	--	--	--	728	11,200	22,000
12	--	--	--	--	--	--	548	5,100	7,550
13	--	--	--	--	--	--	439	2,600	3,080
14	--	--	--	--	--	--	380	1,630	1,670
15	--	--	--	--	--	--	333	1,060	953
16	--	--	--	--	--	--	314	660	560
17	--	--	--	--	--	--	311	550	462
18	--	--	--	--	--	--	314	474	402
19	--	--	--	--	--	--	303	606	496
20	--	--	--	--	--	--	317	2,000	1,710
21	--	--	--	--	--	--	2,080	33,900	231,000
22	--	--	--	--	--	--	5,550	50,400	755,000
23	--	--	--	--	--	--	9,300	45,700	1,150,000
24	--	--	--	--	--	--	8,400	39,900	905,000
25	--	--	--	--	--	--	8,430	30,000	683,000
26	--	--	--	--	--	--	7,140	22,800	440,000
27	--	--	--	229	208	129	8,160	17,900	394,000
28	--	--	--	234	235	148	7,800	13,600	286,000
29	--	--	--	225	164	100	8,250	15,700	350,000
30	--	--	--	215	150	87	5,890	14,200	226,000
31	--	--	--	210	127	72	--	--	--
Total load (tons)	--	--	--	--	--	536	--	--	5,715,000

	July			August			September		
1	5,750	11,800	183,000	333	--	200	82	142	31
2	6,100	15,500	255,000	294	113	90	78	98	21
3	4,090	13,100	145,000	269	61	44	77	76	16
4	3,260	--	108,000	256	57	39	74	59	12
5	1,480	8,600	34,400	249	50	34	70	71	13
6	792	5,940	12,700	344	9,700	9,770	67	57	10
7	1,050	4,400	12,500	1,990	38,800	212,000	64	76	13
8	950	3,860	9,900	1,590	27,500	118,000	60	67	11
9	749	2,240	4,530	1,140	16,100	49,600	58	63	9.9
10	629	1,740	2,950	764	7,650	16,300	54	61	8.9
11	721	4,920	9,580	506	7,300	9,970	53	56	8.0
12	531	10,000	14,300	438	13,700	16,200	53	61	8.7
13	510	3,300	4,540	1,060	18,800	55,900	49	95	13
14	480	3,600	4,670	2,500	--	234,000	47	111	14
15	1,120	5,430	17,900	2,900	--	264,000	46	80	9.9
16	1,730	11,000	62,300	1,370	24,000	89,600	47	69	8.8
17	1,580	24,400	104,000	764	18,700	38,600	49	80	11
18	721	19,600	38,200	584	13,900	21,900	49	78	10
19	581	6,190	9,710	417	10,000	11,300	50	60	8.1
20	575	2,800	4,350	317	7,400	6,330	50	50	6.8
21	700	5,200	9,830	245	5,200	3,440	50	37	5.0
22	635	3,210	5,500	199	3,020	1,620	50	52	7.0
23	536	1,600	2,320	174	1,530	719	47	46	5.8
24	466	770	969	147	850	337	46	33	4.1
25	414	480	536	132	460	164	43	31	3.6
26	485	1,150	1,510	117	322	102	47	45	5.7
27	526	3,440	4,880	116	278	87	44	34	4.0
28	439	1,890	2,240	109	234	69	43	36	4.2
29	359	998	967	106	204	58	40	38	4.1
30	330	392	349	96	198	51	39	48	4.8
31	333	360	324	89	192	46	--	--	--
Total load (tons)	--	--	1,067,000	--	--	1,161,000	--	--	292
Total load for period May 27 to Sept. 30 (tons)									7,944,000

LITTLE MISSOURI RIVER BASIN--Continued

LITTLE MISSOURI RIVER NEAR WATFORD CITY, N. DAK.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Instantaneous discharge (second-feet)	Suspended sediment													
		Concentration at time of sampling (p.p.m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p.p.m.)	Method of analysis 1/	Percent finer than indicated size (in millimeters)									
						0.00195	0.0039	0.0078	0.0156	0.312	0.625	0.125	0.250	0.500	1.000	2.000
Mar. 26, 1947----------	25,200	7,650	521,000	6,230	BN	10	18	34	39	46	63	73	87	96	99	--
Mar. 28 ----------	12,300	6,760	224,000	4,790	BN	7	12	33	40	50	59	70	88	96	99	--
July 16 ----------	2,730	17,700	130,000	6,040	BN	5	9	62	77	81	89	93	96	98	98	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

KNIFE RIVER NEAR GOLDEN VALLEY, N. DAK.

LOCATION.--At gaging station at bridge on highway about 2½ miles downstream from Elm Creek, and 10 miles south of Golden Valley, Mercer County.
DRAINAGE AREA.--1,230 square miles.
RECORDS AVAILABLE.--Sediment records: June 1946 to September 1947.
EXTREMES, June-September 1946.--Sediment loads: Maximum, 6,990 tons per day July 17; minimum, 0.2 ton per day Aug. 8, 10-12, 20-21.
EXTREMES, 1946-47.--Sediment loads: Maximum, 29,680 tons per day June 23; minimum, 0.3 ton per day Jan. 5-9, 19.
EXTREMES, June 1946-September 1947.--Sediment loads: Maximum, 29,680 tons per day June 23, 1947; minimum, 0.2 ton per day Aug. 8, 10-12, 20-21, 1946.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 3, 1946 (5:35 p.m.)	2.9	7.8	--	--	0.00	43	32	374		692	462	4.1	0.9	2.0	--	1,260	1.71	239	0	77
Oct. 3 (10:00 a.m.) ---	14.8	7.8	114	--	.00	63	35	212		547	291	5.5	.5	1.4	--	902	1.23	301	0	60
Oct. 11 ----------	46.1	8.4	149	--	.00	58	33	291		485	485	5.1	.8	2.0	--	1,120	1.53	280	0	69
Mar. 25, 1947 --------	1,700	7.6	19.3	6.6	--	10	4.5	28	7.6	90	18	15	.0	.2	0.3	130	.18	43	0	53
Apr. 21 ----------	160	8.8	65.2	6.0	.06	29	12	75	18	199	132	1.1	.1	6.0	.6	389	.53	122	0	53
May 15 ----------	20	8.4	123	5.0	.06	56	24	207	17	1/427	337	4.2	.2	2.0	1.5	864	1.18	238	0	63
June 9 ----------	89	8.9	133	3.0	.10	50	24	249	20	2/490	370	2.2	.2	1.0	1.0	952	1.29	223	0	69
June 10 ----------	224	8.5	184	6.0	.03	57	32	440	18	3/607	717	5.0	.2	2.0	1.2	1,580	2.14	274	0	76
June 23 ----------	5,880	8.6	47.1	4.0	.20	24	10	39	16	131	92	1.6	.1	.6	.4	267	.36	101	0	41
June 26 ----------	1,510	8.5	50.3	9.0	.16	25	9.2	45	21	146	99	1.1	.1	.6	.9	295	.40	100	0	44

1/ Includes equivalent of 43 parts per million of carbonate (CO_3).
2/ Includes equivalent of 19 parts per million of carbonate (CO_3).
3/ Includes equivalent of 28 parts per million of carbonate (CO_3).

KNIFE RIVER BASIN--Continued

KNIFE RIVER NEAR GOLDEN VALLEY, N. DAK.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	8.4	129	2.9
6	--	--	--	--	--	--	8.4	72	1.6
7	--	--	--	--	--	--	7.8	--	2
8	--	--	--	--	--	--	7.2	--	2
9	--	--	--	--	--	--	6.9	80	1.5
10	--	--	--	--	--	--	7.2	80	1.6
11	--	--	--	--	--	--	7.5	79	1.6
12	--	--	--	--	--	--	7.2	77	1.5
13	--	--	--	--	--	--	6.9	75	1.4
14	--	--	--	--	--	--	6.3	82	1.4
15	--	--	--	--	--	--	6.0	76	1.2
16	--	--	--	--	--	--	5.5	77	1.1
17	--	--	--	--	--	--	5.5	78	1.2
18	--	--	--	--	--	--	5.2	78	1.1
19	--	--	--	--	--	--	5.2	78	1.1
20	--	--	--	--	--	--	5.0	79	1.1
21	--	--	--	--	--	--	4.5	80	1.0
22	--	--	--	--	--	--	4.0	74	.8
23	--	--	--	--	--	--	5.2	100	2.4
24	--	--	--	--	--	--	132	3,430	1,850
25	--	--	--	--	--	--	120	2,320	752
26	--	--	--	--	--	--	125	1,300	439
27	--	--	--	--	--	--	102	1,100	303
28	--	--	--	--	--	--	145	1,220	478
29	--	--	--	--	--	--	125	1,170	395
30	--	--	--	--	--	--	177	1,260	602
31	--	--	--	--	--	--	--	--	--
Total load (tons)	--	--	--	--	--	--	--	--	4,848

Day	July			August			September		
1	102	675	186	4.2	41	0.5	4.2	78	0.9
2	54	575	84	3.8	42	.4	4.8	62	.8
3	45	500	61	3.3	49	.4	4.0	70	.8
4	58	550	86	2.5	58	.4	3.3	55	.5
5	84	900	204	2.3	63	.4	3.3	53	.5
6	106	950	272	1.9	61	.3	3.1	50	.4
7	65	625	110	1.4	68	.3	3.1	44	.4
8	42	398	45	1.0	81	.2	2.9	--	.3
9	28	260	20	1.4	102	.4	5.0	--	.8
10	20	143	7.7	1.2	77	.2	6.3	--	1
11	15	122	4.9	1.2	61	.2	5.0	36	.5
12	12	110	3.6	1.2	58	.2	5.0	--	.5
13	10	87	2.3	2.1	68	.4	6.3	62	1.1
14	8.7	85	2.0	2.9	85	.7	5.0	--	.9
15	7.5	84	1.7	2.3	72	.4	5.0	--	.9
16	58	2,010	458	2.3	81	.5	4.5	--	.7
17	377	6,330	6,990	2.3	82	.5	3.5	50	.5
18	588	3,300	5,240	1.7	81	.4	4.8	55	.7
19	197	1,960	1,100	1.4	80	.3	4.8	--	.8
20	72	1,280	249	1.0	72	.2	4.2	57	.6
21	42	550	62	.9	63	.2	4.8	--	.7
22	26	270	19	.13	306	91	4.5	54	.7
23	19	183	9.4	35	1,620	346	4.2	43	.5
24	14	155	5.9	3.8	158	1.6	4.8	--	.6
25	11	134	4.0	4.0	190	2.1	4.5	63	.8
26	11	115	3.4	8.1	--	6	4.2	68	.8
27	10	99	2.7	5.2	220	3.1	4.0	--	.6
28	8.7	97	2.3	4.0	155	1.7	4.0	45	.5
29	7.5	80	1.6	3.3	126	1.1	3.8	55	.6
30	5.8	71	1.1	3.1	130	1.1	3.5	60	.6
31	4.8	56	.7	2.9	110	.9	--	--	--
Total load (tons)	--	--	15,240	--	--	462	--	--	20

Total load for period June 5 to Sept. 30 (tons) ---------- 20,570

KNIFE RIVER BASIN--Continued

KNIFE RIVER NEAR GOLDEN VALLEY, N. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	3.3	58	0.5	10	90	2.4	5	52	0.7
2	3.3	--	.5	13	56	2.0	5	58	.8
3	2.9	68	.5	19	73	3.7	6	58	.9
4	3.5	--	.8	18	100	4.9	5	56	.8
5	6	681	13	15	--	5	6	63	1.0
6	14	622	26	13	--	3	6	--	1
7	12	68	2.2	12	63	2.0	6	61	1.0
8	12	42	1.4	11	64	1.9	6	68	1.1
9	26	194	14	11	57	1.7	6	62	1.0
10	33	275	25	10	60	1.6	7	--	1
11	39	208	22	9	62	1.5	7	57	1.1
12	39	175	18	8.7	--	2	6	58	.9
13	32	142	12	8.1	60	1.3	6	55	.9
14	28	136	10	7.5	--	1	6	58	.9
15	23	141	8.8	7.5	50	1.0	6	46	.8
16	19	116	6.0	5.8	46	.7	5	46	.6
17	18	101	4.9	6.6	42	.8	5	56	.8
18	18	89	4.3	6.3	46	.8	5	47	.6
19	15	85	3.4	6	60	1.0	5	41	.6
20	14	84	3.2	5.5	64	1.0	5	51	.7
21	12	--	3	5.5	61	.9	5	48	.6
22	11	107	3.2	5	57	.8	6	43	.7
23	11	107	3.2	4.8	52	.7	7	35	.7
24	11	104	3.1	4.5	47	.6	8	33	.7
25	9.7	100	2.6	4.8	47	.6	8	37	.8
26	8.7	91	2.1	4.8	55	.7	8	45	1.0
27	8.4	87	2.0	5	50	.7	8	47	1.0
28	9.4	82	2.1	5.2	56	.8	7	33	.6
29	10	75	2.0	5.2	58	.8	7	34	.6
30	11	91	2.7	5	54	.7	6	37	.6
31	11	--	4	--	--	--	5	38	.5
Total load (tons)	--	--	206	--	--	47	--	--	25

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	5	38	0.5	220	49	29	32	16	1.4
2	5	39	.5	160	43	19	28	16	1.2
3	4	34	.4	120	48	16	26	14	1.0
4	4	38	.4	90	42	10	24	14	.9
5	3	33	.3	70	34	6.4	22	19	1.1
6	3	34	.3	45	31	3.8	21	20	1.1
7	3	34	.3	34	32	2.9	20	19	1.0
8	3	32	.3	26	32	2.2	19	20	1.0
9	3	42	.3	20	34	1.8	18	17	.8
10	3	46	.4	19	38	1.9	18	16	.8
11	4	50	.5	17	33	1.5	17	17	.8
12	4	50	.5	18	29	1.4	17	16	.7
13	5	51	.7	20	34	1.8	17	18	.8
14	5	44	.6	25	35	2.4	16	18	.8
15	5	38	.5	60	87	14	16	16	.7
16	5	36	.5	400	165	178	16	15	.6
17	5	38	.5	1,500	120	486	17	16	.7
18	4	37	.4	1,300	65	228	19	16	.8
19	4	31	.3	600	56	91	18	14	.7
20	4	37	.4	320	48	41	18	98	4.8
21	4	67	.7	230	38	24	50	151	20
22	4	59	.6	160	35	15	700	280	529
23	4	67	.7	120	25	8.1	3,000	--	5,300
24	4	71	.8	95	24	6.2	2,300	--	3,400
25	6	64	1.0	75	22	4.5	1,700	450	2,070
26	40	84	9.1	60	17	2.8	1,800	510	2,480
27	180	140	68	45	16	1.9	950	340	872
28	340	90	83	38	14	1.4	800	370	799
29	400	65	70	--	--	--	750	320	648
30	380	65	67	--	--	--	700	294	556
31	340	58	53	--	--	--	700	306	578
Total load (tons)	--	--	362	--	--	1,202	--	--	17,270

KNIFE RIVER BASIN--Continued

KNIFE RIVER NEAR GOLDEN VALLEY, N. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	650	520	913	37	172	17	13	53	1.9
2	600	515	834	34	142	13	12	58	1.9
3	560	696	1,050	33	--	11	13	55	1.9
4	465	565	709	37	122	12	12	--	2
5	480	--	500	34	--	9	18	46	2.2
6	390	253	266	31	82	6.9	19	64	3.3
7	264	204	145	28	78	5.9	42	90	10
8	190	229	117	27	76	5.5	45	--	12
9	158	345	147	26	70	4.9	70	195	48
10	496	1,160	1,550	24	71	4.6	225	1,080	656
11	811	1,560	3,420	24	67	4.3	129	1,230	428
12	1,410	2,870	10,930	23	48	3.0	95	2,860	734
13	1,580	2,860	12,200	22	38	2.3	65	2,160	379
14	800	--	4,800	22	42	2.5	48	324	42
15	333	1,320	1,190	20	49	2.6	39	--	20
16	264	880	627	18	48	2.3	32	140	12
17	305	768	632	18	47	2.3	27	129	9.4
18	333	--	700	17	--	2	25	126	8.5
19	390	887	934	18	58	2.8	24	115	7.5
20	305	962	792	16	59	2.5	21	99	5.6
21	168	820	372	17	51	2.3	318	3,000	3,450
22	129	580	202	20	47	2.5	1,900	2,660	13,380
23	99	548	146	18	57	2.8	5,090	2,160	29,680
24	79	468	100	17	--	3	5,630	1,720	26,150
25	72	372	72	16	64	2.8	3,480	1,400	13,270
26	62	--	48	16	57	2.5	1,530	1,330	5,520
27	54	--	36	15	45	1.8	611	1,290	2,130
28	48	239	31	15	41	1.7	375	--	1,000
29	42	200	23	14	45	1.7	277	--	600
30	42	180	20	14	53	2.0	251	--	400
31	--	--	--	14	58	2.2	--	--	--
Total load (tons)	--	--	43,510	--	--	142	--	--	97,970

Day	July			August			September		
1	251	396	268	21	93	5.3	12	74	2.4
2	291	415	326	21	83	4.7	12	72	2.3
3	187	302	152	21	90	5.1	12	72	2.3
4	140	243	92	21	84	4.8	12	77	2.5
5	112	163	49	55	--	100	12	73	2.4
6	92	100	25	102	990	273	11	--	2
7	77	75	16	68	1,150	211	11	59	1.8
8	68	72	13	319	2,140	1,850	11	60	1.8
9	59	--	11	140	2,450	965	11	72	2.1
10	55	63	9.4	59	1,000	159	11	70	2.1
11	51	73	10	82	830	184	11	62	1.8
12	55	92	14	64	570	98	10	56	1.5
13	59	94	15	49	308	41	10	49	1.3
14	97	185	48	72	255	50	10	50	1.4
15	68	187	34	49	176	23	10	52	1.4
16	72	198	38	55	166	25	10	52	1.4
17	64	177	31	44	100	12	10	49	1.3
18	55	153	23	34	100	9.2	11	52	1.5
19	44	--	15	37	95	9.5	11	50	1.5
20	37	101	10	29	73	5.7	11	50	1.5
21	34	96	8.8	23	75	4.7	11	50	1.5
22	31	90	7.5	20	80	4.3	10	50	1.4
23	30	107	8.7	17	71	3.3	11	50	1.5
24	28	100	7.6	15	74	3.0	11	50	1.5
25	26	113	7.9	14	74	2.8	10	52	1.4
26	28	126	9.5	13	71	2.5	10	58	1.6
27	28	109	8.2	13	72	2.5	10	60	1.6
28	26	100	7.0	13	70	2.5	10	57	1.5
29	24	95	6.2	13	60	2.1	10	52	1.4
30	23	96	6.0	13	68	2.4	10	50	1.4
31	25	111	7.5	12	73	2.4	--	--	--
Total load (tons)	--	--	1,284	--	--	4,068	--	--	51

Total load for year (tons) ---------- 166,100

KNIFE RIVER NEAR GOLDEN VALLEY, N. DAK.--Continued

Particle-size analysez of suspended sediment, water year October 1946 to September 1947

	Instantaneous discharge (second-feet)	Suspended sediment												
		Concentration at time of sampling (p.p.m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p.p.m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)										
						0.00195	0.0039	0.0078	0.0156	0.0312	0.0625	0.125	0.250	0.500	1.000	2.000
July 17, 1946	319	7,450	6,800	18,300	BN	44	61	71	85	95	100	--	--	--	--	--
Mar. 25, 1947	1,740	478	2,250	1,570	BN	51	60	70	80	90	95	98	99	100	--	--
Mar. 27	850	363	833	995	BN	33	45	56	72	86	93	97	99	100	--	--
Apr. 16	238	853	548	2,350	BN	63	72	82	89	95	97	99	100	--	--	--
June 23	5,880	2,000	31,800	1,780	BN	15	25	83	85	90	94	97	99	100	--	--
June 26	1,360	1,220	4,480	1,080	BN	12	26	54	77	86	92	98	98	99	100	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

KNIFE RIVER BASIN--Continued

KNIFE RIVER AT HAZEN, N. DAK.

LOCATION.--At gaging station at bridge on county highway, half a mile south of Hazen, Mercer County, and 2 miles upstream from Antelope Creek.
DRAINAGE AREA.--2,352 square miles.
RECORDS AVAILABLE.--Sediment records: March to July 1946.
REMARKS.--Records of water discharge for water year October 1945 to September 1946 given in Water-Supply Paper 1056.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids		Hardness as $CaCO_3$		Percent sodium
																Parts per million	Tons per acre-foot	Total	Non-carbonate	
Mar. 25, 1947	3,440	7.6	21.1	9.4	0.80	12	5.6	30	8.3	73	34	20	0.0	7.0	0.7	152	0.21	53	0	51
Apr. 17	463	8.4	51.7	8.0	.16	31	10	44	16	176	81	1.2	.1	6.0	.7	302	.41	118	0	41
May 15	55	7.9	101	5.0	.06	55	23	117	16	341	210	4.2	.2	1.5	1.0	665	.90	232	0	50
June 10 (7:45 p. m.)	121	8.3	122	7.0	.10	55	28	179	14	1/414	300	4.5	.2	1.0	1.5	857	1.17	252	0	59
June 10 (7:40 p. m.)	88	8.0	120	7.0	.06	55	26	179	15	413	295	3.7	.2	.9	1.5	826	1.12	244	0	60
June 23	4,260	7.7	57.1	13	.15	33	14	71		198	123	.0	.2	3.3	--	370	.50	140	0	52
June 26	3,440	8.2	48.6	11	.02	27	11	55		160	93	.7	.2	3.1	.2	296	.40	113	0	51

1/ Includes equivalent of 30 parts per million of carbonate (CO_3).

KNIFE RIVER BASIN--Continued

KNIFE RIVER AT HAZEN, N. DAK.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	March			April			May		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	104	99	28	30	78	6.3
2	--	--	--	91	93	23	31	80	6.7
3	--	--	--	90	97	24	32	--	6.6
4	--	--	--	88	84	20	31	--	6.4
5	--	--	--	87	68	16	31	--	5.7
6	--	--	--	81	71	16	30	--	5.2
7	--	--	--	70	77	15	30	58	4.7
8	750	212	429	71	63	12	33	48	4.3
9	550	179	266	68	56	10	33	57	5.1
10	400	190	205	68	53	9.7	30	49	4.0
11	380	130	133	65	54	9.5	28	38	2.9
12	440	608	722	68	69	13	29	34	2.7
13	550	780	1,160	64	74	13	26	37	2.6
14	440	530	630	55	62	9.2	26	37	2.6
15	320	380	328	50	64	8.6	26	40	2.8
16	250	260	176	51	--	10	26	41	2.9
17	200	177	96	47	86	11	28	42	3.2
18	190	178	91	45	84	10	28	45	3.4
19	180	296	144	43	82	9.5	31	54	4.5
20	190	298	153	41	88	9.7	33	65	5.8
21	190	245	126	40	74	8.0	33	80	7.1
22	180	210	102	39	63	6.6	33	83	7.4
23	170	157	72	38	70	7.2	33	67	6.0
24	159	150	64	38	86	8.8	30	42	3.4
25	159	148	64	35	69	6.5	30	36	2.9
26	145	140	55	33	58	5.2	28	41	3.1
27	138	132	49	33	59	5.3	26	67	4.7
28	131	132	47	30	74	6.0	25	48	3.2
29	124	124	42	31	88	7.4	25	51	3.4
30	110	101	30	30	85	6.9	29	79	6.2
31	104	97	27	--	--	--	34	79	7.3
Total load (tons)	--	--	5,211	--	--	345	--	--	143
	June			July					
1	33	61	5.4	234	990	625			
2	32	68	5.9	166	800	359			
3	30	70	5.7	104	690	194			
4	28	61	4.6	81	540	118			
5	26	66	4.6	98	490	130			
6	26	85	6.0	104	950	267			
7	26	75	5.3	98	660	175			
8	25	78	5.3	91	540	133			
9	25	84	5.7	79	530	113			
10	25	86	5.8	56	460	70			
11	23	107	6.6	38	300	31			
12	22	109	6.5	33	310	28			
13	21	126	7.1	35	440	42			
14	22	112	6.7	67	540	98			
15	20	100	5.4	86	1,070	248			
16	20	108	5.8	173	1,560	1,420			
17	20	98	5.3	496	3,280	4,520			
18	20	92	5.0	837	4,500	10,200			
19	18	101	4.9	752	3,490	7,300			
20	18	106	5.2	324	2,530	2,210			
21	18	109	5.3	273	1,660	1,220			
22	18	117	5.7	152	810	332			
23	18	120	5.8	80	500	108			
24	692	2,620	6,390	56	390	59			
25	569	2,450	3,800	44	300	36			
26	334	2,050	1,970	36	210	20			
27	234	1,330	840	34	180	17			
28	460	2,330	3,250	31	170	14			
29	702	3,030	5,920	28	147	11			
30	299	1,350	1,090	26	145	10			
31	--	--	--	23	150	9.3			
Total load (tons)	--	--	23,390	--	--	30,120			

Total load for period Mar. 8 to July 31 (tons) ---------- 59,210

KNIFE RIVER BASIN--Continued

KNIFE RIVER AT HAZEN, N. DAK.--Continued

Periodic determinations of suspended sediment discharge, water year October 1946 to September 1947

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Instantaneous discharge (tons per day)
Aug. 13, 1946	13	83	2.9
Aug. 28	30	68	5.5
Sept. 11	31	83	6.9
Oct. 3	15	46	1.9
Oct. 11	96	135	35
Oct. 23	28	94	7.1
Nov. 13	28	44	3.3
Nov. 27	15	22	.89
Dec. 3	16	12	.52
Dec. 12	19	30	1.5
Jan. 3, 1947	15	26	1.1
Jan. 23	11	17	.50
Feb. 11	28	31	2.3
Feb. 18	1,680	137	621
Feb. 20	588	77	122
Feb. 25	210	26	15
Mar. 5	50	9	1.2
Mar. 18	36	20	1.9
Mar. 25	3,440	426	3,960
Mar. 28	1,380	296	1,100
Apr. 2	1,080	646	1,880
Apr. 16	548	1,280	1,890
Apr. 28	114	266	82
May 15	56	100	15
May 27	46	82	10
June 10	91	182	45
June 10	120	216	70
June 23	4,260	3,120	35,890
June 26	3,080	1,890	15,720
July 11	120	124	40
July 24	75	139	28
Aug. 14	91	322	79
Sept. 4	36	52	5.1
Sept. 24	32	46	4.0

HEART RIVER NEAR SOUTH HEART, N. DAK.

LOCATION.--At gaging station three-fourths of a mile south of U. S. Highway 10, 2 miles east of South Heart, Stark County, and half a mile downstream from North Creek.
DRAINAGE AREA.--315 square miles.
RECORDS AVAILABLE.--Chemical analyses: May to September 1947.
Water temperatures: May to September 1947.
Sediment records: May to September 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086. Records of specific conductance of daily samples available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
May 17, 1947	1.9	--	8.1	154	28	0.10	59	27	269		535	388	2.6	0.4	0.5	--	1,040	1.41	5.3	261	0	69
May 18-31	1.8	58	8.4	172	19	.02	66	28	301	11	1/587	441	4.0	.4	1.0	--	1,160	1.58	5.6	280	0	69
May 23-31 2/	1.3	59	8.5	153	16	.10	60	31	283	3.2	3/574	399	4.5	.6	1.0	2.3	1,080	1.47	3.8	277	0	69
June 1-7	10	64	8.7	196	21	.02	54	27	375	16	4/657	515	4.0	.4	.2	--	1,340	1.82	36	246	0	75
June 8-10	74	59	8.7	73.7	17	.02	33	12	100	10	206	184	.5	.1	.1	--	467	.64	93	132	0	60
June 10 2/	20	57	8.3	79.2	10	.04	44	16	91	11	217	198	2.0	.1	2.0	1.0	496	.67	27	176	0	51
June 11-21	5.5	62	8.6	106	21	.10	75	17	126	12	5/330	263	1.0	.2	.2	--	693	.94	10	257	0	50
June 22 2/	368	54	8.6	44.2	26	.04	11	3.5	74	2.4	6/173	60	.5	.2	1.2	.8	285	.39	283	42	0	78
June 22-26	840	56	8.1	44.8	13	.06	19	8.3	58	7.2	139	97	1.0	.1	.6	--	287	.39	651	82	0	58
June 23 2/	1,550	51	8.4	35.0	7.0	.04	20	5.9	34	7.2	110	62	1.0	.1	2.0	.6	217	.30	908	74	0	47
June 25 2/	540	58	8.3	40.2	12	.04	24	8.7	35	4.8	112	80	1.0	.1	.8	.6	256	.35	373	96	4	43
June 27-30	184	60	8.6	62.3	17	.02	32	13	74	6.4	7/187	142	1.5	.2	.8	--	400	.54	199	133	0	54
July 1-4	328	65	8.5	50.6	14	.20	30	10	55	7.6	158	109	1.5	.1	.6	---	324	.44	287	116	0	49
July 5-10	16	71	8.7	93.4	25	.02	46	19	137	6.0	8/323	220	1.5	.2	1.6	---	618	.84	27	193	0	60
July 11	17	71	8.2	121	25	.05	68	20	189		438	288	1.0	.4	2.2	--	816	1.11	37	252	0	62
July 12-13	26	70	--	92.0	20	.08	67	21	116	5.6	9/280	242	2.0	.4	3.0	--	616	.84	43	254	24	49
July 14-19	9.1	71	8.8	92.5	18	.10	48	19	137	3.6	315	217	3.3	.4	.8	1.3	600	.82	15	198	0	60
July 20-26	2.9	68	8.3	138	21	.05	80	29	233	1.6	10/521	337	4.2	.4	.8	2.1	952	1.29	7.5	319	0	61
July 27-Aug. 23	2.2	70	8.4	166	22	.05	72	26	312	2.4	11/601	410	3.8	.6	1.0	2.7	1,150	1.56	6.8	287	0	70
Aug. 21 2/	15	64	8.2	173	20	.05	68	22	329		591	464	4.0	.6	.6	--	1,220	1.66	49	260	0	73
Aug. 13 2/	5.5	64	8.6	71.2	58	--	20	.0	160		12/365	92	--	--	2.4	--	526	.72	7.8	50	0	87
Aug. 15 2/	1.7	61	8.1	116	23	.05	30	2.0	232		400	244	1.4	.6	2.2	--	754	1.03	3.5	83	0	86
Aug. 24-Sept. 20	.8	57	8.5	218	15	.05	60	29	472	6.8	13/779	582	5.7	.8	1.0	4.1	1,560	2.12	3.4	269	0	79
Aug. 27 2/	.6	48	8.2	211	16	.05	43	25	433		728	522	5.0	.8	1.8	3.8	1,410	1.92	2.3	210	0	82
Sept. 21-30	1.1	47	8.6	247	18	.05	62	33	529	6.8	14/851	693	5.7	.6	1.0	5.3	1,770	2.41	5.3	290	0	79

See footnotes on p. 264.

HEART RIVER NEAR SOUTH HEART, N. DAK.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

1/ Includes equivalent of 24 parts per million of carbonate (CO_3).
2/ Not included in weighted average.
3/ Includes equivalent of 34 parts per million of carbonate (CO_3).
4/ Includes equivalent of 41 parts per million of carbonate (CO_3).
5/ Includes equivalent of 14 parts per million of carbonate (CO_3).
6/ Includes equivalent of 13 parts per million of carbonate (CO_3).
7/ Includes equivalent of 7 parts per million of carbonate (CO_3).
8/ Includes equivalent of 16 parts per million of carbonate (CO_3).
9/ Includes equivalent of 8 parts per million of carbonate (CO_3).
10/ Includes equivalent of 32 parts per million of carbonate (CO_3).
11/ Includes equivalent of 42 parts per million of carbonate (CO_3).
12/ Includes equivalent of 18 parts per million of carbonate (CO_3).
13/ Includes equivalent of 68 parts per million of carbonate (CO_3).
14/ Includes equivalent of 50 parts per million of carbonate (CO_3).

Temperature (° F.) of water, water year October 1946 to September 1947

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	--	--	--	--	--	--	--	--	60	61	70	60
2	--	--	--	--	--	--	--	--	63	64	72	60
3	--	--	--	--	--	--	--	--	68	68	75	--
4	--	--	--	--	--	--	--	--	64	67	77	64
5	--	--	--	--	--	--	--	--	67	67	75	60
6	--	--	--	--	--	--	--	--	64	64	72	59
7	--	--	--	--	--	--	--	--	61	70	72	60
8	--	--	--	--	--	--	--	--	59	72	--	62
9	--	--	--	--	--	--	--	--	59	75	74	58
10	--	--	--	--	--	--	--	--	57	--	75	57
11	--	--	--	--	--	--	--	--	54	71	69	51
12	--	--	--	--	--	--	--	--	64	71	64	49
13	--	--	--	--	--	--	--	--	58	70	64	57
14	--	--	--	--	--	--	--	--	63	71	--	55
15	--	--	--	--	--	--	--	--	71	75	61	50
16	--	--	--	--	--	--	--	--	64	75	64	49
17	--	--	--	--	--	--	--	--	66	68	65	49
18	--	--	--	--	--	--	--	--	62	--	59	50
19	--	--	--	--	--	--	--	--	59	68	65	51
20	--	--	--	--	--	--	--	59	--	--	69	50
21	--	--	--	--	--	--	--	53	58	--	72	49
22	--	--	--	--	--	--	--	54	54	66	72	45
23	--	--	--	--	--	--	--	61	51	65	70	51
24	--	--	--	--	--	--	--	62	--	68	64	48
25	--	--	--	--	--	--	--	58	58	70	58	45
26	--	--	--	--	--	--	--	--	63	71	63	45
27	--	--	--	--	--	--	--	57	62	70	59	48
28	--	--	--	--	--	--	--	56	60	--	61	50
29	--	--	--	--	--	--	--	54	61	72	60	47
30	--	--	--	--	--	--	--	--	59	--	61	46
31	--	--	--	--	--	--	--	63	--	--	65	--
Average	--	--	--	--	--	--	--	--	61	--	67	53

HEART RIVER BASIN--Continued

HEART RIVER NEAR SOUTH HEART, N. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	1.3	34	0.1
2	--	--	--	--	--	--	1.3	38	.1
3	--	--	--	--	--	--	1.3	51	.2
4	--	--	--	--	--	--	1.5	67	.3
5	--	--	--	--	--	--	1.7	74	.3
6	--	--	--	--	--	--	3.7	109	1.2
7	--	--	--	--	--	--	61	1,900	569
8	--	--	--	--	--	--	143	4,470	1,590
9	--	--	--	--	--	--	58	840	132
10	--	--	--	--	--	--	20	240	13
11	--	--	--	--	--	--	15	129	5.2
12	--	--	--	--	--	--	10	93	2.5
13	--	--	--	--	--	--	7.2	65	1.3
14	--	--	--	--	--	--	5.5	65	1.0
15	--	--	--	--	--	--	4.0	63	.7
16	--	--	--	--	--	--	3.2	71	.6
17	--	--	--	1.9	105	0.5	2.8	75	.6
18	--	--	--	2	--	.5	2.4	79	.5
19	--	--	--	2	--	.4	2.3	83	.5
20	--	--	--	2.0	50	.3	2.5	91	.6
21	--	--	--	2.2	36	.2	5.5	138	2.0
22	--	--	--	2.0	26	.1	368	7,120	5,710
23	--	--	--	1.8	26	.1	1,550	1,770	7,260
24	--	--	--	1.8	64	.3	1,630	652	2,970
25	--	--	--	2.2	76	.5	540	390	570
26	--	--	--	1.8	--	.4	114	325	100
27	--	--	--	1.5	75	.3	70	347	66
28	--	--	--	1.4	70	.3	94	2,290	581
29	--	--	--	1.2	59	.2	124	590	198
30	--	--	--	1.2	49	.2	446	1,190	1,840
31	--	--	--	1.4	43	.2	--	--	--
Total load (tons)	--	--	--	--	--	4	--	--	21,620

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	803	910	1,970	1.4	45	0.2	0.7	41	0.1
2	388	545	590	1.3	53	.2	.7	41	.1
3	81	274	60	1.2	49	.2	.6	46	.1
4	39	209	22	1.2	37	.1	.6	52	.1
5	27	150	11	1.3	54	.2	.6	57	.1
6	20	131	7.1	1.4	72	.3	.7	59	.1
7	16	101	4.4	1.9	69	.4	.7	58	.1
8	13	75	2.6	1.8	49	.2	.6	58	.1
9	10	65	1.8	1.5	31	.1	.6	58	.1
10	8.8	59	1.4	1.8	34	.2	.7	59	.1
11	17	83	5.8	2.4	67	.4	.8	50	.1
12	29	127	9.9	15	8,780	376	.8	59	.1
13	22	192	11	5.5	17,300	257	.8	88	.2
14	14	4,360	165	2.4	10,000	65	.7	72	.1
15	15	342	14	1.7	1,280	5.9	.8	37	.1
16	9.4	41	1.0	1.4	47	.2	.9	39	.1
17	6.6	36	.6	1.2	38	.1	1.2	53	.2
18	5.3	35	.5	1.2	19	.1	1.2	58	.2
19	4.4	40	.5	1.1	23	.1	1.1	58	.2
20	3.8	37	.4	1.0	35	.1	1.1	56	.2
21	3.4	36	.3	1.0	43	.1	1.2	46	.1
22	3.2	48	.4	.9	45	.1	1.2	35	.1
23	2.8	57	.4	.8	39	.1	1.2	33	.1
24	2.6	60	.4	.7	34	.1	1.0	39	.1
25	2.3	60	.4	.7	32	.1	1.1	40	.1
26	2.5	55	.4	.7	39	.1	1.1	38	.1
27	2.5	53	.4	.6	48	.1	1.0	30	.1
28	3.4	51	.5	.7	61	.1	1.0	50	.1
29	2.3	46	.3	.7	65	.1	1.0	58	.2
30	1.9	40	.2	.7	67	.1	1.0	35	.1
31	1.7	39	.2	.6	56	.1	--	--	--
Total load (tons)	--	--	2,883	--	--	708	---	--	4

Total load for period May 17 to Sept. 30 (tons) ---------- 25,220

HEART RIVER NEAR DICKINSON, N. DAK.

LOCATION.--At county bridge 5 miles west of Dickinson, Stark County, and 3 miles upstream from Duck Creek.
DRAINAGE AREA.--330 square miles.
RECORDS AVAILABLE.--Chemical analyses: March to May 1947.
Water temperatures: March to May 1947.
Sediment records: June 1946 to May 1947.
EXTREMES, 1946-47.--Sediment loads: Maximum, 5,360 tons per day Apr. 11; minimum, 0 tons per day Mar. 12.
EXTREMES, June 1946-May 1947.--Sediment loads: Maximum, 5,360 tons per day Apr. 11, 1947; minimum, 0 tons per day Aug. 9-10, Sept.28-29, 1946, Mar. 12, 1947.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086. Records of specific conductance of daily samples available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 7, 1946	4.8	--	8.5	154	--	0.00	25	14	327		1/516	387	2.0	0.6	0.8	--	1,010	1.37	13	120	0	86
Mar. 10, 1947	3.0	34	7.4	61.5	--	.30	25	14	97		232	133	.5	.8	.5	--	440	.60	3.5	120	0	64
Mar. 12	3.0	31	7.6	68.6	--	.14	27	15	106		236	153	3.5	.8	.5	--	490	.67	3.9	129	0	64
Mar. 14	2.0	32	7.4	78.2	--	.20	30	16	131		280	183	1.0	.8	2.5	--	528	.72	2.6	141	0	67
Mar. 16	3.0	31	7.5	94.2	--	.10	32	13	156		309	201	3.5	.8	2.5	--	596	.81	4.8	133	0	72
Mar. 17	3.0	31	7.5	86.1	--	.30	34	15	157		336	200	1.5	.8	.5	--	644	.88	5.2	147	0	70
Mar. 18	3.0	31	7.3	92.0	--	.20	34	16	164		348	207	3.0	.8	.5	--	644	.88	5.2	151	0	70
Mar. 20	2.0	32	7.5	103	--	.07	33	15	194		389	230	3.5	.8	2.0	--	699	.95	3.5	144	0	75
Mar. 21	24	32	7.7	22.6	7.0	.10	23	8.3	30		94	69	2.0	.1	4.0	--	251	.34	16	90	13	42
Mar. 22	300	32	8.0	30.0	4.0	.02	18	6.5	30		108	47	1.0	.1	.4	--	160	.22	130	74	0	47
Mar. 23 (7:55 a. m.)	1,700	32	7.8	12.2	5.0	.02	11	5.2	14		66	21	1.6	.1	.2	--	99	.13	454	48	0	39
Mar. 23 (7:20 p. m.) 2/	1,700	--	7.5	13.6	4.2	.70	9.4	3.6	10	6.6	68	9.0	2.5	.0	.2	0.5	87	.12	399	38	0	32
Mar. 24	2,000	32	7.8	11.3	9.0	.02	14	3.7	16		50	38	3.3	.1	.2	--	105	.14	567	51	11	40
Mar. 25	600	31	7.4	12.9	24	.60	14	4.4	11		60	22	1.7	.1	.4	--	116	.16	188	51	2	32
Mar. 26	280	31	7.3	15.2	7.0	.40	15	5.7	12		72	24	1.6	.1	.6	--	117	.16	88	62	3	29
Mar. 27	220	32	8.1	15.2	3.0	.02	17	5.5	9.2		80	15	1.3	.1	.4	--	108	.15	64	63	0	24
Mar. 28	240	32	8.0	16.1	3.0	.02	13	5.9	15		80	22	1.4	.1	.2	--	131	.18	85	57	0	37
Mar. 29	300	32	7.9	16.0	6.0	.40	18	6.8	11		76	31	1.6	.1	.4	--	137	.19	111	74	12	25
Mar. 30	320	32	8.4	18.1	6.0	.10	15	7.2	10		74	24	1.6	.1	.2	--	130	.18	112	66	5	25
Mar. 31	280	32	7.3	30.6	6.0	.06	14	6.6	17		82	28	.5	.5	.5	--	140	.19	106	62	0	37

1/ Includes equivalent of 12 parts per million of carbonate (CO_3).
2/ Not included in weighted average.

HEART RIVER BASIN--Continued

HEART RIVER NEAR DICKINSON, N. DAK.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Apr. 1, 1947	190	32	7.7	44.8	8.0	0.06	15	6.3		21	80	39	1.0	0.5	0.5	--	157	0.21	81	63	0	42
Apr. 2	130	32	7.2	22.1	--	.30	5.0	9.2		39	104	45	1.0	.4	.5	--	196	.27	69	50	0	63
Apr. 3	140	32	7.7	23.0	--	.20	4.0	8.3		40	102	43	1.0	.4	.5	--	154	.21	58	44	0	66
Apr. 4	190	32	7.8	22.2	--	.10	4.6	6.1		33	78	39	.8	.4	2.0	--	152	.21	78	37	0	66
Apr. 5	80	32	7.3	23.8	--	.14	7.2	4.4		33	79	39	.8	.4	1.5	--	166	.23	36	36	0	67
Apr. 7	50	32	7.6	23.1	--	.16	12	5.7		37	93	51	1.0	.4	1.5	--	196	.27	26	53	0	60
Apr. 8	40	32	7.5	32.2	--	.10	15	4.4		55	124	67	1.0	.4	1.8	--	216	.29	23	56	0	68
Apr. 9	50	32	7.6	38.2	--	.10	50	5.7		17	122	79	.8	.4	1.5	--	252	.34	34	148	48	20
Apr. 10	591	34	7.5	26.9	--	.10	10	5.7		68	112	96	1.0	.4	3.0	--	232	.32	370	48	0	75
Apr. 11	1,360	32	7.6	19.9	--	.20	7.8	6.6		28	88	29	1.0	.4	3.0	--	141	.19	518	47	0	56
Apr. 12	1,440	32	7.5	21.0	--	.30	7.2	10		26	96	34	.8	.4	.2	--	160	.22	622	59	0	49
Apr. 14	170	32	8.0	26.5	--	.80	26	9.4		25	110	60	.6	.4	5.0	--	216	.29	99	104	14	35
Apr. 15	224	37	8.1	34.0	--	.30	27	9.0		36	122	74	.8	.4	4.0	--	220	.30	133	104	4	43
Apr. 16	338	36	8.3	32.6	10	.80	44	11		16	129	77	.5	.3	4.0	--	248	.34	226	155	49	19
Apr. 17	241	42	8.2	31.3	--	.80	24	9.2		28	100	69	.3	.3	5.0	--	195	.27	127	98	16	39
Apr. 18	104	45	8.3	38.2	--	.20	26	10		40	126	82	.6	.3	2.5	--	236	.32	66	106	3	45
Apr. 19	59	49	8.2	44.0	--	.80	30	11		48	141	100	.9	.3	3.5	--	278	.38	44	120	4	47
Apr. 20	43	48	8.2	51.8	--	.20	33	12		61	166	119	.3	.3	3.5	--	320	.44	37	132	0	50
Apr. 21	33	45	8.2	54.7	--	.20	36	14		67	183	134	.7	.3	3.0	--	341	.46	30	147	0	50
Apr. 22	27	44	8.3	57.8	--	.30	38	15		77	200	151	.5	.3	2.5	--	381	.52	28	157	0	52
Apr. 23	22	--	7.5	70.3	12	.06	39	11		92	213	154	3.0	.7	1.0	--	446	.61	26	143	0	58
Apr. 24	19	47	7.5	65.1	10	.10	43	21		84	234	167	4.0	.8	2.5	--	480	.65	24	194	2	48
Apr. 25	16	49	7.5	77.3	8.0	.06	44	17		103	248	181	5.5	.8	2.0	--	508	.69	22	180	0	55
Apr. 26	14	52	7.7	85.0	8.0	.00	44	17		111	268	188	1.5	.8	2.0	--	528	.72	20	180	0	57
Apr. 27	12	54	7.7	91.0	8.0	.10	46	17		121	272	211	1.5	.8	2.5	--	546	.74	17	185	0	59
Apr. 28	10	56	7.7	92.2	4.0	.10	48	18		127	266	234	3.5	.8	2.0	--	566	.77	15	194	0	59
Apr. 30	9.0	58	8.2	94.2	--	.30	48	22		128	305	228	1.2	.3	2.0	--	572	.78	14	210	0	57

May 2	7.2	57	7.8	95.5	12	.10	49	21	147	336	235	3.5	.8	2.5	--	656	.89	12	209	0	61
May 4	4.6	59	7.9	104	12	.10	52	22	161	372	249	1.5	.8	1.5	--	720	.98	8.6	220	0	61
May 6	4.0	58	7.7	110	28	.10	50	24	177	390	265	8.0	.2	1.0	--	750	1.02	8.2	223	0	63
May 8	3.0	58	7.8	116	22	.10	52	24	189	410	282	6.0	.2	.5	--	780	1.06	6.2	228	0	64
May 10	2.8	57	7.9	122	20	.10	54	26	197	435	294	4.0	.2	.5	--	822	1.12	6.6	242	0	64
May 12	3.0	54	8.0	126	14	.10	52	26	211	455	300	7.0	.3	.5	--	848	1.15	6.8	236	0	66
May 14	3.3	60	7.8	130	18	.10	56	25	214	470	305	2.0	.3	.5	--	878	1.19	7.9	243	0	66
May 16	2.9	61	7.9	136	28	.10	60	27	236	491	351	3.0	.3	.5	--	926	1.26	7.4	261	0	66
May 17	2.9	--	8.0	137	36	.05	58	26	234	503	332	1.4	.3	.5	--	932	1.27	7.5	252	0	67
May 18	3.0	60	8.1	139	28	.05	56	28	244	517	340	4.2	.3	.5	--	952	1.29	7.6	255	0	68
May 20	2.9	58	8.4	132	8.0	.20	66	18	258	3/521	358	2.0	.5	.5	--	968	1.32	7.7	244	0	70
May 22	3.5	54	8.4	134	10	.30	64	20	257	4/505	367	2.0	.5	.5	--	978	1.33	8.8	242	0	70
May 24	3.1	63	8.3	139	10	.10	64	24	272	5/543	370	12	.5	.5	--	1,020	1.39	8.2	258	0	70
May 26	2.8	52	8.2	143	6.0	.25	60	19	290	563	376	2.0	.5	.5	--	1,040	1.41	8.3	228	0	73
Weighted average 6/	199	--	--	20.9	--	0.25	14	6.7	25	86	41	1.6	0.2	1.2	--	152	0.21	82	62	0	44

3/ Includes equivalent of 28 parts per million of carbonate (CO_3).
4/ Includes equivalent of 24 parts per million of carbonate (CO_3).
5/ Includes equivalent of 31 parts per million of carbonate (CO_3).
6/ Weighted average for period sampled only.

HEART RIVER BASIN--Continued

HEART RIVER NEAR DICKINSON, N. DAK.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	--	--	--	--	--	--	32	--	--	--	--	--
2	--	--	--	--	--	--	32	57	--	--	--	--
3	--	--	--	--	--	--	32	--	--	--	--	--
4	--	--	--	--	--	--	32	59	--	--	--	--
5	--	--	--	--	--	--	32	--	--	--	--	--
6	--	--	--	--	--	--	--	58	--	--	--	--
7	--	--	--	--	--	--	32	--	--	--	--	--
8	--	--	--	--	--	--	32	58	--	--	--	--
9	--	--	--	--	--	--	32	--	--	--	--	--
10	--	--	--	--	--	34	34	57	--	--	--	--
11	--	--	--	--	--	--	32	--	--	--	--	--
12	--	--	--	--	--	32	32	54	--	--	--	--
13	--	--	--	--	--	--	--	--	--	--	--	--
14	--	--	--	--	--	32	32	60	--	--	--	--
15	--	--	--	--	--	--	37	--	--	--	--	--
16	--	--	--	--	--	32	36	61	--	--	--	--
17	--	--	--	--	--	32	42	--	--	--	--	--
18	--	--	--	--	--	32	45	60	--	--	--	--
19	--	--	--	--	--	--	49	--	--	--	--	--
20	--	--	--	--	--	32	48	58	--	--	--	--
21	--	--	--	--	--	32	45	--	--	--	--	--
22	--	--	--	--	--	32	44	54	--	--	--	--
23	--	--	--	--	--	32	--	--	--	--	--	--
24	--	--	--	--	--	32	47	63	--	--	--	--
25	--	--	--	--	--	32	49	--	--	--	--	--
26	--	--	--	--	--	32	52	52	--	--	--	--
27	--	--	--	--	--	32	54	--	--	--	--	--
28	--	--	--	--	--	32	56	--	--	--	--	--
29	--	--	--	--	--	32	--	--	--	--	--	--
30	--	--	--	--	--	32	58	--	--	--	--	--
31	--	--	--	--	--	32	--	--	--	--	--	--
Average	--	--	--	--	--	--	40	--	--	--	--	--

HEART RIVER BASIN--Continued

HEART RIVER NEAR DICKINSON, N. DAK.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--
8	--	--	--	--	--	--	--	--	--
9	--	--	--	--	--	--	--	--	--
10	--	--	--	--	--	--	--	--	--
11	--	--	--	--	--	--	--	--	--
12	--	--	--	--	--	--	--	--	--
13	--	--	--	--	--	--	--	--	--
14	--	--	--	--	--	--	--	--	--
15	--	--	--	--	--	--	--	--	--
16	--	--	--	--	--	--	--	--	--
17	--	--	--	--	--	--	--	--	--
18	--	--	--	--	--	--	--	--	--
19	--	--	--	--	--	--	--	--	--
20	--	--	--	--	--	--	--	--	--
21	--	--	--	--	--	--	0.8	64	0.1
22	--	--	--	--	--	--	1.1	--	.2
23	--	--	--	--	--	--	1.2	--	.3
24	--	--	--	--	--	--	1.4	109	.4
25	--	--	--	--	--	--	2.8	--	1
26	--	--	--	--	--	--	5.1	450	6.2
27	--	--	--	--	--	--	6.0	--	26
28	--	--	--	--	--	--	5.8	2,540	40
29	--	--	--	--	--	--	4.9	--	36
30	--	--	--	--	--	--	4.4	--	36
31	--	--	--	--	--	--	--	--	--
Total load (tons)	--	--	--	--	--	--	--	--	146

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	5.0	3,400	46	1.7	--	9	1.1	100	0.3
2	5.3	1,000	14	1.5	590	2.4	.9	90	.2
3	3.0	76	.6	1.2	--	.6	.8	--	.2
4	1.7	60	.3	1.0	--	.3	.8	61	.1
5	1.5	57	.2	.7	61	.1	.7	--	.1
6	1.6	--	.3	.6	--	.1	.7	92	.2
7	4.8	--	.9	.5	53	.1	.7	--	.2
8	6.0	89	1.4	.5	--	.1	.8	85	.2
9	3.4	--	2	.4	37	0	1.0	84	.2
10	1.4	273	1.0	.4	--	0	1.0	--	.2
11	1.0	--	.5	.5	--	.1	1.2	69	.2
12	.9	65	.2	.6	59	.1	3.5	120	1.1
13	.9	--	.1	.7	72	.1	2.6	172	1.2
14	.9	--	.1	.7	--	.1	1.7	--	.6
15	.9	47	.1	.8	76	.2	1.6	--	2
16	1.0	--	.1	1.0	74	.2	2.3	3,600	22
17	1.0	40	.1	1.0	73	.2	1.6	550	2.4
18	1.0	--	.1	1.1	--	.2	1.4	165	.6
19	1.1	46	.1	1.1	80	.2	1.2	82	.3
20	1.3	--	.2	1.0	--	.2	1.2	55	.2
21	1.5	--	.2	.7	107	.2	1.1	37	.1
22	1.5	53	.2	4.6	--	7	1.0	46	.1
23	1.2	--	.2	5.6	555	10	.9	29	.1
24	.9	--	.1	1.4	130	.5	.9	23	.1
25	.7	--	.1	1.2	70	.2	.8	30	.1
26	.7	50	.1	1.6	590	2.5	.8	48	.1
27	.7	--	.1	1.6	274	1.2	.7	47	.1
28	.7	--	.1	1.4	--	.5	.7	21	0
29	.7	36	.1	1.6	182	.8	.7	--	0
30	8.0	--	130	1.5	--	.7	.7	32	.1
31	9.3	6,120	168	1.3	--	.4	--	--	--
Total load (tons)	--	--	388	--	--	38	--	--	33

Total load for period June 21 to Sept. 30 (tons) ---------- 585

HEART RIVER BASIN--Continued

HEART RIVER NEAR DICKINSON, N. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	0.8	38	0.1	5.1	464	6.4	1	--	0.5
2	1.0	26	.1	6.2	2,650	44	1	218	.6
3	1.1	28	.1	5.4	2,760	40	1	--	.6
4	1.2	50	.2	5.4	3,950	58	1	192	.5
5	1.6	48	.2	3.9	3,280	35	1	190	.5
6	3.2	58	.5	3.3	1,600	14	1	--	.5
7	4.8	890	12	3.0	375	3.0	1	208	.6
8	9.0	4,130	110	2.7	110	.8	1	--	.6
9	15	11,000	446	2.4	34	.2	2	271	1.5
10	15	8,100	328	1.9	24	.1	4	--	5.2
11	24	8,820	572	1.6	--	.1	7	800	15
12	22	8,600	511	1.4	32	.1	12	1,040	34
13	9.4	5,940	151	1.2	25	.1	10	590	16
14	6.7	5,190	94	1.2	--	.1	6	790	13
15	11	5,080	151	1.1	55	.2	4	2,860	31
16	14	4,600	174	1.0	--	.2	3	--	12
17	7.1	4,140	79	.9	--	.2	2	550	3.0
18	3.9	3,470	37	.7	76	.1	2	--	2
19	3.8	1,440	15	.7	--	.2	1	207	.6
20	3.6	1,870	18	.7	81	.2	1	195	.5
21	2.8	470	3.6	.5	--	.1	1	--	.5
22	2.3	33	.2	.5	134	.2	1	206	.6
23	2.0	40	.2	.5	--	.2	2	--	1
24	1.9	37	.2	.5	65	.1	2	170	.9
25	1.9	38	.2	.5	--	.1	2	--	1
26	2.0	--	.2	.5	140	.2	2	180	1.0
27	2.2	36	.2	.5	151	.2	2	--	.9
28	2.4	40	.3	.5	--	.2	1	137	.4
29	3.4	59	.5	.5	155	.2	1	--	.4
30	5.7	81	1.5	.5	155	.2	1	125	.3
31	7.1	376	7.2	--	--	--	1	102	3
Total load (tons)	--	--	2,714	--	--	205	--	--	146

Day	January			February			March		
1	1	--	0.2	1	--	0.1	9	19	0.5
2	1	82	.2	1	33	.1	8	--	.4
3	1	--	.2	1	--	.1	7	--	.4
4	1	77	.2	1	80	.2	6	19	.3
5	.5	--	.1	1	--	.3	5	--	.3
6	.5	65	.1	1	109	.3	4	22	.2
7	.5	--	.1	1	--	.2	3	--	.2
8	.5	52	.1	1	71	.2	3	24	.2
9	.5	47	.1	1	--	.2	3	--	.2
10	.5	--	.1	1	95	.3	3	18	.1
11	.5	50	.1	1	81	.2	3	--	.1
12	.5	--	.1	4	--	1	3	6	0
13	.5	49	.1	8	--	3	3	--	.1
14	.5	--	0	25	144	10	2	23	.1
15	.5	39	.1	150	162	66	2	--	.2
16	.5	--	.1	400	168	181	3	22	.2
17	.5	75	.1	800	141	305	3	20	.2
18	.5	--	.1	550	62	92	3	18	.1
19	.5	74	.1	180	40	19	2	--	.1
20	.5	--	.1	100	29	7.8	2	27	.1
21	.5	65	.1	80	--	4	24	670	43
22	.5	--	.1	60	13	2.1	300	328	266
23	.5	--	.1	40	10	1.1	1,700	411	1,890
24	.5	42	.1	35	10	.9	2,000	185	999
25	1	35	.1	30	23	1.9	600	150	243
26	1	137	.4	20	25	1.4	280	129	98
27	2	116	.6	13	23	.8	220	139	83
28	2	46	.2	11	21	.6	240	92	60
29	2	42	.2	--	--	--	300	172	139
30	2	--	.2	--	--	--	320	280	242
31	2	37	.2	--	--	--	280	256	194
Total load (tons)	--	--	5	--	--	700	--	--	4,261

HEART RIVER BASIN--Continued

HEART RIVER NEAR DICKINSON, N. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	190	185	95	8.0	--	2	--	--	--
2	130	255	90	7.2	85	1.7	--	--	--
3	140	500	189	6.0	--	1	--	--	--
4	190	495	254	4.6	60	.7	--	--	--
5	80	264	57	4.5	--	.6	--	--	--
6	60	240	39	4.0	43	.5	--	--	--
7	50	--	30	3.5	--	.4	--	--	--
8	40	163	18	3.0	38	.3	--	--	--
9	50	174	23	3.0	--	.3	--	--	--
10	590	1,490	2,790	2.8	32	.2	--	--	--
11	1,360	1,460	5,360	3.0	--	.2	--	--	--
12	1,440	755	2,940	3.0	26	.2	--	--	--
13	500	--	900	3.0	--	.2	--	--	--
14	170	710	326	3.3	22	.2	--	--	--
15	224	995	602	3.0	--	.1	--	--	--
16	338	820	748	2.9	23	.2	--	--	--
17	241	600	390	2.9	63	.5	--	--	--
18	104	530	149	3.0	--	.5	--	--	--
19	59	440	70	2.9	47	.4	--	--	--
20	43	347	40	2.9	79	.6	--	--	--
21	33	237	21	3.0	--	.6	--	--	--
22	27	230	17	3.5	35	.3	--	--	--
23	22	192	11	3.5	--	.3	--	--	--
24	19	161	8.3	3.1	31	.3	--	--	--
25	16	151	6.5	3.0	--	.3	--	--	--
26	14	142	5.4	2.8	34	.3	--	--	--
27	12	124	4.0	2.6	--	.3	--	--	--
28	10	111	3.0	2.4	40	.3	--	--	--
29	10	--	3	2.2	--	.2	--	--	--
30	9.0	104	2.5	2.0	--	.2	--	--	--
31	--	--	--	2.0	33	.2	--	--	--
Total load (tons)	--	--	15,190	--	--	14	--	--	--

Total load for period Oct. 1 to May 31 (tons)---------- 23,240

HEART RIVER BASIN--Continued

HEART RIVER NEAR RICHARDTON, N. DAK.

LOCATION.--At gaging station at bridge on State Highway 8, half a mile downstream from Blacktail Creek, 9½ miles south of Richardton, Stark County, and 14 miles upstream from Spring Creek.
DRAINAGE AREA.--1,310 square miles.
RECORDS AVAILABLE.--Sediment records: March 1946 to September 1947.
EXTREMES, March-September 1946--Sediment loads: Maximum, 196 tons per day Mar. 9; minimum, 0.1 ton per day Aug. 3, 20-23.
EXTREMES, 1946-47.--Sediment loads: Maximum, 36,700 tons per day Apr. 11; minimum, 0.2 ton per day Mar. 20.
EXTREMES, March 1946-September 1947.--Sediment loads: Maximum, 36,700 tons per day Apr. 11, 1947; minimum, 0.1 ton per day Aug. 3, 20-23, 1946.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids		Hardness as $CaCO_3$		Percent sodium
																Parts per million	Tons per acre-foot	Total	Non-carbonate	
Oct. 2, 1946	2.1	8.1	169	--	0.00	39	37	312		498	474	16	0.5	1.8	--	1,130	1.54	249	0	73
Oct. 10	18	8.2	149	--	.00	38	34	261		430	412	14	.4	1.2	--	974	1.32	235	0	71
Mar. 23, 1947	1,900	7.4	31.7	5.2	.15	23	8.8	24	8.1	96	66	3.0	.0	6.0	0.2	201	.27	94	15	34
Apr. 30	66	8.2	56.6	14	.05	54	21	93		242	205	6.0	.1	3.0	1.2	532	.72	221	23	48
May 16	34	8.4	106	8	.10	58	29	123		1/287	273	7.0	.1	1.8	1.5	694	.94	264	29	50
June 11	193	7.4	84.3	11	.05	43	17	115		260	197	4.0	.2	2.5	.9	540	.73	177	0	58
June 21	761	7.3	112	14	.30	62	30	132		205	379	1.0	.2	.2	1.4	768	1.04	278	110	51

1/ Includes equivalent of 18 parts per million of carbonate (CO_3).

HEART RIVER BASIN--Continued

HEART RIVER NEAR RICHARDTON, N. DAK.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--
8	--	--	--	--	--	--	170	420	193
9	--	--	--	--	--	--	140	518	196
10	--	--	--	--	--	--	130	282	99
11	--	--	--	--	--	--	150	192	78
12	--	--	--	--	--	--	178	61	29
13	--	--	--	--	--	--	204	102	56
14	--	--	--	--	--	--	111	57	17
15	--	--	--	--	--	--	106	52	15
16	--	--	--	--	--	--	90	--	13
17	--	--	--	--	--	--	73	86	17
18	--	--	--	--	--	--	166	85	38
19	--	--	--	--	--	--	100	66	18
20	--	--	--	--	--	--	91	50	12
21	--	--	--	--	--	--	100	69	19
22	--	--	--	--	--	--	109	89	26
23	--	--	--	--	--	--	135	123	45
24	--	--	--	--	--	--	106	101	29
25	--	--	--	--	--	--	71	71	14
26	--	--	--	--	--	--	71	58	11
27	--	--	--	--	--	--	88	44	10
28	--	--	--	--	--	--	71	47	9
29	--	--	--	--	--	--	73	36	7.1
30	--	--	--	--	--	--	59	24	3.8
31	--	--	--	--	--	--	38	30	3.1
Total load (tons)	--	--	--	--	--	--	--	--	958

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	30	39	3.2	10	71	1.9	16	105	4.5
2	33	29	2.6	14	53	2.0	14	64	2.4
3	38	34	3.5	22	58	3.4	14	87	3.3
4	45	35	4.3	19	40	2.1	13	79	2.8
5	45	34	4.1	16	30	1.3	16	53	2.3
6	48	32	4.1	14	48	1.8	21	139	7.9
7	43	23	2.7	13	44	1.5	18	102	5.0
8	33	21	1.9	13	50	1.8	14	100	3.8
9	30	21	1.7	12	60	1.9	14	165	6.2
10	28	18	1.4	11	58	1.7	13	88	3.1
11	26	18	1.3	10	48	1.3	11	68	2.0
12	25	28	1.9	10	49	1.3	10	56	1.5
13	24	36	2.3	9.7	57	1.5	9.7	49	1.3
14	21	38	2.2	9.7	47	1.2	8.7	49	1.2
15	21	35	2.0	10	48	1.3	7.8	49	1.0
16	21	30	1.7	11	51	1.5	7.3	58	1.1
17	20	39	2.1	11	50	1.5	6.8	79	1.4
18	18	40	1.9	12	60	1.9	7.3	66	1.3
19	19	46	2.4	16	49	2.1	7.8	59	1.2
20	20	51	2.8	19	50	2.6	7.3	70	1.4
21	18	72	3.5	20	47	2.5	6.8	87	1.6
22	18	58	2.8	22	52	3.1	5.9	67	1.1
23	17	68	3.1	21	66	3.7	6.3	68	1.2
24	16	55	2.4	21	46	2.6	8.3	73	1.6
25	15	48	1.9	20	49	2.6	10	83	2.2
26	14	40	1.5	17	65	3.0	20	67	3.6
27	14	59	2.2	16	72	3.1	23	66	4.1
28	13	65	2.3	14	78	2.9	69	318	59
29	11	45	1.3	13	88	3.1	53	155	22
30	11	59	1.8	13	70	2.5	35	95	9.0
31	--	--	--	16	88	3.8	--	--	--
Total load (tons)	--	--	73	--	--	68	--	--	160

HEART RIVER BASIN--Continued

HEART RIVER NEAR RICHARDTON, N. DAK.--Continued

Suspended sediment, water year October 1945 to September 1946--Continued

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	24	91	5.9	1	131	0.4	5.9	53	0.8
2	84	518	143	1	119	.3	4.9	55	.7
3	57	314	55	.5	96	.1	4.0	61	.7
4	29	202	16	.5	109	.2	3.6	60	.6
5	23	306	19	1	89	.2	2.7	60	.4
6	21	219	12	3.1	79	.7	2.3	67	.4
7	17	151	6.9	2.7	113	.8	1.8	64	.3
8	14	132	5.0	1.8	124	.6	1.8	52	.2
9	13	169	5.9	1.4	102	.4	2.7	52	.4
10	12	194	6.3	1.4	87	.3	5.4	53	.8
11	9.2	127	3.2	1	90	.2	5.9	52	.8
12	6.3	108	1.8	.5	119	.2	4.9	51	.7
13	7.8	119	2.5	.5	114	.2	4.9	66	.9
14	8.3	118	2.6	1.8	82	.4	4.0	68	.7
15	6.3	125	2.1	3.1	101	.8	5.4	64	.9
16	4.0	126	1.4	1.4	100	.4	5.9	76	1.2
17	9.7	131	3.4	1	94	.2	5.4	76	1.1
18	9.7	130	3.4	1	87	.2	6.3	68	1.2
19	10	116	3.1	1	87	.2	7.8	73	1.5
20	10	116	3.1	.5	86	.1	7.3	75	1.5
21	9.2	125	3.1	.5	84	.1	6.3	78	1.3
22	7.8	117	2.5	.5	86	.1	5.4	74	1.1
23	4.9	106	1.4	.5	77	.1	5.9	58	.9
24	4.0	103	1.1	1	96	.3	6.8	49	.9
25	3.1	94	.8	10	67	1.8	5.9	54	.9
26	2.3	79	.5	9.2	80	2.0	4.9	95	1.3
27	2.3	84	.5	8.3	83	1.9	5.4	97	1.4
28	1.4	94	.4	14	78	2.9	4.5	61	.7
29	2.3	93	.6	11	66	2.0	4.0	50	.5
30	2.3	98	.6	11	62	1.8	4.0	47	.5
31	1.4	115	.4	9.2	64	1.6	--	--	--
Total load (tons)	--	--	314	--	--	22	--	--	25

Total load for period Mar. 8 to Sept. 30 (tons) ---------- 1,620

HEART RIVER BASIN--Continued

HEART RIVER NEAR RICHARDTON, N. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	2.7	48	0.4	18	22	1.1	7	56	1.1
2	2.3	69	.4	17	22	1.0	7	62	1.2
3	3.6	84	.8	18	22	1.1	7	75	1.4
4	4.9	49	.6	21	26	1.5	8	79	1.7
5	9.2	38	.9	25	30	2.0	9	67	1.6
6	13	43	1.5	21	42	2.4	10	70	1.9
7	18	40	1.9	18	40	1.9	10	72	1.9
8	22	46	2.7	16	29	1.3	11	64	1.9
9	21	54	3.1	15	26	1.1	12	60	1.9
10	19	50	2.6	13	32	1.1	13	68	2.4
11	22	34	2.0	13	28	1.0	14	61	2.3
12	23	35	2.2	11	28	.8	16	59	2.5
13	28	46	3.5	10	30	.8	17	70	3.2
14	36	51	5.0	9	27	.7	16	60	2.6
15	33	44	3.9	9	28	.7	14	50	1.9
16	29	23	1.8	8	32	.7	13	76	2.7
17	25	24	1.6	9	35	.8	13	61	2.1
18	25	37	2.5	10	38	1.0	12	61	2.0
19	26	40	2.8	10	41	1.1	12	65	2.1
20	24	40	2.6	9	40	1.0	11	76	2.3
21	23	47	2.9	9	44	1.1	13	83	2.9
22	18	49	2.4	8	36	.8	23	76	4.7
23	17	44	2.0	7	43	.8	22	54	3.2
24	15	43	1.7	6	58	.9	16	52	2.2
25	14	30	1.1	6	52	.8	18	42	2.0
26	14	28	1.1	6	49	.8	17	46	2.1
27	14	26	1.0	6	52	.8	14	49	1.9
28	14	21	.8	6	48	.8	15	46	1.9
29	16	22	1.0	6	51	.8	15	42	1.7
30	17	20	.9	7	62	1.2	12	43	1.4
31	19	24	1.2	--	--	--	10	40	1.1
Total load (tons)	--	--	60	--	--	32	--	--	66
	January			February			March		
1	8	36	0.8	100	--	11	50	26	3.5
2	6	37	.6	80	--	8	40	22	2.4
3	4	39	.4	60	--	6	35	26	2.5
4	4	38	.4	50	36	4.9	30	22	1.8
5	5	34	.5	40	30	3.2	26	14	1.0
6	5	31	.4	30	43	3.5	24	14	.9
7	5	28	.4	25	92	6.2	22	18	1.1
8	5	25	.3	18	96	4.7	20	13	.7
9	6	23	.4	14	75	2.8	19	13	.7
10	6	22	.4	12	69	2.2	18	15	.7
11	7	21	.4	11	56	1.7	18	16	.8
12	7	19	.4	12	47	1.5	20	14	.8
13	6	20	.3	25	31	2.1	22	9	.5
14	5	24	.3	120	243	79	20	12	.6
15	4	33	.4	700	166	314	19	20	1.0
16	4	41	.4	900	366	889	18	18	.9
17	4	33	.4	1,100	578	1,720	18	13	.6
18	5	30	.4	1,000	516	1,390	17	9	.4
19	5	28	.4	800	204	441	16	10	.4
20	5	28	.4	600	85	138	16	4	.2
21	5	26	.4	500	70	94	100	265	72
22	5	30	.4	450	46	56	2,000	316	1,710
23	5	42	.6	400	33	36	4,500	765	9,290
24	5	28	.4	300	27	22	3,500	1,340	12,700
25	20	60	3.2	150	20	8.1	3,500	1,410	13,300
26	70	86	16	100	19	5.1	2,000	910	4,910
27	300	108	87	80	24	5.2	1,200	945	3,060
28	300	62	50	60	30	4.9	850	678	1,560
29	250	--	30	--	--	--	800	705	1,520
30	200	--	25	--	--	--	800	940	2,030
31	150	--	18	--	--	--	1,100	1,160	3,450
Total load (tons)	--	--	239	--	--	5,260	--	--	53,620

HEART RIVER BASIN--Continued

HEART RIVER NEAR RICHARDTON, N. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	1,020	1,080	2,970	62	67	11	17	34	1.6
2	810	1,060	2,320	60	79	13	16	34	1.5
3	707	800	1,530	53	66	9.4	15	34	1.4
4	674	600	1,090	48	46	6.0	21	34	1.9
5	810	304	664	42	31	3.5	32	30	2.6
6	1,060	195	558	42	24	2.7	39	27	2.8
7	354	190	176	35	19	1.8	62	36	6.0
8	261	245	173	41	20	2.2	109	42	12
9	356	464	505	42	19	2.2	266	272	284
10	540	1,060	1,610	38	19	1.9	346	382	357
11	2,740	4,890	36,700	32	22	1.9	180	372	181
12	3,260	4,120	36,300	35	20	1.9	125	247	83
13	2,340	3,140	20,500	38	24	2.5	107	162	47
14	796	1,420	3,140	35	31	2.9	81	151	33
15	482	820	1,070	35	38	3.6	64	89	15
16	482	760	989	34	36	3.3	54	64	9.3
17	641	980	1,700	32	40	3.5	44	63	7.5
18	741	1,050	2,100	32	41	3.5	38	60	6.2
19	576	770	1,200	34	41	3.8	36	52	5.1
20	361	480	468	30	44	3.6	51	100	14
21	275	--	220	30	39	3.2	592	3,020	5,440
22	193	225	117	30	31	2.5	1,830	3,620	17,900
23	154	180	75	30	30	2.4	2,700	3,630	28,100
24	123	145	48	25	32	2.2	3,870	3,500	36,600
25	107	116	34	25	29	2.0	2,990	2,180	17,600
26	100	115	31	25	27	1.8	1,460	1,420	5,740
27	79	111	24	25	28	1.9	608	760	1,250
28	67	92	17	24	30	1.9	376	500	508
29	71	70	13	20	32	1.7	318	320	275
30	69	66	12	19	38	1.9	451	380	463
31	--	--	--	18	38	1.8	--	--	--
Total load (tons)	--	--	116,350	--	--	108	--	--	114,950

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	674	910	1,660	19	50	2.6	9.5	46	1.2
2	1,020	1,990	5,480	16	45	1.9	11	49	1.5
3	810	1,350	2,950	15	46	1.9	10	47	1.3
4	332	490	439	15	40	1.6	9.5	43	1.1
5	206	211	117	15	33	1.3	9.0	44	1.1
6	152	177	73	15	31	1.3	8.5	44	1.0
7	116	111	35	125	345	396	8.0	38	.8
8	88	72	17	376	1,180	1,200	7.5	38	.8
9	79	43	9.2	247	857	572	8.0	47	1.0
10	69	32	6.0	234	705	445	10	41	1.1
11	64	28	4.8	164	520	230	9.0	33	.8
12	88	212	50	114	450	139	9.0	36	.9
13	120	113	37	83	314	70	9.0	35	.8
14	96	45	12	64	174	30	9.0	33	.8
15	79	44	9.4	58	120	19	8.5	28	.6
16	67	49	8.9	46	76	9.4	8.5	24	.6
17	58	55	8.6	39	76	8.0	9.5	24	.6
18	56	63	9.5	36	58	5.6	11	25	.7
19	48	67	8.7	27	53	3.9	12	24	.8
20	39	67	7.1	22	58	3.4	12	23	.8
21	35	63	6.0	19	57	2.9	12	20	.6
22	31	60	5.0	17	53	2.4	12	18	.6
23	30	64	5.2	14	53	2.0	12	20	.6
24	29	68	5.3	12	49	1.6	12	24	.8
25	27	68	5.0	11	53	1.6	11	21	.6
26	30	75	6.1	10	48	1.3	11	35	1.0
27	35	60	5.7	9.5	52	1.3	11	45	1.3
28	38	63	6.5	9.0	53	1.3	11	40	1.2
29	31	57	4.8	9.0	55	1.3	11	33	1.0
30	24	57	3.7	9.0	58	1.4	11	19	.6
31	20	60	3.2	9.0	45	1.1	--	--	--
Total load (tons)	--	--	11,000		--	3,160	--	--	27
Total load for year (tons)									304,900

HEART RIVER NEAR RICHARDTON, N. DAK.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Instantaneous discharge (second-feet)	Suspended sediment												
		Concentration at time of sampling (p.p.m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p.p.m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)										
						0.00195	0.0039	0.0076	0.0156	0.0312	0.0625	0.125	0.250	0.500	1.000	2.000
Feb. 18, 1947	1,040	452	1,270	672	BN	66	72	82	86	91	94	95	96	99	100	--
Mar. 23	1,910	653	3,370	1,330	BN	--	27	36	50	63	74	82	90	93	96	--
Mar. 28	904	966	2,360	1,950	BN	--	18	25	39	59	79	95	98	100	--	--
Apr. 11	3,350	5,100	46,100	12,900	BN	--	35	44	54	60	81	91	94	97	99	--
June 22	1,880	3,830	19,400	3,240	BN	11	19	39	60	85	94	96	99	100	--	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

HEART RIVER BASIN--Continued

HEART RIVER NEAR GLEN ULLIN, N. DAK.

LOCATION.--At bridge on State Highway 49, 9 miles downstream from Coal Creek, 14 miles upstream from Heart Butte Creek, 14 miles south of Glen Ullin, Morton County, and 14 miles north of Elgin, Grant County.
DRAINAGE AREA.--1,760 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: March to August 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 1,140 parts per million Oct. 2; minimum, 131 parts per million Mar. 26.
Total hardness: Maximum, 318 parts per million June 11; minimum, 69 parts per million Mar. 26.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086. Records of specific conductance of daily samples available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 2, 1946	4.2	---	8.1	171	--	0.05	30	33	337		563	448	10	0.7	0.8	--	1,140	1.55	13	211	0	78
Mar. 23, 1947	2,500	--	7.1	22.1	8.2	.30	19	6.4	13	7.4	100	24	2.8	.1	1.0	0.4	142	.19	953	74	0	26
Mar. 24	12,000	31	8.0	24.0	6.0	.40	28	7.6	11		144	4.9	.6	.1	.2	--	155	.21	5,020	101	0	19
Mar. 25	4,500	30	7.4	21.5	12	--	25	6.3	22		134	22	.5	.4	1.5	--	165	.22	2,000	89	0	35
Mar. 26	2,900	32	7.3	19.1	6.0	1.0	20	4.6	21		112	19	.5	.4	1.5	--	131	.18	1,030	69	0	40
Mar. 27	1,800	33	7.5	23.1	6.0	.40	25	6.8	21		130	26	.5	.4	.8	--	156	.21	758	90	0	34
Mar. 28	1,220	35	7.4	24.9	6.0	1.0	28	6.3	20		130	28	.5	.4	.5	--	172	.23	566	94	0	32
Mar. 29	1,170	36	7.7	27.6	16	.40	26	14	10		132	33	.5	.1	.2	--	187	.25	591	122	14	10
Mar. 30	975	36	7.6	27.1	8.0	--	30	6.3	30		144	43	.5	.4	.5	--	188	.26	495	101	0	39
Mar. 31	1,120	38	7.6	28.0	6.0	.60	31	7.0	26		148	37	.5	.4	.5	--	193	.26	584	106	0	34
Apr. 2	1,020	33	8.1	26.7	4.0	.40	31	8.7	13		136	26	1.4	.1	.2	--	167	.23	460	113	1	20
Apr. 3	885	38	8.3	28.6	1.0	.40	29	9.0	20		140	35	1.5	.1	.2	--	179	.24	428	109	0	29
Apr. 4	800	34	8.2	31.7	8.0	.10	32	10	14		138	35	1.0	.1	.2	--	194	.26	419	121	8	20
Apr. 8	382	36	8.3	30.0	3.0	.40	23	9.4	33		121	59	2.0	.1	4.0	--	195	.27	201	96	0	42
Apr. 9	366	38	8.2	32.7	5.0	.20	26	9.2	26		127	49	1.5	.1	1.4	--	204	.28	202	102	0	35
Apr. 10	429	38	7.5	37.0	10	.40	41	9.6	19	19	162	66	3.0	.2	1.0	--	254	.35	294	142	9	20
Apr. 11	2,020	36	7.7	43.3	11	.60	41	11	31	20	188	80	1.0	.2	.4	--	291	.40	1,590	148	0	28
Apr. 12	3,370	34	7.6	41.8	8.0	.20	41	10	20	20	184	56	2.0	.2	1.0	--	255	.35	2,320	143	0	21
Apr. 14	1,520	35	8.3	24.5	--	.20	28	10	21		122	49	1.4	.2	3.0	--	197	.27	808	111	11	28
Apr. 15	760	36	--	32.9	--	.80	18	10	38		114	57	2.6	.2	15	--	210	.29	431	76	0	54
Apr. 16	603	39	--	36.1	--	.40	31	12	27		125	72	1.0	.8	5.0	--	244	.33	397	102	0	44
Apr. 17 (8:30 a.m.)	840	42	8.3	40.9	--	.40	37	13	39		145	100	1.2	.8	5.0	--	340	.46	771	145	27	37
Apr. 17 (2:00 p.m.)	840	--	8.2	43.5	14	.05	36	9.4	45		154	81	6.0	.1	10	.8	277	.38	628	128	2	43
Apr. 18	1,100	44	--	49.4	--	.20	40	14	45		157	115	.8	.8	5.0	--	335	.46	995	157	28	39

Apr. 21	429	42	7.5	49.7	12	.40	42	12	36	19	172	106	3.0	.2	.6	--	352	.48	408	154	13	30
Apr. 22	322	42	8.2	50.4	--	.20	35	14		51	160	113	.6	.8	5.0	--	340	.46	296	145	14	43
Apr. 23	252	42	8.2	54.2	--	.20	40	16		49	180	114	1.2	.2	4.0	--	369	.50	251	166	18	39
Apr. 24	201	46	8.4	59.9	--	.20	41	17		66	193	146	2.0	.2	3.0	--	398	.54	216	172	14	45
Apr. 25	177	42	7.6	62.1	7.0	.40	42	17	51	20	208	133	3.0	.2	.8	--	409	.56	195	175	4	37
Apr. 26	154	56	8.4	67.7	--	.10	46	19		75	220	163	1.6	.2	3.0	--	440	.60	183	193	13	46
Apr. 27	132	56	8.4	71.2	--	.10	43	18		84	230	165	1.6	.2	2.0	--	472	.64	168	181	0	50
Apr. 28	124	68	7.6	73.4	8.0	.60	47	19	75	19	248	168	3.0	.2	.4	--	479	.65	160	195	0	43
Apr. 29	117	59	7.6	74.6	8.0	.20	51	18	76	20	252	174	2.5	.2	.6	--	488	.68	154	201	0	42
Apr. 30	115	56	7.7	78.3	9.0	.40	48	19	86	21	267	179	3.5	.2	1.0	--	510	.69	158	198	0	45
May 1-10	75	51	8.0	88.6	8.0	.28	49	24	106	19	298	212	7.0	.2	.0	--	584	.79	118	221	0	48
May 11-21	50	52	8.3	102	7.0	.28	56	28	132	20	356	254	7.0	.2	.0	--	679	.92	92	255	0	50
May 22-June 10	36	55	8.5	105	11	.04	58	31	173	8.8	1/386	316	8.0	.5	1.2	1.3	818	1.11	80	272	0	57
June 11 2/	344	52	7.9	128	18	.04	78	30		178	344	395	7.6	.4	.2	--	884	1.20	821	318	36	55
June 11-18, 20-21	127	62	8.4	85.6	17	.06	45	19	144	4.8	3/306	253	4.0	.6	.7	1.6	648	.88	222	190	0	61
June 19	48	60	7.9	123	14	.04	53	20		144	324	245	3.0	.4	1.8	--	630	.86	82	214	0	59
June 22	2,010	58	7.8	75.4	17	.54	56	20	89	6.8	254	201	.0	.7	1.0	--	530	.72	2,880	222	14	46
June 23	3,600	55	7.8	60.4	19	.47	54	20	54	9.2	210	163	.0	.6	2.1	--	404	.55	3,930	217	45	34
June 23 (10:00 a.m.) 2/	3,600	--	8.2	56.6	13	.05	44	14		55	171	138	1.0	.1	3.0	.8	366	.50	3,560	167	27	42
June 24	4,110	55	7.9	69.6	16	.32	59	23	66	5.6	194	230	.0	.5	1.0	--	494	.67	5,480	242	83	37
June 25-26	3,000	61	7.8	44.8	20	.59	35	13	47	6.4	164	103	.0	.4	1.2	--	312	.42	2,530	141	7	41
June 27	1,300	64	7.9	47.4	20	1.0	44	8.3	43	16	175	114	.7	.4	1.7	--	348	.47	1,220	144	1	36
June 28-29	592	64	8.0	57.7	18	.10	44	16	61	14	177	173	.7	.3	.5	--	412	.56	659	176	31	41
June 30-July 1	484	65	7.7	74.2	17	.60	58	24	84	14	215	240	1.1	.3	2.1	.3	542	.74	708	243	67	41
July 2	900	68	7.8	76.2	18	.04	58	19		92	236	216	2.0	.4	1.2	--	514	.70	1,250	223	29	47
July 3-7	575	72	8.1	57.0	19	.60	41	16	68	14	184	159	.5	.3	.9	.0	400	.54	621	168	17	44
July 8-15	121	74	8.2	80.9	18	.30	61	22	100	17	265	244	1.8	.3	.5	.1	576	.78	188	242	25	45
July 16-23, 26-Aug. 8	46	70	8.1	107	15	.10	70	29	152	16	354	317	5.7	.3	1.1	1.4	758	1.03	94	294	4	51

1/ Includes equivalent of 19 parts per million of carbonate (CO_3).
2/ Not included in weighted average.
3/ Includes equivalent of 13 parts per million of carbonate (CO_3).

HEART RIVER BASIN--Continued

HEART RIVER NEAR GLEN ULLIN, N. DAK.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
July 24, 1947	80	70	7.7	82.3	17	0.20	56	19	116		276	227	3.0	0.4	2.8	--	568	0.77	123	218	0	54
Aug. 9	322	78	8.3	117	16	.10	79	18	168	21	4/331	367	6.0	.3	1.6	--	826	1.12	718	271	0	55
Aug. 10-16	170	69	8.3	50.7	12	.70	36	12	61	12	191	112	1.5	.3	3.0	0.3	330	.45	151	139	0	46
Aug. 17-26	43	67	8.3	80.7	13	.10	54	25	101		5/296	200	3.8	.3	1.1	.8	560	.76	65	238	0	48
Weighted average	6/500	--	--	44.1	--	0.43	37	13	44		170	96	1.2	0.3	1.4	--	308	0.42	416	146	3.4	34

4/ Includes equivalent of 18 parts per million of carbonate (CO_3).
5/ Includes equivalent of 6 parts per million of carbonate (CO_3).
6/ Mean discharge for water year October 1946 to September 1947 was 265 second-feet.

Temperature (° F.) of water, water year October 1946 to September 1947

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

HEART RIVER BASIN--Continued

HEART RIVER NEAR GLEN ULLIN, N. DAK.--Continued

Periodic determinations of suspended-sediment discharge, water year October 1946 to September 1947

Date	Instantaneous water discharge (second-feet)	Suspended sediment		Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Instantaneous discharge (tons per day)			Mean concentration (p. p. m.)	Instantaneous discharge (tons per day)
Apr. 19, 1946	29	20	2.0	Dec. 3, 1946	8.0	17	0.37
May 1	18	42	2.0	Dec. 12	14.0	16	.60
May 20	20	26	1.4	Jan. 3, 1947	6.5	50	.88
May 22	24	47	3.0	Jan. 23	3.5	23	.22
May 24	24	54	3.5	Feb. 12	16.0	21	.91
				Feb. 15	204	49	27.0
May 29	17	54	2.5	Feb. 17	1,390	172	646
June 4	18	64	3.1				
June 10	18	59	2.9	Feb. 21	599	126	194
June 14	15	60	2.4	Feb. 26	100	22	5.9
June 25	170	3,780	1,720	Mar. 12	39	6	.63
				Mar. 18	20	10	.54
July 4	148	919	369	Mar. 22	200	54	29.0
July 13	14	122	4.6				
July 13	14	162	6.1	Mar. 23	2,500	550	3,710
July 18	8.3	106	2.4	Mar. 24	7,600	3,760	78,700
July 23	3.6	65	.63	Mar. 28	1,150	1,900	6,030
				Apr. 2	992	1,850	4,580
July 31	3.2	109	.94	Apr. 17	878	2,440	5,380
Aug. 2	3.0	63	.51				
Aug. 13	2.7	94	.69	Apr. 28	120	108	36
Aug. 14	3.0	74	.60	May 15	50	57	7.7
Aug. 29	8.2	58	1.3	May 27	32	47	4.1
				June 10	123	86	29
Sept. 12	4.8	52	.67	June 11	314	312	265
Sept. 12	6.4	40	.69				
Oct. 2	3.8	76	.78	June 23	3,630	4,610	45,200
Oct. 2	3.8	57	.58	June 25	3,410	3,300	30,400
Oct. 10	28.0	73	5.5	June 26	2,330	2,360	14,800
				July 7	181	289	141
Oct. 24	22.0	70	4.2	July 25	42	140	15.9
Oct. 24	24	79	5.1				
Nov. 14	15.0	25	1.0	Aug. 13	134	540	195
Nov. 14	26	30	2.1	Sept. 3	14	45	1.7
Nov. 26	8.8	31	.74	Sept. 24	16	70	3.0
Nov. 26	11.0	30	.89				

HEART RIVER NEAR GLEN ULLIN, N. DAK.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Instantaneous discharge (second-feet)	Suspended sediment														
		Concentration at time of sampling (p.p.m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p.p.m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)										
						0.00195	0.0039	0.0078	0.0156	0.0312	0.0625	0.125	0.250	0.500	1.000	2.000
Mar. 28, 1947	1,150	1,940	6,020	4,200	BN	15	25	34	46	56	61	82	93	96	98	--
June 23	3,630	4,610	45,200	5,200	BN	--	20	40	54	65	72	80	91	95	97	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

CANNONBALL RIVER BASIN

CANNONBALL RIVER NEAR NEW LEIPZIG, N. DAK.

LOCATION.--At gaging station at bridge on State Highway 49, 2½ miles south of New Leipzig, Grant County.
DRAINAGE AREA.--1,260 square miles.
RECORDS AVAILABLE.--Sediment records: April 1946 to September 1947.
EXTREMES, April-September 1946.--Sediment loads: Maximum, 292 tons per day July 6; minimum, 0.1 ton per day Aug. 11-15, 19-24.
EXTREMES, 1946-47.--Sediment loads: Maximum, 25,200 tons per day Apr. 12; minimum, 0.1 ton per day Dec. 12, Jan. 24.
EXTREMES, April 1946-September 1947.--Sediment loads: Maximum, 25,200 tons per day Apr. 12, 1947; minimum, 0.1 ton per day Aug. 11-15, 19-24, 1946, Dec. 12, Jan. 24, 1947.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 10, 1946	12	8.4	111	--	0.10	48	37	172		379	313	6.0	0.4	0.8	--	785	1.07	272	0	58
Mar. 24, 1947	7,900	7.4	22.6	2.6	.40	23	5.4	15	6.8	132	6.4	3.2	.2	.2	0.3	143	.19	80	0	26
Apr. 17	285	7.6	37.6	17	.02	35	11	34		126	76	12	.1	10	.8	245	.33	133	30	36
May 16	22	7.7	91.0	9.0	.02	73	29	84		288	207	22	.2	2.0	1.8	582	.79	301	65	38
June 10	265	7.4	111	27	.02	85	32	119		372	258	18	.3	4.0	2.0	721	.98	344	39	43
June 22	1,900	7.1	58.0	12	.02	57	24	40		219	123	13	.2	2.0	--	370	.50	241	61	27
June 23	3,300	7.9	42.2	13	.30	31	12	35		118	99	1.0	.2	.4	.5	275	.37	127	30	37

CANNONBALL RIVER BASIN--Continued

CANNONBALL RIVER NEAR NEW LEIPZIG, N. DAK.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	--	--	--	4.4	46	0.5	7.2	51	1.0
2	--	--	--	4.4	--	--	7.2	50	1.0
3	--	--	--	4.4	--	--	8.6	47	1.1
4	--	--	--	4.8	--	--	11	42	1.2
5	--	--	--	5.0	--	--	12	48	1.6
6	--	--	--	4.8	--	--	10	42	1.1
7	--	--	--	4.8	--	--	9.5	57	1.5
8	--	--	--	4.0	--	--	7.7	43	.9
9	--	--	--	3.4	--	--	8.6	44	1.0
10	--	--	--	3.2	--	--	9.0	51	1.2
11	--	--	--	2.7	--	--	7.2	41	.8
12	--	--	--	3.0	--	--	7.7	30	.6
13	--	--	--	3.2	--	--	8.6	32	.7
14	--	--	--	3.7	27	.3	8.6	26	.6
15	--	--	--	4.4	55	.7	7.2	22	.4
16	--	--	--	6.2	52	.9	7.7	43	.9
17	--	--	--	7.7	53	1.1	6.2	40	.7
18	--	--	--	8.1	58	1.3	6.2	34	.6
19	15	46	1.9	10	57	1.5	5.4	36	.5
20	15	--	--	11	52	1.5	2.9	46	.4
21	12	--	--	14	53	2.0	2.3	47	.3
22	11	--	--	14	55	2.1	2.1	35	.2
23	11	--	--	15	55	2.2	3.0	--	.3
24	11	--	--	13	55	1.9	5.4	54	.8
25	16	--	--	12	55	1.8	10	63	1.7
26	14	--	--	11	55	1.6	41	72	7.8
27	11	--	--	9.0	55	1.3	28	62	4.7
28	9.0	--	--	7.2	55	1.1	30	76	6.2
29	7.7	--	--	4.8	54	.7	33	80	7.1
30	5.8	--	--	4.0	53	.6	22	108	6.4
31	--	--	--	5.8	55	.9	--	--	--
Total load (tons)	--	--	1/17	--	--	1/ 29	--	--	53
	July			August			September		
1	14	77	2.9	1.1	58	0.2	5.8	40	0.6
2	15	112	4.5	1.0	56	.2	4.8	46	.6
3	63	327	57	1.2	57	.2	4.8	58	.8
4	170	410	188	1.2	68	.2	2.5	40	.3
5	178	380	183	1.1	72	.2	3.2	31	.3
6	178	608	292	1.0	71	.2	2.9	36	.3
7	145	363	142	.7	109	.2	2.7	49	.4
8	52	356	50	.7	130	.2	2.5	50	.3
9	50	390	53	.6	127	.2	2.5	44	.3
10	36	338	33	.5	120	.2	2.9	40	.3
11	21	280	16	.4	120	.1	3.4	42	.4
12	15	203	8.2	.3	121	.1	3.7	41	.4
13	14	160	6.0	.4	116	.1	3.2	40	.3
14	14	149	5.6	.5	74	.1	2.3	40	.2
15	13	144	5.1	.9	45	.1	1.6	45	.2
16	8.6	100	2.3	1.0	83	.2	1.1	69	.2
17	6.8	78	1.4	.9	98	.2	1.0	68	.2
18	7.2	79	1.5	.8	92	.2	1.2	56	.2
19	7.7	106	2.2	.7	78	.1	2.7	44	.3
20	7.2	158	3.1	.5	79	.1	3.2	41	.4
21	6.2	88	1.5	.4	82	.1	2.5	40	.3
22	4.4	64	.8	.3	80	.1	2.3	38	.2
23	2.9	64	.5	.3	98	.1	2.5	33	.2
24	3.7	69	.7	.4	113	.1	2.7	24	.2
25	2.7	67	.5	.8	102	.2	3.2	28	.2
26	2.5	65	.4	28	86	6.7	3.4	59	.5
27	2.3	64	.4	24	93	6.0	2.7	56	.4
28	1.8	63	.3	17	59	2.7	1.9	41	.2
29	1.3	62	.2	14	54	2.0	1.9	46	.2
30	1.3	60	.2	11	48	1.4	2.3	50	.3
31	1.4	57	.2	8.6	39	.9	---	--	--
Total load (tons)	--	--	1,060	--	--	24	--	--	10

Total load for period Apr. 19 to Sept. 30 (tons) ---------- 1/1,193

1/ Includes estimated load for missing days.

CANNONBALL RIVER BASIN--Continued

CANNONBALL RIVER NEAR NEW LEIPZIG, N. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	2.1	39	0.2	10	22	0.6	5	--	--
2	1.8	44	.2	9.0	19	.5	6	--	--
3	1.8	52	.3	8.6	24	.6	6	--	--
4	1.9	43	.2	8.6	14	.3	6	--	--
5	2.3	36	.2	7.2	10	.2	6	--	--
6	5.1	34	.5	7.7	8	.2	6	--	--
7	9.5	30	.8	10	14	.4	6	--	--
8	10	33	.9	15	15	.6	6	--	--
9	12	38	1.2	12	12	.4	6	--	--
10	12	36	1.2	11	15	.4	5	--	--
11	12	41	1.3	10	21	.6	5	--	--
12	10	45	1.2	9.0	28	.7	5	8	0.1
13	9.0	49	1.2	11	36	1.1	5	12	.2
14	6.8	50	.9	9.0	26	.6	5	16	.2
15	6.5	46	.8	10	25	.7	5	--	--
16	8.1	46	1.0	9	35	.9	5	--	--
17	7.2	54	1.0	9	44	1.1	4	--	--
18	6.5	47	.8	9	--	--	4	--	--
19	5.4	42	.6	8	--	--	4	--	--
20	6.5	23	.4	8	--	--	4	43	.5
21	7.2	27	.5	8	--	--	4	--	--
22	6.5	43	.8	8	--	--	4	--	--
23	5.8	44	.7	7	--	--	4	--	--
24	5.4	47	.7	6	--	--	4	--	--
25	5.1	53	.7	5	43	.6	5	--	--
26	4.8	31	.4	5	36	.5	5	--	--
27	4.8	28	.4	4	32	.3	5	--	--
28	6.5	26	.5	4	--	--	5	--	--
29	8.1	20	.4	4	--	--	4	--	--
30	8.6	18	.4	4	--	--	3	--	--
31	9.0	22	.5	--	--	--	3	--	--
Total load (tons)	--	--	21	--	--	1/19	--	--	1/10

Day	January			February			March		
1	3	--	--	80	--	--	35	--	--
2	2	--	--	60	--	--	30	--	--
3	2	--	--	45	--	--	26	--	--
4	2	--	--	35	--	--	24	--	--
5	2	--	--	30	--	--	22	--	--
6	2	31	0.2	25	--	--	20	--	--
7	2	--	--	20	--	--	19	--	--
8	2	--	--	18	--	--	18	--	--
9	3	--	--	16	--	--	17	--	--
10	4	--	--	14	--	--	16	--	--
11	5	--	--	12	--	--	16	--	--
12	5	--	--	11	--	--	16	--	--
13	5	--	--	18	40	1.9	18	--	--
14	5	--	--	50	--	--	18	--	--
15	4	--	--	300	264	214	17	--	--
16	4	--	--	650	362	635	16	--	--
17	4	--	--	1,000	295	796	16	--	--
18	5	--	--	900	236	573	16	6	0.3
19	5	--	--	800	139	300	15	--	--
20	4	--	--	500	108	146	15	--	--
21	4	--	--	450	56	68	15	--	--
22	4	--	--	400	69	75	400	255	275
23	3	--	--	250	--	--	1,300	650	2,280
24	3	7	.1	150	--	--	4,600	2,000	24,800
25	10	--	--	100	--	--	2,500	765	5,160
26	40	--	--	70	14	2.6	1,600	770	3,330
27	90	--	--	50	--	--	850	534	1,230
28	110	--	--	45	--	--	850	658	1,510
29	130	--	--	--	--	--	500	615	830
30	100	--	--	--	--	--	450	575	699
31	80	--	--	--	--	--	400	535	578
Total load (tons)	--	--	1/100	--	--	1/2,900	--	--	1/40,700

1/ Includes estimated load for missing days.

CANNONBALL RIVER BASIN--Continued

CANNONBALL RIVER NEAR NEW LEIPZIG, N. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	368	425	422	45	78	9.5	14	39	1.5
2	347	440	412	37	72	7.2	13	36	1.3
3	327	455	402	42	44	5.0	12	34	1.1
4	307	327	271	38	38	3.9	13	36	1.3
5	287	155	120	33	24	2.1	14	26	1.1
6	161	135	59	29	17	1.3	16	33	1.4
7	137	120	44	30	15	1.2	21	45	2.6
8	100	130	35	27	17	1.2	19	67	3.4
9	153	191	79	26	26	1.8	22	87	5.2
10	307	343	284	26	30	2.1	136	163	57
11	815	1,940	4,670	26	30	2.1	178	222	101
12	2,030	4,650	25,200	26	30	2.1	106	682	199
13	1,880	2,740	13,900	27	41	3.0	75	774	157
14	911	1,630	4,080	30	88	7.1	57	702	108
15	467	960	1,210	26	78	5.5	49	177	23
16	338	595	543	24	39	2.5	42	142	16
17	299	412	333	22	44	2.6	37	137	14
18	262	340	241	22	45	2.7	32	135	12
19	218	285	168	23	45	2.8	28	134	10
20	169	250	114	22	43	2.6	25	126	8.5
21	138	221	82	22	36	2.1	281	565	780
22	115	172	53	24	34	2.2	1,400	2,350	9,050
23	101	127	35	22	34	2.0	3,040	1,700	14,000
24	87	112	26	19	40	2.1	3,110	1,560	13,100
25	80	92	20	19	46	2.4	2,320	1,190	7,450
26	75	86	17	17	47	2.2	1,400	1,010	3,850
27	69	78	15	16	44	1.9	690	675	1,280
28	56	62	9.4	17	37	1.7	400	356	384
29	54	62	9.0	16	29	1.3	299	215	174
30	53	76	11	16	28	1.2	244	185	122
31	--	--	--	14	40	1.5	--	--	--
Total load (tons)	--	--	52,860	--	--	69	--	--	50,920

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	244	158	104	16	34	1.5	5.3	20	0.3
2	210	149	84	17	27	1.2	4.9	28	.4
3	338	217	198	16	28	1.2	4.5	30	.4
4	280	214	162	15	31	1.3	6.1	29	.5
5	185	181	90	14	39	1.5	6.9	27	.5
6	130	141	49	14	35	1.3	5.7	30	.5
7	101	123	34	14	34	1.3	5.3	31	.4
8	87	90	21	14	30	1.1	3.7	30	.3
9	78	68	14	14	26	1.0	4.1	33	.4
10	68	53	9.7	15	22	.9	4.9	37	.5
11	62	49	8.2	15	32	1.3	6.5	24	.4
12	87	87	20	14	35	1.3	6.1	22	.4
13	161	90	39	14	41	1.5	4.9	24	.3
14	108	69	20	14	50	1.9	4.1	25	.3
15	53	87	12	17	58	2.7	4.1	23	.3
16	101	82	22	16	56	2.4	6.9	19	.4
17	78	58	12	12	50	1.6	4.5	21	.3
18	65	57	10	10	53	1.4	4.5	20	.2
19	55	46	6.8	9.3	47	1.2	5.7	18	.3
20	45	47	5.7	9.8	38	1.0	6.5	18	.3
21	37	51	5.1	8.8	40	1.0	5.7	18	.3
22	35	42	4.0	6.9	39	.7	4.9	20	.3
23	33	40	3.6	6.5	42	.7	4.1	16	.2
24	34	45	4.1	5.3	50	.7	2.9	20	.2
25	31	49	4.1	4.5	52	.6	4.9	20	.3
26	26	50	3.5	5.7	47	.7	5.3	18	.3
27	25	54	3.6	8.2	30	.7	5.7	17	.3
28	23	53	3.3	7.3	29	.6	5.7	17	.3
29	21	50	2.6	6.5	29	.5	6.1	15	.2
30	18	50	2.4	6.1	28	.5	5.7	15	.2
31	17	47	2.2	5.7	20	.3	--	--	--
Total load (tons)	--	--	960	--	--	36	--	--	10

Total load for year (tons) ---------- 1/148,600

1/ Includes estimated load for missing days.

CANNONBALL RIVER BASIN--Continued

CANNONBALL RIVER NEAR NEW LEIPZIG, N. DAK.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Instantaneous discharge (second-feet)	Suspended sediment														
		Concentration at time of sampling (p. p. m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p. p. m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)										
						0.00195	0.0039	0.0078	0.0156	0.0312	0.0625	0.125	0.250	0.500	1.000	2.000
Mar. 24, 1947--------	7,860	3,420	72,600	1,760	BN	19	30	42	52	65	79	85	94	97	98	--
Mar. 28----------	595	950	1,530	1,270	BN	11	20	30	44	61	84	95	98	100	--	--
Apr. 17 ----------	288	407	316	1,070	BN	58	72	82	89	94	97	98	99	100	--	--
June 23----------	3,270	1,680	14,800	3,700	BN	32	42	55	67	78	85	96	98	100	--	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

CEDAR CREEK NEAR PRETTY ROCK, N. DAK.

LOCATION.--At gaging station at county bridge 6 miles north of North Dakota-South Dakota State line, 7 miles north of Keldon, Carson County, 10½ miles south of Pretty Rock, Grant County, and 15 miles downstream from Timber Creek.
DRAINAGE AREA.--1,260 square miles.
RECORDS AVAILABLE.--Sediment records: May 1946 to September 1947.
EXTREMES, May-September 1946.--Sediment loads: Maximum, 984 tons per day June 24; minimum, 0 tons per day on many days in August and September.
EXTREMES, 1946-47.--Sediment loads: Maximum, 18,500 tons per day June 23; minimum, 0 tons per day on many days in fall and winter months.
EXTREMES, May 1946-September 1947.--Sediment loads: Maximum, 18,500 tons per day June 23, 1947; minimum, 0 tons per day on many days in fall and winter months.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 3, 1946	0.8	7.9	120	--	0.00	55	31	178		316	374	1.0	0.3	0.8	--	867	1.18	265	6	59
Mar. 22, 1947	548	7.4	16.9	3.6	1.0	14	4.5	11	7.3	76	17	4.0	.0	.2	0.2	116	.16	53	0	27
Apr. 29	46	8.5	70.4	15	.02	44	24	95		1/236	206	3.0	.1	3.4	1.6	470	.64	208	14	50
May 22	15	8.5	98.6	10	.02	57	34	132		2/328	280	5.0	.1	2.2	1.4	686	.93	282	13	50
June 4	8.6	8.3	110	8.7	.02	48	39	158		3/324	334	6.0	.1	1.8	--	754	1.03	280	14	55
June 24	1,130	8.3	76.0	12	.02	33	27	97		166	253	1.0	.0	3.3	.8	532	.72	193	57	52
Aug. 28	1.3	7.8	140	7.6	.02	46	46	203		360	423	6.3	.1	1.4	1.8	984	1.34	304	9	59

1/ Includes equivalent of 12 parts per million of carbonate (CO_3).
2/ Includes equivalent of 14 parts per million of carbonate (CO_3).
3/ Includes equivalent of 10 parts per million of carbonate (CO_3).

CANNONBALL RIVER BASIN--Continued

CEDAR CREEK NEAR PRETTY ROCK, N. DAK.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	6.9	53	1.0
2	--	--	--	--	--	--	5.5	56	.8
3	--	--	--	--	--	--	4.5	58	.7
4	--	--	--	2.5	45	0.3	4.1	61	.7
5	--	--	--	--	--	--	33	65	5.9
6	--	--	--	--	--	--	16	80	3.3
7	--	--	--	--	--	--	7.7	57	1.2
8	--	--	--	--	--	--	6.9	46	.9
9	--	--	--	--	--	--	5.0	70	.9
10	--	--	--	--	--	--	3.7	74	.7
11	--	--	--	--	--	--	2.7	90	.7
12	--	--	--	--	--	--	2.2	95	.6
13	--	--	--	--	--	--	1.8	85	.4
14	--	--	--	1.5	30	.1	1.7	75	.3
15	--	--	--	2.5	42	.3	1.4	97	.4
16	--	--	--	2.7	44	.3	1.2	82	.3
17	--	--	--	3.0	48	.4	1.1	70	.2
18	--	--	--	3.3	34	.3	1.2	55	.2
19	11	27	80	5.0	34	.5	1.1	55	.2
20	--	--	--	6.2	41	.7	.9	37	.1
21	--	--	--	7.7	44	.9	.7	45	.1
22	--	--	--	11	45	1.3	.7	47	.1
23	--	--	--	13	52	1.8	106	599	416
24	--	--	--	7.7	42	.9	212	1,440	984
25	--	--	--	8.6	67	1.6	57	188	30
26	--	--	--	8.6	73	1.7	31	102	8.5
27	--	--	--	9.6	65	1.7	27	--	6.1
28	--	--	--	5.5	63	.9	23	88	5.5
29	--	--	--	5.0	60	.8	16	70	3.0
30	--	--	--	6.2	47	.8	9.6	70	1.8
31	--	--	--	8.6	53	1.2	--	--	--
Total load (tons)	--	--	--	--	--	16	--	--	1,475

Day	July			August			September		
1	42	103	13	0.5	--	--	0	--	0
2	84	105	24	.5	25	0	0	--	0
3	66	123	22	.4	--	--	0	--	0
4	112	153	46	.4	--	--	0	--	0
5	184	247	123	.4	--	--	0	--	0
6	128	243	84	.4	--	--	0	--	0
7	120	274	89	.3	--	--	0	--	0
8	164	319	141	.3	--	--	0	--	0
9	112	213	64	.3	--	--	0	--	0
10	70	184	35	.3	--	--	0	--	0
11	48	142	18	.3	--	--	0	--	0
12	39	154	16	.3	--	--	0	--	0
13	32	160	14	.2	21	0	0	--	0
14	24	147	9.5	.2	23	0	0	--	0
15	16	128	5.5	.2	27	0	0	--	0
16	11	78	2.3	.2	30	0	0	--	0
17	8.6	87	2.0	.2	33	0	0	--	0
18	8.6	84	2.0	.2	37	0	0	--	0
19	7.7	68	1.4	.2	41	0	0	--	0
20	4.1	53	.6	.1	43	0	0	--	0
21	3.3	--	.4	.1	39	0	0	--	0
22	2.0	--	.3	.1	43	0	0	--	0
23	1.5	--	.2	0	--	0	0	--	0
24	1.7	--	.2	0	--	0	0	--	0
25	2.7	44	.3	0	--	0	0	--	0
26	2.2	--	.2	0	--	0	.3	20	0
27	1.7	--	.2	0	--	0	.6	26	0
28	1.2	40	.1	0	--	0	.7	33	.1
29	1.0	46	.1	0	--	0	.7	32	.1
30	.7	--	.1	0	--	0	.6	20	0
31	.6	--	0	0	--	0	--	--	--
Total load (tons)	--	--	715	--	--	1/1	--	--	0

Total load for period May 14 to Sept 30 (tons)---------- 1/2,207

1/ Includes estimated load for missing days.

CANNONBALL RIVER BASIN--Continued

CEDAR CREEK NEAR PRETTY ROCK, N. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	0.6	13	0.0	3.7	20	0.2	2	23	0.1
2	.7	16	0	3.3	17	.2	2	25	.1
3	.7	23	0	3.3	18	.2	2	33	.2
4	.6	26	0	3.0	28	.2	3	35	.3
5	.7	32	.1	3.3	32	.3	2	19	.1
6	1.5	38	.2	3.7	27	.3	2	10	.1
7	1.8	24	.1	4.5	25	.3	2	14	.1
8	1.5	21	.1	4.1	28	.3	2	17	.1
9	1.4	21	.1	3.7	33	.3	2	20	.1
10	2.2	22	.1	4.1	37	.4	2	22	.1
11	5.5	19	.3	4.1	45	.5	2	23	.1
12	9.6	25	.6	3.7	54	.5	3	23	.2
13	7.7	14	.3	4.1	53	.6	3	24	.2
14	6.9	12	.2	3.7	38	.4	2	24	.1
15	9.6	13	.3	3.3	20	.2	3	25	.2
16	9.6	23	.6	3.3	10	.1	2	28	.2
17	7.7	24	.5	3.0	13	.1	2	31	.2
18	6.2	18	.3	3.0	19	.2	2	34	.2
19	4.1	14	.2	3.0	25	.2	2	49	.3
20	3.3	15	.1	3.0	30	.2	2	52	.3
21	3.0	22	.2	3.0	31	.2	2	21	.1
22	2.7	24	.2	2.2	29	.2	2	12	.1
23	3.0	21	.2	1.7	27	.1	2	13	.1
24	3.7	20	.2	1.5	26	.1	2	15	.1
25	3.3	23	.2	1.4	25	.1	1	17	0
26	3.3	24	.2	1.5	23	.1	1	19	.1
27	3.3	18	.2	1.5	19	.1	1	21	.1
28	3.7	15	.2	1.7	17	.1	1	23	.1
29	3.3	15	.1	1.7	19	.1	1	27	.1
30	3.3	16	.1	1.7	21	.1	1	28	.1
31	3.3	19	.2	--	--	--	1	28	.1
Total load (tons)	--	--	6	--	--	7	--	--	4
	January			February			March		
1	0.5	27	0	45	27	3.3	30	18	1.5
2	.5	26	0	40	26	2.8	26	24	1.7
3	.5	26	0	30	32	2.6	24	26	1.7
4	.5	27	0	25	21	1.4	22	27	1.6
5	.5	29	0	20	23	1.2	20	21	1.1
6	.5	30	0	15	27	1.1	18	28	1.4
7	1	30	.1	11	36	1.1	17	21	1.0
8	1	34	.1	9	45	1.1	16	21	.9
9	1	39	.1	8	34	.7	15	23	.9
10	1	41	.1	7	29	.5	15	18	.7
11	1	42	.1	6	28	.5	15	23	.9
12	1	44	.1	5	23	.3	14	20	.8
13	1	45	.1	11	30	.9	13	27	.9
14	1	46	.1	150	43	17	13	20	.7
15	1	46	.1	450	57	69	12	20	.6
16	1	45	.1	700	160	302	12	12	.4
17	1	43	.1	1,000	85	230	14	15	.6
18	1	41	.1	400	79	85	13	12	.4
19	1	37	.1	350	61	58	12	16	.5
20	1	33	.1	300	51	41	10	23	.6
21	1	26	.1	400	46	50	12	20	.6
22	1	21	.1	300	40	32	300	97	79
23	1	21	.1	200	34	18	1,000	205	554
24	1	22	.1	100	24	6.5	2,600	465	3,260
25	4	25	.3	70	22	4.2	3,000	235	1,900
26	60	40	6.5	50	17	2.3	2,100	276	1,560
27	60	67	11	40	87	9.4	1,600	272	1,180
28	50	43	5.8	35	109	10	1,000	290	783
29	50	27	3.6	--	--	--	700	298	563
30	50	51	6.9	--	--	--	500	310	418
31	50	26	3.5	--	--	--	400	295	318
Total load (tons)	--	--	39	--	--	952	--	--	10,640

CANNONBALL RIVER BASIN--Continued

CEDAR CREEK NEAR PRETTY ROCK, N. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	350	342	323	32	90	7.8	6.1	65	1.1
2	300	287	232	27	94	6.9	6.1	54	.9
3	450	382	464	25	76	5.1	7.4	56	1.1
4	304	365	300	27	55	4.0	8.8	53	1.3
5	236	211	134	26	41	2.9	9.5	46	1.2
6	195	149	78	21	34	1.9	9.5	51	1.3
7	175	165	78	18	26	1.3	13	56	2.0
8	121	135	44	16	31	1.3	45	60	7.8
9	62	187	31	14	37	1.4	58	56	8.8
10	198	290	163	13	48	1.7	50	46	6.2
11	404	573	625	15	53	2.1	29	27	2.1
12	535	820	1,200	19	51	2.6	28	37	2.8
13	1,000	1,800	5,040	17	54	2.5	75	59	12
14	1,490	2,400	9,660	15	58	2.3	45	51	6.2
15	1,060	402	1,160	15	63	2.6	37	48	4.8
16	599	848	1,350	15	65	2.6	33	57	5.1
17	353	975	929	16	65	2.8	29	48	3.8
18	226	715	436	19	65	3.3	26	27	1.9
19	156	535	225	19	68	3.5	27	--	2
20	130	435	153	20	69	3.7	28	20	1.5
21	112	378	114	18	64	3.1	46	125	16
22	82	360	80	15	57	2.3	1,190	2,700	8,680
23	82	285	63	12	52	1.7	2,360	--	18,500
24	67	248	45	11	64	1.9	1,230	650	2,160
25	54	206	30	11	65	1.9	975	230	605
26	47	177	22	11	61	1.8	885	364	870
27	47	153	19	9.5	48	1.2	975	795	2,090
28	38	130	13	8.1	55	1.2	750	618	1,250
29	43	116	13	6.7	60	1.1	450	438	543
30	38	106	11	5.4	63	.9	292	370	292
31	--	--	--	7.4	67	1.3	--	--	--
Total load (tons)	--	--	23,040	--	--	81	--	--	35,080

Day	July			August			September		
1	215	272	158	7.4	41	0.8	0.9	26	0.1
2	166	198	89	6.7	37	.7	.8	28	.1
3	130	206	72	6.7	32	.6	.7	30	.1
4	104	51	14	6.1	34	.6	.7	30	.1
5	93	48	12	5.4	33	.5	.6	29	.1
6	82	48	11	4.7	32	.4	.6	27	0
7	73	49	9.7	6.1	31	.5	.5	25	0
8	78	52	11	4.7	30	.4	.6	20	0
9	76	58	12	4.2	29	.3	.8	17	0
10	63	83	14	4.2	28	.3	.9	20	.1
11	55	81	12	4.2	27	.3	.8	22	.1
12	85	106	24	4.2	28	.3	.6	23	0
13	46	68	8.4	3.8	29	.3	.4	24	0
14	50	69	9.3	3.8	32	.3	.4	24	0
15	49	91	12	3.4	37	.3	.4	23	0
16	38	87	8.9	3.4	38	.4	.5	22	0
17	29	82	6.4	2.7	33	.2	.4	--	0
18	22	77	4.6	2.4	34	.2	.3	34	0
19	20	73	3.9	2.4	36	.2	.4	94	.1
20	18	68	3.3	2.1	34	.2	.4	63	.1
21	20	90	4.9	2.1	32	.2	.5	31	0
22	15	--	6	2.1	30	.2	.4	--	0
23	15	136	5.5	2.1	28	.2	.3	23	0
24	16	53	2.3	1.8	27	.1	.3	30	0
25	13	70	2.5	1.5	26	.1	.3	--	0
26	10	86	2.3	1.3	26	.1	.2	32	0
27	13	89	3.1	1.3	26	.1	.2	26	0
28	12	98	3.2	1.3	26	.1	.2	17	0
29	11	75	2.2	1.3	25	.1	.2	15	0
30	9.5	47	1.2	.9	25	.1	.2	--	0
31	8.8	43	1.0	1.0	26	.1	--	--	--
Total load (tons)	--	--	530	--	--	9	--	--	1

Total load for year (tons)---------- 70,390

CEDAR CREEK NEAR PRETTY ROCK, N. DAK.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Instantaneous discharge (second-feet)	Suspended sediment													
		Concentration at time of sampling (p.p.m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p.p.m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)									
						0.00195	0.0039	0.0078	0.0156	0.0312	0.0625	0.125	0.250	0.500	1.000	2.000
Mar. 22, 1947-------	518	126	176	990	BN	72	80	87	91	97	98	99	100	--	--	--
Mar. 27----------	1,580	259	1,100	501	BN	40	48	60	66	71	74	76	92	98	100	--
June 24----------	1,100	635	1,890	1,430	BN	21	47	51	68	82	91	95	97	98	99	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

GRAND RIVER BASIN

GRAND RIVER AT SHADEHILL, S. DAK.

LOCATION.--At bridge on State Highway 73 at Shadehill, Perkins County, 5 miles downstream from confluence of North and South Forks, and 12 miles south of Lemmon, Perkins County.
DRAINAGE AREA.--3,120 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1947.
Water temperatures: October 1945 to September 1947.
Sediment records: March 1946 to September 1947.
EXTREMES, March-September 1946.--Sediment loads: Maximum, 12,700 tons per day June 14; minimum, 0.9 ton per day Aug. 2, 29.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 2,770 parts per million Jan. 11-20; minimum, 188 parts per million Mar. 24-31.
Total hardness: Maximum, 359 parts per million Feb. 1-10; minimum, 56 parts per million Oct. 1-10.
Water temperatures: Maximum, 78° F. July 15, Aug. 3-4, 10; minimum, freezing point on many days in November, December, January, February, March, and April.
Sediment loads: Maximum, 83,800 tons per day June 24; minimum, 0.1 ton per day Jan. 3-6, 18-19.
EXTREMES, 1945-47.--Dissolved solids: Maximum, 3,910 parts per million Jan. 11-20, 1946; minimum, 188 parts per million Mar. 24-31, 1947.
Total hardness: Maximum, 590 parts per million Feb. 1-5, 1946; minimum, 39 parts per million Sept. 11-20, 1946.
Water temperatures: Maximum, 80° F. July 11, 1946; minimum, freezing point on many days in winter months.
Sediment loads: Maximum, 83,800 tons per day June 24, 1947; minimum, 0.1 ton per day Jan. 3-6, 18-19, 1947.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086. Records of specific conductance of daily samples available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1946	95	42	8.5	147	13	0.14	13	5.7	311	18	1/474	350	7.2	0.4	1.3	0.8	961	1.31	246	56	0	90
Oct. 11-20	104	36	7.9	102	13	.15	13	6.1	194	18	294	259	3.5	.4	2.6	.9	657	.89	185	58	0	84
Oct. 21-31	67	38	8.1	173	9.6	.01	23	15	339	19	462	498	7.4	.2	1.3	1.2	1,140	1.55	206	119	0	84
Nov. 1-2, 4-10	105	34	7.9	139	13	.06	20	12	271	14	359	398	5.2	2.2	1.9	2.0	911	1.24	259	100	0	83
Nov. 11-20	31	31	8.3	203	10	.01	30	18	421	14	2/584	604	8.9	.6	1.0	1.8	1,400	1.90	118	149	0	85
Nov. 21-30	12	32	8.3	296	12	.01	39	26	649	14	3/918	886	14	.7	1.0	1.8	2,090	2.84	67	204	0	86
Dec. 1-3, 5-6, 8-10	39	31	8.4	267	10	.01	30	20	575	8.7	4/870	735	13	.4	.9	2.0	1,820	2.48	191	157	0	88
Dec. 11-16, 18-20	20	31	8.4	254	8.2	.02	32	20	534	8.7	5/824	687	14	.6	.6	1.7	1,710	2.33	92	162	0	87
Dec. 21-22, 24-25, 27-31	5.1	32	8.3	330	5.6	.01	48	32	648	18	6/1,028	946	17	.8	.8	2.0	2,220	3.02	31	252	0	84
Jan. 1-10, 1947	2.0	31	8.5	377	8.0	.05	70	40	831	35	7/1,190	1,130	25	.9	1.4	4.3	2,720	3.70	14	339	0	82
Jan. 11-20	2.4	31	8.4	377	14	.05	87	31	828	35	8/1,090	1,220	13	.9	1.4	5.0	2,770	3.77	14	345	0	82
Jan. 21-31	17	32	8.4	220	18	.05	55	31	419	31	597	694	2.0	.3	.2	5.1	1,550	2.11	71	265	0	75

1/ Includes equivalent of 37 parts per million of carbonate (CO_3).
2/ Includes equivalent of 20 parts per million of carbonate (CO_3).
3/ Includes equivalent of 32 parts per million of carbonate (CO_3).
4/ Includes equivalent of 39 parts per million of carbonate (CO_3).
5/ Includes equivalent of 36 parts per million of carbonate (CO_3).
6/ Includes equivalent of 35 parts per million of carbonate (CO_3).
7/ Includes equivalent of 30 parts per million of carbonate (CO_3).
8/ Includes equivalent of 27 parts per million of carbonate (CO_3).

Feb. 1-10	21	31	8.4	295	12	.05	73	43	566	44	823	930	1.0	.5	.4	3.8	2,080	2.83	119	359	0	75
Feb. 11-19	703	32	8.3	140	5.0	.20	31	17	260	27	433	363	10	.1	.4	1.3	974	1.32	1,850	147	0	76
Mar. 4-13	99	32	8.2	556	10	.05	27	9.6	71	20	184	119	9.0	.1	.2	.7	383	.52	102	107	0	54
Mar. 14-23	1,940	32	8.3	71	14	.05	31	11	108	15	244	165	2.5	.1	1.6	.9	476	.65	2,490	123	0	62
Mar. 24-31	3,700	32	8.0	26	13	.40	18	5.5	23	17	114	42	1.0	.1	.2	.9	188	.26	1,880	68	0	36
Apr. 1-10	586	35	8.1	49	10	.05	23	7.6	62	26	176	106	1.0	.1	1.4	.5	326	.44	516	87	0	53
Apr. 11-20	959	44	8.2	61	18	.05	26	9.6	95	14	208	147	1.5	.1	2.0	.9	412	.56	1,070	104	0	63
Apr. 21-25	162	44	7.9	104	11	.05	35	17	171	15	302	280	4.0	.4	2.0	--	662	.90	289	157	0	68
Apr. 26-30	110	52	8.4	132	11	.05	44	21	222	12	384	356	5.0	.4	.7	1.9	851	1.16	253	196	0	70
May 1-9	72	50	8.3	157	6.0	.10	44	23	258	12	446	389	6.5	.4	1.0	2.4	963	1.31	187	204	0	72
May 10-31	53	54	8.3	188	6.0	.05	36	23	359	12	1/539	505	8.3	.4	1.0	2.6	1,220	1.66	174	184	0	80
June 1-7	58	58	8.4	201	2.0	.05	29	23	394	18	9/556	559	4.5	.4	1.0	3.0	1,310	1.78	206	167	0	82
June 7 10/	131	--	8.6	151	11	.01	33	1.5	335		11/382	474	6.0	.4	1.5	2.1	1,050	1.43	372	88	0	89
June 9-11	213	61	8.5	183	7.0	.05	30	19	316	19	9/532	400	7.2	.4	1.5	--	1,070	1.46	615	153	0	80
June 12-19	78	61	8.3	150	1.0	.02	31	11	300	16	450	392	10	.4	3.5	2.6	981	1.33	207	123	0	82
June 21-30	1,680	62	8.0	97.3	7.0	.05	39	10	154	19	238	288	.4	.4	1.5	1.8	642	.87	2,910	138	0	67
June 24 10/	3,490	--	8.4	84.2	18	.01	33	1.1	165		12/240	237	.0	.4	2.6	.8	568	.77	5,350	87	0	81
June 25 10/	2,090	--	7.4	107	18	.01	37	1.5	216		282	318	1.0	.3	5.2	2.8	796	1.08	4,490	98	0	83
July 1-12	174	72	8.2	156	6.0	.20	51	33	254	16	392	484	4.8	.4	2.0	2.7	1,050	1.43	494	263	0	66
July 13-16	159	75	8.4	175	5.0	.05	37	9.8	361	12	462	521	6.2	.4	2.0	3.5	1,190	1.62	511	133	0	84
July 17-Aug. 10	51	72	8.6	176	11	.04	25	23	346	14	13/456	532	8.0	.5	4.0	3.1	1,210	1.65	167	157	0	81

1/ Includes equivalent of 37 parts per million of carbonate (CO_3).
9/ Includes equivalent of 10 parts per million of carbonate (CO_3).
10/ Not included in weighted average.
11/ Includes equivalent of 18 parts per million of carbonate (CO_3).
12/ Includes equivalent of 8 parts per million of carbonate (CO_3).
13/ Includes equivaelent of 33 parts per million of carbonate (CO_3).

GRAND RIVER BASIN--Continued

GRAND RIVER AT SHADEHILL, S. DAK.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Aug. 11-13, 1947----	35	66	8.9	211	10	0.10	17	22	443	10	14/529	632	12	0.6	1.0	--	1,410	1.92	133	133	0	87
Aug. 14-18 ---------	80	68	8.8	202	11	.06	22	28	422	8.8	15/564	588	8.0	.6	1.0	4.0	1,370	1.86	296	170	0	84
Aug. 19-23 ---------	34	72	8.7	164	10	.07	22	19	371	5.2	7/505	506	8.5	.6	1.4	3.4	1,200	1.63	110	133	0	85
Aug. 24-Sept. 21 ----	11	58	8.7	226	7.2	.07	20	21	492	10	13/632	644	16	.7	2.0	3.6	1,530	2.08	46	136	0	78
Sept. 23-31 ---------	13	49	8.5	232	6.6	.09	18	21	512	6.4	16/683	653	14	.6	.9	2.1	1,570	2.14	55	131	0	89
Sept. 22 ----------	16	45	8.6	263	2.5	.04	25	20	611		4/776	785	12	.8	.9	--	1,840	2.50	79	145	0	90
Weighted average --	17/293	--	--		12	0.05	29	11	126	18	243	198	2.8	0.2	1.1	1.2	524	0.71	415	113	0	58

4/ Includes equivalent of 39 parts per million of carbonate (CO_3).
7/ Includes equivalent of 30 parts per million of carbonate (CO_3).
13/ Includes equivalent of 33 parts per million of carbonate (CO_3).
14/ Includes equivalent of 43 parts per million of carbonate (CO_3).
15/ Includes equivalent of 41 parts per million of carbonate (CO_3).
16/ Includes equivalent of 27 parts per million of carbonate (CO_3).
17/ Mean discharge for water year October 1946 to September 1947 was 291 second-feet.

Temperature (° F.) of water, water year October 1946 to September 1947

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

GRAND RIVER BASIN--Continued

GRAND RIVER AT SHADEHILL, S. DAK.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	--	--	---
2	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--
8	--	--	--	--	--	--	--	--	--
9	--	--	--	--	--	--	55	930	138
10	--	--	--	--	--	--	95	778	200
11	--	--	--	--	--	--	120	848	275
12	--	--	--	--	--	--	126	1,100	374
13	--	--	--	--	--	--	126	1,220	415
14	--	--	--	--	--	--	134	1,400	507
15	--	--	--	--	--	--	142	1,730	663
16	--	--	--	--	--	--	112	1,460	442
17	--	--	--	--	--	--	104	1,290	362
18	--	--	--	--	--	--	75	1,040	211
19	--	--	--	--	--	--	75	1,040	211
20	--	--	--	--	--	--	85	715	164
21	--	--	--	--	--	--	134	930	336
22	--	--	--	--	--	--	134	815	295
23	--	--	--	--	--	--	104	566	159
24	--	--	--	--	--	--	104	350	98
25	--	--	--	--	--	--	142	450	173
26	--	--	--	--	--	--	104	418	117
27	--	--	--	--	--	--	142	660	253
28	--	--	--	--	--	--	204	3,900	2,150
29	--	--	--	--	--	--	195	6,570	3,460
30	--	--	--	--	--	--	142	6,230	2,390
31	--	--	--	--	--	--	112	5,600	1,690
Total load (tons)	--	--	--	--	--	--	--	--	15,080

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	82	4,890	1,080	8	81	1.7	58	3,500	548
2	69	4,000	745	10	81	2.2	226	6,470	4,610
3	76	2,280	468	16	99	4.3	195	11,800	6,210
4	76	1,300	267	179	7,450	3,600	126	17,200	5,850
5	69	900	168	134	18,600	6,730	77	12,800	2,660
6	63	580	99	76	16,400	3,370	63	7,800	1,330
7	71	650	125	52	13,400	1,880	48	6,100	791
8	71	688	132	40	13,100	1,410	39	4,000	421
9	64	598	103	34	6,300	578	35	2,350	222
10	59	339	54	29	1,900	149	26	760	59
11	55	252	37	25	652	44	26	350	25
12	54	176	26	24	220	14	37	1,150	115
13	49	--	19	23	108	6.7	46	529	67
14	47	--	19	24	105	6.8	346	13,300	12,700
15	45	174	21	22	136	8.2	164	17,800	7,680
16	41	193	21	25	129	8.7	104	12,600	3,540
17	36	86	8.4	25	113	7.6	77	8,400	1,750
18	29	114	8.9	30	320	26	65	6,500	1,140
19	24	107	6.9	42	367	42	57	4,600	708
20	21	136	7.7	44	276	33	87	3,900	916
21	17	105	4.8	60	524	85	112	5,400	1,630
22	19	115	5.9	49	426	56	75	6,300	1,280
23	16	80	3.5	66	1,510	269	54	8,700	1,270
24	10	75	2.0	59	2,600	414	46	7,000	869
25	11	62	1.8	282	12,200	11,400	40	3,800	410
26	10	72	1.9	226	17,100	10,400	39	1,300	137
27	10	88	2.4	119	14,400	4,630	31	350	29
28	8	78	1.7	80	12,500	2,700	46	800	99
29	8	59	1.3	60	10,400	1,680	41	480	53
30	8	55	1.2	57	7,750	1,190	30	225	18
31	--	--	--	55	5,330	792	--	--	--
Total load (tons)	--	--	3,442	--	--	51,540	--	--	57,340

GRAND RIVER BASIN--Continued

GRAND RIVER AT SHADEHILL S. DAK.--Continued

Suspended sediment, water year October 1945 to September 1946--Continued

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	44	290	34	4.3	86	1.0	11	82	2.4
2	70	989	248	4.0	80	.9	9	86	2.1
3	97	1,790	469	2.6	150	1.1	7	63	1.2
4	62	370	62	6	350	5.7	6	74	1.2
5	51	210	29	14	130	4.9	5	82	1.1
6	45	210	26	10	330	8.9	6	185	3.0
7	41	190	21	8	620	13	11	600	18
8	31	125	10	7	98	1.9	12	280	9.1
9	39	310	33	5	95	1.3	24	550	36
10	25	595	40	6	78	1.3	97	2,380	623
11	30	160	13	10	115	3.1	104	14,700	4,130
12	26	100	7.0	6	155	2.5	63	15,100	2,570
13	20	59	3.2	7	290	5.5	45	11,800	1,430
14	19	50	2.6	6	360	5.8	35	9,900	936
15	17	62	2.8	6	133	2.2	30	9,750	790
16	15	85	3.4	5	134	1.8	22	8,200	487
17	12	136	4.4	6	164	2.7	16	4,300	186
18	15	330	13	24	262	17	24	3,200	207
19	14	104	3.9	22	230	14	24	2,600	168
20	11	255	7.6	16	163	7.0	26	1,330	93
21	89	12,300	2,960	12	168	5.4	36	1,200	117
22	52	15,500	2,180	8	285	6.2	50	2,620	354
23	39	17,100	1,800	14	795	30	38	6,100	626
24	30	11,000	891	22	676	40	29	6,520	511
25	23	11,100	689	19	400	21	24	5,370	348
26	17	6,700	308	16	213	9.2	20	4,510	244
27	12	1,780	58	11	115	3.4	17	4,700	216
28	10	1,180	32	9	85	2.1	19	2,300	118
29	9	1,050	26	6	56	.9	21	1,360	77
30	8	520	11	6	60	1.0	15	1,080	44
31	6	290	4.7	15	81	3.3	--	--	--
Total load (tons)	--	--	9,993	--	--	224	--	--	14,350

Total load for period Mar. 9 to Sept. 30 (tons) ---------- 152,000

GRAND RIVER BASIN--Continued

GRAND RIVER AT SHADEHILL, S. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	13	426	15	255	4,020	2,770	21	75	4.3
2	12	336	11	185	3,430	1,710	21	77	4.4
3	10	462	12	118	2,520	803	21	85	4.8
4	15	860	35	88	2,010	478	21	90	5.1
5	32	3,330	289	88	1,390	330	32	73	6.3
6	39	2,960	312	82	1,190	263	32	76	6.6
7	219	6,940	5,560	75	1,270	257	32	65	5.6
8	270	10,600	7,730	66	980	175	77	68	14
9	212	9,700	5,550	55	760	113	60	68	11
10	127	5,700	1,950	48	560	73	45	66	8.0
11	198	4,900	2,620	48	440	57	45	72	8.7
12	198	4,460	2,380	44	360	43	45	80	9.7
13	148	4,550	1,820	35	430	41	32	93	8.0
14	116	4,080	1,280	37	270	27	12	92	3.0
15	82	3,270	724	37	320	32	12	78	2.5
16	68	3,190	586	37	268	27	12	74	2.4
17	64	2,670	461	30	212	17	6	--	1.1
18	56	2,260	342	16	142	6.1	6	53	.9
19	58	1,500	235	15	144	5.8	6	55	.9
20	50	1,070	144	10	136	3.7	6	56	.9
21	46	890	111	8	101	2.2	6	55	.9
22	42	780	88	9	87	2.1	6	50	.8
23	38	1,070	110	9	80	1.9	6	45	.7
24	37	820	82	9	78	1.9	6	36	.6
25	35	560	53	10	70	1.9	6	40	.6
26	43	596	69	11	52	1.5	6	39	.6
27	48	514	67	11	50	1.5	6	48	.8
28	49	408	54	13	61	2.1	6	53	.9
29	52	378	53	16	76	3.3	6	51	.8
30	75	760	154	19	78	4.0	2	38	.2
31	276	2,820	2,210	--	--	--	2	48	.3
Total load (tons)	--	--	35,110	--	--	7,254	--	--	115
	January			February			March		
1	2	36	0.2	21	9	0.5	96	--	--
2	2	28	.2	21	12	.7	116	--	--
3	2	26	.1	21	13	.7	77	--	--
4	2	25	.1	21	16	.9	77	15	3.1
5	2	23	.1	21	11	.6	60	16	2.6
6	2	22	.1	21	10	.6	77	15	3.1
7	2	49	.3	21	13	.7	96	13	3.4
8	2	50	.3	21	31	1.8	96	10	2.6
9	2	49	.3	21	18	1.0	116	12	3.8
10	2	50	.3	21	18	1.0	116	10	3.1
11	2	46	.2	21	19	1.1	116	8	2.5
12	2	39	.2	21	38	2.2	116	8	2.5
13	2	35	.2	77	64	13	116	6	1.9
14	2	32	.2	426	66	76	116	8	2.5
15	2	36	.2	796	78	166	116	6	1.9
16	2	35	.2	1,090	310	903	116	5	1.6
17	2	30	.2	1,570	452	1,880	116	3	.9
18	2	26	.1	1,420	258	969	138	3	1.1
19	2	25	.1	906	132	320	162	3	1.3
20	6	26	.4	468	--	--	278	2	1.5
21	6	24	.4	246	64	43	572	11	20
22	6	30	.5	231	--	--	3,230	128	1,760
23	6	26	.4	216	--	--	14,600	1,620	58,100
24	6	60	1.0	188	--	--	12,100	1,660	49,300
25	12	172	5.6	162	--	--	7,330	1,360	24,000
26	16	90	3.9	138	--	--	3,220	895	7,420
27	21	80	4.5	116	--	--	1,870	960	4,750
28	32	54	4.7	96	--	--	1,350	1,600	5,720
29	32	34	2.9	--	--	--	1,280	2,900	9,820
30	32	43	3.7	--	--	--	1,150	1,300	4,000
31	21	21	1.2	--	--	--	1,280	1,700	5,760
Total load (tons)	--	--	33	--	--	1/ 4,590	--	--	1/171,000

1/ Includes estimated load for missing days.

GRAND RIVER BASIN--Continued

GRAND RIVER AT SHADEHILL, S. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	1,280	1,980	6,710	92	85	21	35	26	2.5
2	906	1,580	3,830	86	83	19	30	27	2.2
3	744	1,270	2,530	79	69	15	28	30	2.3
4	646	980	1,710	74	63	13	77	30	6.2
5	555	830	1,240	74	57	11	40	35	3.8
6	330	580	517	65	50	8.8	65	136	24
7	330	500	446	65	44	7.7	131	710	251
8	295	410	327	62	44	7.4	96	350	91
9	348	380	357	54	46	6.7	183	243	120
10	426	510	587	57	52	8.0	348	198	186
11	1,300	4,680	19,500	52	57	8.0	108	260	76
12	2,780	6,710	48,600	52	52	7.3	67	400	72
13	2,340	3,700	23,600	58	46	7.2	129	1,290	449
14	964	1,870	4,820	67	41	7.4	86	1,500	348
15	600	970	1,570	77	43	8.9	65	3,410	598
16	447	600	724	75	46	9.3	77	4,500	936
17	367	446	441	62	38	6.4	65	5,000	878
18	312	333	281	56	30	4.5	74	2,370	474
19	262	274	194	56	32	4.8	62	580	97
20	216	238	139	56	39	5.9	115	1,000	432
21	188	185	94	56	43	6.5	1,000	5,280	14,600
22	170	153	70	52	43	6.0	2,310	4,270	25,000
23	175	138	65	52	37	5.2	3,110	4,630	38,900
24	143	120	46	50	36	4.9	3,490	9,200	83,800
25	136	111	41	48	34	4.4	2,090	5,030	28,900
26	123	108	36	45	32	3.9	1,090	2,340	6,960
27	118	114	36	44	31	3.7	1,340	2,730	10,400
28	110	105	31	38	26	2.7	1,200	2,210	7,240
29	100	84	23	37	25	2.5	646	1,130	1,970
30	98	82	22	37	25	2.5	490	810	1,070
31	--	--	--	36	25	2.4	--	--	--
Total load (tons)	--	--	118,600	--	--	232	--	--	223,900

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	386	770	802	45	43	5.2	9	28	0.7
2	295	500	398	40	37	4.0	8	17	.4
3	262	221	156	40	36	3.9	9	16	.4
4	216	157	92	35	32	3.0	9	15	.4
5	178	82	39	32	26	2.2	8	12	.3
6	150	58	23	32	28	2.4	7	15	.3
7	127	54	19	32	26	2.2	7	15	.3
8	106	59	17	31	29	2.4	6	17	.3
9	96	67	17	33	29	2.6	5	19	.3
10	90	77	19	38	33	3.4	6	23	.4
11	86	84	20	38	29	3.0	9	24	.6
12	102	96	26	31	39	3.3	9	24	.6
13	157	161	68	36	57	5.5	9	26	.6
14	125	118	40	72	63	12	6	32	.5
15	202	128	70	86	68	16	7	26	.5
16	152	87	36	92	58	14	9	27	.7
17	114	64	20	86	66	15	9	26	.6
18	94	70	18	62	60	10	12	28	.9
19	83	74	17	48	51	6.6	14	33	1.2
20	72	72	14	41	39	4.3	15	35	1.4
21	65	61	11	32	33	2.9	16	33	1.4
22	58	64	10	28	34	2.6	16	30	1.3
23	54	52	7.6	21	27	1.5	16	29	1.3
24	51	46	6.3	19	26	1.3	15	27	1.1
25	50	46	6.2	18	28	1.4	14	34	1.3
26	45	43	5.2	17	30	1.4	13	35	1.2
27	45	38	4.6	15	29	1.2	12	35	1.1
28	41	41	4.5	14	34	1.3	11	34	1.0
29	38	49	5.0	12	38	1.2	12	32	1.0
30	58	54	8.5	11	32	1.0	14	35	1.3
31	54	44	6.4	10	30	.8	--	--	--
Total load (tons)	--	--	1,986	--	--	138	--	--	23

Total load for year (tons)---------- 1/ 563,000

1/ Includes estimated load for missing days.

GRAND RIVER BASIN--Continued

GRAND RIVER AT SHADEHILL, S. DAK.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Instantaneous discharge (second-feet)	Suspended sediment													
		Concentration at time of sampling (p.p.m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p.p.m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)									
						0.00195	0.0039	0.0078	0.0156	0.0312	0.0625	0.125	0.250	0.500	1.000	2.000
Mar. 24, 1947	12,800	1,620	56,000	4,550	BN	31	40	49	57	64	73	82	93	98	100	--
Apr. 17	367	464	460	1,140	BN	71	82	87	90	91	93	94	96	98	99	--
June 21	1,020	3,100	8,540	3,250	BN	1	3	17	50	75	79	88	94	97	99	--
June 22	2,710	2,780	20,300	3,430	BN	4	7	20	44	57	67	76	90	100	--	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

MOREAU RIVER NEAR FAITH, S. DAK.

LOCATION.--At bridge on State Highway 73 at Usta, Perkins County, 3 miles downstream from Rabbit Creek, and 13½ miles northwest of Faith, Meade County.
DRAINAGE AREA.--2,660 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: April to September 1947.
Sediment records: August 1946 to September 1947.
EXTREMES, 1946-47.--Sediment loads: Maximum, 131,000 tons per day June 24; minimum, 0 tons per day Sept. 5-12, 15-25.
EXTREMES, August 1946-September 1947.--Sediment loads: Maximum, 131,000 tons per day June 24, 1947; minimum, 0 tons per day Aug. 18-20, 1946, Sept. 5-12, 15-25, 1947.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086. Records of specific conductance of daily samples available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 2, 1946 1/---	13	--	7.4	99	--	0.00	34	13	198		230	359	4.0	0.4	0.6	--	745	1.01	26	138	0	76
Mar. 26, 1947 ----	2,010	--	7.5	43.6	12	1.0	24	10	51	7.4	92	126	8.0	.4	.8	0.5	287	.39	1,560	101	26	55
Apr. 9-18---------	424	41	7.4	130	7.0	.10	22	9.2	274	29	141	575	7.0	.2	2.0	1.0	962	1.31	1,100	93	0	82
Apr. 19-28 --------	90	43	7.8	139	6.0	.10	22	5.7	294	4.0	222	507	8.0	.2	2.0	1.0	960	1.31	233	78	0	88
Apr. 29-May 9 ----	44	52	8.1	188	5.0	.07	24	10	448	18	355	756	12	.4	2.0	2.0	1,450	1.97	274	101	0	89
May 10-19 --------	23	56	8.2	201	4.0	.07	24	12	474	21	404	764	13	.4	2.0	2.0	1,520	2.07	94	109	0	88
May 20-31 --------	16	52	8.3	213	4.0	.05	20	11	503	21	2/418	784	15	.5	2.0	2.0	1,570	2.14	68	95	0	90
June 1-10 --------	39	60	8.7	219	4.0	.03	43	34	423	10	2/421	775	16	.5	.4	--	1,520	2.07	160	247	0	78
June 11-20 -------	56	61	8.6	238	22	.03	61	43	420	14	3/369	900	14	.6	.2	--	1,660	2.26	251	329	27	72
June 21 1/--------	2,720	--	8.4	43.5	9.0	.18	17	5.9	53	8.4	122	88	.5	.1	.8	.7	283	.38	2,080	67	0	60
June 21 (6:00 p. m.) 1/	--	--	8.1	44.9	7.0	.16	25	5.5	50	7.2	130	90	2.0	.1	.8	.7	272	.37	--	85	0	54
June 25 1/ -------	4,900	--	8.2	110	9.0	.10	63	27	115	15	116	416	5.5	.3	1.2	.8	713	.97	9,430	268	173	47
July 1-10---------	126	69	8.3	155	19	.10	78	36	238	19	4/283	583	6.0	.3	.6	1.3	1,120	1.52	381	343	111	58
July 11 1/--------	544	--	8.4	186	6.0	.01	116	43	253		244	770	8.0	.4	4.0	1.6	1,320	1.80	1,940	466	266	54
July 11-20 --------	149	70	8.2	114	19	.01	40	17	193	17	256	365	4.0	.2	2.0	.9	755	1.03	304	170	0	69
July 21-31 --------	21	70	8.3	158	21	.05	41	23	290	18	347	514	7.0	.3	.8	1.9	1,090	1.48	62	197	0	74
Aug. 1-10 --------	7.9	73	8.3	207	14	.01	43	34	394	19	5/369	758	12	.4	.6	2.6	1,460	1.99	31	247	0	76
Aug. 11-20 -------	9.7	66	8.3	207	10	.01	42	29	425	11	6/347	760	11	.3	.8	2.4	1,460	1.99	38	224	0	80
Aug. 21-31 -------	1.8	65	8.3	236	6.0	.05	46	36	453	18	5/376	912	14	.3	.8	2.7	1,670	2.27	8.4	263	0	78
Sept. 1-10--------	1.3	59	8.3	293	7.0	.00	50	45	586	22	5/372	1,209	18	.5	.6	3.1	2,120	2.88	8.5	310	5	79
Sept. 11-30-------	1.1	50	8.3	309	7.6	.04	52	49	708	18	7/417	1,460	26	.9	.0	3.4	2,530	3.44	7.6	331	0	81

MOREAU RIVER BASIN--Continued

MOREAU RIVER NEAR FAITH, S. DAK.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

1/ Not included in weighted average.
2/ Includes equivalent of 20 parts per million of carbonate (CO_3).
3/ Includes equivalent of 18 parts per million of carbonate (CO_3).
4/ Includes equivalent of 22 parts per million of carbonate (CO_3).
5/ Includes equivalent of 32 parts per million of carbonate (CO_3).
6/ Includes equivalent of 28 parts per million of carbonate (CO_3).
7/ Includes equivalent of 11 parts per million of carbonate (CO_3).

Temperature (° F.) of water, water year October 1946 to September 1947

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

MOREAU RIVER BASIN--Continued

MOREAU RIVER NEAR FAITH, S. DAK.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p.p.m.)	Tons per day		Mean concentration (p.p.m.)	Tons per day		Mean concentration (p.p.m.)	Tons per day
1	--	--	--	--	--	--	3.1	32	0.3
2	--	--	--	--	--	--	3.4	29	.3
3	--	--	--	--	--	--	3.1	23	.2
4	--	--	--	--	--	--	3.1	17	.1
5	--	--	--	--	--	--	2.2	13	.1
6	--	--	--	--	--	--	1.6	2,640	11
7	--	--	--	--	--	--	9	10,100	247
8	--	--	--	--	--	--	15	5,800	235
9	--	--	--	--	--	--	26	2,550	179
10	--	--	--	--	--	--	179	7,460	4,400
11	--	--	--	--	--	--	165	6,800	3,030
12	--	--	--	--	--	--	246	13,000	8,630
13	--	--	--	--	--	--	171	5,750	2,650
14	--	--	--	--	--	--	106	6,280	1,800
15	--	--	--	1.3	30	0.1	60	5,990	970
16	--	--	--	1.3	24	.1	33	598	53
17	--	--	--	1.0	24	.1	25	192	13
18	--	--	--	.8	20	0	62	1,820	403
19	--	--	--	.6	13	0	66	5,160	920
20	--	--	--	.5	19	0	75	1,880	381
21	--	--	--	6	49	.8	72	1,860	484
22	--	--	--	6	2,410	39	157	5,950	2,520
23	--	--	--	36	5,660	550	135	3,980	1,450
24	--	--	--	9	443	11	86	9,200	2,140
25	--	--	--	4.0	127	1.4	55	2,860	424
26	--	--	--	7	114	2.2	55	2,430	360
27	--	--	--	16	141	6.1	43	1,180	137
28	--	--	--	9	80	1.9	30	513	42
29	--	--	--	6	60	1.0	23	184	11
30	--	--	--	4.6	50	.6	18	158	7.7
31	--	--	--	3.7	38	.4	--	--	
Total load (tons)	--	--	--	--	--	615	--	--	31,500

Total load for period Aug. 15 to Sept. 30 (tons) ---------- 32,120

MOREAU RIVER BASIN--Continued

MOREAU RIVER NEAR FAITH, S. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	12	132	4.3	628	3,180	5,390	19	45	2.3
2	13	118	4.2	585	2,900	4,580	19	40	2.0
3	10	104	2.8	324	2,100	1,840	19	44	2.3
4	10	210	5.7	215	1,420	824	18	41	2.0
5	58	3,600	564	151	995	406	18	45	2.2
6	127	6,150	2,110	108	650	190	17	48	2.2
7	485	10,600	13,900	80	500	108	17	49	2.3
8	926	10,100	25,300	64	335	58	18	50	2.2
9	870	6,550	15,400	55	231	34	14	51	1.9
10	628	3,870	6,560	49	176	23	13	54	1.9
11	628	3,280	5,560	38	120	12	12	60	2.0
12	585	3,060	4,830	41	106	12	11	70	2.1
13	411	3,760	4,170	29	101	7.5	10	74	2.0
14	276	2,760	2,060	26	82	5.7	9	71	1.7
15	200	1,600	864	25	63	4.3	8	67	1.5
16	151	940	383	23	49	3.0	7	73	1.4
17	165	666	297	22	33	2.0	6	48	.6
18	157	512	217	22	48	2.9	5	66	.9
19	119	406	130	21	50	2.8	4	111	1.2
20	86	305	71	20	47	2.5	4	71	.8
21	64	286	49	20	39	2.1	3	59	.5
22	49	262	35	20	28	1.5	3	55	.4
23	41	175	19	20	38	2.0	3	46	.4
24	29	127	9.9	20	40	2.1	3	55	.4
25	30	97	7.8	20	39	2.1	2	36	.2
26	36	92	8.9	20	39	2.1	2	44	.2
27	46	417	52	20	45	2.4	2	41	.2
28	53	523	75	20	41	2.2	2	42	.2
29	60	784	127	20	36	1.9	1	50	.1
30	266	2,120	1,780	19	40	2.1	1	22	.1
31	544	2,740	4,020	--	--	--	1	28	.1
Total load (tons)	--	--	88,620	--	--	13,530	--	--	38
	January			February			March		
1	1	54	0.1	80	92	20	60	21	3.3
2	1	60	.2	70	78	15	55	20	2.9
3	1	29	.1	65	55	9.7	55	18	2.7
4	2	19	.1	60	28	4.6	50	18	2.4
5	2	18	.1	55	24	3.6	50	15	2.0
6	2	16	.1	50	31	4.2	45	13	1.6
7	3	14	.1	50	59	8.0	45	12	1.5
8	3	18	.1	45	26	3.1	40	11	1.2
9	3	38	.3	45	18	2.2	40	11	1.2
10	3	42	.3	45	25	3.0	35	14	1.3
11	3	42	.3	40	25	2.7	35	21	2.0
12	2	42	.2	40	20	2.2	35	25	2.3
13	2	42	.2	100	90	24	30	27	2.2
14	2	40	.2	600	226	366	30	25	2.1
15	2	37	.2	1,700	772	3,540	30	28	2.3
16	1	42	.1	3,600	3,340	32,500	30	27	2.2
17	1	47	.1	4,400	3,790	45,000	30	24	1.9
18	1	44	.1	2,630	1,120	7,950	35	47	4.4
19	1	42	.1	1,500	790	3,200	35	48	4.5
20	1	49	.1	800	650	1,400	35	40	3.7
21	1	56	.2	300	421	341	400	1,400	1,510
22	1	53	.1	200	--	166	5,000	1,990	26,900
23	1	106	.3	120	169	55	7,600	2,820	57,900
24	100	308	83	90	110	27	6,500	3,730	65,500
25	300	292	237	80	48	10	3,860	3,290	32,800
26	320	280	242	75	31	6.3	2,010	2,120	11,500
27	350	238	225	70	28	5.3	1,240	2,250	7,530
28	300	112	91	65	25	4.4	817	2,020	4,460
29	200	92	50	--	--	--	628	2,100	3,560
30	120	90	29	--	--	--	585	1,430	2,260
31	90	118	29	--	--	--	585	1,280	2,020
Total load (tons)	--	--	990	--	--	94,670	--	--	216,000

MOREAU RIVER BASIN--Continued

MOREAU RIVER NEAR FAITH, S. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	673	4,660	8,470	55	114	17	16	39	1.7
2	984	3,090	8,210	47	99	13	16	39	1.7
3	544	1,900	2,790	44	74	8.7	16	39	1.7
4	585	2,650	4,190	41	55	6.1	48	125	22
5	719	2,430	4,720	39	43	4.6	124	1,290	432
6	544	1,750	2,570	36	40	3.9	49	1,060	141
7	448	1,370	1,660	33	37	3.3	47	235	30
8	324	985	862	39	40	4.2	30	167	14
9	292	810	639	32	32	2.8	26	149	10
10	324	775	678	28	42	3.2	25	278	19
11	308	720	599	24	43	2.8	23	387	24
12	828	3,570	9,540	24	36	2.3	20	189	10
13	870	9,200	21,600	24	36	2.4	28	122	9.2
14	585	7,220	11,400	23	41	2.6	21	220	12
15	358	4,640	4,490	23	36	2.4	98	1,400	370
16	261	3,890	2,740	23	31	1.9	91	3,300	811
17	200	2,890	1,560	19	44	2.3	82	990	219
18	171	2,000	923	19	34	1.7	60	363	59
19	146	1,270	501	19	31	1.6	38	248	25
20	130	795	279	19	30	1.5	96	1,620	823
21	108	535	156	18	39	1.9	2,720	11,700	88,200
22	94	355	90	16	31	1.4	3,300	6,280	56,000
23	86	238	55	14	25	.9	4,600	9,600	119,000
24	80	180	39	14	25	.9	5,000	9,700	131,000
25	73	165	33	15	28	1.2	4,900	8,020	106,000
26	66	125	22	16	34	1.5	2,220	5,300	32,800
27	62	91	15	16	34	1.5	585	5,150	8,130
28	58	89	14	16	34	1.5	429	4,600	5,330
29	62	67	11	16	34	1.5	324	3,000	2,620
30	60	74	12	16	34	1.5	292	2,050	1,620
31	--	--	--	16	35	1.5	--	--	--
Total load (tons)	--	--	88,870	--	--	104	--	--	553,700

Day	July			August			September		
1	276	1,020	760	13	63	2.2	1.9	20	0.1
2	215	720	418	10	59	1.6	1.9	18	.1
3	171	1,600	739	10	51	1.4	1.6	18	.1
4	138	237	88	9	45	1.1	1.6	14	.1
5	111	105	31	8	52	1.1	1.3	12	0
6	94	69	18	8	50	1.1	1.0	13	0
7	77	60	12	6	48	.8	.9	10	0
8	60	59	9.5	6	47	.8	.9	8	0
9	60	73	12	4.6	36	.4	.7	8	0
10	55	66	9.8	4.6	154	1.9	.7	8	0
11	589	5,120	10,500	9	2,930	71	.6	8	0
12	340	2,970	2,730	15	171	6.9	.6	11	0
12	261	3,090	1,790	16	635	27	.5	109	.1
14	296	2,920	2,780	18	2,060	100	.4	278	.3
15	75	394	80	11	126	3.8	.3	41	0
16	43	151	18	8	94	2.0	.2	25	0
17	43	98	11	8	59	1.3	.2	31	0
18	38	81	8.3	5	53	.7	.5	14	0
19	35	80	7.6	3.7	43	.4	.9	20	0
20	30	67	5.4	3.4	42	.4	.8	10	0
21	30	48	3.9	3.4	41	.4	.9	8	0
22	24	51	3.3	3.1	42	.4	.9	10	0
23	25	56	3.8	2.8	56	.4	1.0	7	0
24	24	65	4.2	2.2	40	.2	1.3	8	0
25	24	116	7.5	2.2	32	.2	1.3	12	0
26	23	64	4.0	1.3	34	.1	1.6	12	.1
27	21	59	3.3	1.0	43	.1	1.9	13	.1
28	19	64	3.3	1.0	41	.1	2.2	18	.1
29	16	64	2.8	1.3	34	.1	2.5	11	.1
30	15	73	3.0	1.0	38	.1	4.0	16	.2
31	13	77	2.7	1.0	32	.1	--	--	--
Total load (tons)	--	--	20,460	--	--	228	--	--	1

Total load for year (tons)---------- 1,077,000

MOREAU RIVER NEAR FAITH, S. DAK.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Instantaneous discharge (second-feet)	Suspended sediment													
		Concentration at time of sampling (p. p. m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p. p. m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)									
						0.00195	0.0039	0.0078	0.0156	0.0312	0.0625	0.125	0.250	0.500	1.000	2.000
Feb. 17, 1947 ------	4,320	5,200	60,700	8,810	BN	34	38	48	58	68	82	94	99	100	--	--
Feb. 20 ----------	772	787	1,640	850	BN	23	38	80	84	88	91	93	96	100	--	--
Mar. 26----------	1,610	2,190	9,520	4,500	BN	36	40	49	58	65	74	81	89	100	--	--
June 25 ----------	5,090	9,040	124,000	7,890	BD	25	30	36	43	50	66	78	86	92	98	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

CHEYENNE RIVER BASIN

CHEYENNE RIVER NEAR HOT SPRINGS, S. DAK.

LOCATION.--At bridge on State Highway 87, 10 miles southwest of Hot Springs, Fall River County, and a quarter of a mile downstream from Cascade Creek.
DRAINAGE AREA.--8,710 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: July to September 1947.
Sediment records: April 1946 to September 1947.
EXTREMES, April-September 1946.--Sediment loads: Maximum, 476,000 tons per day June 19; minimum, 0.1 ton per day Apr. 25-29, July 31, Aug. 1.
EXTREMES, 1946-47.--Sediment loads: Maximum, 473,000 tons per day June 22; minimum, 0.1 ton per day May 24-26.
EXTREMES, April 1946-September 1947.--Sediment loads: Maximum, 476,000 tons per day June 19, 1946; minimum, 0.1 ton per day Apr. 25-29, July 31, Aug. 1, 1946, May 24, 26, 1947.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086. Records of specific conductance of daily samples available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Nov. 5, 1946	53	--	7.7	237	--	0.00	504	88	40		168	1,420	62	1.1	0.8	--	2,250	3.06	322	1,620	1,480	5
Dec. 4	29	--	7.7	228	--	.10	512	87	27		180	1,420	50	1.1	.8	--	2,240	3.05	175	1,640	1,490	4
Apr. 2, 1947	144	--	7.8	212	6.0	.08	216	62	182	17	168	732	218	1.4	2.0	1.5	1,520	2.07	591	794	656	34
Apr. 3	257	46	7.4	392	8.0	.10	312	86	468	22	170	898	780	.4	2.5	1.0	2,660	3.62	1,850	1,130	991	48
Apr. 22	65	--	7.8	310	8.0	.05	332	86	300	17	190	1,110	385	.8	.8	--	2,330	3.17	409	1,180	1,020	36
May 2	39	72	8.2	342	10	.01	312	91	443		194	1,320	412	.6	.4	.0	2,690	3.66	283	1,150	991	46
May 15	93	--	8.0	226	33	.01	179	51	302		176	795	240	.6	1.9	1.1	1,690	2.30	424	656	512	50
June 5	65	--	7.7	194	16	.01	173	52	232		230	791	96	.7	.7	.8	1,480	2.01	260	645	456	44
July 1	2,860	--	8.0	107	17	.01	120	28	99		220	410	15	.6	.4	.3	842	1.15	6,500	415	235	34
July 1-2	2,100	68	7.6	117	23	.02	133	31	88	2.4	244	416	10	.8	3.7	--	890	1.21	5,050	459	259	29
July 3-6	621	73	8.3	164	23	.02	228	50	108	4.0	1/176	751	43	.9	2.2	--	1,300	1.77	2,180	774	630	23
July 7	866	72	7.5	118	20	.20	148	33	99		276	440	22	.9	2.3	--	898	1.22	2,100	505	279	30
July 8-12	612	74	8.3	158	19	.10	199	46	115	10	2/188	703	52	.8	2.5	1.8	1,240	1.69	2,050	686	532	26
July 13-21	89	74	8.0	196	21	.02	210	60	187	3.2	182	892	74	1.0	5.4	1.1	1,540	2.09	370	771	622	34
July 22-23	183	69	8.0	241	29	.02	404	71	146	3.6	124	1,330	71	.9	2.7	--	2,120	2.88	1,050	1,300	1,200	20
July 24-Aug. 1	78	77	8.0	178	21	.05	222	50	141	3.6	196	809	58	.8	2.0	.9	1,400	1.90	295	760	599	29
Aug. 2-5	299	83	8.2	147	27	.02	160	43	133	4.8	232	560	59	.8	2.5	.3	1,110	1.51	896	576	386	33
Aug. 6	65	77	8.7	189	24	.04	177	45	232		176	747	146	.9	1.0	--	1,470	2.00	258	627	483	45
Aug. 7-12	20	76	8.1	240	29	.05	372	80	157	4.8	166	1,250	117	.9	1.5	1.0	2,100	2.86	113	757	621	21
Aug. 13-16	97	71	8.2	149	18	.02	188	46	102	3.2	168	648	43	.9	2.5	.9	1,140	1.55	299	658	520	25
Aug. 17-Sept. 12	15	71	7.9	235	24	.02	485	89	48	4.4	124	1,470	48	1.0	1.2	.9	2,230	3.03	90	1,580	1,480	6
Sept. 13	51	63	7.5	226	16	.00	419	72	160		204	1,400	40	.9	2.0	.1	2,220	3.02	306	1,340	1,170	21
Sept. 14-30	23	61	7.9	243	20	.12	480	102	56	11	152	1,470	53	1.0	.9	1.6	2,270	3.09	141	1,620	1,500	7

1/ Includes equivalent of 6 parts per million of carbonate (CO_3).
2/ Includes equivalent of 8 parts per million of carbonate (CO_3).

Temperature (° F.) of water, water year October 1946 to September 1947

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

CHEYENNE RIVER BASIN--Continued

CHEYENNE RIVER NEAR HOT SPRINGS, S. DAK.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	12	68	2	1,500	14,700	59,500
2	--	--	--	530	8,200	13,800	769	7,600	15,800
3	--	--	--	1,070	23,500	67,900	680	7,500	13,800
4	62	36	6	724	17,500	34,200	418	7,800	8,800
5	62	73	12	268	11,600	8,400	264	4,100	2,920
6	116	2,510	786	126	6,650	2,260	198	2,700	1,440
7	58	2,060	323	75	1,650	334	109	1,230	362
8	68	300	55	68	280	51	68	417	77
9	60	150	24	43	102	12	51	187	26
10	43	58	7	65	164	29	25	108	7
11	39	26	3	62	540	90	31	64	5
12	37	18	2	109	1,460	430	1,890	24,800	193,000
13	37	18	2	477	6,590	8,490	1,830	26,300	130,000
14	32	8	.7	173	2,040	952	968	20,200	52,700
15	31	6	.5	39	605	64	597	13,500	21,800
16	31	7	.6	45	285	35	250	6,700	4,520
17	31	8	.7	173	8,630	4,030	173	3,400	1,590
18	26	20	1	78	18,100	3,810	640	11,500	43,800
19	28	26	2	137	19,700	7,280	4,780	34,100	476,000
20	--	12	.8	68	9,750	1,790	3,560	25,300	243,000
21	19	10	.5	45	4,100	498	2,300	12,700	78,800
22	18	4	.2	45	2,050	249	1,500	7,800	31,600
23	13	6	.2	35	1,600	151	724	5,600	10,900
24	14	6	.2	58	5,600	878	394	3,250	3,460
25	9	6	.1	32	925	80	323	2,250	1,960
26	9	5	.1	58	394	62	268	2,250	1,630
27	11	5	.1	29	214	17	213	2,000	1,150
28	8	5	.1	20	90	5	180	495	240
29	7	4	.1	24	90	6	170	250	115
30	9	24	.6	80	784	207	152	470	193
31	--	--	--	1,180	22,500	117,000	--	--	--
Total load (tons)	--	--	1,228	--	--	273,100	--	--	1,399,000

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	418	9,150	10,300	3.9	11	0.1	141	3,950	1,500
2	1,120	4,550	13,800	3.9	20	.2	83	1,980	444
3	818	9,360	20,700	6	12	.2	35	420	40
4	383	4,700	4,860	7	18	.3	24	285	18
5	257	2,500	1,740	8	16	.3	8	79	2
6	336	2,200	2,000	9	15	.4	15	195	8
7	1,610	21,800	152,000	7	25	.5	31	564	47
8	1,830	10,800	53,400	7	42	.8	843	35,800	97,700
9	1,020	5,600	15,400	7	47	.9	1,020	42,300	116,000
10	362	4,200	4,100	13	27	.9	769	21,000	43,500
11	220	2,900	1,720	10	19	.5	769	13,000	27,000
12	141	1,450	552	13	18	.6	597	7,480	12,100
13	96	690	179	13	25	.9	235	1,600	1,020
14	58	400	63	13	32	1	155	900	378
15	41	245	27	8	22	.5	83	471	106
16	15	180	7	11	29	.9	68	280	51
17	11	98	3	13	32	1	55	130	20
18	14	170	6	11	15	.4	604	2,930	7,210
19	31	165	14	15	17	.7	1,120	8,860	23,900
20	22	132	8	14	24	.9	818	10,900	24,100
21	12	90	3	12	13	.4	352	5,950	5,660
22	130	1,400	680	17	12	.6	184	1,900	944
23	37	575	57	13	10	.4	148	475	190
24	19	307	16	10	10	.3	137	340	126
25	14	85	3	10	13	.4	93	142	36
26	26	380	27	9	11	.3	68	57	10
27	17	120	6	11	11	.3	55	53	8
28	10	36	1	198	21,600	19,300	55	32	5
29	8	20	.4	257	14,400	10,000	53	22	3
30	5	12	.2	83	9,750	2,180	47	15	2
31	4.6	9	.1	39	4,950	521	--	--	--
Total load (tons)	--	--	281,700	--	--	32,020	--	--	362,100

Total load for period Apr. 4 to Sept. 30 (tons) ---------- 2,349,000

CHEYENNE RIVER BASIN--Continued

CHEYENNE RIVER NEAR HOT SPRINGS, S. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	47	21	3	51	29	4	32	22	2
2	34	21	2	49	38	5	25	7	1
3	37	18	2	49	37	5	29	11	1
4	37	20	2	47	46	6	29	22	2
5	49	21	3	53	47	7	28	22	2
6	37	12	1	49	31	4	34	23	2
7	35	10	1	34	22	2	32	24	2
8	270	2,400	1,750	43	20	2	32	24	2
9	638	8,080	13,900	34	47	4	31	21	2
10	367	6,100	6,050	34	50	5	31	27	2
11	328	5,650	5,000	34	55	5	28	36	3
12	491	4,500	5,960	51	45	6	24	32	2
13	279	3,840	2,890	28	37	3	31	30	3
14	144	2,800	1,090	68	37	7	31	35	3
15	137	1,840	680	68	34	6	39	38	4
16	162	1,080	472	35	41	4	34	14	1
17	152	820	337	62	108	18	26	14	1
18	119	440	141	75	150	30	21	17	1
19	90	280	68	116	272	85	17	18	.8
20	70	199	38	86	150	35	17	14	.6
21	65	140	25	31	58	5	17	10	.5
22	68	91	17	45	30	4	17	8	.4
23	58	60	9	60	46	7	17	44	2
24	60	41	7	70	80	15	18	31	2
25	34	35	3	53	25	4	29	17	1
26	39	110	12	37	25	2	29	11	.9
27	51	43	6	51	42	6	28	12	.9
28	53	23	3	35	23	2	25	13	.9
29	55	27	4	39	21	2	25	10	.7
30	45	29	4	32	21	2	15	11	.4
31	51	25	3	--	--	--	20	11	.5
Total load (tons)	--	--	38,480	--	--	292	--	--	48
	January			February			March		
1	20	14	0.8	25	15	1	109	57	17
2	20	9	.5	55	14	2	62	64	11
3	18	5	.2	28	36	3	60	31	5
4	19	9	.5	26	35	2	53	18	3
5	19	12	.6	32	12	1	53	24	3
6	19	21	1	20	10	1	43	33	4
7	21	15	.9	28	21	2	43	42	5
8	25	7	.5	24	21	1	39	39	4
9	24	10	.6	28	22	2	34	37	3
10	24	5	.3	31	18	2	43	45	5
11	21	4	.2	31	13	1	47	86	11
12	24	8	.5	32	18	2	62	185	31
13	17	22	1	70	215	41	70	202	38
14	20	9	.5	47	145	18	106	198	57
15	20	19	1	65	95	17	93	195	49
16	20	30	2	357	1,190	1,150	141	395	150
17	21	20	1	394	1,700	1,810	180	1,450	706
18	25	19	1	506	4,600	6,280	116	380	119
19	25	32	2	769	4,500	9,350	206	590	328
20	20	14	8	680	2,540	4,670	148	780	312
21	21	8	.5	597	2,000	3,230	166	1,090	488
22	24	13	.8	298	900	725	188	1,270	646
23	28	11	.8	144	700	272	279	3,070	2,310
24	28	9	.7	116	210	66	209	1,620	913
25	25	17	1	32	115	10	298	2,150	1,730
26	32	15	1	86	300	70	332	3,050	2,740
27	26	10	.7	180	220	107	336	3,000	2,730
28	32	8	.7	116	94	30	202	2,050	1,120
29	26	10	.7	--	--	--	198	1,600	856
30	26	12	.8	--	--	--	191	880	453
31	21	12	.7	--	--	--	173	680	318
Total load (tons)	--	--	24	--	--	27,870	--	--	16,160

CHEYENNE RIVER BASIN--Continued

CHEYENNE RIVER NEAR HOT SPRINGS, S. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	141	560	213	37	52	5	477	16,800	21,600
2	144	580	226	39	48	5	206	4,500	2,510
3	257	1,560	1,080	29	39	3	70	1,500	283
4	253	3,280	2,240	17	40	2	86	1,900	442
5	166	2,230	1,000	14	28	1	65	9,100	1,600
6	116	980	307	13	29	1	28	7,400	560
7	144	890	346	12	30	1	34	2,950	271
8	116	590	185	6	31	.5	34	810	74
9	112	430	130	5	40	.5	21	350	20
10	62	295	50	4.6	27	.3	12	230	7
11	62	250	42	4.6	26	.3	19	120	6
12	70	165	31	22	29	2	41	650	72
13	43	111	13	24	31	2	86	1,800	418
14	45	83	10	126	200	68	209	5,830	3,290
15	55	76	11	93	5,490	1,380	198	6,300	3,370
16	47	40	5	37	7,300	728	109	2,600	766
17	41	33	4	14	2,900	110	75	4,800	973
18	51	60	8	14	602	23	60	4,500	729
19	39	56	6	18	385	19	35	2,000	189
20	41	26	3	9	245	6	184	2,900	1,440
21	51	20	3	7	76	1	597	8,820	14,200
22	65	21	4	5	48	.6	5,920	29,600	473,000
23	78	58	12	5	26	.4	5,260	15,500	220,000
24	70	70	13	3.2	16	.1	2,700	9,300	67,800
25	68	60	11	2.8	9	.1	1,390	8,200	30,800
26	191	321	166	2.8	12	.1	917	5,500	13,600
27	109	495	146	8	20	.4	498	6,200	8,350
28	70	185	35	16	112	5	378	5,100	5,210
29	49	120	16	75	1,400	284	484	3,300	4,320
30	39	92	10	253	4,500	3,070	2,910	14,000	110,000
31	--	--	--	195	9,200	4,850	--	--	--
Total load (tons)	--	--	6,326	--	--	10,570	--	--	985,900

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	2,860	28,600	221,000	31	200	17	14	8	0.3
2	1,340	12,600	45,700	638	46,500	80,200	19	7	.4
3	769	6,600	13,700	332	28,600	25,600	17	5	.2
4	418	3,600	4,070	137	14,000	5,180	16	14	.6
5	302	1,800	1,470	90	4,400	1,070	12	17	.6
6	994	15,600	41,800	65	1,170	206	16	18	.8
7	866	29,600	69,300	41	450	50	16	16	.7
8	424	13,800	15,800	17	160	7	16	10	.4
9	406	11,000	12,000	21	500	28	16	11	.5
10	1,320	15,100	53,800	16	160	7	16	10	.4
11	597	16,200	26,100	12	75	2	22	8	.5
12	311	13,500	11,300	11	25	.7	19	8	.4
13	216	7,800	4,570	202	36,600	20,000	51	200	28
14	155	3,600	1,510	93	24,000	6,020	45	150	18
15	123	1,200	400	62	10,000	1,680	39	6,400	673
16	90	545	132	31	3,000	251	29	4,500	353
17	75	495	99	16	700	30	24	430	28
18	53	175	25	19	165	8	22	81	5
19	41	89	10	15	86	3	18	50	2
20	26	36	3	15	75	3	21	54	3
21	21	60	3	14	36	1	22	41	2
22	13	270	95	14	31	1	22	27	2
23	353	9,450	900	9	25	.6	18	12	.6
24	99	1,000	267	12	22	.7	18	8	.4
25	246	20,000	13,300	14	23	.9	18	8	.4
26	130	14,800	5,190	14	15	.6	18	16	.8
27	60	6,600	1,070	14	10	.4	18	21	1.0
28	90	14,300	3,480	12	10	.3	18	22	1.0
29	21	9,400	533	12	8	.3	18	14	.7
30	16	2,300	100	16	8	.3	24	14	.9
31	11	400	12	12	8	.3	--	--	--
Total load (tons)	--	--	547,700	--	--	140,400	--	--	1,126

Total load for year (tons) ---------- 1,775,000

CHEYENNE RIVER NEAR HOT SPRINGS, S. DAK.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

	Instantaneous discharge (second-feet)	Suspended sediment												
		Concentration at time of sampling (p.p.m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p.p.m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)										
						0.00195	0.0039	0.0078	0.0156	0.312	0.625	0.125	0.250	0.500	1.000	2.0000
May 31, 1946	2,060	35,000	195,000	5,550	BN	1	3	29	81	81	85	90	95	98	99	--
July 1	1,340	13,300	48,200	9,850	BN	4	14	70	75	82	86	92	96	98	99	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

WHITE RIVER BASIN

WHITE RIVER NEAR OGLALA, S. DAK.

LOCATION.--At gaging station at bridge on U. S. Highway 18, 6½ miles northwest of Oglala, Shannon County, and 1 mile downstream from Blacktail Creek.
DRAINAGE AREA.--2,200 square miles.
RECORDS AVAILABLE.--Sediment records: April to September 1947.
EXTREMES, April-September 1947.--Sediment loads: Maximum, 24,100 tons per day June 21; minimum, 8 tons per day May 26, Sept. 8-9, 12.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	Temperature (° F.)	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Nov. 5, 1946	39	--	8.3	80.0	--	0.00	90	19	87		1/334	188	14	0.6	0.9	--	603	0.82	303	28	38
Dec. 4	71	--	8.4	51.0	--	.05	59	13	58		274	68	19	.8	2.0	--	369	.50	201	0	38
Apr. 1, 1947	123	--	7.8	49.3	32	.08	56	10	35	12	234	58	12	.4	3.5	1.2	358	.49	186	0	34
Apr. 3	125	--	8.2	51.9	32	.08	59	9.4	37	11	236	67	12	.4	.2	.9	358	.49	186	0	34
Apr. 24	59	--	8.4	56.8	45	.05	53	14	50		2/227	94	8	.5	1.6	3.1	414	.56	190	4	36
May 2	51	54	8.8	57.6	41	.02	53	3.1	75		3/235	98	8	.3	.8	--	418	.57	145	0	53
May 6	41	--	8.2	63.1	38	.03	59	12	62		222	129	9	.4	1.8	1.4	460	.63	196	14	41
June 4	63	--	8.4	51.7	47	.03	38	6.8	67		2/228	66	6	.5	3.4	1.6	376	.51	123	0	54
July 3	1,150	--	8.5	56.3	35	.02	53	7.6	58		4/195	116	4	.3	2.4	1.6	404	.55	164	4	43
Aug. 12	61	--	7.7	116	40	.03	112	19	130		298	361	12	.3	1.8	2.1	852	1.16	358	114	44

1/ Includes equivalent of 13 parts per million of carbonate (CO_3).
2/ Includes equivalent of 10 parts per million of carbonate (CO_3).
3/ Includes equivalent of 18 parts per million of carbonate (CO_3).
4/ Includes equivalent of 7 parts per million of carbonate (CO_3).

WHITE RIVER BASIN--Continued

WHITE RIVER NEAR OGLALA, S. DAK.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	118	1,200	383	57	289	44	160	--	--
2	125	1,500	507	51	225	31	111	--	--
3	125	2,360	797	43	167	19	86	10,400	2,410
4	125	3,060	1,030	41	171	19	66	6,700	1,190
5	104	2,440	684	41	170	19	51	4,350	598
6	86	1,650	383	41	195	22	92	3,360	805
7	86	1,170	272	41	170	19	98	5,470	1,450
8	86	700	163	36	159	15	86	4,910	1,140
9	86	960	223	31	149	12	74	6,630	1,400
10	86	1,190	276	36	158	15	92	7,000	1,740
11	86	758	176	38	167	17	104	5,500	1,540
12	86	595	138	51	5,150	733	139	11,800	4,440
13	86	599	139	43	4,480	545	304	16,000	13,100
14	86	566	131	63	1,410	239	320	14,400	12,500
15	80	541	117	232	33,600	20,500	426	17,300	19,900
16	80	549	119	98	28,900	7,640	195	14,400	7,590
17	80	420	91	63	14,500	2,470	111	9,600	2,870
18	77	387	81	46	7,900	982	276	13,400	10,100
19	68	359	66	49	4,400	582	661	12,100	21,800
20	63	320	54	41	3,000	332	913	3,180	7,840
21	60	289	47	36	2,400	233	1,460	4,210	24,100
22	60	245	40	31	1,840	137	3,510	2,500	23,000
23	63	199	34	30	420	34	3,870	1,580	16,500
24	60	193	31	30	300	24	3,180	1,340	11,500
25	60	188	30	26	270	19	2,550	845	5,820
26	57	216	33	24	120	8	2,270	775	4,740
27	57	166	26	33	--	--	1,340	2,910	10,600
28	57	169	26	46	--	--	363	5,200	5,100
29	57	169	26	74	--	--	512	5,980	8,270
30	57	191	29	80	--	--	1,680	3,700	16,800
31	--	--	--	111	--	--	--	--	--
Total load (tons)	--	--	6,152	--	--	1/40,900	--	--	1/249,300

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	1,550	3,100	13,000	74	570	114	41	148	16
2	1,150	2,020	6,270	67	365	66	39	159	17
3	937	2,990	7,570	65	322	56	35	148	14
4	368	4,210	4,190	63	275	47	34	152	14
5	257	2,000	1,390	63	300	51	33	124	11
6	215	1,300	755	72	297	58	32	113	10
7	194	1,080	566	74	287	57	31	120	10
8	169	845	386	63	241	41	30	100	8
9	195	870	458	53	235	34	31	93	8
10	1,390	3,170	11,900	51	239	33	32	122	11
11	441	2,040	2,430	61	278	46	34	115	11
12	194	920	482	59	246	39	32	95	8
13	215	1,000	582	56	246	37	33	100	9
14	152	5,470	2,240	63	253	43	129	1,350	471
15	133	2,320	834	65	263	46	102	9,470	2,660
16	122	1,520	501	63	243	41	56	18,600	2,810
17	115	1,150	357	59	227	36	44	10,200	1,210
18	108	680	198	55	229	34	39	4,550	478
19	98	580	154	55	205	30	37	1,700	170
20	92	490	122	49	205	27	39	430	45
21	88	560	133	46	198	25	39	395	42
22	88	570	136	49	186	25	41	314	35
23	85	450	103	44	180	21	41	288	32
24	88	410	97	41	151	17	39	260	27
25	110	490	146	41	155	17	39	199	21
26	105	540	153	39	148	16	41	181	20
27	110	530	157	41	148	16	36	185	18
28	105	980	278	41	142	16	32	165	14
29	90	910	221	39	145	15	31	128	11
30	83	480	108	39	140	15	31	113	9
31	83	670	150	39	133	14	--	--	--
Total load (tons)	--	--	56,070	--	--	1,133	--	--	8,220

Total load for period Mar. 26 to Sept. 30 (tons) ---------- 1/363,000

1/ Includes estimated load for missing days.

PLATTE RIVER BASIN

NORTH PLATTE RIVER BELOW CASPER, WYO.

LOCATION.--Five hundred feet upstream from gaging station, 6½ miles east of Casper, Natrona County.
DRAINAGE AREA.--12,600 square miles.
RECORDS AVAILABLE.--Sediment records: April to September 1947.
EXTREMES, April-September 1947.--Sediment loads: Maximum, 62,500 tons per day May 19; minimum, 1 ton per day Apr. 15, June 16-17.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086.

Suspended sediment, water year October 1946 to September 1947

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	--	--	--	114	45	14	275	23	17
2	--	--	--	132	51	18	208	48	28
3	--	--	--	117	23	7	190	32	18
4	--	--	--	123	35	12	174	17	8
5	126	66	22	154	34	14	166	19	9
6	108	55	16	162	134	59	158	18	8
7	93	42	11	150	120	49	158	14	6
8	88	41	10	138	120	45	154	18	7
9	78	25	5	120	--	40	154	21	9
10	72	12	2	111	220	66	222	18	11
11	75	13	3	190	220	220	245	11	7
12	72	33	6	265	188	135	270	7	5
13	70	15	3	270	4,800	3,550	265	11	8
14	65	13	2	162	187	82	194	11	6
15	70	--	1	114	127	39	166	4	2
16	78	9	2	90	69	17	170	3	1
17	126	12	4	78	59	12	158	--	1
18	93	29	7	540	7,280	9,950	318	1,720	1,480
19	80	14	3	3,540	6,540	62,500	217	296	173
20	82	38	8	3,630	2,680	26,300	166	--	37
21	93	75	19	2,210	654	3,920	435	6,970	9,080
22	147	173	69	2,030	505	2,770	936	12,100	30,600
23	158	45	19	2,080	226	1,270	470	4,550	5,780
24	150	32	13	2,080	195	1,090	358	147	142
25	132	52	19	2,080	167	939	296	78	62
26	111	42	13	2,080	--	950	255	73	50
27	105	20	6	2,090	171	965	230	29	18
28	93	18	5	2,150	160	928	217	62	36
29	102	10	3	960	125	324	230	68	42
30	120	9	3	352	45	43	512	945	1,380
31	--	--	--	296	38	30	--	--	--
Total load (tons)			274			116,400			49,030

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER BELOW CASPER, WYO.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p.p.m.)	Tons per day		Mean concentration (p.p.m.)	Tons per day		Mean concentration (p.p.m.)	Tons per day
1	285	2,250	1,730	5,600	500	7,560	4,980	122	1,640
2	226	861	522	5,600	351	5,310	4,920	63	837
3	194	266	139	5,640	246	3,740	4,400	72	855
4	178	242	116	5,620	205	3,110	4,380	73	863
5	226	--	153	4,760	150	1,930	4,400	55	654
6	178	45	22	4,860	121	1,590	4,400	42	499
7	170	51	23	4,880	137	1,810	4,400	37	440
8	166	44	20	4,840	172	2,240	4,380	47	557
9	226	26	16	4,530	112	1,370	4,320	44	513
10	250	24	16	4,550	106	1,300	4,310	42	488
11	245	20	13	4,520	110	1,340	3,910	56	591
12	596	3,340	6,150	4,500	130	1,580	3,480	43	404
13	3,090	6,150	51,400	4,480	134	1,620	3,100	36	301
14	4,040	3,470	37,800	4,500	128	1,560	2,650	26	186
15	5,000	1,930	26,100	4,480	99	1,200	2,570	--	300
16	5,100	1,270	17,500	4,460	85	1,020	2,560	70	484
17	5,140	930	12,900	4,250	75	860	2,530	36	246
18	5,140	645	8,950	4,290	73	846	2,500	24	162
19	5,100	560	7,720	4,320	79	923	2,080	28	157
20	5,020	500	6,770	4,270	53	612	1,940	36	189
21	4,760	400	5,150	4,250	54	620	1,920	--	230
22	4,610	320	3,990	4,290	60	695	1,910	52	268
23	4,650	260	3,270	4,310	69	804	1,910	49	253
24	4,650	348	4,370	4,650	79	992	888	33	79
25	4,270	248	2,860	4,690	103	1,300	364	45	44
26	4,190	174	1,970	4,670	90	1,140	302	16	13
27	4,210	170	1,930	4,670	75	945	240	7	5
28	4,230	157	1,790	4,670	77	971	186	9	5
29	4,230	140	1,600	4,940	121	1,610	166	13	6
30	4,210	138	1,570	4,960	74	991	150	6	2
31	4,380	188	2,220	4,960	86	1,180	--	--	--
Total load (tons)	--	--	208,800	--	--	52,770	--	--	11,270

Total load for period Apr. 5 to Sept. 30 (tons)---------- 438,500

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER NEAR DOUGLAS, WYO.

LOCATION.--At gaging station, 4½ miles south of Douglas, Converse County, on road to Esterbrook, Albany County, and half a mile downstream from Bedtick Creek.
DRAINAGE AREA.--14,300 square miles.
RECORDS AVAILABLE.--Sediment records: April to September 1947.
EXTREMES, April-September 1947.--Sediment loads: Maximum, 95,700 tons per day May 20; minimum, 10 tons per day Sept. 29.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086.

Suspended sediment, water year October 1946 to September 1947

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	889	--	1,250	988	77	205	856	544	1,260
2	864	270	630	848	47	108	832	584	1,310
3	880	256	608	880	44	105	737	245	487
4	934	333	847	1,170	92	290	716	193	374
5	674	156	284	1,370	151	558	648	107	187
6	460	414	511	1,400	140	529	588	103	164
7	350	207	196	1,330	120	431	534	78	112
8	336	54	49	1,180	117	373	465	43	54
9	312	27	23	1,130	96	293	440	81	96
10	304	33	27	970	74	194	422	172	196
11	298	28	23	840	116	263	412	112	125
12	294	20	16	898	480	1,160	552	202	301
13	294	17	14	1,160	118	370	576	130	202
14	284	18	14	1,070	79	228	570	66	102
15	378	214	218	856	109	252	524	40	57
16	1,020	410	1,130	730	101	199	455	35	43
17	642	103	179	630	82	143	408	43	47
18	524	74	105	552	61	91	386	49	51
19	889	152	365	576	1,070	1,680	430	38	44
20	1,020	157	432	3,360	10,700	95,700	576	2,670	4,180
21	1,160	160	501	3,470	3,370	31,600	916	2,500	6,180
22	1,270	215	738	2,400	1,250	8,100	1,740	1,990	9,600
23	1,150	149	463	2,250	663	4,030	3,110	1,830	15,400
24	779	82	172	2,250	438	2,660	2,410	2,340	15,200
25	674	82	149	2,180	352	2,070	2,020	1,110	6,060
26	688	40	74	2,160	334	1,950	1,800	375	1,820
27	702	39	74	2,130	283	1,630	1,480	314	1,260
28	824	43	96	2,250	386	2,350	1,250	272	918
29	970	68	178	2,300	632	3,920	1,260	620	2,110
30	832	61	137	1,690	354	1,620	1,420	530	2,030
31	--	--	--	970	169	442	--	--	--
Total load (tons)	--	--	9,503	--	--	163,500	--	--	69,970

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER NEAR DOUGLAS, WYO.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p.p.m.)	Tons per day		Mean concentration (p.p.m.)	Tons per day		Mean concentration (p.p.m.)	Tons per day
1	1,580	322	1,370	4,520	500	6,170	4,900	354	4,680
2	1,380	390	1,450	5,720	862	13,300	4,900	301	3,980
3	997	565	1,520	5,860	712	11,300	4,760	255	3,280
4	816	400	882	5,890	588	9,360	4,270	229	2,640
5	737	206	410	5,840	460	7,250	4,280	203	2,340
6	716	112	217	4,820	439	5,710	4,280	165	2,140
7	702	447	832	4,880	407	5,370	4,300	349	4,050
8	600	2,840	4,590	4,880	400	5,280	4,300	145	1,680
9	558	2,810	4,230	4,740	375	4,800	4,270	124	1,430
10	730	3,610	7,310	4,740	1,000	13,100	4,210	139	1,580
11	524	1,100	1,560	4,760	1,320	17,000	4,210	174	1,980
12	455	194	238	4,560	444	5,460	3,740	130	1,310
13	426	364	424	4,440	333	3,990	3,440	118	1,100
14	3,020	7,050	58,500	4,440	233	2,790	3,070	112	930
15	4,120	5,260	58,500	4,440	227	2,720	2,740	--	637
16	4,860	3,950	51,800	4,380	211	2,500	2,650	92	659
17	4,990	2,000	26,900	4,340	190	2,220	2,600	114	801
18	4,990	1,590	21,400	4,160	192	2,150	2,570	86	598
19	4,990	1,370	18,500	4,180	179	2,020	2,540	85	584
20	4,840	1,030	13,500	4,210	188	2,140	2,220	86	516
21	4,700	941	11,900	4,140	166	1,860	2,090	100	565
22	4,520	680	8,300	4,160	166	1,860	2,040	98	541
23	4,600	542	6,740	4,190	193	2,180	2,010	--	375
24	4,660	418	5,260	4,250	141	1,620	1,960	57	302
25	4,540	506	6,200	4,600	198	2,470	1,370	57	211
26	4,140	444	4,960	4,620	239	2,980	636	37	64
27	4,080	328	3,610	4,640	230	2,880	475	39	50
28	4,080	342	3,770	4,620	212	2,640	422	13	15
29	4,010	412	4,460	4,680	235	2,970	358	10	10
30	4,030	320	3,480	4,940	325	4,340	322	15	13
31	4,060	281	3,080	4,900	243	3,210	--	--	--
Total load (tons)	--	--	335,900	--	--	153,600	--	--	39,060

Total load for period Apr. 1 to Sept. 30 (tons)----------771,500

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER NEAR CASSA, WYO.

LOCATION.--One and one half miles south of Cassa, Platte County, and 400 feet upstream from gaging station.
DRAINAGE AREA.--15,700 square miles.
RECORDS AVAILABLE.--Sediment records: March to September 1947.
EXTREMES, March-September 1947.--Sediment loads: Maximum, 65,500 tons per day July 16; minimum, 14 tons per day Sept. 30.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1086.

Suspended sediment, water year October 1946 to September 1947

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--
8	--	--	--	--	--	--	--	--	--
9	--	--	--	--	--	--	--	--	--
10	--	--	--	--	--	--	--	--	--
11	--	--	--	--	--	--	--	--	--
12	--	--	--	--	--	--	--	--	--
13	--	--	--	--	--	--	--	--	--
14	--	--	--	--	--	--	--	--	--
15	--	--	--	--	--	--	--	--	--
16	--	--	--	--	--	--	--	--	--
17	--	--	--	--	--	--	--	--	--
18	--	--	--	--	--	--	--	--	--
19	--	--	--	--	--	--	--	--	--
20	--	--	--	--	--	--	--	--	--
21	--	--	--	--	--	--	--	--	--
22	--	--	--	--	--	--	--	--	--
23	--	--	--	--	--	--	--	--	--
24	--	--	--	--	--	--	--	--	--
25	--	--	--	--	--	--	--	--	--
26	--	--	--	--	--	--	--	--	--
27	--	--	--	--	--	--	670	222	402
28	--	--	--	--	--	--	514	189	262
29	--	--	--	--	--	--	438	328	380
30	--	--	--	--	--	--	400	232	251
31	--	--	--	--	--	--	427	172	198
Total load (tons)	--	--	--	--	--	--	--	--	1,493

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER NEAR CASSA, WYO.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	590	282	457	1,420	130	498	1,640	199	881
2	1,110	724	2,170	1,460	152	598	1,560	301	1,270
3	1,120	369	1,120	1,380	97	362	1,540	471	1,960
4	1,350	370	1,350	1,560	105	442	1,430	402	1,550
5	1,340	566	2,050	1,830	153	757	1,380	259	965
6	1,000	209	564	1,900	191	980	1,280	143	495
7	760	109	224	1,860	164	823	1,130	82	251
8	638	78	135	1,680	124	562	1,060	64	183
9	583	81	127	1,550	98	411	983	52	138
10	541	67	98	1,460	82	323	920	40	99
11	516	38	53	1,290	82	286	890	94	226
12	508	38	52	1,400	160	604	890	55	132
13	502	45	59	1,710	972	4,490	972	234	615
14	496	24	32	1,760	232	1,100	1,000	158	427
15	526	58	82	1,520	158	649	972	58	152
16	841	194	462	1,280	130	449	900	55	134
17	1,300	378	1,330	1,080	98	286	805	50	109
18	950	160	411	983	91	242	760	105	215
19	1,050	156	442	890	63	153	724	135	264
20	1,590	456	1,960	1,200	6,430	22,400	778	53	111
21	1,760	418	1,990	1,880	9,520	48,400	1,420	900	3,520
22	1,950	468	2,460	3,240	3,340	29,200	3,210	2,940	25,500
23	2,020	426	2,320	2,360	1,400	8,940	4,220	2,170	24,700
24	1,750	230	1,090	2,450	780	5,160	3,960	1,700	18,200
25	1,480	138	552	2,310	505	3,150	3,480	1,760	16,500
26	1,350	87	317	2,280	364	2,240	2,990	995	8,050
27	1,280	95	328	2,250	316	1,920	2,590	560	3,920
28	1,290	164	572	2,310	294	1,830	2,070	405	2,260
29	1,430	194	748	2,540	526	3,610	2,130	2,130	12,400
30	1,430	169	652	2,640	576	4,110	2,590	5,800	40,700
31	--	--	--	1,990	320	1,720	--	--	--
Total load (tons)	--	--	24,210	--	--	146,700	--	--	165,900

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	2,190	933	5,510	4,160	505	5,680	4,880	296	3,900
2	2,100	423	2,400	5,150	907	12,600	4,900	240	3,180
3	1,750	317	1,500	5,540	1,380	20,600	4,880	217	2,860
4	1,410	302	1,150	5,640	830	12,600	4,530	159	1,950
5	1,280	367	1,270	5,610	690	10,400	4,340	240	2,810
6	1,140	223	687	5,080	631	8,660	4,340	301	3,530
7	1,120	267	746	4,730	509	6,510	4,340	226	2,650
8	1,040	427	1,200	4,880	455	6,000	4,320	153	1,780
9	920	462	1,150	4,880	374	4,930	4,320	219	2,550
10	920	362	910	4,730	352	4,500	4,320	280	3,270
11	1,000	2,440	6,570	5,130	1,840	25,500	4,340	346	4,060
12	787	876	1,860	4,680	880	11,100	4,220	358	4,080
13	697	335	631	4,600	482	5,980	3,680	277	2,750
14	760	685	1,520	4,570	333	4,120	3,390	244	2,230
15	3,510	6,500	61,700	4,620	285	3,990	3,040	220	1,810
16	4,640	5,220	65,500	4,570	271	3,350	2,770	174	1,300
17	4,860	3,740	49,100	4,400	308	3,660	2,690	117	849
18	4,860	2,700	35,400	4,360	260	3,060	2,670	135	974
19	4,880	1,920	25,300	4,360	188	2,210	2,640	114	812
20	4,860	1,670	21,900	4,380	168	1,990	2,580	63	439
21	4,860	1,200	15,700	4,400	163	1,940	2,200	43	256
22	4,640	970	12,100	4,240	147	1,680	2,140	38	219
23	4,530	860	10,500	4,260	184	2,110	2,130	36	207
24	4,570	730	9,010	4,240	176	2,020	2,070	49	274
25	4,570	780	9,630	4,420	207	2,470	2,000	52	281
26	4,380	705	8,340	4,640	219	2,740	1,350	31	113
27	4,140	570	6,370	4,640	240	3,010	778	47	99
28	4,140	500	5,580	4,660	284	3,570	606	100	164
29	4,140	442	4,940	4,660	201	2,530	520	41	58
30	4,140	420	4,690	4,840	240	3,130	466	11	14
31	4,140	916	10,200	4,900	360	4,770	--	--	--
Total load (tons)	--	--	383,100	--	--	187,400	--	--	49,470
Total load for period Mar. 27 to Sept. 30 (tons)									958,300

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER BELOW GUERNSEY RESERVOIR, WYO.

LOCATION.--Three hundred feet downstream from gaging station which is three-fourths of a mile downstream from Guernsey Dam, and 1 mile northwest of Guernsey, Platte County.
DRAINAGE AREA.--16,200 square miles.
RECORDS AVAILABLE.--Sediment records: April to September 1947.
EXTREMES, April-September 1947.--Sediment loads: Maximum, 16,600 tons per day July 16; minimum, 8 tons per day June 3.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086.

Suspended sediment, water year October 1946 to September 1947

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	1,070	--	20	1,080	15	44	191	--	15
2	1,080	7	20	1,040	16	45	192	28	14
3	1,080	6	18	1,030	--	45	190	16	8
4	1,080	5	15	1,030	--	47	692	10	19
5	1,080	--	12	1,020	17	47	1,340	10	36
6	1,100	6	18	1,460	16	63	1,430	10	39
7	1,100	--	18	1,810	15	73	1,240	--	27
8	1,080	9	26	1,730	15	70	1,030	--	17
9	1,050	17	48	1,550	15	63	1,010	6	16
10	990	16	43	1,660	--	72	1,050	8	23
11	950	17	44	1,820	--	98	1,340	9	33
12	974	--	42	1,940	20	105	1,010	6	16
13	974	--	32	1,980	17	91	1,020	6	17
14	974	11	29	2,430	18	118	1,020	--	19
15	966	--	31	2,400	18	117	1,030	--	22
16	958	12	31	2,970	16	128	1,020	9	25
17	958	12	31	2,980	--	140	1,020	10	28
18	966	11	29	3,060	--	220	1,020	11	30
19	966	--	29	2,970	31	249	1,010	10	27
20	966	--	29	2,610	27	190	1,030	9	25
21	966	11	29	2,810	27	205	1,050	--	26
22	974	--	32	2,810	38	288	1,370	--	37
23	974	--	32	2,680	44	319	4,210	12	136
24	966	12	31	2,710	--	270	5,020	17	230
25	974	10	26	2,580	--	210	3,930	22	234
26	966	--	26	2,540	26	178	3,080	17	141
27	974	--	26	2,540	--	180	2,480	16	107
28	974	11	29	1,930	--	150	2,070	--	84
29	974	12	32	584	28	44	2,160	--	70
30	1,060	14	40	183	--	14	2,720	10	73
31	--	--	--	195	--	15	--	--	--
Total load (tons)	--	--	868	--	--	3,898	--	--	1,594

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER BELOW GUERNSEY RESERVOIR, WYO.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	2,360	13	83	4,740	43	550	4,540	41	502
2	2,030	14	77	4,780	--	540	4,460	36	434
3	1,840	10	50	4,720	--	510	4,450	37	445
4	1,520	--	40	4,670	35	441	4,430	37	442
5	1,590	--	50	4,630	27	338	4,390	30	356
6	1,750	--	70	4,610	20	249	4,370	--	350
7	1,840	17	84	4,650	18	226	4,350	35	411
8	2,040	11	61	4,700	21	266	4,280	32	370
9	2,090	10	56	4,740	--	270	4,210	41	466
10	2,500	10	68	4,780	--	300	4,100	43	476
11	3,080	9	75	4,800	26	337	3,760	--	360
12	3,760	--	90	4,780	31	400	3,410	29	267
13	4,170	--	100	4,760	28	360	3,130	--	200
14	4,300	9	104	4,760	36	462	2,980	--	170
15	4,450	60	721	4,760	30	386	2,820	21	160
16	4,480	1,370	16,600	4,700	31	394	2,740	28	207
17	4,480	--	4,800	4,690	--	--	2,540	--	190
18	4,430	53	634	4,670	--	--	2,440	24	158
19	4,340	--	530	4,590	--	--	2,430	16	105
20	4,280	--	460	4,590	--	--	2,440	--	100
21	4,300	41	476	4,630	--	--	2,440	--	90
22	4,300	47	545	4,610	--	--	2,430	14	92
23	4,260	--	440	4,610	33	411	2,450	14	93
24	4,130	--	370	4,610	--	540	2,440	15	99
25	4,190	30	340	4,590	47	582	2,440	16	106
26	4,220	--	310	4,590	41	508	2,270	18	110
27	4,130	--	270	4,590	41	508	1,950	--	100
28	4,220	18	205	4,590	39	484	1,600	--	86
29	4,460	17	205	4,590	36	446	685	23	43
30	4,720	27	344	4,590	--	460	446	26	31
31	4,890	44	581	4,590	--	510	--	--	--
Total load (tons)	--	--	28,840	--	--	1/13,000	--	--	7,019
Total load for period Apr. 1 to Sept. 30 (tons)									1/55,220

SOUTH PLATTE RIVER AT JULESBURG, COLO.

LOCATION.--At bridge on State Highway 51, half a mile east of Julesburg, Sedgwick County, and 4 miles upstream from Colorado-Nebraska State line.
DRAINAGE AREA.--22,800 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 1,510 parts per million Jan. 1-10; minimum, 686 parts per million June 21-30.
Total hardness: Maximum, 770 parts per million Jan. 1-10; minimum, 173 parts per million Mar. 1-12.
Water temperatures: Maximum, 83° F. July 27, Aug. 2-3; minimum, freezing point on several days in December, January, February, and March.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086. Records of specific conductance of daily samples available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 1-10, 1946	100	59	8.2	170	--	0.00	186	49	172		264	707	60	0.8	1.6	--	1,310	1.78	354	666	450	36
Oct. 11-20	126	50	8.2	172	--	.00	190	49	181		334	696	50	.3	.0	--	1,330	1.81	453	676	462	37
Oct. 21-31	124	53	8.2	172	--	.50	194	50	189		394	633	84	.4	.0	--	1,350	1.84	452	690	367	37
Nov. 1-10	162	45	8.0	175	--	.25	193	50	187		370	663	70	.5	.0	--	1,350	1.84	590	687	384	37
Nov. 11-20	346	36	7.9	178	--	.00	210	59	196		354	765	74	.6	.0	--	1,480	2.01	1,380	767	477	36
Nov. 21-30	375	40	7.8	190	--	.00	206	58	188		333	754	72	.6	.6	--	1,450	1.97	1,470	752	479	35
Dec. 1-10	347	41	7.9	184	--	.00	208	57	185		341	747	68	.5	.2	--	1,440	1.96	1,350	753	473	35
Dec. 11-20	330	38	8.1	187	--	.00	207	57	208		384	754	72	.6	.0	--	1,490	2.03	1,330	751	436	38
Dec. 21-22	343	35	8.1	154	--	.10	170	46	147		266	604	60	.9	.4	--	1,160	1.58	1,070	613	395	34
Dec. 23-25	341	37	8.2	185	--	.25	205	57	199		370	741	72	.6	.0	--	1,460	1.99	1,340	746	443	37
Dec. 26-31	251	37	8.1	201	--	.10	215	56	200		475	691	66	.5	.2	1.1	1,470	2.00	996	717	327	36
Jan. 1-10, 1947	278	34	8.1	205	--	.10	213	58	210		431	749	65	.6	.0	1.0	1,510	2.05	1,130	770	417	37
Jan. 11-20	261	33	7.8	201	--	.00	206	57	188		348	747	63	.7	4.0	1.2	1,440	1.96	1,010	748	463	35
Jan. 21-31	393	35	8.0	195	--	.00	197	59	187		347	734	61	.7	6.0	1.0	1,420	1.93	1,510	734	449	36
Feb. 1-10	304	34	8.0	202	--	.15	207	59	187		331	765	65	.7	4.0	1.0	1,450	1.97	1,190	763	492	35
Feb. 11-20	466	35	8.0	188	--	.20	188	56	169		320	691	56	.7	6.0	1.1	1,330	1.81	1,670	699	437	34
Feb. 21-28	327	35	8.2	194	--	.15	201	59	185		320	759	62	.7	4.0	1.4	1,430	1.94	1,260	744	482	35
Mar. 1-12	382	37	8.0	185	17	.05	48	13	417	18	306	731	60	.7	6.0	1.4	1,460	1.99	1,510	173	0	82
Mar. 13-22	374	44	7.9	179	15	.05	60	15	382	20	298	703	61	.8	4.0	1.4	1,410	1.92	1,420	211	0	78
Mar. 23-31	711	41	8.0	163	14	.15	50	14	357	20	295	635	55	.8	3.0	1.4	1,300	1.88	2,500	182	0	79
Apr. 1-9	483	48	8.0	175	17	.05	88	22	323	29	300	685	58	.8	5.0	1.9	1,380	1.88	1,800	310	64	67
May 15-24	80	56	7.9	158	17	.05	62	14	313	26	270	593	58	.8	3.0	1.2	1,220	1.66	264	212	0	73
May 25-31	479	57	8.0	167	35	.03	162	47	148	11	254	621	55	.7	1.0	1.2	1,210	1.65	1,560	597	389	34

June 1-10	2,520	64	8.0	122	30	.03	118	40	103	7.2	224	427	36	.6	1.0	.8	874	1.19	5,950	459	275	32
June 11-20	2,590	71	8.1	134	25	.03	126	38	123	8.8	224	466	41	.6	1.0	.8	920	1.25	6,430	471	287	36
June 21-30	7,470	65	8.0	103	23	.07	94	29	80	8.8	180	328	30	.5	1.0	.8	687	.93	13,800	354	206	32
July 1-10	4,730	74	8.1	122	26	.05	107	42	97	9.2	222	405	35	.6	1.0	.9	828	1.13	10,600	440	258	32
July 11-20	1,010	77	8.0	153	33	.04	149	47	137	12	252	586	46	.8	4.0	.9	1,140	1.55	3,110	565	358	34
July 21-31	1,350	71	8.3	143	30	.04	147	45	125	12	250	538	44	.8	5.0	.8	1,070	1.46	3,900	553	348	32
Aug. 1-10	210	72	8.3	157	34	.04	164	45	124	14	1/269	593	54	.7	4.0	.8	1,170	1.59	663	594	373	31
Aug. 11-20	57	66	8.2	155	38	.04	170	43	131	15	273	583	55	.7	4.0	1.0	1,180	1.60	182	601	377	31
Aug. 21-31	53	67	8.2	161	37	.04	172	43	137	17	260	612	59	.7	4.0	1.1	1,210	1.65	173	606	386	32
Sept. 1-10	46	69	7.9	157	41	.05	166	43	143	14	256	589	60	.7	3.3	.8	1,190	1.62	148	591	361	34
Sept. 1 Channel 2 2/	43	71	8.3	153	48	.04	166	43	157		3/266	608	58	.7	2.1	--	1,220	1.66	142	596	378	36
Sept. 1 Channel 4 2/	4.2	73	8.3	156	74	.04	163	42	161		4/246	613	58	.7	6.0	--	1,240	1.69	14.1	579	377	38
Sept. 11-14; 16-30	191	58	7.9	170	38	.05	170	51	166	15	275	663	62	.8	2.8	1.0	1,310	1.78	676	634	408	36
Sept. 15 Channel 1 2/	169	51	8.2	173	42	.04	177	52	195		280	728	60	.8	5.8	--	1,400	1.90	639	655	425	39
Sept. 15 Channel 2 7:30 a. m.	181	51	8.2	173	40	.04	178	50	193		280	721	60	.7	3.8	--	1,390	1.89	679	650	420	39
Sept. 15 Channel 2 7:40 a. m. 2/	169	51	8.1	171	45	.04	178	56	188		274	712	62	.8	3.2	--	1,380	1.88	630	650	425	39
Sept. 15 Channel 4 2/	12	51	8.0	168	38	.06	180	50	176		276	695	58	.7	4.0	--	1,340	1.82	43.4	655	429	37
Weighted average	5/822	--	--	136	--	0.06	124	39	140		241	486	43	0.6	1.8	--	976	1.33	2,170	470	272	36

1/ Includes equivalent of 11 parts per million of carbonate (CO_3).
2/ Not included in weighted average.
3/ Includes equivalent of 14 parts per million of carbonate (CO_3).
4/ Includes equivalent of 20 parts per million of carbonate (CO_3).
5/ Mean discharge for water year October 1946 to September 1947 was 764 second-feet.

PLATTE RIVER BASIN--Continued

SOUTH PLATTE RIVER AT JULESBURG, COLO.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

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

WOOD RIVER NEAR RIVERDALE, NEBR.

LOCATION.--At gaging station at bridge on State Highway 40, 1½ miles northwest of Riverdale, Buffalo County.
DRAINAGE AREA.--379 square miles.
RECORDS AVAILABLE.--Sediment records: April to September 1947.
EXTREMES, April-September 1947.--Sediment loads: Maximum, 356,000 tons per day June 22; minimum, 0 tons per day on several days in August and September.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Mar. 27, 1947	5.7	8.6	45.1	40	0.02	77	13	23	1/299	38	6.4	0.1	2.6	2.6	324	0.44	246	1	17
May 7	3.9	7.6	66.1	54	.05	110	26	11	445	25	10	.1	.6	1.2	468	.64	381	16	6

1/ Includes equivalent of 22 parts per million of carbonate (CO_3).

PLATTE RIVER BASIN--Continued

WOOD RIVER NEAR RIVERDALE, NEBR.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	5.0	100	1	4.2	--	2	3.6	155	2
2	5.0	--	1	3.9	170	2	3.9	--	2
3	5.4	--	2	4.2	--	2	3.9	150	2
4	5.4	110	2	4.2	170	2	5.4	--	2
5	8.5	--	3	4.2	--	2	5.7	125	2
6	8.5	115	3	3.9	170	2	5.7	--	2
7	7.0	--	2	3.9	--	2	7.0	95	2
8	7.4	115	2	3.9	160	2	7.4	--	2
9	7.4	--	2	3.9	--	2	7.0	80	2
10	7.0	120	2	3.9	160	2	7.0	--	1
11	7.0	--	2	3.9	--	2	7.0	68	1
12	7.0	120	2	3.9	--	2	13	--	5
13	6.7	--	2	3.9	--	2	18	485	24
14	6.7	130	2	3.9	--	2	11	950	28
15	6.7	--	2	3.9	--	2	8.9	165	4
16	5.7	150	2	3.6	160	2	8.5	140	3
17	5.4	--	2	3.3	--	1	7.2	150	3
18	5.4	160	2	3.3	145	1	43	2,090	234
19	5.4	--	2	4.2	--	2	191	4,280	2,390
20	4.7	145	2	3.9	130	1	154	5,280	3,560
21	4.7	--	2	3.9	--	2	134	4,100	1,690
22	4.4	130	2	3.6	140	1	13,500	9,840	356,000
23	4.7	--	2	3.6	150	2	4,150	2,320	26,000
24	4.7	135	2	3.3	--	1	1,990	2,000	10,700
25	4.7	--	2	3.1	--	1	524	2,200	3,110
26	4.7	140	2	3.1	140	1	63	2,000	340
27	4.7	--	2	3.1	--	1	40	1,780	192
28	4.7	155	2	4.2	135	2	28	2,700	204
29	4.7	--	2	4.2	--	2	19	2,100	108
30	4.7	165	2	3.9	145	2	24	--	120
31	--	--	--	3.6	--	2	--	--	--
Total load (tons)	--	--	60	--	--	54	--	--	404,700

Day	July			August			September		
1	15	1,000	41	5.0	--	20		--	--
2	10	--	18	5.0	1,250	17		108	--
3	8.9	590	14	4.4	--	12		--	--
4	8.9	525	13	3.1	--	7		140	--
5	11	--	14	3.1	--	5		--	--
6	16	400	17	3.9	--	4		50	--
7	10	--	7	3.3	205	2		--	--
8	8.1	140	3	2.6	--	1		52	--
9	7.0	--	2	2.8	175	1		--	--
10	7.0	110	2	2.6	--	1		92	--
11	8.1	--	3	2.6	145	1		67	--
12	16	--	19	2.8	--	1		--	--
13	14	545	21	2.6	--	1		40	--
14	99	9,100	2,680	2.6	--	1		--	--
15	37	3,880	486	3.1	100	1	1.3	38	--
16	12	1,200	39	2.8	--	1		--	--
17	335	7,580	6,730	2.1	90	1		--	--
18	258	4,350	3,030	1.6	--	0		--	--
19	130	--	1,300	1.7	80	0		28	--
20	44	--	360	1.8	--	0		--	--
21	29	--	220	2.1	75	0		28	--
22	17	--	120	2.6	--	1		--	--
23	12	2,500	81	2.6	70	1		30	--
24	8.5	--	55	3.1	--	1		--	--
25	7.4	2,500	50	2.6	60	0		42	--
26	6.7	--	46	3.1	--	1		--	--
27	6.7	2,500	45		62	1		48	--
28	6.3	--	40		--	1		--	--
29	6.0	2,200	36	3.0	56	1		56	--
30	6.0	--	32		--	1	1.2	65	--
31	5.7	1,800	28		110	1	--	--	--
Total load (tons)	--	--	15,550	--	--	86	--	--	1/6

Total load for period Mar. 28 to Sept. 30 (tons) 1/420,500

1/ Includes estimated load for missing days.

WOOD RIVER NEAR RIVERDALE, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Instantaneous discharge (second-feet)	Suspended sediment													
		Concentration at time of sampling (p.p.m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p.p.m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)									
						0.00195	0.0039	0.0078	0.0156	0.0312	0.0625	0.125	0.250	0.500	1.000	2.000
June 21, 1947	164	4,810	2,130	3,050	BN	54	71	85	92	96	98	99	100	--	--	--
June 22	17,800	3,840	185,000	3,470	BN	37	48	68	83	92	96	98	100	--	--	--
June 23	3,460	2,240	20,900	1,640	BN	48	65	83	89	95	97	98	100	--	--	--
June 23	2,780	2,010	15,100	1,260	BN	56	69	84	92	96	98	99	100	--	--	--
June 23	3,120	2,200	19,200	1,420	BN	66	73	90	94	97	98	100	--	--	--	--
June 24	2,370	2,050	13,100	1,490	BN	62	72	86	92	96	98	99	100	--	--	--
June 24	2,080	1,940	10,900	1,290	BN	59	74	80	85	90	94	96	97	98	100	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

PLATTE RIVER BASIN--Continued

MIDDLE LOUP RIVER AT ST. PAUL, NEBR.

LOCATION.--At bridge on U. S. Highway 281 at St. Paul, Howard County.
DRAINAGE AREA.--7,750 square miles of which only 3,200 square miles contribute directly to surface runoff.
RECORDS AVAILABLE.--Sediment records: April 1946 to September 1947.
EXTREMES, April-September 1946.--Sediment loads: Maximum, 152,000 tons per day June 27; minimum, 218 tons per day Aug. 3.
EXTREMES, 1946-47.--Sediment loads: Maximum, 1,600,000 tons per day June 23; minimum, 63 tons per day Jan. 31.
EXTREMES, April 1946-September 1947.--Sediment loads: Maximum, 1,600,000 tons per day June 23, 1947; minimum, 63 tons per day Jan. 31, 1947.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids		Hardness as $CaCO_3$		Percent sodium
															Parts per million	Tons per acre-foot	Total	Non-carbonate	
Mar. 26, 1947	1,200	7.7	28.4	58	0.05	35	5.9	17	151	22	0.0	0.4	2.2	1.1	197	0.27	112	0	25
May 8	1,040	8.3	28.6	61	.02	36	6.6	19	156	27	.0	.4	1.1	2.3	207	.28	117	0	26
Sept. 2	605	8.1	28.8	62	.02	34	5.9	26	150	40	.0	.3	1.4	.1	195	.27	109	0	35

PLATTE RIVER BASIN--Continued

MIDDLE LOUP RIVER AT ST. PAUL, NEBR.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	726	645	1,260	900	985	2,390
2	--	--	--	966	800	2,140	775	905	1,890
3	--	--	--	1,410	1,040	3,960	815	815	1,790
4	--	--	--	933	825	2,080	815	885	1,950
5	--	--	--	878	795	1,880	698	735	1,380
6	--	--	--	911	660	1,620	669	450	813
7	--	--	--	966	575	1,500	660	365	650
8	--	--	--	1,020	595	1,640	688	--	700
9	--	--	--	955	650	1,720	650	370	649
10	--	--	--	1,040	939	2,690	560	315	476
11	1,170	1,030	3,250	1,040	1,360	3,820	518	340	475
12	1,080	1,010	2,950	688	890	1,650	534	434	627
13	835	895	2,020	726	575	1,130	526	550	781
14	933	880	2,220	765	560	1,160	543	450	660
15	978	890	2,350	795	650	1,400	492	370	492
16	1,050	885	2,510	776	602	1,290	408	360	397
17	867	700	1,640	900	510	1,240	421	457	566
18	911	665	1,640	922	475	1,180	3,070	10,200	96,200
19	845	705	1,610	825	450	1,000	4,450	10,300	124,000
20	911	715	1,760	835	460	1,040	2,660	7,000	50,300
21	825	705	1,570	785	505	1,070	1,580	3,400	14,500
22	878	670	1,590	660	570	1,020	1,270	2,600	8,920
23	911	660	1,620	755	419	854	1,200	1,750	5,670
24	878	600	1,420	1,420	4,950	22,800	1,220	1,500	4,940
25	755	570	1,160	1,160	4,060	12,900	1,190	1,160	3,730
26	765	545	1,130	944	1,800	4,590	1,200	1,220	3,950
27	745	525	1,060	933	1,090	2,740	3,790	15,000	152,000
28	736	550	1,090	775	760	1,590	1,610	5,140	27,100
29	726	560	1,100	775	730	1,530	678	1,400	2,560
30	716	540	1,040	1,050	830	2,350	745	840	1,690
31	--	--	--	1,170	985	3,170	--	--	--
Total load (tons)	--	--	34,730	--	--	90,010	--	--	512,200
	July			August			September		
1	726	790	1,550	372	255	256	578	500	780
2	688	832	1,540	386	250	260	614	515	854
3	660	850	1,510	308	262	218	641	475	822
4	726	795	1,560	251	397	269	707	555	1,060
5	660	705	1,260	351	445	422	688	560	1,040
6	678	570	1,040	452	790	964	815	738	1,620
7	966	2,160	5,630	408	515	567	978	795	2,100
8	1,520	5,080	20,800	486	572	778	1,180	1,450	14,600
9	966	2,480	6,470	486	420	566	1,530	2,050	22,700
10	755	2,600	5,300	464	285	357	1,200	1,290	4,260
11	716	1,050	2,030	460	310	385	1,230	1,130	3,880
12	669	635	1,150	492	375	498	1,060	815	2,330
13	605	445	727	492	405	538	990	800	2,140
14	534	495	714	578	535	835	1,060	1,060	3,030
15	534	440	634	560	470	711	944	1,200	3,060
16	1,140	3,660	13,700	500	400	540	775	860	1,800
17	1,520	6,360	27,200	543	360	528	745	550	1,110
18	835	2,320	5,230	509	320	440	825	490	1,090
19	707	1,120	2,140	509	355	488	1,990	3,700	23,300
20	605	785	1,280	509	345	474	1,580	2,850	12,600
21	587	530	840	400	335	362	1,040	1,600	4,490
22	569	450	691	372	250	251	1,080	1,350	3,940
23	492	415	551	408	215	237	1,010	1,150	3,140
24	430	--	380	526	335	476	867	880	2,060
25	475	355	455	543	--	600	867	685	1,600
26	500	--	600	526	375	533	785	560	1,190
27	500	390	526	614	478	792	795	490	1,050
28	500	335	452	596	480	772	900	700	1,700
29	509	320	440	678	560	1,030	1,110	935	2,800
30	509	--	440	716	645	1,250	900	985	2,390
31	452	270	329	650	532	934	--	--	--
Total load (tons)	--	--	107,200	--	--	17,330	--	--	128,500
Total load for period Apr. 11 to Sept. 30 (tons)									890,000

PLATTE RIVER BASIN--Continued

MIDDLE LOUP RIVER AT ST. PAUL, NEBR.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	856	880	2,030	815	--	2,100	1,120	2,200	6,650
2	805	590	1,280	755	870	1,770	1,110	2,270	6,800
3	815	470	1,030	845	1,240	2,830	1,360	2,000	7,340
4	990	758	2,030	805	1,180	2,560	1,560	1,710	7,200
5	2,520	--	42,000	867	970	2,270	1,330	1,400	5,030
6	6,400	8,520	150,000	1,090	1,210	3,560	1,240	--	4,600
7	4,390	5,060	60,000	1,130	1,310	4,000	1,200	--	4,900
8	4,920	5,750	76,400	1,020	1,680	4,630	1,200	1,600	5,180
9	3,150	4,250	36,100	1,000	--	7,600	1,170	--	4,700
10	2,780	3,860	29,000	1,200	4,030	13,100	1,220	--	4,000
11	2,360	4,550	29,000	1,400	3,970	15,000	1,110	860	2,580
12	1,910	3,710	19,100	1,300	3,460	12,200	1,220	900	2,960
13	1,710	1,900	8,770	1,300	2,700	9,480	1,100	900	2,670
14	1,450	1,820	7,120	1,300	2,300	8,070	1,000	1,160	3,130
15	1,270	1,590	5,450	1,370	2,240	8,280	1,100	1,530	4,540
16	1,200	1,300	4,210	1,400	3,380	12,800	900	1,430	3,470
17	1,450	1,560	6,110	1,420	2,590	9,940	450	4,850	5,890
18	1,480	1,900	7,590	1,410	2,040	7,780	400	2,900	3,130
19	1,480	1,510	6,030	1,400	1,600	6,050	350	1,850	1,750
20	1,220	1,330	4,380	1,310	1,740	6,160	500	1,600	2,160
21	1,050	1,160	3,290	1,150	2,020	6,290	450	1,460	1,770
22	1,020	1,100	3,030	1,140	2,120	6,540	450	2,750	3,340
23	1,110	1,040	3,120	1,110	2,160	6,490	900	2,700	6,560
24	1,170	1,210	3,820	1,070	2,200	6,360	850	2,380	5,460
25	1,110	1,100	3,300	1,080	2,230	6,500	900	1,730	4,200
26	1,040	--	3,100	955	2,280	5,890	1,200	--	4,800
27	1,130	--	3,700	1,040	2,330	6,540	1,100	1,900	5,640
28	1,150	1,350	4,200	1,080	1,760	5,130	900	--	--
29	1,240	1,380	4,620	1,110	1,610	4,840	800	--	--
30	1,150	1,410	4,380	1,170	1,900	6,010	650	--	--
31	1,080	1,490	4,350	--	--	--	500	--	--
Total load (tons)	--	--	538,500	--	--	200,800	--	--	1/130,000

Day	January			February			March		
1	450	--	--	450	--	170	800	--	--
2	370	--	--	700	180	340	800	--	--
3	320	--	--	850	200	459	800	--	--
4	310	--	--	700	200	378	850	--	--
5	340	--	--	900	220	535	800	--	--
6	360	--	--	950	240	616	850	--	--
7	440	--	--	1,000	250	675	950	--	--
8	430	--	--	850	220	505	1,000	--	--
9	530	140	189	800	220	475	1,100	--	--
10	810	665	1,080	900	--	700	1,100	190	564
11	1,000	605	1,140	750	280	567	1,400	540	2,040
12	1,500	230	435	700	294	556	1,600	--	2,600
13	1,900	220	713	900	370	899	1,700	500	2,300
14	1,800	270	875	1,500	475	1,920	1,800	--	2,400
15	1,700	--	800	2,200	625	3,710	1,700	--	2,600
16	1,700	445	1,320	2,900	980	7,670	1,700	--	3,200
17	1,600	--	1,800	2,900	1,540	12,100	1,500	810	3,280
18	1,500	--	1,300	2,200	2,000	11,900	1,400	940	3,550
19	1,400	--	950	1,800	1,350	6,560	1,600	2,500	10,800
20	1,200	157	509	1,600	1,700	7,340	1,800	2,980	14,500
21	1,000	155	460	1,400	1,350	5,100	2,400	7,150	46,300
22	1,000	172	557	1,200	1,260	4,080	2,630	3,970	28,200
23	1,200	323	1,050	750	--	--	1,770	2,500	11,900
24	1,400	484	1,700	900	--	--	1,450	2,250	8,810
25	1,500	518	1,680	850	--	--	1,310	2,050	7,250
26	1,500	703	2,280	850	--	--	1,190	2,460	7,900
27	1,500	847	2,740	750	--	--	1,360	3,550	13,000
28	1,100	465	1,260	700	--	--	1,360	2,540	9,330
29	540	--	350	--	--	--	1,260	1,470	5,000
30	170	--	73	--	--	--	1,020	1,830	5,040
31	180	--	63	--	--	--	1,020	1,340	3,690
Total load (tons)	--	--	1/25,000	--	--	1/71,000	--	--	1/196,000

1/ Includes estimated load for missing days.

PLATTE RIVER BASIN--Continued

MIDDLE LOUP RIVER AT ST. PAUL, NEBR.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	1,190	1,250	4,020	1,290	1,710	5,960	1,290	2,090	7,280
2	1,320	1,380	4,920	1,150	2,100	6,520	1,130	1,520	4,640
3	1,440	1,600	6,220	815	1,300	2,860	1,130	1,610	4,910
4	1,590	1,900	8,160	775	895	1,870	1,490	2,890	16,600
5	1,880	2,450	12,400	795	830	1,780	2,510	3,880	27,500
6	1,970	3,220	17,100	845	890	2,030	2,050	2,870	16,000
7	1,650	2,160	9,620	1,060	920	2,630	1,740	2,820	13,200
8	1,480	2,260	9,030	1,040	990	2,780	1,460	1,780	7,020
9	1,370	2,650	9,800	933	1,200	3,020	1,560	1,320	5,560
10	1,880	2,860	14,500	856	1,010	2,330	1,840	1,550	7,700
11	1,990	2,740	14,700	825	1,150	2,560	2,120	2,940	11,700
12	2,030	2,450	13,400	922	920	2,290	3,340	5,350	53,600
13	1,720	1,920	8,920	990	995	2,660	4,340	5,750	67,400
14	1,510	1,390	5,670	955	830	2,140	3,460	5,140	48,000
15	1,310	1,050	3,710	889	600	1,440	2,520	3,840	26,100
16	1,330	1,470	5,280	1,000	725	1,960	1,940	2,920	15,300
17	1,350	1,290	4,700	1,110	1,000	3,000	2,550	2,770	19,100
18	1,240	2,760	9,240	990	750	2,000	5,290	10,200	156,000
19	1,350	2,090	7,620	1,150	1,040	3,790	5,460	8,430	124,000
20	1,330	1,830	6,570	1,070	1,210	3,560	3,490	5,740	54,700
21	1,190	1,800	5,780	911	1,110	2,730	2,140	3,500	20,700
22	1,190	1,450	4,650	856	790	1,830	23,400	9,740	647,000
23	1,260	2,050	6,970	775	810	1,690	40,900	13,000	1,600,000
24	1,380	2,230	8,310	825	825	1,840	13,700	7,700	290,000
25	1,200	2,140	6,930	785	640	1,360	5,900	6,220	100,000
26	1,070	1,460	4,220	795	620	1,330	3,340	4,300	38,800
27	978	1,310	3,460	795	610	1,310	2,210	2,800	16,700
28	978	1,510	3,990	1,010	855	2,330	1,840	2,100	10,400
29	944	1,810	4,610	1,370	2,460	9,100	1,670	1,840	8,300
30	1,230	1,410	4,680	1,310	2,400	8,490	1,540	1,610	6,690
31	--	--	--	1,170	1,660	5,240	--	--	--
Total load (tons)	--	--	229,200	--	--	94,430	--	--	3,425,000
	July			August			September		
1	1,510	1,840	7,500	815	398	876	641	256	443
2	1,510	1,860	7,580	775	397	831	641	222	384
3	1,480	1,510	6,030	726	369	723	641	--	360
4	1,390	1,170	4,390	678	295	540	641	211	365
5	1,260	1,000	3,400	632	259	442	632	234	399
6	1,140	830	2,550	641	267	462	650	--	440
7	1,110	790	2,370	650	269	472	614	263	436
8	1,080	700	2,040	614	264	438	569	236	363
9	1,020	790	2,180	578	258	403	569	225	346
10	950	1,100	2,820	534	251	362	623	276	464
11	1,010	1,000	2,730	445	239	287	1,010	1,160	3,570
12	1,080	895	2,610	534	205	296	1,590	3,030	15,300
13	1,120	980	2,960	430	150	174	1,130	1,460	4,770
14	1,190	--	3,500	534	270	389	1,050	1,050	2,980
15	1,480	1,900	7,590	500	256	346	878	710	1,680
16	1,150	1,860	5,780	587	228	361	944	730	1,860
17	1,700	2,540	12,500	552	209	311	835	437	985
18	1,860	6,560	32,900	509	191	262	805	401	872
19	1,320	3,850	13,700	484	199	260	726	402	788
20	1,360	2,150	7,890	452	214	261	745	434	873
21	1,170	1,390	4,390	408	210	231	755	--	900
22	1,080	940	2,740	468	205	259	755	--	900
23	1,040	740	2,080	415	201	225	785	--	900
24	1,060	670	1,920	365	207	204	795	420	902
25	1,040	680	1,910	519	298	426	755	409	834
26	1,060	693	1,980	828	632	1,420	825	397	884
27	1,000	634	1,710	815	644	1,420	795	385	826
28	933	570	1,440	698	486	916	785	372	788
29	911	483	1,190	641	258	446	815	365	803
30	867	407	953	614	296	491	889	444	1,060
31	856	400	924	660	342	609	--	--	--
Total load (tons)	--	--	154,300	--	--	15,140	--	--	46,480
Total load for year (tons)									1/5,126,000

1/ Includes estimated load for missing days.

PLATTE RIVER BASIN--Continued

MIDDLE LOUP RIVER AT ST. PAUL, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Instantaneous discharge (second-feet)	Suspended sediment														
		Concentration at time of sampling (p.p.m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p.p.m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)										
						0.00195	0.0039	0.0078	0.0156	0.0312	0.0625	0.125	0.250	0.500	1.000	2.000
June 18, 1946	2,570	--	--	9,430	BN	26	37	50	63	74	82	89	95	98	99	--
July 7	2/966	--	--	4,070	BN	36	45	61	73	82	85	92	97	99	100	--
June 13, 1947	4,290	5,300	61,400	7,150	BN	17	26	35	42	50	65	72	76	100	--	--
June 13	4,360	5,880	69,200	7,910	BN	17	18	23	30	38	49	60	97	100	--	--
June 18	6,540	14,500	256,000	9,480	BN	15	22	30	37	48	70	90	95	97	99	--
June 18	7,490	14,400	291,000	5,390	BN	20	28	39	47	59	78	85	90	95	96	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.
2/ Mean daily discharge.

SOUTH LOUP RIVER AT ST. MICHAEL, NEBR.

LOCATION.--At gaging station at county bridge three-fourths of a mile northeast of St. Michael, Buffalo County.
DRAINAGE AREA.--2,560 square miles, of which only 1,650 square miles contribute directly to surface runoff.
RECORDS AVAILABLE.--Sediment records: June 1946 to September 1947.
EXTREMES, June-September 1946.--Sediment loads: Maximum, 90,200 tons per day June 19; minimum, 27 tons per day Aug. 3.
EXTREMES, 1946-47.--Sediment loads: Maximum, 672,000 tons per day June 22; minimum, 26 tons per day Jan. 1.
EXTREMES, June 1946-September 1947.--Sediment loads: Maximum, 672,000 tons per day June 22, 1947; minimum, 26 tons per day Jan. 1, 1947.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Apr. 2, 1947 -------	244	7.3	45.4	56	0.05	60	9.8	22	246	29	2.0	0.2	3.1	1.1	280	0.38	190	0	20
May 1----------	232	8.4	46.6	59	.05	62	10	24	1/256	33	2.0	.3	2.1	2.1	296	.40	198	0	21
Aug. 20----------	124	8.2	45.2	56	.05	62	9.6	23	244	38	2.0	.2	2.8	1.0	298	.41	194	0	21

1/ Includes equivalent of 10 parts per million of carbonate (CO_3).

PLATTE RIVER BASIN--Continued

SOUTH LOUP RIVER AT ST. MICHAEL, NEBR.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--
8	--	--	--	--	--	--	--	--	--
9	--	--	--	--	--	--	--	--	--
10	--	--	--	--	--	--	--	--	--
11	--	--	--	--	--	--	--	--	--
12	--	--	--	--	--	--	--	--	--
12	--	--	--	--	--	--	110	760	226
14	--	--	--	--	--	--	114	690	212
15	--	--	--	--	--	--	110	610	181
16	--	--	--	--	--	--	103	540	150
17	--	--	--	--	--	--	106	470	134
18	--	--	--	--	--	--	730	11,900	57,300
19	--	--	--	--	--	--	1,750	19,100	90,200
20	--	--	--	--	--	--	1,090	8,380	24,700
21	--	--	--	--	--	--	490	8,200	10,800
22	--	--	--	--	--	--	325	5,570	4,890
23	--	--	--	--	--	--	362	6,510	6,360
24	--	--	--	--	--	--	235	4,080	2,590
25	--	--	--	--	--	--	210	2,540	1,440
26	--	--	--	--	--	--	154	1,500	624
27	--	--	--	--	--	--	137	2,240	829
28	--	--	--	--	--	--	126	1,250	425
29	--	--	--	--	--	--	122	1,000	330
30	--	--	--	--	--	--	118	890	284
31	--	--	--	--	--	--	--	--	--
Total load (tons)	--	--	--	--	--	--	--	--	201,700
	July			August			September		
1	110	735	218	61	218	36	82	425	94
2	106	690	199	55	218	32	96	460	119
3	110	460	137	50	201	27	137	1,440	571
4	126	635	216	61	279	46	118	1,040	331
5	122	485	160	82	461	102	118	530	169
6	114	630	194	96	524	136	163	1,210	598
7	409	16,100	25,400	82	462	102	195	2,260	1,870
8	427	13,300	15,800	82	336	74	190	3,530	1,810
9	220	7,600	4,510	72	286	56	246	2,870	1,910
10	154	3,300	1,370	64	276	48	210	1,660	941
11	114	1,900	585	64	246	43	163	1,120	493
12	92	1,100	273	64	251	43	137	690	255
13	79	635	135	92	416	103	154	1,090	549
14	66	510	91	99	421	112	284	4,720	3,840
15	212	3,140	4,180	103	437	122	168	1,480	671
16	434	9,980	12,100	99	443	118	141	734	280
17	295	6,680	5,320	114	416	128	129	603	210
16	195	2,970	1,560	86	330	77	129	587	204
19	150	1,280	518	75	308	62	652	7,720	15,200
20	122	744	245	66	213	38	368	3,650	3,630
21	106	464	133	61	224	37	325	3,490	3,060
22	99	416	111	66	247	44	295	2,400	1,910
23	92	313	76	69	241	45	225	1,160	702
24	82	289	64	69	251	47	172	894	415
25	82	324	72	79	329	70	150	796	322
26	62	300	66	89	422	101	133	621	223
27	79	263	56	86	388	90	126	490	167
28	79	274	58	92	330	82	141	693	276
29	79	293	63	96	365	95	225	2,790	1,750
30	75	351	71	96	480	124	154	946	393
31	69	289	54	92	460	114	--	--	--
Total load (tons)	--	--	74,040	--	--	2,354	--	--	42,960
Total load for period June 13 to Sept. 30 (tons)									321,100

PLATTE RIVER BASIN--Continued

SOUTH LOUP RIVER AT ST. MICHAEL, NEBR.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	132	535	191	244	500	329	272	740	543
2	122	515	170	240	450	292	276	750	559
3	108	515	150	236	425	271	256	860	594
4	128	1,220	422	232	530	332	244	980	646
5	1,020	9,050	34,200	226	560	345	224	980	593
6	3,500	9,560	90,300	256	710	491	224	990	599
7	2,450	8,600	56,900	289	640	499	208	1,000	562
8	2,740	9,100	67,300	294	530	421	220	1,000	594
9	1,580	6,900	29,400	302	660	538	224	1,000	605
10	1,160	5,700	17,900	320	1,370	1,180	224	1,020	617
11	648	2,900	5,070	320	1,480	1,280	224	1,030	623
12	453	1,690	2,070	260	1,190	835	212	1,000	572
13	366	1,170	1,160	268	730	528	208	980	550
14	325	1,110	974	264	880	627	220	950	564
15	307	1,090	904	252	800	544	228	930	573
16	294	1,060	841	320	1,940	1,680	216	910	531
17	284	1,040	797	294	2,180	1,730	150	850	344
18	316	1,050	896	280	1,660	1,250	100	810	219
19	307	1,360	1,130	294	1,890	1,500	150	800	324
20	284	1,320	1,010	280	1,210	915	200	840	454
21	268	840	608	276	880	656	252	990	674
22	264	795	567	268	640	463	264	1,170	834
23	256	800	553	276	580	432	240	1,290	836
24	248	805	539	272	560	411	248	1,290	864
25	240	805	522	260	620	435	224	1,050	635
26	232	790	495	264	710	506	200	780	421
27	232	--	480	260	850	597	192	540	280
28	232	745	467	264	800	570	130	400	140
29	232	690	432	268	730	528	70	300	57
30	232	620	388	268	730	528	85	240	55
31	236	560	357	--	--	--	75	190	38
Total load (tons)	--	--	317,200	--	--	20,710	--	--	15,500
	January			February			March		
1	80	120	26	100	105	28	260	210	147
2	90	125	30	110	105	31	270	220	160
3	100	195	53	140	170	64	250	240	162
4	120	170	55	220	290	172	240	230	149
5	130	100	35	230	340	211	300	145	117
6	140	--	55	230	245	152	320	340	294
7	140	220	83	210	190	108	310	325	272
8	140	240	91	210	190	108	310	460	385
9	150	210	85	210	195	111	280	1,560	1,180
10	160	165	71	160	200	86	290	2,150	1,680
11	170	160	73	160	200	86	260	1,300	913
12	180	150	73	170	200	92	302	2,790	2,270
13	190	150	77	200	340	184	325	3,490	3,060
14	200	160	86	320	--	750	380	3,350	3,440
15	210	180	102	810	2,150	4,700	340	2,700	2,480
16	220	200	119	1,700	3,550	16,300	260	2,220	1,560
17	220	210	125	872	3,700	8,710	300	2,110	1,710
18	210	175	99	542	3,700	5,410	350	2,500	2,360
19	190	155	80	440	3,290	3,910	350	3,390	3,200
20	200	165	89	340	2,940	2,700	320	2,510	2,170
21	210	200	113	300	2,700	2,190	310	1,690	1,410
22	250	220	148	290	2,710	2,120	302	1,940	1,580
22	330	250	223	260	2,660	1,870	284	2,520	1,930
24	340	310	285	200	1,750	945	284	2,220	1,700
25	360	380	369	170	540	248	284	1,270	974
26	370	430	430	170	230	106	280	790	597
27	310	430	360	190	220	113	276	690	514
28	240	325	211	230	200	124	272	830	610
29	150	230	93	--	--	--	268	830	601
30	150	275	111	--	--	--	264	1,470	1,050
31	100	160	43	--	--	--	260	1,380	969
Total load (tons)	--	--	3,893	--	--	51,630	--	--	39,640

PLATTE RIVER BASIN--Continued

SOUTH LOUP RIVER AT ST. MICHAEL, NEBR.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	256	1,010	698	212	790	452	244	1,130	744
2	244	850	560	208	750	421	256	1,210	836
3	320	1,430	1,240	192	580	301	244	865	570
4	361	2,150	2,100	192	540	280	228	990	609
5	415	2,170	2,430	196	500	265	289	3,230	2,520
6	356	1,910	1,840	188	530	269	390	10,000	10,500
7	312	1,710	1,440	188	570	289	272	6,350	4,660
8	312	1,730	1,460	180	600	292	216	2,900	1,690
9	298	1,690	1,360	184	610	303	180	1,600	778
10	361	1,380	1,350	180	580	282	172	1,100	511
11	366	1,000	988	180	560	272	168	800	363
12	370	805	804	180	565	275	441	5,100	7,600
13	361	750	731	180	560	272	1,090	10,160	30,800
14	334	750	676	176	560	266	1,160	9,380	29,400
15	320	760	657	176	525	249	762	5,800	11,900
16	320	725	626	180	510	248	366	3,020	2,980
17	289	1,030	804	192	510	264	312	2,020	1,700
18	289	990	772	204	600	330	2,220	15,400	108,000
19	256	720	498	272	1,860	1,370	2,270	13,900	85,200
20	224	700	423	256	1,050	726	1,410	9,200	35,000
21	232	820	514	208	800	449	762	7,100	14,600
22	240	800	518	208	690	388	19,000	13,100	672,000
23	256	700	484	212	640	366	28,000	7,500	567,000
24	256	780	539	196	615	325	12,900	6,800	237,000
25	252	860	585	164	580	257	4,480	5,100	61,700
26	232	890	557	172	470	218	1,570	3,330	14,100
27	224	770	466	180	350	170	948	1,920	4,910
28	224	740	448	204	380	209	738	1,290	2,570
29	228	700	431	252	1,000	680	630	1,440	2,450
30	220	720	428	256	740	511	525	3,220	4,560
31	--	--	--	252	850	578	--	--	--
Total load (tons)	--	--	26,430	--	--	11,580	--	--	1,917,000
	July			August			September		
1	620	2,300	3,850	192	388	201	138	209	78
2	520	3,650	5,120	184	378	188	133	173	62
3	476	1,400	1,800	180	419	204	132	155	55
4	410	1,500	1,660	176	404	192	127	223	76
5	354	1,850	1,770	168	378	171	126	322	110
6	327	510	450	162	355	155	124	359	120
7	300	410	332	157	320	136	120	288	93
8	290	430	337	154	292	121	114	239	74
9	280	370	280	150	300	122	110	205	61
10	282	270	206	146	270	106	110	211	63
11	292	500	394	142	220	84	146	320	126
12	345	1,320	1,230	140	192	73	186	685	344
13	333	--	--	138	172	64	192	650	337
14	468	--	--	139	250	94	180	485	236
15	348	--	--	136	471	173	168	377	171
16	330	--	--	136	306	112	166	318	143
17	1,700	6,600	30,300	130	259	91	164	310	137
18	950	7,770	19,900	124	218	73	156	285	120
19	535	3,700	5,340	126	174	59	148	260	104
20	363	1,580	1,550	124	152	51	145	230	90
21	295	868	691	121	160	52	145	190	74
22	292	660	520	118	192	61	142	154	59
23	265	585	419	112	207	63	139	164	62
24	252	578	393	121	220	72	136	209	77
25	245	570	377	152	338	139	140	252	95
26	224	556	336	168	428	194	140	249	94
27	222	534	320	178	431	207	134	220	80
28	216	511	298	158	380	162	144	215	84
29	208	480	270	156	320	135	146	209	82
30	204	441	243	148	259	103	146	198	78
31	200	409	221	142	222	85	--	--	--
Total load (tons)	--	--	1/86,000	--	--	3,743	--	--	3,385
Total load for year (tons)									1/2,497,000

1/ Includes estimated load for missing days.

SOUTH LOUP RIVER AT ST. MICHAEL, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Instantaneous discharge (second-feet)	Suspended sediment														
		Concentration at time of sampling (p.p.m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p.p.m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)										
						0.00195	0.0039	0.0078	0.0156	0.0312	0.0625	0.125	0.250	0.500	1.000	2.000
June 18, 1946 -------	--	15,900	--	9,720	BN	22	31	47	59	73	91	98	100	--	--	--
Oct. 11----------	622	2,680	4,500	3,920	BN	22	33	40	48	58	74	83	95	100	--	--
June 18, 1947 -------	3,600	17,200	167,000	9,940	BN	6	10	27	50	59	81	91	95	100	--	--
June 20 ----------	1,400	7,620	28,800	3,950	SBN	36	45	52	58	66	88	96	--	100	--	--
June 22 ----------	8,490	10,300	236,000	6,060	BN	--	15	33	44	50	62	71	80	85	95	--
June 23 ----------	30,700	6,160	511,000	3,700	BN	15	23	46	57	60	65	70	78	100	--	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

NORTH LOUP RIVER NEAR ST. PAUL, NEBR.

LOCATION.--At bridge on U. S. Highway 281, 3 miles north of St. Paul, Howard County.
DRAINAGE AREA.--4,460 square miles, of which only 1,270 square miles contribute directly to surface runoff.
RECORDS AVAILABLE.--Sediment records: April 1946 to September 1947.
EXTREMES, April-September 1946.--Sediment loads: Maximum, 109,000 tons per day June 18; minimum, 20 tons per day Aug. 3.
EXTREMES, 1946-47.--Sediment loads: Maximum, 463,000 tons per day June 22; minimum, 52 tons per day Aug. 9.
EXTREMES, April 1946-September 1947.--Sediment loads: Maximum, 463,000 tons per day June 22, 1947; minimum, 52 tons per day Aug. 9, 1947.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids		Hardness as $CaCO_3$		Percent sodium
															Parts per million	Tons per acre-foot	Total	Non-carbonate	
Mar. 26, 1947	2,000	8.2	23.7	64	0.08	26	5.9	15	120	19	0.0	0.4	2.8	0.6	174	0.24	89	0	27
May 8	1,940	7.4	23.2	49	.11	31	6.3	7.1	131	9.5	.0	.4	.5	.3	175	.24	103	0	13
Aug. 25	805	7.0	23.9	50	.13	29	6.8	11	135	12	.0	.3	.9	--	182	.25	100	0	20

PLATTE RIVER BASIN--Continued

NORTH LOUP RIVER NEAR ST. PAUL, NEBR.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	537	478	693	825	1,190	2,650
2	--	--	--	703	660	1,250	750	495	1,000
3	--	--	--	906	655	1,600	750	360	729
4	--	--	--	906	1,080	2,640	681	340	625
5	--	--	--	864	592	1,380	615	375	623
6	--	--	--	750	395	800	615	305	506
7	--	--	--	750	485	982	576	300	466
8	--	--	--	703	430	816	566	265	405
9	--	--	--	670	455	823	566	280	428
10	--	--	--	800	668	1,470	518	300	420
11	976	900	2,370	962	1,230	3,200	518	240	335
12	892	625	1,500	850	582	1,340	509	200	275
13	825	510	1,140	775	360	753	391	150	158
14	788	480	1,020	738	370	736	518	280	392
15	788	460	979	681	410	754	407	220	242
16	750	410	830	637	310	533	311	188	158
17	714	395	761	670	340	615	399	1,420	3,080
18	681	--	700	648	325	569	2,610	15,000	109,000
19	659	380	676	670	360	651	1,620	8,200	36,700
20	615	345	573	637	305	524	864	1,900	4,430
21	586	345	546	637	260	447	738	740	1,470
22	605	--	600	586	240	380	750	785	1,590
23	605	--	650	626	345	583	557	460	693
24	605	395	645	1,010	3,870	11,100	439	395	468
25	528	255	364	1,100	2,385	7,250	509	440	605
26	483	200	261	948	710	1,820	500	460	621
27	391	410	433	738	410	816	825	6,400	16,600
28	492	425	564	605	380	621	537	985	1,430
29	547	460	679	670	385	713	518	620	867
30	547	450	663	1,130	3,160	9,740	509	565	776
31	--	--	--	1,150	3,020	9,580	--	--	--
Total load (tons)	--	--	15,950	--	--	65,180	--	--	189,700

Day	July			August			September		
1	500	520	702	132	--	30	422	475	541
2	483	460	600	121	80	26	430	468	543
3	448	370	448	115	65	20	439	477	565
4	422	395	450	108	75	22	430	415	482
5	448	720	948	181	235	115	422	350	399
6	557	1,900	2,860	260	450	316	422	380	433
7	744	1,600	3,800	200	202	109	637	1,250	2,830
8	1,110	2,830	8,660	186	145	73	738	2,160	4,370
9	615	1,260	2,090	210	--	80	864	1,440	3,360
10	509	540	742	243	--	100	838	1,050	2,380
11	465	375	471	210	150	85	920	1,390	3,530
12	368	400	397	215	191	111	714	700	1,350
13	338	435	397	383	1,290	1,330	762	980	2,020
14	332	250	224	272	465	341	1,480	4,410	18,100
15	375	860	870	237	180	115	850	1,820	4,390
16	643	6,140	14,100	220	162	96	637	572	984
17	448	1,140	1,380	215	128	74	626	380	642
18	399	415	447	200	118	64	659	758	1,560
19	383	340	352	196	98	52	1,980	5,980	39,400
20	375	230	233	194	100	52	1,440	2,580	10,300
21	338	280	256	192	122	63	864	940	2,190
22	318	295	253	191	160	83	825	460	1,020
23	284	210	161	311	842	781	812	465	1,020
24	266	195	140	291	965	825	762	--	850
25	278	230	173	231	215	134	681	348	640
26	266	155	111	220	168	100	659	295	525
27	243	170	112	270	195	142	626	300	507
28	260	152	117	332	215	193	670	335	606
29	200	205	111	399	580	653	670	350	633
30	172	--	70	407	580	637	681	373	686
31	156	110	46	422	520	592	--	--	--
Total load (tons)	--	--	41,720	--	--	7,414	--	--	106,860
Total load for period Apr. 11 to Sept. 30 (tons)									426,800

PLATTE RIVER BASIN--Continued

NORTH LOUP RIVER NEAR ST. PAUL, NEBR.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	681	355	653	864	--	1,300	976	880	2,320
2	670	330	597	864	550	1,280	878	--	2,000
3	648	310	542	878	600	1,420	838	800	1,810
4	692	300	560	878	950	2,250	878	850	2,020
5	3,190	5,710	62,700	878	750	1,780	878	590	1,400
6	2,830	4,470	34,200	934	660	1,660	934	850	2,140
7	1,910	2,140	11,000	1,190	960	3,080	934	825	2,080
8	2,170	3,120	18,300	1,130	945	2,880	934	800	2,020
9	1,620	2,680	11,700	1,290	--	--	920	790	1,960
10	1,560	1,950	8,210	1,130	--	--	906	760	1,860
11	1,240	1,120	3,750	962	--	--	920	730	1,810
12	1,040	580	1,630	878	--	--	976	700	1,840
13	976	580	1,530	906	--	--	934	660	1,660
14	976	590	1,550	948	--	--	920	630	1,560
15	1,040	590	1,660	1,040	710	1,990	948	570	1,460
16	1,040	625	1,760	1,050	930	2,640	934	1,000	2,520
17	1,100	900	2,670	1,020	880	2,420	640	--	2,000
18	1,100	860	2,550	1,020	870	2,400	540	1,900	2,770
19	1,040	520	1,460	1,010	--	2,300	557	--	1,650
20	990	505	1,350	1,010	830	2,260	725	930	1,820
21	962	510	1,320	1,070	850	2,460	1,040	1,070	3,000
22	962	520	1,350	990	850	2,270	1,010	1,200	3,270
23	920	530	1,320	990	840	2,250	1,070	1,290	3,730
24	906	520	1,270	1,040	830	2,330	1,000	1,820	4,910
25	838	495	1,120	990	780	2,080	1,000	2,040	5,510
26	812	470	1,030	976	730	1,920	970	1,440	3,770
27	812	430	943	948	600	1,540	880	1,130	2,680
28	838	450	1,020	962	500	1,300	700	1,100	2,080
29	850	510	1,170	962	445	1,160	460	--	1,200
30	892	430	1,040	976	580	1,530	460	--	1,100
31	864	495	1,150	--	--	--	380	--	700
Total load (tons)	--	--	181,100	--	--	1/63,000	--	--	70,650

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	410	--	--	410	--	--	640	--	340
2	430	--	--	450	--	--	780	--	420
3	450	--	--	540	--	--	820	240	531
4	460	--	--	740	--	--	870	590	1,390
5	470	--	--	850	--	--	970	--	1,400
6	480	--	--	780	200	421	1,000	--	1,100
7	490	--	--	970	--	800	970	270	707
8	600	80	130	900	--	600	890	260	625
9	740	95	190	690	--	380	870	175	411
10	850	220	505	570	180	277	960	280	726
11	870	510	1,200	660	160	285	1,100	475	1,410
12	900	505	1,230	790	--	380	1,300	--	1,900
13	960	670	1,740	980	190	503	1,500	600	2,430
14	960	350	907	1,300	195	684	1,600	315	1,360
15	960	--	900	3,200	900	7,780	1,500	--	1,200
16	900	--	600	2,800	600	4,540	1,100	290	861
17	780	150	316	1,900	445	2,280	960	240	622
18	700	295	558	1,700	610	2,800	1,100	275	817
19	770	395	821	1,600	--	2,600	1,400	505	1,910
20	900	470	1,140	1,200	--	1,100	1,600	735	3,180
21	900	--	750	800	182	393	1,500	1,030	4,170
22	860	170	395	700	--	--	1,300	1,150	4,040
23	840	150	340	920	--	--	990	1,150	3,070
24	910	210	516	860	--	--	976	1,040	2,740
25	990	210	561	680	--	--	934	870	2,190
26	1,000	300	810	600	--	--	934	950	2,400
27	950	400	1,030	530	--	--	934	970	2,450
28	900	360	875	530	207	296	878	655	1,550
29	850	--	600	--	--	--	850	440	1,010
30	740	--	800	--	--	--	850	400	918
31	500	--	500	--	--	--	878	410	972
Total load (tons)	--	--	1/19,000	--	--	1/31,000	--	--	48,850

1/ Includes estimated load for missing days.

PLATTE RIVER BASIN--Continued

NORTH LOUP RIVER NEAR ST. PAUL, NEBR.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	850	435	998	962	570	1,480	1,130	2,380	7,260
2	850	495	1,140	934	480	1,210	878	1,780	4,220
3	892	550	1,320	812	300	658	750	800	1,620
4	990	555	1,480	738	290	578	4,590	10,700	160,000
5	1,310	1,580	5,590	725	345	675	2,450	4,480	29,600
6	1,310	2,020	7,140	725	395	773	5,030	8,680	152,000
7	1,220	890	2,930	750	395	800	1,580	4,580	19,500
8	1,280	745	2,570	762	400	823	1,050	1,200	3,400
9	1,350	750	2,730	703	400	759	850	900	2,060
10	1,580	1,100	4,690	670	400	724	864	1,510	3,520
11	1,580	1,610	6,870	648	405	708	920	2,410	5,990
12	1,370	1,000	3,700	670	405	733	5,280	10,900	180,000
13	1,330	890	3,200	692	405	757	2,650	5,300	37,900
14	1,280	745	2,570	637	405	696	1,290	2,150	7,490
15	1,240	730	2,440	788	840	1,790	934	1,350	3,400
16	1,190	705	2,270	762	1,520	3,130	800	1,240	2,680
17	1,130	670	2,040	825	850	1,890	838	1,250	2,830
18	1,010	630	1,720	725	385	754	1,410	3,250	12,400
19	948	590	1,510	703	325	617	1,570	2,410	11,200
20	878	530	1,260	681	305	561	1,280	1,320	4,560
21	864	465	1,080	637	795	1,370	1,260	850	2,890
22	878	470	1,110	615	285	473	21,300	7,550	463,000
23	1,050	620	1,760	615	330	548	6,930	4,020	88,300
24	1,050	655	1,860	615	325	540	2,020	1,420	7,740
25	976	495	1,300	615	305	506	1,600	900	3,890
26	850	410	941	615	300	498	1,380	795	2,960
27	812	395	866	615	300	498	1,320	850	3,030
28	812	370	811	762	1,100	2,260	1,210	950	3,100
29	812	360	789	1,070	1,650	4,770	1,120	850	2,570
30	906	440	1,080	1,070	645	1,860	1,210	981	3,230
31	--	--	--	1,050	625	1,770	--	--	--
Total load (tons)	--	--	69,760	--	--	35,210	--	--	1,232,000
	July			August			September		
1	1,110	1,080	3,240	454	295	362	474	235	301
2	968	855	2,230	347	155	145	454	220	270
3	870	620	1,460	313	150	127	440	--	280
4	846	540	1,230	274	--	120	467	260	328
5	838	560	1,270	240	155	100	454	270	331
6	846	505	1,150	240	110	71	434	--	328
7	806	435	947	215	105	61	408	285	314
8	774	420	878	211	110	63	395	--	340
9	750	395	800	215	90	52	377	310	316
10	742	325	651	219	100	59	383	280	290
11	742	425	851	203	105	58	481	660	857
12	798	710	1,530	203	98	54	735	1,040	2,060
13	870	720	1,690	196	100	53	822	830	1,840
14	830	570	1,280	211	140	80	830	665	1,490
15	766	355	734	222	--	120	758	475	972
16	750	380	770	230	150	93	705	--	550
17	742	355	711	245	175	116	660	255	454
18	728	395	776	264	200	143	645	265	461
19	758	470	962	259	185	129	630	275	468
20	790	635	1,350	245	--	100	630	280	476
21	675	430	784	226	150	92	630	--	480
22	615	390	648	259	205	143	615	--	500
23	586	360	570	245	170	112	630	--	540
24	579	325	508	250	240	162	630	310	527
25	586	290	459	313	395	334	600	255	413
26	586	250	396	428	455	526	615	220	365
27	558	220	331	428	390	451	630	260	442
28	537	210	304	421	315	358	630	305	519
29	481	200	260	428	270	312	630	345	587
30	428	190	220	434	250	293	660	390	695
31	460	359	446	467	245	309	--	--	--
Total load (tons)	--	--	29,440	--	--	5,198	--	--	17,790
Total load for year (tons)									1/1,803,000

1/ Includes estimated load for missing days.

PLATTE RIVER BASIN--Continued

NORTH LOUP RIVER NEAR ST. PAUL, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Instantaneous discharge (second-feet)	Suspended sediment														
		Concentration at time of sampling (p.p.m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p.p.m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)										
						0.00195	0.0039	0.0078	0.0156	0.0312	0.0625	0.125	0.250	0.500	1.000	2.000
Sept. 19, 1946	1,310	4,500	15,900	11,700	BN	26	34	47	56	71	84	92	97	99	100	--
June 6, 1947	4,340	9,550	112,000	6,560	BN	34	46	59	69	79	88	96	98	100	--	--
June 12	7,780	18,000	378,000	10,000	SBN	10	13	18	24	35	60	66	72	88	95	99
June 12	11,300	12,800	391,000	5,500	SBN	28	36	43	52	68	86	92	96	99	100	--
June 12	9,300	12,500	314,000	8,180	SBN	22	27	34	38	48	67	74	80	92	97	--
June 22	25,300	10,700	731,000	7,260	SBN	31	40	48	55	62	69	77	94	100	--	--
June 22	34,400	8,160	758,000	5,100	SBN	42	52	64	70	77	83	88	98	99	100	--
June 22	30,800	8,360	695,000	4,820	SBN	37	47	54	61	66	73	79	92	98	100	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

BEAVER CREEK AT LORETTO, NEBR.

LOCATION.--At bridge on county highway at west edge of Loretto, Boone County.
DRAINAGE AREA.--311 square miles.
RECORDS AVAILABLE.--Sediment records: June 1946 to September 1947.
EXTREMES, June-September 1946.--Sediment loads: Maximum, 144 tons per day Aug. 4; minimum, 4 tons per day Aug. 2-3.
EXTREMES, 1946-47.--Sediment loads: Maximum, 7,900 tons per day June 10; minimum, 4.3 tons per day Sept. 30.
EXTREMES, June 1946-September 1947.--Sediment loads: Maximum, 7,900 tons per day June 10, 1947; minimum, 4 tons per day Aug. 2-3, 1946.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids		Hardness as $CaCO_3$		Percent sodium
															Parts per million	Tons per acre-foot	Total	Non-carbonate	
Apr. 2, 1947	54	7.3	24.8	38	0.20	33	8.8	7.2	144	5.8	0.0	0.3	1.4	0.5	171	0.23	110	0	12
May 5	36	7.9	24.8	36	.20	35	7.0	5.7	148	5.8	.0	.2	.8	2.0	172	.23	116	0	10
Aug. 27	28	8.0	22.9	40	.12	31	7.2	5.1	135	5.8	.0	.3	.8	.1	164	.22	107	0	9

PLATTE RIVER BASIN--Continued

BEAVER CREEK AT LORETTO, NEBR.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--
8	--	--	--	--	--	--	--	--	--
9	--	--	--	--	--	--	--	--	--
10	--	--	--	--	--	--	--	--	--
11	--	--	--	--	--	--	--	--	--
12	--	--	--	--	--	--	38	147	15
13	--	--	--	--	--	--	37	141	14
14	--	--	--	--	--	--	36	134	13
15	--	--	--	--	--	--	35	164	16
16	--	--	--	--	--	--	36	166	16
17	--	--	--	--	--	--	36	196	19
18	--	--	--	--	--	--	46	528	67
19	--	--	--	--	--	--	55	335	50
20	--	--	--	--	--	--	56	212	32
21	--	--	--	--	--	--	52	216	30
22	--	--	--	--	--	--	45	178	22
23	--	--	--	--	--	--	41	167	18
24	--	--	--	--	--	--	36	171	16
25	--	--	--	--	--	--	38	170	17
26	--	--	--	--	--	--	42	160	18
27	--	--	--	--	--	--	38	139	14
28	--	--	--	--	--	--	36	135	13
29	--	--	--	--	--	--	36	132	13
30	--	--	--	--	--	--	35	149	14
31	--	--	--	--	--	--	--	--	--
Total load (tons)	--	--	--	--	--	--	--	--	419

Day	July			August			September		
1	34	134	12	23	76	4.7	30	84	6.8
2	32	98	8.5	22	--	4	29	76	6.0
3	32	98	8.5	23	--	4	31	81	6.8
4	34	96	8.8	44	1,050	144	31	119	10
5	36	110	11	40	598	65	31	105	8.8
6	35	111	10	38	267	27	29	103	8.1
7	34	122	11	33	193	17	30	100	8.1
8	34	116	11	33	185	16	40	--	30
9	32	120	10	33	370	33	68	456	110
10	29	100	7.8	32	185	16	48	278	36
11	28	88	6.7	30	128	10	38	273	28
12	28	90	6.8	31	164	14	42	475	55
13	26	87	6.6	31	145	12	52	789	118
14	27	87	6.3	33	133	12	56	820	126
15	28	96	7.3	32	129	11	45	355	44
16	30	99	8.0	31	--	10	39	164	17
17	31	106	8.9	30	--	9	36	118	12
18	31	124	10	29	--	8	36	137	13
19	29	106	6.3	27	97	7.1	54	580	87
20	28	87	6.6	27	98	7.1	56	330	50
21	27	89	6.5	28	114	8.6	44	190	23
22	26	98	6.9	30	123	10	40	170	18
23	25	96	6.5	30	110	8.9	40	96	10
24	24	87	5.6	30	106	8.6	40	101	11
25	24	82	5.3	31	96	8.0	38	106	11
26	26	88	6.2	31	88	7.4	37	119	12
27	26	113	7.9	32	100	8.6	35	120	11
28	26	121	8.5	34	88	8.1	34	113	10
29	26	105	7.4	32	66	5.7	36	101	9.8
30	24	87	5.6	31	85	7.1	38	110	11
31	23	80	5.0	31	91	7.6	--	--	--
Total load (tons)	--	--	246	--	--	520	--	--	907

Total load for period June 12 to Sept. 30 (tons) ---------- 2,092

PLATTE RIVER BASIN--Continued

BEAVER CREEK AT LORETTO, NEBR.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	38	180	18	48	74	9.6	62	92	15
2	37	182	16	47	81	10	58	126	20
3	35	157	15	46	89	11	57	128	20
4	37	138	14	46	71	8.8	58	112	18
5	49	274	38	46	83	10	58	120	19
6	82	329	73	52	120	17	60	122	20
7	73	235	46	77	232	48	60	121	20
8	75	229	46	86	248	58	60	120	19
9	76	190	39	76	142	29	59	105	17
10	66	157	28	76	102	21	58	81	13
11	62	128	21	76	141	29	57	78	12
12	56	120	18	77	188	39	56	76	12
13	53	119	17	73	129	25	56	77	12
14	52	123	17	71	92	18	54	76	11
15	51	123	17	73	115	23	53	84	12
16	49	120	16	91	272	67	50	112	15
17	50	122	16	105	194	55	40	120	13
18	58	132	21	91	150	37	35	120	11
19	74	193	38	86	177	41	55	120	18
20	76	268	55	92	188	47	56	119	18
21	67	206	37	92	210	52	56	118	18
22	61	163	27	84	148	34	58	118	18
23	56	158	24	73	119	23	54	118	17
24	54	154	22	70	132	25	54	117	17
25	54	142	21	67	134	24	53	93	13
26	52	112	16	62	104	17	54	89	13
27	50	107	14	64	96	17	53	101	14
28	49	110	15	64	95	16	45	--	11
29	50	109	15	64	94	16	35	--	8
30	49	99	13	64	93	16	45	--	9
31	48	92	12	--	--	--	45	--	8
Total load (tons)	--	--	787	--	--	843	--	--	461

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	40	--	--	35	88	8.3	45	79	9.6
2	40	--	--	50	79	11	45	78	9.5
3	40	--	--	55	92	14	45	97	12
4	45	--	--	55	98	15	60	134	22
5	45	--	--	55	88	13	55	167	25
6	45	--	--	55	76	11	55	100	15
7	50	--	--	55	68	10	57	79	12
8	50	50	6.8	55	61	9.1	60	89	14
9	50	57	7.7	55	59	8.8	60	132	21
10	55	65	9.7	55	58	8.6	61	161	27
11	60	71	12	55	59	8.8	66	414	74
12	65	72	13	55	61	9.1	93	875	220
13	65	72	13	55	68	10	111	718	215
14	60	70	11	90	157	38	81	352	77
15	55	60	8.9	302	605	501	62	219	37
16	40	62	6.7	259	691	483	76	306	63
17	55	77	11	213	550	316	71	225	43
18	55	88	13	203	348	191	66	180	32
19	55	79	12	120	242	78	68	220	40
20	55	70	10	80	242	52	70	265	50
21	45	63	7.7	80	220	48	74	310	62
22	40	119	13	75	155	31	85	370	85
23	60	154	25	70	111	21	94	391	99
24	64	203	35	60	106	17	95	390	100
25	69	261	49	60	100	16	88	360	86
26	78	278	59	55	95	14	79	202	43
27	80	241	52	50	89	12	73	156	31
28	70	179	34	50	84	11	77	222	46
29	50	117	16	--	--	--	81	237	52
30	25	100	6.8	--	--	--	80	225	49
31	25	92	6.2	--	--	--	75	213	43
Total load (tons)	--	--	1/480	--	--	1,965	--	--	1,714

1/ Includes estimated load for missing days.

PLATTE RIVER BASIN--Continued

BEAVER CREEK AT LORETTO, NEBR.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	74	198	40	53	170	24	212	4,740	3,490
2	72	166	32	52	152	21	124	1,200	402
3	72	154	30	50	135	18	128	860	297
4	79	262	56	47	112	14	257	4,800	3,660
5	107	933	277	44	104	12	189	1,620	827
6	188	1,200	609	45	110	13	160	1,060	458
7	249	866	582	46	102	13	148	2,620	1,050
8	189	632	323	46	100	12	95	1,200	308
9	173	554	259	45	84	10	82	775	229
10	201	607	329	45	88	11	440	6,250	7,900
11	208	608	341	45	105	13	103	1,460	432
12	220	570	339	45	124	15	489	3,380	5,110
13	181	472	231	59	539	86	463	1,080	1,480
14	126	418	142	50	--	30	355	810	776
15	97	374	98	119	11,200	4,070	284	700	537
16	83	282	63	68	1,750	321	183	660	326
17	75	242	49	68	638	117	129	--	200
18	69	242	45	71	532	102	107	470	136
19	64	210	36	66	575	102	100	340	92
20	60	158	26	60	322	52	93	350	88
21	57	146	22	55	235	35	103	370	103
22	55	140	21	52	160	22	443	3,780	5,200
23	74	1,560	356	52	150	21	597	900	1,510
24	94	885	225	50	165	22	539	220	320
25	82	275	61	48	168	22	440	370	440
26	71	212	41	45	158	19	281	630	478
27	64	170	29	44	161	19	152	510	209
28	60	143	23	52	175	25	108	326	95
29	58	142	22	91	431	110	90	285	69
30	58	162	25	135	1,640	598	78	269	57
31	--	--	--	111	600	180	--	--	--
Total load (tons)	--	--	4,732	--	--	6,129	--	--	36,280

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	71	--	48	34	101	9.3	27	98	7.1
2	62	200	33	34	109	10	26	97	6.8
3	57	170	26	33	110	9.8	26	98	6.9
4	53	174	25	31	103	8.6	26	98	6.9
5	52	282	40	29	103	8.1	26	98	6.9
6	51	165	23	29	105	8.2	25	97	6.5
7	48	148	19	29	116	9.1	25	95	6.4
8	46	122	15	29	103	8.1	25	94	6.3
9	44	120	14	28	110	8.3	24	93	6.0
10	42	110	12	28	110	8.3	26	101	7.1
11	42	110	12	27	94	6.9	30	124	10
12	41	121	13	27	103	7.5	32	108	9.3
13	40	108	12	32	145	13	32	102	8.8
14	38	--	11	30	100	8.1	31	93	7.8
15	38	--	12	29	89	7.0	30	56	4.5
16	37	120	12	29	88	6.9	31	72	6.0
17	37	105	10	29	100	7.8	31	76	6.4
18	37	91	9.1	27	99	7.2	31	108	9.0
19	36	90	8.7	28	91	6.9	30	101	8.2
20	43	102	12	26	91	6.4	29	76	6.0
21	54	140	20	26	92	6.5	30	69	5.6
22	46	110	14	25	94	6.3	31	66	5.5
23	43	99	11	25	95	6.4	31	64	5.4
24	42	94	11	25	92	6.2	32	62	5.4
25	41	--	11	27	98	7.1	33	71	6.3
26	42	106	12	30	102	8.3	34	68	6.2
27	41	108	12	30	106	8.6	34	78	7.2
28	39	102	11	28	110	8.3	34	79	7.3
29	38	100	11	27	107	7.8	35	63	6.0
30	36	98	9.5	27	102	7.4	35	46	4.3
31	34	97	8.9	27	100	7.3	--	--	--
Total load (tons)	--	--	498	--	--	245	--	--	202

Total load for year (tons) ---------- 1/54,340

1/ Includes estimated load for missing days.

BEAVER CREEK AT LORETTO, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Instantaneous discharge (second-feet)	Suspended sediment												
		Concentration at time of sampling (p. p. m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p. p. m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)									
						0.00195	0.0039	0.0078	0.0156	0.0312	0.0625	0.125	0.250	0.500	1.000	2.000
May 19, 1947 -------	61	572	94	1,710	BN	--	28	36	55	80	93	97	99	100	--	--
June 10 ----------	458	10,200	12,600	7,420	BN	39	57	69	85	93	96	98	100	--	--	--
June 10 ----------	651	9,090	16,000	5,910	BN	53	67	88	94	97	98	99	--	--	--	--
June 12 ----------	571	4,440	6,850	4,590	BN	43	59	73	80	84	87	90	96	98	99	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

KANSAS RIVER BASIN

ARIKAREE RIVER AT HAIGLER, NEBR.

LOCATION.--At bridge on U. S. Highway 34, 1 miles northwest of Haigler, Dundy County.
DRAINAGE AREA.--1,460 square miles, of which only 1,330 square miles contribute directly to surface runoff.
RECORDS AVAILABLE.--Sediment records: April to September 1947.
EXTREMES, April-September 1947.--Sediment loads: Maximum, 38,500 tons per day Apr. 28; minimum, 0 tons per day on many days in August and September.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Mar. 20, 1947	830	7.5	47.3	32	0.02	77	15	5.8	286	26	2.0	0.4	1.4	1.5	308	0.42	254	19	5
Apr. 29	102	8.5	52.4	36	.02	62	13	34	1/211	93	5.0	.8	4.0	.0	376	.51	208	35	26
May 23	2/34	8.4	56.8	42	.03	61	21	32	3/217	112	6.0	.9	3.4	1.4	402	.55	239	61	23
July 1	14	8.5	65.5	51	.02	69	25	50	4/220	180	9.5	1.0	.3	2.3	498	.68	275	95	28
Aug. 25	2/ .2	7.9	188	49	.02	180	86	166	251	389	20	1.2	.2	1.6	1,520	2.07	803	597	31

1/ Includes equivalent of 10 parts per million of carbonate (CO_3).
2/ Mean.
3/ Includes equivalent of 11 parts per million of carbonate (CO_3).
4/ Includes equivalent of 13 parts per million of carbonate (CO_3).

KANSAS RIVER BASIN--Continued

ARIKAREE RIVER AT HAIGLER, NEBR.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	19	505	26	45	685	83	44	290	34
2	17	470	22	42	565	64	38	270	28
3	20	425	23	35	505	48	51	448	62
4	23	375	23	29	430	34	44	320	38
5	28	325	25	23	350	22	152	2,290	4,700
6	28	280	21	20	205	11	380	5,300	9,390
7	29	458	36	19	170	8.7	27	1,170	87
8	44	610	72	20	170	9.2	18	450	22
9	45	640	78	23	185	11	20	1,420	77
10	48	1,190	154	24	220	14	27	1,700	124
11	48	770	100	28	345	26	25	1,300	88
12	36	490	48	33	475	42	123	2,700	905
13	27	385	28	23	330	20	69	482	90
14	20	310	17	19	225	12	39	360	38
15	19	255	13	19	180	9.2	32	360	31
16	20	340	18	92	2,580	9,960	23	360	22
17	19	320	16	69	1,450	270	26	355	25
18	19	295	15	45	645	78	32	355	31
19	19	405	21	35	370	35	34	495	45
20	23	405	25	46	588	73	36	420	41
21	20	250	14	38	470	48	26	280	20
22	16	195	8.4	30	285	23	32	1,820	157
23	16	185	8.0	34	315	29	19	750	33
24	16	190	8.2	48	345	45	17	430	20
25	19	220	11	42	320	36	14	330	12
26	18	225	11	38	215	22	10	230	6.2
27	16	165	7.1	50	255	34	14	280	11
28	1,070	10,500	38,500	126	1,460	497	16	280	12
29	116	1,990	664	67	595	108	16	240	10
30	56	950	144	46	455	57	16	200	8.6
31	--	--	--	45	360	44	--	--	--
Total load (tons)	--	--	40,160	--	--	11,770	--	--	16,170
	July			August			September		
1	10	240	6.5	2.7	120	0.9	0.2	80	0
2	9.2	160	4.0	2.0	95	.5	.2	75	0
3	9.2	125	3.1	1.2	92	.3	.1	70	0
4	8.5	125	2.9	.6	95	.2	0	--	0
5	6.7	150	2.7	.2	100	.1	0	--	0
6	6.7	200	3.6	.2	110	.1	0	--	0
7	7.1	260	5.0	.1	125	0	0	--	0
8	11	300	8.9	0	--	0	.3	45	0
9	14	315	12	0	--	0	1.8	--	.6
10	14	290	11	0	--	0	1.2	--	.3
11	11	250	7.4	0	--	0	2.0	--	.4
12	6.7	190	3.4	0	--	0	2.7	--	.5
13	4.0	165	1.8	0	--	0	2.9	--	.5
14	4.9	165	2.2	0	--	0	5.8	--	3.0
15	9.6	180	4.7	.2	390	.2	2.7	--	.6
16	8.5	195	4.5	1.0	315	.9	3.1	60	.5
17	8.9	210	5.0	.6	220	.4	3.7	60	.6
18	8.1	220	4.8	.4	130	.1	4.0	65	.7
19	9.6	200	5.2	1.0	160	.4	5.2	80	1.1
20	14	170	6.4	.3	185	.1	4.0	95	1.0
21	12	145	4.7	0	--	0	4.6	90	1.1
22	321	3,560	4,380	0	--	0	3.1	85	.7
23	9.8	597	18	0	--	0	1.6	65	.3
24	9.6	432	11	0	--	0	2.9	60	.5
25	10	410	11	.2	100	.1	4.3	70	.8
26	8.5	220	5.0	1.2	95	.3	6.1	80	1.3
27	7.8	205	4.3	.6	90	.1	7.4	100	2.0
28	5.5	215	3.2	.4	80	.1	9.2	120	3.0
29	2.9	220	1.7	1.2	70	.2	8.9	120	2.9
30	4.6	200	2.5	.6	75	.1	9.6	115	3.0
31	3.1	165	1.4	.3	80	.1	--	--	--
Total load (tons)	--	--	4,548	--	--	5	--	--	25
Total load for period Mar. 27 to Sept. 30 (tons)									72,900

KANSAS RIVER BASIN--Continued

REPUBLICAN RIVER AT MAX, NEBR.

LOCATION.--At bridge on U. S. Highway 34, three-quarters of a mile south of Max, Dundy County.
DRAINAGE AREA.--7,740 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to December 1946.
Water temperatures: October 1945 to December 1946.
EXTREMES, 1945-46.--Dissolved solids: Maximum, 628 parts per million Feb. 16-18; minimum, 282 parts per million July 11-20.
Total hardness: Maximum, 376 parts per million Feb. 16-20; minimum, 155 parts per million July 11-20.
Water temperatures: Maximum, 94° F. Aug. 15-16; minimum, freezing point on several days in December and January.
REMARKS.--Records of specific conductance of daily samples available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-3, 5-10, 1946 -	59	7.8	45.4	39	0.06	48	13	27	11	218	50	5.2	0.8	1.0	0.2	309	0.42	174	0	24
Oct. 11-20----------	55	7.8	53.4	44	.02	55	16	32	11	248	66	6.5	1.1	1.5	.1	354	.48	203	0	24
Oct. 21-31----------	57	7.9	56.2	49	.03	58	18	33	13	262	72	6.8	.9	1.4	.2	378	.51	218	3	23
Nov. 1-10 ----------	46	7.7	54.7	44	.02	56	18	32	12	247	75	6.6	1.0	1.8	.1	368	.50	214	12	23
Nov. 11-20 ----------	43	8.1	56.5	45	.03	61	19	35	9.9	264	77	7.0	1.1	2.4	.6	390	.53	230	14	24
Nov. 21-30 ----------	43	8.2	57.3	54	.02	61	18	35	10	276	71	6.6	1.4	2.2	.6	398	.54	226	0	24
Dec. 1-10 ----------	40	8.2	56.8	51	.02	60	18	31	6.7	274	68	6.9	1.1	1.8	.6	390	.53	224	0	22
Dec. 11-16, 18-20 ---	43	8.1	56.2	49	.03	61	19	34	9.1	267	72	6.6	1.1	.5	.5	386	.52	230	11	23
Dec. 21-26, 29-30 ---	36	7.9	61.4	47	.04	64	19	36	10	285	78	7.9	1.1	2.5	.2	414	.56	238	4	24

Temperature (° F.) of water, water year October 1946 to September 1947

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

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KANSAS RIVER BASIN--Continued

REPUBLICAN RIVER AT TRENTON, NEBR.

LOCATION.--At bridge, on State Highway 25, three quarters of a mile south of Trenton, Hitchcock County, and half a mile upstream from Elm Creek.
DRAINAGE AREA.--8,120 square miles, of which only 4,910 square miles contribute directly to surface runoff.
RECORDS AVAILABLE.--Chemical analyses: November 1946 to September 1947.
Water temperatures: November 1946 to May 1947.
EXTREMES, January-September 1947.--Dissolved solids: Maximum, 504 parts per million Jan. 2-10; minimum, 308 parts per million June 24.
Total hardness: Maximum, 308 parts per million Jan. 2-10; minimum, 196 parts per million June 13-23.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086. Records of specific conductance of daily samples available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet	Temperature (° F.)	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Nov. 25-28, 30, 1946-	242	36	8.2	59.2	--	--	--	--	--	--	279	--	--	--	--	--	--	--	--	--	--	--
Dec. 1-10	199	35	8.2	58.0	--	--	--	--	--	--	280	--	--	--	--	--	--	--	--	--	--	--
Dec. 11-14, 17-20 ---	182	32	8.3	59.7	--	--	--	--	--	--	1/289	--	--	--	--	--	--	--	--	--	--	--
Jan. 2-10, 1947------	57	32	8.0	72.7	45	0.05	79	27	35	22	353	100	9.5	1.3	3.0	1.0	504	0.69	78	308	19	19
Jan. 11-15	190	--	8.4	53.2	40	.05	59	19	29		2/256	63	5.2	1.2	3.0	1.0	360	.49	185	225	15	22
Jan. 23-29	249	33	8.6	50.0	32	.05	54	18	20	15	1/239	59	5.7	1.2	2.5	1.0	336	.46	226	209	13	16
Feb. 10-20	478	33	8.5	67.0	52	.05	73	24	34	17	3/325	87	9.0	1.3	4.0	1.0	464	.63	599	281	14	20
Feb. 21-24	175	32	8.6	56.0	45	.07	62	21	22	19	4/275	70	7.2	1.2	3.5	1.0	391	.53	185	241	15	15
Mar. 3-10	289	33	8.7	57.4	46	.07	64	21	24	18	5/278	73	8.0	1.2	2.5	.9	403	.55	314	246	18	16
Mar. 11-20	459	40	7.8	50.5	36	.07	57	18	19	17	249	58	5.8	1.2	4.0	.9	332	.45	411	216	12	15
Mar. 21-31	353	47	8.6	48.5	33	.07	57	15	28		6/248	48	4.5	1.0	4.0	.9	316	.43	301	204	1	23
Apr. 1-8	194	48	8.4	55.6	47	.10	60	19	29	18	7/279	67	7.5	1.2	3.0	1.2	395	.54	207	228	0	20
Apr. 11-20	201	56	8.6	57.1	45	.07	62	20	28	19	8/281	74	7.7	1.2	2.0	1.2	396	.54	215	237	7	19
Apr. 15 9/	181	--	8.5	59.6	71	.19	60	19	38	20	4/280	86	8.0	1.3	3.9	--	456	.62	223	228	0	24
Apr. 21-30	517	55	8.4	53.1	31	.08	59	18	34		259	66	6.0	1.2	3.0	.8	363	.49	507	221	9	25
May 1-10	237	60	8.4	56.1	31	.05	60	18	27	23	10/264	77	7.3	1.3	2.8	.8	387	.53	248	224	8	19
May 15-27	261	--	8.3	57.3	65	.18	56	17	36	19	7/270	80	6.0	1.2	4.4	.6	410	.56	289	210	0	25
May 29 9/	2,040	--	8.0	64.4	45	.19	80	19	30	12	360	60	3.0	.9	7.8	--	434	.59	2,390	278	0	18
May 29-30	1,430	--	8.2	69.4	0	.14	86	19	63		372	94	3.0	1.0	26	--	486	.66	1,880	293	0	32
May 31-June 5	312	--	8.3	55.2	49	.15	60	14	28	14	7/258	70	4.0	1.0	4.3	--	388	.53	327	207	0	21
June 6	3,430	--	8.0	56.2	39	.24	72	22	49		340	63	2.0	.5	.3	--	402	.55	3,720	241	0	31

1/ Includes equivalent of 12 parts per million of carbonate (CO_3).
2/ Includes equivalent of 8 parts per million of carbonate (CO_3).
3/ Includes equivalent of 13 parts per million of carbonate (CO_3).
4/ Includes equivalent of 18 parts per million of carbonate (CO_3).
5/ Includes equivalent of 15 parts per million of carbonate (CO_3).
6/ Includes equivalent of 7 parts per million of carbonate (CO_3).
7/ Includes equivalent of 10 parts per million of carbonate (CO_3).
8/ Includes equivalent of 24 parts per million of carbonate (CO_3).
9/ Not included in weighted average.
10/ Includes equivalent of 9 parts per million of carbonate (CO_3).

June 7-10	478	--	8.1	55.4	47	.17	60	13	50		264	77	5.0	1.4	6.8	--	408	.55	527	203	0	35
June 12	1,040	--	7.7	55.9	46	.15	60	14	49		260	83	6.0	.9	4.8	--	398	.54	1,120	207	0	34
June 13-23	283	--	8.4	57.4	64	.17	54	15	42	12	11/268	70	6.0	1.2	2.0	.9	422	.57	322	196	0	30
June 24 (6:25 p. m.)	1,060	--	8.0	49.1	29	.10	63	12	25		282	21	4.0	.9	.5	--	308	.42	861	207	0	21
June 24 (8:00 p. m.) 9/	1,060	--	8.0	50.9	--	--	--	--	13	--	268	--	3.0	--	--	--	315	.43	902	--	--	--
June 26-July 3, 8-16	168	--	8.2	59.0	62	.05	60	17	48	6.4	256	86	11	1.4	2.0	.9	411	.56	187	220	10	31
July 8 9/	1,030	67	8.1	49.9	--	--	--	--	17	--	276	--	2.0	--	--	--	320	.44	890	--	--	--
July 22	1,160	--	8.0	69.5	--	--	94	--	39	--	360	--	5.0	--	--	--	430	.58	1,350	--	--	--
July 23-26, Aug. 5-6	154	--	8.0	56.1	56	.02	62	16	37	6.4	260	71	6.5	1.2	3.6	--	386	.52	161	221	8	26
Weighted average	312	--	--	57.1	42	0.10	63	18	30	15	281	71	6.2	1.1	4.4	--	394	0.54	348	229	0	24

9/ Not included in weighted average.
11/ Includes equivalent of 14 parts per million of carbonate (CO_3).

KANSAS RIVER BASIN--Continued

REPUBLICAN RIVER AT TRENTON, NEBR.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	--	--	38	--	33	--	--	60	--	--	--	--
2	--	--	32	32	33	--	--	53	--	--	--	--
3	--	--	33	--	33	33	48	60	--	--	--	--
4	--	--	34	--	33	33	45	74	--	--	--	--
5	--	--	37	--	33	34	--	62	--	--	--	--
6	--	--	37	--	33	32	52	56	--	--	--	--
7	--	--	39	--	33	--	--	44	--	--	--	--
8	--	--	35	--	33	34	--	51	--	--	--	--
9	--	--	32	--	33	--	--	--	--	--	--	--
10	--	--	32	--	33	34	--	--	--	--	--	--
11	--	--	32	--	--	35	--	--	--	--	--	--
12	--	--	35	--	--	--	--	--	--	--	--	--
13	--	--	32	--	--	42	--	--	--	--	--	--
14	--	--	32	--	--	36	--	--	--	--	--	--
15	--	--	--	--	--	34	--	--	--	--	--	--
16	--	--	--	--	--	38	--	--	--	--	--	--
17	--	--	32	--	--	--	--	--	--	--	--	--
18	--	--	32	--	--	40	52	--	--	--	--	--
19	--	--	34	--	32	35	64	--	--	--	--	--
20	--	--	35	--	--	--	52	--	--	--	--	--
21	--	--	--	--	32	49	52	--	--	--	--	--
22	--	--	--	--	55	--	52	--	--	--	--	--
23	--	--	--	--	--	--	42	--	--	--	--	--
24	--	--	--	--	32	44	43	--	--	--	--	--
25	--	36	--	35	--	--	56	--	--	--	--	--
26	--	33	--	--	--	--	--	--	--	--	--	--
27	--	35	--	34	--	--	--	--	--	--	--	--
28	--	36	--	--	--	--	60	--	--	--	--	--
29	--	--	--	32	--	65	62	--	--	--	--	--
30	--	35	--	--	--	--	56	--	--	--	--	--
31	--	--	--	--	--	47	--	--	--	--	--	--
Average	--	--	--	--	--	--	--	--	--	--	--	--

REPUBLICAN RIVER AT TRENTON, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

	Instantaneous discharge (second-feet)	Suspended sediment												
		Concentration at time of sampling (p.p.m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p.p.m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)										
						0.00195	0.0039	0.0078	0.0156	0.0312	0.0625	0.125	0.250	0.500	1.000	2.000
May 29, 1947	4,480	40,000	484,000	4,340	BN	--	10	15	55	62	73	82	92	96	98	--
May 29	4,480	40,000	484,000	5,560	BD	22	32	42	47	55	70	86	93	96	98	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

KANSAS RIVER BASIN--Continued

FRENCHMAN CREEK NEAR ENDERS, NEBR.

LOCATION.--At bridge on State Highway 613 a quarter of a mile downstream from Enders dam site and 2½ miles southeast of Enders, Chase County.
DRAINAGE AREA.--1,300 square miles, of which only 820 square miles contribute directly to surface runoff.
RECORDS AVAILABLE.--Sediment records: November 1946 to September 1947.
EXTREMES, November 1946-September 1947.--Sediment loads: Maximum, 1,230 tons per day June 25; minimum, 14 tons per day Dec. 29.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Mar. 24, 1947	77	8.7	40.2	60	0.05	51	15	11	1/220	20	3.2	0.9	5.0	2.2	271	0.37	189	9	10
Apr. 29	89	8.7	38.8	58	.05	49	14	11	2/212	18	3.0	.9	5.0	2.1	260	.35	180	6	12
May 27	73	8.7	36.0	60	.05	41	15	14	3/198	20	2.9	.9	5.0	1.9	254	.35	164	2	15

1/ Includes equivalent of 10 parts per million of carbonate (CO_3).
2/ Includes equivalent of 14 parts per million of carbonate (CO_3).
3/ Includes equivalent of 13 parts per million of carbonate (CO_3).

KANSAS RIVER BASIN--Continued

FRENCHMAN CREEK NEAR ENDERS, NEBR.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	102	180	50
2	--	--	--	--	--	--	97	150	39
3	--	--	--	--	--	--	101	134	37
4	--	--	--	--	--	--	102	96	26
5	--	--	--	--	--	--	103	118	33
6	--	--	--	--	--	--	99	124	33
7	--	--	--	--	--	--	100	142	38
8	--	--	--	--	--	--	98	134	35
9	--	--	--	--	--	--	98	150	40
10	--	--	--	--	--	--	96	195	51
11	--	--	--	--	--	--	98	220	58
12	--	--	--	--	--	--	90	215	52
13	--	--	--	--	--	--	88	195	46
14	--	--	--	--	--	--	82	192	43
15	--	--	--	103	150	42	85	--	48
16	--	--	--	103	170	47	88	225	53
17	--	--	--	102	190	52	89	295	71
18	--	--	--	101	200	55	83	205	46
19	--	--	--	103	198	55	81	155	34
20	--	--	--	103	202	56	74	170	34
21	--	--	--	90	148	40	77	205	43
22	--	--	--	98	158	42	80	222	48
23	--	--	--	101	246	67	76	265	54
24	--	--	--	101	196	53	88	276	66
25	--	--	--	100	174	47	86	225	52
26	--	--	--	102	--	48	91	218	54
27	--	--	--	102	160	44	100	395	107
28	--	--	--	95	136	35	82	110	24
29	--	--	--	98	175	46	53	96	14
30	--	--	--	101	182	50	86	--	48
31	--	--	--	--	--	--	88	136	32
Total load (tons)	--	--	--	--	--	779	--	--	1,409
	January			February			March		
1	91	85	21	95	490	126	85	105	24
2	92	98	24	100	320	86	80	100	22
3	93	90	23	103	330	92	86	95	22
4	97	120	31	96	--	90	93	100	25
5	97	--	120	107	335	97	93	190	48
6	99	490	131	99	280	75	88	250	59
7	98	400	106	82	250	55	87	210	49
8	96	315	82	66	300	53	91	215	53
9	95	312	80	92	310	77	88	215	51
10	90	220	53	107	355	103	73	210	41
11	93	155	39	108	355	104	84	230	52
12	96	100	26	106	345	99	79	--	55
13	91	215	53	99	335	90	79	270	58
14	95	292	75	95	325	83	81	270	59
15	85	425	98	92	310	77	74	215	43
16	81	375	82	96	300	78	66	329	59
17	93	270	68	97	290	76	70	218	41
18	90	215	52	98	250	66	73	205	40
19	88	290	69	91	205	50	78	190	40
20	88	400	95	95	175	45	80	268	58
21	95	300	77	98	158	42	78	248	52
22	91	225	55	96	140	36	82	260	58
23	93	280	70	96	125	32	84	283	64
24	95	290	74	97	--	34	77	220	46
25	92	280	70	100	140	38	79	235	50
26	99	275	73	91	135	33	80	--	55
27	98	255	68	88	125	30	80	235	51
28	101	140	38	92	115	29	80	235	51
29	87	115	27	--	--	--	81	252	55
30	56	100	15	--	--	--	78	242	51
31	80	671	145	--	--	--	74	290	58
Total load (tons)	--	--	2,040	--	--	1,896	--	--	1,490

KANSAS RIVER BASIN--Continued

FRENCHMAN CREEK NEAR ENDERS, NEBR.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	81	335	73	85	355	81	78	168	35
2	80	243	52	87	185	43	72	192	37
3	84	212	48	86	85	20	75	222	45
4	82	200	44	88	--	30	86	240	56
5	77	--	--	86	255	59	81	270	59
6	79	--	--	83	195	44	80	226	49
7	77	--	--	81	170	37	81	245	54
8	81	--	--	84	130	29	80	--	60
9	81	--	--	82	153	34	81	300	66
10	88	--	--	80	135	29	81	315	69
11	88	--	--	75	145	29	79	262	56
12	87	--	--	75	120	24	89	348	84
13	90	--	--	77	115	24	86	245	57
14	83	--	--	78	140	29	92	240	60
15	82	250	55	87	155	36	91	295	72
16	80	275	59	95	180	46	82	365	81
17	80	252	54	104	330	93	83	350	78
18	80	238	51	105	--	65	79	395	84
19	81	--	50	98	210	56	79	355	76
20	82	200	44	95	260	67	82	205	45
21	78	172	36	98	220	58	85	856	196
22	85	--	38	96	148	38	110	2,890	854
23	87	140	33	97	148	39	103	615	171
24	80	185	40	83	152	34	106	1,080	309
25	80	178	38	82	155	34	201	2,260	1,230
26	80	175	38	85	158	36	185	1,160	579
27	80	125	27	76	164	34	151	1,030	420
28	85	160	37	81	260	57	129	--	400
29	90	250	61	76	--	44	115	1,300	404
30	90	305	74	70	148	28	92	1,150	286
31	--	--	--	73	182	36	--	--	--
Total load (tons)	--	--	1/1,500	--	--	1,313	--	--	6,072

Day	July			August			September		
1	98	880	233	72	285	55	68	396	72
2	92	--	--	73	270	53	77	380	79
3	94	--	--	72	290	56	75	--	--
4	93	--	--	64	285	49	70	--	--
5	92	--	--	70	305	58	68	--	--
6	90	--	--	67	265	48	68	--	--
7	89	--	--	62	255	43	70	--	--
8	92	--	--	63	270	46	64	--	--
9	99	--	--	62	270	45	69	860	160
10	91	--	--	63	260	44	72	--	--
11	88	--	--	59	288	46	84	--	--
12	80	--	--	63	540	92	87	--	--
13	77	--	--	65	--	--	77	--	--
14	76	--	--	70	--	--	75	--	--
15	80	--	--	81	--	--	73	485	96
16	88	765	182	87	--	--	76	480	98
17	92	715	178	88	--	--	78	470	99
18	82	665	147	85	--	--	80	465	100
19	85	615	141	88	745	177	86	460	107
20	91	575	141	85	--	150	77	--	95
21	85	535	123	83	440	99	81	445	97
22	90	492	120	80	355	77	76	440	90
23	86	450	104	80	385	83	84	440	100
24	83	396	89	80	450	97	88	520	124
25	79	375	80	73	405	80	85	495	114
26	83	580	130	73	428	84	86	455	106
27	120	765	248	68	385	71	88	410	97
28	95	590	151	68	620	114	89	370	89
29	83	375	84	69	510	95	89	320	77
30	80	368	79	72	610	119	87	345	81
31	73	370	73	73	558	110	--	--	--
Total load (tons)	--	--	1/4,700	--	--	1/3,000	--	--	1/3,200

Total load for period Nov. 15 to Sept. 30 (tons) ---------- 1/27,400

1/ Includes estimated load for missing days.

MEDICINE CREEK AT CAMBRIDGE, NEBR.

LOCATION.--At bridge on U. S. Highways 6 and 34, a quarter of a mile east of Cambridge, Furnas County, and half a mile above mouth.
DRAINAGE AREA.--1,070 square miles, of which only about 680 square miles contribute directly to surface runoff.
RECORDS AVAILABLE.--Sediment records: November 1945 to September 1947.
EXTREMES, 1945-46.--Sediment loads: Maximum, 321,000 tons per day May 30; minimum, 20 tons per day Dec. 10.
EXTREMES, 1946-47.--Sediment loads: Maximum, 3,700,000 (estimated) tons per day June 22; minimum, 4 tons per day Jan. 31.
EXTREMES, 1945-47.--Sediment loads: Maximum, 3,700,000 tons per day June 22, 1947; minimum, 4 tons per day Jan. 31, 1947.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids		Hardness as $CaCO_3$		Percent sodium
															Parts per million	Tons per acre-foot	Total	Non-carbonate	
Mar. 30, 1947	59	8.7	44.5	56	0.05	64	14	10	1/257	17	3.5	0.5	6.0	2.0	300	0.41	217	6	9
May 1	54	8.7	45.4	60	.05	64	15	11	2/264	19	3.0	.6	5.0	2.0	310	.42	221	5	10
May 30	65	8.6	46.0	46	.05	63	15	11	261	17	3.3	.6	6.0	1.2	306	.42	219	5	10
Sept. 26	42	8.5	46.0	55	.02	72	16	7.1	3/282	21	2.0	.5	4.2	.9	330	.45	245	14	6

1/ Includes equivalent of 20 parts per million of carbonate (CO_3).
2/ Includes equivalent of 19 parts per million of carbonate (CO_3).
3/ Includes equivalent of 14 parts per million of carbonate (CO_3).

KANSAS RIVER BASIN--Continued

MEDICINE CREEK AT CAMBRIDGE, NEBR.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	49	540	72
2	--	--	--	--	--	--	49	515	68
3	--	--	--	--	--	--	50	760	103
4	--	--	--	--	--	--	50	690	93
5	--	--	--	--	--	--	47	850	108
6	--	--	--	--	--	--	47	730	93
7	--	--	--	--	--	--	46	545	68
8	--	--	--	--	--	--	48	490	63
9	--	--	--	--	--	--	32	470	41
10	--	--	--	--	--	--	27	280	20
11	--	--	--	--	--	--	40	435	47
12	--	--	--	--	--	--	43	280	32
13	--	--	--	--	--	--	42	320	36
14	--	--	--	--	--	--	39	300	32
15	--	--	--	--	--	--	38	290	30
16	--	--	--	--	--	--	32	245	21
17	--	--	--	--	--	--	32	275	24
18	--	--	--	--	--	--	38	350	36
19	--	--	--	--	--	--	37	290	29
20	--	--	--	--	--	--	37	285	28
21	--	--	--	--	--	--	40	270	29
22	--	--	--	--	--	--	38	255	26
23	--	--	--	--	--	--	38	--	--
24	--	--	--	--	--	--	38	--	--
25	--	--	--	--	--	--	42	--	--
26	--	--	--	--	--	--	46	--	--
27	--	--	--	--	--	--	47	--	--
28	--	--	--	48	570	74	52	--	--
29	--	--	--	49	510	68	55	285	42
30	--	--	--	50	475	64	54	295	43
31	--	--	--	--	--	--	58	340	53
Total load (tons)	--	--	--	--	--	206	--	--	1/1,430
	January			February			March		
1	77	560	115	34	420	39	63	900	153
2	84	520	118	46	460	57	60	840	136
3	74	250	50	44	470	56	58	850	133
4	70	240	45	43	430	50	58	800	125
5	67	340	62	40	390	42	61	990	163
6	67	330	60	42	390	44	64	1,050	181
7	65	280	49	26	300	21	63	1,000	170
8	60	295	48	43	400	46	66	1,300	232
9	56	290	44	56	365	55	65	1,190	209
10	61	290	48	49	470	62	64	960	166
11	57	340	52	66	400	71	66	920	164
12	62	360	60	66	370	66	66	1,080	192
13	47	265	34	70	430	81	66	1,000	178
14	44	290	34	74	740	148	69	1,200	224
15	54	390	57	69	690	129	72	1,190	231
16	65	425	75	69	650	121	79	1,460	311
17	47	320	41	73	380	75	82	1,350	299
18	62	480	80	72	--	65	83	1,220	273
19	58	425	67	75	--	65	83	1,070	240
20	62	475	80	83	1,040	233	75	1,020	207
21	52	310	44	73	1,600	316	62	1,080	181
22	61	300	49	62	1,160	194	63	1,040	177
23	49	575	76	61	930	153	60	1,010	164
24	63	380	65	62	870	146	63	1,180	201
25	50	390	53	61	890	147	60	1,190	193
26	61	350	58	60	910	147	63	1,170	199
27	60	480	78	60	820	133	58	1,010	158
28	48	340	44	61	880	145	56	980	148
29	50	320	43	--	--	--	56	1,110	168
30	51	310	43	--	--	--	55	1,180	175
31	50	415	56	--	--	--	57	1,440	222
Total load (tons)	--	--	1,829	--	--	2,907	--	--	5,973

1/ Includes estimated load for missing days.

KANSAS RIVER BASIN--Continued

MEDICINE CREEK AT CAMBRIDGE, NEBR.--Continued

Suspended sediment, water year October 1945 to September 1946--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	53	1,280	183	53	950	136	192	7,850	4,070
2	50	1,000	135	62	1,050	176	126	2,960	1,010
3	48	1,250	162	61	1,110	183	90	1,700	413
4	48	1,030	133	61	1,160	191	74	1,240	248
5	49	860	114	59	1,170	186	65	1,060	186
6	48	830	108	87	3,230	759	60	990	160
7	49	840	111	80	3,980	860	54	920	134
8	49	800	106	63	1,900	323	50	800	108
9	50	660	89	62	1,620	271	47	760	96
10	49	560	74	61	1,330	219	45	710	86
11	50	650	88	59	1,090	174	44	690	82
12	50	710	96	52	930	131	46	825	102
13	50	790	107	49	820	109	54	2,730	398
14	50	950	128	46	806	100	44	1,360	162
15	48	830	108	45	755	92	42	770	87
16	47	780	99	44	700	83	40	896	97
17	46	865	107	43	705	82	42	1,080	124
18	44	820	97	42	660	75	66	3,650	650
19	44	795	94	42	630	72	229	19,100	14,500
20	44	803	95	43	595	69	98	4,950	1,310
21	44	840	100	41	565	63	63	2,050	349
22	44	840	100	41	620	69	59	1,760	280
23	45	775	94	77	3,480	1,680	46	1,310	163
24	44	760	90	163	10,100	4,720	254	2,300	27,200
25	44	730	87	76	3,590	737	134	14,300	5,950
26	43	782	91	74	2,700	539	60	2,950	478
27	43	745	86	79	2,400	512	50	1,100	148
28	43	735	85	79	2,790	595	50	3,350	452
29	44	660	78	98	3,080	815	526	44,700	69,400
30	44	670	80	1,740	59,200	321,000	200	25,000	15,500
31	--	--	--	403	25,900	31,300	--	--	--
Total load (tons)	--	--	3,124	--	--	366,300	--	--	143,900

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	98	6,700	1,770	26	518	36	33	615	55
2	100	8,000	2,160	26	565	40	38	1,230	126
3	273	3,000	2,210	27	905	66	38	890	91
4	193	5,750	3,000	35	1,000	94	38	715	73
5	74	3,430	685	42	1,000	113	38	755	77
6	55	2,900	431	30	583	47	38	650	67
7	56	1,990	301	29	680	53	40	705	76
8	84	4,620	1,940	28	590	45	39	4,950	521
9	87	9,050	2,130	27	500	36	61	2,750	453
10	51	3,000	413	27	490	36	314	18,500	16,500
11	43	1,380	160	27	405	30	136	6,450	2,370
12	38	980	101	27	372	27	76	2,590	531
13	35	795	75	32	890	77	55	1,300	193
14	34	1,100	101	35	2,160	204	54	915	133
15	73	1,980	390	29	1,150	90	48	695	90
16	124	1,110	372	27	665	48	44	577	69
17	61	592	97	27	695	51	40	500	54
18	53	1,630	233	26	505	35	37	680	68
19	50	2,080	281	26	440	31	44	845	100
20	80	1,300	324	26	433	30	43	552	64
21	36	870	85	26	425	30	40	515	56
22	33	765	68	27	430	31	38	495	51
23	31	605	51	30	1,000	81	36	472	46
24	30	520	42	28	550	42	34	400	37
25	30	495	40	28	490	37	34	360	33
26	30	490	40	31	505	42	33	390	35
27	29	503	39	32	575	50	33	410	37
28	28	500	38	34	565	52	32	402	35
29	29	500	39	34	565	52	32	600	52
30	29	795	62	34	610	56	35	945	89
31	27	600	44	33	608	54	--	--	--
Total load (tons)	--	--	17,720	--	--	1,716	--	--	22,180

Total load for period Nov. 28 to Sept. 30 (tons) ---------- 1/567,300

1/ Includes estimated load for missing days.

KANSAS RIVER BASIN--Continued

MEDICINE CREEK AT CAMBRIDGE, NEBR.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	41	1,220	135	61	390	64	68	585	107
2	51	1,180	162	60	375	61	68	680	125
3	59	1,260	201	61	355	58	63	470	80
4	55	1,400	208	60	315	51	60	440	71
5	3,260	51,900	453,000	57	290	45	61	465	76
6	726	33,000	73,400	59	305	49	67	575	104
7	1,430	39,200	213,000	63	360	61	66	535	95
8	1,960	30,600	210,000	60	340	55	63	500	85
9	310	10,400	8,980	65	845	148	60	410	66
10	1,650	40,000	185,000	70	1,250	236	58	335	52
11	394	12,200	13,000	70	750	142	56	330	50
12	198	3,500	1,870	70	740	140	66	591	105
13	142	1,620	622	75	680	138	64	482	83
14	115	1,200	373	80	783	169	60	385	62
15	96	850	220	75	880	178	55	375	56
16	80	735	159	77	870	181	52	400	56
17	77	650	135	73	675	133	50	1,250	168
18	77	600	125	73	785	155	32	415	36
19	75	342	69	70	740	140	35	324	31
20	70	345	65	68	580	106	56	590	89
21	70	535	101	66	525	94	63	870	148
22	69	535	100	62	455	76	60	1,440	233
23	72	565	110	61	450	74	64	1,730	298
24	72	540	105	59	445	71	61	1,610	265
25	73	555	109	62	505	84	74	1,680	335
26	65	490	86	65	520	91	73	1,450	287
27	62	410	69	59	400	64	67	990	179
28	64	440	76	57	390	60	45	790	96
29	61	380	63	59	400	64	25	--	--
30	59	365	58	59	420	67	35	--	--
31	64	425	73	--	--	--	40	--	--
Total load (tons)	--	--	1,162,000	--	--	3,055	--	--	1/3,470
	January			February			March		
1	40	--	--	30	170	14	45	283	34
2	40	--	--	70	395	75	40	600	65
3	35	--	--	70	355	67	45	820	100
4	35	--	--	65	375	66	85	980	212
5	35	--	--	65	370	65	70	860	162
6	40	--	--	65	365	64	65	480	84
7	40	--	--	75	355	72	55	350	52
8	40	120	13	50	280	38	75	425	86
9	50	150	20	35	165	16	85	575	132
10	55	160	24	60	365	59	90	932	226
11	60	175	28	65	410	72	122	2,470	813
12	70	195	37	70	445	84	115	2,270	705
13	85	260	60	70	485	92	115	3,180	986
14	80	365	79	80	825	178	102	3,790	1,040
15	70	245	46	100	1,510	407	73	2,680	528
16	55	230	34	120	2,790	904	68	2,100	386
17	40	170	18	142	2,590	993	68	2,200	403
18	50	235	32	117	1,800	569	64	1,920	332
19	60	285	46	105	1,680	476	65	1,780	312
20	65	310	54	60	1,010	164	66	1,500	267
21	70	375	71	75	1,590	322	62	1,460	244
22	60	275	45	75	2,550	516	61	1,880	310
23	65	662	116	70	2,200	415	63	2,460	418
24	60	1,020	165	35	750	71	66	2,250	402
25	60	1,090	176	35	280	26	65	1,750	307
26	65	1,250	219	45	392	48	64	1,570	271
27	70	1,270	240	50	392	53	63	1,740	296
28	60	900	146	40	190	21	60	1,640	266
29	50	200	27	--	--	--	58	1,580	248
30	35	75	7	--	--	--	58	1,550	243
31	20	65	4	--	--	--	56	1,860	282
Total load (tons)	--	--	1/1,800	--	--	5,947	--	--	10,210

1/ Includes estimated load for missing days.

KANSAS RIVER BASIN--Continued

MEDICINE CREEK AT CAMBRIDGE, NEBR.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	50	1,420	192	55	1,200	178	59	1,510	240
2	52	1,360	191	50	1,100	148	54	1,450	211
3	59	1,540	245	48	1,160	150	54	1,400	204
4	65	2,020	354	45	1,160	141	50	1,350	182
5	77	3,250	675	46	1,160	144	47	1,310	166
6	75	2,340	473	47	1,160	147	64	4,050	700
7	74	2,180	435	47	1,120	142	54	2,230	325
8	76	2,490	510	50	1,070	144	50	1,910	257
9	69	2,110	394	54	1,020	149	50	1,760	237
10	83	3,130	702	55	990	147	50	1,600	216
11	94	3,820	969	58	1,080	169	48	1,400	181
12	79	3,370	720	62	1,580	264	142	9,970	3,820
13	74	2,450	490	62	1,630	272	115	6,600	2,050
14	64	2,250	389	57	1,880	289	105	5,200	1,470
15	83	2,090	356	58	1,820	285	84	3,850	874
16	62	1,440	241	61	1,490	245	70	2,600	491
17	57	1,390	214	64	1,530	264	67	3,000	543
18	54	1,550	226	60	1,530	248	262	6,880	4,870
19	60	1,790	290	69	2,000	372	115	--	--
20	54	1,350	197	69	2,200	413	87	--	--
21	51	1,270	175	62	1,960	328	116	--	--
22	53	1,250	179	60	1,820	295	28,500	--	3,700,000
23	55	1,230	183	57	1,560	240	1,600	--	--
24	56	1,220	184	56	1,520	230	642	--	--
25	56	1,240	188	54	1,520	222	412	--	--
26	54	1,300	190	56	1,510	228	250	--	--
27	51	1,360	187	54	1,500	218	--	--	--
28	50	1,410	190	81	1,620	266	170	--	--
29	52	1,120	157	64	1,780	307	--	--	--
30	55	1,190	177	68	1,700	312	--	--	--
31	--	--	--	65	1,610	282	--	--	--
Total load (tons)	--	--	10,070	--	--	7,239	--	--	1/3,890,000
	July			August			September		
1	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--
8	--	--	--	--	--	--	--	--	--
9	--	--	--	--	--	--	--	--	--
10	--	--	--	--	--	--	--	--	--
11	--	--	--	--	--	--	--	--	--
12	--	--	--	--	--	--	--	--	--
13	--	--	--	--	--	--	--	--	--
14	--	--	--	--	--	--	--	--	--
15	--	--	--	--	--	--	--	--	--
16	--	--	--	--	--	--	--	--	--
17	--	--	--	--	--	--	--	--	--
18	--	--	--	--	--	--	--	--	--
19	--	--	--	--	--	--	--	--	--
20	--	--	--	--	--	--	--	--	--
21	--	--	--	--	--	--	--	--	--
22	--	--	--	--	--	--	--	--	--
23	--	--	--	--	--	--	--	--	--
24	--	--	--	--	--	--	--	--	--
25	--	--	--	--	--	--	--	--	--
26	--	--	--	--	--	--	--	--	--
27	--	--	--	--	--	--	--	--	--
28	--	--	--	--	--	--	--	--	--
29	--	--	--	--	--	--	--	--	--
30	--	--	--	--	--	--	--	--	--
31	--	--	--	--	--	--	--	--	--
Total load (tons)	--	--	150,000	--	--	1/7,500	--	--	1/18,000
Total load for year (tons)									1/5,269,000

1/ Includes estimated load for missing days.

KANSAS RIVER BASIN--Continued

MEDICINE CREEK AT CAMBRIDGE, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Instantaneous discharge (second-feet)	Suspended sediment													
		Concentration at time of sampling (p. p. m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p. p. m.)	Method of 1/ analysis	Percent finer than indicated size (in millimeters)									
						0.00195	0.0039	0.0078	0.0156	0.312	0.0625	0.125	0.250	0.500	1.000	2.000
June 24, 1947	500	5,400	7,300	8,010	SBN	22	35	49	58	69	94	100	--	--	--	--
June 25	420	6,500	7,370	4,720	BN	13	28	52	62	77	94	98	99	100	--	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.

SAPPA CREEK NEAR BEAVER CITY, NEBR.

LOCATION.--At bridge on U. S. Highway 283, 7 miles southwest of Beaver City, Furnas County.
DRAINAGE AREA.--1,560 square miles.
RECORDS AVAILABLE.--Sediment records: April to September 1947.
EXTREMES, April-September 1947.--Sediment loads: Maximum, 42,700 tons per day June 22; minimum, 0.2 ton per day Sept. 29-30.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Mar. 29, 1947	30	8.3	50.0	36	0.05	63	16	31	1/276	39	14	0.5	3.5	0.0	360	0.49	223	0	23
Apr. 29	24	8.3	69.7	34	.02	80	30	21	2/390	20	18	.7	1.6	.8	460	.65	323	3	13
May 27	19	8.4	75.4	29	.05	90	25	64	3/438	64	26	.7	2.1	1.1	530	.72	327	0	30
June 18	220	7.4	49.2	32	.02	72	20	6.4	278	33	6.3	.3	4.9	.6	332	.45	262	34	5
Aug. 28	18	7.3	29.3	24	.05	42	7.0	14	177	12	3.9	.4	1.2	.0	232	.32	134	0	19

1/ Includes equivalent of 7 parts per million of carbonate (CO_3).
2/ Includes equivalent of 15 parts per million of carbonate (CO_3).
3/ Includes equivalent of 17 parts per million of carbonate (CO_3).

KANSAS RIVER BASIN--Continued

SAPPA CREEK NEAR BEAVER CITY, NEBR.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	24	171	11	23	358	22
2	--	--	--	19	148	7.6	40	1,140	220
3	--	--	--	21	213	12	76	3,060	638
4	--	--	--	21	168	9.5	56	2,600	393
5	--	--	--	20	169	9.1	33	2,100	187
6	--	--	--	22	199	12	31	3,610	323
7	--	--	--	18	201	9.8	29	2,720	267
8	--	--	--	19	190	9.7	42	2,000	251
9	--	--	--	19	183	9.4	30	3,370	276
10	--	--	--	22	220	13	22	1,140	68
11	--	--	--	17	222	10	44	2,190	532
12	--	--	--	19	209	11	207	5,630	3,260
13	--	--	--	19	203	10	231	5,190	3,190
14	--	--	--	21	217	12	187	4,300	2,170
15	--	---	--	21	209	12	91	3,340	821
16	24	155	10	24	220	14	70	2,050	387
17	25	134	9.0	26	260	18	88	2,050	504
18	24	--	7	22	220	13	201	9,710	5,750
19	25	--	7	27	252	18	222	6,580	4,460
20	25	--	7	24	238	15	147	5,350	2,040
21	26	112	7.9	27	227	16	72	6,970	1,370
22	26	153	11	27	193	14	1,420	11,300	42,700
23	24	154	10	26	178	12	1,540	5,650	23,700
24	24	154	10	24	169	11	1,170	6,410	20,600
25	25	153	10	23	162	10	1,520	7,530	30,400
26	23	153	9.5	23	158	9.8	1,470	4,790	19,000
27	23	153	9.5	19	164	8.4	1,170	5,540	17,500
28	23	152	9.4	22	174	10	638	7,610	13,100
29	24	152	9.8	23	161	10	276	6,040	4,500
30	24	156	10	23	157	9.7	138	3,700	1,380
31	--	--	--	22	148	8.8	--	--	--
Total load (tons)	--	--	137	--	--	356	--	--	200,000

Day	July			August			September		
1	108	2,170	633	24	98	6.4	2.6	--	--
2	88	1,490	354	24	148	9.6	2.4	--	--
3	82	1,010	224	22	281	16	2.3	--	--
4	72	705	137	20	251	14	2.2	--	--
5	66	535	95	18	235	11	2.1	--	--
6	62	440	74	20	234	13	2.0	171	0.9
7	56	376	57	18	234	11	2.0	--	1
8	54	298	43	18	233	11	1.8	199	1.0
9	49	287	38	18	233	11	1.8	--	1
10	110	2,680	2,100	16	228	9.8	2.1	217	1.2
11	476	14,100	19,000	15	197	8.0	2.1	134	.8
12	295	10,100	8,900	14	185	7.0	2.2	129	.8
13	108	4,700	1,460	14	172	6.5	2.4	142	.9
14	64	3,100	536	14	169	6.4	2.8	143	1.1
15	144	3,800	1,670	14	201	7.6	2.8	144	1.1
16	82	4,270	998	20	204	11	2.8	139	1.1
17	47	1,940	246	14	182	6.9	2.5	115	.8
18	40	1,020	110	13	171	6.0	2.2	107	.6
19	39	663	70	12	161	5.2	1.8	102	.5
20	37	410	41	12	188	6.1	1.7	98	.4
21	33	248	22	12	187	6.0	1.6	93	.4
22	35	439	41	11	170	5.0	1.4	88	.3
23	82	3,310	1,140	11	151	4.5	1.4	73	.3
24	76	4,340	978	11	--	--	1.4	71	.3
25	45	1,960	238	11	--	--	1.4	74	.3
26	40	1,190	129	28	--	--	1.3	110	.4
27	33	358	32	48	--	--	1.4	88	.3
28	31	233	20	20	--	--	1.4	67	.3
29	30	134	11	10	--	--	1.4	58	.2
30	27	93	6.8	4.8	--	--	1.5	61	.2
31	26	87	6.1	3.8	--	--	--	--	--
Total load (tons)	--	---	39,410	--	--	1/650	--	--	1/22

Total load for period Apr. 16 to Sept. 30 (tons)---------- 1/240,600

1/ Includes estimated load for missing days.

PRAIRIE DOG CREEK AT NORTON, KANS.

LOCATION.--At gaging station at bridge on U. S. Highway 283, half a mile south of Norton, Norton County.
RECORDS AVAILABLE.--Sediment records: March to September 1947.
EXTREMES, March-September 1947.--Sediment loads: Maximum, 95,800 tons per day June 22; minimum, 0.2 ton per day Sept. 28-30.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Mar. 27, 1947	20	7.6	56.3	19	0.04	76	16	18	8.4	304	34	9.8	0.0	8.0	0.9	359	0.49	256	6.5	13
Apr. 29	22	7.6	52.0	32	.02	64	16	18	14	281	33	11	.2	1.5	.5	317	.43	226	0	14
May 27	15	8.4	57.7	35	.02	80	18	24		1/331	35	10	.5	2.3	2.1	394	.54	274	3.0	16
Aug. 28	10	7.5	59.8	44	.02	91	16	16		344	29	7.0	.3	4.7	.6	408	.55	298	16	10

1/ Includes equivalent of 15 parts per million of carbonate (CO_3).

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KANSAS RIVER BASIN--Continued

PRAIRIE DOG CREEK AT NORTON, KANS.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--
8	--	--	--	--	--	--	--	--	--
9	--	--	--	--	--	--	--	--	--
10	--	--	--	--	--	--	--	--	--
11	--	--	--	--	--	--	206	3,620	2,010
12	--	--	--	--	--	--	183	3,230	1,600
13	--	--	--	--	--	--	123	2,710	900
14	--	--	--	--	--	--	116	2,240	702
15	--	--	--	--	--	--	95	--	500
16	--	--	--	--	--	--	75	2,040	413
17	--	--	--	--	--	--	112	--	900
18	--	--	--	--	--	--	95	--	600
19	--	--	--	--	--	--	63	--	280
20	--	--	--	--	--	--	45	--	120
21	--	--	--	--	--	--	39	630	66
22	--	--	--	--	--	--	33	498	44
23	--	--	--	--	--	--	30	430	35
24	--	--	--	--	--	--	27	--	26
25	--	--	--	--	--	--	24	271	18
26	--	--	--	--	--	--	22	--	12
27	--	--	--	--	--	--	21	187	11
28	--	--	--	--	--	--	21	178	10
29	--	--	--	--	--	--	20	170	9.2
30	--	--	--	--	--	--	19	163	8.4
31	--	--	--	--	--	--	19	155	8.0
Total load (tons)	--	--	--	--	--	--	--	--	8,273

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	18	--	7	17	190	8.7	30	2,210	270
2	18	--	6	24	346	22	14	236	8.9
3	18	110	5.3	18	182	8.8	14	205	7.7
4	18	105	5.1	16	--	6	15	189	7.7
5	18	118	5.7	16	115	5.0	15	214	9.4
6	17	81	3.7	15	90	3.6	1,180	14,000	46,900
7	17	--	3	14	85	3.2	109	4,690	1,630
8	17	62	2.8	14	84	3.2	56	1,730	265
9	18	--	3	14	83	3.1	31	900	75
10	18	--	4	13	83	2.9	58	1,530	322
11	18	--	4	14	82	3.1	57	2,120	332
12	18	--	4	14	82	3.1	384	8,320	9,270
13	17	--	4	14	82	3.1	109	4,360	1,370
14	17	75	3.4	15	390	18	50	1,650	229
15	18	--	4	20	1,410	83	34	875	80
16	17	112	5.1	23	1,040	85	40	1,020	116
17	17	148	6.8	56	3,050	558	51	1,370	189
18	17	--	6.4	21	675	38	43	1,560	180
19	16	--	5.7	17	350	16	25	1,180	80
20	16	121	5.2	16	195	8.4	17	618	28
21	16	112	4.8	16	173	7.5	16	440	19
22	16	104	4.5	15	160	6.5	3,800	8,450	95,800
23	16	98	4.2	14	147	5.6	750	6,880	14,200
24	16	90	3.9	14	132	5.0	667	7,780	23,400
25	16	75	3.2	14	130	4.9	1,370	8,690	33,000
26	16	57	2.5	15	124	5.0	1,040	8,850	25,800
27	16	51	2.2	15	149	6.0	812	6,050	13,800
28	22	1,090	146	16	148	6.4	212	4,120	2,510
29	33	1,990	258	15	106	4.3	109	2,190	656
30	19	345	18	15	90	3.6	82	1,120	248
31	--	--	--	15	1,430	6.7	--	--	--
Total load (tons)	--	--	542	--	--	944	--	--	270,800

KANSAS RIVER BASIN--Continued

PRAIRIE DOG CREEK AT NORTON, KANS.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	68	704	129	17	114	5.2	10	159	4.3
2	59	490	78	16	102	4.4	10	133	3.6
3	54	388	57	15	90	3.6	10	102	2.8
4	50	323	44	15	78	3.2	9	85	2.1
5	45	278	34	14	67	2.5	9	70	1.7
6	40	239	26	14	59	2.2	9	59	1.4
7	36	207	20	14	80	3.0	8	57	1.2
8	36	201	20	14	97	3.7	8	54	1.2
9	34	197	18	13	97	3.4	8	53	1.1
10	49	1,730	729	12	96	3.1	12	500	16
11	396	10,000	13,100	12	96	3.1	10	630	17
12	70	2,570	520	11	96	2.9	8	208	4.5
13	48	1,200	156	12	106	3.4	7	131	2.5
14	39	740	78	14	188	7.1	7	118	2.2
15	45	1,470	259	18	1,330	65	6	102	1.7
16	81	3,700	842	131	12,200	4,900	6	87	1.4
17	53	1,760	252	38	7,010	794	6	66	1.1
18	41	1,000	111	22	1,380	82	6	53	.9
19	34	640	59	16	525	23	5	52	.7
20	30	410	33	13	326	11	5	52	.7
21	26	350	25	12	252	8.2	5	51	.7
22	49	2,320	345	11	221	6.6	5	50	.7
23	34	1,010	96	10	197	5.3	4	50	.5
24	26	372	26	11	187	5.6	4	50	.5
25	24	243	16	28	3,880	332	5	50	.7
26	22	201	12	44	3,960	546	5	48	.6
27	21	190	11	30	1,590	131	4	27	.3
28	19	182	9.3	18	760	37	4	20	.2
29	20	171	9.2	14	403	15	4	20	.2
30	18	142	6.9	12	229	7.4	4	20	.2
31	17	127	5.8	10	172	4.6	--	--	--
Total load (tons)	--	--	17,130	--	--	7,024	--	--	73

Total load for period Mar. 11 to Sept. 30 (tons) ---------- 304,800

SMOKY HILL RIVER NEAR ELLIS, KANS.

LOCATION.--At gaging station at bridge 11½ miles south of Ellis, Ellis County.
DRAINAGE AREA.--5,630 square miles.
RECORDS AVAILABLE.--Sediment records: March to September 1947.
EXTREMES, March-September 1947.--Sediment loads: Maximum, 8,950 tons per day Apr. 10; minimum, less than 0.1 ton per day on several days in September.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Mar. 27, 1947	111	7.7	93.2	19	0.00	109	28	49	10	218	282	22	0.8	2.5	1.1	646	0.88	387	208	21
Apr. 7	60	7.8	103	27	.02	142	14	84		204	380	20	--	3.2	--	826	1.12	412	245	31
Apr. 26	82	7.7	102	11	.40	138	35	43	12	193	380	28	.7	2.5	.8	795	1.08	488	330	16
May 23	160	8.0	87.7	24	.03	106	27	51		200	279	18	1.3	4.0	--	644	.88	375	211	23
Aug. 21	14	7.9	116	27	.02	176	31	55		158	509	16	.9	2.4	.9	952	1.29	566	436	17

KANSAS RIVER BASIN--Continued

SMOKY HILL RIVER NEAR ELLIS, KANS.

Suspended sediment, water year October 1946 to September 1947

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--	--	--
7	--	--	--	--	--	--	45	64	8
8	--	--	--	--	--	--	50	--	11
9	--	--	--	--	--	--	50	--	13
10	--	--	--	--	--	--	55	110	16
11	--	--	--	--	--	--	58	--	--
12	--	--	--	--	--	--	68	--	--
13	--	--	--	--	--	--	73	--	--
14	--	--	--	--	--	--	77	--	--
15	--	--	--	--	--	--	75	460	93
16	--	--	--	--	--	--	79	--	--
17	--	--	--	--	--	--	92	--	--
18	--	--	--	--	--	--	94	--	--
19	--	--	--	--	--	--	96	--	--
20	--	--	--	--	--	--	98	--	--
21	--	--	--	--	--	--	94	--	--
22	--	--	--	--	--	--	100	--	--
23	--	--	--	--	--	--	106	--	--
24	--	--	--	--	--	--	113	--	--
25	--	--	--	--	--	--	127	--	--
26	--	--	--	--	--	--	125	--	--
27	--	--	--	--	--	--	111	456	137
28	--	--	--	--	--	--	94	--	--
29	--	--	--	--	--	--	90	--	--
30	--	--	--	--	--	--	82	--	--
31	--	--	--	--	--	--	80	--	--
Total load (tons)	--	--	--	--	--	--	--	--	1/2, 300

Day	April			May			June		
1	79	--	55	42	140	16	100	394	106
2	77	--	44	37	135	13	94	330	84
3	71	--	32	36	128	12	102	1, 530	421
4	75	130	26	34	115	11	82	1, 110	246
5	75	--	40	31	104	8.7	77	998	207
6	68	--	36	30	87	7.0	109	1, 160	341
7	61	176	29	29	62	4.9	96	350	91
8	58	170	27	30	81	6.6	90	--	97
9	63	576	98	30	92	7.5	84	370	84
10	491	5, 830	8, 950	32	91	7.9	82	350	77
11	155	1, 116	487	40	102	11	84	1, 110	252
12	134	717	263	43	115	13	228	2, 370	1, 580
13	106	341	98	43	117	14	157	1, 440	610
14	94	230	58	50	184	25	125	--	400
15	82	230	51	73	395	78	106	--	240
16	75	230	47	82	378	101	82	498	110
17	64	228	39	333	1, 720	1, 620	70	330	62
18	60	191	31	165	820	365	61	310	51
19	60	183	30	186	1, 440	763	128	1, 040	691
20	55	--	28	170	1, 960	900	235	1, 140	723
21	55	176	26	170	1, 900	872	109	230	68
22	55	141	21	173	1, 810	845	73	210	41
23	52	130	18	157	1, 220	517	61	--	120
24	52	--	18	162	770	337	56	1, 440	218
25	55	120	18	150	676	274	79	1, 600	341
26	50	117	16	132	440	157	160	--	900
27	47	117	15	116	366	115	186	1, 540	773
28	47	118	15	113	555	169	152	1, 280	525
29	46	126	16	142	646	248	132	964	344
30	44	130	15	113	607	185	116	896	281
31	--	--	--	102	505	139	--	--	--
Total load (tons)	--	--	10, 650	--	--	7, 840	--	--	10, 080

1/ Includes estimated load for missing days.

KANSAS RIVER BASIN--Continued

SMOKY HILL RIVER NEAR ELLIS, KANS.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	102	875	241	9	46	1.1	5	80	1.1
2	94	706	179	9	--	--	4	61	.7
3	84	534	121	8	--	--	3	--	--
4	80	490	106	6	--	--	3	--	--
5	70	--	75	5	--	--	3	--	--
6	61	250	41	5	--	--	2	--	--
7	56	187	28	5	--	--	2	--	--
8	52	180	25	5	--	--	1	--	--
9	50	230	31	4	--	--	1	--	--
10	47	277	35	4	--	--	1	31	.1
11	47	268	34	3	--	--	2	--	--
12	47	--	--	4	--	--	2	--	--
13	47	--	--	5	--	--	2	--	--
14	44	--	--	5	--	--	1	--	--
15	44	--	--	17	--	--	1	--	--
16	37	--	--	46	2,770	344	1	--	--
17	36	130	13	46	3,020	375	1	--	--
18	34	121	11	31	1,140	95	1	--	--
19	28	113	8.5	25	684	46	1	--	--
20	23	104	6.5	20	406	22	1	--	--
21	21	98	5.6	14	264	10	1	--	--
22	28	--	13	11	--	--	1	--	--
23	30	--	12	8	--	--	2	--	--
24	29	104	8.1	10	--	--	2	--	--
25	24	85	5.5	13	--	--	2	--	--
26	20	--	4	11	--	--	2	40	.2
27	17	61	2.8	9	--	--	2	--	--
28	17	60	2.8	7	--	--	1	--	--
29	14	--	2	6	--	--	1	--	--
30	13	--	2	6	--	--	1	--	--
31	12	--	2	5	--	--	--	--	--
Total load (tons)	--	--	1/1,130	--	--	1/1,000	--	--	1/7

Total load for period Mar. 7 to Sept. 30 (tons) ---------- 1/33,010

1/ Includes estimated load for missing days.

KANSAS RIVER BASIN--Continued

SALINE RIVER NEAR RUSSELL, KANS.

LOCATION.--At bridge on U. S. Highway 281, 5 miles north of Russell, Russell County.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1947.
Water temperatures: January to May 1946, October 1946 to September 1947.
Sediment records: May 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 4,200 parts per million Sept. 18-30; minimum, 367 parts per million June 5-14.
Total hardness: Maximum, 978 parts per million Sept. 18-30; minimum, 186 parts per million Oct. 1-10.
Water temperatures: Maximum, 80° F. July 8; minimum, freezing point on many days in December, January, February, and March.
Sediment loads: Maximum, 112,000 tons per day Oct. 9; minimum, 0.3 ton per day Sept. 26-30.
EXTREMES, 1945-47.--Dissolved solids: Maximum, 4,200 parts per million Sept. 18-30, 1946; minimum, 367 parts per million June 5-14, 1947.
Total hardness: Maximum, 978 parts per million Sept. 18-30, 1947; minimum, 186 parts per million Oct. 1-10, 1946.
Water temperatures: Maximum, 80° F. July 8, 1947; minimum, freezing point on many days in winter months.
Sediment loads: Maximum, 112,000 tons per day Oct. 9, 1946; minimum, 0.3 ton per day Sept. 26-30, 1947.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086. Records of specific conductance of daily samples available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1946 ----	2,470	57	8.2	61.2	--	0.15	65	5.9	61		140	85	80	0.4	2.0	--	370	0.50	2,470	186	71	41
Oct. 11-20 ---------	880	51	8.4	78.8	--	.10	82	7.9	79		180	116	96	.4	4.0	--	490	.87	900	237	89	42
Oct. 21-31 ---------	175	56	8.3	158	--	.05	141	29	167		1/270	232	250	.4	6.0	--	949	1.29	448	471	250	43
Nov. 1-10----------	220	45	8.4	144	--	.00	131	28	140		240	227	220	.3	3.0	--	930	1.26	552	442	245	41
Nov. 11-20---------	314	39	8.2	98.9	--	.00	92	17	90		198	140	130	.3	3.0	--	618	.84	524	299	137	39
Nov. 21-30---------	126	39	8.2	167	--	.05	143	30	191		274	248	290	.3	4.0	--	1,040	1.41	354	480	255	46
Dec. 1-10----------	94	39	8.2	210	--	.00	167	36	259		300	314	390	.4	4.0	--	1,320	1.80	335	565	319	50
Dec. 11-20---------	83	36	8.0	243	--	.05	167	40	269		308	302	420	.5	7.0	--	1,360	1.85	305	581	328	50
Dec. 21-Jan. 6-----	66	35	8.0	250	--	.03	165	38	305		307	313	460	.5	5.0	--	1,440	1.96	257	568	316	54
Jan. 7-20, 1947 ----	49	33	8.0	253	--	.03	175	38	317		311	326	480	.6	5.0	--	1,500	2.04	198	593	338	54
Jan. 21-31---------	57	33	8.0	250	--	.03	166	32	313		310	302	460	.5	10	--	1,440	1.96	222	546	292	56
Feb. 1-10----------	54	31	8.1	360	--	.02	227	54	500		350	434	800	.6	7.0	--	2,200	2.99	321	788	501	58
Feb. 11-20---------	64	33	8.0	287	--	.02	183	38	367		286	312	600	.5	5.0	--	1,650	2.24	285	613	378	57
Feb. 21-28---------	43	32	8.2	311	--	.00	192	46	406		302	358	650	.6	5.0	--	1,860	2.53	216	406	150	57
Mar. 1-10 ---------	52	32	7.9	333	--	.20	192	49	434		308	370	696	.5	5.0	--	1,900	2.58	286	681	428	58
Mar. 11-20 ---------	73	37	8.3	264	--	.10	165	45	309		2/260	331	500	.5	4.5	--	1,480	2.01	292	597	384	53
Mar. 21-31 ---------	73	44	7.9	218	--	.10	140	36	259		265	247	414	.6	2.0	--	1,230	1.67	242	497	280	53
Mar. 27 3/--------	65	--	7.5	209	12	.05	134	38	273	13	252	246	445	.1	3.0	2.0	1,290	1.75	227	482	276	54

1/ Includes equivalent of 8 parts per million of carbonate (CO_3).
2/ Includes equivalent of 14 parts per million of carbonate (CO_3).
3/ Not included in weighted average.

KANSAS RIVER BASIN--Continued

SALINE RIVER NEAR RUSSELL, KANS.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Apr. 1-5, 1947	53	48	8.2	265	16	0.05	146	44	364	3.6	241	312	576	0.5	3.5	1.2	1,590	2.16	227	545	347	59
Apr. 6-9	55	44	7.9	292	13	.00	160	50	410	1.6	236	357	655	.5	3.0	1.2	1,770	2.41	262	605	411	59
Apr. 10 3/	494	--	8.0	102	17	.15	83	12	115		226	119	139	.4	.1	.2	604	.82	806	256	71	49
Apr. 11 3/	222	--	8.2	120	23	.01	141	21	85		142	313	125	.4	3.5	--	823	1.12	493	438	322	30
Apr. 10-13	231	47	7.8	167	27	.01	141	32	180	1.6	200	288	280	.6	8.5	.5	1,060	1.44	661	483	319	44
Apr. 14-30	64	49	7.9	279	15	.01	175	54	373	1.2	244	404	595	.6	4.0	1.0	1,770	2.41	306	659	459	55
Apr. 25 3/	51	--	7.9	307	10	.20	170	46	448	15	237	406	700	.8	1.0	1.1	1,910	2.80	264	613	419	61
May 1-3	151	55	7.8	94.1	27	.05	79	20	88	1.6	188	120	130	.3	3.5	--	560	.76	228	279	125	40
May 4-8	68	57	8.2	203	20	.05	132	24	285	1.6	236	278	395	.4	3.5	.8	1,260	1.71	232	428	234	59
May 9-27	66	59	8.2	246	18	.05	161	46	304	4.0	228	383	485	.4	1.5	.5	1,500	2.04	267	591	404	53
May 28-31	166	55	8.1	103	27	.01	99	22	98	2.0	176	234	110	.4	3.0	.3	880	.92	305	337	193	39
June 1-4	193	68	7.7	175	23	.05	138	35	171	15	210	271	294	.5	1.5	--	1,050	1.43	547	488	316	42
June 5-14	1,500	67	8.1	62.8	25	.05	68	9.6	30	7.2	163	67	52	.4	.5	.2	367	.50	1,490	209	75	23
June 15-30	418	68	8.0	114	23	.05	112	20	78	11	187	170	152	.4	2.0	.2	694	.94	784	362	209	31
July 1-3	203	68	8.4	139	25	.02	134	24	128	11	4/215	184	223	.4	4.0	.4	864	1.18	473	433	257	38
July 4-14	121	74	8.2	197	26	.02	166	33	208	8.8	276	278	359	.4	4.0	.8	1,220	1.66	399	550	324	45
July 15-28	73	71	8.0	260	24	.04	180	44	329	13	253	356	522	.4	4.0	1.0	1,600	2.18	315	630	423	52
July 29-Aug. 10	38	72	8.2	347	20	.02	190	52	500	9.8	261	453	756	.4	2.0	1.2	2,120	2.88	218	688	474	61
Aug. 11-19	25	72	7.9	416	24	.02	209	62	636	10	262	521	984	.4	1.0	1.5	2,580	3.51	175	776	561	64
Aug. 20-Sept. 1	19	71	7.9	478	24	.02	219	69	781	8.8	265	575	1,190	.5	2.0	2.2	3,000	4.08	153	830	613	67
Sept. 2-6	13	68	7.8	545	18	.02	221	76	907	11	281	635	1,380	.5	2.0	2.2	3,390	4.61	119	864	634	69
Sept. 7-17	9.6	66	7.8	600	18	.02	232	83	1,050	19	292	890	1,560	.5	2.0	2.2	3,800	5.17	99	920	681	71
Sept. 18-30	6.4	60	7.9	668	22	.02	242	91	1,180	19	308	745	1,750	.6	2.0	2.8	4,200	5.71	71	978	725	72
Weighted average -	216	--	--	117	--	0.08	99	18	124		190	158	186	0.4	2.6	--	706	0.96	416	321	165	39

3/ Not included in weighted average.
4/ Includes equivalent of 20 parts per million of carbonate (CO_3).

Temperature (° F.) of water, water year October 1946 to September 1947

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

KANSAS RIVER BASIN--Continued

SALINE RIVER NEAR RUSSELL, KANS.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	76	2,300	472
2	--	--	--	--	--	--	47	735	93
3	--	--	--	--	--	--	38	242	25
4	--	--	--	--	--	--	35	172	16
5	--	--	--	--	--	--	31	146	12
6	--	--	--	--	--	--	28	116	8.8
7	--	--	--	--	--	--	25	106	7.2
8	--	--	--	--	--	--	24	104	6.7
9	--	--	--	--	--	--	22	102	6.1
10	--	--	--	--	--	--	21	99	5.6
11	--	--	--	--	--	--	20	99	5.3
12	--	--	--	--	--	--	18	110	5.3
13	--	--	--	--	--	--	18	128	6.2
14	--	--	--	--	--	--	17	146	6.7
15	--	--	--	--	--	--	16	141	6.1
16	--	--	--	--	--	--	15	132	5.3
17	--	--	--	--	--	--	15	123	5.0
18	--	--	--	--	--	--	16	118	5.1
19	--	--	--	--	--	--	43	1,280	252
20	--	--	--	--	--	--	44	2,350	294
21	--	--	--	--	--	--	70	1,710	327
22	--	--	--	--	--	--	39	714	75
23	--	--	--	16	75	3.2	35	380	36
24	--	--	--	15	75	3.0	30	262	21
25	--	--	--	15	75	3.0	26	151	11
26	--	--	--	15	75	3.0	22	157	9.3
27	--	--	--	16	112	4.8	20	161	8.7
28	--	--	--	16	114	4.9	73	2,060	1,850
29	--	--	--	22	133	7.9	86	3,500	1,580
30	--	--	--	33	3,630	32	18	201	9.8
31	--	--	--	301	9,700	8,740	--	--	--
Total load (tons)	--	--	--	--	--	8,802	--	--	5,171

Day	July			August			September		
1	16	155	6.7	24	177	11	31	1,590	226
2	15	152	6.2	18	141	6.9	32	1,270	110
3	16	151	6.5	16	121	5.2	16	97	4.2
4	16	126	5.4	15	117	4.7	13	62	2.2
5	22	1,660	146	14	129	4.9	11	64	1.9
6	122	3,120	1,240	13	118	4.1	49	1,000	971
7	238	6,100	4,110	11	96	2.9	2,150	7,680	42,400
8	162	3,270	1,580	11	103	3.1	330	4,900	4,760
9	97	1,570	411	10	88	2.4	904	11,700	31,100
10	90	2,340	572	9	82	2.0	385	4,560	5,040
11	50	750	101	8	82	1.8	170	2,410	1,120
12	33	450	40	9	97	2.4	118	1,140	371
13	28	307	23	8	73	1.6	96	645	167
14	25	214	14	9	69	1.7	122	1,450	506
15	22	196	12	8	72	1.6	77	446	93
16	20	183	9.9	9	101	2.5	70	259	49
17	19	205	11	11	116	3.4	64	215	37
18	18	214	10	8	67	1.4	55	170	25
19	17	216	9.9	6	56	.9	53	161	23
20	53	1,840	294	6	52	.8	51	146	20
21	28	730	55	5	66	.9	47	138	18
22	28	657	50	5	74	1.0	47	128	16
23	24	367	24	6	86	1.4	43	103	12
24	26	349	24	6	103	1.7	39	89	9.4
25	23	350	22	7	78	1.5	37	84	8.4
26	87	2,500	620	6	53	.9	34	54	5.0
27	73	1,680	335	6	52	.8	32	47	4.1
28	52	998	140	6	56	.9	31	47	3.9
29	40	630	68	11	77	2.3	30	47	3.8
30	33	410	37	13	92	3.2	2,160	6,850	44,400
31	28	300	23	17	81	3.7	--	--	--
Total load (tons)	--	--	10,010	--	--	84	--	--	131,500

Total load for period May 23 to Sept. 30 (tons) ---------- 155,600

KANSAS RIVER BASIN--Continued

SALINE RIVER NEAR RUSSELL, KANS.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	937	4,870	13,200	139	178	67	100	96	26
2	260	2,900	2,100	140	168	64	99	85	23
3	148	1,540	622	146	149	59	97	84	22
4	134	2,370	1,020	146	169	67	95	84	22
5	216	5,540	3,460	146	250	99	91	84	21
6	432	4,950	7,460	192	650	358	90	84	20
7	5,610	5,150	77,600	272	1,500	1,100	93	83	21
8	3,370	4,850	46,400	272	1,110	833	95	81	21
9	9,060	4,580	112,000	350	1,620	1,500	88	74	18
10	4,500	3,910	47,400	400	1,210	1,350	88	80	19
11	2,430	3,730	25,100	842	5,110	12,200	88	118	28
12	1,140	3,340	10,400	505	2,630	3,690	87	152	36
13	710	2,020	3,920	375	1,680	1,700	87	145	34
14	550	1,260	1,870	270	792	585	86	126	29
15	445	920	1,100	230	505	315	84	114	26
16	375	829	839	206	426	237	82	108	24
17	338	620	566	200	296	160	82	128	28
18	300	506	410	182	284	140	87	152	36
19	270	432	315	168	234	106	73	159	31
20	246	411	273	160	198	86	76	153	30
21	230	375	233	152	195	80	76	110	21
22	216	305	178	145	194	76	82	93	19
23	200	300	165	142	193	74	85	99	20
24	187	292	147	136	189	69	81	94	18
25	175	240	113	134	177	64	81	81	16
26	167	226	102	123	171	57	81	85	16
27	160	207	89	114	147	45	82	85	16
28	154	187	78	105	122	35	74	--	--
29	148	185	74	104	109	31	50	--	--
30	144	184	72	104	105	29	35	--	--
31	140	181	68	--	--	--	30	--	--
Total load (tons)	--	--	357,400	--	--	25,280	--	--	1/700

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	30	--	--	30	84	7.9	30	87	8.9
2	30	--	--	30	112	12	30	80	9.7
3	30	--	--	30	100	12	35	86	13
4	30	--	--	30	100	13	35	86	13
5	30	--	--	35	122		40	--	13
6	35	--	--	35	142	25	40	92	12
7	35	--	--	40	--	18	45	96	15
8	40	--	--	45	--	24	50	97	14
9	40	--	--	45	117	19	52	89	12
10	40	--	--	50	143	23	57	81	12
11	40	--	--	55	113	18	56	80	12
12	40	--	--	60	80	14	67	117	21
13	40	--	--	67	126	23	79	156	33
14	45	--	--	61	168	28	79	155	33
15	45	--	--	71	172	33	79	165	35
16	50	--	--	69	169	31	77	151	31
17	50	118	18	69	144	27	70	96	18
18	55	106	17	63	115	20	74	78	16
19	55	91	16	59	105	17	74	73	15
20	60	107	19	56	98	15	75	68	14
21	60	98	18	52	92	13	88	93	22
22	60	112	21	51	86	12	101	253	69
23	63	128	22	51	91	13	94	197	50
24	63	127	22	31	94	7.9	86	125	29
25	64	117	20	30	105	11	77	80	17
26	63	107	18	30	131	13	70	69	13
27	60	98	16	30	82	9.1	65	59	10
28	56	91	14	30	78	8.8	59	50	8.0
29	54	90	13	--	--	--	58	41	6.4
30	34	105	9.6	--	--	--	55	39	5.8
31	30	84	6.8	--	--	--	54	38	5.5
Total load (tons)	--	--	1/450	--	--	489	--	--	586

1/ Includes estimated load for missing days.

KANSAS RIVER BASIN--Continued

SALINE RIVER NEAR RUSSELL, KANS.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	53	37	5.3	214	5,450	3,360	99	796	213
2	53	37	5.3	136	1,880	700	87	642	151
3	53	37	5.3	104	735	206	79	548	117
4	53	39	5.6	84	360	82	506	4,180	12,100
5	53	47	6.7	73	259	51	2,160	7,110	42,800
6	53	43	6.2	66	230	41	1,870	8,360	42,600
7	51	34	4.7	61	200	33	1,810	7,330	35,400
8	48	27	3.5	57	178	27	3,440	5,460	52,400
9	68	969	485	56	172	26	1,150	3,810	12,300
10	494	14,700	19,900	54	170	25	560	2,300	3,480
11	222	7,390	4,860	54	170	25	367	1,380	1,370
12	117	1,880	602	57	170	26	906	3,850	13,200
13	90	600	146	54	169	25	1,940	5,930	30,800
14	79	302	64	53	167	24	755	2,640	5,700
15	73	242	48	54	156	23	488	1,310	8,730
16	68	280	51	54	158	23	352	1,110	1,050
17	64	292	50	61	248	41	296	--	800
18	61	295	49	82	585	130	259	--	640
19	60	287	46	95	831	213	230	--	500
20	58	274	43	90	720	175	232	1,200	752
21	56	263	40	75	294	60	239	1,570	1,030
22	54	253	37	65	221	39	1,090	5,560	16,900
23	53	245	35	61	210	35	756	4,360	9,610
24	51	243	33	62	202	34	261	1,330	963
25	51	257	35	63	328	84	364	2,360	2,320
26	50	275	37	79	1,380	323	379	2,440	2,580
27	50	286	39	86	562	157	681	4,320	8,720
28	49	286	38	175	1,760	1,770	496	3,780	5,150
29	48	286	37	173	4,880	2,300	313	1,550	1,310
30	163	4,300	3,350	192	4,300	2,310	247	820	547
31	--	--	--	122	1,600	527	--	--	--
Total load (tons)	--	--	30,070	--	--	12,900	--	--	307,200

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	237	800	512	44	169	20	16	61	2.6
2	185	590	295	39	169	18	14	54	2.0
3	188	1,210	660	37	169	17	13	54	1.9
4	148	434	173	34	169	16	13	54	1.9
5	141	360	137	32	171	15	12	54	1.7
6	134	297	107	36	218	21	12	54	1.7
7	128	252	87	33	206	18	11	53	1.6
8	120	235	76	30	190	15	10	53	1.4
9	113	187	57	28	174	13	10	52	1.4
10	110	169	50	27	162	12	10	51	1.4
11	109	197	58	25	157	11	11	49	1.5
12	120	382	124	24	176	11	10	47	1.3
13	116	409	128	24	237	15	9	45	1.1
14	97	322	84	24	218	14	9	43	1.0
15	90	248	60	26	191	13	9	41	1.0
16	84	202	46	26	212	15	9	43	1.0
17	82	198	44	24	205	13	8	57	1.2
18	78	198	42	24	200	13	8	55	1.2
19	75	198	40	24	194	13	7	51	1.0
20	72	198	38	23	189	12	7	44	.8
21	69	198	37	21	185	10	7	31	.6
22	73	241	48	20	201	11	6	27	.4
23	70	230	43	19	219	11	6	27	.4
24	70	211	40	18	229	11	8	27	.4
25	70	193	36	18	274	13	8	23	.4
26	68	178	33	20	261	14	9	20	.3
27	63	169	29	20	271	15	9	18	.3
28	58	169	26	19	313	16	8	18	.3
29	53	169	24	18	223	11	8	18	.3
30	49	168	22	17	208	9.5	8	18	.3
31	47	168	21	16	230	9.9	--	--	--
Total load (tons)	--	--	3,177	--	--	426	--	--	32

Total load for year (tons)---------- 1/738,700

1/ Includes estimated load for missing days.

PARADISE CREEK NEAR PARADISE, KANS.

LOCATION.--At bridge on U. S. Highway 281, 3½ miles east and 3 miles south of Paradise, Russell County, and 12 miles north of Russell County.
DRAINAGE AREA.--212 square miles.
RECORDS AVAILABLE.--Chemical analyses: March to September 1947.
Sediment records: March to September 1947.
EXTREMES, March-September 1947.--Dissolved solids: Maximum, 1,040 parts per million Apr. 25; minimum, 238 parts per million June 25-30.
Total hardness: Maximum, 700 parts per million Apr. 25; minimum, 168 parts per million June 25-30.
Sediment loads: Maximum, 22,200 tons per day Apr. 10; minimum, 0 tons per day during frequent periods of no flow.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086. Records of specific conductance of daily samples available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Mar. 7-18, 1947----	3.3	7.4	103	12	0.05	169	23	25	14	216	363	21	0.2	4.0	0.3	767	1.04	6.9	516	339	9
Mar. 19-31---------	.4	8.3	97.8	7.0	.04	172	21	34	14	222	369	27	.2	2.0	.3	774	1.05	.8	515	333	12
Mar. 27 1/---------	0	7.2	107	22	.10	172	26	37	15	245	362	39	.5	1.8	1.6	814	1.11	.0	536	335	13
Apr. 1-10 ---------	48	8.1	120	8.0	.10	178	23	63	16	236	389	70	.2	1.6	.5	890	1.21	116	541	347	20
Apr. 11-20 --------	23	8.5	85.1	14	.10	145	19	18	16	200	294	18	.2	5.0	.5	644	.88	40	440	276	8
Apr. 21-30 --------	21	8.4	120	9.0	.09	211	29	34	16	210	504	29	.2	3.0	.5	975	1.33	56	646	474	10
Apr. 25 1/---------	.6	7.0	133	1.0	.05	218	38	47	15	184	588	40	.2	2.0	.8	1,040	1.41	2.1	700	549	13
May 1-10 ----------	2.8	8.9	68.7	15	.05	109	12	19	7.0	215	162	21	.3	4.0	.5	467	.64	3.7	321	145	15
May 11-17 ---------	1.1	8.5	91.2	9.0	.05	157	19	25	17	213	323	23	.3	3.0	.5	701	.95	2.1	470	295	10
May 18-21 ---------	10	7.9	87.9	18	.20	43	18	107	9.2	142	300	5.0	.4	1.5	--	581	.79	16	181	65	55
May 22-31 ---------	.9	8.3	103	13	.04	189	27	21	21	252	395	25	.3	2.0	.5	849	1.15	1.7	582	375	7
June 1-10 ---------	142	8.0	53.5	8.0	.09	88	11	9.6	3.4	180	126	8.0	.3	4.0	.3	368	.50	141	265	117	10
June 11-20---------	170	8.5	48.6	12	.02	79	9.4	11	4.0	180	100	8.8	.4	5.0	.3	337	.46	155	236	88	12
June 21-24---------	327	7.8	92.3	20	.10	143	23	21	3.2	206	291	19	.4	2.5	--	650	.88	574	451	282	9
June 25-30---------	55	7.8	37.7	23	.50	56	6.8	7.5	4.4	168	38	5.5	.3	3.5	--	238	.32	35	168	30	9
June 27 1/---------	296	7.8	40.9	17	.07	98	5.0	3.5	1.2	230	77	1.0	.4	.0	--	330	.45	264	265	76	2
July 1-22 ----------	.7	7.6	64	22	.40	96	10	19	3.2	176	155	12	.3	6.0	--	431	.59	.9	281	137	13
July 23-Aug. 21 1/--	0.0	7.7	99.2	18	.05	152	22	31	5.6	221	298	24	.4	4.0	--	692	.94	.0	470	289	12
Weighted average-	2/29.1	--	69.9	13	0.10	111	15	19	5.8	192	196	17	0.3	3.7	--	497	0.68	39	338	181	11

1/Not included in weighted average.
2/Mean discharge for water year October 1946 to September 1947 was 18.1 second-feet.

KANSAS RIVER BASIN--Continued

PARADISE CREEK NEAR PARADISE, KANS.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--
8	--	--	--	--	--	--	--	--	--
9	--	--	--	--	--	--	--	--	--
10	--	--	--	--	--	--	--	--	--
11	--	--	--	--	--	--	--	--	--
12	--	--	--	--	--	--	--	--	--
13	--	--	--	--	--	--	--	--	--
14	--	--	--	--	--	--	--	--	--
15	--	--	--	--	--	--	--	--	--
16	--	--	--	--	--	--	2.4	--	--
17	--	--	--	--	--	--	1.2	--	--
18	--	--	--	--	--	--	.8	--	--
19	--	--	--	--	--	--	.6	43	0.1
20	--	--	--	--	--	--	.5	--	0
21	--	--	--	--	--	--	.5	22	0
22	--	--	--	--	--	--	.3	--	0
23	--	--	--	--	--	--	0	--	0
24	--	--	--	--	--	--	.1	69	0
25	--	--	--	--	--	--	0	--	0
26	--	--	--	--	--	--	0	--	0
27	--	--	--	--	--	--	0	--	0
28	--	--	--	--	--	--	0	--	0
29	--	--	--	--	--	--	0	--	0
30	--	--	--	--	--	--	0	--	0
31	--	--	--	--	--	--	0	--	0
Total load (tons)	--	--	--	--	--	--	--	--	1/1

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	0	--	0	11	1,120	33	5.6	160	2.4
2	0	--	0	6.7	1,010	18	1.9	160	.8
3	0	--	0	3.3	632	5.6	.8	150	.3
4	0	--	0	3.5	350	3.3	.5	84	.1
5	.1	28	0	1.1	203	.6	268	11,600	9,850
6	.1	--	0	1.2	137	.4	351	12,300	11,700
7	.1	138	0	.7	95	.2	407	7,380	8,580
8	.1	152	0	.5	62	.1	77	2,450	509
9	44	--	950	.5	54	.1	19	1,010	52
10	570	13,900	22,200	.6	52	.1	8.3	300	6.7
11	172	11,800	5,480	.5	70	.1	6.3	200	3.4
12	43	3,500	406	.5	88	.1	823	8,900	20,700
13	7.6	860	18	.6	90	.1	275	5,400	4,360
14	3.5	265	2.5	.7	90	.2	66	2,150	383
15	2.2	182	1.1	.5	90	.1	11	640	19
16	1.9	168	.9	3.3	247	2.2	3.8	267	2.7
17	3.8	147	1.5	7.3	291	5.7	1.9	201	1.0
18	1.4	104	.4	1.1	173	.5	1.1	164	.5
19	2.2	130	.8	3.6	233	2.3	.6	150	.2
20	.1	129	0	8.0	227	4.9	.6	105	.2
21	0	--	0	7.0	111	2.1	5.3	186	2.7
22	0	--	0	1.3	125	.4	872	8,130	19,700
23	.1	115	0	1.0	117	.3	275	4,430	3,290
24	2.1	118	.7	1.3	100	.4	57	1,860	286
25	6.0	121	2.0	1.1	87	.3	12	620	20
26	.6	128	0	.6	109	.2	6.3	780	13
27	.3	134	.1	.4	104	.1	296	6,090	6,210
28	.1	--	0	.3	95	.1	13	970	34
29	.1	--	0	.3	109	.1	6.3	--	4
30	7.0	1,310	25	.9	169	.4	7.6	180	3.7
31	--	--	--	.3	171	1.5	--	--	--
Total load (tons)	--	--	29,090	--	--	84	--	--	85,730

KANSAS RIVER BASIN--Continued

PARADISE CREEK NEAR PARADISE, KANS.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	4.5	122	1.5	0	--	0	0	--	0
2	3.8	131	1.3	0	--	0	0	--	0
3	4.9	202	2.7	0	--	0	0	--	0
4	4.0	130	1.4	0	--	0	0	--	0
5	4.0	119	1.3	0	--	0	0	--	0
6	3.8	82	.8	0	--	0	0	--	0
7	3.2	53	.4	0	--	0	0	--	0
8	2.5	50	.3	0	--	0	0	--	0
9	2.1	51	.3	0	--	0	0	--	0
10	1.8	71	.3	0	--	0	0	--	0
11	1.9	86	.4	0	--	0	0	--	0
12	3.8	114	1.2	0	--	0	0	--	0
13	1.5	62	.2	0	--	0	0	--	0
14	1.0	56	.2	0	--	0	0	--	0
15	.8	58	.1	0	--	0	0	--	0
16	.4	65	0	0	--	0	0	--	0
17	.3	63	0	0	--	0	0	--	0
18	.3	57	0	0	--	0	0	--	0
19	.1	52	0	0	--	0	0	--	0
20	0	--	0	0	--	0	0	--	0
21	0	--	0	0	--	0	0	--	0
22	.1	40	0	0	--	0	0	--	0
23	.1	49	0	0	--	0	0	--	0
24	.1	50	0	0	--	0	0	--	0
25	.1	50	0	0	--	0	0	--	0
26	.1	48	0	0	--	0	0	--	0
27	.1	40	0	0	--	0	0	--	0
28	.1	30	0	0	--	0	0	--	0
29	.1	21	0	0	--	0	0	--	0
30	0	--	0	0	--	0	0	--	0
31	0	--	0	0	--	0	--	--	--
Total load (tons)	--	--	12	--	--	0	--	--	0

Total load for period Mar. 16 to Sept. 30 (tons)---------- 1/114,900

1/Includes estimated load for missing days.

KANSAS RIVER BASIN--Continued

WOLF CREEK NEAR SYLVAN GROVE, KANS.

LOCATION.--Three miles upstream from mouth, and 4½ miles west of Sylvan Grove, Lincoln County.
RECORDS AVAILABLE.--Sediment records: April to September 1947.
EXTREMES, April-September 1947.--Sediment loads: Maximum, 36,800 tons per day Apr. 10; minimum, 0.1 ton per day on many days in September.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Mar. 12, 1947	5.0	7.7	259	20	0.05	127	35	445	6.0	290	395	541	0.2	30	0.9	1,740	2.37	461	223	67
Apr. 2	4.0	7.2	341	1.6	.05	130	43	554	11	315	440	710	.0	2.5	1.6	2,050	2.79	502	244	70
Apr. 10	950	8.3	45.9	17	.01	69	7.9	20		191	72	9.3	.4	2.0	.3	297	.40	205	48	17
Apr. 11	320	8.2	43.4	24	.01	67	6.8	14		138	74	20	.3	8.0	.3	291	.40	195	82	14
Apr. 25	7.0	7.3	292	4.4	.02	162	40	422	11	291	479	530	.0	20	1.5	1,810	2.46	568	330	61
May 22	6.0	7.8	226	9.0	.01	173	34	274		266	460	330	.3	6.0	2.0	1,420	1.93	571	353	51
June 12	1,250	7.9	43.6	16	.01	74	8.3	13		222	43	14	.3	.2	1.0	281	.38	219	37	12

KANSAS RIVER BASIN--Continued

WOLF CREEK NEAR SYLVAN GROVE, KANS.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	3	130	1.1	5	220	3.0	21	2,660	232
2	4	129	1.4	5	220	3.0	13	755	26
3	4	180	1.9	5	220	3.0	10	224	6.0
4	4	187	2.0	4	220	2.4	8	240	5.2
5	4	170	1.8	5	220	3.0	289	4,070	6,610
6	4	157	1.7	5	221	3.0	1,040	4,970	13,500
7	4	174	1.9	4	256	2.8	633	3,090	5,980
8	3	171	1.4	4	261	2.8	78	1,080	256
9	4	229	8.8	4	231	2.5	22	162	9.6
10	950	16,600	36,800	5	183	2.5	10	250	6.8
11	320	7,090	7,450	5	197	2.7	7	296	5.6
12	29	2,250	199	6	191	3.1	384	4,620	5,560
13	15	--	40	6	--	3	646	3,300	6,760
14	12	--	20	6	202	3.3	85	1,670	414
15	11	376	11	5	200	2.7	18	680	33
16	11	--	9	5	216	2.9	13	308	11
17	11	305	9.0	6	199	3.2	10	258	7.0
18	11	315	9.4	7	163	3.1	8	230	5.0
19	10	300	8.1	10	233	6.3	88	1,600	999
20	9	--	7	8	142	3.1	80	3,160	853
21	9	267	6.5	6	140	2.3	10	1,100	30
22	8	228	4.9	6	140	2.3	82	2,060	1,320
23	8	217	4.7	5	140	1.9	1,170	2,780	8,830
24	7	213	4.0	5	140	1.9	64	1,920	347
25	7	210	4.0	6	140	2.3	33	760	68
26	7	207	3.9	6	140	2.3	34	1,030	94
27	6	204	3.3	6	140	2.3	209	2,410	2,640
26	6	200	3.2	7	140	2.6	248	3,320	2,500
29	6	198	3.2	10	139	3.8	22	1,460	94
30	6	168	2.7	8	122	2.6	14	--	26
31	--	--	--	7	111	2.1	--	--	--
Total load (tons)	--	--	44,620	--	--	88	--	--	57,230

Day	July			August			September		
1	12	289	9.4	2	--	0.5	1	--	--
2	11	195	5.8	2	154	.8	1	--	--
3	99	1,250	1,120	2	--	1	1	--	--
4	186	2,740	1,830	2	--	1	1	--	--
5	13	860	30	2	180	1.0	1	50	.1
6	8	228	4.9	2	183	1.0	1	--	.1
7	6	--	3	2	205	1.1	1	--	.1
8	5	--	2	2	--	1	1	50	.1
9	5	--	2	2	210	1.1	1	--	.1
10	4	92	1.0	2	208	1.1	1	--	.1
11	4	--	.7	2	207	1.1	1	--	.1
12	6	42	.7	1	--	.6	1	50	.1
13	5	--	.5	1	205	.6	1	--	--
14	4	40	.4	1	205	.6	1	--	--
15	4	--	.4	2	217	1.2	1	--	--
16	4	40	.4	2	--	1	1	--	--
17	4	40	.4	2	--	1	1	50	.1
18	4	--	.5	1	220	.6	1	--	.1
19	3	--	.4	1	--	.6	1	50	.1
20	3	50	.4	1	--	.6	1	--	--
21	3	--	.4	1	--	.6	1	--	--
22	4	--	.5	1	220	.6	1	--	--
23	4	55	.6	1	--	.6	1	--	--
24	4	--	.6	1	--	.6	1	--	--
25	4	--	.6	1	--	.6	1	40	.1
26	4	--	.6	1	220	.6	1	40	.1
27	4	60	.6	1	220	.6	1	--	.1
28	3	--	.5	1	265	.7	1	--	.1
29	3	--	.5	1	--	.7	1	--	.1
30	3	60	.5	1	--	.8	1	53	.1
31	2	62	.3	1	--	.5	--	--	--
Total load (tons)	--	--	3,019	--	--	24	--	--	1/3

Total load for period Apr. 1 to Sept. 30 (tons) ---------- 1/105,000

1/Includes estimated load for missing days.

KANSAS RIVER BASIN--Continued

SOUTH FORK SOLOMON RIVER AT ALTON, KANS.

LOCATION.--At gaging station at steel truss county bridge one mile south of Alton, Oregon County.
DRAINAGE AREA.--1,720 square miles.
RECORDS AVAILABLE.--Sediment records: June 1946 to September 1947.
EXTREMES, 1946-47.--Sediment loads: Maximum, 168,000 tons per day Oct. 8; minimum, 0.4 ton per day Sept. 26-30.
EXTREMES, June 1946-September 1947.--Sediment loads: Maximum, 168,000 tons per day Oct. 8, 1946; minimum, 0.4 ton per day Aug. 15-22, 28-31, Sept. 1, 4, 1946, Sept. 26-30, 1947.
REMARKS.--Records of water discharge for water years October 1945 to September 1947 given in Water-Supply Papers 1056 and 1086.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Mar. 21, 1947	104	7.7	66.1	22	0.02	90	16	26	9.7	242	124	20	0.3	2.8	1.0	436	0.60	290	92	16
Apr. 7	45	8.4	61.3	39	--	99	12	26		1/229	126	24	--	.8	--	450	.61	296	108	16
Apr. 25	36	7.6	70.5	18	.02	88	18	34	10	241	138	26	.3	2.0	.7	463	.63	294	96	19
May 22	57	7.8	65.0	29	.02	85	19	27		225	129	20	.4	1.6	2.0	464	.63	290	106	17
June 6	798	7.5	42.8	21	.02	65	8.1	10		226	26	2.0	.3	.2	1.0	282	.38	196	11	10
Aug. 21	4	7.6	66.5	31	.02	92	17	38		251	135	23	.4	2.2	.9	480	.65	299	93	22

1/ Includes equivalent of 12 parts per million of carbonate (CO_3).

KANSAS RIVER BASIN--Continued

SOUTH FORK SOLOMON RIVER AT ALTON, KANS.--Continued

Suspended sediment, water year October 1945 to September 1946

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--
8	--	--	--	--	--	--	--	--	--
9	--	--	--	--	--	--	--	--	--
10	--	--	--	--	--	--	--	--	--
11	--	--	--	--	--	--	--	--	--
12	--	--	--	--	--	--	5	280	3.8
13	--	--	--	--	--	--	4	280	3.0
14	--	--	--	--	--	--	4	280	3.0
15	--	--	--	--	--	--	3	280	2.3
16	--	--	--	--	--	--	3	280	2.3
17	--	--	--	--	--	--	3	282	2.3
18	--	--	--	--	--	--	64	1,460	1,280
19	--	--	--	--	--	--	1,510	11,700	47,800
20	--	--	--	--	--	--	1,060	8,060	23,600
21	--	--	--	--	--	--	318	6,610	5,810
22	--	--	--	--	--	--	159	3,060	1,400
23	--	--	--	--	--	--	95	845	217
24	--	--	--	--	--	--	68	360	66
25	--	--	--	--	--	--	52	269	38
26	--	--	--	--	--	--	42	239	27
27	--	--	--	--	--	--	32	206	18
28	--	--	--	--	--	--	29	214	16
29	--	--	--	--	--	--	23	250	16
30	--	--	--	--	--	--	17	208	9.5
31	--	--	--	--	--	--	--	--	--
Total load (tons)	--	--	--	--	--	--	--	--	80,320

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	15	208	8.4	4	200	2.2	1	145	0.4
2	13	208	7.3	3	200	1.6	1	197	.5
3	13	--	7	3	200	1.6	2	176	1.0
4	13	--	8	2	199	1.1	1	149	.4
5	391	--	8,000	2	192	1.0	1	179	.5
6	272	--	5,000	2	180	1.0	2	428	2.3
7	158	--	1,300	2	172	.9	1,050	10,900	42,900
8	103	--	390	2	169	.9	2,470	11,000	77,400
9	72	--	100	2	164	.9	448	6,800	8,610
10	52	296	42	2	218	1.2	238	2,800	1,880
11	37	227	23	1	230	.6	177	1,410	674
12	28	202	15	1	205	.6	127	1,010	346
13	21	195	11	2	180	1.0	131	--	1,200
14	17	195	9.0	2	161	.9	88	756	180
15	46	1,450	205	1	150	.4	86	312	72
16	24	272	18	1	141	.4	66	277	49
17	12	171	5.5	1	134	.4	54	168	27
18	10	165	4.5	1	133	.4	47	151	19
19	8	179	3.9	1	134	.4	46	142	18
20	6	168	2.7	1	136	.4	46	114	14
21	6	149	2.4	1	137	.4	47	--	13
22	6	170	2.8	1	144	.4	43	90	10
23	91	957	242	1	170	.5	34	64	6.0
24	72	660	128	1	185	.5	30	68	5.5
25	55	--	140	1	195	.5	25	991	6.1
26	65	1,050	164	1	193	.5	21	105	6.0
27	43	510	59	1	173	.5	18	108	5.2
28	31	295	25	1	160	.4	20	80	4.3
29	20	242	13	1	151	.4	498	11,200	26,100
30	13	218	7.7	1	140	.4	408	11,000	12,400
31	8	201	4.3	1	137	.4	--	--	--
Total load (tons)	--	--	15,970	--	--	23	--	--	172,000
Total load for period June 12 to Sept. 30 (tons)									268,300

KANSAS RIVER BASIN--Continued

SOUTH FORK SOLOMON RIVER AT ALTON, KANS.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	200	5,680	3,150	160	1,740	903	69	108	20
2	128	--	950	157	1,040	444	67	111	20
3	92	910	226	128	375	130	67	112	20
4	100	1,450	573	116	555	174	66	--	19
5	295	5,690	6,550	112	455	138	67	97	18
6	3,610	12,100	114,000	132	--	300	66	87	16
7	2,500	9,020	59,400	140	680	257	64	86	15
8	7,360	8,580	168,000	186	1,640	853	62	--	14
9	4,620	8,330	105,000	192	2,440	1,260	60	82	13
10	1,660	8,100	37,100	405	4,480	5,920	58	81	13
11	675	5,420	10,200	460	4,320	5,710	56	81	12
12	430	2,530	3,020	260	2,300	1,640	55	81	12
13	318	1,410	1,220	205	1,300	720	54	80	12
14	268	880	637	172	630	293	52	80	11
15	239	610	394	153	405	167	52	78	11
16	218	434	255	138	323	120	52	71	10
17	212	352	201	124	--	95	45	67	8.1
18	198	313	167	115	232	72	37	--	7
19	186	--	130	106	188	54	34	72	6.6
20	172	216	100	100	--	50	33	--	7
21	165	182	81	100	180	49	31	79	6.6
22	154	158	66	97	--	47	30	--	8
23	146	128	50	91	173	42	29	--	8
24	139	107	40	86	--	40	28	104	7.9
25	132	--	35	80	155	33	27	--	7
26	128	91	31	80	142	31	26	--	7
27	120	78	25	77	128	27	25	90	6.1
28	115	68	21	74	114	23	24	88	5.7
29	112	57	17	72	108	21	23	89	5.5
30	108	46	13	70	104	20	21	--	--
31	109	48	14	--	--	--	20	--	--
Total load (tons)	--	--	511,700	--	--	19,640	--	--	1/340

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	17	--	--	23	103	6.4	19	106	5.4
2	15	--	--	21	80	4.5	19	--	7
3	14	--	--	20	54	2.9	19	59	3.0
4	12	--	--	21	48	2.7	20	24	1.3
5	11	--	--	23	47	2.9	22	--	2
6	10	--	--	24	48	3.1	25	34	2.3
7	10	41	1.1	26	--	4	28	40	3.0
8	10	--	--	27	72	5.2	31	84	7.0
9	10	--	--	29	--	7	37	--	12
10	10	32	.9	31	104	8.7	62	132	22
11	11	31	.9	38	133	14	92	245	61
12	13	30	1.1	44	120	14	105	333	94
13	16	38	1.6	44	--	11	104	310	87
14	18	177	8.6	60	131	21	111	348	104
15	20	162	8.7	102	509	140	103	293	81
16	24	108	7.0	99	515	138	97	240	63
17	28	55	4.2	81	284	62	86	209	49
18	33	72	6.4	71	174	33	85	--	44
19	40	60	6.5	59	--	18	91	182	45
20	50	94	13	49	95	13	96	197	51
21	56	100	15	42	120	14	98	210	56
22	59	--	14	48	148	19	92	163	40
23	69	129	24	42	--	12	84	130	29
24	82	139	31	30	--	6	77	--	24
25	88	228	54	27	42	3.1	69	105	20
26	80	--	40	24	--	3	62	93	16
27	76	138	28	22	--	3	56	--	13
28	66	114	20	20	55	3.0	53	--	11
29	53	95	14	--	--	--	52	--	10
30	35	81	7.7	--	--	--	50	68	9.2
31	28	80	6.0	--	--	--	49	61	8.1
Total load (tons)	--	--	1/330	--	--	574	--	--	980

1/ Includes estimated load for missing days.

KANSAS RIVER BASIN--Continued

SOUTH FORK SOLOMON RIVER AT ALTON, KANS.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	47	58	7.4	111	2,120	635	98	1,320	363
2	46	52	6.4	72	--	170	73	362	71
3	44	--	5	53	--	50	60	202	33
4	44	36	4.3	44	251	30	61	140	23
5	45	27	3.3	36	189	18	55	109	16
6	45	20	2.4	31	156	13	683	6,480	13,400
7	44	20	2.4	28	130	9.8	1,340	10,100	37,000
8	41	80	8.9	27	99	7.2	433	6,620	8,080
9	44	--	64	27	76	5.5	225	2,810	1,750
10	121	3,020	1,030	28	73	5.5	161	1,090	474
11	110	2,640	809	28	68	5.1	126	670	228
12	80	745	161	30	61	4.9	268	3,620	2,970
13	69	224	42	31	83	6.9	450	4,640	5,640
14	59	185	29	41	643	161	401	3,220	3,500
15	55	94	14	44	297	35	218	1,950	1,150
16	48	71	9.2	40	126	14	146	890	351
17	47	92	12	51	172	24	112	422	128
18	46	96	12	59	196	31	91	296	73
19	45	94	11	115	205	64	92	376	93
20	41	93	10	77	157	33	85	266	61
21	40	--	10	64	132	23	112	915	277
22	39	90	9.5	54	105	15	128	980	339
23	38	86	8.8	44	122	14	414	5,260	9,870
24	36	81	7.9	40	119	13	392	7,930	8,490
25	35	79	7.5	38	--	11	627	7,910	18,000
26	36	87	8.5	38	101	10	826	11,900	28,100
27	38	87	8.9	47	--	55	450	7,360	8,910
28	37	84	8.4	134	1,800	651	526	--	11,000
29	62	--	320	116	1,480	464	368	6,330	6,540
30	162	2,860	1,280	114	1,370	422	212	--	1,700
31	--	--	--	78	520	110	--	--	--
Total load (tons)	--	--	3,912	--	--	3,111	--	--	168,600

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	158	1,210	516	18	127	6.2	4	120	1.3
2	124	710	238	16	114	4.9	4	117	1.3
3	102	--	140	15	118	4.8	3	--	1
4	85	352	81	14	--	5	3	--	1
5	73	250	49	13	168	5.9	4	111	1.2
6	65	--	30	12	--	6	4	114	1.2
7	59	123	20	12	147	4.8	3	120	1.0
8	52	--	17	11	127	3.8	3	137	1.1
9	49	--	17	10	125	3.4	3	135	1.1
10	46	140	17	10	124	3.3	3	130	1.0
11	53	--	23	9	124	3.0	3	127	1.0
12	116	1,140	361	9	128	3.1	3	122	1.0
13	86	1,510	359	9	140	3.4	3	--	1
14	61	--	110	8	133	2.9	3	119	1.0
15	92	1,890	655	8	130	2.8	3	117	.9
16	98	2,750	746	8	112	2.4	3	111	.9
17	64	840	145	7	139	2.6	3	100	.8
18	49	274	36	6	148	2.4	2	89	.5
19	43	167	19	6	142	2.3	2	91	.5
20	39	179	19	5	137	1.8	2	112	.6
21	36	181	18	4	131	1.4	2	128	.7
22	38	--	16	4	--	2	2	119	.6
23	41	148	16	4	169	1.8	2	110	.6
24	40	94	10	4	--	2	2	101	.5
25	41	161	18	5	150	2.0	2	--	.5
26	38	200	21	5	139	1.9	2	83	.4
27	34	200	18	5	126	1.7	2	78	.4
28	30	193	16	5	--	2	2	73	.4
29	27	164	12	4	123	1.3	2	--	.4
30	23	--	9	4	123	1.3	2	82	.4
31	20	139	7.5	4	122	1.3	--	--	--
Total load (tons)	--	--	3,760	--	--	94	--	--	24

Total load for year (tons) ---------- 1/713,100

1/ Includes estimated load for missing days

MISSOURI RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN MISSOURI RIVER BASIN

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance (K×10 ^{6} at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
MARIAS RIVER NEAR SHELBY, MONT.																				
June 4, 1947	1/2,800	8.4	33.4	3.0	0.02	36	14	6.8		130	50	2.0	0.1	0.6	0.5	177	0.24	147	40	5
July 22	1/526	8.4	39.8	5.3	.08	44	19	13		2/163	76	1.4	.1	.1	.1	252	.34	188	54	13
MIDDLE FORK POWDER RIVER NEAR KAYCEE, WYO.																				
Oct. 31, 1946	114	8.3	113	--	0.05	110	37	116		2/242	409	38	0.3	1.5	--	870	1.18	427	228	37
Mar. 30, 1947	165	8.0	97.2	19	.05	115	39	72		207	368	34	.5	2.3	1.5	790	1.07	447	277	26
May 16	720	8.4	50.2	14	.05	70	19	21		2/157	144	13	.4	.4	1.0	398	.54	253	124	15
June 27	377	8.2	50.6	15	.05	62	22	24		155	140	16	.4	.6	1.3	368	.50	245	118	17
July 15	96	8.4	73.7	11	.04	77	34	51		185	228	36	.4	1.4	1.0	548	.75	332	180	25
Aug. 12	28	7.9	92.8	12	.05	104	41	72		215	311	59	.4	.1	1.1	760	1.03	428	252	27
LITTLE MISSOURI RIVER AT MARMARTH, N. DAK.																				
Oct. 1, 1946	52	7.6	110	--	0.05	61	17	157		242	343	4.6	0.5	0.6	--	764	1.04	222	24	61
Mar. 23, 1947	23,400	7.0	24.6	6.4	--	19	4.3	28 | 3.3		94	42	5.5	.1	.5	0.3	167	.23	65	0	46
Apr. 18	979	8.2	78.4	14	.02	59	21	75		118	281	3.5	.3	1.7	1.5	566	.77	234	137	41
May 5	130	8.2	123	14	.02	73	32	164		302	398	5.0	.3	.6	--	852	1.16	314	66	53
May 20	117	8.3	134	15	.02	52	30	214		3/312	433	7.0	.3	.6	1.0	922	1.25	253	0	65
June 5	67	7.6	138	11	.02	63	30	209		302	456	7.5	.4	1.2	--	952	1.29	280	32	62
June 24	6,950	8.1	60.5	15	.02	32	14	.78		146	177	2.0	.3	.4	.3	408	.55	137	17	55
RAILROAD RESERVOIR NEAR DICKINSON, N. DAK.																				
Oct. 8, 1946	--	8.4	115	--	1.5	31	20	221		4/386	302	3.5	0.5	2.5	--	803	1.09	160	0	75
Apr. 17, 1947	--	8.2	25.1	9.5	.02	12	9.4	26		104	37	.7	.2	.7	0.3	164	.22	69	0	46
May 20	--	8.5	50.9	7.0	.02	27	15	63		3/226	73	1.0	.2	2.9	.0	308	.42	129	0	51
May 29	--	7.7	8.8	6.0	.02	5.2	2.6	11		28	16	.5	.2	8.3	--	80	.11	24	1	50
June 10	--	7.8	47.1	6.0	.02	26	19	49		226	57	1.5	.2	2.1	.5	280	.38	143	0	43

1/ Mean.
2/ Includes equivalent of 6 parts per million of carbonate (CO_3).
3/ Includes equivalent of 8 parts per million of carbonate (CO_3).
4/ Includes equivalent of 19 parts per million of carbonate (CO_3).

HEART RIVER AT LEHIGH, N. DAK.																			
Mar. 29, 1947	300	7.7	19.4	10	0.50	12	4.2	17	8.2	70	28	3.2	0.0	5.5	0.2	131	0.18	47	0	40
Apr. 17	363	7.8	35.8	16	.02	31	8.7	34		114	82	.0	.2	10	.6	244	.33	113	20	40
HEART RIVER NEAR ELGIN, N. DAK.																			
Oct. 2, 1946	3.8	8.1	164	--	0.10	33	36	315		528	449	9.0	0.6	1.3	--	1,280	1.74	230	0	75
June 10, 1947	88	8.2	118	18	.02	58	32	167		357	319	9.0	.3	1.5	2.5	775	1.05	276	0	57
June 23	3,650	8.1	53.3	8.0	.02	44	15	67		158	170	4.8	.3	3.0	1.7	350	.48	172	42	46
June 26	2,350	7.9	46.4	16	.02	36	11	50		160	104	1.7	.2	1.0	.8	297	.40	135	4	44
HEART RIVER NEAR MANDAN, N. DAK.																			
June 27, 1947	2,860	7.8	52.6	16	0.05	39	12	56		182	106	3.0	0.1	5.0	1.2	336	0.46	147	0	45
Aug. 29	47	8.1	109	12	.05	54	25	159		360	260	12	.1	.5	1.7	708	.96	238	0	59
CANNONBALL RIVER AT BREIEN, N. DAK.																			
Oct. 22, 1946	24	8.3	109	12	0.02	37	20	175		318	273	6.3	0.3	1.0	--	680	0.92	175	0	69
Apr. 17, 1947	1,650	6.7	41.0	20	.05	57	18	5.3		190	60	6.0	.2	.6	0.8	258	.35	216	60	5
June 27	3,570	7.1	60.3	17	.02	62	18	45		184	156	6.0	.3	5.0	--	395	.54	229	78	30
July 9	273	6.9	87.3	18	.02	76	50	44		284	230	11	.3	2.0	1.5	575	.78	395	162	19
Aug. 29	12	7.7	125	15	.02	77	32	172		361	346	28	.4	1.0	2.8	822	1.12	324	28	54
NORTH FORK GRAND RIVER NEAR WHITE BUTTE, S. DAK.																			
Mar. 23, 1947	4,270	7.8	20.9	9.5	1.5	14	2.2	27	4.9	98	18	6.0	0.4	1.0	1.0	138	0.19	44	0	60
Apr. 17	213	7.8	50.7	11	.88	26	11	70	7.5	158	123	6.0	1.0	3.0	1.4	345	.47	110	0	59
May 22	18	8.4	157	11	.02	40	32	276		1/374	498	2.0	.5	1.8	4.3	1,050	1.43	231	0	72
June 3	10	8.4	168	8.0	.02	38	40	299		2/388	559	4.0	.5	2.0	--	1,140	1.55	259	0	71
June 8	26	8.4	147	9.7	.02	44	30	266		2/354	492	3.0	.5	2.6	4.4	1,020	1.39	233	0	71
June 24	1,120	7.5	91.2	12	.03	30	18	152		235	274	.0	.2	1.5	--	614	.84	149	0	69
Aug. 28	6.0	7.8	147	8.6	.03	45	27	264		358	478	2.0	.5	1.8	3.5	1,010	1.37	223	0	70

1/ Includes equivalent of 10 parts per million of carbonate (CO_3).
2/ Includes equivalent of 14 parts per million of carbonate (CO_3).

MISCELLANEOUS ANALYSES OF STREAMS IN MISSOURI RIVER BASIN--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
GRAND RIVER NEAR WAKPALA, S. DAK.																				
Mar. 24, 1947	7,070	7.3	34.2	9.2	0.58	18	5.5	45	6.2	126	58	6.0	0.4	1.0	--	234	0.32	68	0	61
Mar. 25	11,200	7.8	35.2	8.7	.22	18	4.6	53	2.4	128	65	6.0	.4	.2	1.7	233	.32	64	0	65
Apr. 17	1,030	7.5	52.0	12	.01	27	1.1	91		176	115	2.0	.2	3.3	.4	344	.47	72	0	73
May 6	149	8.6	125	12	.01	37	1.1	268		1/328	379	6.0	.3	8.8	.1	902	1.23	97	0	86
June 17	265	8.0	95.0	13	.01	27	.9	195		262	258	4.5	.3	4.4	1.7	652	.89	71	0	86
Sept. 9	16	8.2	211	8.5	.01	46	.7	492		451	767	13	.4	1.3	2.6	1,550	2.11	118	0	90
SOUTH FORK GRAND RIVER NEAR CASH, S. DAK.																				
Mar. 25, 1947	1,280	7.5	20.5	26	0.73	8.6	3.9	27	5.3	84	23	6.0	0.4	1.5	1.4	173	0.24	38	0	64
Apr. 17	91	8.6	87.2	18	.03	20	9.8	163		2/277	206	.0	.3	2.6	2.2	562	.76	90	0	80
May 21	30	8.8	205	26	.02	16	14	459		3/667	517	6.0	.5	1.0	5.4	1,370	1.86	97	0	91
June 3	14	8.7	229	15	.02	20	9.8	540		4/776	582	8.0	.6	1.1	--	1,570	2.14	90	0	93
June 7	44	8.9	210	13	.02	16	11	488		5/686	551	6.0	.5	1.8	--	1,430	1.94	85	0	92
June 23	1,670	7.6	94.3	19	.02	31	10	175		308	233	.0	.5	1.9	.8	622	.85	118	0	76
June 24	1,040	8.3	81	15	.02	21	9.6	151		6/220	227	.0	.4	4.2	--	540	.73	92	0	78
June 25	385	8.3	104	13	.03	28	16	183		227	330	.0	.5	4.3	--	698	.95	136	0	75
Aug. 28	9.0	8.7	251	8.6	.02	14	12	566		732	672	8.0	.5	3.7	2.3	1,650	2.24	84	2	93
MOREAU RIVER NEAR EAGLE BUTTE, S. DAK.																				
Oct. 8, 1946	57	8.2	113	--	0.00	47	16	223		202	474	5.0	0.3	0.2	--	890	1.21	183	17	72
Mar. 24, 1947	10,600	7.4	37.2	11	.15	31	6.3	40	3.2	140	66	6.0	.8	1.0	0.9	239	.33	103	0	47
Apr. 16	701	7.7	122	9.5	.10	63	32	167	10	130	514	13	1.2	1.5	.8	896	1.22	288	181	57
May 5	68	8.2	186	9.0	.02	88	36	217	20	253	613	12	.4	.7	1.7	1,120	1.52	368	161	54
June 18	132	8.5	142	4.0	.01	58	18	207	21	7/228	477	12	.4	2.0	1.6	918	1.25	219	32	65
Sept. 10	8/.0	7.7	230	3.5	.00	87	20	510		237	1,080	62	.5	.8	2.6	1,880	2.56	279	85	79

1/ Includes equivalent of 12 parts per million of carbonate (CO_3).
2/ Includes equivalent of 14 parts per million of carbonate (CO_3).
3/ Includes equivalent of 45 parts per million of carbonate (CO_3).
4/ Includes equivalent of 42 parts per million of carbonate (CO_3).
5/ Includes equivalent of 51 parts per million of carbonate (CO_3).
6/ Includes equivalent of 6 parts per million of carbonate (CO_3).
7/ Includes equivalent of 7 parts per million of carbonate (CO_3).
8/ Practically no flow.

MOREAU RIVER AT PROMISE, S. DAK.

Mar. 24, 1947	5,160	--	8.0	69.5	8.8	0.05	55	12	73	6.2	152	210	5.5	0.1	1.8	0.8	457	0.62	187	62	45
Mar. 26	12,400	--	8.0	43.5	7.8	.10	32	6.2	49	5.0	118	110	3.5	.1	2.5	.2	274	.37	105	8.6	49
Apr. 17	689	--	7.5	142	12	.08	88	34	178	14	146	593	16	1.2	1.8	--	1,010	1.37	360	240	53
May 6	93	--	7.7	170	5.0	.12	112	37	203	19	239	653	14	.4	.8	.5	1,160	1.58	432	236	49
June 18	503	--	8.0	113	19	.02	99	21	103	20	146	433	7.0	.4	.6	.8	791	1.06	333	213	38
Sept. 9	2.0	--	8.4	285	10	.01	207	61	429		260	1,400	19	.4	.8	2.1	2,260	3.07	767	554	55

CHEYENNE RIVER NEAR WASTA, S. DAK.

Dec. 10, 1946	178	--	7.8	141	--	0.00	196	56	72		188	629	46	0.4	0.5	--	1,150	1.56	719	565	18
Mar. 31, 1947	388	--	8.1	157	7.0	.08	176	47	113	18	178	547	130	1.2	.2	1.7	1,130	1.54	632	486	30
Apr. 24	406	--	8.1	156	11	.10	176	60	89	22	188	615	78	1.2	.5	--	1,150	1.56	686	532	24
May 13	517	--	8.0	85.1	41	.01	14	2.4	182		242	206	16	.7	3.1	.9	632	.80	45	0	90
June 2	398	--	8.1	153	29	.01	168	2.0	216		156	642	69	.5	2.9	--	1,210	1.65	427	299	52
Aug. 20	187	--	7.8	119	16	.01	140	40	91		192	488	30	.5	2.0	.9	950	1.29	514	357	28

BEAVER CREEK NEAR NEWCASTLE, WYO.

Oct. 30, 1946	16	--	7.3	212	--	1.5	192	52	236		134	740	234	0.7	1.0	--	1,580	2.15	693	583	43
Apr. 2, 1947	1/222	40	8.2	193	19	.05	259	67	143		165	877	128	.5	2.4	2.2	1,580	2.15	922	787	25
May 8	1/4.3	--	7.7	456	5.5	.02	359	128	677		180	1,600	765	.7	.0	2.1	3,630	4.94	1,422	1,920	51
June 3	1/4.6	--	8.2	588	6.5	.05	409	198	952		200	2,100	1,100	.7	.0	1.0	4,870	6.62	1,830	1,670	53
July 9	1/41	--	8.1	337	13	.02	323	112	404		195	1,250	483	.6	.4	2.8	2,680	3.64	1,266	1,110	41
Aug. 14	1/2.3	--	8.1	723	5.6	.05	501	183	1,220		104	2,000	1,760	.7	.0	3.2	5,722	7.78	2,000	85	57

BELLE FOURCHE RIVER NEAR MOORCROFT, WYO.

Oct. 2, 1946	1/4	--	7.9	65.8	--	0.00	48	13	86		236	158	0.0	0.4	1.4	--	443	0.60	173	0	52
Mar. 25, 1947	1/46	--	8.0	30.2	13	1.20	27	16	16		81	94	1.6	.5	.6	0.5	224	.30	133	67	21
May 1	1/6.5	60	8.1	105	12	.05	70	37	138		243	401	4.4	.5	1.9	1.0	802	1.09	327	128	48
June 5	1/.9	62	7.7	182	9.8	.05	119	64	288		436	745	36	.5	.4	1.2	1,480	2.01	560	202	53
June 30	2.8	55	8.4	80.5	10	.02	56	31	83		2/176	284	4.4	.5	1.2	1.1	588	.80	267	123	40
Aug. 19	4/.0	76	8.4	226	5.7	.02	112	76	328		3/266	1,020	14	.6	5.5	1.6	1,695	2.31	597	379	55

1/ Mean.
2/ Includes equivalent of 6 parts per million of carbonate (CO_3).
3/ Includes equivalent of 12 parts per million of carbonate (CO_3).
4/ Practically no flow.

MISCELLANEOUS ANALYSES OF STREAMS IN MISSOURI RIVER BASIN--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Discharge (second-feet	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
BELLE FOURCHE RIVER NEAR ELM SPRINGS, S. DAK.																				
Mar. 31, 1947	1,440	7.7	127	5.0	0.05	140	50	83	17	164	575	14	0.4	3.5	0.8	969	1.32	555	421	27
Apr. 24	986	7.4	161	12	.01	167	61	150		202	770	15	.5	3.7	1.4	1,280	1.74	667	501	33
May 13	540	8.0	127	10	.01	153	57	81		170	611	9	.5	2.2	--	1,010	1.37	616	477	22
June 2	330	8.0	194	8.1	--	185	77	199		158	1,000	24	.7	5.0	--	1,580	2.15	778	648	36
Aug. 20	228	8.2	219	2.0	.01	254	106	137		142	1,170	21	.7	2.0	2.4	1,760	2.39	1,070	954	22
BAD RIVER NEAR FORT PIERRE, S. DAK.																				
Oct. 1, 1946	4.0	8.1	99.3	--	0.00	81	13	162		182	399	30	0.4	0.4	--	772	1.05	255	111	58
Oct. 9	455	7.5	209	--	.03	198	28	302		152	1,070	20	.7	.8	--	1,690	2.30	609	484	52
Oct. 23	3.4	8.5	134	--	.03	95	9.2	213		1/224	477	38	.6	3.5	--	991	1.35	275	101	63
Mar. 27, 1947	34	7.7	78.4	9.5	.05	90	13	58	13	164	242	22	1.2	1.0	0.8	554	.75	278	144	34
June 7	153	6.9	181	30	.02	184	40	212		366	733	14	.6	.0	.6	1,400	1.90	624	324	42
WHITE RIVER NEAR KADOKA, S. DAK.																				
Oct. 9, 1946	946	--	54.1	--	0.00	7.5	9.6	191		502	34	17	0.9	0.5	--	429	0.58	58	0	88
Mar. 29, 1947	211	7.9	44.9	28	.05	40	4.5	51	9.8	212	51	8.0	.4	3.5	1.4	306	.42	118	0	51
Apr. 10	1,060	7.8	47.5	33	.39	9.0	1.4	102	6.2	234	44	10	1.2	3.5	1.2	331	.45	28	0	89
Apr. 30	155	8.5	55.3	45	.03	36	5.5	81		2/244	75	6.0	.3	.4	1.9	384	.52	112	0	61
May 21	123	7.5	114	46	.02	76	7.0	189		338	321	12	.3	.1	2.3	830	1.13	218	0	65
June 12	1,210	8.3	65.9	47	.03	20	2.4	107		275	59	3.0	.5	.1	2.7	394	.54	60	0	80
Sept. 3	41	7.5	110	42	.02	59	15	164		204	362	14	.5	1.3	1.3	780	1.06	209	42	63
WHITE RIVER NEAR OACOMA, S. DAK.																				
Oct. 22, 1946	268	7.8	59.3	--	0.00	43	6.6	93		226	120	18	0.6	0.6	--	452	0.61	134	0	60
Apr. 21, 1947	461	8.3	53.6	41	.02	36	4.8	77		3/224	80	4	.8	2.1	1.6	386	.52	110	0	60
May 9	336	7.8	63.3	42	.03	54	8.3	76		236	119	10	.6	1.2	1.0	446	.61	169	0	49
June 13	3,110	7.5	81.9	37	.15	43	5.7	134		253	200	4	.4	.0	1.9	566	.77	131	0	69
Sept. 18	46	8.1	111	45	.02	70	13	163		216	354	24	.8	.2	1.5	820	1.12	228	51	61

1/ Includes equivalent of 12 parts per of carbonate (CO_3).
2/ Includes equivalent of 10 parts per of carbonate (CO_3).
3/ Includes equivalent of 6 parts per million of carbonate (CO_3).

NIOBRARA RIVER NEAR GORDON, NEBR.																			
Mar. 10, 1947	149	8.2	26.6	54	0.02	37	6.3	15		156	15	2.2	0.4	3.6	0.6	208	0.28	118	0	22
Apr. 29	1/114	8.5	26.9	57	.02	32	7.0	20		2/158	16	2.3	.4	1.0	2.2	218	.30	109	0	28
June 6	1/111	8.4	26.4	54	.05	32	7.6	20		3/151	26	1.0	.5	1.4	.6	218	.30	111	0	28
No date	--	7.6	26.4	55	.05	36	7.9	6.2		140	18	.0	.4	1.6	.3	228	.31	122	7	10
NIOBRARA RIVER NEAR SPARKS, NEBR.																			
Mar. 20, 1947	1,730	8.1	22.3	56	0.02	33	5.7	7.8		133	9.1	1.0	0.3	2.4	0.3	212	0.29	106	0	14
May 1	920	8.3	22.6	58	.04	34	4.4	10		136	11	1.2	.2	.1	1.0	196	.27	103	0	18
Aug. 20	680	8.3	20.0	70	.02	27	5.5	8.4		4/120	7.4	1.0	.1	.2	.0	180	.24	90	0	17
McCONAUGHY LAKE ON NORTH PLATTE RIVER, NEBR.																			
Mar. 21, 1947	--	8.4	55.5	15	0.05	42	15	51	13	178	121	15	0.4	1.2	1.4	348	0.47	167	21	38
May 10	--	8.6	72.9	36	.05	54	18	68	16	227	153	20	.5	2.0	1.8	455	.62	209	23	39
SOUTH PLATTE RIVER NEAR KERSEY, COLO.																			
Apr. 5, 1947	718	8.0	144	19	0.02	127	61	139		278	545	51	1.1	1.2	0.6	1,080	1.47	568	340	35
May 10	732	7.7	63.3	18	.02	54	21	53		140	179	23	.8	1.9	.5	448	.61	221	106	34
Sept. 2	212	7.7	167	19	.02	155	71	160		308	679	42	1.3	8.7	1.9	1,290	1.75	681	428	34
PLATTE RIVER NEAR COZAD, NEBR.																			
Nov. 6, 1946	355	7.7	66.3	--	0.10	65	19	51		232	129	16	0.5	4.0	--	466	0.63	240	50	32
May 10, 1947	239	8.4	62.9	43	.02	65	16	66		5/227	151	19	.4	1.6	2.0	466	.63	228	42	39
Aug. 26	161	8.3	65.5	33	.02	56	14	60		3/177	147	20	.4	.4	1.0	458	.62	197	52	40

1/ Mean.
2/ Includes equivalent of 10 parts per million of carbonate (CO_3).
3/ Includes equivalent of 6 parts per million of carbonate (CO_3).
4/ Includes equivalent of 5 parts per million of carbonate (CO_3).
5/ Includes equivalent of 8 parts per million of carbonate (CO_3).

MISSOURI RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN MISSOURI RIVER BASIN--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
PLATTE RIVER NEAR ODESSA, NEBR.																				
Nov. 6, 1946	995	8.8	75.3	--	0.05	61	20	66		1/208	170	20	0.5	1.0	--	480	0.65	234	64	38
Mar. 20, 1947	1,800	8.4	74.5	33	.02	62	16	94		2/188	224	25	.5	1.2	2.8	542	.74	220	66	48
May 10	3/976	7.8	77.3	28	.02	62	3.7	122		173	244	27	.5	.0	1.4	564	.77	170	0	61
Aug. 28	548	7.6	89.1	26	.02	77	5.5	139		204	294	29	.6	.3	.5	648	.88	215	48	58
BUFFALO CREEK NEAR OVERTON, NEBR.																				
Nov. 6, 1946	15	7.6	97.3	--	0.10	118	31	60		406	172	26	0.3	4.0	--	688	0.94	422	89	24
Mar. 21, 1947	20	7.5	76.8	37	.24	93	24	45		318	130	19	.2	6.3	0.8	531	.72	331	70	23
BUFFALO CREEK NEAR ELM CREEK, NEBR.																				
May 10, 1947	20	8.4	91.6	35	0.02	104	37	56		4/346	209	22	0.1	1.4	2.1	676	0.92	412	126	23
Aug. 28	0.8	7.9	92.6	46	.02	118	30	67		361	205	20	.2	3.1	1.1	678	.92	418	122	26
MIDDLE LOUP RIVER AT DUNNING, NEBR.																				
Apr. 1, 1947	397	7.1	19.9	60	0.08	23	4.4	21		104	31	0.0	0.4	2.2	0.1	157	0.21	76	0	37
May 6	394	8.1	19.8	62	.01	22	4.4	20		104	29	.0	.3	1.4	1.4	158	.21	73	0	38
Aug. 19	385	7.1	19.3	61	.06	20	3.9	25		102	33	.0	.3	2.2	.4	156	.21	66	0	45
CEDAR RIVER NEAR SPALDING, NEBR.																				
Apr. 2, 1947	187	7.0	20.3	37	0.12	26	6.3	5.7		116	6.6	0.0	0.2	0.9	0.1	147	0.20	91	0	12
May 6	288	7.2	22.8	40	.20	30	7.4	5.6		133	7.0	.0	.2	.9	.1	164	.22	105	0	10
Aug. 27	60	8.2	20.4	47	.13	26	6.8	5.4		117	7.4	.0	.2	.7	.8	165	.22	93	0	11
ELKHORN RIVER AT NELIGH, NEBR.																				
Mar. 18, 1947	332	6.2	28	46	0.02	36	5.5	11	3.6	146	7.4	0.8	0.3	2.0	1.2	184	0.25	112	0	17
May 19	257	7.9	26.8	44	.03	44	5.2	8.1		162	14	.0	.2	1.3	.6	184	.25	131	0	12
Aug. 27	121	8.6	25.7	53	.02	42	4.7	9.1		5/156	13	.0	.3	1.6	1.0	214	.29	124	0	14

1/ Includes equivalent of 10 parts per million of carbonate (CO_3).
2/ Includes equivalent of 7 parts per million of carbonate (CO_3).
3/ Mean.
4/ Includes equivalent of 8 parts per million of carbonate (CO_3).
5/ Includes equivalent of 12 parts per million of carbonate (CO_3).

REPUBLICAN RIVER AT CAMBRIDGE, NEBR.

Mar. 20, 1947	1,010	8.0	48.5	59	0.05	61	19	22	263	44	7.5	0.7	4.7	0.0	350	0.48	243	27	17
May 1	506	8.3	42.9	44	.02	54	20	12	1/212	49	8.2	.9	5.8	1.5	302	.41	217	43	11
May 30	1,630	7.7	50.7	47	.05	66	19	23	290	42	6.0	.7	1.0	.0	376	.51	243	5	17
Aug. 29	46	7.8	43.0	60	.05	56	18	12	256	19	5.8	.6	1.8	.0	320	.44	214	4	11
Sept. 26	49	7.8	45.1	63	.04	62	17	17	280	19	6.0	.6	2.8	.0	358	.49	225	0	14

REPUBLICAN RIVER NEAR BLOOMINGTON, NEBR.

Mar. 21, 1947	838	7.5	48.2	40	0.02	65	21	10	255	42	9.2	0.7	4.6	2.0	332	0.45	248	39	8
May 6	636	8.6	48.7	43	.03	58	17	37	2/261	63	9.8	.8	.0	2.4	352	.48	215	1	27
May 31	2,030	8.3	49.8	47	.02	59	26	13	1/261	51	8.5	.9	.0	2.1	356	.48	254	40	10
Sept. 1	172	7.5	56.1	37	.02	64	26	23	301	50	12	.6	.0	.4	376	.51	267	20	16

NORTH FORK REPUBLICAN RIVER NEAR WRAY, COLO.

Mar. 24, 1947	(3/)	8.4	37.7	45	0.08	39	19	18 | 8.5	4/241	16	3.0	1.6	2.8	1.7	266	0.36	175	0	17
Apr. 29	--	8.4	54.1	47	.02	46	23	27 | 15	4/272	49	4.0	1.1	4.0	1.0	354	.48	209	0	20
June 2	--	7.9	39.1	49	.10	35	16	28	216	26	3.0	1.5	3.6	.0	292	.40	153	0	29
Aug. 25	--	7.6	36.4	50	.02	42	15	17	200	28	2.0	1.3	4.0	.0	286	.39	166	2	18

NORTH FORK REPUBLICAN RIVER AT COLORADO-NEBRASKA STATE LINE

Apr. 28, 1947	5/519	8.1	32.1	29	0.02	34	12	14 | 12	162	34	4.5	0.7	4.0	0.3	221	0.30	134	1.2	17
May 24	62	7.4	41.3	36	.05	49	13	25 | 14	238	33	8.0	1.2	4.0	1.1	310	.42	176	0	22
May 28	97	7.7	40.7	39	.03	51	12	18 | 16	226	37	5.0	1.0	3.0	.8	288	.39	177	0	16
July 1	32	8.5	42.9	51	.02	47	16	24	6/226	37	4.0	1.2	3.5	1.4	320	.44	183	0	22
Aug. 25	5/35	7.4	38.9	40	.10	43	12	28	202	40	3.0	1.0	3.1	.0	284	.39	156	0	28

1/ Includes equivalent of 8 parts per million of carbonate (CO_3).
2/ Includes equivalent of 14 parts per million of carbonate (CO_3).
3/ No discharges available.
4/ Includes equivalent of 17 parts per million of carbonate (CO_3).
5/ Mean.
6/ Includes equivalent of 12 parts per million of carbonate (CO_3).

MISSOURI RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN MISSOURI RIVER BASIN--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
SOUTH FORK REPUBLICAN RIVER AT COLORADO-KANSAS STATE LINE																				
Mar. 25, 1947	53	8.6	45.6	36	0.02	56	12	17		214	33	6.9	1.0	4.0	1.2	290	0.39	189	14	16
Apr. 28	2,140	8.4	37.0	19	.02	57	13	3.0		215	20	2.3	.6	.4	.9	248	.34	196	20	3
May 27	61	8.6	44.6	38	.02	60	15	19		1/240	38	7.0	1.0	5.0	1.3	293	.40	211	14	16
June 30	24	8.7	46.8	41	.02	64	14	20		2/249	38	7.6	.8	5.0	.8	311	.42	218	14	17
Aug. 26	3/4	7.6	41.7	48	.02	42	15	32		220	41	6.0	1.4	1.6	1.0	298	.41	166	0	30
FRENCHMAN CREEK AT CULBERTSON, NEBR.																				
Mar. 25, 1947	171	8.6	46.1	55	0.05	59	16	12	5.6	245	30	5.0	0.9	6.0	1.9	310	0.42	213	12	11
Apr. 28	166	8.7	45.9	57	.10	61	16	6.2	5.6	4/241	28	5.4	.9	2.0	2.0	306	.42	218	20	6
May 27	121	8.8	47.4	59	.05	61	17	12	6.0	5/256	31	5.4	.9	4.0	2.3	322	.44	222	12	10
Sept. 22	60	8.5	46.7	59	.02	60	20	12		6/256	34	4.0	.8	4.6	.3	328	.45	232	22	10
Sept. 23	3/60	7.5	39.2	58	.02	50	17	7.2		220	21	2.0	.7	4.5	--	288	.39	195	15	8
SMOKY HILL RIVER AT ELLSWORTH, KANS.																				
Mar. 26, 1947	135	7.1	144	8.0	0.40	134	35	133	12	170	325	215	0.5	2.0	1.4	965	1.31	478	339	37
Apr. 25	128	7.4	173	14	.05	145	28	180	13	216	282	292	.3	2.5	.8	1,160	1.44	477	300	44
May 20	1,120	7.5	94.9	21	.05	109	16	68		179	117	140	.4	3.1	.8	628	.85	323	177	31
July 2	286	8.4	101	23	.02	103	19	79		7/188	174	120	.5	2.4	2.1	656	.89	335	181	34
ROSE CREEK NEAR WALLACE, KANS.																				
Apr. 23, 1947	5.6	7.8	47.7	4.4	0.02	50	16	36	6.0	269	38	8.0	1.4	2.0	1.5	297	0.40	190	0	28
May 26	6.5	7.9	53.3	30	.03	57	15	37		276	42	6.0	1.3	3.2	2.1	348	.47	204	0	28
June 12	6.6	7.4	45.2	26	.02	56	12	36		252	44	6.0	.9	4.3	.8	298	.41	190	0	29
June 30	3.8	8.4	47.3	38	.03	50	12	39		2/241	44	6.0	1.2	5.5	2.4	324	.44	174	0	33
July 31	1.8	7.7	46.5	33	.02	48	13	37		238	42	6.0	1.3	4.0	2.1	296	.40	173	0	32

1/ Includes equivalent of 7 parts per million of carbonate (CO_3).
2/ Includes equivalent of 8 parts per million of carbonate (CO_3).
3/ Mean.
4/ Includes equivalent of 16 parts per million of carbonate (CO_3).
5/ Includes equivalent of 17 parts per million of carbonate (CO_3).
6/ Includes equivalent of 14 parts per million of carbonate (CO_3).
7/ Includes equivalent of 10 parts per million of carbonate (CO_3).

SALINE RIVER NEAR WILSON, KANS.

Oct. 3, 1946	359	7.6	45.3	6.0	0.05	52	5.5	29	13	166	33	42	0.3	2.5	0.2	296	0.40	152	16	27
Oct. 8	4,980	7.7	38.5	5.0	.01	54	4.8	14	7.6	144	30	28	.3	6.0	.2	253	.34	155	37	16

NORTH FORK SOLOMON RIVER AT KIRWIN, KANS.

Mar. 20, 1947	88	7.3	39.8	20	0.02	58	10	12	11	204	42	7.0	0.1	6.0	--	261	0.35	186	19	11
Apr. 25	35	7.9	58.2	20	.05	86	17	20	12	284	90	12	.0	.2	--	393	.53	284	52	13
May 22	58	8.1	43.7	29	.03	64	9.2	19		214	52	4.0	.3	2.8	0.9	302	.41	198	23	17
June 22	159	7.5	37.7	23	.03	60	5.6	12		198	31	2.0	.2	.8	.9	250	.34	173	11	13
Aug. 21	124	7.7	62.3	37	.02	94	17	16.		286	90	7.0	.3	1.7	1.4	440	.60	304	70	10

MISSOURI RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE MISSOURI RIVER BASIN--Continued

Periodic determinations of suspended-sediment discharge, water year October 1946 to September 1947

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Instantaneous discharge (tons per day)
MARIAS RIVER NEAR SHELBY, MONT.			
June 4, 1947	2,810	444	3,370
July 22	526	76	108
Aug. 27	356	102	98
BADWATER CREEK AT BONNEVILLE, WYO.			
May 7, 1947	158	7,270	3,100
June 20	109	20,100	5,910
July 2	49	2,100	278
July 17	29	8,140	638
July 17	18	4,720	229
July 22	35	37,600	3,550
July 23	1.8	15,800	77
July 23	1.7	14,500	67
Aug. 11	1.6	18,600	80
Aug. 11	1.6	20,700	89
Aug. 12	1.6	27,400	118
Sept. 18	2.9	44,400	347
Sept. 18	1.5	41,200	167
LITTLE MISSOURI RIVER AT MARMARTH, N. DAK.			
Aug. 6, 1946	140	8,540	3,230
Aug. 20	8.8	88	2.1
Sept. 5	8.8	69	1.6
Sept. 17	206	3,070	1,710
Oct. 1	41	151	17
Oct. 13	1,830	3,470	17,100
Oct. 22	231	518	323
Nov. 6	389	563	591
Nov. 27	31	29	2.4
Dec. 5	46	8	1.0
Dec. 23	12	14	.5
Jan. 8, 1947	3.0	5	0
Jan. 28	90	282	69
Feb. 11	8.0	190	4.1
Feb. 16	1,940	503	2,630
Feb. 19	3,980	741	7,960
Feb. 22	1,950	349	1,840
Mar. 12	68	182	33
Mar. 22	1/2,000	1,060	5,720
Mar. 23	22,900	3,380	209,000
Mar. 25	11,000	4,260	127,000
Apr. 3	1,810	3,130	15,300
Apr. 18	1,000	1,580	4,270
May 5	130	92	32
May 20	120	312	101
June 5	64	105	18
June 22	2,280	12,900	79,400
June 24	7,200	7,200	140,000
July 10	199	139	75
July 30	44	70	8.3
Aug. 14	130	4,630	1,630
Sept. 3	12	12	.4
Sept. 19	16	18	.8

1/ Mean daily discharge.

MISSOURI RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE MISSOURI RIVER BASIN--Continued

Periodic determinations of suspended-sediment discharge, water year October 1946 to September 1947--Continued

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Instantaneous discharge (tons per day)
HEART RIVER AT LEHIGH, N. DAK.			
May 21, 1946	4.8	15	0.2
July 3	6.4	6	.1
July 16	2.3	7	0
Aug. 1	11	37	1.1
Aug. 19	.4	14	0
Sept. 6	2.5	12	.1
Sept. 23	1.0	10	0
Oct. 9	10	14	.4
Oct. 14	17	10	.5
Oct. 16	28	21	1.6
Oct. 17	22	12	.7
Oct. 30	7.7	20	.4
Nov. 7	8.0	4	.1
Nov. 22	1.9	12	.1
Dec. 4	2.9	2	0
Dec. 11	13	29	1.0
Jan. 3, 1947	2.5	23	.2
Jan. 23	1/2	29	.2
Jan. 27	11	6	.2
Feb. 11	2.9	44	.3
Feb. 15	195	202	106
Feb. 19	338	82	75
Feb. 27	22	80	4.8
Mar. 18	6.1	20	.3
Mar. 22	748	632	1,280
Mar. 26	262	499	353
Mar. 29	1/300	194	157
Apr. 4	229	468	289
Apr. 17	354	1,100	1,050
Apr. 30	21	50	2.8
NORTH FORK GRAND RIVER NEAR WHITE BUTTE, S. DAK.			
May 8, 1946	3.3	27	0.2
July 11	10	60	1.6
July 24	1.3	69	.2
Aug. 1	.2	48	0
Oct. 10	6	28	.5
Oct. 23	9	25	.6
Nov. 7	26	34	2.4
Nov. 19	9	31	.8
Dec. 4	6	22	.4
Dec. 19	2.3	16	.1
Jan. 8, 1947	1.7	15	.1
Jan. 27	8	27	.6
Feb. 6	4.3	20	.2
Feb. 17	491	286	379
Feb. 19	290	69	54
Mar. 5	18	9	.4
Mar. 23	4,270	855	9,860
Mar. 27	874	442	1,040
Apr. 17	213	259	149
Apr. 29	54	78	11.4
May 22	18	69	3.4
June 3	10	43	1.2
June 8	26	259	18.2
June 24	1,120	611	1,850
July 9	50	41	5.5

1/ Mean daily discharge.

MISSOURI RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE MISSOURI RIVER BASIN--Continued

Periodic determinations of suspended-sediment discharge, water year October 1946 to September 1947--Continued

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Instantaneous discharge (tons per day)
NORTH FORK GRAND RIVER NEAR WHITE BUTTE, S. DAK.--Continued			
July 29, 1947	52	64	9.0
Aug. 13	52	54	7.6
Aug. 28	6	36	.6
Sept. 8	3.7	52	.5
Sept. 18	2.4	19	.1
SOUTH FORK GRAND RIVER NEAR CASH, S. DAK.			
May 8, 1946	23.9	1,110	71.6
July 10	16.9	6,180	282
July 24	20.3	559	30.6
Aug. 1	12.9	143	5.0
Aug. 14	15.3	90	3.7
Aug. 16	55.4	228	34.1
Sept. 4	11.3	134	4.1
Sept. 23	32.5	7,830	687
Oct. 2	10.0	169	4.6
Oct. 9	146	4,600	1,810
Oct. 23	17	598	27.4
Nov. 6	36	1,290	125
Nov. 19	12	148	4.8
Dec. 3	14	38	1.4
Dec. 18	3.5	68	.6
Jan. 8, 1947	.7	79	.1
Jan. 27	133	544	195
Feb. 6	14	164	6.2
Feb. 17	752	419	85
Feb. 19	52	74	10.4
Mar. 5	10	10	.3
Mar. 25	1,280	609	2,100
Mar. 28	493	986	1,310
Apr. 16	111	530	159
Apr. 28	33	98	8.7
May 21	30	76	6.2
June 3	15	55	2.2
June 7	47	198	25.1
June 23	1,940	11,300	59,200
June 24	1,080	6,440	18,800
June 25	385	2,730	2,840
July 8	29	122	9.6
Aug. 12	10	85	2.3
Aug. 28	8	116	2.5
Sept. 17	8	74	1.6
BELLE FOURCHE RIVER BELOW MOORCROFT, WYO.			
Apr. 3, 1947	25	361	24
Apr. 17	6.2	70	1.2
Apr. 29	11	634	19
May 1	6.5	266	4.7
May 7	2.7	70	.5
May 8	2.8	182	1.4
May 22	2.3	67	.4
May 23	1.8	59	.3
June 3	1.1	84	.2
June 5	.9	107	.3
June 6	.7	60	.1
June 18	6.5	94	1.6
June 19	72	481	94
June 20	21	145	8.2
June 30	3.1	499	4.2

MISSOURI RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE MISSOURI RIVER BASIN--Continued

Periodic determinations of suspended-sediment discharge, water year October 1946 to September 1947--Continued

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (p.p.m.)	Instantaneous discharge (tons per day)
BELLE FOURCHE RIVER BELOW MOORCROFT, WYO.--Continued			
July 1, 1947	2.3	388	2.4
July 8	.9	84	.2
July 9	.7	106	.2
July 10	.5	96	.1
Aug. 4	0	59	0
Aug. 14	0	69	0
Aug. 15	0	67	0
CEDAR RIVER NEAR SPALDING, NEBR.			
June 20, 1946	49	94	12.4
June 24	42	64	7.2
June 26	41	50	5.5
July 2	146	504	199
July 8	42	66	7.5
July 16	46	54	6.7
July 22	96	389	101
July 30	58	212	33.2
Aug. 5	177	733	350
Aug. 13	143	382	148
Aug. 19	64	120	20.7
Aug. 27	60	82	13.3
Sept. 3	39	30	3.2
Sept. 10	67	103	18.6
Sept. 16	43	53	6.2
Sept. 24	42	37	4.2
Sept. 30	98	260	68.8
Oct. 9	60	63	10
Oct. 14	320	424	366
Oct. 23	55	33	4.9
Oct. 28	60	33	5.3
Nov. 5	43	14	1.6
Nov. 13	198	403	215
Dec. 4	187	438	221
Dec. 16	59	52	8.3
Dec. 23	46	22	2.7
Jan. 10, 1947	323	47	41
Jan. 21	482	149	194
Feb. 14	278	72	54
Feb. 21	37	54	5.4
Feb. 27	166	872	391
Mar. 4	45	54	6.6
Mar. 13	212	807	462
Mar. 19	42	33	3.7
Mar. 27	198	548	293
Apr. 2	47	34	4.3
Apr. 14	290	467	366
Apr. 22	164	391	173
Apr. 30	52	25	3.5
May 6	119	435	140
May 13	45	32	3.9
May 20	56	49	7.4
May 26	45	31	3.8
June 9	290	594	465
June 20	343	564	522
June 27	618	316	527
July 1	333	342	308
July 10	48	93	12
July 17	54	77	11.2
July 22	46	92	11.4
July 28	54	83	12.1

MISSOURI RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE MISSOURI RIVER BASIN--Continued

Periodic determinations of suspended-sediment discharge, water year October 1946 to September 1947--Continued

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Instantaneous discharge (tons per day)
CEDAR RIVER NEAR SPALDING, NEBR.--Continued			
Aug. 5, 1947	45	78	9.5
Aug. 12	177	313	149
Aug. 19	37	59	5.9
Aug. 27	41	41	4.5
Sept. 3	107	120	35
Sept. 10	110	138	41
Sept. 16	109	64	19
Sept. 23	109	73	22
Sept. 29	119	68	22

MISCELLANEOUS ANALYSES OF STREAMS IN THE MISSOURI RIVER BASIN--Continued

Particle-size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Instantaneous discharge (second-feet)	Suspended sediment														
		Concentration at time of sampling (p. p. m.)	Instantaneous discharge (tons per day)	Concentration during analysis (p. p. m.)	Method of analysis 1/	Percent finer than indicated size (in millimeters)										
						0.00195	0.0039	0.0078	0.0156	0.0312	0.0625	0.125	0.250	0.500	1.000	2.000
LITTLE MISSOURI RIVER AT MARMARTH, N. DAK.																
Feb. 19, 1947	3,980	741	7,960	1,360	BN	56	66	72	77	83	89	96	99	100	--	--
Feb. 22	1,950	349	1,840	647	BN	--	85	87	90	93	96	98	99	100	--	--
Mar. 23	22,900	3,380	209,000	10,100	BN	23	30	38	45	55	69	81	94	98	99	--
Mar. 25	11,000	4,260	127,000	5,940	BN	37	44	52	57	62	66	77	90	95	97	--
Apr. 3	1,810	3,130	15,300	3,860	BN	63	70	80	84	89	92	94	96	98	100	--
HEART RIVER AT LEHIGH, N. DAK.																
Mar. 22, 1947	748	632	1,280	795	BN	30	38	56	75	81	82	84	91	95	96	--
Apr. 4	229	468	289	1,120	BN	49	65	79	89	92	95	96	99	100	--	--
NORTH FORK GRAND RIVER NEAR WHITE BUTTE, S. DAK.																
Mar. 23, 1947	4,270	855	9,860	1,850	BN	15	20	31	41	56	79	94	98	99	100	--
Apr. 17	213	259	149	646	BN	78	86	89	93	96	97	98	99	100	--	--
June 24	1,120	611	1,850	1,110	BN	11	21	40	56	66	71	73	88	94	97	--
SOUTH FORK GRAND RIVER NEAR CASH, S. DAK.																
Feb. 17, 1947	752	419	851	607	BN	51	57	67	74	84	91	96	99	100	--	--
Mar. 25	1,280	609	2,100	1,260	BN	32	40	53	66	78	88	95	99	100	--	--
Apr. 16	111	530	159	1,470	BN	63	87	--	99	100	--	--	--	--	--	--
June 23	1,940	11,300	59,200	2,130	BNX	72	78	88	92	94	96	97	98	98	99	--
NIOBRARA RIVER NEAR SPARKS, NEBR.																
June 9, 1947	1,380	2,820	10,500	2,640	BN	--	--	15	20	28	39	50	70	100	--	--
June 9	984	4,700	12,500	3,950	BN	--	8	11	12	17	30	48	88	97	100	--
June 19	2,040	2,240	12,300	2,110	BN	--	--	--	7	14	31	58	91	98	100	--
NORTH PLATTE RIVER NEAR GOOSE EGG, WYO.																
May 19, 1947	2/3,500	3,630	2/38,200	5,370	BN	--	5	16	47	77	92	96	99	100	--	--

1/ B. Bottom-withdrawal tube. S. Sieve. N. Native water. D. Distilled water. X. Sample chemically dispersed.
2/ Mean daily discharge.

ST. FRANCIS RIVER BASIN

MISCELLANEOUS ANALYSES OF STREAMS IN ST. FRANCIS RIVER BASIN IN ARKANSAS

Chemical analyses, in parts per million

Date of collection	Discharge (second-feet)	Specific conductance ($K \times 10^5$ at 25° C.)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Hardness as $CaCO_3$	
							Total	Non-carbonate
ST. FRANCIS RIVER AT MARKED TREE								
Jan. 16, 1947	2,930	36.2	196	18	12	0.8	198	37
Aug. 20	354	37.5	316	25	1.0	1.5	232	0

WHITE RIVER AT NEWPORT, ARK.

LOCATION.--At bridge on U.S. Highway 67 at Newport, Jackson County, 7¼ miles downstream from Black River.
DRAINAGE AREA.--19,812 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1947.
Water temperatures: October 1945 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 192 parts per million Oct. 11-20; minimum, 125 parts per million Dec. 11-20.
Total hardness: Maximum, 179 parts per million Sept. 11-20; minimum, 104 parts per million Dec. 11-20.
Water temperatures: Maximum, 87° F. Aug. 4, 9; minimum, 39° F. Mar. 3.
EXTREMES, 1945-47.--Dissolved solids: Maximum, 192 parts per million Oct. 11-20, 1946; minimum, 122 parts per million May 21-31, 1946.
Total hardness: Maximum, 179 parts per million Sept. 11-20, 1947; minimum, 99 parts per million May 21-31, 1946.
Water temperatures: Maximum, 87° F. Aug. 4, 9, 1947; minimum, 37° F. Dec. 21, 1945.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1087. Records of specific conductance of daily samples are available in district office at Fayetteville, Ark.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Non-carbonate
Oct. 1-10, 1946----	5,349	65	8.2	31.8	9.4	0.05	38	20	3.8	1.1	12	216	3.3	2.0	0.1	1.8	187	177	0
Oct. 11-20 --------	5,262	62	8.4	32.8	7.0	.05	38	19	6.0	1.2	16	219	3.4	1.5	.1	2.2	192	173	0
Oct. 21-31 --------	6,540	62	8.2	29.8	7.8	.08	34	17	5.6	1.3	0	195	3.4	2.8	.1	1.2	174	155	0
Nov. 1-10---------	25,790	63	8.0	24.9	8.8	.10	31	13	2.4	2.1	0	155	4.4	3.5	.1	2.5	145	131	4
Nov. 11-20--------	53,110	53	8.1	21.3	11	.12	28	9.1	4.0	2.2	0	131	4.4	3.0	.1	3.0	130	107	0
Nov. 21-30--------	32,130	50	7.9	25.8	8.5	.12	34	12	2.7	1.3	0	157	4.5	4.0	.1	3.0	148	134	6
Dec. 1-10---------	27,790	49	8.2	25.6	9.5	.06	29	12	6.6	2.3	9	151	5.2	5.0	.1	3.0	147	122	0
Dec. 11-20--------	74,550	52	8.1	21.1	12	.20	27	8.9	3.1	2.0	0	122	4.8	4.0	.1	3.0	125	104	4
Dec. 21-31--------	31,770	51	8.1	25.4	9.4	.12	31	12	1.8	1.6	0	149	5.0	2.0	.1	2.8	140	127	5
Jan. 1-10, 1947----	25,820	48	8.3	26.6	8.6	.04	34	14	1.3	1.0	10	164	5.1	2.5	.1	3.5	154	142	8
Jan. 11-20 --------	19,360	49	8.4	27.2	6.9	.05	35	15	3.4	1.2	8	178	4.8	3.0	.0	3.2	161	149	3
Jan. 21-31 --------	15,820	49	8.2	29.7	5.4	.08	36	16	4.2	.7	10	186	5.9	3.2	.0	2.8	167	156	3
Feb. 1-10---------	15,280	45	8.1	30.7	7.6	.06	36	17	4.1	1.5	9	192	5.0	3.8	.0	3.0	178	160	2
Feb. 11-20--------	13,030	45	6.3	30.4	6.9	.06	36	17	5.0	1.1	8	191	5.0	3.8	.1	5.6	177	160	3
Feb. 21-28---------	11,750	45	8.1	30.9	8.1	.06	36	18	4.9	1.1	6	196	4.8	4.0	.1	5.0	182	164	3
Mar. 1-10---------	9,732	42	8.0	32.7	7.7	.18	36	18	5.2	2.1	0	202	4.4	3.8	.0	3.0	183	164	0
Mar. 11-20--------	10,620	47	8.4	32.2	8.0	.08	34	18	8.3	1.8	13	204	4.5	3.2	.0	3.0	185	159	0
Mar. 21-31--------	11,900	51	8.0	31.9	7.0	.08	34	17	7.2	1.9	0	197	4.8	3.2	.0	2.2	178	155	0

WHITE RIVER BASIN--Continued

WHITE RIVER AT NEWPORT, ARK.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Non-carbonate
Apr. 1-10, 1947---	13,340	60	8.2	30.5	7.3	0.12	37	17	2.2	1.5	14	190	5.0	3.8	0.1	2.5	170	162	6
Apr. 11-20--------	48,510	61	8.1	23.2	10	.16	28	10	3.6	1.9	9	128	8.5	4.2	.1	5.0	139	114	9
Apr. 21-30--------	38,680	61	8.1	23.4	10	.14	29	11	2.9	1.1	0	138	5.0	3.5	.1	2.2	136	118	5
May 1-10 ---------	39,500	65	7.7	23.4	7.6	.06	26	10	7.2	1.6	0	138	4.8	2.0	.1	3.2	132	106	0
May 11-20 --------	33,390	69	7.9	24.2	11	.06	30	11	3.2	1.7	0	144	5.1	2.5	.1	2.8	139	120	2
May 21-31 --------	38,000	69	7.7	24.8	7.6	.06	31	12	2.6	1.3	0	152	4.3	2.0	.0	2.8	141	127	2
June 1-10---------	23,880	73	8.2	27.1	9.1	.02	34	13	3.2	2.9	0	169	4.3	1.5	.2	4.0	158	138	0
June 11-20 --------	15,780	77	8.2	28.2	9.8	.02	35	15	4.0		0	178	3.9	2.8	.2	4.0	167	149	3
June 21-30- --------	13,880	77	8.3	28.8	9.0	.02	35	16	2.3		0	178	4.4	2.5	.1	5.0	169	153	7
July 1-10 ---------	13,390	79	8.5	27.1	13	.02	34	15	2.9		0	173	3.8	2.5	.3	3.5	160	147	5
July 11-20 --------	11,600	80	8.4	28.0	8.9	.02	33	15	3.6		0	173	3.5	2.2	.1	3.8	159	144	2
July 21-31 --------	8,492	80	8.3	30.1	9.9	.02	36	18	3.2		0	195	3.7	2.8	.2	3.5	178	164	4
Aug. 1-10---------	6,726	86	8.6	30.5	12	.04	35	19	3.0	2.5	0	198	3.6	4.0	.2	3.8	181	165	3
Aug. 11-20--------	5,827	84	8.6	29.9	9.7	.02	33	20	5.0		7	200	3.5	3.2	.3	3.0	179	165	1
Aug. 21-31--------	5,960	83	8.6	31.5	13	.02	36	20	3.5		0	208	3.5	3.2	.3	2.2	185	172	2
Sept. 1-10 --------	5,597	83	8.7	31.7	10	.04	35	19	6.5	2.8	5	210	3.5	3.5	.1	2.5	186	165	0
Sept. 11-20 -------	5,062	78	8.7	31.5	12	.02	37	21	2.9		7	212	3.3	3.5	.2	2.5	189	179	5
Sept. 21-30 -------	5,470	69	8.6	32.2	7.8	.02	35	20	4.5	2.8	0	209	3.7	3.2	.1	3.8	185	170	0
Average--------	20,220	63	--	28.2	9.1	0.07	34	15	4.0	1.7	--	178	4.4	3.1	0.1	3.2	163	147	3

Temperature (° F.) of water, water year October 1946 to September 1947

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

WHITE RIVER BASIN--Continued

NORTH FORK RIVER AT NORFORK DAM NEAR NORFORK, ARK.

LOCATION.--At Norfork Dam, 4.3 miles northeast of Norfork, Baxter County.
DRAINAGE AREA.--1,806 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: October to December 1946.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1087.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as Ca CO_3	
																	Total	Non-carbonate
Oct. 1-10, 1946	9,082	62	8.0	28.1	10	0.02	31	17	5.0	1.3	181	4.9	2.5	0.1	3.2	167	147	0
Oct. 11-20	6,385	62	7.9	28.1	13	.04	32	16	6.5	1.4	186	3.2	2.5	.4	1.5	169	146	0
Oct. 21-31	8,780	62	8.2	27.9	12	.04	32	17	4.7	1.1	185	3.2	3.2	.1	1.8	167	150	0
Nov. 1-10	9,000	62	8.3	28.6	10	.08	29	18	9.2	1.8	192	3.7	4.5	.1	1.0	173	146	0
Nov. 11-20	23,340	60	8.3	28.8	8.3	.08	28	18	8.3	2.1	191	3.3	2.0	.1	1.5	167	144	0
Nov. 21-30	26,300	58	8.2	28.4	8.2	.08	27	19	7.1	1.8	184	3.6	5.0	.1	1.5	165	145	0
Dec. 30	2,640	--	8.0	28.3	4.7	.04	31	18	2.2	1.4	182	4.1	2.2	.1	1.5	158	151	2
Jan. 31, 1947	2,640	--	7.5	29.2	2.3	.06	30	19	1.8	1.0	183	3.8	2.0	.2	1.2	160	153	3
Feb. 20	2,730	--	8.3	28.8	3.7	.06	29	19	2.7	.9	183	4.0	1.5	.1	1.0	158	150	1
Mar. 27	1,360	--	8.0	29.2	6.0	.06	30	18	3.9	.9	184	3.7	1.8	.1	1.2	160	149	0
Apr. 21	1,660	--	8.0	29.4	4.7	.12	30	19	5.1	1.2	190	3.5	3.2	.1	1.8	163	153	0
May 28	2,640	--	8.0	28.9	4.6	.06	32	20	3.1	.9	190	5.0	3.0	.0	2.0	167	162	3
June 24	2,690	--	7.8	31.1	6.8	.10	32	19	5.4	2.3	198	4.0	3.2	.0	2.2	174	158	0
July 23	1,510	--	7.7	31.4	4.8	.06	28	19	11	1.5	199	4.0	3.5	.0	2.0	174	148	0
Aug. 11	1,080	--	7.8	31.6	4.6	.06	34	19	2.4	1.6	198	3.9	1.5	.0	2.2	174	163	1
Sept. 11	1,580	--	8.3	30.8	6.7	.02	34	20	3.4		203	3.4	1.5	.2	2.5	179	167	1

MISCELLANEOUS ANALYSES OF STREAMS IN WHITE RIVER BASIN IN ARKANSAS

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
															Total	Noncarbonate
WHITE RIVER NEAR FLIPPIN																
Aug. 13, 1947	344	--	25.3	--	--	--	--	--	168	2.0	2.6	--	0.2	--	129	0
WHITE RIVER AT CALICO ROCK																
Jan. 13, 1947	9,210	--	28.7	--	--	--	--	--	180	7.0	5.0	--	4.0	--	198	50
Aug. 22	2,050	--	30.6	--	--	--	--	--	198	4.0	1.5	--	.8	--	152	0
WHITE RIVER AT BATESVILLE																
Aug. 2, 1947	2,740	--	30.3	--	--	--	--	--	196	4.0	1.2	--	0.5	--	152	0
WHITE RIVER AT DE VALLS BLUFF																
Feb. 14, 1947	--	--	28.7	--	--	--	--	--	182	5.0	10	--	1.2	--	213	64
Sept. 23	--	9.0	38.6	0.06	34	13	15	2.2	1/199	4.0	4.0	0.0	.5	184	138	0
WEST FORK WHITE RIVER AT GREENLAND																
Apr. 21, 1947	119	--	--	--	--	--	--	--	30	8.0	4.0	--	0.2	--	32	7
KINGS RIVER NEAR BERRYVILLE																
Jan. 23, 1947	241	--	21.0	--	--	--	--	--	126	8.0	6.0	--	1.0	--	129	26
July 29	31	--	23.4	--	--	--	--	--	148	3.0	.8	--	.2	--	111	0
BUFFALO RIVER NEAR ST. JOE																
Jan. 7, 1947	780	--	19.8	--	--	--	--	--	118	7.0	5.0	--	0.5	--	92	0
Aug. 12	41	--	22.5	--	--	--	--	--	136	3.0	1.5	--	.2	--	100	0
BUFFALO RIVER NEAR RUSH																
Jan. 9, 1947	970	--	21.0	--	--	--	--	--	128	5.0	6.0	--	0.5	--	92	0
July 30	96	--	21.8	--	--	--	--	--	128	4.0	1.2	--	.2	--	91	0

1/ Includes equivalent of 12 parts per million of carbonate (CO_3).

WHITE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN WHITE RIVER BASIN IN ARKANSAS--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
															Total	Non-carbonate
BLACK RIVER NEAR CORNING																
Aug. 18, 1947	538	--	23.4	--	--	--	--	--	162	3.0	1.0	--	0.5	--	122	0
BLACK RIVER AT POCAHONTAS																
Aug. 17, 1947	2,370	--	30.1	--	--	--	--	--	190	2.0	1.0	--	0.2	--	144	0
SPRING RIVER AT IMBODEN																
Jan. 17, 1947	900	--	39.3	--	--	--	--	--	262	4.0	6.0	--	3.0	--	273	58
Aug. 16	358	--	40.3	--	--	--	--	--	270	2.0	1.5	--	1.0	--	213	0
ELEVEN POINT RIVER NEAR ELEVEN POINT																
Jan. 14, 1947	1,060	--	32.9	--	--	--	--	--	212	3.0	6.0	--	2.6	--	243	69
Aug. 18	553	--	36.8	--	--	--	--	--	242	2.0	1.0	--	1.5	--	186	0
STRAWBERRY RIVER NEAR EVENING SHADE																
Feb. 5, 1947	77	--	30.9	--	--	--	--	--	198	6.0	6.0	--	0.8	--	152	0
Aug. 5	12	--	42.0	--	--	--	--	--	278	4.0	.8	--	.2	--	226	0
STRAWBERRY RIVER NEAR POUGHKEEPSIE																
Feb. 5, 1947	212	--	30.0	--	--	--	--	--	198	4.0	6.0	--	0.8	--	174	12
Aug. 6	55	--	33.3	--	--	--	--	--	251	4.0	1.0	--	.2	--	202	0
PINEY FORK STRAWBERRY RIVER NEAR EVENING SHADE																
Feb. 5, 1947	26	--	28.7	--	--	--	--	--	179	3.0	5.0	--	3.2	--	159	12
Aug. 5	3.6	--	30.6	--	--	--	--	--	201	1.0	1.0	--	.2	--	162	0
SOUTH FORK LITTLE RED RIVER NEAR CLINTON																
Feb. 3, 1947	192	--	3.30	--	--	--	--	--	12	3.0	5.0	--	2.2	--	16	6
Aug. 4	1.2	--	4.52	--	--	--	--	--	21	1.0	.8	--	.2	--	13	0

LITTLE RED RIVER NEAR HEBER SPRINGS																
Feb. 4, 1947	830	--	5.40	-1	--	--	--	--	22	7.0	6.0	--	0.2	--	39	21
Aug. 5	7.4	--	5.50	--	--	--	--	--	27	1.0	1.2	--	.2	--	18	0
MIDDLE FORK LITTLE RED RIVER AT SHIRLEY																
Feb. 3, 1947	273	--	10.3	--	--	--	--	--	47	13	4.0	--	0.0	--	54	16
Aug. 4	.4	--	9.86	--	--	--	--	--	54	3.0	1.5	--	.2	--	39	0
LAGRUE BAYOU NEAR STUTTGART																
Feb. 13, 1947	41	--	12.3	--	--	--	--	--	59	5.0	7.0	--	1.8	--	82	14
Aug. 7	1.4	--	29.7	--	--	--	--	--	164	4.0	9.8	--	1.0	--	91	0
CACHE RIVER NEAR BISCOE																
Sept. 23, 1947	--	8.7	33.3	0.05	22	2.8	47	3.8	155	12	23	0.1	0.8	207	66	0

ARKANSAS RIVER BASIN

ARKANSAS RIVER AT SAND SPRINGS BRIDGE NEAR TULSA, OKLA.

LOCATION.--At bridge on U. S. Highway 64 at Sand Springs, Tulsa County, 10 miles upstream from gaging station at Tulsa, Tulsa County.
DRAINAGE AREA.--74,700 square miles above gaging station.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 5,360 parts per million Oct. 12-17; minimum, 511 parts per million May 18-19.
Total hardness: Maximum, 1,280 parts per million Oct. 11; minimum, 106 parts per million July 2.
Water temperatures: Maximum, 96° F. Aug. 7; minimum, freezing point Dec. 30, Feb. 8.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1087. No appreciable inflow between sampling point and gaging station except during periods of heavy local rains. Records of specific conductance of daily samples are available in district office at Stillwater, Okla.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-6, 1946------	622	65	--	444	--	--	160	43	689		152	137	1,280	--	1.5	2,390	3.25	4,010	576	452	72
Oct. 7-10 ----------	577	70	--	612	--	--	214	53	991		138	150	1,870	--	1.5	3,350	4.56	5,220	752	639	74
Oct. 11 ------------	1,050	61	--	1,530	--	--	--	--	--		79	380	5,030	--	.5	--	--	--	1,280	1,215	--
Oct. 12-17 ---------	2,757	61	--	920	--	--	210	51	1,770		137	323	2,930	--	4.0	5,360	7.29	39,900	734	622	84
Oct. 18-24 ---------	3,633	63	--	434	--	--	94	24	740		144	126	1,200	--	.5	2,260	3.07	22,200	333	215	83
Oct. 25-Nov. 1 -----	2,068	65	--	353	--	--	109	32	593		146	168	990	--	2.5	1,970	2.68	11,000	404	284	78
Nov. 3-8 -----------	4,378	56	--	371	--	--	101	25	646		142	140	1,060	--	3.8	2,050	2.79	24,200	355	239	80
Nov. 2, 9-10 -------	4,367	53	--	274	--	--	80	30	438		129	85	765	--	3.8	1,470	2.00	17,300	323	218	75
Nov. 11-12, 20 -----	5,360	50	--	532	--	--	128	50	931		152	238	1,540	--	5.5	2,970	4.04	43,000	525	400	79
Nov. 13, 16-17 -----	4,527	51	--	261	--	--	92	29	401		131	144	680	--	5.5	1,420	1.93	17,400	348	241	71
Nov. 14-15, 18-19 --	4,212	52	--	351	--	--	105	34	580		139	184	960	--	3.8	1,940	2.64	22,100	402	288	76
Nov. 21-30---------	2,303	52	--	459	--	--	153	45	773		177	340	1,240	--	1.2	2,640	3.59	16,400	567	422	75
Dec. 1-10----------	1,708	54	--	486	--	--	187	51	787		216	374	1,290	--	1.5	2,800	3.81	12,900	676	488	72
Dec. 11-20---------	2,418	49	--	481	--	--	166	44	819		205	331	1,320	--	1.5	2,780	3.78	18,100	595	427	75
Dec. 21-31---------	2,464	45	--	543	--	--	179	53	936		204	385	1,510	--	1.8	3,160	4.30	21,000	664	497	75
Jan. 1-10, 1947-----	1,002	36	--	604	--	--	188	55	1,060		223	336	1,740	--	3.5	3,490	4.75	9,440	695	512	77
Jan. 11-20 ---------	2,055	44	--	512	--	--	160	48	883		224	273	1,450	--	4.5	2,930	3.98	16,300	596	413	76
Jan. 21-31----------	2,076	47	8.1	631	6.0	0.10	166	53	1,140	14	226	336	1,840	0.2	1.8	3,670	4.99	20,600	632	446	79
Feb. 1-10----------	1,579	38	--	562	--	--	193	56	960		235	388	1,560	--	3.5	3,280	4.46	14,000	712	519	75
Feb. 11-20---------	1,289	49	--	557	--	--	195	57	953		222	365	1,580	--	2.5	3,260	4.43	11,300	721	539	74
Feb. 21-28---------	1,375	45	--	532	--	--	190	57	902		215	388	1,480	--	2.0	3,120	4.24	11,600	708	532	73

Mar. 1-10	1,281	46	--	555	--	--	190	62	952	214	349	1,600	--	3.0	3,260	4.43	11,300	730	553	73
Mar. 11-17	7,747	47	--	486	--	--	161	46	857	202	298	1,400	--	3.0	2,860	3.89	59,800	590	424	76
Mar. 18-20	14,590	47	--	338	--	--	102	26	589	126	181	955	--	4.0	1,920	2.61	75,600	362	258	78
Mar. 21-31	4,569	52	--	481	--	--	146	40	859	176	305	1,370	--	3.0	2,810	3.82	34,700	529	384	78
Apr. 1-7	3,546	59	--	457	--	--	144	37	849	151	300	1,360	--	2.5	2,770	3.77	26,500	512	388	78
Apr. 9-12, 16-17	58,750	59	--	97.0	--	--	45	12	154	124	42	248	--	2.5	570	.78	90,400	162	60	68
Apr. 8, 13-15	65,880	53	--	191	--	--	70	14	310	138	83	500	--	2.5	1,050	1.43	187,000	232	119	74
Apr. 18-23	40,950	59	--	226	--	--	94	20	377	146	160	600	--	3.0	1,330	1.81	147,000	316	196	72
Apr. 24-30	22,740	64	--	184	--	--	80	23	272	130	123	460	--	2.5	1,020	1.39	62,600	294	188	67
May 1-2	12,650	70	--	220	--	--	108	24	318	157	214	500	--	3.5	1,240	1.69	42,400	368	239	65
May 3-10	7,482	70	--	320	--	--	128	34	513	191	250	820	--	3.5	1,840	2.50	37,200	460	303	71
May 11-13	6,290	70	--	269	--	--	94	25	431	154	146	705	--	2.0	1,480	2.01	25,100	338	212	73
May 14-17, 20-26	35,550	73	--	160	--	--	77	16	226	118	137	360	--	4.0	916	1.25	87,900	258	162	66
May 18-19	58,550	76	--	91.1	--	--	56	9.8	113	105	94	170	--	2.0	511	.69	80,800	180	94	58
May 27-31	27,740	72	--	232	--	--	110	22	354	134	216	565	--	3.0	1,340	1.82	100,000	365	255	68
June 1-10	14,920	78	7.7	221	3.5	00	114	28	294 | 22	167	232	485	.3	3.0	1,260	1.71	50,800	400	262	60
June 11-19, 22-23	8,454	80	--	237	--	--	124	36	322	175	253	530	--	4.0	1,360	1.85	31,000	458	314	60
June 20-21, 24-30	12,300	78	--	155	--	--	72	24	221	131	137	360	--	1.5	904	1.23	30,000	278	170	63
July 1, 3-4, 6-10	12,200	82	--	134	--	--	90	22	105	146	101	220	--	10	809	1.10	26,600	315	195	42
July 2	13,900	83	--	67.2	--	--	--	--	--	50	75	215	--	0	--	--	--	106	65	--
July 5	9,520	85	--	79.2	--	--	--	--	--	47	150	835	--	12	--	--	--	272	234	--
July 11-20	5,317	84	--	190	--	--	123	33	150	186	156	320	--	4.0	878	1.19	12,600	442	290	42
July 21-31	4,572	86	--	367	--	--	141	39	368	191	350	560	--	1.5	1,550	2.11	19,100	512	356	61
Aug. 1, 4	3,025	90	--	168	--	--	104	27	213	140	220	345	--	2.2	980	1.33	8,000	370	256	55
Aug. 2-3, 5-6	2,728	89	--	265	--	--	138	39	362	186	327	565	--	2.8	1,530	2.08	11,300	505	352	61
Aug. 7-10	2,135	86	--	326	--	--	175	47	469	156	416	770	--	3.0	1,960	2.67	11,300	630	502	62
Aug. 11-20	1,648	88	--	372	--	--	170	46	541	136	317	955	--	2.5	2,100	2.86	9,340	613	502	66
Aug. 21-31	1,297	84	--	358	--	--	164	44	519	136	283	930	--	1.2	2,010	2.73	7,040	590	478	66
Sept. 1-10	1,034	87	--	476	--	--	173	49	817	156	267	1,420	--	1.0	2,800	3.81	7,820	633	505	74
Sept. 11-20	868	80	--	478	--	--	175	51	806	154	258	1,420	--	2.0	2,790	3.79	6,540	646	520	73
Sept. 21-30	891	59	--	487	--	--	181	49	805	156	233	1,440	--	1.0	2,790	3.79	6,710	653	525	73
Weighted average	8,096	--	--	237	--	--	--	--	--	145	166	605	--	3.1	--	--	--	341	--	--

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT SAND SPRINGS BRIDGE NEAR TULSA, OKLA.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	62	65	60	38	44	42	56	70	72	--	91	83
2	61	60	56	33	44	44	55	70	72	83	90	87
3	70	56	54	34	47	46	57	70	74	80	88	84
4	64	55	53	34	43	41	58	71	79	82	88	66
5	65	54	51	34	34	49	59	70	80	85	92	62
6	70	54	52	34	36	44	61	71	80	82	85	93
7	71	56	54	38	34	45	70	89	80	82	96	91
8	70	54	58	37	32	47	60	69	79	83	86	90
9	70	52	57	38	34	46	61	69	83	85	81	89
10	69	48	56	40	34	52	59	68	80	83	81	66
11	61	50	52	39	48	50	--	67	80	83	95	82
12	57	46	55	38	44	51	--	67	80	85	88	78
13	56	51	51	48	46	49	50	72	76	83	91	75
14	58	54	54	46	51	47	51	75	78	--	82	87
15	64	56	54	45	49	45	51	74	80	--	92	70
16	63	51	54	44	55	43	58	68	80	--	61	78
17	68	51	42	43	54	46	58	76	81	--	95	88
18	62	48	42	46	51	45	60	76	84	--	89	80
19	58	50	43	49	50	47	58	77	87	85	82	82
20	58	53	44	46	43	49	60	74	77	84	85	75
21	65	52	45	47	45	50	80	74	73	85	60	70
22	66	57	47	48	48	50	60	72	80	--	--	64
23	64	49	46	44	42	54	58	71	79	--	80	68
24	65	54	46	53	44	50	58	73	80	68	92	55
25	64	40	48	52	44	56	58	74	82	82	82	56
26	59	49	54	51	45	51	61	73	--	85	82	60
27	58	48	60	49	47	51	68	77	--	89	81	58
28	--	54	48	47	43	54	68	74	--	94	80	54
29	68	56	34	44	--	53	68	71	--	95	91	55
30	70	58	32	42	--	56	69	70	--	88	93	47
31	68	--	33	44	--	52	--	70	--	--	83	--
Average	64	53	49	43	44	49	60	72	--	--	87	75

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ARKANSAS RIVER AT VAN BUREN, ARK.

LOCATION.--At bridge on U. S. Highway 64 at Van Buren, Crawford County, 1½ miles downstreams from Lee Creek, and 8½ miles downstream from Poteau River.
DRAINAGE AREA.--150,300 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1947.
Water temperatures: October 1945 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 1,610 parts per million Oct. 21-24; minimum, 239 parts per million Dec. 12-19.
Total hardness: Maximum, 397 parts per million Oct. 17-20; minimum, 90 parts per million Nov. 11-14.
Water temperatures: Maximum, 87° F. Aug. 1; minimum, 34° F. Jan. 5-6.
EXTREMES, 1945-47.--Dissolved solids: Maximum, 1,610 parts per million Oct. 21-24, 1946; minimum, 217 parts per million May 21, 24-26, 28-30, 1946.
Total hardness: Maximum, 397 parts per million Oct. 17-20, 1946; minimum, 79 parts per million May 12-13, 16-18, 1946.
Water temperatures: Maximum, 87° F. July 23, 1946, Aug. 1, 1947; minimum, 29° F. Dec. 20-21, 1945.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1087. Records of specific conductance of daily samples are available in district office at Fayetteville, Ark.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 1-10, 1946 ---	4,487	67	--	154	--	--	76	19	222		10	164	91	368	--	3.2	925	1.26	11,200	268	133	64
Oct. 11-16 --------	13,920	61	--	147	--	--	84	23	175		0	188	168	250	--	2.8	853	1.16	32,100	304	150	56
Oct. 17-20 --------	12,050	64	--	292	--	--	113	28	444		10	188	214	708	--	3.0	1,590	2.16	51,700	397	259	71
Oct. 21-24 --------	10,050	69	--	306	--	--	84	17	506		14	157	140	782	--	2.5	1,610	2.19	43,700	280	150	80
Oct. 25-31 --------	11,890	67	--	190	--	--	70	16	297		11	147	97	470	--	2.0	1,020	1.39	32,700	240	119	73
Nov. 1-2, 6 ------	27,170	68	--	182	--	--	76	16	258		10	127	73	450	--	2.0	938	1.28	68,800	256	151	69
Nov. 3-5, 7-10 ----	68,200	61	--	55.0	--	--	35	7.4	63		0	83	27	112	--	2.0	336	.46	61,900	118	50	54
Nov. 11-14 -------	62,180	55	--	44.3	--	--	26	6.1	49		0	70	21	82	--	1.5	261	.36	43,800	90	33	54
Nov. 15-20 -------	24,930	53	--	100	--	--	46	9.8	134		0	96	52	222	--	2.0	568	.77	38,200	156	77	65
Nov. 21-26 -------	14,580	63	--	119	--	--	60	13	156		0	113	62	272	--	2.0	675	.92	26,600	203	110	63
Nov. 27-30 -------	25,400	51	--	58.8	--	--	30	7.2	78		0	67	37	128	--	1.2	354	.48	24,300	104	49	62
Dec. 1-2, 11, 20 --	63,950	51	--	97.0	--	--	51	11	139		0	106	52	235	--	3.0	605	.82	104,000	172	85	64
Dec. 3-10 ---------	22,440	50	--	172	--	--	75	18	243		0	134	89	415	--	2.2	908	1.24	55,000	261	151	67
Dec. 12-19--------	141,800	54	--	39.0	--	--	28	6.2	40		0	82	17	67	--	2.8	239	.33	91,500	95	28	48
Dec. 21-25--------	18,900	46	--	109	--	--	53	13	135		0	110	56	232	--	3.5	620	.84	31,600	186	95	61
Dec. 26-31--------	12,900	48	--	143	--	--	72	17	219		0	130	80	378	--	3.5	908	1.23	31,600	250	143	66

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT VAN BUREN, ARK.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Jan. 1-10, 1947 ---	10,600	37	--	117	--	--	56	13	145		0	120	49	254	--	2.0	648	0.88	18,500	193	94	62
Jan. 11-16 --------	10,150	46	--	164	--	--	77	17	230		10	144	71	402	--	2.5	942	1.28	25,800	262	144	66
Jan. 17-20 --------	10,330	46	--	248	--	--	102	23	348		8	154	83	632	--	3.0	1,270	1.73	35,400	349	222	68
Jan. 21-22, 26-28 -	9,016	47	--	204	--	--	89	21	275		8	159	90	482	--	3.2	1,040	1.41	25,300	308	178	66
Jan. 23-25, 29-31 -	8,668	48	--	260	--	--	101	25	384		19	181	104	660	--	3.5	1,370	1.86	32,100	355	206	70
Feb. 1, 7-9 -------	6,903	43	--	267	--	--	102	26	402		12	174	134	675	--	2.2	1,430	1.94	26,700	362	218	71
Feb. 2-6, 10 ------	7,075	43	--	229	--	--	92	22	328		10	167	115	550	--	2.0	1,190	1.62	22,700	320	183	69
Feb. 11-20 -------	5,821	44	--	233	--	--	99	25	333		14	175	122	568	--	3.0	1,240	1.69	19,500	350	206	67
Feb. 21-28 -------	5,995	42	--	237	--	--	100	25	338		10	166	114	598	--	2.0	1,250	1.70	20,280	352	216	68
Mar. 1-10 --------	5,643	42	--	220	--	--	98	24	309		14	165	114	538	--	2.5	1,170	1.59	17,800	343	207	66
Mar. 11-20 -------	19,010	47	--	203	--	--	83	21	278		7	149	94	480	--	1.8	1,030	1.40	52,900	294	171	67
Mar. 21-31 -------	17,530	54	--	198	--	--	76	18	317		8	130	117	478	--	.2	1,070	1.46	50,600	264	156	76
Apr. 1-4, 9 -------	18,850	61	--	209	--	--	79	19	307		7	140	118	500	--	.2	1,090	1.48	55,500	275	161	71
Apr. 5-8, 10 ------	39,500	65	--	125	--	--	58	13	169		0	111	76	280	--	1.0	744	1.01	79,300	198	107	65
Apr. 11-12, 17-19 -	192,600	56	--	86.6	--	--	41	8.7	111		0	110	41	175	--	1.2	507	.69	264,000	138	48	64
Apr. 13-16, 20 ----	176,000	58	--	55.8	--	--	38	7.0	62		0	118	38	87	--	1.5	335	.46	159,000	124	27	52
Apr. 21-30 -------	146,900	59	7.8	59.1	9.2	0.10	43	7.2	6.1	1.7	0	106	44	96	0.2	2.8	348	.47	138,000	137	50	61
May 1-5 ----------	113,000	66	--	52.4	--	--	38	6.0	58		0	97	39	87	--	3.2	323	.44	98,500	119	40	51
May 6-9 ----------	42,050	68	--	83.2	--	--	53	8.8	103		0	120	62	161	--	3.0	509	.69	57,800	168	69	57
May 10-13 --------	41,530	64	--	115	--	--	62	13	152		8	126	78	249	--	2.8	686	.93	76,900	208	104	61
May 14-20 --------	161,100	71	--	66.0	--	--	44	6.7	76		0	106	38	123	--	2.5	381	.52	166,000	138	49	55
May 21-23, 25, 27-28 ----------	158,700	68	--	52.4	--	--	40	6.1	61		0	104	39	92	--	2.2	311	.42	133,000	125	40	51
May 24, 26, 29-31 -	123,800	68	--	68.2	--	--	48	7.9	80		0	120	53	121	--	2.2	408	.55	136,000	152	54	53
June 1-2, 8-10 ----	64,940	75	--	81.7	--	--	52	9.0	94		0	118	64	145	--	4.0	474	.64	83,100	167	70	55
June 3-7 ----------	104,300	73	--	59.7	--	--	42	6.1	64		0	104	41	99	--	3.8	347	.47	97,700	130	45	52
June 11-20 --------	37,340	76	--	98.0	--	--	62	12	106		0	126	100	161	--	2.5	588	.80	59,300	204	101	53
June 21-26 --------	43,970	79	--	116	--	--	61	14	141		0	116	70	245	--	2.5	664	.90	78,800	210	114	59
June 27-30 --------	63,630	81	--	66.2	--	--	40	8.1	79		0	98	45	125	--	2.2	393	.53	67,500	134	53	56

July 1-2, 4, 6-----	46,220	80	--	60.0	--	--	42	7.0	60	0	103	45	93	--	3.8	349	.47	43,600	134	50	49
July 3, 5, 7-8, 10 -	35,180	79	--	85.5	--	--	52	12	115	5	116	67	185	--	3.0	562	.76	53,400	180	84	58
July 12-16, 19-----	12,950	80	--	93.2	--	--	68	17	130	0	187	132	165	--	.2	622	.85	21,700	240	87	54
July 11, 17-18, 20 -	14,980	79	--	124	--	--	76	18	166	31	200	143	220	--	3.0	756	1.03	30,600	264	99	58
July 21-26 --------	9,770	77	--	159	--	--	87	22	201	0	175	150	315	--	2.2	976	1.33	25,700	312	164	58
July 27-31 --------	13,660	84	--	229	--	--	109	29	324	5	164	176	550	--	3.0	1,270	1.73	46,800	391	257	52
Aug. 1-4 ---------	12,650	85	--	166	--	--	82	19	230	5	151	135	365	--	3.5	962	1.31	32,900	282	159	64
Aug. 5-10 --------	8,603	85	--	116	--	--	66	16	141	0	139	103	222	--	3.5	678	.92	15,700	230	117	57
Aug. 11-20 -------	6,465	84	--	140	--	--	68	19	185	5	122	115	302	--	4.0	830	1.13	14,500	248	147	62
Aug. 21-22, 25-27, 30-31 ----------	5,689	84	--	142	--	--	70	17	189	6	130	94	318	--	3.2	804	1.09	12,400	244	138	63
Aug. 23-24, 28-29 -	5,520	82	--	184	--	--	74	21	256	0	138	115	420	--	3.0	957	1.30	14,300	271	158	67
Sept. 1-10 --------	4,301	84	--	147	--	--	70	19	188	0	130	67	342	--	2.8	850	1.16	9,870	252	146	62
Sept. 11-13, 19-20-	7,025	78	--	195	--	--	80	23	277	5	128	68	510	--	2.0	1,020	1.39	19,350	294	189	67
Sept. 14-18 -------	9,546	74	--	79.2	--	--	37	11	98	0	90	37	168	--	2.0	433	.59	11,200	138	64	61
Sept. 21-22, 27-30-	6,523	74	--	187	--	--	74	20	275	0	124	67	490	--	2.2	989	1.35	17,400	266	165	69
Sept. 23-26 -------	6,705	72	--	115	--	--	52	13	155	0	103	42	278	--	1.8	674	.92	12,200	184	99	65
Weighted average-	38,660	--	--	84.5	--	--	48	9.7	108	--	111	54	174	--	2.4	494	0.67	51,600	161	69	57

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT VAN BUREN, ARK.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

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

ARKANSAS RIVER AT LITTLE ROCK, ARK.

LOCATION.--At gaging station on Missouri Pacific Railway bridge at Little Rock, Pulaski County.
DRAINAGE AREA.--157,900 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1947.
Water temperatures: October 1945 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 1,730 parts per million Oct. 24-29; minimum, 187 parts per million Dec. 11-20.
Total hardness: Maximum, 406 parts per million Aug. 3-5, 7; minimum, 70 parts per million Apr. 13-17.
Water temperatures: Maximum, 91° F. Aug. 6, 9; minimum, 34° F. Jan. 6.
EXTREMES, 1945-47.--Dissolved solids: Maximum, 1,730 parts per million Oct. 24-29, 1946; minimum, 187 parts per million Dec. 11-20, 1946.
Total hardness: Maximum, 406 parts per million Aug. 3-5, 7, 1947; minimum, 70 parts per million Apr. 13-17, 1947.
Water temperatures: Maximum, 91° F. Aug. 6, 9, 1947; minimum, freezing point Dec. 19, 1946.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1087. Records of specific conductance of daily samples are available in district office at Fayetteville, Ark.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Specific conductance (K×10⁶ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 1-10, 1946	7,022	70	185	86	25	253	10	172	122	405	2.0	998	1.36	18,900	318	189	61
Oct. 11-20	10,490	64	165	87	23	198		1/190	138	312	3.0	924	1.26	26,200	312	155	58
Oct. 21-23, 30-31	12,020	66	200	88	23	267		1/172	150	422	3.2	1,040	1.41	33,800	314	172	65
Oct. 24-29	10,920	65	334	104	26	514		2/164	186	818	1.8	1,730	2.35	51,000	366	232	75
Nov. 1-6	14,440	66	154	66	15	204		137	72	340	3.0	807	1.10	31,500	226	114	66
Nov. 7-10	94,880	60	119	58	10	155		2/133	55	252	2.0	639	.87	164,000	186	76	65
Nov. 11-16	100,100	52	37.0	25	5.0	37		76	17	58	1.8	214	.29	57,800	83	21	49
Nov. 17-20	49,830	52	66.2	32	6.6	67		79	31	131	2.2	359	.49	48,300	107	42	62
Nov. 21-30	32,360	52	72.8	34	7.4	92		85	43	141	2.0	383	.52	33,500	116	46	63
Dec. 1-6	31,950	48	58.0	28	6.6	67		65	33	109	2.0	315	.43	27,200	97	44	60
Dec. 7-10	16,950	52	109	51	12	135		102	57	231	1.8	574	.78	26,300	176	93	62
Dec. 11-20	188,300	51	29.4	23	4.3	28		81	15	38	.2	187	.25	95,100	75	9	45
Dec. 21-25	55,080	47	39.2	24	5.7	38		62	19	67	1.5	227	.31	33,800	83	32	50
Dec. 26-31	34,480	45	62.2	34	7.5	69		74	36	117	3.5	340	.46	31,700	116	55	56
Jan. 1-10, 1947	25,660	37	93.4	44	11	122		96	50	204	2.2	546	.74	37,800	155	76	63
Jan. 11-12, 14-16	18,660	41	79.0	41	9.4	98		105	41	159	2.5	444	.60	22,400	141	55	60
Jan. 13, 17-20	17,580	41	102	51	11	131		117	44	222	2.0	576	.78	27,300	172	76	62
Jan. 21-31	15,470	44	154	68	19	216		3/132	61	385	2.5	873	1.19	36,500	248	139	66

1/ Includes equivalent of 12 parts per million of carbonate (CO_3).
2/ Includes equivalent of 8 parts per million of carbonate (CO_3).
3/ Includes equivalent of 6 parts per million of carbonate (CO_3).

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT LITTLE ROCK, ARK.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Specific conductance ($K \times 10^6$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Feb. 1-5, 1947	12,880	40	149	68	17	200		144	72	340	2.8	796	1.08	27,700	240	121	65
Feb. 6-10	10,800	37	193	78	19	288		153	83	485	2.0	1,030	1.40	30,030	272	147	70
Feb. 11-20	9,015	42	186	81	19	264		4/165	92	440	2.0	979	1.33	23,800	280	144	67
Feb. 21-28	8,718	42	185	82	21	253		5/168	92	430	1.8	963	1.31	22,700	291	153	65
Mar. 1-10	8,252	42	192	82	22	266		158	91	460	1.0	1,000	1.36	22,300	295	165	66
Mar. 11-14, 18-19	12,560	48	152	57	22	201		134	75	340	1.5	867	1.18	29,400	232	122	65
Mar. 15-17, 20-23	28,120	50	172	69	17	253		132	84	422	1.5	912	1.24	69,200	242	134	69
Mar. 24-31	31,790	53	114	39	10	169		93	59	260	2.8	664	.90	57,000	138	62	73
Apr. 1-10	21,660	62	154	60	14	218		108	90	352	3.0	865	1.18	50,600	207	118	70
Apr. 11-12, 18-20	174,400	61	91.0	46	8.6	116		121	49	177	3.0	512	.70	241,000	150	51	63
Apr. 13-17	183,800	61	56.5	18	6.2	84		102	36	92	2.5	326	.44	162,000	70	0	72
Apr. 21-30	162,100	62	56.6	18	7.5	84		110	41	88	3.0	337	.46	147,000	76	0	71
May 1-10	127,100	67	50.2	36	7.2	53		102	37	78	3.5	301	.41	103,000	119	36	49
May 11-15	56,680	70	82.2	47	10	100		110	56	160	2.2	476	.65	72,800	158	68	58
May 16-20	155,200	72	61.4	38	7.8	71		101	34	114	1.8	356	.48	149,000	127	44	55
May 21-31	184,000	72	51.0	39	7.8	50		114	36	74	2.5	305	.41	151,000	129	36	45
June 1-10	109,120	77	61.3	43	7.9	65		111	44	101	2.2	357	.49	10,500	140	49	50
June 11-20	47,110	80	77.8	51	11	89		114	82	130	2.2	467	.64	5,940	172	78	53
June 21-30	47,970	83	88.5	56	13	109		119	74	180	2.5	533	.72	6,900	193	95	55
July 1-10	50,100	82	61.8	40	8.3	70		102	46	108	3.5	350	.48	4,730	134	50	53
July 11-12, 17-20	20,780	84	89.9	58	13	109		3/134	91	162	3.2	540	.73	3,030	198	88	55
July 13-16	22,850	86	126	69	15	175		137	99	282	2.5	778	1.06	4,800	234	121	62
July 21-31	12,490	85	111	74	18	133		163	125	200	2.8	689	.94	2,320	258	125	53
Aug. 1, 2, 6, 8-10	12,190	90	158	86	23	220		165	150	350	3.0	988	1.34	32,500	309	174	61
Aug. 3-5, 7	13,680	90	244	110	32	333		166	167	580	2.5	1,310	1.78	48,400	406	270	64
Aug. 11-20	8,068	86	100	70	18	144		164	107	222	2.2	729	.99	1,590	248	114	56
Aug. 21-31	5,978	86	132	70	21	170		155	109	275	1.2	812	1.10	1,310	261	134	59
Sept. 1-10	5,699	87	146	74	21	204		6/155	94	345	3.0	883	1.20	1,360	271	144	67
Sept. 11-20	8,002	80	131	65	17	175		144	72	295	3.8	755	1.03	1,630	232	114	62
Sept. 21-26	6,977	73	86.3	44	10	112		110	36	188	2.2	481	.65	3,360	151	61	62
Sept. 27-30	7,178	74	167	73	20	235		134	53	432	2.0	974	1.32	1,890	264	154	66
Weighted average	47,590	--	72.6	39	9.0	91		108	47	137	2.3	419	0.57	53,800	135	49	57

3/ Includes equivalent of 6 parts per million of carbonate (CO_3).

4/ Includes equivalent of 22 parts per million of carbonate (CO_3).

5/ Includes equivalent of 11 parts per million of carbonate (CO_3).

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

Temperature (° F.) of water, water year October 1946 to September 1947

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	68	70	48	40	43	41	58	64	73	83	90	87
2	67	69	48	39	41	40	60	64	74	84	89	88
3	--	69	47	38	42	40	60	65	73	83	90	87
4	70	64	47	35	40	44	63	69	75	84	90	87
5	72	63	48	38	36	44	64	69	76	82	90	87
6	69	62	50	34	40	43	64	68	77	80	91	88
7	70	62	51	38	37	40	65	70	79	82	90	86
8	70	60	51	36	37	43	64	68	80	82	90	84
9	71	59	54	36	42	45	62	69	82	82	91	85
10	70	56	55	36	30	46	64	68	82	82	90	86
11	66	60	--	38	32	48	64	68	82	83	86	85
12	64	55	--	36	35	49	62	68	82	84	86	83
13	66	55	54	41	36	46	65	70	79	84	87	82
14	64	55	53	44	40	51	60	72	79	85	86	82
15	63	54	55	46	41	48	62	71	77	87	85	78
16	63	54	55	40	49	50	59	72	78	87	84	79
17	65	52	48	42	48	49	60	74	80	88	85	78
18	64	52	49	43	47	47	60	73	80	88	87	80
19	61	53	47	43	44	50	59	72	82	86	87	79
20	60	53	47	40	44	50	61	71	81	85	88	77
21	63	54	47	42	45	52	59	72	80	85	88	74
22	63	55	47	41	41	52	60	72	82	82	88	74
23	65	53	47	42	42	52	62	72	84	80	87	72
24	64	53	48	44	42	52	62	73	82	81	88	72
25	64	54	48	41	42	53	60	72	82	82	88	73
26	65	50	47	44	42	51	62	72	82	85	87	73
27	66	50	52	47	38	51	64	72	82	85	80	74
28	66	50	53	44	47	54	61	73	83	87	84	78
29	66	52	39	54	--	53	62	71	89	87	85	74
30	68	51	41	40	--	54	64	72	86	89	87	72
31	69	--	38	45	--	57	--	72	--	90	86	--
Average	66	56	49	41	41	48	62	70	80	84	87	80

ARKANSAS RIVER BASIN--Continued

CIMARRON RIVER NEAR MOCANE, OKLA.

LOCATION.--At county highway bridge, 6½ miles northeast of Mocane, Beaver County, and 13 miles upstream from Crooked Creek.
DRAINAGE AREA.--9,350 square miles.
RECORDS AVAILABLE.--Chemical analyses: May 1946 to September 1947.
Water temperatures: January to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 1,690 parts per million Sept. 11-20; minimum, 435 parts per million Oct. 6, 8-11, 17.
Total hardness: Maximum, 432 parts per million Jan. 2-9; minimum, 162 parts per million Nov. 4-5.
Water temperatures: Maximum, 74° F. July 13; minimum, freezing point on many days in December, January, February, and March.
EXTREMES, May 1946 to September 1947.--Dissolved solids: Maximum, 1,690 parts per million Sept. 11-20, 1947; minimum, 394 parts per million Aug. 21, 25, 1946.
Total hardness: Maximum, 432 parts per million Jan. 2-9, 1947; minimum, 162 parts per million Nov. 4-5, 1946.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1087. Records of specific conductance of daily samples are available in district office at Stillwater, Okla.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 6, 8-11, 17, 1946	1,175	--	--	75.6	--	--	48	16	89		180	67	113	--	2.0	435	0.59	1,380	186	38	51
Oct. 5, 14	700	--	--	155	--	--	76	29	213		210	151	312	--	3.0	909	1.24	1,720	309	136	60
Oct. 20-31	71.2	--	--	179	--	--	90	33	251		253	166	370	--	3.5	1,040	1.41	200	360	153	60
Nov. 1-3, 6-10	160	--	--	174	--	--	83	33	264		225	193	375	--	3.5	1,060	1.44	456	342	158	63
Nov. 4-5	872	--	--	86.4	--	--	--	--	--		156	40	162	--	2.5	--	--	--	162	34	--
Nov. 11-20	103	--	--	188	--	--	88	35	266		259	180	382	--	3.2	1,080	1.47	300	364	151	61
Nov. 21-30	104	--	--	198	--	--	89	36	284		252	176	422	--	3.5	1,130	1.54	317	370	163	63
Dec. 1-10	91.1	--	--	205	--	--	94	36	298		261	174	448	--	3.0	1,180	1.60	290	382	168	63
Dec. 11-20	83.9	--	--	214	--	--	99	37	302		259	173	468	--	3.0	1,210	1.65	274	399	186	62
Dec. 21-31	72.6	34	--	224	--	--	94	42	324		283	180	488	--	3.5	1,270	1.73	249	407	175	63
Jan. 1, 1947	12	35	--	137	--	--	--	--	--		195	111	300	--	6.0	--	--	--	278	118	--
Jan. 2-9	29.6	33	--	268	--	--	94	48	397		265	230	592	--	4.0	1,500	2.04	120	432	214	67
Jan. 10-14, 19-20	115	33	--	191	--	--	81	34	275		251	149	408	--	4.0	1,070	1.46	332	342	136	64
Jan. 15-18, 21	121	33	--	77.5	--	--	76	23	58		313	55	66	--	3.0	458	.62	150	284	27	31
Jan. 22-31	108	34	8.2	225	9.0	0.10	97	38	317	11	267	173	495	0.9	3.0	1,280	1.74	373	398	179	63

Feb. 1-10	91.9	33	--	249	--	--	99	44	391	270	203	595	--	7.0	1,470	2.00	365	428	206	66
Feb. 11-20	108	35	--	212	--	--	95	38	308	250	163	485	--	5.0	1,220	1.66	356	393	188	63
Feb. 21-28	53.2	33	--	235	--	--	98	40	371	262	178	575	--	4.5	1,400	1.90	201	409	194	66
Mar. 1-10	67.2	33	--	235	--	--	94	42	365	263	178	565	--	4.0	1,380	1.88	250	407	191	78
Mar. 11-20	217	38	--	224	--	--	90	39	356	242	175	550	--	4.0	1,330	1.81	779	385	186	67
Mar. 21-31	62.8	41	--	222	--	--	84	36	328	240	173	490	--	2.0	1,230	1.67	209	358	160	67
Apr. 1-10	81.9	47	--	218	--	--	82	40	332	242	167	508	--	3.0	1,250	1.70	276	369	170	66
Apr. 11-20	190	44	--	216	--	--	84	43	314	249	161	492	--	3.5	1,220	1.66	626	386	182	64
Apr. 21-30	106	53	--	212	--	--	84	41	314	246	159	490	--	3.5	1,210	1.65	346	378	176	64
May 1-10	61.7	57	--	223	--	--	78	38	311	222	121	508	--	1.0	1,170	1.59	195	350	168	66
May 11-16	111	59	--	218	--	--	75	36	337	220	174	500	--	2.0	1,230	1.67	369	335	154	69
May 17-22	120	60	--	168	--	--	72	29	252	230	163	345	--	2.0	976	1.33	316	298	110	65
May 23-31	82.7	57	--	212	--	--	80	36	290	234	130	460	--	3.0	1,110	1.51	248	348	156	64
June 1-10	47.3	66	8.4	224	4.0	02	73	37	363 — 5.2	205	175	550	.9	2.0	1,310	1.78	167	334	166	70
June 11-18	43.9	62	--	238	--	--	70	39	392	205	178	590	--	2.0	1,370	1.66	162	335	167	72
June 19-25	197	66	--	162	--	--	68	26	250	206	129	365	--	3.0	949	1.29	505	276	108	66
June 26-30	55.4	68	--	211	--	--	76	33	345	210	167	515	--	2.5	1,240	1.69	185	325	153	70
July 1-5	36.4	67	--	233	--	--	72	49	356	196	175	575	--	2.0	1,330	1.81	131	381	220	67
July 6-10	196	68	--	181	--	--	71	29	283	197	137	430	--	2.0	1,050	1.43	556	296	134	68
July 11-16	163	71	--	150	--	--	69	34	213	239	175	280	--	2.0	891	1.21	392	312	116	60
July 17-20	32.0	68	--	212	--	--	77	39	334	237	177	495	--	4.0	1,240	1.69	107	352	158	67
July 21-31	41.5	67	--	239	--	--	74	44	388	217	182	595	--	2.0	1,390	1.89	156	366	188	70
Aug. 1-10	25.1	68	--	273	--	--	80	42	461	204	209	700	--	2.0	1,590	2.16	108	372	204	73
Aug. 11-20	55.5	70	--	254	--	--	80	40	207	212	199	615	--	1.0	1,450	1.97	217	364	190	71
Aug. 21-31	30.3	70	--	249	--	--	85	39	403	236	190	605	--	5.0	1,440	1.96	118	372	178	70
Sept. 1-10	23.8	66	--	267	--	--	77	42	470	217	204	705	--	2.0	1,610	2.19	103	364	186	74
Sept. 11-20	19.2	59	--	280	--	--	80	42	498	217	208	750	--	4.5	1,690	2.30	88	372	194	74
Sept. 21-30	24.2	56	--	264	--	--	78	41	453	230	191	680	--	2.5	1,560	2.12	102	363	174	73
Weighted average	113	--	--	176	--	--	77	33	266	226	143	387	--	3.0	1,040	1.41	300	328	142	64

ARKANSAS RIVER BASIN--Continued

CIMARRON RIVER NEAR MOCANE, OKLA.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

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

ARKANSAS RIVER BASIN--Continued

CROOKED CREEK NEAR NYE, KANS.

LOCATION.--At gaging station at bridge on county road, 6½ miles east of Nye, Meade County, and 11 miles upstream from mouth.
DRAINAGE AREA.--1,100 square miles, of which about 800 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: June 1946 to July 1947.
Water temperatures: December 1946 to July 1947.
EXTREMES, October 1946-July 1947.--Dissolved solids: Maximum, 2,390 parts per million July 21-31; minimum, 216 parts per million Oct. 11-15.
Total hardness: Maximum, 412 parts per million Apr. 1-9, July 21-31; minimum, 69 parts per million Oct. 11-15.
Water temperatures: Maximum, 100° F. June 26; minimum, freezing point on several days in December, January, February, and March.
EXTREMES, June 1946-July 1947.--Total hardness: Maximum, 412 parts per million Apr. 1-9, July 21-31; minimum, 69 parts per million Oct. 11-15.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1087. Records of specific conductance of daily samples available in district office at Stillwater, Okla.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 1-5, 1946	14.6	--	--	333	--	--	86	35	599		215	200	905	--	1.0	1,930	2.62	76	358	182	78
Oct. 7	179	--	--	80.4	--	--	--	--	--		150	20	160	--	4.0	--	--	--	129	6	--
Oct. 8-10	1,336	--	--	38.1	--	--	43	7.6	33		159	24	38	--	.8	249	.34	898	139	8	34
Oct. 11-15	787	--	--	34.2	--	--	18	5.8	47		123	15	38	--	2.5	216	.29	459	69	0	60
Oct. 16-17	312	--	--	55.8	--	--	22	5.9	90		144	30	88	--	2.0	324	.44	273	80	0	71
Oct. 21-25, 30	132	--	--	80.0	--	--	52	10	95		167	38	142	--	2.0	462	.63	165	171	34	55
Oct. 26-29, 31	75	--	--	124	--	--	66	14	177		197	58	272	--	2.5	717	.98	145	222	61	63
Nov. 3, 7-10	131	--	--	117	--	--	62	16	161		182	65	250	--	2.5	658	.89	233	220	72	61
Nov. 11-15	231	--	--	59.0	--	--	43	9.5	67		144	38	95	--	2.0	357	.49	223	146	29	50
Nov. 16-19	117	--	--	117	--	--	50	16	172		179	61	250	--	2.0	684	.93	216	191	44	66
Nov. 20-30	52.7	--	--	209	--	--	88	22	313		236	112	480	--	5.0	1,140	1.55	162	310	116	69
Dec. 1-10	37.7	--	--	273	--	--	102	28	445		262	140	690	--	4.5	1,540	2.09	157	370	154	72
Dec. 11-20	25.3	--	--	285	--	--	100	31	484		257	151	750	--	4.5	1,650	2.24	113	377	166	74
Dec. 21-29	24.3	45	--	306	--	--	96	33	509		239	156	795	--	3.0	1,710	2.33	112	375	179	75
Jan. 1-10, 1947	11.6	34	--	343	--	--	102	35	575		250	157	905	--	4.0	1,900	2.58	60	398	194	76
Jan. 11-19	38.2	36	--	259	--	--	90	30	416		242	137	645	--	3.0	1,440	1.96	149	348	150	72
Jan. 20	34	--	--	136	--	--	--	--	--		234	76	290	--	6.0	--	--	--	260	68	--
Jan. 21-31	30.1	46	--	266	13	0.05	98	29	420	24	256	141	670	0.7	4.0	1,530	2.08	124	364	154	70
Feb. 1-10	16.5	40	--	302	--	--	105	33	518		263	143	820	--	2.0	1,750	2.38	78	398	182	74
Feb. 11-20	19.1	48	--	304	--	--	104	31	513		250	142	815	--	.5	1,730	2.35	89	387	182	74
Feb. 21-28	20.1	42	--	304	--	--	106	32	504		248	146	805	--	1.0	1,720	2.36	93	396	192	73

CROOKED CREEK NEAR NYE, KANS.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Mar. 1-10, 1947	18.3	40	--	301	--	--	98	30	499		245	137	785	--	3.0	1,670	2.27	83	368	167	75
Mar. 11-20	29.8	50	--	252	--	--	90	27	419		244	130	645	--	2.5	1,430	1.94	115	336	136	73
Mar. 21-31	24.3	67	--	290	--	--	92	30	497		236	149	770	--	.5	1,650	2.24	108	353	160	75
Apr. 1-9	18.4	63	--	315	--	--	96	42	533		239	147	865	--	4.0	1,800	2.45	89	412	216	74
Apr. 10-18	1,356	58	--	42.7	--	--	43	9.0	30		153	26	40	--	.0	250	.34	915	144	19	31
Apr. 19-21	243	65	--	76.6	--	--	54	13	94		193	47	129	--	5.0	443	6.02	291	188	30	52
Apr. 22-25	147.2	61	--	144	--	--	78	19	203		216	86	315	--	4.0	826	1.12	328	272	95	62
Apr. 26-30	72.8	74	--	222	--	--	108	31	344		287	125	550	--	4.0	1,300	1.77	256	397	162	65
May 1-10	37.2	76	--	293	--	--	102	32	470		246	155	740	--	2.0	1,620	2.21	163	386	184	73
May 11-15, 18-19	42.7	78	--	272	--	--	96	30	432		236	156	670	--	2.0	1,500	2.04	173	363	170	72
May 16-17, 21	110.3	76	--	115	--	--	60	15	152		182	71	225	--	2.0	648	.88	193	211	62	61
May 20, 22-27	65.6	77	--	172	--	--	77	21	260		220	106	385	--	.5	969	1.32	172	278	98	67
May 28-31	39.2	78	--	222	--	--	90	25	338		242	111	530	--	2.0	1,220	1.66	129	328	128	69
June 1-10	21.8	85	8.8	334	15	0.02	97	32	599	5.2	220	158	945	0.8	3.0	1,960	2.66	115	374	193	77
June 11-20	15.7	84	--	371	--	--	102	36	669		209	166	1,070	--	4.0	2,150	2.92	91	402	231	78
June 21-30	17.6	87	--	351	--	--	94	32	631		210	155	995	--	2.0	2,010	2.73	96	366	194	79
July 1-5, 7, 9-10	15.9	85	--	342	--	--	90	31	635		197	179	980	--	2.0	2,010	2.73	86	352	190	80
July 6, 8	34.0	79	--	182	--	--	65	16	308		147	94	480	--	4.0	1,040	1.41	95	228	108	75
July 11-20	24.4	84	--	365	--	--	106	32	665		217	174	1,050	--	4.0	2,140	2.91	14	396	218	78
July 21-31	6.64	81	--	412	--	--	104	37	757		206	186	1,200	--	4.0	2,390	3.25	43	412	242	80
Average	93.5	--	--	258	--	--	88	27	434		223	129	674	--	2.7	1,300	1.77	390	330	148	74

Temperature (° F.) of water, water year October 1946 to September 1947

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	--	--	--	35	34	33	70	70	81	80	--	--
2	--	--	--	32	48	40	63	85	89	90	--	--
3	--	--	--	32	45	51	63	85	79	90	--	--
4	--	--	--	32	38	49	57	80	88	90	--	--
5	--	--	--	36	38	35	59	75	86	85	--	--
6	--	--	--	34	48	35	65	75	83	82	--	--
7	--	--	--	36	36	36	65	80	93	80	--	--
8	--	--	--	35	39	38	70	65	84	76	--	--
9	--	--	--	32	35	41	55	70	86	80	--	--
10	--	--	--	35	35	37	60	70	79	84	--	--
11	--	--	--	35	40	48	55	71	65	75	--	--
12	--	--	--	35	49	32	50	80	75	85	--	--
13	--	--	--	35	50	51	59	75	75	90	--	--
14	--	--	--	37	52	39	59	85	79	85	--	--
15	--	--	--	35	--	45	55	75	95	87	--	--
16	--	--	--	34	51	59	69	75	95	83	--	--
17	--	--	--	35	51	60	59	70	96	80	--	--
18	--	--	35	35	56	63	60	--	93	83	--	--
19	--	--	37	40	47	44	55	80	80	90	--	--
20	--	--	42	--	40	60	70	75	89	--	--	--
21	--	--	44	49	50	72	70	83	90	79	--	--
22	--	--	45	52	55	79	73	70	75	85	--	--
23	--	--	47	45	49	70	50	75	80	73	--	--
24	--	--	54	50	43	65	50	65	82	81	--	--
25	--	--	50	45	36	65	60	80	85	90	--	--
26	--	--	51	50	34	60	70	83	100	92	--	--
27	--	--	52	50	35	70	55	92	90	90	--	--
28	--	--	33	52	32	65	81	65	93	82	--	--
29	--	--	32	40	--	60	75	85	--	85	--	--
30	--	--	--	34	--	60	85	83	85	66	--	--
31	--	--	--	35	--	75	--	79	--	68	--	--
Average	--	--	--	39	43	53	63	77	85	83	--	--

ARKANSAS RIVER BASIN--Continued

CANADIAN RIVER NEAR SANCHEZ, N. MEX.

LOCATION.--At Sabinoso, San Miguel County, about 5 miles downstream from Mora River and 5 miles upstream from gaging station which is at bridge on State Highway 65, 3 miles northeast of Sanchez, San Miguel County.
DRAINAGE AREA.--6,000 square miles above gaging station.
RECORDS AVAILABLE.--Chemical analyses: October 1940 to September 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1087. Records of specific conductance of daily samples are available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Specific conductance ($K \times 10^6$ at 25° C.)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Dissolved solids
Oct. 1-2, 5-10, 1946	1/313	82.9	--	--	920
Oct. 3-4	1/3,947	52.4	--	--	334
Oct. 11-20	156	104	--	--	758
Oct. 21-31	61.9	121	--	--	917
Nov. 1-10	81.3	126	--	--	966
Nov. 11-20	102	137	206	578	--
Nov. 21-30	69.3	153	204	668	--
Dec. 1-8	61.1	151	213	652	--
Dec. 11-14, 16-19	48.2	145	217	615	--
Dec. 24-27, 29, 31	39.3	155	216	670	--
Jan. 1-10, 1947	28.3	163	243	712	--
Jan. 11-20	34.5	141	233	577	--
Jan. 21-31	43.2	152	224	651	--
Feb. 1-10	32.0	164	227	713	--
Feb. 11-20	29.4	189	220	866	--
Feb. 21-28	20.4	204	212	965	--
Mar. 1-10	22.1	217	214	1,020	--
Mar. 11-20	20.7	228	202	1,060	--
Mar. 21-31	12.5	225	202	1,110	--
Apr. 1-10	6.0	212	222	994	--
Apr. 11-20	6.4	197	226	877	--
Apr. 21-30	20.3	248	208	1,250	--
May 1-8	2/9.3	198	197	940	--
May 9	2/556	39.2	158	72	--
May 10-11, 14-20	625	90.3	170	329	--
May 12-13	1,020	155	192	702	--
May 21-26	166	101	184	379	--
May 27-31	105	147	194	638	--
June 1-10	20.9	148	216	625	--
June 11-20	18.0	166	234	715	--
June 21-23, 26-30	78.0	126	153	541	--
June 24-25	612	54.5	181	126	--
July 1-10	1,995	91.8	166	362	--
July 11-20	109	121	158	497	--
July 21-27	73.1	161	160	728	--
July 28-31	36.5	213	179	1,040	--
Aug. 1-10	8.1	180	211	824	--
Aug. 11-14, 17, 20	3/33.0	170	181	759	--
Aug. 15-16, 18-19	3/377	90.2	156	328	--
Aug. 21-31	260	88.5	158	317	--
Sept. 1-10	23.8	130	180	526	--
Sept. 11-20	6.2	138	206	558	--
Sept. 21-31	22.1	137	166	585	--
Weighted average	173	95.5	--	--	--

1/ Discharge for Oct. 3 included with discharge reported for Oct. 1-2, 5-10. Discharge for Oct. 5-6 included with discharge reported for Oct. 3-4.
2/ Discharge for May 8 included with discharge reported for May 9.
3/ Discharge for Aug. 14, 17, 20 included with discharge reported for Aug. 15-16, 18-19.

CANADIAN RIVER NEAR WHITEFIELD, OKLA.

LOCATION.--At bridge on State Highway 10, three-quarters of a mile north of Whitefield, Haskell County, and 5½ miles upstream from Snake Creek.
DRAINAGE AREA.--47,370 square miles.
RECORDS AVAILABLE.--Chemical analyses: September 1944 to February 1945, September 1946 to September 1947.
Water temperatures: September 1944 to February 1945, September 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 4,370 parts per million Sept. 21, 25-30; minimum, 210 parts per million June 9-17, 1947.
Total hardness: Maximum, 1,010 parts per million Mar. 8-13; minimum, 89 parts per million June 1-6.
Water temperatures: Maximum, 87° F. Aug. 2-3, 9-10; minimum, freezing point Feb. 5.
EXTREMES, 1944-45, 1946-47.--Dissolved solids: Maximum, 5,520 parts per million Sept. 3-6, 1944; minimum, 210 parts per million June 9-17.
Total hardness: Maximum, 1,250 parts per million Sept. 3-6 1944; minimum, 89 parts per million June 1-6, 1947.
Water temperatures: Maximum, 88° Sept. 3-6, 1944; minimum, 38° F. Feb. 5, 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1087. Records of specific conductance of daily samples available in district office at Stillwater, Okla.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Specific conductance ($K \times 10^5$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-9, 1946	627	64	337	152	58	483	195	212	910	6.5	1,920	2.61	3,250	618	458	63
Oct. 10-15, 17-20	8,590	61	150	99	28	184	201	218	258	9.0	924	1.22	21,430	362	197	52
Oct. 16	8,760	64	237	--	--	--	202	230	505	10	--	--	--	502	337	--
Oct. 21-24, 26	2,692	66	137	80	26	159	152	143	265	7.5	795	1.08	5,780	306	182	53
Oct. 25, 27, 29-31	2,192	68	195	95	27	267	147	118	482	7.5	1,070	1.46	6,330	348	228	63
Oct. 28	2,460	65	355	--	--	--	151	80	1,020	5.5	--	--	--	495	371	--
Nov. 1-2	1,735	71	216	111	42	277	186	129	540	3.2	1,190	1.62	5,570	450	297	57
Nov. 3-4	8,845	66	111	62	19	121	119	52	252	2.8	611	.83	14,600	232	135	54
Nov. 5	13,200	65	373	--	--	--	106	35	1,130	5.5	--	--	--	570	483	--
Nov. 6-10	26,400	59	68.1	34	11	83	90	23	150	1.8	376	.51	26,800	130	56	58
Nov. 11-12	14,000	53	68.6	39	9.5	83	99	44	134	2.0	392	.53	14,800	136	55	57
Nov. 13-18	4,708	54	122	59	18	160	114	74	282	2.0	685	.93	8,710	221	128	61
Nov. 19-22	2,255	57	209	98	29	291	138	94	555	4.0	1,140	1.55	6,940	364	250	64
Nov. 23-25, 29-30	1,940	55	278	118	33	407	167	112	750	4.0	1,510	2.05	7,910	430	242	67
Nov. 26-28	3,500	50	124	62	17	161	107	59	300	2.0	694	.94	6,560	225	137	61
Dec. 1-8	1,271	56	439	173	50	662	188	110	1,280	4.0	2,370	3.22	8,130	637	483	69
Dec. 9-11, 17-18	46,480	57	63.9	32	8.7	78	86	18	138	2.0	362	.49	45,400	116	45	59
Dec. 12-16	62,980	61	42.9	32	7.2	42	89	14	78	3.5	256	.35	43,500	109	36	45
Dec. 19-22	6,365	46	141	79	18	175	113	33	370	2.0	806	1.10	13,900	271	178	58
Dec. 23-31	2,606	52	301	150	41	399	192	83	825	3.0	1,600	2.18	11,300	542	385	62

ARKANSAS RIVER BASIN--Continued

CANADIAN RIVER NEAR WHITEFIELD, OKLA.--Continued

Chemical analyses, in parts per million, October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Specific conductance ($K \times 10^6$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Jan. 1-10, 1947------	1,589	42	394	166	50	572	185	83	1,150	3.5	2,120	2.88	9,100	620	468	67
Jan. 11-13, 18-20----	1,832	46	450	166	56	696	135	67	1,400	3.0	2,450	3.33	12,100	644	533	70
Jan. 14-17----------	1,930	52	562	190	63	910	92	64	1,820	4.0	3,100	4.22	16,200	733	658	73
Jan. 21-31 ----------	1,603	48	404	184	55	580	202	121	1,170	5.5	2,220	3.02	9,610	685	519	65
Feb. 1-10----------	1,048	38	482	214	61	712	210	109	1,450	4.0	2,650	3.60	7,500	785	612	66
Feb. 11-20----------	870	45	544	230	66	835	222	101	1,680	4.5	3,030	4.12	7,120	846	663	68
Feb. 21-28----------	771	41	637	240	71	1,030	197	92	2,040	4.5	3,570	4.86	7,430	891	230	72
Mar. 1-7----------	694	51	641	245	73	1,040	207	72	2,080	4.0	3,620	4.92	6,780	912	742	71
Mar. 8-13----------	782	46	734	273	79	1,220	195	59	2,440	5.0	4,170	5.67	8,800	1,010	846	73
Mar. 14-15, 17-20---	2,123	46	563	216	59	905	139	61	1,820	5.0	3,130	4.26	17,900	782	668	72
Mar. 16----------	2,570	--	267	--	--	--	115	67	760	2.5	--	--	--	282	188	--
Mar. 21----------	1,840	--	876	--	--	--	144	96	3,000	2.0	--	--	--	184	66	--
Mar. 22-23----------	1,715	56	532	168	68	841	55	189	1,620	.5	2,910	3.96	13,500	698	654	72
Mar. 24-31----------	1,478	52	405	163	52	593	165	157	1,140	5.0	2,190	2.98	8,740	620	486	68
Apr. 1-3----------	1,267	59	402	163	52	596	182	136	1,150	3.5	2,190	2.98	7,490	620	471	68
Apr. 4-10----------	7,716	63	288	106	28	433	86	54	845	3.5	1,510	2.05	31,500	380	309	71
Apr. 11----------	41,300	59	187	72	22	196	103	42	400	5.0	859	1.17	95,800	270	186	61
Apr. 12-20----------	26,360	57	84.1	52	18	94	118	39	190	3.0	460	.63	32,700	204	107	50
Apr. 21-25, 28 ------	13,270	61	96.4	52	9.6	129	114	46	218	.5	582	.79	20,900	169	75	62
Apr. 26-27----------	24,100	56	146	73	18	198	126	35	385	4.0	872	1.19	56,700	256	152	63
Apr. 29-30, May 1-3-	25,400	66	70.2	46	10	82	111	23	155	2.0	412	.56	28,300	156	65	54
May 4-8----------	9,206	65	102	53	16	128	115	33	245	2.0	589	.80	14,600	198	104	58
May 9-10----------	4,960	62	206	92	29	294	155	65	560	3.0	1,120	1.52	15,000	348	221	65
May 11----------	3,530	62	315	134	42	459	193	99	880	4.0	1,710	2.33	16,300	507	348	66
May 12-13, 16-17,19-20	69,070	68	52.6	40	8.5	59	104	28	105	2.0	306	.42	57,100	135	496	49
May 14-15, 18-------	51,930	70	75.7	51	12	86	125	31	160	3.0	458	.62	64,200	177	74	51
May 21-29----------	39,940	67	57.6	26	10	82	57	48	132	.0	334	.45	36,000	106	59	63
May 30-31----------	12,950	65	112	62	17	157	140	61	275	.5	642	.87	22,400	224	110	60

June 1-6	41,480	72	55.2	23	7.6	86	51	35	140	.0	317	.43	35,500	89	47	68
June 7-8, 19	6,070	77	107	64	16	152	143	41	280	2.0	625	.85	10,200	226	108	59
June 9-17	3,188	71	34.1	33	7.8	37	145	20	38	3.0	210	.29	1,810	114	0	42
June 18, 20	2,000	78	253	116	33	404	177	81	760	2.0	1,500	2.04	8,100	425	280	67
June 21-22, 25	9,607	77	248	73	29	381	44	54	735	.5	1,290	1.75	33,500	301	264	73
June 23-24, 26	1,482	77	124	39	17	197	71	35	355	.0	678	.92	2,710	167	109	72
June 27-30	1,069	79	64.6	39	12	118	98	23	210	2.0	452	.61	1,300	147	66	64
July 1-6, 9-10	5,950	73	127	40	18	189	61	88	350	2.0	667	.91	10,700	174	124	70
July 7-8	6,315	74	199	88	28	302	137	55	580	3.0	1,120	1.52	19,100	334	222	66
July 11-14	2,008	80	176	62	23	270	104	45	490	16	961	1.31	5,210	249	164	70
July 15-18	1,278	81	253	96	36	390	135	69	745	4.0	1,410	1.92	4,870	388	276	69
July 19-25, 28	2,004	75	308	95	41	476	65	112	900	3.0	1,660	2.28	8,980	406	352	72
July 26-27	5,165	76	574	197	63	916	37	109	1,840	5.0	3,150	4.28	43,900	750	720	73
July 29	3,830	84	192	--	--	--	52	40	535	1.0	--	--	--	186	--	--
July 30-31, Aug. 1, 6-7	2,018	85	172	71	22	238	113	47	455	2.5	966	1.31	5,260	268	175	66
Aug. 2-5	2,260	86	124	54	18	161	112	33	305	2.5	688	.94	4,200	209	117	63
Aug. 8-14	684	84	281	103	33	408	108	43	810	6.0	1,460	1.99	3,480	392	304	69
Aug. 15-18	660	82	362	129	42	537	136	37	1,070	3.0	1,880	2.56	3,350	494	382	70
Aug. 19-26	442	82	428	168	50	633	140	34	1,310	4.0	2,270	3.09	2,710	624	510	69
Aug. 27-31	334	81	569	212	66	889	152	25	1,830	3.0	3,100	4.22	2,800	800	676	71
Sept. 1-10	246	81	607	229	67	945	118	37	1,960	3.0	3,300	4.49	2,190	847	750	71
Sept. 11-12, 16-20	920	73	531	225	55	818	105	37	1,730	2.0	2,920	3.97	7,250	788	702	69
Sept. 13-15	1,840	74	155	61	17	221	71	32	430	7.0	850	1.16	4,220	222	164	68
Sept. 21, 25-30	504	68	759	276	73	1,310	114	34	2,620	2.0	4,370	5.94	5,950	988	895	74
Sept. 22-24	700	63	486	185	54	728	130	28	1,510	2.0	2,570	3.50	4,860	684	577	70
Weighted average	8,997	--	110	--	--	--	101	44	278	2.4	--	--	--	198	--	--

ARKANSAS RIVER BASIN--Continued

CANADIAN RIVER NEAR WHITEFIELD, OKLA.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

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

ARKANSAS RIVER BASIN--Continued

CIMARRON RIVER AT UTE PARK, N. MEX.

LOCATION.--At gaging station half a mile downstream from Ute Creek and 1 mile east of post office at Ute Park, Colfax County.
DRAINAGE AREA.--235 square miles.
RECORDS AVAILABLE.--Chemical analyses: June 1945 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 199 parts per million Sept. 11-20; minimum, 100 parts per million May 11-19.
Total hardness: Maximum, 151 parts per million Jan. 11-20; minimum, 72 parts per million May 11-19
EXTREMES, 1945-47.--Dissolved solids: Maximum, 199 parts per million Sept. 11-20, 1947; minimum, 100 parts per million May 11-19, 1947.
Total hardness: Maximum, 151 parts per million Jan. 11-20, 1947; minimum, 72 parts per million May 11-19, 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1087. Records of specific conductance of daily samples are available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 1-10, 1946	8.22	7.7	30.9	15	0.01	41	8.8	9.9	4.4	170	17	4.6	0.5	0.5	0.1	185	0.26	4.1	138	0	13
Oct. 11-20	7.90	7.9	31.9	16	.01	42	9.3	11	4.6	176	19	5.2	.4	.6	.1	195	.27	4.2	143	0	14
Oct. 21-31	14.3	7.9	31.6	15	.00	43	9.3	9.4	4.1	176	18	4.5	.5	.6	.1	191	.26	7.4	146	2	12
Nov. 1-3, 5-10	15.0	7.9	31.2	14	.01	43	9.2	9.7	3.3	175	19	4.4	.4	.3	.0	190	.26	7.7	146	2	12
Nov. 11-20	11.6	7.8	30.8	14	.01	42	9.2	9.0	2.9	171	18	4.4	.4	.4	.1	185	.25	5.8	143	3	12
Nov. 21, 23-30	9.79	7.7	30.3	15	.00	41	8.8	10	3.3	164	21	4.8	.4	.9	.1	186	.25	4.9	138	4	14
Dec. 1-10	8.65	8.0	29.7	12	.05	42	9.2	7.1	2.0	166	17	4.5	.3	.3	.1	176	.24	4.1	143	7	11
Dec. 11-20	7.85	8.0	31.0	13	.05	44	9.4	8.3	2.6	173	19	5.0	.4	.2	.1	187	.25	4.0	148	6	11
Dec. 21-31	7.87	7.9	30.2	14	.06	39	9.7	12	2.0	173	17	4.4	.4	.2	.1	184	.25	3.9	138	0	16
Jan. 1-10, 1947	7.71	7.8	31.0	13	.05	42	9.4	11	1.6	175	18	4.4	.4	.1	.1	186	.25	3.9	144	0	14
Jan. 11-20	7.77	8.1	31.4	14	.04	44	10	8.0	2.6	177	19	4.0	.4	.6	.1	190	.26	4.0	151	6	10
Jan. 21-31	8.43	8.1	30.0	9.2	.06	42	9.9	7.6	2.2	170	18	4.0	.4	.5	.1	178	.24	4.1	146	6	10
Feb. 1-10	7.52	8.0	31.4	13	.05	43	10	9.2	1.6	173	19	5.0	.4	.6	.1	187	.25	3.8	148	6	12
Feb. 11-20	7.44	8.1	30.1	16	.04	42	9.4	9.9	1.6	171	17	5.5	.4	.5	.1	187	.25	3.8	144	4	13
Feb. 21-28	7.69	8.0	29.7	11	.04	40	9.8	9.0	2.6	167	18	4.5	.4	.4	.1	178	.24	3.7	140	4	12
Mar. 1-10	8.28	8.0	30.3	12	.04	40	9.7	9.2	2.6	169	16	5.0	.5	.2	.1	179	.24	4.0	140	2	12
Mar. 11-20	8.80	8.0	29.3	12	.08	42	9.2	5.3	2.0	163	16	4.0	.5	.2	.1	172	.23	4.1	143	10	7
Mar. 21-31	12.6	8.2	27.1	16	.02	37	8.4	6.0	4.0	149	15	4.0	.5	.4	.0	165	.22	5.6	127	5	9
Apr. 1-10	38.9	7.8	29.6	8.5	.02	40	9.7	7.1	4.6	167	16	4.2	.5	.4	.0	173	.24	18	140	3	10
Apr. 11-20	52.8	7.7	30.2	17	.02	41	9.2	6.7	4.0	165	16	5.0	.4	.4	.0	181	.25	26	140	6	9
Apr. 21-30	62.8	7.7	28.6	14	.04	38	9.0	6.9	3.4	155	15	5.0	.5	.5	.1	169	.23	29	132	5	10
May 1-10	69.2	7.6	22.2	11	.03	30	6.9	5.5	3.5	121	13	3.8	.5	.6	.1	134	.18	25	104	4	10
May 11-19	48.9	7.7	16.0	11	.04	20	5.2	5.5	2.4	90	9.9	.5	.5	.6	.1	100	.14	13	72	0	14
May 21-23, 26-28	52.9	7.6	22.9	11	.03	30	7.1	7.8	3.0	122	14	8.2	.5	.6	.1	140	.19	20	104	4	14

ARKANSAS RIVER BASIN--Continued

CIMARRON RIVER AT UTE PARK, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																Parts per million	Tons per acre-foot	Tons per day	Total	Noncarbonate	
June 1-2, 4-10, 1947	76.2	7.4	29.6	10	0.02	39	8.7	10	3.6	168	15	3.8	0.5	0.4	0.1	174	0.24	36	134	0	14
June 11-20	95.1	7.4	30.5	9.3	.01	40	9.3	12	2.8	174	16	4.2	.5	.8	.1	181	.25	46	138	0	15
June 21-22, 24-30	54.9	7.6	30.6	14	.01	42	8.7	9.9	3.6	176	15	4.0	.5	.5	.2	185	.25	27	141	0	13
July 1-10	34.8	7.6	29.3	11	.02	40	8.7	9.0	2.6	166	15	3.8	.5	.7	.1	173	.24	16	136	0	12
July 11-20	34.4	7.8	31.2	17	.01	42	8.9	14	2.4	180	16	4.2	.5	1.0	.1	195	.27	18	142	0	17
July 21-31	51.0	7.9	31.7	17	.01	42	8.9	15	2.4	183	17	3.8	.5	1.0	.1	198	.27	27	142	0	18
Aug. 1-10	83.5	7.8	32.1	13	.01	44	8.8	14	2.2	183	17	4.2	.5	1.2	.1	195	.27	44	146	0	17
Aug. 11-16, 18-20	74.0	7.7	31.5	16	.02	43	8.7	15	2.1	182	16	4.0	.5	.7	.1	196	.27	39	144	0	18
Aug. 21, 23-31	32.3	7.7	31.6	12	.01	42	9.0	12	1.8	180	16	4.0	.5	.6	.1	187	.25	16	142	0	16
Sept. 1-10	17.9	7.6	31.7	12	.01	44	9.3	11	3.0	182	17	5.0	.4	.9	.1	192	.26	9.3	148	0	13
Sept. 11-20	23.1	7.7	32.5	12	.01	44	9.2	15	2.2	191	16	4.8	.5	1.1	.1	199	.27	12	148	0	18
Sept. 21-30	25.5	7.6	32.0	13	.02	44	9.4	14	2.4	188	16	4.8	.5	.8	.2	198	.27	14	148	0	17
Weighted average	30.5	--	29.1	13	0.02	39	8.6	10	2.9	164	16	4.2	0.5	0.7	0.1	176	0.24	14	133	0	14

ARKANSAS RIVER BASIN--Continued

CONCHAS RIVER NEAR VARIADERO, N. MEX.

(Composites of daily samples collected at Quintana Ranch approximately 4 miles upstream from gaging station, at Highway 104 at Variadero, San Miguel County, approximately 14 miles west of Conchas Dam. Samples are obtained at this point only when rainfall is sufficient to cause the river to flow.)

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Specific conductance ($K \times 10^5$ at 25° C.)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)
Oct. 4-9, 1946	33.4	140	48	--
Oct. 10	55.2	180	113	--
May 8, 1947	164	294	533	83
May 9-10	56.5	181	113	20
May 11-14	69.2	212	149	26
May 15-19	41.9	184	53	10
June 20-22	96.4	241	242	43
Aug. 16	87.2	265	193	40
Aug. 17-20	46.2	171	79	12
Aug. 21, 25-27	53.8	176	100	19

ARKANSAS RIVER BASIN--Continued

RESERVOIR BEHIND CONCHAS DAM, N. MEX.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Sampling point	Depth (feet)	Specific conductance ($K \times 10^6$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
MONTHLY COMPOSITE SAMPLES												
Oct. 10, 15, 24, 30, 1946	Station 1 1/	--	101	--	--	--	--	388	--	--	--	--
Nov. 13, 23, 27---------		--	98.6	--	--	--	--	372	--	--	--	--
Dec. 3, 11, 18, 27 ------		--	98.1	--	--	--	150	367	--	--	--	--
Jan. 1, 8, 16, 30, 1947--		--	99.5	--	--	--	153	377	--	--	--	--
Feb. 5, 12, 19, 27 ------		--	101	--	--	--	--	381	--	--	--	--
Mar. 7, 15, 20, 27------		--	101	--	--	--	--	395	--	--	--	--
Apr. 5, 10, 17, 24, 29---		--	101	--	--	--	--	382	--	--	--	--
May 8, 15, 22, 29-------		--	101	--	--	--	--	382	--	--	--	--
June 5, 10, 17, 26 ------		--	104	85	40	82	159	378	22	0.3	686	376
July 2, 10, 16, 23, 31 ---		--	103	--	--	--	159	387	--	--	--	--
Aug. 7, 15, 21, 28 ------		--	102	--	--	--	154	388	--	--	--	--
Sept. 6, 11, 19, 25------		--	103	--	--	--	--	392	--	--	--	--
Oct. 10, 15, 24, 30, 1946	Station 2 2/	--	101	--	--	--	--	385	--	--	--	--
Nov. 13, 23, 27---------		--	97.6	--	--	--	--	371	--	--	--	--
Dec. 3, 11, 18, 27 ------		--	98.1	--	--	--	152	365	--	--	--	--
Jan. 1, 8, 16, 30, 1947--		--	99.2	--	--	--	151	376	--	--	--	--
Feb. 5, 12, 19, 27 ------		--	100	--	--	--	--	379	--	--	--	--
Mar. 7, 15, 20, 27------		--	101	--	--	--	--	383	--	--	--	--
Apr. 5, 10, 17, 24, 29---		--	101	--	--	--	--	381	--	--	--	--
May 8, 15, 22, 29-------		--	102	--	--	--	--	382	--	--	--	--
June 5, 10, 17, 26 ------		--	103	84	41	81	159	381	19	.3	685	378
July 2, 10, 16, 23, 31 ---		--	103	--	--	--	158	387	--	--	--	--
Aug. 7, 15, 20, 28 ------		--	102	--	--	--	152	388	--	--	--	--
Sept. 6, 11, 19, 25 -----		--	102	--	--	--	--	390	--	--	--	--

1/ Station 1: Conchas River arm of reservoir, approximately 3,000 feet above dam.
2/ Station 2: 400 feet above dam.

Oct. 10, 15, 24, 30, 1946	Station 3 3/	--	99.7	--	--	--	--	386	--	--	--	--
Nov. 13, 23, 27---------		--	97.8	--	--	--	--	372	--	--	--	--
Dec. 3, 11, 18, 27------		--	98.4	--	--	--	153	371	--	--	--	--
Jan. 1, 8, 16, 30, 1947--		--	98.9	--	--	--	159	372	--	--	--	--
Feb. 5, 12, 19, 27------		--	100	--	--	--	--	374	--	--	--	--
Mar. 7, 15, 20, 27------		--	101	--	--	--	--	380	--	--	--	--
Apr. 5, 10, 17, 24, 29 --		--	101	--	--	--	--	383	--	--	--	--
May 8, 15, 22, 29-------		--	102	--	--	--	--	383	--	--	--	--
June 5, 10, 17, 26 ------		--	103	84	40	85	159	383	21	.3	692	374
July 2, 10, 16, 23, 31 ---		--	103	--	--	--	160	389	--	--	--	--
Aug. 7, 15, 21, 28------		--	102	--	--	--	151	385	--	--	--	--
Sept. 6, 11, 19, 25------		--	102	--	--	--	--	391	--	--	--	--
SAMPLES FROM DIFFERENT DEPTHS												
Oct. 3, 1946------------	Station 1 1/	Surface	105	--	--	--	--	--	--	--	--	--
		25	105	--	--	--	--	--	--	--	--	--
		50	105	--	--	--	--	--	--	--	--	--
		75	106	--	--	--	--	--	--	--	--	--
		105	106	--	--	--	--	--	--	--	--	--
		110	105	--	--	--	--	--	--	--	--	--
		115	105	--	--	--	--	--	--	--	--	--
		120	105	--	--	--	--	--	--	--	--	--
		125	105	--	--	--	167	--	--	--	--	--
		130	124	--	--	--	478	--	--	--	--	--

1/ Station 1: Conchas River arm of reservoir, approximately 3, 000 feet above dam.
3/ Station 3: Canadian River arm of reservoir, 800 feet above dam.

ARKANSAS RIVER BASIN--Continued

RESERVOIR BEHIND CONCHAS DAM, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Sampling point	Depth (feet)	Specific conductance ($K \times 10^6$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
SAMPLES FROM DIFFERENT DEPTHS--Continued												
Jan. 20, 1947	Station 1 1/	Surface	97.7	--	--	--	154	372	--	--	--	--
		25	96.9	--	--	--	--	--	--	--	--	--
		50	98.7	--	--	--	--	--	--	--	--	--
		75	98.4	--	--	--	--	--	--	--	--	--
		100	97.7	--	--	--	--	--	--	--	--	--
		105	97.7	--	--	--	--	--	--	--	--	--
		110	98.7	--	--	--	--	--	--	--	--	--
		115	97.2	--	--	--	--	--	--	--	--	--
		120	97.4	--	--	--	--	--	--	--	--	--
		125	103	--	--	--	203	377	--	--	--	--
May 9	Station 1 1/	Surface	102	--	--	--	--	388	--	--	--	--
		25	101	--	--	--	--	--	--	--	--	--
		50	101	--	--	--	--	--	--	--	--	--
		75	101	--	--	--	--	--	--	--	--	--
		100	101	--	--	--	--	--	--	--	--	--
		105	101	--	--	--	--	--	--	--	--	--
		110	101	--	--	--	--	--	--	--	--	--
		115	101	--	--	--	--	--	--	--	--	--
		120	111	--	--	--	--	384	--	--	--	--
July 16	Station 1 1/	Surface	104	--	--	--	--	--	--	--	--	--
		25	102	--	--	--	--	--	--	--	--	--
		50	103	86	38	89	160	386	21	0.5	699	370
		75	102	--	--	--	--	--	--	--	--	--
		100	102	--	--	--	--	--	--	--	--	--
		105	101	--	--	--	--	--	--	--	--	--
		110	102	--	--	--	--	--	--	--	--	--
		115	102	--	--	--	--	--	--	--	--	--
		120	105	--	--	--	--	--	--	--	--	--
		125	160	--	--	--	1,060	--	--	--	--	--

1/ Station 1: Conchas River arm of reservoir, approximately 3,000 feet above dam.

Oct. 4, 1946----------	Station 2 2/	Surface	105	--	--	--	--	--	--	--	--	--
		25	105	--	--	--	--	--	--	--	--	--
		50	105	--	--	--	--	--	--	--	--	--
		75	105	--	--	--	--	--	--	--	--	--
		100	104	--	--	--	--	--	--	--	--	--
		105	104	--	--	--	--	--	--	--	--	--
		110	105	--	--	--	--	--	--	--	--	--
		115	105	--	--	--	--	--	--	--	--	--
		120	105	--	--	--	168	--	--	--	--	--
		125	123	--	--	--	527	--	--	--	--	--
Jan. 20, 1947----------	Station 2 2/	Surface	97.4	--	--	--	154	366	--	--	--	--
		25	97.4	--	--	--	--	--	--	--	--	--
		50	98.4	--	--	--	--	--	--	--	--	--
		75	98.2	--	--	--	--	--	--	--	--	--
		100	97.9	--	--	--	--	--	--	--	--	--
		105	98.2	--	--	--	--	--	--	--	--	--
		110	98.7	--	--	--	--	--	--	--	--	--
		115	98.2	--	--	--	--	--	--	--	--	--
		120	97.9	--	--	--	--	--	--	--	--	--
		125	97.7	--	--	--	--	--	--	--	--	--
		130	104	--	--	--	203	361	--	--	--	--
May 9----------	Station 2 2/	Surface	102	--	--	--	--	388	--	--	--	--
		25	101	--	--	--	--	--	--	--	--	--
		50	101	--	--	--	--	--	--	--	--	--
		75	101	--	--	--	--	--	--	--	--	--
		100	101	--	--	--	--	--	--	--	--	--
		115	101	--	--	--	--	--	--	--	--	--
		120	101	--	--	--	--	--	--	--	--	--
		125	101	--	--	--	--	--	--	--	--	--
		130	105	--	--	--	--	--	--	--	--	--
		135	104	--	--	--	--	389	--	--	--	--

2/ Station 2: 400 feet above dam.

ARKANSAS RIVER BASIN--Continued

RESERVOIR BEHIND CONCHAS DAM, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Sampling point	Depth (feet)	Specific conductance ($K \times 10^6$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
SAMPLES FROM DIFFERENT DEPTHS--Continued												
July 16, 1947	Station 2 2/	Surface	103	84	41	84	154	388	22	0.1	695	378
		25	101	--	--	--	--	--	--	--	--	--
		50	103	--	--	--	--	--	--	--	--	--
		75	102	--	--	--	--	--	--	--	--	--
		100	102	--	--	--	--	--	--	--	--	--
		105	102	--	--	--	--	--	--	--	--	--
		110	102	--	--	--	--	--	--	--	--	--
		115	101	--	--	--	--	--	--	--	--	--
		120	102	--	--	--	--	--	--	--	--	--
		125	101	--	--	--	--	--	--	--	--	--
		130	102	--	--	--	--	--	--	--	--	--
		135	119	--	--	--	492	249	--	--	--	--
Oct. 3, 1946	Station 3 3/	Surface	105	--	--	--	--	--	--	--	--	--
		25	106	--	--	--	--	--	--	--	--	--
		50	105	--	--	--	--	--	--	--	--	--
		75	105	--	--	--	--	--	--	--	--	--
		100	104	--	--	--	--	--	--	--	--	--
		105	104	--	--	--	--	--	--	--	--	--
		110	105	--	--	--	--	--	--	--	--	--
		115	105	--	--	--	--	--	--	--	--	--
		120	105	--	--	--	168	--	--	--	--	--
		125	112	--	--	--	275	--	--	--	--	--

2/ Station 2: 400 feet above dam.
3/ Station 3: Canadian River arm of reservoir, 800 feet above dam.

Jan. 20, 1947	Station 3 3/	Surface	98.2	--	--	--	150	351	--	--	--	--	--	--
		25	97.9	--	--	--	--	--	--	--	--	--	--	--
		50	97.9	--	--	--	--	--	--	--	--	--	--	--
		75	98.2	--	--	--	--	--	--	--	--	--	--	--
		100	98.2	--	--	--	--	--	--	--	--	--	--	--
		105	97.4	--	--	--	--	--	--	--	--	--	--	--
		110	97.9	--	--	--	--	--	--	--	--	--	--	--
		115	97.9	--	--	--	--	--	--	--	--	--	--	--
		120	96.3	--	--	--	--	--	--	--	--	--	--	--
		125	101	--	--	--	175	371	--	--	--	--	--	--
May 9	Station 3 3/	Surface	102	--	--	--	--	387	--	--	--	--	--	--
		25	101	--	--	--	--	--	--	--	--	--	--	--
		50	101	--	--	--	--	--	--	--	--	--	--	--
		75	101	--	--	--	--	--	--	--	--	--	--	--
		100	101	--	--	--	--	--	--	--	--	--	--	--
		105	101	--	--	--	--	--	--	--	--	--	--	--
		110	101	--	--	--	--	--	--	--	--	--	--	--
		115	101	--	--	--	--	--	--	--	--	--	--	--
		120	114	--	--	--	--	370	--	--	--	--	--	--
July 16	Station 3 3/	Surface	104	84	41	84	156	388	20	.2	694	378		
		25	98.9	83	38	80	149	374	18	.3	667	363		
		50	103	--	--	--	--	--	--	--	--	--		
		75	102	--	--	--	--	--	--	--	--	--		
		100	102	--	--	--	--	--	--	--	--	--		
		105	101	--	--	--	--	--	--	--	--	--		
		110	101	--	--	--	--	--	--	--	--	--		
		115	101	--	--	--	--	--	--	--	--	--		
		120	102	--	--	--	--	--	--	--	--	--		
		122	144	--	--	--	934	--	--	--	--	--		

3/ Station 3: Canadian River arm of reservoir, 800 feet above dam.

ARKANSAS RIVER BASIN--Continued

RESERVOIR BEHIND CONCHAS DAM, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Sampling point	Depth (feet)	Specific conductance ($K \times 10^5$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
SAMPLES FROM DIFFERENT DEPTHS--Continued												
Oct. 3, 1946	Station 6 4/	Surface	105	--	--	--	--	--	--	--	--	--
		25	105	--	--	--	--	--	--	--	--	--
		50	105	--	--	--	--	--	--	--	--	--
		75	103	--	--	--	--	--	--	--	--	--
		80	106	--	--	--	--	--	--	--	--	--
		85	106	--	--	--	--	--	--	--	--	--
		90	106	--	--	--	169	--	--	--	--	--
		95	128	--	--	--	304	--	--	--	--	--
Jan. 20, 1947	Station 6 4/	Surface	98.7	--	--	--	159	380	--	--	--	--
		25	98.4	--	--	--	--	--	--	--	--	--
		50	98.9	--	--	--	--	--	--	--	--	--
		75	98.7	--	--	--	--	--	--	--	--	--
		80	98.2	--	--	--	--	--	--	--	--	--
		85	99.2	--	--	--	--	--	--	--	--	--
		90	107	--	--	--	225	388	--	--	--	--
May 9	Station 6 4/	Surface	102	--	--	--	--	393	--	--	--	--
		25	102	--	--	--	--	--	--	--	--	--
		50	101	--	--	--	--	--	--	--	--	--
		75	101	--	--	--	--	--	--	--	--	--
		80	101	--	--	--	--	--	--	--	--	--
		85	101	--	--	--	--	--	--	--	--	--
		90	101	--	--	--	--	--	--	--	--	--
		95	104	--	--	--	--	388	--	--	--	--
July 16	Station 6 4/	Surface	104	84	42	82	156	387	21	0.1	693	382
		25	103	--	--	--	--	--	--	--	--	--
		50	103	--	--	--	--	--	--	--	--	--
		70	102	--	--	--	--	--	--	--	--	--
		75	102	--	--	--	--	--	--	--	--	--
		80	102	--	--	--	--	--	--	--	--	--
		85	103	--	--	--	--	--	--	--	--	--
		90	102	--	--	--	--	--	--	--	--	--
		95	103	--	--	--	--	--	--	--	--	--

4/ Station 6: Conchas River arm of reservoir, 5 miles above dam.

Oct. 3, 1946	Station 7 5/	Surface	102	--	--	--	--	--	--	--	--	--
		25	103	--	--	--	--	--	--	--	--	--
		50	104	--	--	--	--	--	--	--	--	--
		75	103	--	--	--	--	--	--	--	--	--
		95	101	--	--	--	--	--	--	--	--	--
		100	102	--	--	--	--	--	--	--	--	--
		105	103	--	--	--	--	--	--	--	--	--
		110	103	--	--	--	162	--	--	--	--	--
		115	110	--	--	--	225	--	--	--	--	--
		120	107	--	--	--	196	--	--	--	--	--
Jan. 20, 1947	Station 7 5/	Surface	96.9	--	--	--	151	368	--	--	--	--
		25	97.4	--	--	--	--	--	--	--	--	--
		50	97.4	--	--	--	--	--	--	--	--	--
		75	97.1	--	--	--	--	--	--	--	--	--
		100	98.3	--	--	--	--	--	--	--	--	--
		105	97.9	--	--	--	--	--	--	--	--	--
		110	98.4	--	--	--	--	--	--	--	--	--
		115	98.7	--	--	--	--	--	--	--	--	--
		120	96.7	--	--	--	--	--	--	--	--	--
		125	98.7	--	--	--	160	376	--	--	--	--
May 9	Station 7 5/	Surface	101	--	--	--	--	389	--	--	--	--
		25	101	--	--	--	--	--	--	--	--	--
		50	101	--	--	--	--	--	--	--	--	--
		75	102	--	--	--	--	--	--	--	--	--
		95	101	--	--	--	--	--	--	--	--	--
		100	101	--	--	--	--	--	--	--	--	--
		105	101	--	--	--	--	--	--	--	--	--
		110	101	--	--	--	--	--	--	--	--	--
		115	105	--	--	--	--	386	--	--	--	--

5/ Station 7: Canadian River arm of reservoir, 5 miles above dam.

ARKANSAS RIVER BASIN--Continued

RESERVOIR BEHIND CONCHAS DAM, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Sampling point	Depth (feet)	Specific conductance ($K \times 10^5$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
SAMPLES FROM DIFFERENT DEPTHS--Continued												
July 16, 1947----------	Station 7 5/	Surface	104	82	41	88	152	395	21	0.1	702	373
		25	98.9	82	38	80	146	372	20	.5	664	360
		50	100	--	--	--	--	--	--	--	--	--
		75	100	--	--	--	--	--	--	--	--	--
		100	100	--	--	--	--	--	--	--	--	--
		105	101	--	--	--	--	--	--	--	--	--
		110	101	--	--	--	--	--	--	--	--	--
		115	101	--	--	--	--	--	--	--	--	--
		120	101	--	--	--	--	--	--	--	--	--

5/ Station 7: Canadian River arm of reservoir, 5 miles above dam.

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN NEW MEXICO

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	Specific conductance ($K \times 10^6$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids		Hardness as $CaCO_3$		Percent sodium
											Parts per million	Tons per acre-foot	Total	Non-carbonate	
CANADIAN RIVER NEAR TAYLOR SPRINGS															
Oct. 12, 1946	33.6	225	223	27	340	224	1,110	47	--	1.3	1,860	2.53	668	484	53
Nov. 18	24.0	289	--	--	--	249	1,540	--	--	--	--	--	--	--	--
Dec. 12	9.98	297	--	--	--	267	1,580	--	--	--	--	--	--	--	--
Jan. 14, 1947	11.6	341	344	197	297	324	1,860	78	--	2.5	2,940	4.00	1,670	1,400	28
Jan. 24	18.4	302	305	169	257	284	1,610	74	0.0	1.7	2,560	3.48	1,460	1,220	28
Feb. 22	20.0	295	--	--	--	256	1,550	--	--	--	--	--	--	--	--
Mar. 20	13.1	304	--	--	--	148	1,680	--	--	--	--	--	--	--	--
Apr. 8	6.73	329	327	185	292	243	1,800	98	--	.5	2,820	3.84	1,580	1,380	29
Apr. 21	29.6	370	344	215	271	240	1,940	82	--	1.0	2,970	4.04	1,740	1,550	25
May 20	57.0	156	--	--	--	197	705	--	--	--	--	--	--	--	--
June 13	6.39	309	--	--	--	231	1,660	--	--	--	--	--	--	--	--
July 13	37.5	208	201	59	232	204	987	38	--	.6	1,620	2.20	744	577	40
July 27	25.8	207	210	93	154	202	972	45	--	.8	1,570	2.14	906	741	27
Aug. 11	7.81	270	--	--	--	177	1,420	--	--	--	--	--	--	--	--
Aug. 25	30.2	227	--	--	--	220	1,120	--	--	--	--	--	--	--	--
Sept. 8	7.14	255	--	--	--	212	1,300	--	--	--	--	--	--	--	--
CHICORICA CREEK AT IRON BRIDGE ON OLD CLAYTON HIGHWAY NEAR MAXWELL															
Apr. 12, 19, 26, 1946	--	92.1	78	37	80	244	298	6	--	2.9	622	.85	346	146	33
May 3	--	111	92	47	102	276	388	9	--	1.6	776	1.06	423	197	34
Dec. 24	--	88.8	86	36	69	278	260	8	--	4.0	600	.82	362	134	29
Jan. 9, 20, 30, 1947	--	96.6	93	41	78	309	290	9	--	3.2	666	.91	400	148	30
UNA DE GATO CREEK 1½ MILES ABOVE CONFLUENCE WITH CHICORICA CREEK NEAR MAXWELL															
Apr. 12, 19, 26, 1946	--	152	129	77	124	236	656	21	--	1.1	1,120	1.52	638	445	30
May 2	--	143	128	74	104	249	594	19	--	1.1	1,040	1.41	624	420	27
Dec. 24	--	134	148	74	85	218	612	28	--	4.6	1,060	1.44	674	496	21
Jan. 9, 20, 30, 1947	--	161	188	80	90	308	665	32	--	4.5	1,210	1.65	798	546	20

ARKANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN NEW MEXICO--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Discharge (second-feet)	Specific conductance ($K \times 10^6$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids		Hardness as $CaCO_3$		Percent sodium
											Parts per million	Tons per acre-foot	Total	Non-carbonate	
VERMEJO RIVER NEAR DAWSON															
Oct. 16, 1946	5.61	54.4	65	17	32	204	123	5	--	0.0	342	0.47	232	64	23
Nov. 13	10.6	52.7	--	--	--	193	112	--	--	--	--	--	--	--	--
Dec. 13	7.35	56.3	--	--	--	208	124	--	--	--	--	--	--	--	--
Jan. 31, 1947	12.9	56.5	67	15	37	200	128	6	0.7	.7	353	.48	228	64	26
Feb. 24	5.34	53.3	--	--	--	211	118	--	--	--	--	--	--	--	--
Mar. 29	5.64	51.0	--	--	--	183	113	--	--	--	--	--	--	--	--
Apr. 11	2.33	55.2	64	15	38	198	123	6.0	--	.5	342	.47	221	59	26
Apr. 22	2.41	57.0	66	16	37	201	131	5.5	--	1.2	356	.48	230	66	26
May 22	64.3	31.2	--	--	--	133	51	--	--	--	--	--	--	--	--
July 15	30.2	48.3	60	24	1.2	187	93	0	--	.5	271	.37	248	95	1
July 29	16.0	45.6	60	15	19	175	100	3	--	.8	284	.39	211	68	16
Aug. 13	22.4	35.3	--	--	--	155	64	--	--	--	--	--	--	--	--
Aug. 29	25.7	46.8	--	--	--	169	102	--	--	--	--	--	--	--	--
Sept. 10	14.2	49.6	--	--	--	184	108	--	--	--	--	--	--	--	--
VERMEJO CANAL ABOVE VERMEJO PROJECT NEAR MAXWELL															
Apr. 12, 1946	--	100	106	30	133	258	413	24	--	2.4	836	1.14	388	176	43
Dec. 22	--	126	133	41	52	309	305	29	--	2.9	715	.97	500	248	18
Jan. 9, 20, 30, 1947	--	118	119	39	97	253	398	31	--	2.2	811	1.10	458	250	31
CIENEQUILLA CREEK NEAR EAGLE NEST															
Oct. 23, 1946	1.85	25.9	32	6.6	14	146	10	4	0.8	0.3	140	0.19	107	0	22
Apr. 23, 1947	54.1	12.3	16	3.6	6.9	64	14	1.8	--	.8	75	.10	55	2	21
Mar. 25	6.00	17.5	--	--	--	87	--	--	--	--	--	--	--	--	--
May 27	13.3	20.0	--	--	--	115	--	--	--	--	--	--	--	--	--
June 23	2.38	28.5	--	--	--	167	--	--	--	--	--	--	--	--	--
July 16	1.49	28.6	42	8.7	7.8	171	12	3.5	--	.8	159	.22	141	1	11
Aug. 11	1.38	23.0	--	--	--	133	--	--	--	--	--	--	--	--	--
Sept. 23	1.12	21.9	--	--	--	128	--	--	--	--	--	--	--	--	--

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CIMARRON RIVER AT SPRINGER

Oct. 12, 1946	5.27	297	347	184	223	282	1,700	76	--	0.4	2,670	3.63	1,620	1,390	23
Nov. 19	7.64	315	--	--	--	301	1,720	--	--	--	--	--	--	--	--
Dec. 11	5.06	310	--	--	--	297	1,680	--	--	--	--	--	--	--	--
Jan. 24, 1947	6.50	311	361	189	214	327	1,700	74	0.0	1.7	2,700	3.67	1,680	1,410	22
Feb. 22	4.48	314	--	--	--	275	1,720	--	--	--	--	--	--	--	--
Mar. 20	3.92	323	--	--	--	293	1,750	--	--	--	--	--	--	--	--
Apr. 8	2.65	292	331	166	214	267	1,590	70	--	1.1	2,500	3.40	1,510	1,290	24
Apr. 21	7.93	273	295	161	154	257	1,360	75	--	.9	2,170	2.95	1,400	1,190	19
May 20	7.20	320	--	--	--	292	1,740	--	--	--	--	--	--	--	--
June 13	5.97	290	--	--	--	197	1,580	--	--	--	--	--	--	--	--
July 13	4.56	303	338	176	195	275	1,600	70	--	.4	2,510	3.41	1,570	1,340	21
July 27	2.08	294	357	161	164	249	1,550	65	--	.6	2,420	3.29	1,550	1,350	19
Aug. 12	6.96	150	--	--	--	159	651	--	--	--	--	--	--	--	--
Aug. 25	10.2	262	--	--	--	290	1,340	--	--	--	--	--	--	--	--
Sept. 8	2.32	282	--	--	--	255	1,510	--	--	--	--	--	--	--	--

SIX MILE CREEK NEAR EAGLE NEST

Oct. 23, 1946	1.05	26.6	46	4.8	4.1	157	13	1	--	0.0	146	0.20	134	6	6
Dec. 20	1.16	26.1	--	--	--	146	--	--	--	--	--	--	--	--	--
Feb. 7, 1947	1.00	24.7	--	--	--	133	--	--	--	--	--	--	--	--	--
Mar. 29	6.99	19.4	--	--	--	113	--	--	--	--	--	--	--	--	--
Apr. 23	11.9	10.8	16	2.2	12	62	20	1.8	--	1.0	84	.11	49	0	35
May 23	7.47	18.9	--	--	--	111	--	--	--	--	--	--	--	--	--
June 23	.44	25.9	--	--	--	158	--	--	--	--	--	--	--	--	--
July 16	.22	28.3	48	7.2	3.0	172	13	.5	--	1.0	157	.21	150	8	4
Aug. 11	.21	26.6	--	--	--	163	--	--	--	--	--	--	--	--	--
Sept. 23	.51	25.2	--	--	--	152	--	--	--	--	--	--	--	--	--

MORENO CREEK AT EAGLE NEST

Oct. 23, 1946	1.14	38.2	56	10	14	227	21	3	--	0.0	216	0.29	180	16	15
Dec. 20	2.66	34.7	--	--	--	202	19	--	--	--	--	--	--	--	--
Feb. 7, 1947	3.45	27.8	--	--	--	151	--	--	--	--	--	--	--	--	--
Apr. 23	14.3	24.9	35	7.0	14	149	19	3.5	--	1.1	153	.21	116	0	21

ARKANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN NEW MEXICO--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Discharge (second-feet)	Specific conductance ($K \times 10^6$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids		Hardness as $CaCO_3$		Percent sodium
											Parts per million	Tons per acre-foot	Total	Non-carbonate	
MORENO CREEK AT EAGLE NEST--Continued															
Mar. 29, 1947	20.6	22.5	--	--	--	125	--	--	--	--	--	--	--	--	--
May 23	22.7	28.2	--	--	--	178	--	--	--	--	--	--	--	--	--
June 23	2.18	38.2	--	--	--	241	--	--	--	--	--	--	--	--	--
July 16	1.30	39.5	59	12	12	247	16	2.5	--	0.3	224	0.30	196	0	12
Aug. 11	.48	37.4	--	--	--	236	--	--	--	--	--	--	--	--	--
Sept. 23	.34	35.1	--	--	--	215	--	--	--	--	--	--	--	--	--
RAYADO RIVER AT SAUBLE RANCH NEAR CIMARRON															
Oct. 15, 1946	3.78	13.7	16	5.8	5.5	81	7.6	1	--	0.0	76	0.10	64	0	16
Nov. 18	4.47	14.3	--	--	--	82	7.0	--	--	--	--	--	--	--	--
Dec. 12	7.30	13.4	--	--	--	81	--	--	--	--	--	--	--	--	--
Jan. 25, 1947	3.46	14.4	16	5.5	7.8	82	8.4	1	0.8	.5	80	.11	62	0	21
Feb. 23	6.91	17.2	--	--	--	87	--	--	--	--	--	--	--	--	--
Mar. 21	8.86	12.7	--	--	--	81	--	--	--	--	--	--	--	--	--
Apr. 9	20.6	10.3	11	2.7	11	62	8.2	1.0	--	.6	65	.09	38	0	37
Apr. 22	38.7	9.9	12	3.8	5.1	53	10	1.2	--	1.1	59	.08	46	2	19
May 21	2.90	8.8	--	--	--	56	--	--	--	--	--	--	--	--	--
June 10	8.88	11.1	--	--	--	67	--	--	--	--	--	--	--	--	--
July 14	4.17	13.5	15	5.6	4.4	81	3.5	0	--	.2	69	.09	60	0	14
July 28	2.42	13.9	17	5.2	6.4	84	6.8	1.2	--	.4	78	.11	64	0	18
Aug. 12	3.21	14.1	--	--	--	85	7.2	--	--	--	--	--	--	--	--
Aug. 26	12.0	15.1	--	--	--	88	--	--	--	--	--	--	--	--	--
Sept. 9	2.82	15.0	--	--	--	89	--	--	--	--	--	--	--	--	--
Sept. 21	4.15	13.5	--	--	--	83	--	--	--	--	--	--	--	--	--
RAYADO RIVER NEAR MIAMI															
Apr. 9, 1947	9.69	12.9	17	4.6	5.8	73	10	2.2	--	0.7	76	0.10	62	2	17
Apr. 22	16.2	13.2	--	--	--	73	10	1.2	--	--	--	--	--	--	--
July 14	--	22.9	31	6.3	12	135	13	2.2	--	2.0	133	.18	104	0	19
July 28	1.49	20.5	28	5.9	9.4	123	11	1.5	--	.5	117	.16	94	0	18
Aug. 26	--	17.0	--	--	--	100	--	--	--	--	--	--	--	--	--

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN OKLAHOMA

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$		Percent sodium
															Total	Non-carbonate	
LAKE CARL BLACKWELL NEAR STILLWATER																	
Nov. 10, 1946	--	30.4	--	--	33	14	19		171	21	14	--	0.2	190	140	0	23
Feb. 5, 1947	7.1	34.9	4.0	0 06	28	15	18	9.0	172	22	12	0.0	.5	193	132	0	21
Apr. 4	--	33.8	--	--	17	7.8	48		174	19	12	--	.0	198	74	0	58
Apr. 30	--	27.9	--	--	27	12	16		141	20	10	.3	.0	161	117	1	23
May 20	7.7	26.0	1.0	.05	25	12	11	2.2	131	15	11	.2	.5	150	112	4	18
June 11	7.7	26.0	2.4	.10	26	10	17	3.8	140	16	10	.2	1.0	156	106	0	25
July 15	8.3	26.3	7.6	.10	27	11	11	5.5	135	17	10	.2	1.0	157	113	2	17
Aug. 4 1/	8.2	27.6	1.1	.20	29	10	12	5.2	140	16	9.5	.2	1.5	157	113	0	18
Aug. 4 2/	8.1	27.3	4.4	.40	27	11	11	5.4	138	16	9.5	.1	1.0	161	113	0	17
Aug. 4 3/	8.0	27.3	2.2	.40	27	10	16	4.1	143	16	9.7	.2	1.5	160	108	0	24
NEOSHO RIVER ABOVE MIAMI																	
Nov. 9, 1946	7.7	31.4	5.8	0.12	33	10	13	5.2	73	64	21	0.0	2.8	205	123	64	18
Nov. 11	--	30.8	--	--	38	8.6	15		4/88	74	32	--	3.5	214	130	93	20
Nov. 23	--	34.7	--	--	48	11	18		5/96	83	26	--	3.2	247	165	86	19
Nov. 30	--	38.3	--	--	40	12	29		90	101	20	--	5.0	270	149	75	29
Dec. 7	--	50.7	--	--	64	16	23		145	113	26	--	3.5	348	226	107	18
Dec. 14	--	58.1	--	--	--	--	--		196	97	30	--	4.5	--	206	45	--
Dec. 21	--	64.9	--	--	--	--	--		205	108	43	--	4.5	--	231	63	--
Jan. 24, 1947	--	43.5	--	--	--	--	--		128	85	22	--	5.0	--	165	60	--
Jan. 11	--	47.4	--	--	--	--	--		127	94	22	--	5.0	--	164	60	--
Jan. 18	--	50.1	--	--	--	--	--		150	89	28	--	5.5	--	186	63	--
Feb. 1	--	72.2	--	--	81	24	35		6/211	115	56	--	5.5	444	300	128	20
Feb. 15	--	80.8	--	--	82	28	48		210	160	60	--	1.0	514	320	148	25
Feb. 22	--	82.0	--	--	86	31	46		216	167	62	--	3.5	529	342	165	22
Feb. 25	--	61.4	--	--	76	19	18		205	78	38	--	6.5	373	268	100	13
Mar. 1	--	87.2	--	--	92	35	68		212	193	103	--	1.0	596	374	200	28

1/ 5 feet below surface.
2/ 17 feet below surface.
3/ 29 feet below surface.

4/ Includes equivalent of 20 parts per million of carbonate (CO_3).
5/ Includes equivalent of 12 parts per million of carbonate (CO_3).
6/ Includes equivalent of 6 parts per million of carbonate (CO_3).

ARKANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN OKLAHOMA--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$		Percent sodium
															Total	Non-carbonate	
STREAM BELOW GOODRICH PLANT NORTH OF MIAMI																	
Feb. 15, 1947	--	40.9	--	--	30	16	30		148	22	44	--	0.5	248	141	19	32
Feb. 15	--	80.6	--	--	78	28	44		187	156	62	--	3.0	490	310	157	24
Mar. 8	--	40.7	--	--	30	19	27		7/155	22	44	--	.5	240	153	26	28
NEOSHO RIVER AT TWIN BRIDGES AT MIAMI																	
Nov. 8, 1946	7.7	30.8	6.0	0.18	34	9.2	10	7.3	67	67	19	--	3.5	195	123	68	14
Nov. 11	--	41.4	--	--	54	8.7	21		110	91	12	--	18	259	171	80	21
Nov. 23	--	32.4	--	--	35	8.1	16		84	61	14	--	3.5	202	121	52	22
Nov. 30	--	29.3	--	--	44	6.9	9.9		84	63	15	--	5.0	208	138	69	13
Dec. 7	--	41.6	--	--	50	7.9	19		98	84	12	--	18	243	157	77	21
Dec. 14	--	35.0	--	--	--	--	--		112	70	12	--	15	--	150	58	--
Dec. 21	--	41.7	--	--	--	--	--		120	82	23	--	7.5	--	162	64	--
Dec. 28	--	46.0	--	--	--	--	--		136	77	32	--	12	--	168	56	--
Jan. 4, 1947	--	42.1	--	--	--	--	--		144	73	16	--	12	-	174	56	--
Jan. 11	--	40.7	--	--	--	--	--		133	67	14	--	8.0	--	171	62	--
Jan. 18	--	42.5	--	--	--	--	--		138	77	15	--	7.0	--	182	69	--
Feb. 1	--	45.7	--	--	66	12	10		133	91	18	--	8.0	288	214	105	--
GRAND LAKE BELOW TWIN BRIDGES AT MIAMI																	
Feb. 8, 1947	--	46.8	--	--	67	14	9.6		5/146	90	17	--	10	304	225	0	9
Feb. 15	--	46.7	--	--	62	10	22		143	91	18	--	7.5	298	196	79.0	9
Feb. 22	--	48.3	--	--	70	14	9.0		149	94	18	--	8.0	330	232	110	20
Feb. 25	--	45.6	--	--	62	14	12		132	94	18	--	7.5	280	212	104	8
Mar. 1	--	46.5	--	--	71	14	6.8		8/156	86	18	--	8.0	306	235	107	11
DRIPPING SPRINGS ON SPRING RIVER AT MIAMI																	
Nov. 8, 1946	7.7	24.9	8.6	0.12	35	6.7	5.3	4.4	71	56	7.0	0.0	7.0	165	115	57	6
Nov. 16	--	32.4	--	--	47	5.2	19		9/88	85	6.0	--	15	220	139	67	9
Nov. 23	--	38.9	--	--	60	7.8	12		5/108	90	7.0	--	18	258	182	93	23

5/ Includes equivalent of 20 parts per million of carbonate (CO_3).
7/ Includes equivalent of 13 parts per million of carbonate (CO_3).
8/ Includes equivalent of 6 parts per million of carbonate (CO_3).
9/ Includes equivalent of 10 parts per million of carbonate (CO_3).

Nov. 30	--	36.9	--	--	62	6.6	12	122	81	7.5	--	15	244	182	82	12
Dec. 7	--	36.8	--	--	64	7.6	8.0	119	84	8.0	--	15	264	191	93	12
Dec. 14	--	27.6	--	--	--	--	--	98	72	5.8	--	12	--	111	31	8
Dec. 21	--	31.6	--	--	--	--	--	107	58	5.2	--	10	--	130	42	--
Dec. 28	--	34.8	--	--	--	--	--	122	57	6.8	--	15	--	144	44	--
Jan. 4, 1947	--	36.2	--	--	--	--	--	126	57	8.2	--	18	--	148	45	--
Jan. 11	--	44.0	--	--	--	--	--	128	94	8.2	--	15	--	177	72	--
Jan. 18	--	42.2	--	--	--	--	--	123	92	8.0	--	15	--	178	77	--
Feb. 1	--	40.0	--	--	62	8.1	12	124	82	10	--	15	256	188	87	12
Feb. 15	--	43.1	--	--	62	9.0	14	131	90	10	--	10	291	192	84	14
Feb. 22	--	45.7	--	--	72	11	4.3	121	101	9.8	--	20	301	225	126	4
Feb. 25	--	40.1	--	--	64	7.2	8.6	124	77	10	--	15	259	189	88	9
Mar. 1	--	48.0	--	--	74	13	4.1	123	113	10	--	18	316	238	138	4

ARKANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN OKLAHOMA--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$		Percent sodium
																Total	Non-carbonate	
GAINES CREEK 6½ MILES NORTHEAST OF KREBS																		
Sept. 1-10, 1946	--	--	17.6	--	--	17	6.9	10		77	15	9.0	--	1.5	112	71	8	24
Sept. 11-20	--	--	18.5	--	--	18	7.4	9.4		78	16	10	--	1.5	110	75	11	21
Sept. 21-30	--	--	19.4	--	--	15	8.0	12		78	16	10	--	1.5	111	70	6	27
Oct. 12	--	--	39.6	--	--	--	--	--		101	19	11	--	1.0	--	90	7	--
Oct. 1, 7, 8, 13-15	--	--	20.4	--	--	16	7.3	14		88	16	7.2	--	1.5	126	70	0	30
Oct. 18-21, 24-26	--	--	21.0	--	--	17	7.4	20		96	17	13	--	2.0	131	73	0	37
Dec. 12	21,200	--	15.1	--	--	9.2	6.9	13		32	41	7.0	--	1.0	122	51	25	35
Jan. 22, 1947	65	--	20.9	--	--	12	7.3	17		31	55	10	--	1.0	138	60	35	39
Feb. 18	25	--	14.2	--	--	9.2	5.5	7.6		23	29	8.8	--	.8	108	46	27	27
Mar. 21	104	--	28.5	--	--	18	9.0	24		42	74	16	--	.0	174	82	48	39
May 1	4,800	--	6.96	--	--	4.9	3.9	1.2		17	10	3.8	--	1.5	73	28	14	9
June 17	28	--	23.3	--	--	15	7.8	5.0		46	28	9.0	--	1.0	149	70	32	13
Sept. 18	.2	7.2	26.7	1.2	0.06	18	8.6	26	4.6	89	48	14	0.1	.5	165	80	7	40

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN ARKANSAS

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
															Total	Non-carbonate
ARKANSAS RIVER AT DARDANELLE																
Feb. 11, 1947	7,680	--	210	--	--	--	--	--	175	115	488	--	1.5	--	308	164
POTEAU RIVER AT CAUTHRON																
Feb. 3, 1947	25	--	9.80	--	--	--	--	--	19	17	10	--	0.5	--	39	23
FROG BAYOU NEAR MOUNTAINBURG																
Jan. 14, 1947	52	--	3.30	--	--	--	--	--	12	6.0	8.0	--	0.8	--	16	6
MULBERRY RIVER NEAR MULBERRY																
Jan. 21, 1947	251	--	2.80	--	--	--	--	--	11	3.0	5.0	--	0.2	--	9	0
Aug. 15	1.1	--	5.38	--	--	--	--	--	24	1.0	1.0	--	.2	--	18	0
PETIT JEAN CREEK NEAR BOONEVILLE																
Jan. 8, 1947	1.95	--	7.10	--	--	--	--	--	17	18	10	--	0.5	--	16	2
PETIT JEAN CREEK NEAR WAVELAND																
Jan. 8, 1947	410	--	9.30	--	--	--	--	--	20	11	8.0	--	0.8	--	24	8
Aug. 4	3.8	--	12.3	--	--	--	--	--	41	8.0	2.8	--	1.0	--	30	0
PETIT JEAN CREEK NEAR DANVILLE																
Jan. 9, 1947	524	--	7.30	--	--	--	--	--	13	17	8.0	--	1.2	--	16	5
Aug. 6	1.9	--	10.6	--	--	--	--	--	51	5.0	5.0	--	.2	--	37	0
FOURCHE LA FAVE RIVER NEAR GRAVELLY																
Jan. 10, 1947	300	--	3.30	--	--	--	--	--	10	7.0	5.0	--	0.2	--	32	24
Aug. 7	0	--	5.70	--	--	--	--	--	24	2.0	2.5	--	.5	--	18	0

ARKANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN ARKANSAS--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
															Total	Non-carbonate
FOURCHE LA FAVE RIVER NEAR NIMROD																
Jan. 9, 1947	390	--	3.50	--	--	--	--	--	13	3.0	4.0	--	0.2	--	16	5
Aug. 9	3.3	--	5.38	--	--	--	--	--	19	1.0	1.5	--	1.2	--	15	0
SOUTH FOURCHE LA FAVE RIVER NEAR HOLLIS																
Jan. 9, 1947	172	--	2.70	--	--	--	--	--	11	3.0	4.0	--	0.2	--	16	7
BAYOU METO NEAR STUTTGART																
Feb. 12, 1947	110	--	6.30	--	--	--	--	--	18	9.0	8.0	--	0.5	--	39	24
CROOKED CREEK NEAR HUMPHREY																
Feb. 12, 1947	6.2	--	9.30	--	--	--	--	--	26	17	4.0	--	1.2	--	39	18
Sept. 28	8.2	--	22.7	--	--	--	--	--	118	7.5	12	--	.2	--	81	0
ARKANSAS RIVER NEAR PINE BLUFF																
Sept. 24, 1947	--	8.4	86.0	0.02	46	12	96	4.5	111	40	174	0.2	1.8	460	164	74

RED RIVER AT DENISON DAM NEAR DENISON, TEX.

LOCATION.--Immediately below dam on Red River, 1.7 miles upstream from Sand Creek, 5 miles north of Denison, Grayson County, and 3 miles upstream from gaging station near Colbert, Bryan County, Okla.
DRAINAGE AREA.--38,291 square miles above dam (38,700 square miles above gaging station).
RECORDS AVAILABLE.--Chemical analyses: May 1944 to September 1947.
Water temperatures: October 1945 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 1,360 parts per million Oct. 20-31; minimum, 644 parts per million Oct. 1-10.
Total hardness: Maximum, 497 parts per million Oct. 20-31; minimum, 269 parts per million Oct. 1-10.
Water temperatures: Maximum, 82° F. Sept. 5; minimum, 43° F. Mar. 6-10.
EXTREMES, 1944-47.--Dissolved solids: Maximum, 1,430 parts per million Aug. 11-20, 1944, Sept. 1-10, 1944; minimum, 464 parts per million Oct. 21-31, 1945.
Total hardness: Maximum, 522 parts per million Aug. 11-20, 1944, Sept. 1-10, 1944; minimum, 233 parts per million Dec. 21-31, 1945, Jan. 11-20, 1946.
Water temperatures: Maximum, 82° F. Sept. 5, 1947; minimum, 43° F. Mar. 6-10, 1947.
REMARKS.--Discharge records reported are for gaging station near Colbert, Okla. No appreciable inflow between dam and gaging station except during periods of heavy local rains. Records of specific conductance of daily samples available in district office at Austin, Tex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 1-10, 1946 ---	2,528	72	7.8	107	--	--	70	23	116		163	120	185	--	1.5	--	644	0.88	4,400	269	136	48
Oct. 11-19 --------	4,330	70	7.9	111	--	--	75	25	115		162	126	195	--	1.5	--	648	.88	7,580	290	157	46
Oct. 20-31 --------	2,347	69	7.5	229	--	--	143	34	298		145	321	490	--	1.5	--	1,360	1.85	8,620	497	378	57
Nov. 1-10---------	4,445	67	8.0	189	--	--	115	30	239		152	248	388	--	.5	--	1,100	1.50	13,200	410	286	56
Nov. 11-20--------	5,115	63	8.2	142	--	--	90	26	172		160	176	278	--	.8	--	957	1.30	13,200	332	200	53
Nov. 21-30--------	5,060	59	8.2	129	--	--	84	25	160		161	161	255	--	2.0	--	822	1.12	11,200	312	180	53
Dec. 1-10---------	4,974	58	8.0	136	7.0	0.00	86	25	144	16	159	159	250	0.2	1.2	--	800	1.09	10,700	318	187	51
Dec. 11-20--------	12,700	58	7.9	136	--	--	89	26	147		158	158	250	--	1.5	--	814	1.11	27,900	329	199	49
Dec. 21-31--------	16,270	53	7.8	138	--	--	90	25	152		160	165	250	--	1.5	--	795	1.08	34,900	328	196	50
Jan. 1-10, 1947 ---	5,275	48	7.9	139	--	--	88	24	150		157	154	250	--	1.8	--	779	1.06	11,100	318	189	51
Jan. 11-20 --------	5,165	47	7.7	135	--	--	86	24	153		158	162	245	--	2.0	--	772	1.05	10,800	313	184	51
Jan. 21-31 --------	4,943	47	7.8	133	--	--	88	24	148		156	159	245	--	1.2	--	750	1.02	10,000	318	190	50
Feb. 1-10---------	4,864	46	8.2	131	--	--	88	23	148		154	157	245	--	.5	--	740	1.01	9,720	314	188	51
Feb. 11-19--------	4,353	46	7.9	133	--	--	83	24	154		155	164	242	--	1.8	--	758	1.03	8,910	306	178	52
Feb. 20-28--------	3,661	45	7.8	126	--	--	80	24	148		154	160	232	--	.8	--	722	.98	7,140	298	172	52
Mar. 1-10---------	2,323	44	8.1	122	--	--	82	26	134		151	153	226	--	.0	--	728	.99	4,570	312	188	48
Mar. 11-20 -------	2,208	45	8.3	122	--	--	87	27	129		149	154	232	--	.0	--	734	1.00	4,380	328	206	46
Mar. 21-31 -------	1,996	48	--	126	--	--	84	24	143		149	151	240	--	1.0	--	772	1.05	4,160	308	186	50

RED RIVER BASIN--Continued

RED RIVER AT DENISON DAM NEAR DENISON, TEX.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Apr. 1-10, 1947 ---	2,314	51	7.6	125	--	--	85	24	150		128	145	268	--	2.5	--	779	1.06	4,870	310	206	51
Apr. 11-20--------	5,400	55	8.1	125	--	--	85	24	150		151	149	252	--	1.2	--	766	1.04	11,200	310	186	51
Apr. 21-30--------	11,240	58	7.7	123	--	--	88	24	144		152	150	246	--	3.0	--	805	1.09	24,400	318	194	50
May 1-10 ---------	7,506	61	7.6	123	--	--	86	24	134		152	146	231	--	3.0	--	773	1.05	15,700	313	188	48
May 11-20 --------	8,503	63	8.3	139	--	--	89	24	161		151	158	269	--	2.8	--	844	1.15	19,400	320	196	52
May 21-31 --------	49,670	67	7.7	137	--	--	91	25	147		147	154	260	--	3.0	--	801	1.09	107,000	330	210	49
June 1-30 ---------	26,080	74	8.2	133	--	--	90	22	143		140	167	238	--	1.8	--	804	1.09	56,600	315	200	50
July 1-31 ---------	4,217	76	8.1	123	--	--	94	21	136		140	166	232	--	3.0	--	776	1.06	8,840	321	206	48
Aug. 1-31---------	2,335	78	7.9	130	12	0.02	94	22	150		135	188	242	0.4	2.2	0.5	829	1.13	5,230	325	214	50
Sept. 1-30 --------	2,314	78	--	129	--	--	88	24	149		136	185	238	--	2.0	--	791	1.08	4,940	318	206	50
Weighted average	7,923	--	--	134	--	--	90	24	149		148	164	250	--	2.0	--	805	1.09	17,200	323	202	50

Temperature (° F.) of water, water year October 1946 to September 1947

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

RED RIVER BASIN--Continued

RED RIVER AT FULTON, ARK.

LOCATION.--At bridge on U. S. Highway 67, approximately 20 miles upstream from gaging station at Garland, Miller County.
DRAINAGE AREA.--51,500 square miles above gaging station.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 728 parts per million Jan. 1-10; minimum, 107 parts per million Sept. 24-26.
Total hardness: Maximum, 295 parts per million Aug. 11-20; minimum, 36 parts per million Sept. 24-26.
Water temperatures: Maximum, 86° F. Aug. 6-8, 10; minimum, 39° F. Jan. 1.
REMARKS.--Discharge records reported are for gaging station at Garland, Ark. There is no appreciable inflow between sampling point and gaging station except during periods of heavy local rains. Records of specific conductance of daily samples are available in district office at Fayetteville, Ark.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Specific conductance ($K \times 10^5$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1946 -------- --	3,606	--	84.0	62	19	7	1/189	73	134	1.0	519	0.71	5,050	232	77	32
Oct. 11-20 ----------	3,760	65	92.4	71	22	98	2/187	100	158	.5	593	.81	6,020	268	114	41
Oct. 21-31, Nov. 1-4 ------	4,249	66	106	74	22	107	3/178	108	175	1.0	627	.85	7,190	275	128	46
Nov. 5-19 ----------	78,250	56	19.9	22	4.4	18	78	18	20	1.2	150	.20	31,690	83	9	36
Nov. 20-30 ----------	22,100	52	42.7	32	7.6	42	88	41	62	.5	263	.36	15,690	111	39	45
Dec. 1-5, 7, 9, 11, 13-21 --	39,803	51	39.4	34	8.1	32	89	37	54	1.5	245	.33	26,330	118	45	37
Dec. 6, 8, 10, 12, 22-31 ---	62,952	52	79.1	58	14	87	139	87	132	1.0	507	.69	86,170	202	88	48
Jan. 1-10, 1947 ----------	16,300	42	61.2	48	12	67	124	68	100	1.5	391	.53	17,200	170	68	46
Jan. 11-20 ----------	13,020	47	61.6	52	13	67	129	71	106	1.2	404	.55	14,200	184	78	44
Jan. 21-31 ----------	12,550	51	61.0	48	12	64	121	67	99	1.2	382	.52	12,900	170	70	45
Feb. 1-10 ----------	9,041	47	87.0	56	16	92	4/152	92	131	.8	504	.69	12,300	206	81	49
Feb. 11-20 ----------	8,146	46	86.8	54	16	95	150	92	133	.8	503	.68	11,100	201	78	50
Feb. 21-28 ----------	7,276	44	82.8	52	16	90	151	87	125	.5	482	.66	9,470	196	72	50
Mar. 1-7, 9 ----------	6,220	43	79.5	61	16	81	5/164	84	122	.5	496	.67	8,330	218	83	45
Mar. 8, 10-13, 26, 31 -----	12,250	49	41.1	33	7.2	37	84	43	54	3.5	247	.34	8,160	112	43	42
Mar. 14-17, 23, 25, 27 ----	24,680	51	24.9	22	4.4	18	64	21	26	.5	158	.24	10,500	73	21	35
Mar. 18-22, 28-30 --------	27,380	51	13.6	12	3.1	13	50	13	12	.5	113	.15	8,290	43	2	40

1/ Includes equivalent of 14 parts per million of carbonate (CO_3).
2/ Includes equivalent of 11 parts per million of carbonate (CO_3).
3/ Includes equivalent of 18 parts per million of carbonate (CO_3).
4/ Includes equivalent of 6 parts per million of carbonate (CO_3).
5/ Includes equivalent of 8 parts per million of carbonate (CO_3).

Apr. 1, 8-10, 13	22,720	68	29.9	24	5.4	30	90	28	30	1.5	201	.27	12,300	82	8	44
Apr. 2-6, 7, 11-12	12,812	62	36.7	25	6.8	39	95	36	42	1.0	225	.31	7,780	90	12	48
Apr. 14-20, 21-22	39,410	61	20.3	19	6.4	18	80	22	17	1.0	164	.22	17,700	74	8	35
Apr. 23-24, 29-30	34,600	65	53.2	36	8.2	57	113	52	71	.8	313	.43	29,200	124	31	50
Apr. 25-28	24,780	63	70.2	48	12	81	114	82	118	.8	436	.59	29,200	170	76	51
May 1, 11-13, 24	46,860	66	48.6	34	7.5	53	90	50	74	.2	287	.39	36,300	116	42	50
May 4-8	58,910	67	15.4	11	5.2	12	60	10	11	.8	121	.16	19,700	49	0	36
May 2-3, 9-10, 14-18	59,770	68	27.5	22	6.7	25	75	23	32	1.2	182	.25	29,400	82	21	41
May 19-20, 21-23	77,800	71	17.5	12	5.7	14	54	12	18	1.0	124	.17	26,000	53	9	36
May 25-31	83,640	69	80.2	54	13	87	115	86	137	1.2	498	.68	112,000	188	94	50
June 1-10	61,790	75	119	74	17	144	5/131	142	221	1.0	728	.99	121,000	254	147	55
June 11-20	33,290	76	110	78	17	133	4/143	147	200	1.2	726	.99	63,290	264	148	52
June 21-30	15,550	78	117	78	17	125	161	135	187	.8	688	.94	28,900	264	132	51
July 1-10	13,900	80	103	75	17	120	159	133	175	2.0	662	.90	25,000	257	126	50
July 11-20	6,751	82	108	82	20	123	184	142	180	1.2	698	.95	12,700	286	136	48
July 21-31	4,921	80	113	84	20	121	201	143	170	1.2	700	.95	9,300	292	127	48
Aug. 1-10	4,018	85	110	78	20	114	187	126	170	1.2	665	.90	7,210	276	124	47
Aug. 11-20	3,614	82	114	82	22	118	196	136	175	2.0	708	.96	6,910	295	134	46
Aug. 21-31	5,365	81	109	79	20	117	179	136	172	2.5	704	.96	10,200	279	132	48
Sept. 1, 2, 4, 5	21,920	80	22.8	15	4.8	23	52	22	29	1.2	146	.20	8,640	57	15	47
Sept. 3, 6, 7	14,520	82	45.2	37	9.7	44	98	50	66	1.8	272	.37	10,700	132	52	42
Sept. 8-10	4,757	83	91.9	68	17	106	161	117	152	1.2	580	.79	7,450	240	108	49
Sept. 11-20	4,228	77	98.8	70	18	99	4/151	100	167	.5	613	.83	7,000	248	124	46
Sept. 21, 22, 29, 30	3,970	70	84.2	62	16	103	151	128	132	.8	539	.73	5,770	220	96	50
Sept. 24-26	9,257	68	19.3	9.0	3.2	21	33	16	25	1.8	107	.15	2,680	36	9	56
Sept. 23, 27, 28	5,170	69	42.4	30	9.3	49	78	63	63	.8	253	.34	3,530	113	49	49
Weighted average	24,620	--	66.7	42	10	61	106	62	89	1.1	361	0.49	24,000	147	69	44

4/ Includes equivalent of 6 parts per million of carbonate (CO_3).
5/ Includes equivalent of 8 parts per million of carbonate (CO_3).

RED RIVER BASIN--Continued

RED RIVER AT FULTON, ARK.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

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

SALT FORK RED RIVER AT MANGUM, OKLA.

LOCATION.--At bridge on State Highway 34, half a mile south of Mangum, Greer County, and 13 miles downstream from Fish Creek.
DRAINAGE AREA.--1,390 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: December 1946 to August 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 3,300 parts per million Aug. 11-20; minimum, 630 parts per million May 12-13, 16-18, 20.
Total hardness: Maximum, 1,880 parts per million May 1-5; minimum, 366 parts per million May 12-13, 16-18, 20.
Water temperatures: Maximum, 98° F. July 28; minimum, freezing point on many days in December, January, February, and March.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given Water-Supply Paper 1087. Records of specific conductance of daily samples are available in district office at Stillwater, Okla.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Specific conductance ($K \times 10^6$ at 25°C.)	Temperature (° F.)	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 7-9, 12, 14, 1946	1,360	135	--	--	--	--	170	36	86		134	485	100	--	3.0	946	1.29	3,470	572	462	25
Oct. 16, 24, 26, 29---	29.8	237	--	--	--	--	332	71	146		122	1,020	195	--	1.0	1,830	2.49	147	1,120	1,020	22
Nov. 1, 4, 8-9-------	53.8	229	--	--	--	--	312	67	154		143	951	198	--	2.5	1,750	2.38	254	1,050	937	24
Nov. 12-16, 18-20----	26.8	252	--	--	--	--	354	88	143		130	1,100	215	--	2.5	1,970	2.68	143	1,250	1,140	20
Nov. 22-30 ----------	15.7	273	--	--	--	--	398	94	157		145	1,250	212	--	2.2	2,180	2.96	92	1,380	1,260	3
Dec. 1-10----------	20.2	276	47	--	--	--	404	96	152		136	1,270	212	--	2.2	2,200	2.99	120	1,400	1,290	19
Dec. 11-20----------	69.3	245	42	--	--	--	370	83	97		154	1,000	218	--	1.8	1,850	2.52	346	1,260	1,140	14
Dec. 21-31----------	19.1	282	41	--	--	--	412	106	132		155	1,260	220	--	2.0	2,210	3.01	114	1,460	1,340	16
Jan. 6-8, 1947 ------	10.0	301	32	--	--	--	478	108	157		202	1,420	225	--	2.0	2,490	3.39	67	1,640	1,470	17
Jan. 11-19----------	97.2	232	39	8.2	19	0.12	318	76	128	6.4	166	922	208	0.5	2.2	1,760	2.39	462	1,170	970	20
Jan. 22-23, 25, 28-31-	34.9	265	45	--	--	--	384	91	145		154	1,150	228	--	2.2	2,080	2.83	196	1,330	1,210	19
Feb. 1-10 ----------	12.3	296	33	--	--	--	460	117	152		157	1,420	248	--	2.8	2,480	3.37	82	1,630	1,500	17
Feb. 11-20 ----------	14.5	294	37	--	--	--	454	115	153		150	1,420	238	--	2.5	2,460	3.35	96	1,610	1,480	17
Feb. 21-28 ----------	14.4	289	36	--	--	--	444	111	154		148	1,380	240	--	2.5	2,400	3.26	93	1,560	1,440	18
Mar. 1-10----------	30.8	293	34	--	--	--	442	102	157		149	1,350	238	--	2.0	2,360	3.21	196	1,520	1,400	18
Mar. 11-15, 17 ------	109	255	40	--	--	--	362	88	131		151	1,060	228	--	2.0	1,950	2.65	574	1,260	1,140	18
Mar. 21-31----------	13.3	295	52	--	--	--	444	104	160		132	1,380	240	--	.8	2,390	3.25	86	1,540	1,430	18
Apr. 2-5, 7-10-------	50.2	265	65	--	--	--	372	94	175		142	1,200	232	--	3.2	2,150	2.92	291	1,310	1,200	22
Apr. 6, 13, 15-------	347	175	55	--	--	--	244	58	95		111	733	140	--	3.0	1,330	1.81	1,250	848	756	20
Apr. 11-12, 14, 16-20	156	228	59	--	--	--	300	84	158		162	951	222	--	3.0	1,800	2.45	758	1,090	961	24
Apr. 21-30 ----------	51.5	300	69	--	--	--	412	111	219		205	1,240	355	--	1.5	2,440	3.32	339	1,480	1,320	24

SALT FORK RED RIVER AT MANGUM, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Specific conductance ($K \times 10^6$ at 25° F)	Temperature (° F.)	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
May 1-5, 1947	6.16	389	82	--	--	--	520	142	250		112	1,540	520	--	0.5	3,030	4.12	50	1,880	1,700	22
May 6-10	115	266	69	--	--	--	388	91	158		129	1,260	190	--	2.0	2,150	2.92	668	1,340	1,240	20
May 11, 14-15, 19	1,650	190	76	--	--	--	270	58	92		139	777	130	--	8.0	1,400	1.90	6,240	912	796	18
May 12-13, 16-18, 20	3,933	138	73	--	--	--	112	21	69		141	281	75	--	2.0	630	.86	6,690	366	250	29
May 21, 27-31	349	256	74	--	--	--	376	91	140		153	1,160	200	--	1.5	2,040	2.77	1,920	1,310	1,190	19
May 22-26	588	182	72	--	--	--	262	49	113		127	790	122	--	2.0	1,400	1.90	2,220	855	751	22
June 2-4, 8-11	33.1	259	82	--	--	--	400	94	159		129	1,310	185	--	.5	2,210	3.01	198	1,380	1,280	20
June 1, 5-7	261	160	85	--	--	--	202	49	99		47	677	125	--	.5	1,180	1.60	832	706	666	23
June 12-14, 21-27	834	133	80	--	--	--	200	35	56		91	561	74	--	.5	1,040	1.41	2,340	643	568	16
June 15-20	146	184	83	--	--	--	277	55	92		127	790	135	--	.0	1,410	1.92	556	917	813	18
June 28-30	42.7	175	92	--	--	--	240	53	92		57	749	135	--	.5	1,300	1.77	150	817	770	20
July 1-10	6.14	267	90	--	--	--	426	95	129		111	1,330	182	--	3.0	2,220	3.02	37	1,450	1,360	16
July 11-17, 19	19.5	291	92	--	--	--	478	105	117		107	1,450	198	--	2.0	2,240	3.26	126	1,620	1,540	14
July 18	1,460	77.4	--	--	--	--	--	--	--		36	100	540	--	.0	--	--	--	410	380	--
July 20-22, 26	21.2	182	83	--	--	--	262	56	107		126	798	132	--	3.0	1,420	1.93	81	884	780	21
July 23-25, 27-31	4.3	255	89	--	--	--	402	87	128		112	1,240	182	--	.5	2,090	2.84	24	1,360	1,270	17
Aug. 1-10	.01	400	82	--	--	--	490	154	329		79	1,710	515	--	1.0	3,240	4.41	.1	1,860	1,790	28
Aug. 11-20	.0	408	80	--	--	--	488	158	355		118	1,690	555	--	.5	3,300	4.49	--	1,870	1,770	29
Aug. 21-25	.0	340	83	--	--	--	390	128	285		133	1,340	435	--	2.0	2,650	3.60	--	1,500	1,390	29
Aug. 26-31	3.12	248	83	--	--	--	436	85	90		79	1,310	145	--	.5	2,110	2.87	18	1,440	1,370	12
Average	183	263	--	--	--	--	378	93	154		134	1,170	234	--	1.9	2,100	2.86	--	1,330	1,220	20

Temperature (° F.) of water, water year October 1946 to September 1947

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	--	--	--	--	32	32	--	80	85	85	87	--
2	--	--	--	--	32	32	87	83	82	90	85	--
3	--	--	35	--	33	32	69	85	85	96	82	--
4	--	--	38	--	32	--	71	82	85	90	80	--
5	--	--	50	--	32	41	55	82	85	90	80	--
6	--	--	47	32	35	32	86	85	84	90	85	--
7	--	--	49	32	34	32	68	75	85	90	80	--
8	--	--	53	32	32	32	55	65	79	85	85	--
9	--	--	52	--	32	38	70	62	85	70	80	--
10	--	--	54	--	32	40	88	80	82	73	80	--
11	--	--	55	34	32	42	65	88	80	85	80	--
12	--	--	49	35	33	51	48	70	80	92	85	--
13	--	--	44	38	38	35	44	75	70	95	80	--
14	--	--	47	40	37	40	55	80	75	95	80	--
15	--	--	47	39	42	32	55	74	85	97	80	--
16	--	--	48	38	39	--	52	70	90	97	80	--
17	--	--	34	36	40	43	55	70	83	95	80	--
18	--	--	32	46	37	--	88	83	85	75	80	--
19	--	--	34	42	--	--	82	83	82	80	80	--
20	--	--	33	--	--	--	70	70	73	90	80	--
21	--	--	35	--	45	84	72	70	85	80	80	--
22	--	--	38	49	43	63	72	70	85	75	82	--
23	--	--	40	55	--	--	72	72	75	78	85	--
24	--	--	53	--	32	49	53	84	82	85	82	--
25	--	--	47	56	32	45	60	78	80	85	84	--
26	--	--	44	--	32	47	65	75	85	87	85	--
27	--	--	53	--	32	--	85	80	87	85	80	--
28	--	--	44	52	33	43	72	80	90	98	82	--
29	--	--	32	42	--	48	77	65	97	95	84	--
30	--	--	32	32	--	--	81	75	90	90	80	--
31	--	--	32	32	--	53	--	75	--	95	85	--
Average	--	--	43	--	35	--	64	74	83	88	83	--

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WASHITA RIVER AT FOSS DAM SITE NEAR FOSS, OKLA.

LOCATION.--Seven miles north and three-quarters of a mile west of river bridge on correction line, section 3 near Foss, Washita County.
RECORDS AVAILABLE.--Chemical analyses: June 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 1,670 parts per million Sept. 11-20; minimum, 236 parts per million Apr. 15.
Total hardness: Maximum, 1,270 parts per million Sept. 11-20; minimum, 171 parts per million Apr. 15.
Water temperatures: Maximum, 92° F. July 30; minimum, 33° F. Dec. 29, 31, Jan. 4, 6.
EXTREMES, June 1946-September 1947.--Dissolved solids: Maximum, 1,670 parts per million Sept. 11-20, 1947; minimum, 236 parts per million Apr. 15, 1947.
Total hardness: Maximum, 1,270 parts per million Sept. 11-20, 1947; minimum, 171 parts per million Apr. 15, 1947.
REMARKS.--Staff gage on cottonwood tree 50 feet below bridge on left bank. Records of specific conductance of daily samples available in district office at Stillwater, Okla.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$		Percent sodium
																Total	Noncarbonate	
Oct. 1-3, 7, 1946 ----	62	--	84.0	--	--	128	38	5.1		144	336	11	--	3.8	661	476	358	2
Oct. 4-5----------	68	--	124	--	--	184	69	19		186	584	14	--	2.8	964	742	590	5
Oct. 6, 10----------	63	--	25.8	--	--	--	--	--		118	94	3.0	--	2.0	256	207	--	--
Oct. 8-9, 11-16------	58	--	68.2	--	--	91	26	20		136	235	14	--	2.0	477	334	222	1
Oct. 17-20----------	58	--	112	--	--	157	45	44		205	452	23	--	1.5	872	576	408	14
Oct. 21-31----------	82	--	137	--	--	202	67	35		232	603	25	--	1.5	1,050	780	589	9
Nov. 1-10 ----------	52	--	70.2	--	--	95	31	33		162	274	12	--	2.0	527	364	232	18
Nov. 11-20 ----------	46	--	137	--	--	198	73	32		257	579	34	--	2.0	1,040	794	584	8
Nov. 21-30 ----------	47	--	168	--	--	234	81	52		277	723	35	--	2.0	1,260	917	690	11
Dec. 1-2, 4-10-------	--	--	167	--	--	217	85	71		265	744	37	--	2.2	1,290	891	674	15
Dec. 12, 18-19, 21-24, 29-31----------	--	--	157	--	--	194	79	73		256	671	40	--	2.5	1,190	809	599	16
Jan. 4, 6-8, 10, 1947-	35	--	196	--	--	280	113	61		297	961	34	--	4.0	1,600	1,160	920	10
Jan. 11-20----------	44	--	134	--	--	164	61	63		259	506	39	--	3.5	984	660	448	17
Jan. 21-31----------	48	--	152	21	0.00	178	74	68	7.2	232	624	44	0.4	3.2	1,130	748	558	16
Feb. 1-10 ----------	36	--	169	--	--	233	86	64		263	759	48	--	3.5	1,320	935	720	13
Feb. 11-20 ----------	47	--	166	--	--	220	82	72		249	740	46	--	3.0	1,290	886	682	15
Feb. 21-28 ----------	42	--	161	--	--	214	85	60		240	719	48	--	1.0	1,250	884	686	13
Mar. 1-10 ----------	47	--	160	--	--	194	84	70		243	695	41	--	1.0	1,200	830	630	15
Mar. 11-20----------	52	--	140	--	--	187	66	60		241	542	39	--	2.0	995	688	490	16
Mar. 21-31----------	60	--	155	--	--	182	82	69		236	658	44	--	1.0	1,150	791	598	16

Apr. 1-3	70	--	166	--	--	197	82	80	202	738	48	--	1.0	1,250	828	662	17
Apr. 8	57	--	36.2	--	--	--	--	--	130	79	8.0	--	2.0	--	206	99	--
Apr. 4-7, 9-10	63	--	79.1	--	--	110	29	21	170	267	14	--	1.5	591	394	254	10
Apr. 11-14, 16	50	--	63.0	--	--	86	24	13	146	188	16	--	3.8	450	313	194	8
Apr. 15	49	--	35.6	--	--	44	15	8.3	117	79	7.0	--	1.5	236	171	75	9
Apr. 17-20	62	--	115	--	--	149	50	40	280	364	36	--	6.5	900	578	348	13
Apr. 21-23, 28-30	73	--	133	--	--	177	53	59	266	491	40	--	3.2	954	660	442	16
Apr. 24-27	52	--	88.5	--	--	114	36	30	175	303	25	--	3.5	646	432	289	13
May 1-11	73	--	150	--	--	186	70	77	226	644	43	--	3.0	1,130	752	566	18
May 12, 14-16, 24	62	--	51.9	--	--	70	17	19	153	140	8.8	--	1.5	351	245	119	14
May 13, 17-23, 25	66	--	76.7	--	--	104	24	30	177	245	15	--	4.0	548	358	213	16
May 26-31	69	--	128	--	--	170	54	54	258	479	36	--	3.5	997	646	434	15
June 1-3, 9-11	79	--	133	--	--	172	64	49	207	558	33	--	2.5	980	692	522	13
June 4-8	76	--	56.7	--	--	76	20	19	157	155	14	--	4.5	391	272	143	13
June 12-19	78	--	158	--	--	206	83	61	207	738	35	--	2.0	1,230	856	686	13
June 20-22, 29-30	80	--	116	--	--	157	52	40	192	472	29	--	3.5	907	606	448	13
June 23-28	77	--	80.4	--	--	105	32	30	180	272	20	--	1.5	584	394	246	14
July 1-10	77	7.9	158	2.0	.10	222	88	32 | 9.2	187	765	33	.4	3.0	1,360	916	763	7
July 11-13, 19-21	74	--	103	--	--	151	42	26	160	421	24	--	3.0	787	550	418	9
July 14-18	78	--	143	--	--	192	73	41	185	641	32	--	3.5	1,070	779	627	10
July 22-31	80	--	166	--	--	245	99	15	174	838	24	--	3.0	1,310	1,020	876	3
Aug. 1-10	78	--	179	--	--	260	113	25	156	961	26	--	2.5	1,460	1,110	985	5
Aug. 11-20	82	--	184	--	--	266	120	26	151	1,010	25	--	2.5	1,520	1,160	1,030	5
Aug. 21-31	84	--	189	--	--	274	124	22	160	1,030	25	--	3.5	1,560	1,190	1,060	4
Sept. 1-10	79	--	188	--	--	298	119	19	140	1,080	23	--	3.0	1,610	1,230	1,120	3
Sept. 11-20	73	--	192	--	--	300	127	23	150	1,120	21	--	4.0	1,670	1,270	1,150	4
Sept. 21-30	67	--	192	--	--	280	130	32	153	1,090	26	--	6.0	1,640	1,230	1,110	5
Average	63	--	141	--	--	193	75	44	205	639	30	--	2.8	1,100	790	622	11

RED RIVER BASIN--Continued

WASHITA RIVER AT FOSS DAM SITE NEAR FOSS, OKLA.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	--	61	43	--	34	42	72	74	68	82	78	80
2	65	60	48	--	35	45	70	75	80	76	80	78
3	58	55	--	--	34	48	69	80	82	80	78	78
4	68	51	52	33	38	54	65	72	75	78	76	80
5	67	50	53	--	40	48	62	82	72	76	78	82
6	64	48	58	33	36	46	57	83	74	84	76	80
7	63	48	56	34	34	49	68	79	76	78	78	78
8	62	51	56	35	34	44	--	71	77	76	80	78
9	62	53	57	--	36	45	62	65	80	72	78	80
10	62	46	54	38	38	47	63	61	83	68	80	76
11	55	49	--	40	42	50	60	59	83	72	90	77
12	52	48	53	43	48	48	53	57	80	74	85	78
13	52	48	--	45	48	50	40	70	84	79	85	76
14	55	48	--	45	45	51	44	68	78	78	88	78
15	64	48	--	45	42	52	--	62	76	78	76	70
16	64	44	--	42	47	53	52	63	79	78	78	68
17	63	42	--	40	54	55	58	65	74	77	78	68
18	56	48	44	48	48	55	67	68	75	77	85	67
19	56	52	45	49	46	53	58	68	76	72	83	67
20	55	56	--	44	47	54	67	65	78	73	80	68
21	60	55	48	45	49	55	69	64	79	74	82	66
22	65	45	44	48	50	54	72	67	76	70	80	67
23	65	43	50	48	42	57	75	65	75	66	86	68
24	61	48	44	49	45	60	52	59	74	62	86	65
25	54	35	--	47	50	62	52	58	76	78	84	67
26	54	36	--	48	38	65	48	65	78	82	83	66
27	60	48	--	50	36	61	57	69	80	85	79	65
28	64	54	--	50	39	63	69	68	78	88	85	67
29	66	56	33	47	--	60	75	67	82	90	84	68
30	65	50	--	45	--	58	78	71	86	92	84	70
31	67	--	33	46	--	--	--	72	--	91	86	--
Average	61	49	--	44	42	53	62	68	78	78	81	73

RED RIVER BASIN--Continued

WASHITA RIVER NEAR CLINTON, OKLA.

LOCATION.--At bridge on U. S. Highway 183, three-quarters of a mile upstream from Beaver Creek, 3 miles downstream from Barnitz Creek, and one-half mile north of Clinton, Summit County.
DRAINAGE AREA.--1,990 square miles.
RECORDS AVAILABLE.--Sediment analyses: May to September 1947.
EXTREMES, 1947.--Sediment loads: Maximum, 253,000 tons per day May 12; minimum, 0.9 ton per day Sept. 30.
REMARKS.--Records of water discharge for water year October 1946 to September given in Water-Supply Paper 1087.

Suspended sediment, water year October 1946 to September 1947

Day	May			June			July		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	112	200	60	184	600	298	70	518	98
2	100	200	54	172	600	279	67	500	90
3	93	200	50	166	800	358	63	416	71
4	92	200	50	189	2,720	1,390	57	354	54
5	88	200	48	3,250	18,800	165,000	54	274	40
6	84	1/ 200	45	1,310	14,700	52,100	50	298	40
7	80	200	43	1,130	16,600	50,800	47	353	45
8	77	200	42	1,500	13,000	52,700	43	248	29
9	74	200	40	346	5,030	4,700	47	314	40
10	85	200	46	240	1,900	1,230	83	7,850	1,760
11	361	1/21,800	21,300	191	1,150	592	200	17,700	9,570
12	7,000	13,400	253,000	160	700	302	105	9,600	2,720
13	2,030	17,200	94,600	143	600	232	72	3,200	622
14	453	2,060	2,520	133	500	180	58	1,350	212
15	1,890	21,100	108,000	122	500	165	50	708	96
16	5,410	13,100	191,000	110	460	136	44	491	58
17	2,120	21,600	124,000	99	417	111	40	320	35
18	500	1/ 5,770	7,800	92	354	88	132	1/ 6,930	2,470
19	320	1/ 5,200	4,490	328	11,300	9,980	317	14,900	12,800
20	3,010	12,000	97,600	238	2,950	1,900	124	1/ 5,400	1,810
21	2,740	26,600	197,000	180	4,900	2,380	70	2,300	434
22	785	13,900	29,400	248	7,300	4,880	57	1,200	185
23	586	8,300	13,100	177	5,700	2,720	69	1,730	322
24	1,130	17,600	53,600	145	3,000	1,180	168	3,810	1,730
25	1,110	19,300	58,000	533	13,000	18,700	68	1,300	238
26	446	6,900	8,300	614	1,450	2,400	75	562	114
27	332	3,900	3,500	230	1/10,800	6,710	59	336	54
28	279	1/ 1,600	1,200	132	4,900	1,750	48	316	41
29	240	1,100	713	100	1/ 2,350	635	44	258	31
30	212	800	458	84	1,250	284	38	205	21
31	191	950	490	--	--	--	38	209	21
Total load (tons)	--	--	1,270,549	--	--	384,180	--	--	35,851

1/Estimated.

RED RIVER BASIN--Continued

WASHITA RIVER NEAR CLINTON, OKLA.

Suspended sediment, water year October 1946 to September 1947--Continued

Day	August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	34	316	29	8.0	1/180	3.9
2	31	302	25	7.8	1/160	3.4
3	29	1/280	22	7.8	1/150	3.2
4	28	1/240	18	7.8	144	3.0
5	28	1/220	17	4.9	130	1.7
6	26	1/200	14	4.6	154	1.9
7	26	176	12	4.4	152	1.8
8	24	180	12	4.3	210	2.4
9	24	205	13	4.6	144	1.8
10	22	272	16	4.9	138	1.8
11	19	169	8.7	4.3	142	1.6
12	16	170	7.4	4.3	114	1.3
13	15	154	6.2	4.3	150	1.7
14	15	150	6.1	4.3	112	1.3
15	14	138	5.2	4.3	124	1.4
16	11	139	4.1	4.3	112	1.3
17	9.2	146	3.6	4.1	114	1.3
18	6.2	168	2.8	3.8	106	1.1
19	8.8	272	6.5	3.8	118	1.2
20	8.8	154	3.7	3.8	129	1.3
21	8.4	161	3.7	3.8	122	1.3
22	8.4	152	3.4	3.5	132	1.2
23	8.1	182	4.0	3.8	107	1.1
24	8	1/190	4.1	3.5	158	1.5
25	8	1/200	4.3	3.5	132	1.2
26	16	210	9.1	3.5	112	1.1
27	18	196	9.5	3.5	106	1.0
28	13	164	5.8	3.5	112	1.1
29	10	166	4.5	3.5	102	1.0
30	8.8	267	6.3	3.5	1/100	.9
31	8.4	1/200	4.5	--	--	--
Total load (tons)	--	--	291.5	--	--	49.8

Total load for period May 1 to Sept. 30 (tons) ----------1,691,000

1/Estimated.

RED RIVER BASIN--Continued

WASHITA RIVER NEAR CARNEGIE, OKLA.

LOCATION.--At bridge on State Highway 9, 1,300 feet upstream from Running Creek, and 2.7 miles east of Carnegie, Caddo County.
DRAINAGE AREA.--3,230 square miles, including that of Running Creek.
RECORDS AVAILABLE.--Sediment analyses: May to September 1947.
EXTREMES, 1947.--Sediment loads: Maximum, 116,000 tons per day May 13; minimum, 12 tons per day Sept. 19.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1087.

Suspended sediment, water year October 1946 to September 1947

Day	May			June			July		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	197	300	160	3,640	8,770	86,300	257	1,300	902
2	184	300	149	3,940	3,000	31,900	443	7,710	9,240
3	178	300	144	3,340	1,650	14,900	232	1,450	908
4	165	300	134	749	2,300	4,650	184	660	328
5	155	300	125	436	1,100	1,290	165	366	163
6	145	300	117	785	5,520	11,700	155	544	228
7	139	300	113	1,980	9,180	49,100	148	355	142
8	135	300	109	1,220	7,420	24,400	142	358	137
9	139	300	113	1,340	8,400	30,400	136	336	123
10	317	300	257	1,100	5,320	15,800	132	444	158
11	185	--	150	516	3,870	5,400	130	388	136
12	1,080	1/13,400	39,100	380	2,230	2,290	136	337	124
13	4,290	10,000	116,000	310	1,610	1,350	236	591	377
14	8,160	4,320	95,200	262	800	566	184	404	200
15	5,870	3,000	47,600	232	641	402	140	380	144
16	4,500	7,040	85,600	204	500	275	121	310	102
17	9,370	3,700	93,700	184	432	215	138	494	184
18	8,100	2,530	55,400	159	394	169	280	870	657
19	5,290	2,100	30,000	302	669	367	225	670	406
20	2,100	6,500	36,800	328	1,130	1,000	225	1,900	1,150
21	2,440	6,950	45,800	530	2,830	4,050	286	3,650	2,820
22	3,580	3,850	37,200	518	5,330	7,460	190	1,550	796
23	3,740	3,000	30,300	906	5,900	14,400	132	500	178
24	1,860	8,350	41,900	770	6,100	12,700	113	300	91
25	2,100	7,200	40,800	2,080	10,700	60,100	124	626	210
26	2,110	5,840	33,300	1,700	10,500	48,200	326	4,200	3,700
27	1,260	6,200	21,100	1,030	6,300	17,500	171	600	277
28	722	5,200	10,100	738	5,610	11,200	139	230	86
29	559	3,000	4,530	430	5,900	6,860	126	248	84
30	448	1,600	1,940	282	1,700	1,290	111	294	88
31	450	2,040	2,480	--	--	--	95	274	70
Total load (tons)	--	--	870,421	--	--	466,234	--	--	24,209

1/ Estimated.

RED RIVER BASIN--Continued

WASHITA RIVER NEAR CARNEGIE, OKLA.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (p. p. m.)	Tons per day		Mean concentration (p. p. m.)	Tons per day
1	96	292	76	43	228	26
2	81	264	58	42	356	40
3	81	254	56	40	246	27
4	85	238	55	38	239	25
5	67	254	46	35	234	22
6	77	258	54	34	232	21
7	63	355	60	32	222	19
8	62	259	43	30	194	16
9	61	253	42	30	328	27
10	60	330	53	31	223	19
11	59	388	62	32	358	31
12	57	290	45	30	264	21
13	50	295	40	30	477	39
14	60	309	50	30	202	16
15	63	303	52	28	316	24
16	49	759	100	26	204	14
17	51	287	40	27	416	30
18	91	296	73	25	316	21
19	81	1,660	363	24	178	12
20	48	695	90	25	204	14
21	45	532	65	25	240	16
22	43	444	52	25	352	24
23	45	528	64	25	388	26
24	44	264	31	24	318	21
25	42	343	39	23	215	13
26	42	337	38	23	222	14
27	43	438	51	24	396	26
28	45	476	58	23	219	14
29	55	274	41	22	234	14
30	57	286	44	21	229	13
31	47	220	28	--	--	--
Total load (tons)	--	--	1,969	--	--	645

Total load for period (tons) ---------- 1,363,000

WASHITA RIVER NEAR TABLER, OKLA.

LOCATION.--At bridge on county highway, 1 mile downstream from Little Washita River, 5 miles south of Tabler, Grady County, and 7½ miles upstream from Winter Creek.
DRAINAGE AREA.--4,760 square miles.
RECORDS AVAILABLE.--Chemical analyses: September 1946 to September 1947.
Water temperatures: September 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 1,190 parts per million Sept. 1-9; minimum, 362 parts per million June 1, 3-6.
Total hardness: Maximum, 765 parts per million Jan. 21-31; minimum, 250 parts per million June 1, 3-6.
Water temperatures: Maximum, 85° F. Aug. 10; minimum, freezing point on several days in December, January, and February.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1087. Records of specific conductance of daily samples are available in district office at Stillwater, Okla.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Oct. 1-10, 1946-----	141	64	--	156	--	--	178	50	103		252	419	162	--	3.5	1,040	1.41	396	650	444	26
Oct. 11-20 ----------	784	59	--	70.6	--	--	96	21	24		142	209	29	--	4.2	500	.68	1,060	326	210	14
Oct. 21-31 ----------	170	63	--	117	--	--	152	34	65		238	308	100	--	3.5	849	1.15	390	519	324	21
Nov. 1-2, 7-8 ------	329	58	--	120	--	--	160	39	84		237	401	91	--	2.5	899	1.22	799	560	366	25
Nov. 3-6, 9-10 -----	877	53	--	75.6	--	--	104	25	38		183	230	38	--	3.0	528	.72	1,250	362	212	19
Nov. 11-20 ----------	336	48	--	110	--	--	156	38	11		228	342	91	--	3.0	845	1.09	727	545	358	19
Nov. 21-30 ----------	211	48	--	153	--	--	186	48	99		287	429	136	--	3.0	1,040	1.41	592	662	426	25
Dec. 1-10 ----------	207	48	--	150	--	--	187	53	82		286	432	125	--	3.0	1,020	1.39	570	684	450	21
Dec. 11-20 ----------	424	45	--	136	--	--	185	43	72		280	405	100	--	2.5	945	1.37	1,160	638	409	20
Dec. 21-31 ----------	241	41	--	154	--	--	207	56	80		326	473	112	--	3.0	1,090	1.48	709	746	479	19
Jan. 1-10, 1947-----	203	32	--	163	--	--	194	56	110		320	494	123	--	4.0	1,140	1.55	625	714	452	25
Jan. 11-20 ----------	271	38	--	152	--	--	196	54	77		303	458	106	--	4.0	1,040	1.41	761	711	462	19
Jan. 21-31 ----------	235	41	7.9	156	11	0.10	216	55	60	13	303	500	98	0.3	4.0	1,110	1.51	704	765	516	14
Feb. 1-10 ----------	195	37	--	150	--	--	190	57	84		264	496	109	--	4.5	1,070	1.46	563	706	492	20
Feb. 11-20 ----------	193	41	--	150	--	--	208	59	57		266	494	107	--	4.0	1,060	1.44	552	762	544	14
Feb. 21-25, 28 -----	191	39	--	151	--	--	199	58	74		269	495	112	--	2.0	1,070	1.46	552	735	514	18
Feb. 26-27 ----------	194	35	--	256	--	--	193	59	85		243	527	113	--	2.0	1,100	1.50	576	724	524	20
Mar. 1-10 ----------	194	38	--	148	--	--	186	57	72		254	485	100	--	2.5	1,030	1.40	540	698	490	18
Mar. 11-20 ----------	227	43	--	150	--	--	197	56	74		290	483	100	--	1.8	1,050	1.43	644	722	484	18
Mar. 21-31 ----------	206	54	--	150	--	--	194	58	76		266	513	95	--	1.8	1,070	1.46	595	722	504	19

RED RIVER BASIN--Continued

WASHITA RIVER NEAR TABLER, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Apr. 1-6, 1947	253	61	--	141	--	--	186	56	72		243	486	101	--	3.0	1,020	1.39	697	694	494	18
Apr. 7-10	213	59	--	78.0	--	--	104	26	30		175	231	32	--	4.0	554	.75	319	366	223	15
Apr. 11-20	3,582	52	--	59.5	--	--	82	19	18		141	173	17	--	4.0	396	.54	3,830	282	167	12
Apr. 21-26	1,052	58	--	89.9	--	--	116	27	41		180	252	54	--	3.5	656	.89	1,860	400	253	18
Apr. 27-30	915	62	--	117	--	--	188	50	48		295	436	56	--	3.5	944	1.28	2,330	674	432	13
May 1-11	377	66	--	131	--	--	166	53	59		227	446	76	--	3.0	966	1.31	983	632	446	17
May 12-15	3,598	68	--	76.1	--	--	108	24	23		157	243	24	--	4.0	553	.72	5,180	368	240	12
May 16-20, 23-25	9,272	70	--	57.7	--	--	82	17	17		143	161	18	--	2.0	384	.52	9,610	274	158	12
May 21-22, 26-31	4,284	65	--	88.8	--	--	122	31	32		208	274	30	--	2.5	638	.87	7,380	432	261	14
June 1, 3-6	4,848	74	--	55.0	--	--	72	17	20		134	138	25	--	5.0	362	.49	4,740	250	140	15
June 2, 7-14	2,164	75	--	87.2	--	--	82	29	41		90	275	36	--	1.0	520	.71	3,040	324	250	22
June 15-22, 24	904	74	--	120	--	--	145	49	55		180	413	73	--	4.0	892	1.21	2,180	564	416	18
June 23, 25-30	1,581	77	--	70.4	--	--	79	26	31		104	228	34	--	.5	471	.64	2,010	304	219	18
July 1-2, 6-10	510	79	--	114	--	--	146	45	46		210	374	59	--	5.5	839	1.14	1,160	549	377	15
July 3-5	1,012	78	--	68.6	--	--	84	23	32		171	170	37	--	6.0	448	.61	1,220	304	164	19
July 11-20	346	81	--	154	--	--	181	68	87		248	552	100	--	2.5	1,110	1.51	1,040	731	528	21
July 21-23, 28-29	368	76	--	119	--	--	147	52	49		235	384	64	--	4.0	882	1.20	876	581	388	15
July 24-27, 30-31	340	77	--	145	--	--	183	53	78		256	469	99	--	7.0	1,020	1.39	936	674	464	20
Aug. 1-10	170	81	8.2	135	2.0	0.05	157	59	62	6.4	219	455	85	0.3	3.0	938	1.28	431	634	454	17
Aug. 11-13, 15-20	130	80	--	158	--	--	176	70	89		228	563	103	--	2.5	1,120	1.52	393	727	540	21
Aug. 14	250	70	--	252	--	--	--	--	--		174	764	385	--	2.5	--	--	--	502	359	--
Aug. 21-31	109	80	--	160	--	--	174	72	95		275	535	108	--	2.0	1,120	1.52	330	730	504	22
Sept. 1-9	92.7	80	--	158	--	--	165	69	129		223	602	116	--	3.0	1,190	1.62	298	695	512	29
Sept. 10-20	121	73	--	147	--	--	174	62	81		244	516	90	--	2.0	1,050	1.43	343	689	489	20
Sept. 21-30	68.2	69	--	168	--	--	170	66	132		256	518	156	--	4.0	1,170	1.59	215	696	476	29
Weighted average	872	--	--	85.0	--	--	110	29	35		173	259	42	--	3.0	587	0.80	1,380	394	252	16

Temperature (° F.) of water, water year October 1946 to September 1947

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	61	65	50	32	37	35	59	65	--	79	82	81
2	60	64	40	32	39	39	58	65	69	78	61	82
3	61	55	40	--	39	36	63	65	70	78	80	82
4	68	54	41	32	36	37	65	66	73	76	80	81
5	67	53	45	--	38	45	61	70	75	79	80	79
6	61	51	47	33	45	33	59	71	78	61	60	60
7	61	51	51	33	37	36	59	64	77	83	80	80
8	68	50	56	--	32	34	59	66	78	78	79	79
9	68	55	56	32	37	43	58	68	78	76	81	78
10	67	50	56	32	--	39	61	64	79	76	85	74
11	58	49	55	34	33	36	59	61	75	75	81	76
12	58	48	52	37	37	45	59	66	77	78	78	74
13	58	47	50	37	34	43	50	64	70	94	79	74
14	56	49	49	41	39	43	52	71	69	--	70	80
15	57	52	50	41	40	38	52	69	69	80	81	66
16	61	51	50	36	53	41	45	--	70	81	61	67
17	64	46	38	36	45	50	40	--	74	83	63	--
18	59	45	33	37	45	44	55	73	74	81	81	--
19	59	49	38	41	42	45	54	74	77	77	60	--
20	64	48	35	40	36	45	53	68	77	77	80	--
21	60	49	42	37	38	49	55	--	74	76	80	--
22	64	50	41	45	41	52	60	--	77	75	80	--
23	64	48	47	41	48	65	64	69	73	70	80	--
24	67	55	38	43	32	61	59	70	76	71	81	--
25	58	44	41	41	34	60	50	64	75	75	80	71
26	57	41	43	42	34	52	--	66	76	76	79	66
27	60	40	53	42	36	51	57	66	77	80	79	67
28	63	50	49	41	39	47	61	66	80	78	80	69
29	63	53	37	45	--	52	64	62	80	80	61	70
30	66	54	33	39	--	51	64	62	61	80	82	69
31	68	--	32	36	--	55	--	66	--	80	81	--
Average	62	51	45	36	39	45	57	67	75	78	60	--

WASHITA RIVER NEAR DURWOOD, OKLA.

LOCATION.--At gaging station at Mulkey Bridge on State Highway 18, 1½ miles downstream from Caddo Creek, and 4 miles north of Durwood, Carter County.
DRAINAGE AREA.--7,310 square miles.
RECORDS AVAILABLE.--Chemical analyses: May 1944 to September 1947.
Water temperatures: April to September 1947.
EXTREMES, December 1946-June 1947.--Dissolved solids: Maximum, 818 parts per million Mar. 21-31; minimum, 193 parts per million May 13-14, 17-21, 25-26.
Total hardness: Maximum, 528 parts per million June 13, 20; minimum, 148 parts per million June 21, 23-26.
EXTREMES, 1944-47.--Dissolved solids: Maximum, 936 parts per million July 21-25, 30-31, 1944; minimum, 140 parts per million Oct. 1-3, 1945.
Total hardness: Maximum, 574 parts per million Dec. 21-31, 1945; minimum, 114 parts per million Oct. 1-3, 1945.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1087. Records of specific conductance of daily samples are available in district office at Stillwater, Okla.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Dec. 6-8, 13-14, 16, 19-20, 1946	3,836	--	91.5	--	--	89	37	62		323	140	69	--	0.8	601	0.82	6,220	374	110	27
Dec. 9-12, 15, 17-18	12,320	--	55.6	--	--	55	21	40		229	57	45	--	.2	349	.47	11,600	224	36	28
Dec. 21-31	871	--	81.8	--	--	88	33	57		321	121	63	--	.8	557	.76	1,310	355	92	26
Jan. 1-10, 1947	608	--	96.5	--	--	84	48	61		297	182	74	--	2.8	652	.89	1,070	407	164	25
Jan. 11-20	721	--	104	--	--	91	52	66		281	224	84	--	2.8	732	1.00	1,420	441	211	24
Jan. 21-31	606	8.1	106	12	0.05	103	49	67	16	309	247	80	0.1	2.5	752	1.02	1,230	458	205	23
Feb. 1-10	496	--	101	--	--	78	54	60		200	249	87	--	3.0	669	.91	896	416	252	24
Feb. 11-20	489	--	112	--	--	110	57	61		302	256	88	--	2.0	763	1.04	1,010	509	262	21
Feb. 21-28	462	--	115	--	--	114	55	68		310	265	90	--	1.0	779	1.06	972	510	256	22
Mar. 1-10	452	--	116	--	--	116	57	67		312	273	92	--	1.0	780	1.06	952	524	268	22
Mar. 11-20	474	--	109	--	--	92	54	66		240	265	87	--	1.5	746	1.01	955	452	255	24
Mar. 21-31	463	--	118	--	--	112	56	64		255	305	86	--	1.0	818	1.11	1,020	510	300	21
Apr. 1-4, 7-10	832	--	101	--	--	93	42	62		250	208	83	--	1.5	661	.90	1,480	404	200	25
Apr. 5-6	1,550	--	60.2	--	--	54	24	46		195	88	56	--	3.2	370	.50	1,550	233	74	30
Apr. 11-12, 14, 18	8,138	--	47.4	--	--	44	14	23		107	82	30	--	1.5	266	.36	5,840	167	80	23
Apr. 15-17	22,170	--	32.6	--	--	42	13	8.3		126	49	15	--	1.8	211	.29	12,600	158	55	11
Apr. 13, 19-20	4,810	--	67.8	--	--	88	25	18		170	174	23	--	10	460	.63	5,970	322	183	11
Apr. 21-25, 28-30	3,314	--	63.4	--	--	72	23	27		200	116	32	--	2.5	409	.56	3,660	274	110	17
Apr. 26-27	7,593	--	39.4	--	--	44	15	12		136	51	22	--	2.5	238	.32	4,860	172	60	13

May 1-10	1,764	--	86.6	--	--	100	40	50	252	212	66	--	2.5	647	.88	3,080	414	208	21
May 11-12, 15-16	4,118	--	68.4	--	--	63	32	26	140	163	42	--	2.0	443	.60	4,930	288	174	16
May 22-24, 27	15,520	--	47.9	--	--	62	18	12	147	99	19	--	3.5	315	.43	13,200	229	108	9.6
May 13-14, 17-21, 25-26	20,810	--	31.2	--	--	39	13	4.8	109	47	15	--	2.2	193	.26	10,800	151	61	6.5
May 28-29, 30-31, June 1	5,938	--	71.1	--	--	86	27	25	198	153	38	--	6.0	481	.65	7,710	326	163	14
June 2-4	11,230	--	42.1	--	--	50	17	12	139	78	16	--	3.0	267	.36	8,100	195	81	12
June 5-10	4,518	--	63.9	--	--	78	24	18	183	132	30	--	4.0	436	.59	5,320	293	143	12
June 11-12, 14-19	2,255	--	80.0	--	--	96	33	43	236	201	44	--	6.0	547	.74	3,330	375	182	20
June 13, 20	2,040	--	110	--	--	136	46	72	277	354	60	--	6.0	810	1.10	4,460	528	302	23
June 21, 23-26	12,460	--	37.5	--	--	41	11	26	133	54	25	--	5.5	228	.31	7,670	148	39	28
June 22, 27-30	3,056	--	75.0	--	--	90	26	49	228	177	46	--	4.0	511	.69	4,220	332	144	24
Weighted average	5,652	--	53.5	--	--	60	21	25	171	98	33	--	2.7	348	0.47	5,310	236	31	19

RED RIVER BASIN--Continued

WASHITA RIVER NEAR DURWOOD, OKLA.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	--	--	--	--	--	--	--	70	71	82	83	79
2	--	--	--	--	--	--	--	70	71	81	83	83
3	--	--	--	--	--	--	--	67	73	81	82	84
4	--	--	--	--	--	--	--	70	74	74	82	83
5	--	--	--	--	--	--	--	72	76	72	83	82
6	--	--	--	--	--	--	--	71	76	79	83	82
7	--	--	--	--	--	--	--	70	72	81	81	82
8	--	--	--	--	--	--	--	71	79	79	83	81
9	--	--	--	--	--	--	--	66	79	78	83	81
10	--	--	--	--	--	--	--	66	78	78	83	80
11	--	--	--	--	--	--	--	64	78	78	83	83
12	--	--	--	--	--	--	--	69	77	79	79	74
13	--	--	--	--	--	--	--	69	75	81	79	73
14	--	--	--	--	--	--	--	70	73	82	80	76
15	--	--	--	--	--	--	--	73	73	93	81	72
16	--	--	--	--	--	--	--	72	73	84	82	--
17	--	--	--	--	--	--	--	68	75	85	82	70
18	--	--	--	--	--	--	--	70	76	84	80	77
19	--	--	--	--	--	--	--	71	78	80	82	77
20	--	--	--	--	--	--	58	68	78	79	82	--
21	--	--	--	--	--	--	59	67	73	81	82	--
22	--	--	--	--	--	--	60	69	76	65	83	64
23	--	--	--	--	--	--	64	71	75	71	82	65
24	--	--	--	--	--	--	63	71	74	72	82	68
25	--	--	--	--	--	--	57	66	75	74	81	69
26	--	--	--	--	--	--	52	69	77	76	81	73
27	--	--	--	--	--	--	56	70	80	81	78	72
28	--	--	--	--	--	--	59	72	81	82	78	71
29	--	--	--	--	--	--	62	66	81	83	82	73
30	--	--	--	--	--	--	66	68	81	83	83	72
31	--	--	--	--	--	--	--	68	--	84	83	--
Average	--	--	--	--	--	--	--	69	76	79	82	76

RED RIVER BASIN--Continued

BARNITZ CREEK NEAR ARAPAHO, OKLA.

LOCATION.--At gaging station at bridge on county road, half a mile downstream from junction of East and West Barnitz Creeks, 6 miles upstream from mouth, and 4½ miles west of Arapaho, Custer County.
DRAINAGE AREA.--247 square miles.
RECORDS AVAILABLE.--Sediment analyses: May to September 1947.
EXTREMES, 1947.--Sediment loads: Maximum, 47,100 tons per day May 12; minimum, no flow July 1-17, July 31-Sept. 30.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1087.

Suspended sediment, water year October 1946 to September 1947

Day	May			June			August		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p.p.m.)	Suspended sediment: Tons per day
1	3.0	150	1.2	5.4	230	3.3	0.2	71	0.0
2	2.5	150	1.0	4.7	220	2.8	.1	72	.0
3	2.2	150	.9	3.6	200	1.9	.1	58	.0
4	2.1	150	.9	131	14,000	4,940	.1	--	--
5	1.8	150	.7	130	10,900	3,820	.1	--	--
6	1.6	150	.6	15	210	8.5	0	--	--
7	1.3	150	.5	8.0	118	2.5	0	--	--
8	.9	150	.4	4.9	135	1.8	0	--	--
9	.7	150	.3	2.9	153	1.2	0	--	--
10	.4	150	.2	1.3	172	.6	.1	--	--
11	1.8	150	.7	.6	200	.3	.1	--	--
12	1,120	2/15,600	47,100	.6	180	.3	0	--	--
13	79	320	682	.6	217	.4	.1	--	--
14	29	500	39	.6	216	.3	0	--	--
15	673	2/18,700	33,900	.6	170	.3	0	--	--
16	1/956	7,010	18,100	.6	1/160	.3	0	--	--
17	75	2,230	451	.4	1/140	.2	0	--	--
18	28	2/280	21	.2	1/100	.1	84	7,580	1,720
19	20	2/200	11	17	675	31	155	10,700	4,480
20	158	9,020	3,850	7.1	80	1.5	7.7	140	3.0
21	1/161	6,670	2,900	2.4	30	.2	2.6	94	.7
22	25	652	44	2.1	38	.2	1.4	64	.2
23	15	2/151	6.1	1.4	104	.4	194	1/12,200	6,390
24	310	2/13,500	11,300	5.2	1/10,600	149	30	1/3,000	243
25	164	2/11,400	5,050	84	8,820	2,000	35	1/3,500	331
26	32	2/3,200	190	18	473	23	17	236	11
27	11	2/240	7.1	4.7	97	1.2	2.9	57	.4
28	10	140	3.8	1.7	74	.3	1.1	72	.2
29	10	200	5.4	.6	75	.1	.4	92	.1
30	9.5	220	5.6	.3	84	.1	.3	66	.1
31	5.8	220	3.5	--	--		.1	1/48	--
Total load (tons)	--	--	123,700	--	--	10,990	--	--	2/13,180

Total load for period May 1 to July 31, 1947 (tons) ---------- 147,800

1/ Interpolated.
2/ Estimated.

POND CREEK NEAR FORT COBB, OKLA.

LOCATION.--May to November 1946, at gaging station 100 feet downstream from bridge on County Trunk Highway, 2.7 miles north of Fort Cobb, Caddo County, and 5 miles upstream from mouth. November 1946 to September 1947, in vicinity of old C. C. C. Camp, 2 miles downstream from bridge on County Trunk Highway.
DRAINAGE AREA.--Approximately 320 square miles.
RECORDS AVAILABLE.--Chemical analyses: May 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
Sediment loads: May to September 1947.
EXTREMES, October 1946-September 1947.--Dissolved solids: Maximum, 603 parts per million June 11-20; minimum, 149 parts per million May 15, 24.
Total hardness: Maximum, 432 parts per million July 21-31; minimum, 69 parts per million June 1.
Water temperatures: Maximum, 89° F. July 4, 6-7, 9; minimum, freezing point Jan. 3-5.
Sediment loads May-September 1947: Maximum, 45,200 tons per day May 16; minimum, 1.4 tons per day Sept. 9, 14, 24.
EXTREMES, May 1946-September 1947.--Dissolved solids: Maximum, 603 parts per million June 11-20, 1947; minimum, 149 parts per million May 15, 1947.
Total hardness: Maximum, 432 parts per million July 21-31, 1947; minimum, 69 parts per million June 1, 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1087. Records of specific conductance of daily samples are available in district office at Stillwater, Okla.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 1-17, 19-20, 1946	23.4	--	--	75.0	--	--	110	22	35		296	166	16	--	2.8	527	0.72	33	365	122	17
Oct. 18, 21-31	22.9	62	--	75.0	--	--	110	22	31		312	148	15	--	1.5	514	.70	32	365	109	16
Nov. 1-10	69.7	56	--	64.7	--	--	89	20	31		282	111	17	--	.2	435	.59	82	304	73	18
Nov. 11-20	32.7	54	--	75.9	--	--	103	26	21		316	121	15	--	3.8	472	.64	42	364	105	11
Nov. 21-30	39.4	52	--	75.3	--	--	104	24	28		332	118	14	--	3.5	480	.65	51	358	86	14
Dec. 1-10	38.1	54	--	73.1	--	--	102	25	33		331	128	15	--	4.5	500	.68	51	358	86	17
Dec. 11-20	41.5	52	--	75.0	--	--	104	27	26		350	109	16	--	4.0	510	.69	57	370	83	13
Dec. 21-31	32.3	43	--	71.5	--	--	98	25	32		310	132	16	--	3.5	500	.68	44	348	94	17
Jan. 1-10, 1947	40.6	39	--	72.2	--	--	94	26	31		305	126	17	--	5.0	449	.61	49	342	91	17
Jan. 11-20	45.9	45	--	69.3	--	--	91	25	29		305	112	16	--	3.0	458	.62	57	330	80	16
Jan. 21-31	36.9	47	8.2	68.0	2.4	0.25	90	25	22	5.3	274	123	18	0.1	5.0	445	.61	44	328	103	12
Feb. 1-10	33.0	44	--	66.2	--	--	95	27	20		285	127	16	--	3.0	465	.63	41	348	114	11
Feb. 11-20	35.4	44	--	65.0	--	--	87	28	19		268	123	16	--	2.5	438	.60	42	332	112	11
Feb. 21-28	34.6	44	--	65.8	--	--	89	28	20		274	124	18	--	2.5	445	.61	42	337	112	12

Mar. 1-10	36.7	44	--	65.4	--	--	84	24	26	266	118	15	--	3.0	464	.63	46	308	90	16
Mar. 11-20	44.6	48	--	71.6	--	--	95	27	27	314	116	17	--	5.5	498	.68	60	348	90	14
Mar. 21-31	34.1	54	--	70.2	--	--	98	27	18	297	121	15	--	6.0	496	.67	46	356	112	10
Apr. 1-4, 6-7	45.0	57	--	67.8	--	--	87	24	33	282	126	15	--	4.0	456	.62	55	316	84	18
Apr. 5, 8-11, 15-16	357	57	--	46.2	--	--	57	14	22	187	73	11	--	4.0	298	.41	287	200	46	19
Apr. 12-14, 17-20	85.3	55	--	61.5	--	--	90	24	28	294	114	14	--	3.5	457	.62	105	323	81	16
Apr. 21-30	52.6	59	--	66.6	--	--	101	28	25	315	132	16	--	3.0	503	.68	71	367	109	13
May 1-11	32.5	72	--	74.2	--	--	100	25	32	280	157	18	--	5.0	506	.69	44	352	122	17
May 12-13, 16, 19-20, 25	660	69	--	42.3	--	--	59	11	21	169	81	8.0	--	4.0	270	.37	481	192	54	19
May 14, 17-18, 21-23	184	72	--	66.6	--	--	98	19	29	268	135	15	--	5.0	448	.61	223	322	102	16
May 15, 24	231	72	--	24.1	--	--	32	5.4	12	112	28	4.3	--	2.5	149	.20	93	102	10	21
May 26-31	53.0	75	--	70.2	--	--	98	24	27	234	176	17	--	2.5	523	.71	75	343	151	14
June 1	210	75	--	19.5	--	--	--	--	--	79	10	7.0	--	20	--	--	--	69	4	--
June 2-3	47.5	76	--	53.2	--	--	50	21	23	275	15	14	--	.5	377	.51	48	212	0	19
June 4-10	32.6	78	--	75.5	--	--	92	29	40	213	226	16	--	4.0	545	.74	48	348	174	20
June 11-20	23.2	82	8.8	82.8	22	.10	112	31	31 | 3.7	272	219	16	.3	6.0	603	.82	38	407	184	14
June 21, 23-24, 27-30	41.0	83	--	61.5	--	--	84	21	23	257	108	14	--	5.0	430	.58	48	296	83	15
June 22, 25-26	82.0	84	--	36.0	--	--	44	12	14	148	50	8.0	--	5.0	240	.33	53	159	38	16
July 1-10	135	88	--	67.2	--	--	118	28	8.3	263	179	16	--	4.0	540	.73	197	410	194	4
July 11-20	21.3	85	--	72.1	--	--	96	25	22	207	185	16	--	6.0	516	.70	30	342	172	12
July 21-31	14.1	86	--	73.7	--	--	127	28	8.0	259	204	16	--	3.0	577	.78	22	482	220	4
Aug. 1-10	10.1	84	--	71.5	--	--	90	28	19	147	223	18	--	3.0	512	.70	14	340	219	11
Aug. 11-20	9.64	82	--	72.7	--	--	85	26	25	156	208	18	--	4.0	492	.67	13	319	191	14
Aug. 21-31	8.45	81	--	69.3	--	--	79	26	26	144	208	18	--	.5	466	.63	11	304	186	16
Sept 1-10	6.36	79	--	71.0	--	--	84	28	40	181	227	18	--	2.0	502	.68	9	324	176	21
Sept. 11-20	6.57	78	--	74.4	--	--	96	28	31	217	207	18	--	4.0	530	.72	9	354	176	16
Sept. 21-30	6.82	72	--	74.0	--	--	96	29	49	223	244	18	--	2.0	547	.74	10	358	175	23
Weighted average -	55.6	--	--	59.3	--	--	83	20	24	240	116	13	--	4.0	409	0.56	61	289	92	15

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RED RIVER BASIN--Continued

POND CREEK NEAR FORT COBB, OKLA.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

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

RED RIVER BASIN--Continued

POND CREEK NEAR FORT COBB, OKLA.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	May			June			July		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	39	330	35	210	5,830	3,310	942	7,690	19,600
2	36	330	32	52	550	77	153	3,380	1,400
3	34	330	30	43	519	60	49	600	79
4	34	330	30	40	357	39	38	400	41
5	32	330	29	37	290	29	32	332	29
6	32	1/ 330	29	35	265	25	28	284	21
7	30	330	27	32	276	24	27	296	22
8	29	330	26	30	268	22	26	284	20
9	30	330	27	28	268	20	25	302	20
10	30	330	27	26	263	18	26	282	20
11	32	330	29	25	256	17	29	500	39
12	649	12,400	21,700	25	247	17	24	320	21
13	528	6,430	9,180	25	236	16	21	180	10
14	72	1/1,500	292	24	218	14	20	205	11
15	170	5,600	2,570	24	216	14	19	1/188	9.6
16	1,980	8,450	45,200	23	241	15	18	172	8.4
17	500	1/2,430	3,290	22	202	12	17	153	7.0
18	121	1,150	376	21	214	12	28	420	32
19	92	1/830	206	20	216	12	20	230	12
20	505	6,290	8,590	23	230	14	17	179	8.2
21	264	4,960	3,540	40	400	43	16	148	6.4
22	84	1,200	272	60	3,460	561	15	674	27
23	66	652	116	93	3,920	986	14	240	9.1
24	292	7,690	6,070	33	480	43	13	191	6.7
25	208	4,470	2,510	132	4,000	1,430	16	1/216	9.3
26	74	730	146	54	1,200	175	18	242	12
27	58	368	58	32	260	22	15	1/200	8.1
28	50	294	40	26	280	20	13	157	5.5
29	44	418	50	27	220	16	12	174	5.6
30	43	337	39	36	1/1,860	181	12	1/170	5.5
31	49	1,070	142	--	--	--	11	158	4.7
Total load (tons)	--	--	104,708	--	--	7,244	--	--	21,510.1

Day	August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (p. p. m.)	Suspended sediment: Tons per day
1	11	173	5.1	7.0	1/ 126	2.4
2	11	160	4.8	7.0	126	2.4
3	11	134	4.0	6.7	126	2.3
4	10	184	5.0	6.3	126	2.1
5	10	206	5.6	6.2	144	2.4
6	9.6	100	2.6	6.1	148	2.4
7	9.6	104	2.7	6.0	166	2.7
8	9.6	104	2.7	6.0	126	2.0
9	9.6	1/ 104	2.7	6.0	88	1.4
10	9.4	104	2.6	6.3	154	2.6
11	9.2	104	2.6	7.6	122	2.5
12	8.9	108	2.6	7.9	107	2.3
13	9.2	146	3.6	7.1	118	2.3
14	9.7	400	10	6.6	78	1.4
15	13	1/960	34	6.0	109	1.8
16	11	1/460	14	6.0	99	1.6
17	9.3	160	4.0	6.1	107	1.8
18	8.7	1/118	2.8	6.2	94	1.6
19	8.7	120	2.8	6.0	105	1.7
20	8.7	128	3.0	6.2	1/94	1.6
21	8.5	122	2.8	6.7	82	1.5
22	8.1	1/129	2.8	6.9	85	1.6
23	8.5	92	2.1	6.6	86	1.5
24	8.5	126	2.9	6.6	79	1.4
25	8.3	126	2.8	6.7	90	1.6
26	8.3	126	2.8	6.9	100	1.9
27	8.7	126	3.0	7.1	86	1.6
28	9.2	1/ 126	3.1	7.1	94	1.8
29	9.1	126	3.1	6.9	104	1.9
30	8.2	126	2.8	6.7	90	1.6
31	7.6	126	2.6	--	--	--
Total load (tons)	--	--	148.0	--	--	57.7

Total load for period (tons) ---------- 133,700

1/ Estimated.

RED RIVER BASIN--Continued

RUSH CREEK AT PURDY, OKLA.

LOCATION.--At bridge on State Highway 76, three-quarters of a mile south of Purdy, Garvin County, and 8½ miles south of Lindsay, Garvin County.
DRAINAGE AREA.--139 square miles.
RECORDS AVAILABLE.--Chemical analyses: August 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 1,600 parts per million Oct. 6, 10-13; minimum, 242 parts per million Apr. 12-15.
Total hardness: Maximum, 660 parts per million, Aug. 21-31; minimum, 182 parts per million Apr. 12-15.
Water temperatures: Maximum, 100° F. Sept. 2; minimum, 34° F. Dec. 29.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1087. Records of specific conductance of daily samples are available in district office at Stillwater, Okla.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Specific conductance ($K \times 10^6$ at 25° C.)	pH	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 1-5, 7-9, 1946 --	18.0	74	152	--	--	--	93	68	125		266	165	275	--	4.0	930	1.26	45	512	292	35
Oct. 6, 10-13 --------	13.2	73	234	--	--	--	123	73	362		298	291	598	--	4.2	1,600	2.18	57	607	362	56
Oct. 14-20 ----------	11.1	73	169	--	--	--	94	71	155		260	175	330	--	3.8	957	1.30	29	526	313	39
Oct. 21-31 ----------	11.3	72	164	--	--	--	100	76	134		302	169	302	--	4.0	934	1.27	28	562	314	34
Nov. 1-2 ----------	19.5	72	213	--	--	--	86	62	266		213	163	498	--	1.5	1,180	1.60	62	470	294	55
Nov. 3-6 ----------	110	62	55.3	--	--	--	54	20	33		161	67	59	--	3.8	343	.47	102	217	85	25
Nov. 7-10 ----------	17.5	58	125	--	--	--	89	53	100		261	140	208	--	5.0	793	1.08	37	440	226	33
Nov. 11-20 ----------	16.8	62	145	--	--	--	98	62	111		283	165	235	--	6.0	876	1.19	40	500	268	33
Nov. 21-30 ----------	18.4	58	142	--	--	--	106	60	102		313	166	212	--	4.5	885	1.20	44	511	254	30
Dec. 1-8 ----------	15.6	--	140	--	--	--	98	62	103		272	192	210	--	5.0	861	1.17	36	500	276	31
Dec. 9-11 ----------	544	--	63.2	--	--	--	68	25	23		179	106	45	--	4.0	398	.54	585	272	126	16
Dec. 12-20 ----------	32.1	--	133	--	--	--	110	57	89		317	173	182	--	8.0	845	1.15	73	509	249	28
Dec. 21-31 ----------	19.5	--	148	--	--	--	80	66	105		230	206	205	--	8.0	833	1.13	44	471	282	33
Jan. 1-10, 1947------	18.9	44	128	--	--	--	100	58	97		315	188	165	--	15	818	1.11	42	488	230	30
Jan. 11-20----------	13.8	50	136	--	--	--	115	62	88		317	207	180	--	4.0	870	1.18	32	542	282	26
Jan. 21-31----------	18.2	52	143	7.9	7.5	0.50	120	63	91	7.0	328	209	195	0.1	4.5	905	1.23	44	558	290	26
Feb. 1, 6-10 ---------	16.5	46	156	--	--	--	124	71	125		354	215	250	--	7.5	998	1.36	44	602	311	31
Feb. 2-5 ----------	18.8	46	210	--	--	--	130	73	228		333	211	442	--	4.0	1,250	1.70	63	624	351	44
Feb. 11-20 ----------	18.0	47	145	--	--	--	114	66	111		317	213	220	--	7.0	924	1.26	45	556	296	30
Feb. 21-28 ----------	19.4	47	152	--	--	--	124	68	114		337	211	238	--	7.5	928	1.26	49	589	312	30
Mar. 1-10 ----------	19.7	49	152	--	--	--	114	71	112		299	223	240	--	6.0	913	1.24	49	576	332	30
Mar. 11-20----------	20.4	53	141	--	--	--	111	68	93		298	206	210	--	6.0	926	1.26	51	556	312	27
Mar. 21-31----------	17.6	66	170	--	--	--	117	79	130		301	209	308	--	2.5	994	1.35	47	617	370	31

Apr. 1-2, 5-6	50.5	54	112	--	--	--	102	48	82	260	200	145	--	5.0	755	1.03	103	452	238	28
Apr. 3, 8-11	160	65	76.2	--	--	--	82	28	43	192	128	84	--	5.0	501	.68	216	320	162	23
Apr. 4, 7	37.5	62	152	--	--	--	126	54	146	296	203	280	--	5.0	960	1.31	97	536	294	37
Apr. 12-15	737	57	40.7	--	--	--	50	14	17	133	54	36	--	4.5	242	.33	482	182	73	17
Apr. 16-23	44.8	67	127	--	--	--	113	61	91	288	223	182	--	6.0	846	1.15	102	533	296	27
Apr. 24-25	544	64	89.2	--	--	--	90	42	51	273	130	102	--	5.0	588	.80	864	397	173	22
Apr. 26-30	37.4	66	123	--	--	--	131	58	77	342	227	150	--	5.5	874	1.19	88	566	285	23
May 1-4	31.0	78	129	--	--	--	91	62	101	227	258	170	--	8.0	851	1.16	71	482	296	31
May 5-11	28.6	71	122	--	--	--	100	54	93	255	216	165	--	8.0	776	1.06	60	472	262	30
May 12-13, 19-20	542	74	77.6	--	--	--	83	31	39	226	124	72	--	5.0	467	.64	68	334	149	20
May 14-18	443	82	101	--	--	--	99	45	50	162	218	125	--	5.0	706	.96	844	432	299	20
May 21-31	132	69	108	--	--	--	112	52	56	287	205	115	--	6.0	715	.97	255	494	258	20
June 1-10	115	84	132	7.9	4.5	.00	103	63	98	251	244	172	.3	7.0	866	1.18	289	516	310	23
June 11-19, 22	29.0	84	145	--	--	--	100	68	109	259	232	218	--	5.0	956	1.30	75	529	316	31
June 20, 23-25	282	86	64.4	--	--	--	67	30	23	197	94	55	--	5.0	410	.56	312	292	129	15
June 21, 26-30	27.0	89	128	--	--	--	93	63	91	280	187	185	--	5.0	850	1.16	62	491	261	29
July 1-10	19.8	90	137	--	--	--	62	69	132	206	206	240	--	5.0	820	1.11	44	438	269	40
July 11-10	15.1	91	155	--	--	--	70	79	149	246	199	292	--	4.0	916	1.25	37	500	298	39
July 21-31	11.1	89	166	--	--	--	79	81	162	266	202	320	--	3.0	994	1.35	30	530	312	40
Aug. 1-9	6.93	--	188	--	--	--	69	97	190	250	216	392	--	2.0	1,090	1.48	20	571	366	42
Aug. 10-13	8.60	89	250	--	--	--	69	102	313	196	211	630	--	3.0	1,420	1.93	33	592	430	53
Aug. 14-20	5.57	90	197	--	--	--	62	101	205	231	203	435	--	2.0	1,120	1.52	17	570	380	44
Aug. 21-31	4.45	87	199	--	--	--	67	120	173	251	202	438	--	4.0	1,130	1.54	14	660	454	36
Sept. 1-9	3.11	90	200	--	--	--	74	95	225	309	178	440	--	6.0	1,170	1.59	9.8	575	322	46
Sept. 10	53	82	80.3	--	--	--	--	--	--	164	128	118	--	8.0	--	--	--	303	168	--
Sept. 11-21	9.49	71	171	--	--	--	80	79	182	227	187	380	--	4.0	1,020	1.39	26	524	338	43
Sept. 22-30	6.83	82	218	--	--	--	81	88	252	232	164	530	--	3.0	1,230	1.67	23	564	374	49
Weighted average	56.6	--	97	--	--	--	86	43	63	221	154	126	--	5.2	618	0.84	94	392	210	26

RED RIVER BASIN--Continued

RUSH CREEK AT PURDY, OKLA.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	--	72	--	--	48	47	54	65	74	87	--	98
2	72	71	--	40	48	50	56	68	88	90	--	100
3	74	70	--	38	45	58	63	88	92	91	87	98
4	72	65	--	41	42	54	62	92	88	90	--	88
5	74	51	62	42	49	44	54	84	88	89	--	93
6	73	60	61	48	50	41	54	81	87	87	84	92
7	73	62	60	43	44	42	63	76	81	96	89	88
8	75	60	--	44	42	62	64	54	84	89	97	84
9	76	56	56	49	43	52	58	68	81	90	97	72
10	74	52	48	50	46	44	62	65	82	88	96	82
11	72	63	--	52	46	53	76	69	82	88	80	77
12	73	62	52	54	49	54	54	75	78	92	89	78
13	74	64	--	60	51	46	68	83	72	90	92	76
14	73	63	--	55	50	43	51	87	80	93	90	78
15	73	64	--	51	48	45	56	72	84	90	--	70
16	72	60	56	39	51	44	63	85	86	95	90	68
17	74	61	49	46	48	60	64	80	91	92	92	68
18	72	61	52	47	41	60	69	84	96	90	92	67
19	74	60	--	48	42	59	65	70	82	92	89	67
20	73	62	56	49	47	68	68	66	78	89	88	68
21	74	61	--	50	48	58	65	72	87	87	86	66
22	71	65	58	48	58	69	69	75	89	86	85	77
23	72	60	56	51	43	62	71	72	87	83	86	83
24	70	64	52	58	46	62	62	68	88	88	89	76
25	72	40	51	55	49	66	65	70	89	91	94	77
26	71	54	52	55	40	71	65	72	89	89	84	85
27	72	54	50	56	45	67	62	72	92	85	85	77
28	74	56	48	56	46	64	62	68	87	98	86	85
29	72	62	34	54	--	72	68	52	89	98	84	89
30	70	64	--	48	--	68	72	62	91	87	88	87
31	72	--	--	44	--	--	--	79	--	90	97	--
Average	73	62	--	49	47	56	63	73	85	90	89	80

OUACHITA RIVER NEAR MALVERN, ARK.

LOCATION.--At Rockport Bridge on State Highway 84, 2 miles northwest of Malvern, Hot Spring County, and 6 miles downstream from Remmel Dam.
DRAINAGE AREA.--1,570 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 65 parts per million Sept. 1-10; minimum, 41 parts per million Feb.11-20.
Total hardness: Maximum, 29 parts per million Sept. 11-20; minimum, 13 parts per million Nov. 11-20, Jan. 1-20.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1087. Flow regulated by operation of dam. Records of specific conductance of daily samples available in district office at Fayetteville, Ark.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																Total	Non-carbonate
Oct. 1-10, 1946	311	7.3	6.01	7.7	0.04	4.7	1.7	3.3	1.1	20	2.5	3.0	0.5	3.5	44	19	3
Oct. 11-20	232	7.3	6.42	8.4	.01	4.0	1.7	6.2	1.0	26	2.8	2.5	.6	3.0	45	17	0
Oct. 21-31	401	7.4	6.46	8.9	.01	4.9	1.4	6.3	1.0	28	2.8	2.5	.5	2.8	46	18	0
Nov. 1-10	6,366	7.4	7.20	6.4	.02	5.4	1.7	7.0	.9	31	4.5	2.5	.6	2.0	46	20	0
Nov. 11-20	3,364	7.3	5.64	7.4	.06	3.0	1.4	6.7	1.0	22	4.9	2.5	.6	1.2	47	13	0
Nov. 21-30	1,975	7.2	5.54	7.4	.02	3.5	1.6	6.6	1.0	25	4.3	2.5	.5	1.5	42	15	0
Dec. 1-10	1,656	7.4	5.55	7.7	.11	6.4	1.6	3.7	1.2	28	4.2	2.5	.1	1.5	47	23	0
Dec. 11-20	10,500	7.7	5.18	6.3	.16	5.8	1.6	2.8	1.0	23	4.0	2.5	.3	1.5	47	21	2
Dec. 20-31	1,889	7.4	5.12	6.3	.14	5.2	1.4	4.0	.8	23	3.6	3.0	.3	1.0	45	19	0
Jan. 1-10, 1947	2,824	7.2	4.85	7.1	.04	2.9	1.4	5.2	.8	18	3.7	3.0	.4	1.8	42	13	0
Jan. 11-20	1,559	7.1	4.73	7.1	.02	2.8	1.5	5.8	.7	20	4.0	2.5	.5	1.5	43	13	0
Jan. 21-31	1,238	7.2	5.11	8.0	.06	3.8	1.4	5.9	1.2	23	4.3	3.0	.4	1.2	48	15	0
Feb. 1-10	619	7.6	5.64	7.6	.06	5.4	1.4	3.8	.8	23	4.2	2.8	.3	.8	42	19	0
Feb. 11-20	732	7.7	5.45	8.9	.04	5.2	1.4	4.1	.7	23	3.8	3.0	.3	.8	41	19	0
Feb. 21-28	509	7.1	6.06	6.8	.06	5.5	1.3	5.0		24	4.0	3.0	.4	1.0	47	19	0
Mar. 1-10	421	7.4	5.68	6.6	.06	5.3	1.3	2.9	1.4	22	4.2	1.8	.1	1.8	42	19	0
Mar. 11-20	1,706	7.2	5.91	7.7	.04	5.6	1.4	2.5	1.6	22	4.0	2.5	.1	1.5	44	20	2
Mar. 21-31	2,034	7.1	6.66	5.9	.04	6.8	1.5	2.3	1.8	25	4.1	2.5	.1	2.5	45	23	3
Apr. 1-10	1,522	7.4	7.74	6.4	.02	8.4	1.7	2.9	1.2	29	4.8	2.2	.2	4.2	51	28	4
Apr. 11-20	2,769	7.0	7.45	6.8	.04	8.4	1.7	3.7	1.0	31	4.9	3.0	.1	2.8	48	28	3
Apr. 21-30	2,774	6.8	6.91	5.6	.04	8.4	1.7	2.3	1.1	31	4.8	2.0	.1	1.2	48	28	3
May 1-10	3,915	7.2	7.44	7.0	.02	8.4	1.7	2.4	.7	30	4.6	1.8	.1	2.2	48	28	3
May 11-20	4,351	7.1	7.04	--	.03	8.0	1.7	2.9	.7	30	4.3	1.8	.1	2.8	47	27	2
May 21-31	1,615	7.0	6.76	5.5	.04	7.6	1.7	3.6	.7	31	5.4	1.8	.1	1.0	45	26	1

RED RIVER BASIN--Continued

OUACHITA RIVER NEAR MALVERN, ARK.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																Total	Noncarbonate
June 1-10, 1947	735	7.4	6.54	8.1	0.02	4.6	1.7	7.3	0.9	31	4.5	2.0	0.2	2.5	51	18	0
June 11-20	396	7.5	7.40	6.2	.02	6.0	1.8	4.9	1.4	31	4.4	2.0	.2	1.8	49	22	0
June 21-30	201	7.9	6.76	8.2	.02	5.8	1.6	5.1	.8	30	4.9	2.0	.1	.5	50	21	0
July 1-10	186	8.0	6.92	6.9	.04	8.2	1.8	3.2	.9	31	4.8	3.0	.1	1.2	48	28	2
July 11-20	505	7.9	6.52	8.4	.02	7.8	1.8	4.7	1.0	35	3.9	3.0	.2	1.0	52	27	0
July 21-31	257	7.9	6.90	7.3	.04	8.2	1.9	3.7	1.0	36	3.5	2.5	.1	1.0	50	28	0
Aug. 1-10	351	7.5	6.71	10	.02	7.6	1.0	5.8	1.0	34	2.8	3.5	.2	1.0	54	23	0
Aug. 11-20	167	7.6	7.62	9.7	.03	8.8	.9	5.4	.9	36	2.8	2.8	.2	2.0	56	26	0
Aug. 21-31	186	7.6	7.72	8.1	.02	8.8	1.0	5.1	1.2	35	2.6	2.8	.2	3.5	54	26	0
Sept. 1-10	492	7.4	8.60	8.1	.04	8.6	1.0	6.0	1.2	36	3.5	3.5	.2	2.0	65	25	0
Sept. 11-20	322	7.2	7.84	7.4	.03	9.8	1.1	6.0	1.0	31	10	3.5	.2	2.5	60	29	4
Sept. 21-30	239	7.2	7.44	8.9	.02	8.8	1.1	7.1	1.2	31	9.0	4.0	.3	2.8	62	26	1
Average	1,643	--	6.49	7.5	0.04	6.3	1.5	4.6	1.0	28	4.3	2.6	0.3	1.9	48	22	1

OUACHITA RIVER AT CAMDEN, ARK.

LOCATION.--At gaging station at bridge on U. S. Highway 79 half a mile northeast of Camden, Ouachita County.
DRAINAGE AREA.--5,390 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
Water temperatures: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 183 parts per million Oct. 25-27 20-31; minimum, 58 parts per million Nov. 11-20, Dec. 13-31.
Total hardness: Maximum 45 parts per million Sept. 19-21, 26; minimum, 18 parts per million Dec. 13-31 Jan. 21-31.
Water temperatures: Maximum 89° F. July 17; minimum 40° F. Jan. 7.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 were furnished by the Corps of Engineers. Records of specific conductance of daily samples are available in district office at Fayetteville, Ark.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1946------	390	--	7.2	14.5	7.7	0.10	8.0	1.7	17	1.6	28	5.8	25	0.3	0.8	86	27	4
Oct. 11-20 ----------	524	62	7.1	12.9	7.3	.08	7.2	1.6	16	1.5	30	6.2	20	.2	1.0	79	25	0
Oct. 25-27, 30-31----	1,013	65	7.1	28.7	6.6	.12	10	2.6	44	2.5	30	6.7	72	.2	1.5	183	36	11
Oct. 21-24, 28-29----	922	64	7.0	17.1	6.4	.08	8.0	1.7	22	1.8	28	6.3	32	.2	1.8	103	27	4
Nov. 1-5, 8 ---------	3,540	69	5.8	15.5	6.8	.18	7.4	1.9	6.7	3.7	3	7.3	24	.3	1.2	91	26	24
Nov. 6-7, 9-10 ------	13,150	61	7.2	7.53	9.8	.22	6.4	1.3	7.2	3.2	26	6.1	8.5	.2	1.0	74	21	0
Nov. 11-20----------	23,650	57	7.2	7.22	7.8	.12	6.4	1.2	5.3	2.0	22	4.7	7.5	.2	1.0	58	21	3
Nov. 21-30----------	7,563	53	6.9	8.10	9.5	.20	6.8	1.4	5.8	2.3	22	5.6	9.5	.1	1.0	67	23	5
Dec. 1-12-----------	5,246	54	7.8	9.10	10	.33	6.9	1.4	8.9	1.0	25	5.8	11	.2	1.2	72	23	2
Dec. 13-31----------	14,100	53	7.8	6.90	8.3	.38	5.1	1.3	7.8	1.0	25	5.0	6.5	.3	.8	58	18	0
Jan. 1-10, 1947 -----	8,785	46	7.6	7.64	8.5	.36	5.5	1.3	7.4	1.4	20	5.8	9.5	.1	1.0	63	19	3
Jan. 11-20 ----------	6,067	51	7.5	8.40	9.7	.31	5.8	1.4	8.2	.8	20	6.0	11	.2	.5	63	20	4
Jan. 21-31 ----------	7,932	51	7.4	7.44	11	.43	5.2	1.3	9.5	1.0	20	6.8	11	.2	1.0	67	18	2
Feb. 1-10 -----------	3,430	50	7.1	10.1	11	.34	6.3	1.4	12	1.2	24	6.8	15	.4	.8	72	21	2
Feb. 11-20----------	2,388	48	7.1	11.6	11	.39	7.8	1.5	13	1.5	25	6.7	19	.3	.5	76	26	5
Feb. 21-28----------	3,351	47	7.3	12.7	11	.36	6.7	1.4	15	1.2	23	7.4	21	.3	.5	83	22	4
Mar. 1-10 ----------	3,468	47	7.1	12.9	9.0	.20	7.0	1.4	13	2.4	20	7.4	20	.1	2.5	85	23	7
Mar. 11-20----------	10,520	50	7.2	8.28	12	.36	6.0	1.2	6.6	3.2	18	7.0	10	.1	2.5	76	20	5
Mar. 21-31----------	11,520	54	7.1	6.82	9.6	.09	5.3	1.3	5.4	2.1	20	5.8	6.8	.1	.8	62	19	2

RED RIVER BASIN--Continued

OUACHITA RIVER AT CAMDEN, ARK.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Apr. 1-10, 1947-----	5,030	61	7.0	10.0	9.5	0.60	5.0	1.5	11	1.1	22	5.8	13	0.1	2.8	69	19	1
Apr. 11-20 ---------	13,210	62	6.7	7.16	7.6	1.0	6.4	1.2	5.3	1.2	18	4.9	8.2	.1	2.8	63	21	6
Apr. 21-30 ---------	5,241	62	7.2	7.78	9.3	1.8	7.0	1.3	7.1	1.2	23	5.0	9.8	.0	2.5	68	23	4
May 1-10 ----------	19,900	67	7.1	6.60	10	1.4	6.4	1.5	3.4	2.5	22	4.9	5.0	.0	3.2	66	22	4
May 11-20 ---------	18,720	70	7.0	7.00	12	1.8	7.1	1.2	2.4	2.0	26	3.9	6.0	.1	1.8	72	23	1
May 21-31 ---------	13,210	68	6.9	8.14	10	1.8	7.8	1.3	7.0	1.4	29	5.1	7.8	.1	1.8	69	25	1
June 1-10 ---------	2,349	76	7.8	11.0	11	.38	8.0	1.6	10	1.9	26	5.6	15	.3	3.0	77	27	5
June 11-20---------	951	79	8.2	10.6	9.6	.25	5.6	1.9	13	1.6	28	6.7	14	.2	1.5	72	22	0
June 21-30---------	2,472	80	7.9	10.3	12	.88	7.8	1.3	11	2.1	28	6.4	14	.1	2.2	81	25	2
July 1-10----------	598	82	7.9	16.6	12	.75	10	2.4	19	2.5	32	8.6	30	.3	2.0	112	35	9
July 11-20---------	594	84	7.9	12.4	9.2	.06	8.0	2.9	12	1.3	35	7.2	16	.2	1.5	82	32	3
July 21-31---------	339	82	7.9	9.76	9.6	.04	8.4	1.9	9.0	1.6	35	6.4	9.0	.3	1.8	65	28	0
Aug. 1-10 ---------	527	85	7.7	11.9	11	.01	8.6	3.2	6.5	3.2	35	5.3	12	.1	1.8	76	35	6
Aug. 11-20 ---------	334	82	7.6	10.1	11	.02	7.7	3.5	4.5	3.0	33	5.3	8.8	.1	2.5	68	34	7
Aug. 21-31 ---------	717	83	7.6	10.1	10	.02	7.8	3.1	5.0	3.5	31	4.9	10	.0	3.8	69	32	7
Sept. 1-10---------	2,389	84	7.4	12.1	11	.16	11	2.5	6.2		34	6.4	11	.0	1.5	86	38	10
Sept. 11-18---------	723	78	7.6	12.0	12	.08	7.5	2.5	12	3.2	35	5.5	16	.0	2.0	81	29	0
Sept. 19-21, 26 -----	834	74	7.5	28.3	--	--	13	3.1	37		31	7.7	64	.0	1.5	172	45	20
Sept. 22-25, 27-30 --	816	71	7.5	17.0	11	.14	9.2	3.1	16	3.2	29	6.1	31	.0	1.8	102	36	12
Average----------	6,081	65	--	11.4	9.8	0.43	7.3	1.8	11	2.0	26	6.1	17	0.1	1.7	81	26	5

Temperature (° F.) of water, water year October 1946 to September 1947

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

RED RIVER BASIN--Continued

SALINE RIVER NEAR RYE, ARK.

LOCATION.- At gaging station on bridge on State Highway 15, 4 miles southwest of Rye, Cleveland County, and 5 miles upstream from Hudgin Creek.
DRAINAGE AREA.-2,040 square miles.
RECORDS AVAILABLE.-Chemical analyses: October 1946 to August 1947.
Water temperatures: November 1946 to August 1947.
EXTREMES, 1946-47.-Dissolved solids: Maximum, 92 parts per million Nov. 1-8; minimum, 45 parts per million June 21, 23-28, 30.
Total hardness: Maximum, 40 parts per million Oct. 1-10; minimum, 8 parts per million June 1-7, 9-10.
Water temperatures: Maximum, 92° F. Aug. 4-6, 9, Sept. 2; minimum, 37° F. Jan. 7.
REMARKS.-Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1087. Records of specific conductance of daily samples are available in district office at Stillwater, Okla.

Chemical analyses, in parts per million, water year October 1946 to 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Specific conductance (K×10⁶ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
												Total	Noncarbonate
Oct. 1-10, 1946	59.9	--	12.1	11	3.1	8.5	48	11	5.5	0.2	75	40	1
Oct. 11-20	45.1	--	12.5	10	3.1	11	48	14	5.0	.5	76	38	0
Oct. 21-31	79.8	--	13.1	9.7	3.1	13	48	18	5.5	.5	87	37	0
Nov. 1-8	290	--	13.6	9.8	2.2	15	47	19	4.5	1.0	92	34	0
Nov. 9-20	2,440	53	7.10	6.4	1.8	5.4	19	14	3.0	.8	58	23	8
Nov. 21-26, 29-30	1,040	52	9.06	7.8	2.1	9.8	28	19	4.5	.5	74	28	5
Dec. 1-5	1,288	47	9.88	8.0	2.4	8.9	28	19	4.0	.8	78	30	7
Dec. 7, 9-10, 12, 14, 16-19	1,231	52	9.61	8.7	2.4	4.7	24	15	4.0	1.0	74	32	12
Jan. 7-9, 11-17, 19-20, 1947	2,299	45	8.22	5.7	2.3	6.7	21	14	4.2	.8	65	24	6
Jan. 21, 22, 24-31	2,979	50	8.48	5.4	2.0	8.7	22	15	4.5	.8	69	22	4
Feb. 1, 2, 4, 5, 7, 10	956	44	10.0	7.2	2.5	8.3	32	14	3.8	.2	71	28	2
Feb. 11-18, 20	560	44	9.81	8.3	2.6	9.5	36	14	5.0	1.2	73	31	2
Feb. 21-28	840	41	9.17	7.0	2.8	9.2	28	18	5.0	.2	75	29	6
Mar. 1, 3-6, 8-10	1,281	44	11.0	6.5	3.0	10	30	18	5.5	.2	85	29	4
Mar. 11, 13-20	3,605	48	6.92	4.2	2.2	5.4	16	12	3.8	.5	70	20	6
Mar. 21-22, 24-28, 30-31	3,203	54	7.12	5.1	2.2	5.2	18	12	3.8	.5	66	22	7
Apr. 1-5, 7-10	2,166	62	7.66	5.8	2.6	3.7	17	13	3.5	1.0	65	25	11
Apr. 11-12, 14-17, 20	7,070	65	5.72	3.4	1.9	3.2	15	7.0	1.5	2.0	59	16	4
Apr. 21-25, 27-30	4,524	65	7.62	6.5	2.5	3.9	26	9.0	3.0	.2	68	26	5
May 1-4, 6-10	5,059	67	6.23	4.4	1.2	6.0	20	7.3	3.0	1.0	57	16	0
May 12-20	3,750	71	5.88	4.4	2.0	3.7	19	6.8	3.0	.5	56	19	4
May 22-23, 25-27, 29-30	6,247	69	5.20	3.2	1.6	4.0	15	6.5	2.8	.5	55	15	2

June 1-7, 9-10----------	1,157	67	7.96	2.9	.3	15	28	8.3	5.5	1.2	70	8	0
June 11-13, 15-20-------	254	83	9.88	8.7	2.1	9.6	40	10	4.8	1.5	77	30	0
June 21, 23-28, 30------	6,559	76	3.07	2.5	1.4	1.1	8	4.0	2.0	1.2	45	12	5
July 1-3, 5, 7-10 -------	1,650	80	9.88	6.2	2.4	4.8	18	16	2.0	2.0	70	25	10
July 11, 13-20----------	147	84	9.64	7.5	2.5	6.9	27	16	2.0	3.0	76	20	7
July 21-27, 29-31-------	72.5	83	10.3	7.9	2.4	8.8	32	15	4.0	1.5	74	30	3
Aug. 1, 3-9 ------------	41.0	88	11.0	8.1	2.8	9.3	36	14	4.0	2.8	79	32	2
Aug. 11-16, 18-20 ------	34.4	85	10.8	7.3	3.1	10	38	13	4.0	2.8	77	31	0
Aug. 21-23, 25-27, 29-31	24.2	85	10.9	7.1	4.5	8.2	44	11	4.0	1.2	77	36	0
Sept. 1, 2, 4, 5---------	23.2	88	10.1	6.8	3.6	8.9	40	12	4.0	.2	73	32	0
Average----------	1,822	--	9.05	6.7	2.4	7.7	29	13	3.9	1.0	71	27	4

RED RIVER BASIN--Continued

SALINE RIVER NEAR RYE, ARK.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	--	--	49	--	50	41	58	67	71	80	85	91
2	--	--	48	--	44	--	62	68	73	80	--	92
3	--	--	47	--	--	41	59	69	73	77	85	--
4	--	--	46	--	45	47	65	68	77	--	92	83
5	--	--	46	--	44	47	63	--	76	81	92	85
6	--	--	--	--	--	45	--	68	76	--	92	--
7	65	--	50	37	43	--	63	69	79	79	87	--
8	--	--	--	39	--	43	64	65	--	83	86	--
9	--	--	52	38	--	44	64	65	80	84	92	--
10	--	--	55	--	35	43	64	68	81	78	--	--
11	--	--	--	39	40	47	67	--	80	78	84	--
12	--	--	55	42	45	--	66	66	81	--	83	--
13	--	--	--	46	45	47	--	72	85	84	85	--
14	--	--	52	49	40	48	65	73	--	86	85	--
15	--	--	--	51	44	43	66	72	77	85	85	--
16	--	--	54	52	45	50	62	73	81	86	84	--
17	--	53	54	50	46	50	65	74	93	86	--	--
18	--	52	50	--	50	47	--	72	85	82	83	--
19	--	54	47	42	--	50	--	72	80	87	86	--
20	--	53	--	49	42	48	62	69	81	80	89	--
21	--	54	--	47	46	54	64	73	79	85	84	--
22	--	53	--	46	--	51	67	68	--	75	84	--
23	--	53	--	--	40	--	65	69	73	82	88	--
24	--	54	--	47	39	54	65	--	74	82	--	--
25	--	52	--	47	40	56	62	68	74	85	84	--
26	--	52	--	51	38	54	--	70	74	87	84	--
27	--	--	--	49	44	52	64	70	76	83	83	--
28	--	--	--	53	42	55	65	--	78	--	--	--
29	--	51	--	55	--	--	66	68	--	85	86	--
30	--	50	--	53	--	56	69	70	80	91	89	--
31	--	--	--	49	--	58	--	--	--	85	86	--
Average	--	--	--	--	--	49	64	69	78	82	86	--

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Specific conductance ($K \times 10^6$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
										Total	Noncarbonate
ELM CREEK NEAR SHAMROCK											
Oct. 26, 1946	105	139	31	57	306	230	70	11	743	474	224
Nov. 25	132	178	31	70	260	352	94	14	998	572	358
Dec. 16	124	156	28	73	196	359	90	4.0	864	504	344
Feb. 13, 1947	123	173	35	54	242	343	95	3.8	908	576	377
Apr. 8	122	161	28	81	248	342	92	5.0	891	517	314
May 6	124	151	28	78	204	351	90	1.2	898	492	325
June 12	122	181	31	38	264	310	83	7.4	853	579	362
July 7	121	--	--	--	--	--	95	--	--	--	--
Aug. 12	125	162	29	71	208	351	97	5.5	943	524	353
QUITAQUE CREEK NEAR QUITAQUE											
Oct. 12, 1946	50.8	37	16	42	214	20	34	5.6	298	158	0
Oct. 15	75.1	37	35	67	312	40	60	.8	445	236	0
Nov. 15	80.9	38	39	65	335	35	60	.2	452	256	0
SULPHUR RIVER NEAR DARDEN											
Sept. 5, 1947	442	76	125	658	114	290	1,230	4.5	2,440	704	610
Sept. 6	179	49	13	284	96	116	420	2.2	978	176	98
Sept. 7-10	113	43	9.2	164	102	77	240	1.2	623	146	62
Sept. 11-15	84.3	34	6.1	132	99	62	177	1.2	485	110	29
Sept. 16-19	100	35	12	142	83	66	218	3.2	585	137	69
Sept. 20, 22-23	159	30	15	262	63	125	371	1.8	884	136	85
Sept. 21	319	49	18	610	81	218	870	2.5	1,810	196	130
Sept. 24-30	81.2	27	4.7	134	80	79	162	2.2	478	87	22

RED RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN ARKANSAS

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
															Total	Non-carbonate
LITTLE MISSOURI RIVER NEAR MURFREESBORO																
Jan. 9, 1947	314	--	3.90	--	--	--	--	--	14	6.0	3.0	--	0.5	--	24	13
Aug. 20	31	--	6.10	--	--	--	--	--	28	4.0	2.5	--	1.0	--	20	0
RED RIVER AT INDEX																
Jan. 21, 1947	11,100	--	89.6	--	--	--	--	--	166	90	137	--	0.2	--	243	107
Aug. 21	3,140	--	89.6	--	--	--	--	--	158	175	142	--	.8	--	222	92
LITTLE RIVER NEAR HORATIO																
Aug. 19, 1947	26	--	32.7	--	--	--	--	--	33	10	75	--	0.2	--	40	13
COSSATOT RIVER NEAR DE QUEEN																
Aug. 19, 1947	37	--	5.95	--	--	--	--	--	24	3.0	2.0	--	0.2	--	16	0
SALINE RIVER NEAR DIERKS																
Jan. 18, 1947	94	--	3.40	--	--	--	--	--	16	5.0	6.0	--	0.2	--	16	3
Sept. 30	20	--	3.38	--	--	--	--	--	16	1.0	2.5	--	.2	--	18	5
OUACHITA RIVER NEAR MOUNTAIN PINE																
Jan. 8, 1947	1,260	--	7.80	--	--	--	--	--	35	5.0	6.0	--	4.0	--	32	3
Sept. 11	98	--	8.59	--	--	--	--	--	42	2.5	2.5	--	1.0	--	29	0
DORCHEAT CREEK NEAR WALDO																
Sept. 25, 1947	--	8.3	47.6	0.12	30	4.4	46	2.6	3	4.7	133	0.1	0.2	300	93	90
TERRE NOIR CREEK NEAR GURDON																
Sept. 25, 1947	--	8.1	19.1	0.57	12	2.3	22	3.6	60	11	21	0.1	0.8	123	39	0

SOUTH DITCH OF TERRE NOIR CREEK NEAR GURDON																
Sept. 25, 1947	--	8.7	32.0	0.02	33	2.1	26	2.5	99	35	23	0.2	0.2	192	91	10
SMACKOVER CREEK ON HIGHWAY 7 NEAR SMACKOVER																
Sept. 24, 1947	--	7.0	512	0.10	129	42	907	14	2	69	1,710	0.0	0.2	2,880	494	493
SMACKOVER CREEK NORTH OF SMACKOVER																
Sept. 24, 1947	--	7.3	430	0.10	44	34	804	14	2	11	1,420	0.0	0.2	2,350	250	248
CADDO RIVER NEAR ARKADELPHIA																
Sept. 25, 1947	--	9.0	8.48	0.04	10	1.6	4.3	1.4	42	4.9	1.8	0.0	0.8	54	32	0
OUACHITA RIVER NEAR ARKADELPHIA																
Sept. 25, 1947	--	8.9	17.1	0.06	10	2.3	4.2	1.5	36	7.2	5.2	0.1	1.0	60	34	5
OUACHITA RIVER NEAR MORO BAY																
Sept. 24, 1947	--	8.1	111	0.08	40	8.5	154	3.7	36	8.4	308	0.0	1.2	630	135	106
OUACHITA RIVER NEAR EL DORADO																
Sept. 24, 1947	--	8.0	48.8	0.22	19	4.7	62	2.5	36	7.3	118	0.1	2.2	277	67	37
LA PAIL CREEK NEAR STRONG																
Sept. 24, 1947	--	--	794	0.20	141	48	1,550	13	0	21	2,770	0.0	0.5	4,560	550	550

RED RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN ARKANSAS--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
															Total	Non-carbonate
OUACHITA RIVER NEAR CROSSETT																
Dec. 27, 1946	--	6.5	37.6	0.27	13	3.4	52	2.0	20	6.3	98	0.2	0.5	228	46	30
Feb. 7, 1947	--	6.8	42.7	.39	14	4.2	56	2.1	20	9.3	106	.2	.5	236	52	36
Mar. 11	--	6.5	36.2	.67	11	3.7	49	2.1	11	9.8	95	.3	.2	216	43	34
Apr. 5	--	6.5	29.9	.30	9.3	3.3	40		15	5.8	73	1.0	.2	188	37	24
May 19	--	7.0	10.6	1.1	7.1	1.5	13	1.4	26	6.0	18	.2	.8	87	24	3
June 19	--	6.6	63.2	.19	22	5.4	85	2.0	28	6.5	166	.1	.5	358	77	54
July 15	--	6.5	41.6	.65	11	3.9	60	2.6	25	8.8	104	.1	.8	250	44	23
Aug. 9	--	7.7	103	.0	33	8.6	154	3.0	28	13	298	.1	.5	592	118	95
Sept. 24	--	6.7	59.9	.05	19	7.8	80	6.8	29	7.0	162	.1	1.2	350	80	56

NECHES RIVER BASIN

NECHES RIVER NEAR ROCKLAND, TEX.

LOCATION.--At bridge on U. S. Highway 69, 1 mile north of Rockland, Tyler County, 3.2 miles downstream from Billams Creek, and 0.4 mile upstream from gaging station.
DRAINAGE AREA.--3,539 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 161 parts per million July 1-31; minimum, 95 parts per million Nov. 4-30.
Total hardness: Maximum, 59 parts per million Aug. 1-31; minimum, 21 parts per million Nov. 4-30.
EXTREMES, 1945-47.--Dissolved solids: Maximum, 168 parts per million Aug. 1-10, 1946; minimum, 84 parts per million Feb. 11-19, 1946.
Total hardness: Maximum, 73 parts per million May 11-12, 1946; minimum, 19 parts per million Feb. 11-19, 1946.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088. Records of specific conductance of daily samples are available in district office at Austin, Tex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
															Total	Non-carbonate
Oct. 1-31, 1946 ----	968	--	16.8	--	--	9.3	4.1	15	26	16	24	--	1.0	129	40	19
Nov. 1-3 ----------	968	--	18.3	--	--	9.2	4.2	21	29	18	31	--	.8	136	40	16
Nov. 4-30 ---------	10,440	--	8.6	--	--	4.9	2.2	18	37	11	13	--	.5	95	21	0
Dec. 1-31 ---------	5,606	--	14.4	--	--	8.1	4.1	14	21	19	22	--	.2	126	37	20
Jan. 1-31, 1947 ----	10,550	--	12.1	--	--	7.7	4.5	7.9	18	18	15	--	.5	117	38	23
Feb. 1-28 ---------	4,059	--	21.2	--	--	11	4.8	36	58	33	30	--	.5	156	47	0
Mar. 1-10 ---------	3,323	--	21.3	--	--	12	5.0	19	0	31	42	--	.0	158	50	50
Mar. 11-31 --------	10,810	--	11.7	--	--	7.8	3.4	7.3	14	16	15	--	.0	101	33	22
Apr. 1-30 ---------	4,073	--	20.0	--	--	12	4.9	20	35	22	29	--	.2	138	50	21
May 1-17, 19 ------	4,126	--	17.3	--	--	10	4.4	19	38	15	26	--	2.0	124	43	12
May 18, 20-31 -----	8,842	--	10.5	--	--	6.0	3.1	13	27	13	14	--	.2	101	28	6
June 1-12 ---------	6,395	--	13.0	--	--	9.8	4.1	8.8	30	12	16	--	1.0	122	41	17
June 13-30 --------	1,685	--	19.3	--	--	12	5.4	21	50	18	26	--	2.0	158	52	11
July 1-31 ----------	768	7.3	22.3	23	0.67	12	5.0	21	34	20	33	0.0	1.0	161	50	23
Aug. 1-31 ---------	163	--	24.7	--	--	14	5.9	29	49	14	48	--	.8	156	59	19
Sept. 1-30 ---------	144	--	22.8	--	--	11	4.6	27	51	11	37	--	.8	154	46	5
Weighted average -	4,497	--	13.7	--	--	8.2	3.9	15	28	17	19	--	0.5	118	36	14

TRINITY RIVER BASIN

TRINITY RIVER AT ROMAYOR, TEX.

LOCATION.--At Gulf, Colorado, and Santa Fe Railway bridge, a quarter of a mile west of Romayor, Liberty County, and 2½ miles downstream from Big Creek.
DRAINAGE AREA.--17,170 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 585 parts per million Oct. 13, 15-16; minimum, 137 parts per million May 14-19.
Total hardness: Maximum, 198 parts per million Apr. 11-16, Aug. 1-10; minimum, 51 parts per million May 14-19.
EXTREMES, 1945-47.--Dissolved solids: Maximum, 585 parts per million Oct. 13, 15-16, 1946; minimum, 137 parts per million May 14-19, 1947.
Total hardness: Maximum, 198 parts per million Apr. 11-16, Aug. 1-10, 1947; minimum, 51 parts per million May 14-19, 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088. Records of specific conductance of daily samples are available at district office in Austin, Tex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																Total	Non-carbonate
Oct. 1-10, 1946 ----	1,320	--	63.9	--	--	53	6.1	67		146	35	104	--	1.2	355	158	38
Oct. 11-12, 14, 17-20	1,056	--	60.2	--	--	40	5.9	76		139	33	99	--	2.5	334	124	10
Oct. 13, 15-16 -----	1,039	--	110	--	--	51	7.0	146		158	38	215	--	3.0	585	156	27
Oct. 21-25 ---------	1,305	--	73.2	--	--	49	6.5	97		138	40	145	--	1.5	422	149	36
Oct. 26-31 ---------	1,695	--	43.7	--	--	31	5.2	56		115	26	70	--	1.5	289	99	4
Nov. 1-3 ----------	1,177	--	40.5	--	--	32	4.1	53		115	19	69	--	2.0	257	97	2
Nov. 4-6, 10 -------	29,250	--	21.4	--	--	20	2.8	23		78	16	21	--	.5	184	61	0
Nov. 7-9 ----------	34,500	--	10.5	--	--	18	4.0	13		64	13	16	--	1.0	161	61	9
Nov. 11-20 --------	29,730	--	24.3	--	--	29	3.5	17		90	21	20	--	.5	170	87	13
Nov. 21-30 --------	30,380	7.9	28.3	18	0.25	36	3.6	19		108	24	22	0.2	1.0	194	105	16
Dec. 1-10 ---------	7,824	--	36.4	--	--	38	3.5	32		105	27	44	--	2.0	235	109	23
Dec. 11-20 --------	10,520	--	32.3	--	--	41	2.9	24		119	30	26	--	2.2	220	114	17
Dec. 21-31 --------	19,780	--	30.6	--	--	46	2.7	17		131	28	18	--	2.0	213	126	19
Jan. 1-10, 1947 ----	19,240	--	27.0	--		31	3.9	26		106	22	27	--	2.2	201	93	7
Jan. 11-20 ---------	19,140	--	25.9	--	--	23	3.8	27		72	27	30	--	3.0	196	73	14
Jan. 21-31 ---------	19,960	--	35.0	--	--	34	5.2	33		112	41	29	--	3.0	229	106	14
Feb. 1-10 ----------	5,470	--	52.4	--	--	60	7.4	38		159	54	52	--	2.2	315	180	50
Feb. 11-19 ---------	3,690	--	55.5	--	--	60	7.8	49		164	56	66	--	3.0	346	182	47
Feb. 20-28 ---------	6,192	--	52.1	--	--	48	7.0	58		146	53	69	--	4.0	363	149	30
Mar. 1-10----------	4,468	--	51.3	--	--	50	8.6	46		121	59	68	--	3.5	333	160	62
Mar. 11-13, 20, 24-31	12,660	--	43.2	--	--	43	6.9	39		99	51	60	--	3.2	292	136	54
Mar. 14-19, 21-23 --	31,600	--	28.6	--	--	29	4.6	22		79	31	30	--	1.0	204	91	26

Apr. 1-10	4,653	--	63.7	--	--	59	7.5	54	157	60	65	--	15	375	178	50
Apr. 11-16	5,702	--	72.8	--	--	66	8.3	64	127	65	113	--	8.5	463	198	94
Apr. 17-25	16,590	--	33.2	--	--	35	3.8	25	114	23	26	--	4.0	196	103	10
Apr. 26-30	15,950	--	46.0	--	--	43	4.7	49	138	45	47	--	7.8	292	127	14
May 1-10	4,605	--	59.1	--	--	58	6.8	54	164	52	69	--	3.8	341	172	38
May 11-13	4,453	--	56.3	--	--	54	6.7	47	140	49	68	--	5.2	329	162	48
May 14-19	13,190	--	18.2	--	--	16	2.7	19	66	9.5	18	--	3.0	137	51	0
May 20-26	27,690	--	29.0	--	--	29	4.1	24	87	23	31	--	3.2	202	89	18
May 27-31, June 1-6	6,295	--	40.0	--	--	31	4.6	34	94	18	48	--	8.9	226	96	19
June 7-10	3,562	--	65.1	--	--	44	7.0	72	130	36	105	--	4.5	366	139	32
June 11-20	1,737	--	62.1	--	--	53	6.7	52	154	35	74	--	8.8	349	160	34
June 21-30	5,808	--	57.2	--	--	49	7.4	56	148	52	70	--	.0	343	153	32
July 1-10	9,115	--	48.0	--	--	50	5.7	36	146	42	43	--	2.0	302	148	29
July 11-20	1,601	7.3	54.0	12	02	52	5.9	40 | 11	152	35	65	.4	3.5	319	154	30
July 21-31	999	--	71.7	--	--	56	6.7	75	158	49	104	--	4.0	413	168	38
Aug. 1-10	876	--	91.8	--	--	65	8.7	107	168	47	167	--	9.7	524	198	60
Aug. 11-20	910	--	82.8	--	--	53	6.9	104	164	47	141	--	5.6	470	161	26
Aug. 21-31	1,083	--	80.3	--	--	43	7.2	114	166	53	137	--	.5	453	137	1
Sept. 1-4	3,470	--	76.5	--	--	44	7.3	97	134	49	128	--	12	428	140	30
Sept. 5-10	5,240	--	53.5	--	--	52	5.7	46	144	51	56	--	5.3	304	154	36
Sept. 11-20	2,118	--	59.0	--	--	54	5.4	61	170	49	70	--	.5	360	157	18
Sept. 21-30	2,339	--	60.2	--	--	58	5.0	53	151	51	71	--	5.2	360	165	41
Weighted average	9,681	--	35.1	--	--	36	4.6	31	108	32	37	--	2.7	235	109	20

TRINITY RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN TRINITY RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Specific conductance ($K \times 10^6$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
										Total	Non-carbonate
TRINITY RIVER NEAR OAKWOOD											
Sept. 4-10, 1947	44.6	50	5.1	35	148	40	40	3.3	296	146	24
Sept. 11-20	57.7	50	5.0	55	146	49	65	5.0	332	146	26
Sept. 21-30	58.3	49	6.3	59	148	54	68	5.2	350	148	27
TRINITY RIVER AT DEVERS PUMPING PLANT NEAR MOSS BLUFF											
Oct. 1-8, 1946	55.7	53	6.5	59	162	29	88	1.5	342	159	26
July 1-10, 1947	40.3	48	5.2	27	123	47	34	2.8	262	141	40
Aug. 1-10	70.6	64	6.5	74	188	42	105	.5	396	186	32
Sept. 6	94.0	58	8.5	128	171	65	168	16	580	180	40
TRINITY RIVER AT BARBER HILL PUMPING PLANT NEAR COVE											
Oct. 1-10, 1946	47.4	44	7.3	45	161	11	66	0.5	280	140	8
Oct. 11-16	51.0	47	7.2	48	162	17	71	1.0	296	147	14
Aug. 24-25, 1947	142	64	20	188	144	77	320	1.0	799	242	124
Aug. 26-31	64.0	44	7.9	70	127	20	119	1.5	396	142	38
Sept. 14-20	107	55	15	130	128	60	222	1.5	617	199	94
Sept. 23-24	55.2	54	6.3	51	174	29	70	.8	385	161	18
TRINITY RIVER AT LONE STAR PUMPING PLANT AT ANAHUAC											
Aug. 2-3, 1947	339	69	67	534	137	160	942	1.5	2,000	448	335
Aug. 4-10	123	54	19	166	132	63	282	4.0	716	213	105
Aug. 11-20	90.9	61	10	109	181	50	161	2.0	533	193	44
Aug. 11-12, 15-20	107	61	13	138	177	57	212	2.0	624	206	60
Aug. 13-14	250	73	45	377	165	114	660	2.5	1,500	367	232
Aug. 21-24, 27-31	131	46	20	191	120	62	318	1.5	736	197	98
Aug. 25	753	118	218	1,770	132	469	3,150	--	5,790	1,190	1,083
Aug. 25-26	421	88	86	677	131	193	1,230	3.0	2,340	573	466
Sept. 1-10	108	42	16	152	108	53	252	2.5	625	171	82
Sept. 11-18	87.9	39	12	116	105	43	190	1.2	522	147	61

SAN JACINTO RIVER NEAR HUFFMAN, TEX.

LOCATION.--At the Sheldon Pumping Plant, City of Houston, Harris County, 5½ miles downstream from gaging station which is at Beaumont, Sour Lake and Western Railway bridge, 3.4 miles southwest of Huffman, Harris County.
DRAINAGE AREA.--2,791 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 710 parts per million Sept. 27-29; minimum, 135 parts per million Jan. 1-10.
Total hardness: Maximum, 149 parts per million Sept. 27-29; minimum, 36 parts per million Oct. 13-17.
EXTREMES, 1945-47.--Dissolved solids: Maximum, 710 parts per million Sept. 27-29, 1947; minimum, 113 parts per million Feb. 17-18, 20-23, 1946.
Total hardness: Maximum, 149 parts per million Sept. 27-29, 1947; minimum, 36 parts per million Feb. 17-18, 20-23, Oct. 13-17, 1946.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088. Records of specific conductance of daily samples are available in district office at Austin, Tex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
															Total	Noncarbonate
Oct. 1-5, 8-10, 1946	--	38.9	--	--	22	3.5	55		63	5.8	92	--	1.0	259	69	18
Oct. 11, 18-20	--	36.4	--	--	18	4.4	53		60	7.0	86	--	2.0	234	63	14
Oct. 13-17	--	21.5	--	--	9.4	3.0	38		47	8.0	50	--	1.0	145	36	0
Dec. 2-10	--	26.3	--	--	20	3.2	29		59	5.2	50	--	1.0	191	63	15
Dec. 11-20	--	26.2	--	--	20	3.6	29		51	5.0	57	--	.8	208	65	23
Dec. 21-31	--	32.1	--	--	24	4.1	37		69	4.2	67	--	1.0	231	77	20
Jan. 1-10, 1947	--	15.1	--	--	12	29	14		38	4.5	26	--	.8	135	42	11
Jan. 11-15, 17-20	--	14.3	--	--	11	2.9	14		38	5.6	23	--	.8	144	39	8
Jan. 21-28, 31	--	15.1	--	--	13	3.8	11		38	5.8	24	--	.8	142	48	17
Feb. 1-10	--	31.0	--	--	22	3.8	34		64	6.1	60	--	.5	223	70	18
Feb. 11-19	--	36.3	--	--	25	3.5	40		67	6.8	72	--	1.0	213	77	22
Feb. 20-28	--	39.8	--	--	26	3.4	48		69	7.7	84	--	.8	234	79	22
Mar. 1-7, 9-13	--	40.6	--	--	29	4.7	45		74	6.5	86	--	.8	256	92	31
Mar. 14-18	--	15.8	--	--	13	3.6	13		34	7.0	28	--	.5	157	47	19
Mar. 21-31	--	27.5	--	--	23	4.4	27		56	7.0	57	--	1.2	215	76	30
Apr. 1-10	--	38.4	--	--	28	3.9	41		82	6.9	72	--	.0	243	86	19
Apr. 11-20	--	44.6	--	--	31	4.2	52		89	6.7	90	--	.0	276	95	22
Apr. 21-30	--	45.2	--	--	28	4.1	55		82	6.9	93	--	.2	270	87	20

SAN JACINTO RIVER BASIN--Continued

SAN JACINTO RIVER NEAR HUFFMAN, TEX.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	pH	Specific conductance ($K \times 10^6$ at 25 °C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
															Total	Noncarbonate
May 1-10, 1947	--	46.0	--	--	30	4.5	61		86	8.0	104	--	1.0	269	93	23
May 11-18	--	50.6	--	--	27	4.5	63		74	5.3	111	--	.5	288	86	25
May 19-21, 23-31	--	21.2	--	--	15	3.5	24		53	4.5	39	--	.5	157	52	8
June 1-4	--	22.5	--	--	16	3.8	35		72	8.0	46	--	.2	172	56	0
June 5-10	--	38.1	--	--	23	4.0	44		73	4.4	75	--	.0	232	74	14
June 11-19	--	43.4	--	--	27	4.5	49		82	4.6	86	--	.0	264	86	19
June 21-26, 28, 30	--	40.4	--	--	20	3.6	54		62	4.2	90	--	.2	253	65	14
July 2-5, 9-10	--	43.4	--	--	27	4.6	52		76	4.9	94	--	.5	260	86	24
July 6-8	--	77.3	--	--	29	5.4	115		74	5.6	196	--	.5	440	94	34
July 11, 13-15, 17-19	7.1	46.5	14	0.30	24	4.2	53	13	68	4.4	105	0.2	.8	271	77	21
July 21-30	--	49.8	--	--	26	4.0	65		73	5.1	112	--	.2	296	81	22
Aug. 1-10	--	50.5	--	--	29	4.4	65		79	4.6	114	--	.5	284	90	26
Aug. 11-20	--	59.2	--	--	29	5.8	78		79	6.3	138	--	1.0	347	96	32
Aug. 21-25, 28-30	--	74.2	--	--	28	7.3	113		73	9.4	195	--	.5	426	100	40
Aug. 22-24, 26-27, 31	--	54.0	--	--	23	4.6	76		66	4.4	129	--	.5	298	76	22
Sept. 1-6, 9-10	--	50.9	--	--	23	4.6	71		70	5.5	119	--	.8	278	76	19
Sept. 11-20	--	56.3	--	--	28	5.3	75		78	6.4	131	--	.8	328	92	28
Sept. 21-26	--	57.5	--	--	23	3.9	81		64	4.1	137	--	.8	326	74	21
Sept. 27-29	--	124	--	--	30	18	187		76	32	325	--	.8	710	149	86

BRAZOS RIVER NEAR SOUTH BEND, TEX.

LOCATION.--At gaging station at bridge on State Highway 67, 0.3 mile upstream from Wichita Falls and Southern Railroad bridge, 1.6 miles downstream from Clear Fork of Brazos River, and 2.0 miles northeast of South Bend, Young County.
DRAINAGE AREA.--21,600 square miles of which 9,240 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: January 1942 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 8,100 parts per million Apr. 11-16; minimum, 361 parts per million Nov. 5-6.
Total hardness: Maximum, 1,850 parts per million July 21-24; minimum, 147 parts per million Nov. 5-6.
EXTREMES, 1942-47.--Dissolved solids: Maximum, 13,800 parts per million Dec. 11, 1944; minimum, 257 parts per million July 8, 1945.
Total hardness: Maximum, 1,950 parts per million Dec. 11-20, 1943; minimum, 123 parts per million Apr. 8-10, 1942.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088. Records of specific conductance of daily samples are available at district office in Austin, Tex.

Chemical analysee, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25°C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent eodium
Oct. 1-2, 6-10, 1946--	1,707	--	320	--	--	209	26	446		100	514	700	--	1.5	--	1,950	2.65	8,990	636	554	60
Oct. 3-5----------	692	--	621	--	--	393	46	938		98	975	1,500	--	2.0	--	3,900	5.30	7,290	1,170	1,090	64
Oct. 11-16 ----------	4,623	--	135	--	--	126	17	137		98	291	210	--	2.2	--	892	1.21	11,100	384	304	44
Oct. 17-20 ----------	555	--	230	--	--	164	20	311		103	391	478	--	2.2	--	1,420	1.93	2,130	492	407	56
Oct. 21-25 ----------	238	--	411	--	--	227	38	604		125	528	980	--	3.0	--	2,440	3.32	1,570	722	620	65
Oct. 26-31 ----------	110	--	613	--	--	296	55	1,000		122	728	1,620	--	1.0	--	3,760	5.11	1,120	970	870	69
Nov. 1-2----------	476	--	698	--	--	340	65	1,130		120	807	1,860	--	1.5	--	4,260	5.79	5,470	1,120	1,020	69
Nov. 3,8,10 ----------	1,704	--	187	--	--	102	21	245		103	153	445	--	1.8	--	1,020	1.39	4,690	341	256	61
Nov. 4,7----------	3,519	--	115	--	--	68	12	146		96	101	248	--	2.0	--	657	.89	6,240	218	140	59
Nov. 5-6----------	1,710	--	62.5	--	--	44	9.0	66		107	33	118	--	2.0	--	361	.49	1,670	147	60	49
Nov. 9----------	442	--	331	--	--	153	30	515		105	360	825	--	1.5	--	1,940	2.64	2,320	506	420	69
Nov. 11-14----------	215	--	325	--	--	181	34	470		127	379	790	--	2.0	--	1,920	2.61	1,110	592	488	63
Nov. 15-20----------	99.8	--	598	--	--	312	60	946		151	672	1,600	--	1.0	--	3,670	4.99	989	1,020	901	67
Nov. 21-26, 28-30 ----	85.3	--	747	--	--	338	67	1,300		150	777	2,130	--	.5	--	4,690	6.38	1,060	1,120	996	72
Nov. 27----------	122	--	339	--	--	157	31	542		105	301	920	--	1.0	--	2,000	2.72	659	520	434	69
Dec. 1-10----------	82.9	7.3	675	14	0.25	318	63	1,090	26	150	724	1,830	0.3	2.0	--	4,140	5.63	927	1,050	930	69
Dec. 11----------	3,280	--	566	--	--	289	62	836		135	679	1,400	--	2.5	--	3,340	4.54	29,600	976	865	65
Dec. 12-15----------	5,550	--	143	--	--	91	21	156		110	165	275	--	3.2	--	652	1.16	12,600	314	224	52
Dec. 16-17----------	1,140	--	286	--	--	134	32	423		97	331	680	--	2.2	--	1,650	2.24	5,080	466	386	66
Dec. 18-20----------	647	--	462	--	--	220	41	689		92	536	1,120	--	3.0	--	2,650	3.60	4,630	718	642	66
Dec. 21-31----------	270	7.6	599	11	.00	282	49	959	24	147	657	1,570	.3	1.0	--	3,630	4.94	2,650	906	785	69

BRAZOS RIVER BASIN--Continued

BRAZOS RIVER NEAR SOUTH BEND, TEX.--Continued

Chemical analyses, in parts per million, water year October 1946 to 1947--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^5$ at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Jan. 1-10, 1947	132	--	677	--	--	334	66	1,100		173	713	1,860	--	2.5	--	4,160	5.66	1,480	1,100	963	68
Jan. 11-20	129	--	906	--	--	378	81	1,600		172	887	2,620	--	--	--	5,650	7.68	1,970	1,280	1,140	73
Jan. 21-31	76.0	--	1,030	--	--	412	89	1,880		144	912	3,130	--	--	--	6,490	8.83	1,330	1,390	1,280	75
Feb. 1-10	41.8	--	1,100	--	--	472	101	1,980		163	998	3,350	--	--	--	6,980	9.49	788	1,590	1,460	73
Feb. 11-19	34.3	--	1,040	--	--	464	104	1,830		171	1,020	3,100	--	--	--	6,600	8.98	611	1,590	1,450	72
Feb. 20-28	35.9	--	981	--	--	456	100	1,710		163	999	2,900	--	--	--	6,250	8.50	606	1,550	1,420	71
Mar. 1-10	36.4	--	937	--	--	442	111	1,610		152	960	2,720	--	--	--	5,920	8.05	582	1,460	1,340	71
Mar. 11-20	65.0	--	883	--	--	404	95	1,480		150	841	2,560	--	1.0	--	5,450	7.41	956	1,400	1,280	70
Mar. 21-31	78.2	--	934	--	--	388	96	1,580		132	736	2,800	--	--	--	5,660	7.70	1,200	1,380	1,270	71
Apr. 1-10	39.0	--	1,060	--	--	456	111	1,840		132	928	3,200	--	--	--	6,600	8.98	695	1,590	1,490	71
Apr. 11-16	62.3	--	1,280	--	--	530	127	2,290		110	1,240	3,860	--	--	--	8,100	11.02	1,360	1,840	1,750	73
Apr. 17-20	113	--	984	--	--	432	103	1,640		122	821	2,920	--	--	--	5,980	8.13	1,820	1,500	1,400	70
Apr. 21-30	61.3	--	938	--	--	404	97	1,610		141	920	2,720	--	--	--	5,820	7.92	963	1,410	1,290	71
May 1-7	29.9	--	1,180	--	--	494	115	2,120		147	1,020	3,640	--	--	--	7,460	10.15	602	1,710	1,590	73
May 8-9	2,904	--	558	--	--	246	55	911		130	395	1,630	--	5.0	--	3,310	4.50	26,000	840	734	70
May 10-12, 15-17, 19-20	10,860	--	125	--	--	114	17	138		80	237	240	--	3.6	--	843	1.15	24,700	354	289	46
May 13-14, 18	26,570	--	231	--	--	204	25	285		98	473	465	--	2.8	--	1,500	2.04	108,000	612	532	50
May 21-24	8,542	--	161	--	--	142	20	168		134	271	288	--	4.5	--	960	1.31	22,100	436	326	46
May 25-27	11,340	--	86.3	--	--	83	10	78		120	141	120	--	2.8	--	540	.73	16,500	248	150	41
May 28-31	1,418	--	308	--	--	237	31	395		135	514	660	--	2.8	--	1,910	2.60	7,310	719	608	54
June 1-10	483	--	590	--	--	346	62	909		145	825	1,500	--	2.2	--	3,720	5.06	4,850	1,120	1,000	64
June 11-15	272	--	822	--	--	464	94	1,300		145	1,070	2,230	--	2.5	--	5,230	7.11	3,840	1,540	1,430	65
June 16-19	526	7.9	498	--	--	261	56	773		155	523	1,340	--	2.5	--	3,030	4.12	4,300	882	755	66
June 20-27	984	--	580	--	--	339	65	859		127	756	1,480	--	3.0	--	3,560	4.84	9,460	1,110	1,110	63
June 28-30	728	--	383	--	--	220	38	558		125	568	865	--	5.0	--	2,320	3.16	4,560	705	602	63
July 1-10	164	8.0	593	12	0.02	320	61	875	28	118	785	1,470	0.6	.5	1.5	3,610	4.91	1,600	1,050	953	64
July 11-18	98.1	--	733	--	--	376	80	1,130		125	894	1,910	--	1.0	--	4,450	6.05	1,180	1,270	1,160	66
July 19-20	110	--	1,060	--	--	516	108	1,840		123	1,240	3,080	--	--	--	6,840	9.30	2,030	1,730	1,630	70
July 21-24	63.0	--	1,060	--	--	564	107	1,730		122	1,440	2,840	--	--	--	6,740	9.17	1,150	1,850	1,750	67
July 25-31	47.6	--	655	--	--	394	71	979		116	1,010	1,600	--	1.5	--	4,110	5.59	528	1,280	1,180	63

Aug. 1-10	8.29	--	808	--	--	492	96	1,260	126	1,240	2,100	--	2.5	--	5,250	7.14	118	1,620	1,520	63
Aug. 11-20	.51	--	794	--	--	466	93	1,250	122	1,120	2,120	--	1.0	--	5,110	6.95	7.0	1,550	1,450	64
Aug. 21-31	.02	--	870	--	--	456	107	1,420	120	1,160	2,380	--	--	--	5,580	7.59	.3	1,580	1,480	66
Sept. 1-10	.00	--	932	--	--	480	107	1,530	114	1,130	2,620	--	--	--	5,920	8.05	.0	1,640	1,540	67
Sept. 11-14	53.0	--	927	--	--	472	108	1,540	122	1,040	2,680	--	--	--	5,900	8.02	844	1,620	1,520	67
Sept. 15-16	457	--	90.0	--	--	69	16	87	167	73	150	--	2.2	--	527	.72	650	238	101	44
Sept. 17	112	--	354	--	--	194	44	525	131	445	875	--	3.2	--	2,150	2.92	650	665	558	63
Sept. 18-20	81.0	--	695	--	--	426	89	1,090	127	1,100	1,800	--	3.0	--	4,570	6.22	999	1,430	1,320	62
Sept. 21-30	17.3	--	577	--	--	406	74	827	108	1,050	1,370	--	3.0	--	3,780	5.14	177	1,320	1,230	58
Weighted average	1,032	--	231	--	--	165	26	308	106	358	514	--	3.0	--	1,450	1.97	4,040	519	432	56

BRAZOS RIVER AT POSSUM KINGDOM DAM NEAR GRAFORD, TEX.

LOCATION.--Immediately below dam on Brazos River, 2.6 miles upstream from Loving Creek, and 11.3 miles southwest of Graford, Palo Pinto County.
DRAINAGE AREA.--22,500 square miles (22,760 square miles above gaging station).
RECORDS AVAILABLE.--Chemical analyses: January 1942 to September 1947.
EXTREMES, 1946-47. Dissolved solids: Maximum, 1,560 parts per million Oct. 1-10, Oct. 11-20; minimum, 1,250 parts per million Sept. 1-30.
Total hardness: Maximum, 537 parts per million Oct. 1-10; minimum, 431 parts per million Jan. 11-20, Feb. 11-19.
EXTREMES, 1942-47.--Dissolved solids: Maximum, 2,131 parts per million Feb. 2-9, 1942; minimum, 829 parts per million Sept. 1-10, 1942.
Total hardness: Maximum, 661 parts per million Feb. 2-9, 1942; minimum, 318 parts per million Dec. 21-31, 1942.
REMARKS.--Records of water discharge reported are those for gaging station near Palo Pinto, 20 miles downstream from Possum Kingdom Dam. There is no appreciable inflow between dam and gaging station except during periods of heavy local rains. Records of specific conductance of daily samples are available in district office at Austin, Tex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1946 --	2,123	--	267	--	--	164	31	359		126	325	620	--	1.0	--	1,560	2.12	8,940	537	434	59
Oct. 11-20 ------	4,235	--	267	--	--	163	28	364		116	333	617	--	1.0	--	1,560	2.12	17,800	522	427	60
Oct. 21-31 ------	1,736	--	259	--	--	158	26	358		120	337	588	--	1.2	--	1,530	2.08	7,170	502	403	61
Nov. 1-10 -------	1,721	--	248	--	--	152	25	330		114	320	548	--	1.5	--	1,430	1.94	6,640	482	389	60
Nov. 11-20 ------	986	--	240	--	--	145	25	349		113	321	565	--	1.5	--	1,460	1.99	3,890	465	372	62
Nov. 21-30 ------	876	--	240	--	--	148	30	325		114	316	550	--	1.0	--	1,430	1.94	3,380	493	400	59
Dec. 1-10 -------	924	7.4	252	11	0.0	151	24	318	22	109	315	550	0.3	2.0	--	1,450	1.97	3,620	476	386	58
Dec. 11-20 ------	2,182	--	237	--	--	142	25	313		111	303	518	--	2.0	--	1,360	1.85	8,010	458	366	60
Dec. 21-31 ------	654	--	233	--	--	138	23	312		110	295	510	--	1.8	--	1,330	1.81	2,350	439	349	61
Jan. 1-10, 1947 --	1,140	--	225	--	--	138	23	302		111	284	502	--	1.2	--	1,300	1.77	4,000	439	348	60
Jan. 11-20 ------	1,018	--	229	--	--	138	21	310		114	301	495	--	1.5	--	1,320	1.80	3,630	431	338	61
Jan. 21-31 ------	817	--	227	--	--	140	22	313		112	298	508	--	1.2	--	1,340	1.82	2,960	440	348	61
Feb. 1-10 -------	500	--	232	--	--	140	21	319		118	300	510	--	1.0	--	1,350	1.84	1,820	436	340	61
Feb. 11-19 ------	403	--	232	--	--	138	21	313		114	293	505	--	.8	--	1,330	1.81	1,770	431	338	61
Feb. 20-28 ------	512	--	227	--	--	138	22	320		114	293	518	--	1.5	--	1,350	1.84	1,870	435	342	62
Mar. 1-10 -------	290	--	235	--	--	140	25	319		114	305	522	--	.0	--	1,370	1.86	1,070	452	359	61
Mar. 11-20 ------	310	--	231	--	--	138	23	317		113	297	515	--	.0	--	1,350	1.84	1,130	439	346	61
Mar. 21-31 ------	213	--	232	--	--	138	24	309		113	294	508	--	.0	--	1,330	1.81	765	443	350	60

Apr. 1-10	396	--	237	--	--	146	27	308	97	279	548	--	1.2	--	1,360	1.85	1,450	476	396	58
Apr. 11-30	315	--	231	--	--	147	26	291	116	266	520	--	1.8	--	1,310	1.78	1,110	474	379	57
May 1-10	561	--	229	--	--	138	22	320	112	289	522	--	1.2	--	1,350	1.84	2,040	435	343	62
May 11-20	7,858	--	229	--	--	137	22	326	101	286	538	--	2.0	--	1,360	1.85	28,900	432	350	62
May 21-31	7,622	7.7	229	--	--	139	22	311	116	280	515	--	1.8	--	1,330	1.81	27,400	438	342	61
June 1-30	1,451	--	236	--	--	140	22	324	116	308	515	--	3.2	--	1,370	1.86	5,370	440	345	62
July 1-31	670	7.4	227	9.0	.0	146	23	279 | 26	118	300	488	.2	1.5	.5	1,330	1.81	2,410	459	362	58
Aug. 1-31	625	--	214	--	--	159	24	261	117	329	442	--	1.8	--	1,270	1.73	2,140	496	400	53
Sept. 1-30	620	--	208	--	--	149	23	264	116	338	420	--	2.0	--	1,250	1.70	2,090	466	372	55
Weighted average	1,343	--	236	--	--	145	24	321	113	303	530	--	1.7	--	1,380	1.88	5,000	460	368	60

BRAZOS RIVER BASIN--Continued

BRAZOS RIVER AT RICHMOND, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 59 in Richmond, Fort Bend County, 925 feet downstream from Texas and New Orleans Railroad bridge.
DRAINAGE AREA.--44,050 square miles, of which 9,240 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 1,060 parts per million Oct. 21-31, Nov. 1-4; minimum, 133 parts per million Aug. 27-31.
Total hardness: Maximum, 430 parts per million Sept. 21-30; minimum, 97 parts per million Aug. 27-31.
EXTREMES, 1945-47.--Dissolved solids: Maximum, 1,060 parts per million Oct. 21-31, Nov. 1-4, 1946; minimum, 133 parts per million Aug. 27-31, 1947.
Total hardness: Maximum, 430 parts per million Sept. 21-30, 1947; minimum, 97 parts per million Aug. 27-31, 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088. Records of specific conductance of daily samples are available in district office at Austin, Tex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 1, 3, 5-8, 1946	6,443	--	59.2	--	--	49	8.6	55		137	48	81	--	2.5	--	326	0.44	5,670	158	46	43
Oct. 2, 4, 9-10	6,370	--	95.5	--	--	72	13	100		141	95	166	--	1.2	--	608	.83	10,500	233	118	48
Oct. 11-20	4,281	--	151	--	--	108	19	182		162	167	308	--	1.5	--	935	1.27	10,800	348	214	53
Oct. 21-31	4,859	--	186	--	--	121	22	235		147	216	395	--	1.0	--	1,060	1.44	13,900	392	272	57
Nov. 1-4	4,128	--	187	--	--	114	20	246		155	211	392	--	1.0	--	1,060	1.44	11,800	366	240	59
Nov. 5, 7-8	29,330	--	69.9	--	--	55	9.4	73		122	72	112	--	2.0	--	433	.59	34,300	176	76	47
Nov. 6, 9-10	23,430	--	42.2	--	--	44	6.8	32		118	40	48	--	2.0	--	273	.37	17,300	138	41	34
Nov. 11-20	22,220	7.2	39.2	9.2	0.00	43	5.8	25	6.4	121	32	43	0.2	1.2	--	243	.33	14,600	131	40	28
Nov. 21-24	16,450	--	34.2	--	--	35	7.3	22		100	25	40	--	1.0	--	218	.30	9,680	118	36	29
Nov. 25-30	10,630	--	53.7	--	--	46	8.4	44		117	41	75	--	1.2	--	323	.44	9,270	150	54	39
Dec. 1-10	5,709	--	74.3	--	--	64	9.0	75		151	78	109	--	1.8	--	454	.62	7,000	197	73	45
Dec. 11-20	15,380	--	72.7	--	--	67	12	61		160	71	101	--	1.8	--	442	.60	18,400	217	85	38
Dec. 21-31	6,766	--	55.3	--	--	60	8.7	45		166	51	66	--	2.0	--	356	.48	6,500	186	49	35
Jan. 1-10, 1947	7,959	--	69.2	--	--	68	11	59		174	67	92	--	2.0	--	425	.58	9,130	214	72	37
Jan. 11-20	18,380	--	55.7	--	--	57	9.0	45		148	58	66	--	2.0	--	342	.47	17,000	180	58	35
Jan. 21-31	23,110	--	46.3	--	--	48	7.3	36		144	44	43	--	3.5	--	288	.39	18,000	150	32	34
Feb. 1-10	7,735	--	68.0	--	--	45	12	52		200	64	82	--	2.8	--	415	.56	8,670	236	72	32
Feb. 11-19	4,853	--	89.5	--	--	92	16	77		247	87	119	--	2.5	--	552	.75	7,230	296	93	36
Feb. 20-28	4,686	--	97.3	--	--	92	17	90		236	100	139	--	2.5	--	590	.80	7,460	300	106	40
Mar. 1-14	5,065	--	91.9	--	--	88	17	76		235	88	121	--	1.5	--	543	.74	7,430	290	97	36
Mar. 15-20	19,100	--	38.2	--	--	45	7.2	22		113	39	40	--	1.2	--	238	.32	12,300	142	49	26
Mar. 21-31	20,370	--	46.7	--	--	57	8.6	32		157	48	47	--	2.0	--	296	.40	16,300	178	49	28

Apr. 1-10	7,072	--	57.1	--	--	65	11	45	191	52	66	--	1.2	--	364	.50	6,950	207	50	32
Apr. 11-20	78,180	--	66.6	--	--	72	12	48	207	63	69	--	1.5	--	398	.54	8,400	229	60	31
Apr. 21-30	6,963	--	68.5	--	--	73	11	55	191	73	80	--	1.5	--	424	.58	7,970	227	70	34
May 1-10	4,532	--	66.5	--	--	72	12	55	215	62	76	--	1.5	--	419	.57	5,130	229	53	34
May 11-20	8,888	--	65.1	--	--	64	11	54	181	62	76	--	3.0	--	386	.52	9,260	204	56	37
May 21-23	32,500	--	40.1	--	--	45	6.6	28	144	30	34	--	3.0	--	234	.32	20,500	139	21	30
May 24-31	24,850	--	114	--	--	82	13	132	132	129	214	--	2.0	--	703	.96	47,200	258	150	53
June 1-10	10,310	--	129	--	--	96	16	127	140	135	230	--	2.2	--	776	1.06	21,600	306	191	47
June 11-20	3,690	--	114	--	--	92	17	114	164	120	203	--	.8	--	708	.96	7,050	300	165	45
June 21-26, 28	3,951	--	158	--	--	114	21	191	172	185	320	--	1.2	--	917	1.25	9,780	371	0	53
June 27, 29-30	4,227	--	91.6	--	--	74	12	92	140	101	151	--	1.8	--	562	.76	6,410	234	120	46
July 1-10	2,107	7.9	107	14	.05	87	15	99 | 5.3	193	94	173	.2	1.2	.5	639	.87	3,640	278	128	44
July 11-20	1,501	--	137	--	--	100	21	151	222	139	239	--	1.0	--	840	1.14	3,400	336	154	49
July 21-31	1,385	--	144	--	--	103	22	159	210	155	254	--	.5	--	868	1.18	3,250	348	175	50
Aug. 1-10	855	--	140	--	--	104	22	162	211	154	260	--	2.0	--	832	1.13	1,920	350	176	50
Aug. 11-20	864	--	151	--	--	107	26	186	210	177	298	--	1.0	--	942	1.28	2,200	374	202	52
Aug. 21-26	1,759	--	151	--	--	105	25	178	194	181	285	--	2.5	--	924	1.26	4,390	365	206	51
Aug. 27-31	31,140	--	22.8	--	--	29	5.9	10	92	16	18	--	1.0	--	133	.18	11,200	97	21	18
Sept. 1-3	10,070	--	29.2	--	--	38	5.1	15	106	25	25	--	.8	--	194	.26	5,270	116	29	22
Sept. 4-13	2,222	--	66.2	--	--	60	9.1	61	133	69	98	--	.8	--	400	.54	2,400	187	78	41
Sept. 14-20	1,243	--	101	--	--	91	16	95	194	112	158	--	1.0	--	617	.84	2,070	293	134	41
Sept. 21-30	1,138	--	153	--	--	131	25	173	192	218	298	--	1.0	--	941	1.28	2,890	430	272	47
Weighted average -	8,765	--	69.1	--	--	63	11	63	152	70	100	--	1.9	--	425	0.58	10,100	202	78	40

BRAZOS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN BRAZOS RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Specific conductance ($K \times 10^6$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
										Total	Noncarbonate
BRAZOS RIVER NEAR GLEN ROSE											
Oct. 12, 1946	176	--	--	--	120	200	380	--	--	--	--
Nov. 5	62.9	--	--	--	118	49	93	--	--	--	--
BRAZOS RIVER NEAR WHITNEY											
Oct. 24, 1946	257	--	--	--	121	312	585	--	--	--	--
Sept. 9-11, 1947	221	149	26	284	111	349	455	0.2	1,320	479	388
Sept. 12-20	174	122	21	220	111	286	340	.5	1,040	391	300
Sept. 21-30	203	144	19	271	117	339	410	.2	1,240	438	342
BRAZOS RIVER NEAR MARLIN											
Oct. 9, 1946	235	--	--	--	147	233	530	2.5	--	--	--
Nov. 14	157	--	--	--	155	193	322	--	--	--	--
Dec. 21	91.9	83	15	84	160	103	150	1.2	560	268	138
Feb. 19, 1947	137	80	20	154	102	165	256	.2	759	282	198
Mar. 26	64.8	69	9.4	60	172	79	82	2.8	430	210	70
Apr. 30	78.3	91	15	59	220	107	88	2.0	498	288	108
BRAZOS RIVER NEAR BRYAN											
Oct. 8, 1946	193	--	--	--	135	279	410	1.5	--	--	108
Nov. 13	56.6	--	--	--	148	48	65	--	--	--	--
Jan. 14, 1947	95.0	93	14	84	214	106	129	4.5	597	290	114
Feb. 18	92.6	76	21	80	184	100	136	3.2	537	276	125
Mar. 25	67.9	73	11	58	192	72	84	3.0	436	227	70
Apr. 29	54.5	46	8.5	60	200	49	45	3.5	351	150	0
Aug. 14	179	96	28	240	129	245	365	2.2	1,040	354	249

COLORADO RIVER AT COLORADO CITY, TEX.

LOCATION.--At gaging station 3,517 feet upstream from bridge on U. S. Highway 80 at Colorado City, Mitchell County, 4,100 feet upstream from Texas and Pacific Railway bridge, and 1.6 miles upstream from Lone Wolf Creek.
DRAINAGE AREA.--4,274 square miles of which 2,440 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: May 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 13,500 parts per million May 10 (6:00 p.m.); minimum, 206 parts per million May 12-14, 17.
Total hardness: Maximum, 1,900 parts per million May 1-8; minimum, 88 parts per million May 12-14, 17.
EXTREMES, May 1946-September 1947.--Dissolved solids: Maximum, 27,800 parts per million Aug. 9-12, 1946; minimum, 206 parts per million May 12-14, 17, 1947.
Total hardness: Maximum, 4,500 parts per million Aug. 9-12, 1946; minimum, 88 parts per million May 12-14, 17, 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088. Records of specific conductance of daily samples are available in district office at Austin, Tex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-9, 1946	1/148	--	736	--	--	176	59	1,370		117	448	2,200	--	2.0	--	4,310	5.86	1,720	682	586	81
Oct. 9, 10, 13	1/1,067	--	60.5	--	--	32	6.8	79		107	42	104	--	4.0	--	338	.46	974	108	20	61
Oct. 11-12	1,026	--	37.9	--	--	27	5.8	46		135	29	34	--	3.2	--	228	.31	632	91	0	52
Oct. 14-16	31.7	--	160	--	--	51	13	253		110	98	380	--	3.0	--	894	1.22	77	181	90	75
Oct. 17-20	9.82	--	353	--	--	103	28	596		119	207	960	--	2.0	--	1,950	2.65	52	372	274	78
Oct. 21-31	3.41	--	673	--	--	161	53	1,230		129	402	1,960	--	2.5	--	3,870	5.26	36	620	514	81
Nov. 1-10	2.32	--	897	--	--	228	79	1,730		133	579	2,800	--	1.0	--	5,480	7.45	34	894	785	81
Nov. 11-20	1.42	--	1,260	--	--	287	103	2,460		142	803	3,930	--	2.0	--	7,660	10.42	29	1,140	1,020	82
Nov. 21-26, 28-30	4.71	--	1,280	--	--	291	109	2,410		139	831	3,860	--	2.0	--	7,570	10.30	96	1,170	1,060	82
Nov. 27	12.0	--	696	--	--	174	63	1,240		108	451	2,010	--	3.0	--	3,990	5.43	129	693	604	80
Dec. 1-9	4.16	7.3	1,200	2.0	0.00	281	102	2,260	30	144	764	3,660	0.4	.4	--	7,170	9.75	81	1,120	1,000	81
Dec. 10, 12-20	49.7	--	606	--	--	138	59	1,070		120	355	1,740	--	2.5	--	3,420	4.65	459	587	488	80
Dec. 11	203	--	233	--	--	72	19	353		97	162	548	--	3.5	--	1,210	1.65	663	258	178	75
Dec. 21-31	3.57	--	966	--	--	224	77	1,830		156	590	2,910	--	1.5	--	5,710	7.77	55	876	748	82
Jan. 1-10, 1947	5.61	--	1,210	--	--	289	128	2,250		176	768	3,690	--	--	--	7,210	9.81	109	1,250	1,100	80
Jan. 11-20	3.92	--	1,160	--	--	273	96	2,160		181	756	3,430	--	--	--	6,800	9.25	72	1,080	928	81
Jan. 21-31	3.24	--	1,240	--	--	295	106	2,450		176	853	3,870	--	--	--	7,660	10.42	67	1,170	1,030	82
Feb. 1-10	1.85	--	1,500	--	--	320	129	3,040		171	1,050	4,760	--	--	--	9,380	12.76	47	1,330	1,190	83
Feb. 11-19	2.04	--	1,590	--	--	373	134	3,260		167	1,080	5,180	--	--	--	10,100	13.74	56	1,480	1,340	83
Feb. 20-28	2.67	--	1,640	--	--	366	141	3,280		159	1,220	5,120	--	--	--	10,200	13.87	74	1,490	1,360	83

1/ Includes 1/2 discharge for Oct. 9.

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COLORADO RIVER BASIN (TEXAS)--Continued

COLORADO RIVER AT COLORADO CITY, TEX.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Mar. 1-10, 1947---	2.74	--	1,720	--	--	378	155	3,460		160	1,280	5,420	--	--	--	10,800	14.69	80	1,580	1,450	83
Mar. 11-20 -------	3.84	--	1,690	--	--	378	162	3,380		132	1,200	5,390	--	--	--	10,600	14.42	110	1,610	1,500	82
Mar. 21-31--------	3.85	--	1,520	--	--	352	152	3,190		126	1,110	5,090	--	--	--	9,960	13.55	104	1,500	1,400	82
Apr. 1-3----------	19.8	--	1,720	--	--	393	158	3,580		124	1,240	5,690	--	--	--	11,100	15.10	593	1,630	1,530	83
Apr. 4-7----------	2.42	--	453	--	--	112	36	804		83	291	1,280	--	0.2	--	2,560	3.48	17	428	360	80
Apr. 8-10---------	1.03	--	734	--	--	198	70	1,330		91	492	2,190	--	--	--	4,320	5.88	12	782	708	79
Apr. 11-15--------	.82	--	1,050	--	--	250	94	2,060		109	721	3,300	--	--	--	6,480	8.81	14	1,010	921	82
Apr. 16-20--------	.80	--	1,600	--	--	360	144	3,190		140	1,110	5,070	--	--	--	9,940	13.52	21	1,490	1,380	82
Apr. 21-30--------	.27	--	1,910	--	--	423	181	4,020		122	1,410	6,360	--	--	--	12,500	17.00	9.1	1,800	1,700	83
May 1-8 ----------	.10	--	2,070	--	--	453	187	4,300		148	1,470	6,800	--	--	--	13,300	18.09	3.6	1,900	1,780	83
May 9 ------------	1.30	--	896	--	--	234	73	1,610		102	625	2,580	--	6.0	--	5,180	7.04	18	884	800	80
May 10(7:30 a. m.) -	2/1,450	--	1,330	--	--	287	118	2,620		157	988	4,060	--	10	--	8,160	11.10	31,900	1,200	1,070	83
May 10(6:00 p. m.) -	2/1,450	--	2,070	--	--	441	192	4,370		110	1,500	6,900	--	4.0	--	13,500	18.36	52,900	1,890	1,800	83
May 10, 11, 15-16 18-19 ----------	3/2,950	--	71.2	--	--	37	7.3	92		118	52	120	--	3.5	--	391	.53	311	122	26	62
May 12-14, 17-----	6,532	--	34.2	--	--	27	4.9	35		112	26	30	--	1.8	--	206	.28	3,630	88	0	46
May 20-23---------	192	--	199	--	--	76	18	307		128	131	485	--	6.0	--	1,090	1.48	565	264	158	72
May 24-27 --------	117	--	151	--	--	60	13	221		104	89	356	--	4.6	--	853	1.16	269	203	118	70
May 28-31 --------	13.2	--	362	--	--	119	30	606		129	223	990	--	4.3	--	2,040	2.77	73	420	315	76
June 1-4 ----------	7.68	--	472	--	--	163	46	811		165	327	1,330	--	8.0	--	2,770	3.77	57	596	460	75
June 5-10 ---------	3.27	--	744	--	--	230	66	1,290		153	483	2,140	--	3.5	--	4,290	5.83	38	846	720	77
June 11-20 --------	5.88	--	967	--	--	266	85	1,750		130	629	2,870	--	4.0	--	5,670	7.71	90	1,010	907	79
June 21-22 --------	8.40	--	1,150	--	--	317	104	2,130		136	783	3,490	--	--	--	6,890	9.37	156	1,220	1,110	79
June 23 ----------	76.0	--	414	--	--	149	36	696		174	285	1,130	--	.5	--	2,380	3.24	488	520	378	74
June 24-25 --------	288	--	100	--	--	54	8.5	129		114	74	198	--	1.5	--	564	.77	438	170	76	62
June 26 ----------	39.0	--	201	--	--	77	16	311		96	117	520	--	1.0	--	1,090	1.48	115	258	180	72
June 27 ----------	16.0	--	409	--	--	142	33	675		99	258	1,140	--	1.0	--	2,300	3.13	99	490	409	75
June 28-30 --------	6.37	--	930	--	--	290	80	1,660		120	611	2,790	--	--	--	5,490	7.47	94	1,050	954	77

2/ Includes 1/4 discharge for May 10.
3/ Includes 1/2 discharge for May 10.

July 1-10----------	.92	--	1,390	--	--	373	115	2,600	100	859	4,310	--	--	--	8,310	11.30	21	1,400	1,320	80
July 11-12---------	24.0	--	1,450	--	--	368	123	2,760	100	921	4,530	--	--	--	8,750	11.90	567	1,420	1,340	81
July 13-20 ---------	3.31	8.0	623	7.0	.0	154	55	1,080 | 24	92	438	1,740	.4	1.5	1.0	3,550	4.83	32	610	535	79
July 21-31 ---------	12.4	--	826	--	--	210	69	1,470	99	517	2,400	--	---	--	4,710	6.41	158	808	726	80
Aug. 1-Sept. 9 ----	4/.11	--	826	--	--	192	67	1,520	93	487	2,470	--	--	--	4,780	6.50	1.4	754	678	81
Sept. 10 ----------	5/184	--	283	--	--	96	21	441	109	186	708	--	5.0	--	1,510	2.05	750	326	236	75
Sept. 10 ----------	6/184	--	1,960	--	--	473	161	4,100	121	1,350	6,560	--	--	--	12,700	17.27	6,320	1,840	1,740	83
Sept. 10 ----------	6/184	--	705	--	--	248	58	1,190	128	505	2,000	--	5.0	--	4,070	5.54	2,020	858	752	75
Sept. 11 ----------	212	--	486	--	--	133	32	858	93	252	1,410	--	2.5	--	2,730	3.71	1,560	464	388	80
Sept. 12-15 -------	71.7	--	219	--	--	66	16	366	95	154	558	--	1.5	--	1,210	1.65	234	230	152	78
Sept. 16-20 -------	3.28	--	486	--	--	113	37	862	100	267	1,380	--	1.5	--	2,710	3.69	24	434	352	81
Sept. 21-30 -------	.44	--	758	--	--	158	59	1,450	90	454	2,300	--	--	--	4,470	6.08	5.3	637	563	83
Weighted average-	147	--	123	--	--	47	12	201	115	85	298	--	2.7	--	724	0.98	287	167	73	72

4/ No flow Aug. 7-Sept. 9.
5/ Includes 2/3 discharge for Sept. 10.
6/ Includes 1/6 discharge for Sept. 10.

COLORADO RIVER BASIN (TEXAS)--Continued

COLORADO RIVER AT WHARTON, TEX.

LOCATION.--At bridge on U. S. Highway 59 in Wharton, Wharton County, 1,000 feet downstream from Texas and New Orleans Railroad bridge and 12 miles upstream from Jones Creek.
DRAINAGE AREA.--41,150 square miles of which 11,800 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: April 1944 to September 1947.
Water temperatures: October 1945 to September 1946.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 337 parts per million Feb. 1-10; minimum, 179 parts per million Aug. 27-31.
Total hardness: Maximum, 231 parts per million Feb. 1-10; minimum, 116 parts per million Aug. 27-31.
EXTREMES, 1944-47.--Dissolved solids: Maximum, 358 parts per million Nov. 21-30, 1945; minimum, 164 parts per million June 2, 10, 1946.
Total hardness: Maximum, 231 parts per million Feb. 1-10, 1947; minimum, 114 parts per million Apr. 1-4, 1945.
Water temperatures: Maximum, 90° F. June 27-28, 1947; minimum, 45° F. Jan. 15-16, 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1088. Records of specific conductance of daily samples available in district office at Austin, Tex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1946	3,158	--	43.0	--	--	46	14	24		178	29	34	--	1.5	--	262	0.36	2,230	172	26	23
Oct. 11-20	3,128	--	44.3	--	--	45	15	27		185	27	37	--	1.5	--	265	.36	2,240	174	22	25
Oct. 21-31	2,644	--	46.1	--	--	48	18	36		198	35	52	--	.8	--	305	.41	2,180	194	32	29
Nov. 1-4	3,828	--	47.9	--	--	48	18	34		198	29	53	--	1.0	--	311	.42	3,210	194	32	28
Nov. 5-10	12,800	--	27.2	--	--	36	6.7	12		120	21	15	--	3.0	--	187	.25	6,460	117	19	18
Nov. 11-20	6,814	--	34.7	--	--	43	9.6	29		151	30	38	--	2.0	--	261	.35	4,800	147	23	30
Nov. 21-30	3,990	--	40.4	--	--	51	11	25		192	25	29	--	2.5	--	270	.37	2,910	173	15	24
Dec. 1-10	2,673	--	51.8	--	--	58	18	24		219	30	42	--	1.5	--	316	.43	2,280	218	39	19
Dec. 11-20	5,083	--	46.7	--	--	56	14	21		196	31	35	--	2.0	--	286	.39	3,930	198	37	19
Dec. 21-31	3,448	8.0	51.8	11	0.00	60	16	24	5.6	227	30	39	0.1	1.5	--	308	.42	2,870	216	29	21
Jan. 1-10, 1947	4,278	--	48.6	--	--	49	15	31		186	37	42	--	2.0	--	293	.40	3,380	184	32	27
Jan. 11-20	7,931	--	42.1	--	--	48	12	23		164	36	33	--	1.8	--	251	.34	5,370	170	35	23
Jan. 21-31	5,114	--	47.6	--	--	58	13	26		210	33	32	--	3.0	--	292	.40	4,030	198	26	22
Feb. 1-10	3,596	--	54.6	--	--	63	18	32		236	35	49	--	2.0	--	337	.46	3,290	231	38	23
Feb. 11-19	3,220	--	53.9	--	--	62	18	27		237	29	44	--	1.8	--	301	.41	2,720	228	34	21
Feb. 20-28	3,141	--	52.1	--	--	58	18	26		227	28	42	--	1.2	--	292	.40	2,540	218	32	21
Mar. 1-10	3,050	--	52.4	--	--	58	19	26		224	33	42	--	1.0	--	317	.43	2,610	222	39	20
Mar. 11-20	4,088	--	47.7	--	--	54	16	21		183	39	39	--	2.0	--	298	.41	3,290	201	51	19
Mar. 21-31	3,743	--	49.9	--	--	58	15	22		189	40	40	--	1.2	--	315	.43	3,180	206	51	19

Apr. 1-10	2,360	--	52.3	--	--	58	19	30	214	37	51	--	1.8	--	331	.45	2,110	222	47	23
Apr. 11-20	3,074	--	49.4	--	--	56	14	25	173	45	42	--	3.5	--	308	.42	2,560	198	56	21
Apr. 21-30	1,854	--	53.0	--	--	62	16	26	212	39	44	--	2.5	--	325	.44	1,630	220	47	21
May 1-10	1,102	--	50.9	--	--	48	18	34	199	34	47	--	3.0	--	307	.42	913	194	31	27
May 11-20	1,780	--	48.7	--	--	44	16	34	181	32	46	--	3.0	--	281	.38	1,350	176	27	29
May 21-31	2,865	--	45.2	--	--	47	13	26	173	29	37	--	4.0	--	262	.36	2,030	171	29	25
June 1-10	1,336	--	51.5	--	--	49	18	29	200	31	43	--	2.8	--	295	.40	1,060	196	32	24
June 11-20	1,335	--	50.5	--	--	48	19	25	191	28	46	--	1.8	--	287	.39	1,030	198	42	21
June 21-30	1,527	--	49.5	--	--	46	18	26	185	30	44	--	1.5	--	275	.37	1,130	189	37	23
July 1-10	1,192	--	50.3	--	--	48	19	28	192	29	49	--	3.2	--	306	.42	985	198	40	24
July 11-20	1,459	--	48.0	--	--	43	18	29	180	29	46	--	1.5	--	291	.40	1,150	181	34	26
July 21-31	1,278	7.9	48.0	10	.00	45	19	21 | 7.7	187	26	46	.2	1.0	.5	288	.39	994	190	47	23
Aug. 1-10	1,441	--	49.0	--	--	47	20	25	184	32	49	--	1.5	--	294	.40	1,140	200	48	22
Aug. 11-26	1,465	--	47.8	--	--	45	20	27	191	29	45	--	3.8	--	294	.40	1,160	194	38	23
Aug. 27-31	6,792	--	27.1	--	--	34	7.6	9.6	114	16	18	--	1.8	--	179	.24	3,280	116	23	15
Sept. 1-10	1,734	--	48.3	--	--	48	16	26	185	27	44	--	1.5	--	282	.38	1,320	186	34	24
Sept. 11-20	1,633	--	50.2	--	--	46	19	29	193	29	47	--	1.8	--	292	.40	1,290	193	35	25
Sept. 21-30	1,480	--	52.1	--	--	49	21	30	205	33	50	--	.5	--	310	.42	1,240	209	41	24
Weighted average	3,090	--	45.4	--	--	50	15	25	186	31	38	--	2.1	--	280	0.38	2,340	186	34	23

COLORADO RIVER BASIN (TEXAS)--Continued

MORGAN CREEK NEAR COLORADO CITY, TEX.

LOCATION.--Two hundred twenty-seven feet downstream from bridge on U. S. Highway 80, about 1 mile upstream from Texas and Pacific Railway bridge, 5 miles west of Colorado City, Mitchell County, and 5½ miles downstream from Cherry Creek.
DRAINAGE AREA.--236 square miles.
RECORDS AVAILABLE.--Chemical analyses: May to September 1947.
EXTREMES. May 1947 to September 1947.-Dissolved solids: Maximum, 3,340 parts per million Sept. 10 (8:10 a.m.); minimum, 171 parts per million Sept. 11, 13.
Total hardness: Maximum, 1,090 parts per million Sept. 10 (8:10 a.m.); minimum, 87 parts per million Sept. 11, 13.
REMARKS: Records of specific conductance of daily samples are available in district office at Austin, Tex.

Chemical analyses, in parts per million, water year October 1946 to September 1947.

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
May 1-10, 1947	1/11.0	--	323	--	--	162	58	451		161	528	665	--	4.0	--	1,950	2.65	58	643	511	60
May 10-13, 16-18	2/629	--	29.5	--	--	31	5.2	23		100	31	.22	--	3.2	--	182	.25	309	99	17	33
May 14-16, 19-20	3/18.2	--	70.3	--	--	50	10	81		129	94	97	--	2.8	--	428	.58	21	166	60	52
May 21-24	.78	--	157	--	--	94	24	209		169	226	290	--	3.8	--	968	1.32	2.0	333	194	58
May 25-31	.29	--	269	--	--	130	37	410		186	389	572	--	3.8	--	1,630	2.22	1.3	476	324	65
June 1-10	.10	--	382	--	--	175	57	591		200	571	848	--	2.0	--	2,340	3.18	.6	671	507	66
June 11-23	.00	--	503	--	--	196	86	805		132	802	1,170	--	.5	--	3,120	4.24	.0	842	734	68
June 24	4/20.0	--	130	--	--	84	24	153		86	309	176	--	.2	--	858	1.17	46	308	238	52
June 24	4/20.0	--	77.1	--	--	59	11	84		140	136	84	--	1.2	--	475	.65	26	192	78	49
June 25-July 10	.20	--	185	--	--	110	35	234		96	426	285	--	5.1	--	1,140	1.55	.6	418	340	55
July 11	142	7.5	49.9	17	0.02	43	8.3	44	5.0	159	54	36	0.8	4.5	0.5	300	.41	115	141	11	39
July 12	25.0	--	37.8	--	--	37	7.3	31		123	45	28	--	4.5	--	254	.35	17	122	22	36
July 13-Aug. 28	.04	--	61.6	--	--	42	11	56		112	73	72	--	2.8	--	358	.49	.0	150	58	45
Aug. 29-Sept. 9	.22	--	111	--	--	62	17	147		120	193	171	--	4.7	--	706	.96	.4	224	126	59

Sept. 10 (8:10 a. m.)	5/28.0	--	502	--	--	252	113	762	249	1,090	1,000	--	2.0	--	3,340	4.54	253	1,090	890	60
Sept. 10	5/28.0	--	158	--	--	81	24	205	147	230	272	--	3.2	--	928	1.23	70	300	180	60
Sept. 10	6/28.0	--	46.0	--	--	32	7.3	49	127	56	38	--	1.8	--	277	.38	21	110	6	49
Sept. 11, 13	38.0	--	27.6	--	--	26	5.4	26	99	38	13	--	5.2	--	171	.23	18	87	6	39
Sept. 12	16.0	--	57.4	--	--	42	8.2	60	103	101	55	--	2.2	--	352	.48	15	138	54	49
Sept. 14-17	4.02	--	36.2	--	--	35	6.2	31	113	40	32	--	.0	--	233	.32	2.5	113	20	37
Sept. 18-19	.05	--	99.4	--	--	46	12	139	172	117	143	--	2.8	--	587	.80	.1	164	24	65
Sept. 20-30	.00	--	215	--	--	63	26	413	311	298	420	--	6.2	--	1,380	1.88	.0	264	9	77
Weighted average	31.2	--	38.7	--	--	35	6.8	36	104	47	40	--	3.3	--	238	0.32	20	116	30	41

1/Includes 1/8 discharge for May 10.
2/Includes 7/8 discharge for May 10, 9/10 discharge for May 16.
3/Includes 1/10 discharge for May 16.
4/Includes 1/2 discharge for June 24, composites of several samples collected on June 24.
5/Includes 1/4 discharge for Sept. 10, composites of several samples collected on Sept. 10.
6/Includes 1/2 discharge for Sept. 10, composites of several samples collected on Sept. 10.

COLORADO RIVER BASIN (TEXAS)--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN COLORADO RIVER BASIN (TEXAS) IN TEXAS

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Specific conductance (K×10⁶ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
										Total	Noncarbonate
COLORADO RIVER AT SUSPENSION BRIDGE NEAR IRA											
July 7, 1947	2,020	--	--	--	99	1,050	6,990	--	--	--	--
July 8	2,080	--	--	--	121	1,140	7,260	--	--	--	--
BULL CREEK NEAR IRA											
Apr. 30, 1947	336	102	78	489	131	609	635	--	1,980	575	468
BLUFF CREEK NEAR IRA											
Feb. 6, 1947	271	--	--	--	--	384	510	--	--	--	--
Apr. 30	247	144	68	255	94	351	532	--	1,400	639	562
CANYON CREEK NEAR COLORADO CITY											
Feb. 13, 1947	208	--	--	--	--	490	155	--	--	--	--
Apr. 30	223	59	67	350	197	759	165	--	1,500	422	261
DEEP CREEK NEAR COLORADO CITY											
Apr. 30, 1947	140	100	47	113	112	431	105	--	917	443	351
May 1	623	212	235	983	101	2,210	885	--	4,570	1,500	1,410
LONE WOLF CREEK AT COLORADO CITY											
Apr. 30, 1947	372	340	273	242	136	1,980	230	--	3,130	1,970	1,860
NORTH CHAMPLIN CREEK NEAR COLORADO CITY											
June 22, 1947	107	--	--	--	155	218	109	--	--	--	--
July 11	73.1	--	--	--	147	150	71	--	--	--	--
July 11	42.2	--	--	--	120	55	36	--	--	--	--
July 14	87.4	--	--	--	179	177	91	--	--	--	--

COLORADO RIVER NEAR ROBERT LEE											
Sept. 16-17, 1947----	116	53	13	162	92	110	245	3.8	698	186	110
Sept. 18-20 ---------	227	84	21	342	89	182	550	1.5	1,220	296	223
Sept. 21-31 ---------	228	94	24	350	122	251	418	2.8	1,300	333	233
COLORADO RIVER NEAR SAN SABA											
Sept. 18, 1947-------	134	89	30	151	184	195	225	2.2	837	346	194
Sept. 19 ------------	222	136	41	273	148	303	470	3.2	1,300	508	386
Sept. 20 ------------	342	163	56	493	156	391	830	3.2	2,010	638	509
Sept. 21-30----------	198	118	40	240	182	288	375	2.2	1,150	459	310
NORTH CONCHO RIVER AT SAN ANGELO											
Sept. 16, 1947-------	150	75	40	180	261	100	300	1.8	920	352	138
SOUTH CONCHO RIVER NEAR SAN ANGELO											
Sept. 16, 1947-------	62.8	47	22	53	226	36	71	0.5	362	208	23
SAN SABA RIVER NEAR SAN SABA											
Sept. 16, 1947-------	38.1	24	32	7.1	212	12	13	2.8	222	192	18

RIO GRANDE BASIN

RIO GRANDE NEAR LOBATOS, COLO.

LOCATION.--Two and one-half miles south of Lasauses, Conejos County, 7 miles downstream from Conejos River, 4 miles upstream from Culebra Creek, and 11 miles upstream from gaging station near Lobatos, Conejos County.
DRAINAGE AREA.--7,700 square miles above gaging station (including 2,940 square miles in closed basin).
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 517 parts per million Aug. 12-16; minimum, 104 parts per million May 2-10.
Total hardness: Maximum, 228 parts per million June 30, July 1-8; minimum, 56 parts per million May 2-10.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088. Records of specific conductance of daily samples are available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 11-20, 1946 ---	73.4	7.8	43.4	35	0.03	39	8.5	55	6.6	143	119	13	0.5	0.5	0.4	348	0.47	69	132	16	46
Oct. 21-31 ---------	74.1	7.7	45.9	35	.02	42	9.3	43	6.4	141	104	13	.5	.8	.4	324	.44	65	143	28	38
Nov. 1-9 ----------	240	7.7	38.5	35	.09	37	7.1	35	4.0	128	79	10	.4	1.5	.6	272	.34	176	121	16	38
Nov. 11-17, 19-20 --	398	7.6	24.9	30	.09	26	5.1	18	3.6	91	44	5.0	.4	1.4	--	178	.24	191	86	12	30
Nov. 21-30---------	409	7.6	25.3	29	.12	26	5.5	21	4.0	99	47	5.4	.2	1.1	.6	188	.26	208	88	6	33
Dec. 1, 3-10 -------	378	7.7	25.6	33	.02	26	8.5	9.2	6.9	95	40	6.0	.2	.9	.4	178	.24	182	100	22	16
Dec. 11-20---------	293	7.9	26.2	25	.03	27	6.6	13	7.7	98	41	5.9	.4	1.0	.2	176	.24	139	94	14	22
Dec. 21-31---------	251	7.8	27.7	29	.03	30	6.4	14	6.9	105	43	5.8	.4	1.0	.2	188	.26	127	102	16	22
Jan. 1-10, 1947 ----	240	7.7	29.7	35	.02	32	7.2	13	7.5	114	41	6.9	.2	2.2	.2	201	.27	130	110	16	20
Jan. 11-20 ---------	231	7.8	25.2	33	.03	26	5.7	13	7.5	99	32	6.2	.2	3.1	.2	176	.24	110	88	8	22
Jan. 21-31 ---------	251	7.8	23.7	37	.03	25	5.6	14	6.7	101	31	5.2	.2	1.1	.2	176	.24	119	86	2	24
Feb. 1-10----------	295	8.1	24.1	31	.03	25	4.6	15	4.3	101	28	3.8	.6	.6	.0	163	.22	130	82	0	27
Feb. 11-20---------	334	8.1	21.8	29	.03	23	3.9	16	4.6	96	26	4.5	.4	.5	.0	155	.21	140	74	0	30
Feb. 21-28---------	343	8.0	24.7	30	.03	28	4.2	16	4.6	101	33	6.0	.6	1.2	.0	173	.24	160	88	4	27
Mar. 2-4, 6-10-----	346	8.0	27.4	32	.05	29	5.3	19	3.5	105	41	6.4	.4	1.2	.0	190	.26	177	94	8	29
Mar. 11-20---------	259	8.0	34.9	29	.09	36	7.6	22	6.2	122	60	8.9	.6	1.0	.0	231	.31	162	121	21	27
Mar. 21-31---------	166	7.9	41.8	34	.01	44	10	27	5.3	135	84	12	.5	1.5	.2	285	.39	128	151	40	27
Apr. 1-10----------	112	7.6	45.0	29	.02	45	9.7	34	4.5	137	97	12	.5	.9	.1	300	.41	91	152	40	32
Apr. 11-13, 15-20 --	126	7.6	40.6	31	.02	40	8.8	32	4.8	139	77	11	.6	.8	.1	275	.37	94	136	22	33
Apr. 21-30, May 1 --	403	7.6	27.4	21	.08	27	6.6	19	4.6	100	47	6.5	.6	.8	.0	182	.25	198	94	12	29
May 2-10----------	1,339	7.7	14.4	22	.17	14	5.0	7.6	3.2	64	15	4.2	.6	.8	.0	104	.14	376	56	3	22
May 11-20 ---------	1,217	7.5	24.1	22	.06	26	6.5	13	4.0	87	43	4.5	.6	.8	.0	163	.22	536	92	20	23
May 21-23, 25-30---	814	7.4	38.3	23	.02	37	8.0	27	5.0	106	85	9.0	.6	.7	.1	248	.34	545	126	38	31

June 1-10	584	8.1	32.4	20	.09	34	7.1	23	6.4	109	66	8.0	.5	1.2	.2	220	.30	347	114	24	29
June 11-12, 15-20	240	7.8	41.0	27	.02	40	8.6	33	5.8	121	97	8.5	.3	1.1	.3	281	.38	182	136	36	33
June 21-29	347	7.8	25.4	25	.04	29	5.4	15	4.6	125	25	2.5	.4	.9	.9	169	.23	158	94	0	25
June 30, July 1-8	1/209	7.6	72.8	25	.02	67	15	69	6.6	170	206	21	.7	1.4	.2	495	.67	279	228	89	39
July 9-10	(1/)	--	20.7	--	--	--	--	--	--	221	--	--	--	--	--	--	--	--	--	--	--
July 11-16	2/198	7.6	60.4	27	.04	56	12	59	7.2	176	143	18	.7	1.4	.3	411	.56	220	189	45	40
July 17-20	2/252	7.8	25.3	35	.25	27	5.7	21		132	22	1.8	.5	1.2	.3	179	.24	122	91	0	33
July 22-26, 28-31	121	7.8	74.5	31	.02	64	14	78	6.4	198	186	25	.8	1.2	.8	504	.69	165	217	55	43
Aug. 1-6	3/45.4	8.1	71.0	39	.05	63	13	68	9.6	188	176	25	.9	1.1	.8	488	.66	60	210	56	40
Aug. 7-11	(3/)	8.2	31.0	48	.38	25	6.7	36	5.6	162	34	2.0	.8	.9	.4	239	.33	--	90	0	45
Aug. 12-16	4/75.0	8.1	75.4	41	.14	64	15	75	11	187	188	28	.9	1.5	1.0	517	.70	105	221	68	41
Aug. 17-20	(4/)	8.0	31.1	41	.05	32	6.4	21	6.0	133	41	5.0	.5	.8	.4	219	.30	--	106	0	29
Aug. 21-25, 27-29, 31	5/181	7.8	40.9	39	.06	38	8.3	35	6.2	144	74	11	.6	1.1	.2	284	.39	139	129	11	36
Aug. 26	(5/)	--	26.7	--	--	--	--	--	--	86	--	--	--	--	--	--	--	--	--	--	--
Sept. 1-10	146	7.9	48.8	39	.05	46	9.2	44	4.8	155	101	14	.6	1.1	.4	336	.46	132	153	26	37
Sept. 11-15, 17-20	174	7.4	40.9	31	.05	38	8.2	34	4.5	132	82	8.8	.5	.9	.4	273	.37	128	128	20	35
Sept. 21-30	305	7.5	37.6	28	.04	36	5.8	31	3.8	118	74	9.5	.5	1.0	.4	248	.34	204	114	18	36
Weighted average	310	--	30.8	27	0.06	31	6.9	22	5.1	107	57	7.4	0.5	1.0	0.2	211	0.29	177	106	18	30

1/ Discharge for July 9-10 included with discharge reported for June 30, July 1-8.
2/ Discharge for July 16 included with discharge reported for July 17-20.
3/ Discharge for Aug. 7-11 included with discharge reported for Aug. 1-6.
4/ Discharge for Aug. 17-20 included with discharge reported for Aug. 12-16.
5/ Discharge for Aug. 26 included with discharge reported for Aug. 21-25, 27-29, 31.

RIO GRANDE BASIN--Continued

RIO GRANDE AT OTOWI BRIDGE NEAR SAN ILDEFONSO, N. MEX.

LOCATION.--At gaging station 100 feet downstream from bridge on State Highway 4, 1¾ miles southwest of San Ildefonso Pueblo, Santa Fe County, 2½ miles downstream from Rio Pojoaque, and 7 miles west of Pojoaque, Santa Fe County.
DRAINAGE AREA.--14,300 square miles, including 2,940 square miles in closed basin in northern part of San Luis Valley, Colo.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 462 parts per million Aug. 15, 18-20; minimum, 167 parts per million May 11-14, 16-20.
Total hardness: Maximum, 274 parts per million Aug. 15, 18-20; minimum, 110 parts per million May 11-14, 16-20.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088. Records of specific conductance of daily samples are available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 10-20, 1946 -	408	7.5	41.8	25	0.04	47	8.6	29	4.8	166	66	10	0.6	1.0	0.4	274	0.37	302	153	17	28
Oct. 21-31 -------	405	7.6	38.3	29	.03	43	9.4	30	4.2	162	64	9.0	.6	.5	.2	270	.37	295	146	14	30
Nov. 1-10 -------	475	7.7	40.5	27	.03	48	10	29	3.2	170	71	9.2	.6	.9	.2	283	.38	363	161	22	28
Nov. 11-20 ------	1,380	7.8	36.5	25	.03	47	9.3	23	4.0	149	68	5.8	.4	1.4	.2	257	.35	958	156	34	24
Nov. 21-30 ------	2,058	7.8	34.2	21	.03	48	8.7	16	2.9	142	69	4.0	.4	.9	.2	241	.33	1,340	156	40	18
Dec. 1-10 -------	1,933	7.8	33.0	21	.03	45	9.8	18	3.5	140	71	4.0	.4	1.0	.2	243	.33	1,270	153	38	20
Dec. 11-20 ------	1,717	7.7	35.2	20	.03	43	10	18	3.4	127	75	4.0	.4	1.0	.2	237	.32	1,100	148	44	20
Dec. 21-31 ------	731	7.7	33.9	29	.02	41	8.7	24	4.0	143	60	7.2	.5	1.2	.2	246	.33	486	138	22	27
Jan. 1-10, 1947 --	549	7.7	34.6	34	.03	40	9.0	24	2.9	149	50	11	.6	1.0	.2	246	.33	365	137	15	27
Jan. 11-20 ------	578	7.7	32.4	32	.03	38	8.1	28	4.6	145	54	7.5	.6	.9	.2	245	.33	382	128	10	31
Jan. 21-31 ------	596	7.7	32.2	30	.03	36	7.6	23	4.0	142	45	7.8	.6	.7	.2	225	.31	362	121	41	28
Feb. 1-8, 10 -----	636	8.0	32.7	27	.03	36	7.9	18	4.6	136	44	6.4	.4	.5	.2	212	.29	364	122	11	24
Feb. 11-20 ------	753	8.0	36.8	26	.04	40	8.3	23	4.2	135	66	7.1	.4	.5	.1	242	.33	492	134	24	27
Feb. 21-28 ------	714	8.0	35.0	25	.04	39	8.0	21	3.8	134	58	6.6	.6	.5	.6	229	.31	441	130	20	26
Mar. 1-10 -------	720	7.9	34.8	24	.03	39	8.0	19	5.6	136	54	7.1	.6	.5	.4	225	.31	437	130	19	23
Mar. 11-20 ------	638	7.9	39.7	23	.03	41	9.0	23	6.1	143	65	8.1	.6	.5	.3	247	.34	425	140	22	26
Mar. 21-31 ------	645	7.9	39.2	24	.04	43	9.1	23	6.6	143	70	8.3	.6	.5	.4	256	.35	446	145	28	25
Apr. 1-10 -------	676	7.9	36.8	22	.04	43	8.7	20	4.0	143	61	7.5	.4	.5	.4	238	.32	434	144	26	23
Apr. 11-20 ------	611	8.0	37.2	29	.02	42	8.8	23	3.4	147	63	5.5	.6	.6	.0	248	.34	409	141	20	26
Apr. 21-22, 24-30	1,250	8.0	30.4	25	.05	37	6.6	16	3.0	124	45	5.5	.6	1.2	.0	198	.27	668	120	18	22
May 1-10 --------	2,526	7.9	28.9	18	.06	40	5.7	11	3.0	132	33	4.5	.6	1.6	.0	180	.24	1,230	124	16	16
May 11-14, 16-20-	3,300	7.9	25.4	19	.06	34	6.0	9.9	2.9	109	36	3.5	.6	1.0	.0	167	.23	1,490	110	20	16
May 21-31 -------	1,631	7.8	32.8	19	.04	37	7.6	20	4.6	119	58	6.5	.4	1.0	.0	213	.29	938	124	26	25

June 1-10	1,071	7.8	34.7	22	.04	38	8.2	23	5.3	122	66	9.0	.4	.6	.0	233	.32	674	128	28	27
June 11-12, 14-19	1,015	7.8	30.7	20	.02	36	8.2	18	6.4	114	56	6.5	.4	.6	.0	208	.28	570	124	30	23
June 13	--	--	56.8	--	--	--	--	--	--	144	156	14	--	--	--	--	--	--	--	--	--
June 20-30	1,338	7.8	33.5	21	.05	40	8.0	16	4.6	120	65	4.5	.4	1.1	.1	220	.30	795	133	34	20
July 1-10	1,102	7.8	36.9	25	.03	43	8.0	25	2.6	134	73	6.0	.4	.9	.1	250	.34	744	140	30	27
July 11-20	1,228	7.9	37.9	28	.04	40	8.8	27	2.4	122	83	6.0	.4	.4	.1	256	.35	849	136	36	30
July 21-31	778	7.9	40.7	26	.05	44	9.0	31	2.4	139	87	8.0	.4	.6	.2	277	.38	582	147	33	31
Aug. 1-10	1,334	8.0	35.8	19	.06	43	8.0	21	2.2	128	75	4.0	.3	1.1	.1	237	.32	854	140	36	24
Aug. 11-14, 16	1,192	7.9	36.5	22	.08	46	7.9	20	2.2	134	72	4.5	.3	1.7	.1	243	.33	782	148	38	22
Aug. 15, 18-20	726	7.8	66.7	24	.11	90	12	40	3.9	193	186	9.2	.6	1.2	.6	462	.63	906	274	116	24
Aug. 21-31	661	7.9	50.3	26	.38	59	9.4	36	2.6	172	110	9.8	.6	1.2	.5	340	.46	607	186	44	29
Sept. 1-10	499	7.9	53.5	26	.05	69	9.4	34	3.0	169	129	10	.5	.7	.5	365	.50	492	210	72	26
Sept. 11-18	450	8.0	45.9	25	.07	51	8.1	36	2.8	165	90	10	.6	.6	.4	305	.41	371	160	26	32
Sept. 22-30	523	8.0	35.0	26	.13	38	7.3	28	2.8	134	63	7.2	.5	.4	.5	239	.33	337	125	15	32
Weighted average	1,009	--	34.8	23	0.05	42	8.2	20	3.6	135	64	5.8	0.5	0.9	0.2	235	0.32	640	138	28	23

RIO GRANDE BASIN--Continued

RIO GRANDE AT SAN ACACIA, N. MEX.

LOCATION.--At San Acacia diversion dam which is 0.2 mile above the gaging station at San Acacia, Socorro County, half a mile east of San Acacia, and 2 miles downstream from Rio Salado.
DRAINAGE AREA.--26,770 square miles, including 2,940 square miles in closed basin in northern part of San Luis Valley, Colorado.
RECORDS AVAILABLE.--Chemical analyses: July 1937 to December 1937, March 1939 to September 1947.
Sediment loads: July 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 2,440 parts per million Aug. 10; minimum, 303 parts per million May 11-14, 16-20.
Total hardness: Maximum, 961 parts per million Aug. 10; minimum, 158 parts per million May 11-14, 16-20.
Sediment loads: Maximum, 1,570,000 tons per day Aug. 17; minimum, 3 tons per day June 14.
EXTREMES, 1937, 1939-47.--Dissolved solids: Maximum, 2,470 parts per million July 18, 1946; minimum, 183 parts per million June 1-10, 1942.
Total hardness: Maximum, 1,180 parts per million Aug. 13-14, 1945; minimum, 101 parts per million June 11-20, 1942.
Sediment loads, 1946-47: Maximum, 1,570,000 tons per day Aug. 17, 1947; minimum, 0 on several days in 1946.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088. Water discharges reported do not include flow in Socorro Main Canal North. Records of specific conductance of daily samples are available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 1-5, 9-10, 1946-	187	8.0	109	26	0.02	101	19	113	6.0	190	337	52	0.6	1.6	0.6	750	1.02	379	330	174	42
Oct. 6-8	448	7.8	194	16	.02	196	39	196	8.4	197	819	49	.5	2.0	.8	1,420	1.93	1,720	650	488	39
Oct. 11-20	194	8.0	82.4	28	.02	76	15	85	5.6	215	203	36	.7	2.0	.6	557	.76	292	251	75	42
Oct. 21-31	101	7.7	91.6	30	.02	86	17	95	7.0	243	223	47	.5	1.0	.6	633	.86	173	284	86	41
Nov. 1-10	228	7.8	83.4	30	.01	79	16	92	5.6	229	210	43	.5	1.6	.6	591	.80	364	263	76	42
Nov. 11-20	1,026	7.8	70.8	26	.01	71	13	69	5.2	205	165	31	.5	1.9	.8	484	.66	1,340	230	62	39
Nov. 21-30	2,002	7.9	50.5	22	.02	55	9.6	46	4.4	159	121	17	.3	1.7	.4	355	.48	1,920	176	46	36
Dec. 1-10	1,922	8.0	50.8	28	.01	56	12	37	4.0	164	102	17	.4	1.2	.6	338	.46	1,750	189	54	29
Dec. 11-20	1,831	7.8	49.4	29	.01	55	12	33	4.6	161	103	17	.4	1.3	.6	335	.46	1,660	186	54	27
Dec. 21-31	992	7.8	56.8	28	.01	59	12	47	4.0	177	117	24	.4	1.3	.6	380	.52	1,020	196	52	33
Jan. 1, 4-5, 9, 1947 -	615	7.9	61.5	29	.01	62	13	57	3.8	190	129	31	.7	1.2	.6	420	.57	697	208	52	37
Jan. 12-14, 20	755	7.9	60.6	29	.01	60	13	59	5.4	185	122	36	.4	1.2	.3	417	.57	850	203	52	38
Jan. 21-25, 27-30	656	7.8	61.6	29	.01	60	13	60	5.4	186	123	36	.5	1.2	.6	420	.57	744	203	50	38
Feb. 1-10	653	7.9	63.7	35	.01	64	19	46	4.4	190	132	34	.5	1.6	.4	430	.58	758	236	82	29
Feb. 11-20	634	8.0	62.0	38	.01	64	17	45	4.6	187	127	32	.5	1.5	.4	422	.57	722	230	76	29
Feb. 22-25, 28	629	8.0	62.6	33	.02	66	18	44	3.8	183	134	33	.5	1.5	.4	424	.58	720	238	88	28
Mar. 1-10	526	8.1	62.3	29	.01	66	18	43	4.2	181	135	33	.5	1.4	.4	419	.57	595	238	90	28
Mar. 11-20	190	8.0	71.3	36	.02	70	19	59	4.4	199	156	41	.5	1.4	.4	485	.66	249	252	90	33
Mar. 21-31	80.6	8.0	81.3	36	.01	78	24	65	5.0	217	184	49	.5	1.4	.5	550	.75	120	293	115	32

Apr. 1-10	85.8	8.2	77.3	29	.04	62	17	80	10	184	182	48	.5	1.1	.5	520	.71	120	224	74	42
Apr. 11-20	29.6	8.0	79.7	26	.02	53	18	93	5.6	153	205	53	.5	.3	.5	530	.72	42.4	206	80	49
Apr. 21-23, 25-30	231	8.1	76.0	31	.02	61	16	80	6.0	176	181	46	.5	1.2	.5	509	.69	317	218	74	44
May 1-10	1,234	8.2	54.8	24	.02	54	13	44	5.8	164	112	26	.5	1.6	.5	362	.49	1,210	188	54	33
May 11-14, 16-20	3,021	8.2	45.7	20	.01	45	11	35	6.4	132	98	20	.5	2.3	.4	303	.41	2,470	158	50	31
May 21-31	986	8.2	52.0	19	.02	53	12	41	5.6	158	110	22	.5	.5	.4	341	.46	908	182	52	32
June 1-10	320	7.8	66.7	29	.03	60	13	64	6.4	179	152	34	.5	.8	.4	448	.61	387	203	56	40
June 11-20	38.6	7.9	99.1	28	.03	77	20	111	6.2	175	262	68	.6	.9	.4	660	.90	69	274	130	46
June 21-30	220	8.1	71.8	28	.02	66	14	71	6.6	188	168	36	.5	1.0	.4	484	.66	287	222	68	40
July 1-10	198	8.0	68.3	25	.01	56	12	76	6.2	165	170	34	.5	1.6	.4	463	.63	248	189	54	46
July 2	(1/)	--	187	--	--	--	--	--	--	174	--	--	--	--	--	--	--	--	--	--	--
July 9	(1/)	--	146	--	--	--	--	--	--	200	--	--	--	--	--	--	--	--	--	--	--
July 11-20	185	8.2	70.5	26	.02	62	13	72	5.8	167	177	34	.5	1.5	.4	474	.64	237	208	71	42
July 21-31	183	8.2	72.6	26	.01	64	13	76	6.4	182	177	35	.5	1.2	.4	489	.67	242	213	64	43
Aug. 1-2, 4-9	9.9	7.8	88.3	24	.02	49	16	115	8.4	135	240	62	.6	.6	.8	582	.79	16	188	78	56
Aug. 10	1,000	--	307	--	--	278	65	409		176	1,490	108	.7	1.1	--	2,440	3.32	6,590	961	817	48
Aug. 11	600	--	163	--	--	125	29	212		219	591	66	1.1	1.2	--	1,130	1.54	1,830	431	252	52
Aug. 12	416	--	98.6	--	--	82	18	112		172	293	48	1.0	6.4	--	645	.88	724	278	138	47
Aug. 13-20	2,140	7.8	163	15	.03	154	30	193	8.6	194	656	65	.9	2.1	.8	1,220	1.66	7,050	508	348	45
Aug. 21-25, 27-30	2/1,742	7.6	125	19	.02	116	22	130	11	179	448	42	.7	2.5	1.2	879	1.20	4,130	380	234	42
Aug. 26	2,020	7.9	165	--	--	192	32	150		162	691	55	1.0	5.6	.8	1,210	1.65	6,600	610	478	35
Aug. 31, Sept. 1-8	2/182	8.1	91.7	26	.02	89	16	86	8.4	182	268	40	.8	2.5	1.2	626	.85	308	288	139	39
Sept. 9-13	423	8.2	131	21	.02	128	23	134	10	168	485	53	.9	4.7	.8	942	1.28	1,080	414	276	41
Sept. 14-20	139	8.2	96.2	29	.02	84	16	102	12	187	278	47	.6	2.6	.8	663	.90	249	276	122	43
Sept. 21-30	33.0	8.2	109	25	.02	98	19	121	9.6	186	349	49	.8	2.8	.6	766	1.04	68	322	170	44
Weighted average	672	--	73.4	24	0.02	72	15	69	5.9	172	205	31	0.5	1.7	0.6	509	0.69	924	241	100	38

1/ Discharge for July 2 and July 9 included with discharge reported for July 1-10.
2/ Discharge for Aug. 31 included with discharge reported for Aug. 21-25, 27-30.

RIO GRANDE BASIN--Continued

RIO GRANDE AT SAN ACACIA, N. MEX.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day
1	12	0.56	181	123	0.34	1,130	2,030	0.98	53,700
2	12	1.51	489	64	.32	553	1,950	1.06	55,800
3	6	.09	15	102	.39	1,070	1,950	.65	34,200
4	6	.14	23	131	1.31	4,630	1,980	.71	38,000
5	6	.26	42	250	.71	4,790	2,110	.76	43,300
6	240	1/16.0	104,000	456	.79	9,730	1,860	.68	34,100
7	282	7.95	60,500	375	.67	6,780	1,810	.80	39,100
8	822	1/11.4	253,000	317	.44	3,770	1,810	.67	32,700
9	804	6.81	148,000	263	.46	3,270	1,860	.64	32,100
10	465	4.51	56,600	203	.49	2,690	1,860	.87	43,700
11	346	3.07	28,700	302	.53	4,320	2,030	.62	34,000
12	244	1.68	11,100	383	.56	5,790	1,950	.74	39,000
13	226	1.49	9,090	509	.49	6,730	1,860	.63	31,600
14	186	1.15	5,780	483	.51	6,650	1,860	1.11	55,700
15	214	2.02	11,700	432	.86	10,000	1,660	1.11	49,800
16	203	.84	4,600	407	1.10	12,100	1,670	.77	34,700
17	156	.65	2,740	1,350	3.19	116,000	1,890	.94	48,000
18	136	.76	2,790	1,960	1.84	97,400	1,820	.74	36,400
19	106	.42	1,200	2,110	1.80	103,000	1,810	.55	26,900
20	127	.45	1,540	2,090	1.88	106,000	1,760	1.30	61,800
21	151	.82	3,340	1,700	1.52	69,800	1,480	1.38	55,100
22	110	.37	1,100	1,600	1.37	59,200	1,450	.90	35,200
23	203	.37	2,030	1,790	1.52	73,500	1,300	1.68	59,000
24	52	.19	267	2,070	1.37	76,600	969	.65	17,000
25	50	.18	243	2,200	1.33	79,000	920	.68	16,900
26	34	.18	165	2,140	1.22	70,500	815	.40	8,800
27	50	.19	256	2,110	.92	52,400	860	.31	7,200
28	102	.18	496	2,050	2/ .90	49,800	804	.40	8,680
29	94	.37	939	2,160	1.06	61,800	849	.47	10,800
30	151	.41	1,670	2,200	1.31	77,800	826	.61	13,600
31	119	.38	1,220				634	1.06	18,100
Total load (tons)	--	--	713,800	--	--	1,176,800	--	--	1,075,000
	January			February			March		
1	758	1.21	24,800	632	0.29	4,950	716	0.20	3,870
2	716	.47	9,090	652	.25	4,400	705	.25	4,760
3	620	.48	8,040	726	.35	6,860	663	.24	4,300
4	550	.60	8,910	623	.21	3,530	613	.22	3,640
5	550	.61	9,060	694	.38	7,120	584	.16	2,520
6	500	.28	3,780	594	.37	5,930	399	.13	1,400
7	440	.14	1,660	642	.48	8,320	346	.15	1,400
8	555	.24	3,600	642	.23	3,990	309	.08	667
9	726	.36	7,060	663	.30	5,370	474	.21	2,690
10	736	.40	7,950	663	.21	3,760	448	.22	2,660
11	804	.62	13,500	574	.15	2,320	391	.18	1,900
12	716	.88	17,000	584	.21	3,310	324	.14	1,220
13	674	.60	10,900	684	.20	3,690	220	.15	891
14	804	.49	10,600	663	2/.16	2,860	156	.12	505
15	747	.92	18,600	632	.11	1,880	131	.14	495
16	674	.42	7,640	747	.17	3,430	175	2/.13	614
17	849	.68	15,600	623	.20	3,360	151	.11	448
18	860	.70	16,300	623	2/.18	3,030	136	.14	514
19	758	.83	17,000	555	.15	2,250	141	.15	571
20	663	.57	10,200	652	.29	5,110	77	.10	208
21	623	.28	4,710	674	.17	3,090	54	2/.08	116
22	663	.24	4,300	705	2/.50	9,520	32	.06	52
23	747	.71	14,300	632	.33	5,630	67	1.14	2,060
24	747	.86	17,300	574	.19	2,940	64	2/.10	173
25	674	.50	9,100	603	2/.21	3,420	237	.16	1,020
26	574	.59	9,140	603	2/.22	3,580	131	.15	531
27	623	.21	3,530	536	.23	3,330	87	.15	352
28	694	.12	2,250	705	.23	4,380	77	.10	208
29	613	.50	8,280	--	--	--	52	.07	98
30	555	.63	9,440	--	--	--	44	.10	119
31	705	.33	6,280	--	--	--	42	.06	68
Total load (tons)	--	--	309,900	--	--	121,400	--	--	40,070

RIO GRANDE BASIN--Continued

RIO GRANDE AT SAN ACACIA, N. MEX.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day
1	37	0.10	100	509	0.20	2,750	758	0.20	4,090
2	50	.15	202	399	.18	1,940	804	.20	4,340
3	28	.18	136	282	.13	990	663	.13	2,330
4	37	.10	100	416	.13	1,460	331	.12	1,070
5	57	.14	215	456	.16	1,970	226	.14	854
6	83	.14	314	1,300	.58	20,400	175	.08	378
7	186	2/ .07	352	1,880	.75	38,070	87	.07	164
8	146	.14	552	2,240	.79	47,800	28	.05	38
9	127	.14	480	2,350	.88	55,800	57	.08	123
10	107	.14	404	2,510	.56	38,000	74	.14	280
11	57	.08	123	3,410	1.37	126,000	50	.06	81
12	44	.10	119	4,830	1.33	173,000	25	.09	61
13	33	2/ .06	53	4,690	2.16	274,000	12	.06	19
14	23	2/ .06	37	4,020	.99	107,000	3	.04	3
15	25	.07	47	3,150	2/ .90	76,500	3	.11	9
16	37	.12	120	2,550	.78	53,700	11	.05	15
17	27	.14	102	2,140	.50	28,900	41	.06	66
18	37	.17	170	2,240	.39	23,600	83	.11	247
19	2	.14	8	2,020	.41	22,400	106	2.52	7,210
20	11	2/ .16	48	1,160	.29	9,080	52	.40	562
21	11	.17	50	1,080	.24	7,000	34	.36	330
22	11	.41	122	920	.13	3,230	57	.18	277
23	10	.14	38	981	.18	4,770	64	.07	121
24	32	2/ .12	104	1,110	.37	11,100	119	.12	386
25	52	.13	183	1,360	.29	10,600	309	.24	2,000
26	51	.30	413	1,160	.26	8,140	324	.20	1,750
27	399	.88	9,480	1,010	.26	7,090	331	.15	1,340
28	474	.22	2,820	933	.17	4,280	407	.12	1,320
29	594	.26	4,170	884	.10	2,390	375	.10	1,010
30	674	.28	5,100	694	.10	1,870	180	.08	389
31	--	--	--	716	.08	1,550	--	--	--
Total load (tons)	--	--	26,160	--	--	1,165,400	--	--	30,866

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day
1	141	0.16	609	12	0.04	13	263	0.88	6,250
2	385	1/3.34	34,700	11	.04	12	160	.43	1,860
3	296	2/ .48	3,840	11	2/ .06	18	94	.26	660
4	289	.46	3,590	11	.07	21	115	2/ .45	1,400
5	331	.30	2,680	9	.02	5	191	2/1.62	8,350
6	244	.19	1,250	7	.04	8	204	1.68	9,250
7	115	.15	466	9	.03	7	270	2.06	15,000
8	44	.14	166	9	.02	5	160	1/1.98	8,550
9	70	2/ .82	1,550	10	.02	5	796	1/7.96	171,000
10	60	.32	502	1,000	1/16.5	446,000	812	1/7.25	159,000
11	40	.12	130	600	1/ 8.84	143,000	263	2/1.47	10,400
12	23	.14	87	416	2.25	25,300	141	1.70	6,470
13	60	.10	162	660	1/ 4.63	82,500	102	1.25	3,440
14	77	.12	249	1,250	1/11.2	379,000	87	.61	1,430
15	102	.14	386	1,280	1/ 8.25	285,000	47	.46	584
16	244	.39	2,570	1,340	1/ 9.15	331,000	23	.36	224
17	302	.22	1,790	4,010	1/14.5	1,570,000	19	.24	123
18	175	.24	1,130	4,090	1/12.0	1,330,000	14	1/1.31	495
19	424	2/ .65	7,440	2,990	1/12.3	993,000	289	1/6.70	52,300
20	407	2/ .48	5,270	1,500	7.62	309,000	493	1/4.21	56,000
21	509	.30	4,120	1,460	1/ 7.15	282,000	119	2.90	9,320
22	416	.29	3,260	1,980	1/ 9.52	509,000	74	2/2.85	5,690
23	474	.24	3,070	4,540	1/11.0	1,350,000	32	2.04	1,760
24	353	.29	2,760	3,410	6.05	557,000	18	1.54	748
25	115	.14	435	2,820	1/ 8.47	645,000	16	.86	372
26	52	.14	197	2,020	1/ 7.22	394,000	11	.37	110
27	28	.13	98	1,060	2/ 4.50	129,000	6	.37	60
28	23	.09	56	694	3.83	71,800	32	.42	363
29	23	.08	50	492	2.72	36,100	12	.46	149
30	10	.09	24	465	2.92	36,700	10	.27	73
31	10	.05	14	500	2.10	28,400	--	--	--
Total load (tons)	--	--	82,650	--	--	9,932,900	--	--	531,400

Total load for year (tons) 15,210,000

1/ Subdivided day.

2/ Interpolated or computed on the basis of records from near by station.

RIO GRANDE BASIN--Continued

RIO GRANDE AT SAN ACACIA, N. MEX.--Continued

Size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Time	Mean discharge (second-feet)	Suspended sediment													1/ Remarks
			Mean daily concentration (percent)	Tons per day	Weight of material in tube (grams)	Percent finer than indicated size (in millimeters)										
						0.00195	0.00276	0.0039	0.0055	0.0078	0.0110	0.0156	0.0312	0.0625	0.125	0.250	0.500	
Oct. 5, 1946	2:00 p.m.	6	0.26	42	0.1454	68	--	--	--	--	--	--	--	--	--	--	--	C
Oct. 5	2:00 p.m.	6	.26	42	.0365	31	--	--	--	--	--	--	--	--	--	--	--	A, C
Oct. 10	7:30 a.m.	465	4.51	56,600	.5155	69	--	--	--	--	--	--	--	--	--	--	--	C
Oct. 10	7:30 a.m.	465	4.51	56,600	.5433	2	--	--	--	--	--	--	--	--	--	--	--	A, C
Oct. 13	6:00 a.m.	226	1.49	9,090	.4120	40	--	--	--	--	--	--	--	--	--	--	--	C
Oct. 13	6:00 a.m.	226	1.49	9,090	.3142	2	--	--	--	--	--	--	--	--	--	--	--	A, C
Oct. 16	6:00 a.m.	203	.84	4,600	.4856	30	--	--	--	--	--	--	--	--	--	--	--	C
Oct. 16	6:00 a.m.	203	.84	4,600	.3737	2	--	--	--	--	--	--	--	--	--	--	--	A, C
Oct. 20	8:00 a.m.	127	.45	1,540	.2326	55	--	--	--	--	--	--	--	--	--	--	--	C
Oct. 20	8:00 a.m.	127	.45	1,540	.1463	6	--	--	--	--	--	--	--	--	--	--	--	A, C
Nov. 16	11:10 a.m.	407	1.10	12,100	2.0294	--	6	9	17	20	50	55	71	83	95	99	100	A
Nov. 16	1:52 p.m.	407	1.10	12,100	3.3489	2	3	4	13	22	36	44	55	78	95	99	100	A
Nov. 16 2/	2:40 p.m.	407	1.10	12,100	2.6437	2	4	5	11	24	41	49	63	80	92	99	100	A
Nov. 19	12:00 a.m.	2,110	1.80	103,000	4.7211	1	2	3	9	15	39	54	60	79	96	100	--	A
Nov. 19 3/	2:10 p.m.	2,110	1.80	103,000	4.2541	29	30	33	38	45	47	48	68	87	98	100	--	--
Nov. 19 3/	2:10 p.m.	2,110	1.80	103,000	3.5110	2	4	6	11	19	38	53	72	82	96	99	100	A
Nov. 19	2:35 p.m.	2,110	1.80	103,000	3.3656	19	26	29	36	41	42	43	60	79	95	99	100	--
Nov. 19	2:35 p.m.	2,110	1.80	103,000	2.6102	2	3	7	12	28	41	46	59	77	96	100	--	A
Nov. 27	7:00 a.m.	2,110	.92	52,400	3.1001	--	--	--	--	--	--	--	--	71	90	99	100	D
Nov. 29	6:30 a.m.	2,160	1.06	61,800	3.4727	--	--	--	--	--	--	--	--	58	92	96	99	D
Nov. 29	4:00 p.m.	2,160	1.06	61,800	5.8131	--	--	--	--	--	--	--	--	51	82	98	99	D
Nov. 30	9:00 a.m.	2,200	1.31	77,800	7.2117	--	--	--	--	--	--	--	--	40	69	97	100	D
Nov. 30	5:00 p.m.	2,200	1.31	77,800	3.1632	--	--	--	--	--	--	--	--	48	68	95	100	D
Dec. 10	9:00 a.m.	1,860	.87	43,700	3.2509	--	--	--	--	--	--	--	--	36	67	95	99	D
Dec. 20	9:30 a.m.	1,760	1.30	61,800	3.8218	--	--	--	--	--	--	--	--	26	53	89	99	D

1/ Analysis by the bottom-withdrawal tube method, samples dispersed and settled in distilled water, except as indicated.
A. Settled in native water.
B. Sizes greater than 0.0625 mm determined by sieving.
C. Decantation method, 10 cm column in tube 1 inch in diameter.
D. Sieve method.

2/ From canal.
3/ From river at cable section.

Dec. 31	10:00 a. m.	634	1.06	18,100	3.8959	--	--	--	--	--	--	--	--	18	49	94	100	D
Jan. 10, 1947	9:15 a. m.	736	.40	7,950	1.4280	--	--	--	--	--	--	--	--	49	82	99	100	D
Jan. 20	9:00 a. m.	663	.57	10,200	2.4720	--	--	--	--	--	--	--	--	31	58	95	100	D
Jan. 31	7:30 a. m.	705	.33	6,280	1.1040	--	--	--	--	--	--	--	--	41	70	97	100	D
Feb. 1	4:00 p. m.	632	.29	4,950	1.1875	--	--	--	--	--	--	--	--	36	68	94	100	D
Feb. 6	5:00 p. m.	594	.37	5,930	1.5599	--	--	--	--	--	--	--	--	46	74	96	100	D
Feb. 11	2:00 p. m.	574	.15	2,320	.4513	--	--	--	--	--	--	--	--	50	88	97	99	D
Feb. 16	5:00 p. m.	747	.17	3,430	.5811	--	--	--	--	--	--	--	--	66	84	98	99	D
Feb. 22	2:00 p. m.	705	.50	9,520	.6328	--	--	--	--	--	--	--	--	71	91	99	100	D
Feb. 28	--	705	.23	4,380	.9579	--	--	--	--	--	--	--	--	37	76	97	100	D
Mar. 5	7:30 a. m.	584	.16	2,520	.6078	--	--	--	--	--	--	--	--	57	90	100	--	D
Mar. 10	10:00 a. m.	448	.22	2,660	.8284	--	--	--	--	--	--	--	--	42	80	100	--	D
Mar. 15	7:30 a. m.	131	.14	495	.6281	--	--	--	--	--	--	--	--	38	76	98	--	D
Mar. 20	9:00 a. m.	77	.10	208	.3322	--	--	--	--	--	--	--	--	44	77	98	--	D
Mar. 25	7:00 a. m.	237	.16	1,020	.4837	--	--	--	--	--	--	--	--	43	78	99	100	D
Mar. 30	6:45 a. m.	44	.10	119	.4494	--	--	--	--	--	--	--	--	33	56	93	99	D
Apr. 1	7:00 a. m.	37	.10	100	.2408	--	--	--	--	--	--	--	--	61	85	100	--	D
Apr. 1	6:45 p. m.	37	.10	100	1.3542	--	--	--	--	--	--	2	5	9	25	88	100	--
Apr. 11	8:30 a. m.	57	.08	123	.3816	--	--	--	--	--	--	--	--	50	78	99	100	D
Apr. 11	5:00 p. m.	57	.08	123	.1837	--	--	9	16	19	21	24	31	43	82	100	--	--
May 1	6:30 a. m.	509	.20	2,750	.7414	--	--	--	--	--	--	--	--	50	79	96	99	D
May 1	5:00 p. m.	509	.20	2,750	.3248	--	--	--	--	--	10	15	25	43	76	97	100	--
May 11	7:00 a. m.	3,410	1.37	126,000	.6391	--	--	14	16	20	24	27	40	60	87	99	100	--
May 11	7:00 a. m.	3,410	1.37	126,000	2.4729	--	--	--	--	--	--	--	--	56	85	99	100	D
May 11	6:30 p. m.	3,410	1.37	126,000	5.6897	--	--	--	--	--	--	--	--	28	49	86	99	D

1/ Analysis by the bottom-withdrawal tube method, samples dispersed and settled in distilled water, except as indicated.
A. Settled in native water.
B. Sizes greater than 0.0625 mm determined by sieving.
C. Decantation method, 10 cm column in tube 1 inch in diameter.
D. Sieve method.

RIO GRANDE BASIN--Continued

RIO GRANDE AT SAN ACACIA, N. MEX.--Continued

Size analyses of suspended sediment, water year October 1946 to September 1947--Continued

Date of collection	Time	Mean discharge (second-feet)	Suspended sediment													1/ Remarks
			Mean daily concentration (percent)	Tons per day	Weight of material in tube (grams)	Percent finer than indicated size (in millimeters)										
						0.00195	0.00276	0.0039	0.0055	0.0078	0.0110	0.0156	0.0312	0.0625	0.125	0.250	0.500	
May 21, 1947	9:00 a.m.	1,080	0.24	7,000	1.2106	--	--	--	--	--	--	--	--	55	84	99	100	D
May 21	9:00 a.m.	1,080	.24	7,000	.5493	--	21	25	28	32	34	36	46	55	91	100	--	--
May 21	5:00 p.m.	1,080	.24	7,000	.6322	--	--	--	--	--	--	--	--	58	94	100	--	D
June 1	7:00 a.m.	758	.20	4,090	.4196	--	--	--	--	--	--	--	--	48	83	99	--	D
June 11	5:45 a.m.	50	.06	81	.2264	--	--	--	--	--	--	--	--	36	73	100	--	D
June 21	6:00 a.m.	34	.36	330	.9962	--	--	--	--	--	--	--	--	97	99	100	--	D
Aug. 1	--	12	.04	13	.1058	--	--	--	--	--	--	--	--	60	78	99	100	D
Aug. 10	--	1,000	16.5	446,000	.6663	24	28	33	45	57	60	63	70	72	81	97	100	B
Aug. 11	--	600	8.84	143,000	1.1462	44	53	62	74	82	86	89	96	98	99	--	--	--
Aug. 20	--	1,500	7.62	309,000	1.3486	--	27	30	40	46	51	53	61	68	81	97	100	B
Aug. 24	--	3,410	6.05	557,000	1.2101	36	41	44	55	63	68	72	82	92	97	--	--	--

1/ Analysis by the bottom-withdrawal tube method, samples dispersed and settled in distilled water, except as indicated.
A. Settled in native water.
B. Sizes greater than 0.0625 mm determined by sieving.
C. Decantation method, 10 cm column in tube 1 inch in diameter.
D. Sieve method.

RIO GRANDE AT SAN MARCIAL, N. MEX.

LOCATION.--At gaging station at Atchison, Topeka and Santa Fe Railway bridge 1.1 miles downstream from San Marcial, Socorro County.
DRAINAGE AREA.--27,700 square miles, including 2,940 square miles in closed basin in northern part of San Luis Valley, Colo.
RECORDS AVAILABLE.--Chemical analyses: July 1946 to July 1947.
Sediment records: July 1946 to July 1947.
EXTREMES, October 1946 to July 1947.--Dissolved solids: Maximum, 1,460 parts per million Oct. 7-10; minimum, 346 parts per million Dec. 11-16, 18-20.
Total hardness: Maximum, 664 parts per million Oct. 7-10; minimum, 194 parts per million May 11-20.
Sediment loads: Maximum, 105,000 tons per day Oct. 10; minimum, 21 tons per day June 21.
EXTREMES, July 1946 to July 1947.--Dissolved solids: Maximum, 1,670 parts per million Aug. 11-16, 19-22, 1946; minimum, 346 parts per million Dec. 11-16, 18-20, 1946.
Total hardness: Maximum, 820 parts per million Aug. 11-16, 19-22, 1946; minimum, 194 parts per million May 11-20, 1947.
Sediment loads: Maximum, 151,000 tons per day Aug. 12, 1946; minimum, less than 1 ton per day on several days.
REMARKS.--Sampling program at this site conducted by International Boundary and Water Commission prior to July 1946. Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-6, 1946 ---	47.8	--	125	--	121	21	132	217	356	90	--	0.6	--	828	1.13	107	388	210	43
Oct. 7-10 --------	441	--	192	--	202	39	215	218	826	66	--	.7	--	1,460	1.99	1,740	664	486	41
Oct. 11-20 -------	199	--	101	--	96	20	109	252	272	48	--	3.3	--	672	.91	361	322	115	43
Oct. 21-31 -------	101	--	102	--	88	17	124	246	244	72	--	1.2	--	667	.91	182	290	88	48
Nov. 1-10 --------	205	--	95.6	--	89	18	104	246	222	62	--	1.6	--	618	.84	342	296	94	43
Nov. 11-20 -------	485	--	90.5	--	86	17	95	241	215	48	--	3.0	--	583	.79	763	284	87	42
Nov. 21-30 -------	1,680	--	65.6	--	70	13	59	207	145	24	--	1.8	--	415	.56	1,880	228	58	36
Dec. 1-10 --------	1,745	--	58.4	--	65	12	40	165	122	24	--	2.4	--	347	.47	1,630	212	76	29
Dec. 11-16, 18-20-	1,702	--	56.8	--	62	12	--	179	116	22	0.4	1.3	0.6	346	.47	1,590	204	58	32
Dec. 21-22, 25-28-	1,101	--	61.7	--	64	12	--	187	129	31	.4	1.3	.6	387	.53	1,150	209	56	37
Jan. 15-20, 1947--	667	7.6	78.3	26	75	15	72	199	153	58	--	.9	--	498	.68	897	248	86	39
Jan. 21-31 -------	683	7.7	84.3	25	81	17	75	207	157	71	--	2.0	--	530	.72	977	272	102	37
Feb. 1-10 --------	568	7.7	87.7	22	92	19	66	207	150	88	--	1.2	--	540	.73	828	308	138	32
Feb. 11-20 -------	588	7.8	71.5	23	65	12	73	192	140	47	--	1.0	--	456	.62	724	212	54	43
Feb. 21-28 -------	642	7.7	71.9	24	65	12	73	188	144	46	--	.8	--	457	.62	792	212	58	43
Mar. 1-10 --------	578	7.9	76.4	24	69	13	78	198	148	56	--	.7	--	486	.66	758	226	64	43
Mar. 11-20 -------	296	7.9	94.2	25	75	15	110	214	185	84	--	.7	--	600	.82	480	248	73	49
Mar. 21-31 -------	126	7.6	110	24	83	16	132	234	227	94	--	.7	--	692	.94	235	273	82	51

RIO GRANDE BASIN--Continued

RIO GRANDE AT SAN MARCIAL, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Apr. 1-10, 1947 --	93.8	7.6	113	27	84	16	145	243	232	106	--	0.6	--	730	0.99	185	276	76	53
Apr. 11-20 -------	85.4	7.7	118	22	83	17	157	250	236	119	--	.6	--	758	1.03	175	277	72	55
Apr. 21-30 -------	70.1	7.7	109	28	78	15	146	241	222	102	--	.7	--	710	.97	134	256	58	55
May 1-10 ---------	670	7.7	82.0	23	70	13	93	209	166	60	--	1.3	--	529	.72	957	228	56	47
May 11-20 --------	3,095	7.6	56.6	25	60	11	51	198	99	28	--	1.6	--	373	.51	3,120	194	32	36
May 21-31 -------	919	7.7	64.2	20	66	13	51	197	123	27	--	1.6	--	399	.54	990	218	56	34
June 1-10 --------	332	7.6	88.6	20	72	15	103	227	174	68	--	1.0	--	565	.77	506	241	55	48
June 11-20 -------	27.2	7.6	115	26	82	17	146	247	230	105	--	1.3	--	729	.99	54	274	72	54
June 21-30 -------	47.2	7.5	91.7	27	84	17	96	223	194	73	--	2.0	--	603	.82	77	280	97	43
July 1-10 ---------	90.0	7.6	97.5	32	82	16	115	246	205	73	--	1.6	--	646	.88	157	270	69	48
July 11-20 --------	31.5	7.6	108	23	91	18	125	248	209	106	--	2.8	--	697	.95	59	301	98	47
July 21-29 --------	98.1	7.4	110	31	86	18	129	243	209	107	--	1.5	--	701	.95	186	288	90	49

RIO GRANDE BASIN--Continued
RIO GRANDE AT SAN MARCIAL, N. MEX.--Continued
Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day
1	12	0.09	29	109	0.81	2,380	1,930	0.49	25,500
2	14	.10	38	114	.77	2,370	1,900	1.25	64,100
3	13	.09	32	94	.44	1,120	1,860	1.10	55,200
4	16	.09	39	131	.45	1,590	1,740	1.36	63,900
5	206	1.23	6,840	179	.44	2,130	1,700	1.12	51,400
6	26	1.23	863	276	.35	2,610	1,770	.89	42,500
7	443	7.46	89,200	346	.60	5,610	1,620	.76	33,200
8	292	6.67	52,600	292	.66	5,200	1,430	.72	27,800
9	511	6.73	92,900	265	.91	6,510	1,660	.95	42,600
10	519	7.49	105,000	240	.71	4,600	1,840	.89	44,200
11	340	4.73	43,400	225	1.24	7,530	1,900	.97	49,800
12	276	2.81	20,900	255	1.02	7,020	1,810	.70	34,200
13	235	2.83	18,000	287	.71	5,500	1,880	1.23	62,400
14	211	1.47	8,370	320	.74	6,390	1,740	.67	31,500
15	199	1.51	8,110	340	.63	5,780	1,790	.67	32,400
16	199	.66	4,620	326	.73	6,430	1,700	.46	21,100
17	168	.85	3,860	352	.87	8,270	1,590	1/.66	28,300
18	126	1.16	4,010	602	2.48	40,300	1,550	.85	35,600
19	120	.69	2,240	874	2.83	66,800	1,490	.69	27,800
20	111	.59	1,770	1,270	2.48	85,000	1,570	.75	31,800
21	128	.46	1,590	1,570	.65	27,600	1,550	.73	35,600
22	128	.63	2,180	1,490	.66	26,600	1,550	.98	41,000
23	126	.83	2,820	1,250	.44	14,800	1,510	1/.75	30,600
24	168	.87	3,950	1,450	.35	13,700	1,200	1/.75	24,300
25	109	.94	2,770	1,770	.64	30,600	944	.74	18,900
26	74	.80	1,600	1,610	.63	30,800	930	.27	6,780
27	52	.37	519	1,860	1.39	69,800	902	1.12	27,300
28	48	.37	480	1,860	1.43	71,800	930	.31	7,780
29	74	.56	1,120	1,810	1.33	65,000	900	1/.40	9,720
30	74	.57	1,140	1,930	.60	31,300	900	.47	11,400
31	126	.43	1,460	--	--	--	800	.42	9,070
Total load (tons)	--	--	482,400	--	--	655,100	--	--	1,028,000
	January			February			March		
1	640	1/0.4	6,910	620	0.37	6,190	652	0.22	3,870
2	500	1/.4	5,400	630	.35	5,950	630	.19	3,230
3	385	1/.4	4,160	611	.27	4,450	663	.27	4,630
4	314	1/.5	4,250	573	.40	6,190	685	.24	4,440
5	270	1/.6	4,370	611	.21	3,460	652	.09	1,580
6	245	1/.7	4,630	592	.41	6,550	630	.29	4,930
7	270	1/.3	2,190	564	.31	4,720	544	.19	2,790
8	406	1/.2	2,190	519	.47	6,590	487	.11	1,450
9	519	1/.3	4,200	503	.49	6,650	434	.14	1,640
10	641	1/.4	6,920	455	.32	3,930	406	.14	1,530
11	788	1/.4	8,510	495	.40	5,350	406	.15	1,640
12	1,100	1/.6	17,800	544	.40	5,880	420	.19	2,150
13	1,120	1/.7	21,200	511	.34	4,690	434	.06	703
14	836	1/.6	13,500	564	.39	5,940	366	.16	1,580
15	812	.35	7,670	602	.32	5,200	304	.13	1,070
16	357	.41	3,950	630	.31	5,270	255	.09	620
17	230	.36	2,240	641	.32	5,540	215	.08	464
18	260	.49	3,440	641	.31	5,370	191	.13	670
19	479	.58	7,500	630	.35	5,950	187	.19	959
20	685	.31	5,730	620	.35	5,860	183	.08	395
21	612	.64	14,000	611	.31	5,110	179	.08	387
22	888	.82	19,700	620	.31	5,190	150	.10	405
23	812	.49	10,700	652	.35	6,160	126	.07	238
24	740	.45	8,990	685	.48	8,880	101	.15	409
25	685	.27	4,990	663	.45	8,060	99	.15	401
26	652	.50	8,800	630	.20	3,400	101	.05	136
27	641	.47	8,130	641	.23	3,980	131	.07	248
28	582	.56	8,800	630	.56	9,530	137	.10	370
29	573	.44	6,810	--	--	--	131	.09	318
30	564	.26	3,960	--	--	--	126	.11	374
31	564	.44	6,700	--	--	--	106	.09	258
Total load (tons)	--	--	238,300	--	--	160,000	--	--	44,080

1/ Computed on basis of record for Rio Grande at San Acacia.

RIO GRANDE BASIN--Continued

RIO GRANDE AT SAN MARCIAL, N. MEX.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day
1	109	0.05	147	406	0.19	2,080	554	0.16	2,390
2	89	.08	192	434	.20	2,340	554	.14	2,090
3	79	.21	448	359	.08	775	602	.10	1,630
4	81	.20	437	309	.13	1,080	611	.11	1,810
5	83	.05	112	265	.14	1,000	340	.11	1,010
6	85	.20	459	287	.12	930	230	.13	807
7	83	.15	336	427	.17	1,960	168	.38	1,720
8	69	.06	144	1,020	.18	4,960	128	.45	1,560
9	114	.25	770	1,470	.29	11,500	79	.04	85
10	126	.07	238	1,720	.35	16,300	52	.26	365
11	134	.07	253	2,050	.28	15,500	39	.12	126
12	120	.09	292	2,590	.34	23,600	30	.24	194
13	106	.08	229	4,350	.26	30,500	30	.19	154
14	101	.07	191	5,170	.67	93,500	28	.50	378
15	89	.05	120	4,400	.57	67,700	27	.07	51
18	72	.06	117	3,420	.62	57,300	24	.08	52
17	65	.05	86	2,710	.61	44,600	23	.06	37
18	63	.03	51	2,280	.15	9,230	24	.06	39
19	55	.03	45	2,100	.16	9,070	23	.05	31
20	49	.03	40	1,880	.16	8,120	24	.07	45
21	46	.06	75	1,290	.14	4,880	26	.03	21
22	43	.05	58	1,020	.26	7,160	27	.06	44
23	39	.06	63	848	.27	6,180	27	.05	36
24	37	.03	30	788	.32	6,810	23	.04	25
25	35	.03	28	986	.38	10,100	20	.10	54
26	35	.06	57	1,200	.34	11,000	18	.08	39
27	36	.05	49	972	.11	2,890	37	.10	100
28	43	.11	128	902	.15	3,650	60	.13	211
29	137	.18	666	788	.14	2,980	114	.17	523
30	250	.19	1,280	729	.16	3,150	120	.34	1,100
31	--	--	--	582	.19	2,990	--	--	--
Total load (tons)	--	--	7,143	--	--	464,000	--	--	16,730
	July			August			September		
1	87	0.31	728	11	--	--	519	--	--
2	54	.59	860	8	--	--	320	--	--
3	213	.30	1,730	5	--	--	225	--	--
4	109	.18	530	5	--	--	147	--	--
5	94	.23	564	4	--	--	120	--	--
6	109	.14	412	0	--	--	154	--	--
7	104	.16	449	0	--	--	150	--	--
8	63	.15	255	0	--	--	215	--	--
9	37	.16	160	0	--	--	400	--	--
10	30	.14	113	0	--	--	500	--	--
11	28	.14	106	59	--	--	399	--	--
12	32	.11	95	211	--	--	300	--	--
13	31	.11	92	255	--	--	200	--	--
14	28	.11	83	309	--	--	176	--	--
15	27	.10	73	427	--	--	150	--	--
16	24	.10	65	519	--	--	100	--	--
17	21	.07	40	663	--	--	80	--	--
18	23	.06	37	1,990	--	--	60	--	--
19	47	.05	63	4,450	--	--	50	--	--
20	54	.04	58	3,350	--	--	45	--	--
21	128	.12	415	1,950	--	--	150	--	--
22	158	.16	663	1,510	--	--	200	--	--
23	183	.03	148	1,550	--	--	98	--	--
24	187	.07	353	3,030	--	--	80	--	--
25	179	1/.06	290	2,500	--	--	60	--	--
26	97	.04	105	1,810	--	--	34	--	--
27	44	.04	48	1,420	--	--	30	--	--
28	33	.03	27	1,150	--	--	26	--	--
29	30	.05	40	812	--	--	22	--	--
30	23	1/.05	31	527	--	--	23	--	--
31	17	1/.05	23	573	--	--	--	--	--
Total load (tons)	--	--	8,696	--	--	--	--	--	--

1/ Computed on basis of record for Rio Grande at San Acacia.

RIO GRANDE AT MISSION PUMPING PLANT NEAR MISSION, TEX.

LOCATION.--At Mission pumping plant 3 miles south of Mission, Hidalgo County.
DRAINAGE AREA.--171,800 square miles (estimated).
RECORDS AVAILABLE.--Chemical analyses: July 1945 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 1,440 parts per million May 9-11; minimum, 333 parts per million June 21-30.
Total hardness: Maximum, 672 parts per million May 9-11; minimum, 103 parts per million June 1-3.
EXTREMES, 1945-47.--Dissolved solids: Maximum, 1,440 parts per million May 9-11, 1947; minimum, 284 parts per million Oct. 12-15, 1945.
Total hardness: Maximum, 672 parts per million May 9-11, 1947; minimum, 103 parts per million June 1-3, 1947.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Specific conductance ($K \times 10^6$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
										Total	Non-carbonate
Oct. 1-10, 1946	68.6	66	11	67	156	136	57	5.6	456	210	82
Oct. 11-20	61.8	66	9.3	52	151	110	51	6.9	403	202	78
Oct. 21-31	86.9	88	15	80	180	166	93	5.8	576	281	134
Nov. 1-10	98.7	76	16	110	161	177	124	2.8	627	256	124
Nov. 11-20	107	74	21	124	151	195	150	1.5	677	271	147
Nov. 21-30	108	87	24	104	170	190	145	.2	685	316	176
Dec. 1-10	110	84	26	142	158	219	188	3.0	821	316	187
Dec. 11-18	111	80	24	131	168	196	170	1.5	742	298	160
Jan. 1-8, 10, 1947	138	92	27	146	174	231	192	4.0	805	340	198
Jan. 11-20	135	92	27	157	182	238	200	3.0	842	340	192
Jan. 21-31	142	90	27	148	183	226	190	3.8	817	336	186
Feb. 1-10	130	90	32	147	176	244	196	2.5	843	356	212
Feb. 11-19	128	88	31	132	176	204	197	.0	840	347	203
Feb. 20-28	128	90	31	138	176	242	180	1.0	855	352	208
Mar. 1-10	133	82	29	159	149	249	202	4.0	904	324	202
Mar. 11-20	131	79	29	159	155	240	200	2.5	856	316	189
Mar. 21-31	145	91	32	171	150	265	233	3.8	950	358	236
Apr. 1-10	144	94	33	164	165	262	224	3.5	933	370	235
Apr. 11-20	144	86	28	165	142	242	224	4.0	875	330	213
Apr. 21-30	131	86	28	142	122	230	211	2.5	822	330	230
May 1-8	137	84	32	146	139	237	210	1.8	887	341	227
May 9-11	217	167	62	225	110	669	265	1.8	1,440	672	582
May 12-20	102	81	21	98	144	190	130	2.2	648	288	170
May 21-31	76.1	70	13	61	122	141	79	3.8	492	228	128

RIO GRANDE BASIN--Continued

RIO GRANDE AT MISSION PUMPING PLANT, NEAR MISSION, TEX.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Specific conductance ($K \times 10^5$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
										Total	Non-carbonate
June 1-3, 1947	68.9	34	4.4	108	160	98	71	6.1	434	103	0
June 4, 6-10	152	104	29	170	149	256	252	6.0	982	378	256
June 11-20	120	88	30	111	132	208	182	4.3	755	343	235
June 21-30	52.2	54	10	35	124	74	50	4.0	333	176	74
July 1-8	55.3	50	9.8	50	124	78	63	4.0	360	166	64
July 9-12	157	99	31	197	125	273	295	1.0	958	374	272
July 13-20	99.0	64	20	110	130	185	128	2.0	633	242	135
July 21-31	102	68	22	114	130	194	140	2.2	653	260	154
Aug. 1-2	116	88	21	121	180	170	170	5.2	725	306	158
Aug. 3-10	51.0	58	7.6	39	138	85	40	6.4	337	176	62
Aug. 11-20	64.4	64	11	55	143	111	63	3.8	419	204	88
Aug. 21-31	75.6	66	13	72	138	143	77	4.0	485	218	105
Sept. 1-10	74.9	69	11	75	147	159	62	6.9	495	217	96
Sept. 11-20	60.1	56	9.0	57	139	109	48	5.9	407	177	63
Sept. 21-30	68.5	71	10	61	146	150	50	5.7	455	218	98

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR PUERTO DE LUNA, N. MEX.

LOCATION.--At bridge at Puerto de Luna, Guadalupe County, 17 miles upstream from gaging station which is 14 miles upstream from Alamogordo Dam.
DRAINAGE AREA.--3,970 square miles above gaging station (contributing area).
RECORDS AVAILABLE.--Chemical analyses: November 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 2,530 parts per million July 1-10; minimum, 846 parts per million May 10-19.
Total hardness: Maximum, 1,690 parts per million Mar. 21-31; minimum, 615 parts per million May 10-19.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088. Records of specific conductance of daily samples are available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Nov. 19-20, 1946 ---	114	--	239	22	470	64	82	164	1,250	126	0.9	2,090	2.84	643	1,440	1,300	11
Nov. 22-24, 26-30 --	116	7.8	244	18	474	65	67	158	1,250	116	1.2	2,070	2.82	648	1,450	1,320	9
Dec. 1-10 ----------	114	7.7	246	17	480	65	79	176	1,270	120	2.3	2,120	2.88	653	1,460	1,320	11
Dec. 11-20 ---------	108	7.7	228	14	428	58	78	148	1,150	110	4.1	1,920	2.61	560	1,310	1,180	12
Dec. 21-31 ---------	105	7.7	253	18	498	67	77	159	1,320	128	.8	2,190	2.98	621	1,520	1,390	10
Jan. 1-3, 9-10, 1947	110	7.7	255	15	497	68	87	158	1,340	130	.6	2,220	3.02	659	1,520	1,390	11
Jan. 11-20 ---------	108	7.6	259	23	502	72	60	181	1,340	95	.7	2,180	2.96	636	1,550	1,400	8
Jan. 21-31 ---------	103	7.6	261	19	518	69	76	169	1,370	125	.6	2,260	3.07	629	1,580	1,440	10
Feb. 1-10 ----------	101	7.6	261	13	518	66	88	164	1,380	130	.3	2,280	3.10	622	1,560	1,430	11
Feb. 11-20 ---------	109	7.7	268	19	521	70	90	161	1,390	145	.2	2,310	3.14	680	1,590	1,460	11
Feb. 21-28 ---------	112	7.7	263	12	503	68	110	163	1,400	130	.0	2,300	3.13	696	1,530	1,400	14
Mar. 1, 3-10 -------	112	8.0	285	14	531	84	110	160	1,450	190	.5	2,460	3.35	744	1,670	1,540	12
Mar. 11-20 ---------	97.0	8.0	267	8.0	547	74	66	158	1,440	130	.5	2,340	3.18	613	1,670	1,540	8
Mar. 21-31 ---------	97.8	7.9	270	11	559	73	68	148	1,470	134	.5	2,390	3.25	631	1,690	1,570	8
Apr. 1-10 ----------	86.1	7.8	284	7.0	537	80	115	149	1,470	189	.5	2,470	3.36	574	1,670	1,550	13
Apr. 11-16, 20 -----	94.7	7.9	269	8.0	548	74	64	141	1,450	132	.5	2,350	3.20	601	1,670	1,560	8
Apr. 17-19 ---------	90.0	7.5	274	13	534	74	104	144	1,490	138	.2	2,420	3.29	588	1,640	1,520	12
Apr. 21-30 ---------	93.9	7.7	266	12	530	73	86	141	1,460	124	.1	2,350	3.20	596	1,620	1,510	10
May 1-4, 6-9 -------	224	7.8	230	15	448	59	69	155	1,190	103	.8	1,960	2.67	1,190	1,360	1,230	10
May 10-19 ----------	479	7.9	113	12	202	27	22	135	472	43	1.2	846	1.15	1,090	615	504	7
May 20-31 ----------	149	7.8	236	11	454	61	85	143	1,240	114	.2	2,040	2.77	821	1,380	1,270	12

PECOS RIVER NEAR PUERTO DE LUNA, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
June 1-10, 1947	92.4	7.8	275	10	536	73	105	151	1,470	150	0.1	2,420	3.29	604	1,640	1,510	12
June 11-16, 20	97.0	7.6	284	27	524	82	104	111	1,460	184	.9	2,440	3.32	639	1,640	1,550	12
June 22-30	86.2	7.6	272	15	540	78	75	148	1,450	141	.9	2,370	3.22	552	1,670	1,550	9
July 1-10	83.9	7.7	279	18	540	80	122	143	1,530	164	.8	2,530	3.44	573	1,680	1,560	14
July 11-20	82.9	7.8	260	18	532	73	57	152	1,400	120	.6	2,280	3.10	510	1,630	1,500	7
July 21-25, 27, 29-31	73.5	7.9	265	21	544	72	58	150	1,430	119	.9	2,320	3.16	460	1,650	1,530	7
Aug. 1-10	94.1	7.6	270	23	542	71	78	128	1,470	127	.0	2,370	3.22	602	1,640	1,540	9
Aug. 11-15	96.6	7.5	275	21	544	71	103	143	1,510	130	.2	2,450	3.33	639	1,650	1,530	12
Aug. 16-20	376	7.7	119	15	220	29	27	161	519	39	.0	928	1.26	942	668	536	8
Aug. 21-22, 25, 27, 30-31	205	7.8	239	18	457	59	86	154	1,220	123	.9	2,040	2.77	1,130	1,380	1,260	12
Aug. 23-24, 26, 28-29	174	7.9	152	16	282	38	28	114	709	62	.5	1,190	1.62	559	860	766	7
Sept. 1-10	77.1	7.9	266	16	531	69	90	155	1,440	127	.2	2,350	3.20	489	1,610	1,480	11
Sept. 11-20	77.2	7.9	279	16	546	70	110	162	1,480	153	2.1	2,460	3.35	513	1,650	1,520	13
Sept. 21-30	88.0	7.3	275	19	547	73	83	148	1,480	130	.1	2,400	3.26	570	1,660	1,540	10
Weighted average	138	--	232	15	452	62	72	151	1,200	115	0.8	1,990	2.71	741	1,380	1,260	10

PECOS RIVER BELOW ALAMOGORDO DAM, N. MEX.

LOCATION.--Approximately 600 feet upstream from gaging station which is 1,200 feet downstream from Alamogordo Dam, 1½ miles downstream from Alamogordo Creek, and 4½ miles northeast of Guadalupe, De Bacca County.
DRAINAGE AREA.--4,390 square miles (contributing area).
RECORDS AVAILABLE.--Chemical analyses: June 1937 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 2,440 parts per million Aug. 11-20; minimum, 840 parts per million Oct. 11-16, 18-20.
Total hardness: Maximum, 1,630 parts per million Aug. 1-10; minimum, 567 parts per million Oct. 11-16, 18-20.
EXTREMES, 1937-47.--Dissolved solids: Maximum, 2,590 parts per million Apr. 21-30, 1938; minimum, 435 parts per million Oct. 1-8, 1941.
Total hardness: Maximum, 1,690 parts per million May 21-31, 1946; minimum, 294 parts per million Oct. 1-8,12-20, 1941.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088. Records of specific conductance of daily samples are available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-5,7-10, 1946---	40.2	7.8	120	21	200	30	40	139	514	42	1.1	917	1.25	100	622	508	12
Oct. 11-16, 18-20-----	77.4	7.8	110	14	186	25	38	118	480	38	1.1	840	1.14	176	567	470	13
Oct. 21-31----------	85.5	7.8	166	11	306	40	48	139	791	66	1.1	1,330	1.81	307	928	814	10
Nov. 1-10----------	75.7	7.7	148	9.3	264	35	42	138	670	58	1.4	1,150	1.56	235	802	690	10
Nov. 11-17, 19-20-----	42.5	7.7	181	12	330	44	63	134	882	80	1.3	1,480	2.01	170	1,000	894	12
Nov. 21-30----------	2.44	7.7	179	14	320	47	65	146	867	78	1.1	1,460	1.99	9.6	992	875	12
Dec. 1-10----------	1.96	7.7	204	16	374	54	74	159	1,010	94	.9	1,700	2.31	9.0	1,160	1,020	12
Dec. 11-20----------	1.78	7.7	217	14	408	59	74	167	1,100	98	1.2	1,840	2.50	8.8	1,260	1,120	11
Dec. 21-31----------	1.82	7.7	218	16	400	60	80	160	1,100	100	1.2	1,840	2.50	9.0	1,240	1,110	12
Jan. 1-10, 1947-------	1.93	7.7	220	16	410	60	80	165	1,120	100	1.2	1,870	2.54	9.7	1,270	1,130	12
Jan. 11-20 ----------	1.79	7.7	232	12	432	64	80	172	1,170	110	.7	1,950	2.65	9.4	1,340	1,200	11
Jan. 21-31 ----------	1.55	7.7	222	13	411	61	77	170	1,110	105	.7	1,860	2.53	7.8	1,280	1,140	12
Feb. 1-10----------	1.42	7.7	206	9.5	376	56	71	166	1,010	95	.4	1,700	2.31	6.5	1,170	1,030	12
Feb. 11-20----------	1.48	7.7	217	13	396	62	68	166	1,070	100	.3	1,790	2.43	7.2	1,240	1,110	11
Feb. 21-28----------	2.38	7.7	227	12	434	61	69	156	1,160	105	.3	1,920	2.61	12	1,330	1,210	10
Mar. 1-10----------	86.1	7.9	213	13	415	62	34	144	1,070	94	.5	1,760	2.39	409	1,290	1,170	5
Mar. 11-20----------	90.2	7.9	209	14	407	58	50	144	1,070	92	.5	1,760	2.39	429	1,250	1,140	8
Mar. 21-31----------	669	7.8	212	9.0	410	59	52	148	1,080	93	.5	1,780	2.42	3,220	1,270	1,140	8

RIO GRANDE BASIN--Continued

PECOS RIVER BELOW ALAMOGORDO DAM, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25 ° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Harness as $CaCO_3$: Total	Harness as $CaCO_3$: Non-carbonate	Percent sodium
Apr. 1-10, 1947	778	7.7	219	7.0	431	62	52	141	1,140	99	0.5	1,860	2.53	3,910	1,330	1,220	8
Apr. 11-20	83.7	7.6	225	6.0	441	65	47	147	1,160	101	.5	1,890	2.57	427	1,370	1,250	7
Apr. 21-30	94.6	7.9	229	13	440	63	70	140	1,200	103	.5	1,960	2.67	501	1,360	1,240	10
May 1-10	89.9	7.9	230	13	448	63	65	135	1,210	105	.4	1,970	2.68	478	1,380	1,270	9
May 11-20	33.2	7.9	228	10	444	67	54	143	1,190	103	.3	1,940	2.64	174	1,380	1,270	8
May 21-31	117	7.9	214	11	412	57	64	137	1,110	94	.4	1,820	2.48	575	1,260	1,150	10
June 1-10	102	7.9	190	10	354	52	58	129	963	81	.7	1,580	2.15	435	1,100	992	10
June 11-20	81.0	7.9	191	18	350	49	78	128	984	82	.7	1,620	2.20	354	1,080	970	14
June 21-30	75.5	7.9	198	18	368	52	82	140	1,030	87	.8	1,710	2.33	349	1,130	1,020	14
July 1, 3-10	1,180	7.9	205	14	386	54	132	143	1,180	89	.8	1,980	2.62	5,150	1,180	1,070	19
July 11-20	456	7.9	229	18	440	64	136	149	1,330	105	2.1	2,170	2.95	2,670	1,360	1,240	18
July 21-31	71.9	7.9	249	15	472	69	83	123	1,320	118	1.1	2,140	2.91	415	1,460	1,360	11
Aug. 1-10	83.5	7.9	272	19	529	76	100	124	1,490	139	.6	2,410	3.28	543	1,630	1,530	12
Aug. 11-20	73.0	7.9	262	18	518	72	131	121	1,450	135	4.3	2,440	3.32	481	1,590	1,490	15
Aug. 21-31	87.8	7.9	207	15	400	51	61	125	1,080	80	1.5	1,750	2.38	415	1,210	1,100	10
Sept. 1-10	85.0	7.9	193	14	362	49	65	135	988	75	2.0	1,620	2.20	372	1,100	994	11
Sept. 11-20	95.0	7.9	203	15	384	51	55	131	1,020	83	1.1	1,670	2.27	428	1,170	1,060	9
Sept. 21-30	84.4	7.4	227	15	425	57	63	126	1,150	94	.8	1,870	2.54	426	1,300	1,190	10
Weighted average	136	--	210	12	403	57	83	141	1,130	94	0.9	1,850	2.52	679	1,240	1,120	13

PECOS RIVER NEAR ACME, N. MEX.

LOCATION.--At bridge on U. S. Highway 70, approximately 3 miles above gaging station which is 1 mile southeast of Melena railroad station, 3½ miles downstream from Salt Creek, 5 miles southwest of Acme, Chaves County, and 13 miles northeast of Roswell, Chaves County.
DRAINAGE AREA.--11,380 square miles (contributing area).
RECORDS AVAILABLE.--Chemical analyses: July 1937 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 11,800 parts per million June 1-8, 10; minimum, 1,050 parts per million Oct. 23-24, 27.
Total hardness: Maximum, 3,700 parts per million June 1-8, 10; minimum, 588 parts per million Oct. 23-24, 27.
EXTREMES, 1937-47.--Dissolved solids: Maximum, 19,870 parts per million May 23-June 2, 1938; minimum, 806 parts per million May 24, 1941.
Total hardness: Maximum, 5,320 parts per million May 23-June 2, 1938; minimum, 528 parts per million May 24, 1941.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088. Records of specific conductance are available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-11, 1946 -----	135	7.5	190	18	282	49	77	128	714	155	5.7	1,360	1.85	496	905	800	16
Oct. 12-20 ----------	27.2	7.4	286	17	348	74	255	126	1,030	390	3.6	2,180	2.96	160	1,170	1,070	32
Oct. 21-22, 25-26, 28-31 ----------	1/19.5	7.4	323	19	404	89	280	114	1,230	430	2.5	2,510	3.41	132	1,370	1,280	31
Oct. 23-24, 27 ------	(1/)	7.5	141	19	188	29	104	118	530	115	4.4	1,050	1.43	--	588	492	28
Nov. 1-9 ----------	35.2	7.6	286	21	380	73	226	118	1,120	335	5.0	2,220	3.02	211	1,250	1,150	28
Nov. 10-18, 20 ------	52.4	7.5	306	16	404	84	254	138	1,200	385	2.1	2,410	3.28	341	1,350	1,240	29
Nov. 21-30 ----------	28.4	7.5	385	15	448	97	374	144	1,380	550	1.4	2,940	4.00	225	1,520	1,400	35
Dec. 1-10 ----------	19.2	7.5	440	17	480	105	483	142	1,500	710	1.3	3,370	4.58	175	1,630	1,510	39
Dec. 11, 13-20 ------	23.9	7.5	504	17	500	117	614	139	1,600	910	1.9	3,830	5.21	247	1,730	1,610	44
Dec. 21-22, 28-31 ---	2/10.6	7.5	1,040	21	632	163	1,780	133	2,090	2,710	--	7,460	10.15	214	2,250	2,140	63
Dec. 23-27 ---------	2/13.8	7.8	439	18	548	101	398	132	1,450	730	1.9	3,310	4.50	123	1,780	1,680	33
Jan. 1-4, 6, 10, 1947 -	8.7	7.6	504	18	470	105	632	133	1,480	940	3.9	3,710	5.05	87	1,600	1,500	46
Jan. 5, 7-9 ---------	6.0	7.5	1,140	19	710	192	1,970	133	2,340	3,050	--	8,350	11.36	135	2,560	2,450	63
Jan. 11-15, 17-20 ----	3/29.5	7.9	702	15	556	148	950	150	1,750	1,500	2.1	5,000	6.80	398	2,000	1,870	51
Jan. 16 -------------	(3/)	--	378	--	373	79	420	132	1,110	640	1.0	2,690	3.66	--	1,260	1,150	42
Jan. 21-30 ----------	8.2	7.9	935	15	652	185	1,420	158	2,100	2,240	2.7	6,690	9.10	148	2,390	2,260	56
Jan. 31, Feb. 1-4, 6-10 ----------	4/ 1.1	7.9	1,440	12	804	287	2,410	193	2,580	3,960	--	10,100	13.7	30	3,190	3,030	62

1/ Discharge for Oct. 23-24, 27 included with discharge reported for Oct. 21-22, 25-26, 28-31.
2/ Discharge for Dec. 28 included with discharge reported for Dec. 23-27.
3/ Discharge for Jan. 16 included with discharge reported for Jan. 11-15, 17-20.
4/ Discharge for Feb. 5 included with discharge reported for Jan. 31, Feb. 1-4, 6-10.

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR ACME, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Feb. 5, 1947	(4/)	--	585	--	520	120	759	134	1,640	1,150	2.3	4,260	5.79	--	1,790	1,680	48
Feb. 11-14, 16-20	5/ 1.5	7.9	1,570	10	847	300	2,680	191	2,730	4,380	--	11,000	15.0	45	3,350	3,190	64
Feb. 15	(5/)	--	530	--	464	119	644	148	1,440	1,010	4.0	3,750	5.10	--	1,650	1,530	46
Feb. 21-28	1.9	7.8	1,340	11	807	264	2,200	175	2,550	3,610	--	9,530	13.0	49	3,100	2,960	61
Mar. 1-8	6/ 2.8	7.8	1,420	5.1	798	281	2,330	187	2,580	3,810	--	9,900	13.5	75	3,150	2,990	62
Mar. 9-20	6/57.4	8.0	505	12	588	146	457	138	1,800	760	2.9	3,830	5.21	594	2,070	1,950	32
Mar. 21	(7/)	--	--	--	--	--	--	--	2,270	2,740	--	--	--	--	--	--	--
Mar. 22-31	7/311	8.1	396	11	558	116	265	135	1,590	480	3.1	3,090	4.20	2,590	1,870	1,760	24
Apr. 1-10	857	8.2	268	10	474	78	97	144	1,280	185	2.5	2,200	2.99	5,090	1,500	1,380	12
Apr. 11-20	57.1	8.0	352	17	528	100	211	132	1,460	395	2.2	2,780	3.78	429	1,730	1,620	21
Apr. 21-30	18.8	7.6	521	18	608	128	505	128	1,830	800	3.9	3,960	5.39	201	2,040	1,940	35
May 1-8	5.9	7.6	764	21	740	181	942	135	2,300	1,510	4.1	5,760	7.83	92	2,590	2,480	44
May 9-20	187	7.7	396	16	456	87	363	127	1,290	590	5.9	2,870	3.90	1,450	1,500	1,390	35
May 21-23, 25-26	4.4	7.7	726	20	712	167	832	155	1,960	1,490	4.2	5,260	7.15	62	2,460	2,340	42
May 24, 27-31	8/ .5	7.6	1,290	17	845	254	2,050	182	2,540	3,410	--	9,210	12.5	12	3,150	3,000	59
June 1-8, 10	(9/)	7.5	1,660	19	984	302	2,810	155	3,010	4,640	--	11,800	16.0	--	3,700	3,570	62
June 9	(9/)	--	590	--	--	--	--	124	2,040	990	--	--	--	--	--	--	--
June 11-18, 20	(9/)	7.3	1,270	19	896	248	2,010	146	2,800	3,250	--	9,290	12.6	--	3,260	3,140	57
June 21-30, July 1-3	(9/)	7.4	1,250	15	975	248	1,950	125	3,000	3,170	--	9,420	12.8	--	3,450	3,350	55
July 4-10	860	7.7	292	17	484	74	168	134	1,410	210	5.0	2,430	3.30	5,640	1,510	1,400	19
July 11-17, 20	621	7.8	270	16	476	72	145	125	1,340	210	5.8	2,330	3.17	3,910	1,480	1,380	17
July 18-19	341	7.5	752	16	696	153	978	121	2,080	1,580	--	5,560	7.56	5,120	2,370	2,270	47
July 21-31	8/10.5	7.7	303	17	508	80	178	108	1,480	250	3.8	2,570	3.50	73	1,600	1,510	20

4/ Discharge for Feb. 5 included with discharge reported for Jan. 31, Feb. 1-4, 6-10.
5/ Discharge for Feb. 15 included with discharge reported for Feb. 11-14, 16-20.
6/ Discharge for Mar. 9 included with discharge reported for Mar. 1-8.
7/ Discharge for Mar. 21 included with discharge reported for Mar. 22-31.
8/ No flow at the gage during a part of period.
9/ No flow at the gage during period.

Aug. 1, 6-9	(9/)	7.4	463	19	688	108	393	114	2,020	580	--	3,860	5.25	--	2,160	2,070	28
Aug. 2-5, 10	(9/)	7.4	896	20	764	169	1,250	104	2,340	1,990	--	6,590	8.96	--	2,600	2,520	51
Aug. 11-12, 14-16	(9/)	7.4	828	13	848	167	1,130	120	2,550	1,770	--	6,540	8.89	--	2,800	2,700	47
Aug. 13, 17-20	(9/)	7.6	429	14	800	116	190	130	2,370	220	2.6	3,780	5.14	--	2,470	2,370	14
Aug. 21-25, 29-30	8/4.0	7.6	640	11	756	122	762	121	2,230	1,150	3.8	5,090	6.92	55	2,390	2,390	41
Aug. 26-28, 31	(9/)	7.5	1,040	8.6	732	126	1,650	62	2,070	2,640	--	7,260	9.87	--	2,340	2,290	60
Sept. 1-10	(9/)	7.6	1,020	10	768	129	1,590	71	2,210	2,520	--	7,260	9.87	--	2,450	2,390	59
Sept. 11-14, 17-20	(9/)	7.5	1,260	9.4	908	176	2,080	135	2,630	3,310	--	9,180	12.5	--	2,990	2,880	60
Sept. 15-16	(9/)	7.6	675	17	760	128	801	98	2,240	1,240	3.0	5,240	7.13	--	2,420	2,340	42
Sept. 21-25, 27-30	(9/)	7.2	1,110	19	880	200	1,640	133	2,600	2,670	--	8,070	11.0	--	3,020	2,910	54
Sept. 26	(9/)	--	312	22	480	79	189	82	1,400	280	16	2,510	3.41	--	1,520	1,460	21
Weighted average	86.9	--	328	14	484	86	225	134	1,370	361	4.0	2,610	3.55	612	1,560	1,450	24

8/ No flow at the gage during a part of period.
9/ No flow at the gage during period.

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PECOS RIVER NEAR ARTESIA, N. MEX.

LOCATION.--At gaging station at bridge on State Highway 83, 4.2 miles east of Artesia, Eddy County, 6.5 miles north of mouth of Rio Penasco, and 16.5 miles north of McMillan Dam.
DRAINAGE AREA.--15,300 square miles (contributing area).
RECORDS AVAILABLE.--Chemical analyses: July 1937 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 9,400 parts per million June 21-30; minimum, 2,080 parts per million Nov. 25-26.
Total hardness: Maximum, 3,240 parts per million June 21-30; minimum, 1,000 parts per million Nov. 25-26.
EXTREMES, 1937-47.--Dissolved solids: Maximum, 10,900 parts per million Aug. 11-13, 17-21, 1945; minimum, 681 parts per million Sept. 6, 1938.
Total hardness: Maximum, 3,430 parts per million Aug. 11-13, 17-21, 1945; minimum, 404 parts per million Sept. 6, 1938.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088. Records of specific conductance of daily samples are available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
												Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Oct. 1-7, 9-10, 1946	476	7.5	356	20	388	88	352	124	1,160	555	4.8	2,630	3.58	3,380	1,330	1,230	36
Oct. 11-20	224	7.4	506	25	452	151	613	171	1,500	975	6.3	3,810	5.18	2,300	1,750	1,610	43
Oct. 21-31	156	7.4	569	24	466	177	714	159	1,620	1,150	5.8	4,240	5.77	1,790	1,890	1,760	45
Nov. 1-10	144	7.5	590	24	490	177	751	192	1,620	1,230	6.9	4,390	5.97	1,710	1,950	1,790	46
Nov. 11-18, 20	192	7.6	522	22	472	156	604	190	1,520	985	6.2	3,860	5.25	2,000	1,820	1,660	42
Nov. 21-24, 27-30	172	7.7	577	25	478	166	725	209	1,590	1,150	5.1	4,240	5.77	1,970	1,880	1,700	46
Nov. 25-26	167	7.3	296	11	264	83	318	120	810	530	2.2	2,080	2.83	938	1,000	902	41
Dec. 1-10	162	7.4	576	23	492	164	704	198	1,580	1,150	4.9	4,220	5.74	1,850	1,900	1,740	45
Dec. 11-20	172	7.6	630	23	496	175	818	203	1,650	1,310	5.0	4,580	6.23	2,130	1,960	1,790	48
Dec. 21-25, 27-31	149	7.6	623	22	492	173	797	210	1,610	1,290	5.4	4,490	6.11	1,810	1,940	1,770	47
Jan. 1-8, 10, 1947	141	7.7	630	23	492	174	815	240	1,600	1,310	6.2	4,540	6.17	1,730	1,940	1,750	48
Jan. 11-20	158	8.0	679	17	500	175	892	209	1,660	1,420	5.2	4,770	6.49	2,030	1,970	1,800	50
Jan. 21-31	131	8.0	662	19	496	178	855	205	1,670	1,360	5.0	4,680	6.36	1,660	1,970	1,800	49
Feb. 1-10	93.4	8.0	683	19	524	195	877	200	1,800	1,400	4.8	4,920	6.69	1,240	2,110	1,950	47
Feb. 11-20	83.4	8.0	715	19	532	206	936	190	1,860	1,500	3.8	5,150	7.00	1,160	2,170	2,020	48
Feb. 21-28	77.9	8.0	750	18	544	212	1,010	200	1,900	1,610	2.7	5,400	7.34	1,140	2,230	2,060	50
Mar. 1-10	92.4	7.7	721	17	540	225	910	193	1,870	1,520	4.5	5,180	7.04	1,290	2,270	2,110	47
Mar. 11-20	114	7.9	679	13	544	209	831	179	1,880	1,360	3.5	4,930	6.70	1,520	2,220	2,070	45
Mar. 21-29	1/123	7.9	627	12	558	191	718	158	1,880	1,170	2.9	4,610	6.27	1,530	2,180	2,050	42
Mar. 31, Apr. 1-10	940	8.1	315	9.4	504	96	152	147	1,420	270	3.6	2,530	3.44	6,420	1,650	1,530	17

1/ Includes discharge for Mar. 30.

Apr. 11-20	140	8.0	509	12	546	148	520	162	1,710	840	4.5	3,860	5.25	1,460	1,970	1,840	36
Apr. 21-30	87.9	7.6	684	24	588	190	833	145	1,980	1,330	4.3	5,020	6.83	1,190	2,250	2,130	45
May 1-10	113	7.7	763	20	596	212	1,010	157	2,070	1,610	4.7	5,600	7.62	1,710	2,360	2,230	48
May 11-20	337	7.8	535	23	514	134	615	151	1,610	970	4.2	3,940	5.36	3,590	1,830	1,710	42
May 21-31	74.2	7.7	691	21	558	239	776	158	1,890	1,390	4.6	4,960	6.75	994	2,370	2,240	42
June 1-10	35.6	7.7	837	21	600	205	1,190	150	2,130	1,830	4.8	6,050	8.23	582	2,340	2,220	52
June 11, 13-17, 19-20	6.00	7.4	1,040	34	684	323	1,500	147	2,590	2,460	--	7,660	10.4	124	3,030	2,910	52
June 21-30	5.16	7.4	1,270	34	781	315	2,060	121	2,860	3,290	--	9,400	12.8	131	3,240	3,140	58
July 1-5	13.8	7.4	1,100	23	717	303	1,670	116	2,690	2,670	--	8,130	11.1	303	3,040	2,940	54
July 6-10	796	7.6	344	17	534	88	254	145	1,580	340	4.7	2,890	3.93	6,210	1,690	1,580	25
July 12-22	515	7.7	303	18	500	80	182	122	1,430	270	4.4	2,540	3.45	3,530	1,580	1,480	20
July 23-31	18.0	7.5	574	19	586	151	661	104	1,930	1,010	1.5	4,410	6.00	214	2,080	2,000	41
Aug. 1-10	(2/)	7.7	804	15	736	208	1,030	104	2,520	1,570	--	6,130	8.34	--	2,690	2,610	45
Aug. 11-12, 17-20	(2/)	7.6	1,190	14	837	242	1,880	113	2,850	2,910	--	8,790	12.0	--	3,080	2,990	57
Aug. 13-16	(2/)	7.6	736	10	504	154	1,080	77	1,830	1,610	--	5,230	7.11	--	1,890	1,830	55
Aug. 21-31	2/19.2	7.5	1,080	15	660	218	1,700	104	2,300	2,660	--	7,600	10.3	394	2,540	2,460	59
Sept. 1-10	9.48	7.5	965	20	598	242	1,470	97	2,250	2,320	--	6,950	9.45	178	2,490	2,410	56
Sept. 11-20	12.7	7.7	850	19	560	237	1,230	123	2,120	1,940	--	6,170	8.39	212	2,370	2,270	53
Sept. 21-30	5.46	7.2	1,070	19	634	287	1,600	124	2,410	2,570	--	7,580	10.3	112	2,760	2,660	56
Weighted average	159	--	491	18	500	138	529	162	1,570	848	4.6	3,690	5.02	1,580	1,820	1,680	39

2/ No flow Aug. 1-22.

PECOS RIVER NEAR MALAGA, N. MEX.

LOCATION.--Two and one-half miles upstream from gaging station which is 3 miles southeast of Malaga, Eddy County, and 3 miles downstream from
DRAINAGE AREA.--19,190 square miles (contributing area).
RECORDS AVAILABLE.--Chemical analyses: July 1937 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 5,280 parts per million Aug. 1-10; minimum, 3,030 parts per million Oct. 1-10, 11-20.
Total hardness: Maximum, 2,290 parts per million Aug. 1-10, 11-20; minimum, 1,560 parts per million Oct. 1-10.
EXTREMES, 1937-47.--Dissolved solids: Maximum, 5,290 parts per million Aug. 2-10, 1946; minimum, 384 parts per million Sept. 21-22, 1941.
Total hardness: Maximum, 2,290 parts per million Aug. 1-10, 11-20, 1947; minimum, 254 parts per million Sept. 21-22, 1941.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088. Records of specific conductance of daily samples are available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1946	203	7.8	405	25	412	129	402	171	1,320	650	3.4	3,030	4.12	1,660	1,560	1,420	36
Oct. 11-20	203	7.8	400	22	414	139	387	176	1,320	655	4.2	3,030	4.12	1,660	1,600	1,460	34
Oct. 21-31	230	7.8	407	19	438	135	446	164	1,510	645	2.9	3,280	4.46	2,040	1,650	1,510	37
Nov. 1-8, 10	231	7.8	430	21	490	142	430	173	1,540	705	2.9	3,420	4.65	2,130	1,810	1,660	34
Nov. 11-20	263	7.8	436	21	484	154	452	170	1,600	720	3.0	3,520	4.79	2,500	1,840	1,700	35
Nov. 21, 23-30	234	7.5	459	15	504	144	459	171	1,610	730	3.3	3,550	4.83	2,240	1,850	1,310	35
Dec. 1-10	145	7.6	493	15	514	153	522	173	1,690	810	4.2	3,790	5.15	1,480	1,910	1,770	37
Dec. 11-14, 16-17, 19-20	160	7.7	458	19	490	143	485	187	1,600	740	4.3	3,570	4.86	1,540	1,810	1,660	37
Dec. 21-31	128	7.8	487	20	484	155	523	190	1,600	820	5.6	3,700	5.03	1,280	1,840	1,690	38
Jan. 3-10, 1947	234	7.8	446	19	464	146	473	194	1,530	730	5.4	3,460	4.71	2,190	1,760	1,600	37
Jan. 12-20	252	7.8	491	12	536	155	454	160	1,660	780	2.8	3,680	5.00	2,500	1,980	1,840	33
Jan. 21-31	239	7.6	483	17	532	155	477	172	1,640	770	3.2	3,650	4.96	2,360	1,960	1,820	33
Feb. 1-10	231	7.7	475	13	528	149	457	166	1,660	750	3.1	3,640	4.95	2,270	1,930	1,790	34
Feb. 11-20	160	7.8	485	13	538	161	443	171	1,670	770	3.6	3,680	5.00	1,590	2,000	1,860	32
Feb. 21-28	125	7.8	507	12	512	166	512	175	1,660	850	4.1	3,800	5.17	1,280	1,960	1,820	36
Mar. 1-10	137	7.9	487	21	496	181	440	172	1,600	800	5.8	3,630	4.94	1,340	1,980	1,840	33
Mar. 11-20	145	7.9	467	12	486	169	414	176	1,540	750	4.8	3,460	4.71	1,350	1,910	1,760	32
Mar. 21-31	118	7.8	469	16	490	170	431	172	1,590	750	4.7	3,540	4.81	1,130	1,920	1,780	33

Apr. 1-10 ----------	67.7	7.8	528	13	516	179	534	168	1,690	910	5.5	3,930	5.34	718	2,020	1,890	36
Apr. 11-20 --------	81.1	7.8	539	16	528	181	553	178	1,730	930	5.3	4,030	5.48	882	2,060	1,920	37
Apr. 21-30 --------	83.0	7.5	538	24	508	177	575	179	1,710	930	8.2	4,020	5.47	901	2,000	1,850	38
May 1-9 ----------	114	7.7	518	18	488	181	544	165	1,680	890	7.7	3;890	5.29	1,200	1,960	1,830	38
May 11-20 ---------	118	7.7	508	36	488	168	550	170	1,650	880	8.5	3,860	5.25	1,230	1,910	1,770	39
May 21-31 ---------	107	7.8	517	25	488	170	569	170	1,670	900	8.0	3,910	5.32	1,130	1,920	1,780	39
June 1-10 ----------	97.3	7.7	517	26	482	172	566	155	1,670	900	7.4	3,900	5.30	1,020	1,910	1,780	39
June 11-20 ---------	52.0	7.7	572	31	506	179	675	154	1,780	1,050	8.4	4,310	5.86	605	2,000	1,870	42
June 21-30 ---------	36.5	7.7	619	34	528	189	759	172	1,870	1,170	8.5	4,640	6.31	457	2,090	1,950	44
July 1-10 ----------	35.9	7.7	627	38	548	190	762	174	1,900	1,190	8.0	4,720	6.42	458	2,150	2,010	44
July 11-20 ----------	38.2	7.7	647	33	548	193	791	170	1,920	1,230	8.5	4,810	6.54	496	2,160	2,020	44
July 21-31 ----------	39.9	7.7	643	31	544	191	797	171	1,930	1,220	7.3	4,800	6.53	517	2,140	2,000	45
Aug. 1-10 ----------	28.3	7.7	717	29	580	205	917	186	2,000	1,450	4.1	5,280	7.18	403	2,290	2,140	47
Aug. 11-20 ---------	33.8	7.7	713	27	572	209	915	183	2,010	1,440	3.1	5,270	7.17	481	2,290	2,140	47
Aug. 21-31 ---------	43.2	7.7	683	30	556	204	860	189	1,940	1,360	4.0	5,050	6.87	589	2,230	2,070	46
Sept. 1-10 ----------	58.7	7.7	627	29	522	191	785	180	1,820	1,240	3.8	4,680	6.36	742	2,090	1,940	45
Sept. 11-20 ---------	80.7	7.8	544	23	486	180	597	172	1,670	970	3.7	4,010	5.45	874	1,950	1,810	40
Sept. 21-30 ---------	43.5	7.5	607	22	500	184	719	175	1,740	1,140	4.7	4,400	5.98	517	2,000	1,860	44
Weighted average --	128	--	484	20	494	158	501	173	1,620	810	4.5	3,690	5.02	1,280	1,880	1,740	37

RIO GRANDE BASIN--Continued

PECOS RIVER AT RED BLUFF, N. MEX.

LOCATION--About 1 mile upstream from gaging station which is just downstream from Red Bluff Creek and 5½ miles upstream from Delaware River.
DRAINAGE AREA.--19,540 square miles above gaging station (contributing area).
RECORDS AVAILABLE.--Chemical analyses: October 1937 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 11,900 parts per million Aug. 11-20; minimum, 640 parts per million Oct. 4-6.
Total hardness: Maximum, 2,810 parts per million Aug. 11-20; minimum, 470 parts per million Oct. 4-6.
EXTREMES, 1937-47.--Dissolved solids: Maximum, 11,900 parts per million Aug. 11-20, 1947; minimum, 541 parts per million May 23, 1941.
Total hardness: Maximum, 2,810 parts per million Aug. 11-20, 1947; minimum, 302 parts per million May 23, 1941.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-3, 7, 9-10, 1946	169	7.4	631	25	408	154	898	163	1,420	1,410	2.8	4,400	5.98	2,010	1,650	1,520	54
Oct. 4-6	561	7.6	85.9	16	164	15	9.0	81	365	30	1.5	640	.87	969	470	404	4
Oct. 11, 12, 14-20	1/204	7.4	568	28	424	153	752	169	1,430	1,200	3.1	4,070	5.54	2,240	1,690	1,550	49
Oct. 13	(1/)	--	303	--	326	--	--	--	1,170	395	--	--	--	--	--	--	--
Oct. 21-26, 28-31	261	7.3	512	19	430	142	628	160	1,420	1,000	2.8	3,720	5.06	2,620	1,660	1,530	45
Nov. 1-10	260	7.6	563	19	496	152	658	160	1,600	1,060	2.7	4,070	5.54	2,860	1,860	1,730	43
Nov. 11-20	275	7.7	532	18	504	149	616	156	1,630	980	2.4	3,980	5.41	2,960	1,870	1,740	42
Nov. 21-30	255	7.8	569	21	514	149	704	166	1,680	1,090	3.3	4,240	5.77	2,920	1,900	1,760	45
Dec. 1-10	155	7.8	685	22	522	163	950	168	1,750	1,470	6.3	4,970	6.76	2,080	1,970	1,840	51
Dec. 11-20	170	7.8	663	20	500	165	910	178	1,680	1,420	7.9	4,790	6.51	2,200	1,930	1,780	51
Dec. 21-31	145	7.9	693	21	494	172	967	186	1,670	1,520	8.8	4,490	6.72	1,760	1,940	1,790	52
Jan. 4-10, 1947	242	7.9	524	20	448	153	699	201	1,660	970	8.9	4,060	5.52	2,650	1,750	1,580	47
Jan. 11-20	265	7.8	570	18	516	156	655	172	1,660	1,050	3.8	4,140	5.63	2,960	1,930	1,790	42
Jan. 21-31	254	7.8	577	12	524	152	668	164	1,670	1,070	3.2	4,180	5.68	2,870	1,930	1,800	43
Feb. 1-10	246	7.8	579	19	520	158	663	166	1,700	1,050	3.1	4,190	5.70	2,780	1,950	1,810	43
Feb. 11-20	162	7.8	676	18	534	165	886	165	1,740	1,410	2.9	4,840	6.58	2,120	2,010	1,880	49
Feb. 21-28	124	7.8	739	11	526	181	1,000	160	1,770	1,600	2.9	5,170	7.03	1,730	2,060	1,930	51
Mar. 1-10	131	7.4	717	13	504	191	964	168	1,730	1,560	--	5,040	6.85	1,780	2,040	1,910	51
Mar. 11-20	140	7.5	675	19	488	184	869	165	1,630	1,440	--	4,710	6.41	1,780	1,970	1,840	49
Mar. 21-31	128	7.6	675	13	488	181	870	154	1,630	1,440	--	4,700	6.39	1,620	1,960	1,840	49
Apr. 1-10	80.7	7.6	896	20	512	205	1,350	156	1,800	2,170	--	6,130	8.34	1,340	2,120	1,990	58
Apr. 11-20	88.1	7.7	894	12	536	210	1,320	154	1,870	2,130	--	6,150	8.36	1,460	2,200	2,080	57
Apr. 21-30	91.3	7.3	849	23	542	192	1,240	161	1,830	1,990	6.9	5,900	8.02	1,450	2,140	2,010	56
May 1-4	113	7.3	841	19	530	194	1,250	167	1,840	1,970	7.0	5,890	8.01	1,800	2,120	1,980	57

June 11-20	72.3	7.4	863	16	508	209	1,300	150	1,870	2,040	--	6,020	8.19	1,180	2,130	2,000	57
June 21-30	48.5	7.4	1,120	22	568	242	1,830	151	2,050	2,930	--	7,720	10.5	1,010	2,410	2,290	62
July 1-10	42.5	7.5	1,190	23	578	242	2,000	156	2,130	3,150	--	8,200	11.2	941	2,440	2,310	64
July 11-20	36.4	7.6	1,320	27	608	255	2,300	142	2,270	3,610	--	9,140	12.4	898	2,570	2,450	66
July 21-31	38.1	7.6	1,390	29	612	265	2,420	136	2,260	3,840	--	9,490	12.9	976	2,620	2,500	67
Aug. 1-10	26.3	7.6	1,380	27	609	268	2,410	134	2,280	3,820	--	9,480	12.9	673	2,620	2,510	67
Aug. 11-20	27.5	7.5	1,740	24	647	290	3,270	127	2,500	5,120	--	11,900	16.2	884	2,810	2,700	72
Aug. 21-31	49.9	7.6	1,350	23	573	248	2,360	137	2,130	3,730	--	9,130	12.4	1,230	2,450	2,340	68
Sept. 1-10	55.4	7.6	1,300	21	557	256	2,260	138	2,130	3,570	--	8,860	12.0	1,330	2,440	2,330	67
Sept. 11-20	78.0	7.7	938	23	512	212	1,470	147	1,890	2,310	--	6,490	8.83	1,370	2,150	2,030	60
Sept. 21-30	51.3	7.5	997	24	492	212	1,610	145	1,860	2,510	--	6,780	9.22	939	2,100	1,980	62
Weighted average	137	--	668	19	490	167	913	161	1,650	1,440	4.2	4,760	6.47	1,760	1,910	1,780	51

1/ Discharge for Oct. 13 included with discharge reported for Oct. 11-12, 14-20.

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR ORLA, TEX.

LOCATION.--At gaging station 600 feet upstream from Pasotex pipe-line crossing, 6 miles southeast of Orla, Reeves County, 11 miles downstream from Salt (Screwbean) Draw, and 14 miles downstream from Red Bluff Dam.
DRAINAGE AREA.--21,300 square miles (contributing area).
RECORDS AVAILABLE.--Chemical analyses: July 1937 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 9,050 parts per million Sept. 1-10; minimum, 3,010 parts per million Oct. 1-10.
Total hardness: Maximum, 2,740 parts per million Sept. 1-10; minimum, 1,290 parts per million Oct. 1-10.
EXTREMES, 1937-47.--Dissolved solids: Maximum, 9,610 parts per million Feb. 11, 13, 16-19, 1946; minimum, 1,880 parts per million Oct. 13-15, 1941.
Total hardness: Maximum, 3,240 parts per million Feb. 11, 13, 16-19, 1946; minimum, 930 parts per million Oct. 13-15, 1941.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088. Records of specific conductance of daily samples are available in district office at Austin, Tex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 1-10, 1946	31.0	7.6	433	--	--	408	66	528		73	1,090	880	--	1.0	--	3,010	4.09	252	1,290	1,230	47
Oct. 11-20	10.4	7.8	918	--	--	568	184	1,460		102	1,800	2,400	--	1.0	--	6,460	8.79	181	2,170	2,090	59
Oct. 21-Dec. 15	13.3	7.6	893	--	--	566	184	1,410		105	1,820	2,300	--	1.0	--	6,330	8.61	227	2,170	2,080	58
Dec. 16-Feb. 10, 1947	8.43	7.9	673	--	--	484	158	908		129	1,600	1,460	--	.5	--	4,670	6.35	106	1,860	1,750	52
Feb. 11-19	3.84	7.9	680	--	--	488	164	967		114	1,660	1,540	--	.5	--	4,880	6.64	51	1,890	1,800	53
Feb. 20-28	18.6	7.8	670	--	--	504	163	1,010		136	1,830	1,490	--	1.0	--	5,060	6.88	254	1,930	1,820	53
Mar. 1-10	19.4	7.6	665	--	--	500	165	879		105	1,650	1,440	--	3.0	--	4,690	6.38	246	1,930	1,840	50
Mar. 11-20	54.8	7.8	665	--	--	502	165	883		95	1,660	1,450	--	1.0	--	4,710	6.41	697	1,930	1,850	50
Mar. 21-31	343	8.1	636	--	--	498	157	824		130	1,630	1,330	--	1.5	--	4,500	6.12	4,170	1,890	1,780	49
Apr. 1-10	524	7.5	650	--	--	494	163	895		106	1,660	1,440	--	3.5	--	4,710	6.41	6,660	1,900	1,820	51
Apr. 11-20	548	7.7	667	--	--	522	172	848		132	1,700	1,400	--	2.0	--	4,710	6.41	6,970	2,010	1,900	48
Apr. 21-30	514	7.6	689	--	--	538	173	875		138	1,740	1,440	--	2.0	--	4,840	6.58	6,720	2,050	1,940	48
May 1-10	405	7.8	740	--	--	524	175	1,020		100	1,760	1,650	--	3.5	--	5,180	7.04	5,660	2,030	1,940	52
May 11-20	94.8	8.0	749	--	--	560	183	1,030		113	1,870	1,660	--	4.0	--	5,360	7.29	1,370	2,150	2,060	51
May 21-31	3.57	7.8	843	--	--	620	210	1,160		110	2,040	1,920	--	3.0	--	6,010	8.17	58	2,410	2,320	51
June 1-10	48.9	8.0	758	--	--	578	187	989		98	1,860	1,630	--	4.0	--	5,280	7.18	697	2,210	2,130	49
June 11-20	180	7.9	741	--	--	570	186	958		112	1,830	1,610	--	3.0	--	5,210	7.09	2,530	2,190	2,100	49
June 21-30	233	8.0	773	--	--	586	190	1,010		129	1,900	1,670	--	1.5	--	5,420	7.37	3,410	2,240	2,140	49

July 1-10	325	8.3	803	--	--	584	198	1,090	92	1,950	1,800	--	4.0	--	5,670	7.71	4,980	2,270	2,200	51
July 11-20	306	8.3	825	--	--	606	205	1,130	101	2,000	1,880	--	6.0	--	5,880	8.00	4,860	2,360	2,270	51
July 21-31	236	8.4	921	--	--	626	216	1,330	126	2,080	2,180	--	4.5	--	6,500	8.84	4,140	2,450	2,350	54
Aug. 1-10	165	7.9	965	18	.02	644	223	1,420	38	110	2,200	2,320	1.4	5.0	2.5	6,930	9.42	3,090	2,570	2,430	55
Aug. 11-20	124	--	1,010	--	--	634	235	1,550	119	2,240	2,480	--	--	--	7,200	9.79	2,410	2,550	2,450	57
Aug. 21-31	49.5	--	1,200	--	--	669	249	1,970	126	2,360	3,130	--	--	--	8,440	11.48	1,130	2,690	2,590	61
Sept. 1-10	49.6	--	1,290	--	--	665	262	2,190	117	2,390	3,490	--	--	--	9,050	12.31	1,210	2,740	2,640	64
Sept. 11-20	49.3	--	1,190	--	--	672	256	1,900	116	2,350	3,070	--	--	--	8,300	11.29	1,100	2,730	2,630	60
Sept. 21-30	50.0	--	1,160	--	--	659	258	1,880	96	2,360	3,020	--	--	--	8,220	11.18	1,110	2,710	2,630	60
Weighted average	125	--	764	--	--	554	185	1,050	116	1,840	1,720	--	3.1	--	5,410	7.36	1,830	2,140	2,050	51

RIO GRANDE BASIN--Continued

PECOS RIVER BELOW GRANDFALLS, TEX.

LOCATION.--At gaging station at bridge on State Farm to Market Road 11, 7.1 miles southeast of Grandfalls, Ward County, and about 10 miles downstream from Chacatori Draw.
DRAINAGE AREA.--27,820 square miles (contributing area).
RECORDS AVAILABLE.--Chemical analyses: April 1939 to June 1942, October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 11,600 parts per million Mar. 1-10; minimum, 776 parts per million June 5.
Total hardness: Maximum, 3,630 parts per million July 21-31; minimum, 339 parts per million June 5.
EXTREMES, 1939-42, 1946-47.--Dissolved solids: Maximum, 12,000 parts per million Feb. 1-10, 1941; minimum, 776 parts per million June 5, 1947.
Total hardness: Maximum, 3,630 parts per million July 21-31, 1947; minimum, 339 parts per million June 5, 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088. Records of specific conductance of daily samples are available in district office at Austin, Tex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-20, 1946 ---	21.2	--	1,430	--	--	789	351	2,360		181	3,020	3,720	--	--	--	10,300	14.01	590	3,410	3,260	60
Oct. 21-31 -------	20.8	--	1,440	--	--	789	363	2,390		176	3,050	3,780	--	--	--	10,500	14.28	590	3,460	3,320	60
Nov. 1-10 --------	19.6	--	1,470	--	--	753	367	2,470		158	3,040	3,880	--	--	--	10,600	14.42	561	3,390	3,260	61
Nov. 11-20 -------	18.2	--	1,440	--	--	767	371	2,370		157	3,010	3,780	--	--	--	10,400	14.14	511	3,440	3,310	60
Nov. 21-30 -------	20.0	--	1,440	--	--	759	362	2,340		152	2,970	3,730	--	--	--	10,200	13.87	551	3,380	3,260	60
Dec. 1-10 --------	29.2	--	1,480	--	--	759	358	2,430		171	2,910	3,880	--	--	--	10,400	14.14	820	3,370	3,230	61
Dec. 11-20 -------	30.7	--	1,400	--	--	729	345	2,380		179	2,810	3,790	--	--	--	10,100	13.74	837	3,240	3,090	62
Dec. 21-31 -------	33.5	--	1,460	--	--	732	350	2,450		179	2,810	3,920	--	--	--	10,400	14.14	941	3,270	3,120	62
Jan. 1-10, 1947 ---	42.7	--	1,600	--	--	768	363	2,680		184	3,010	4,220	--	--	--	11,100	15.10	1,280	3,410	3,260	63
Jan. 11-20 -------	30.1	--	1,550	--	--	751	354	2,560		191	2,900	4,050	--	--	--	10,700	14.55	870	3,330	3,170	63
Jan. 21-31 -------	24.0	--	1,550	--	--	740	373	2,580		191	3,020	4,030	--	--	--	10,800	14.69	700	3,380	3,220	62
Feb. 1-10 --------	24.7	--	1,530	--	--	769	391	2,540		176	3,050	4,070	--	--	--	10,900	14.82	727	3,530	3,380	61
Feb. 11-19 -------	37.0	--	1,530	--	--	769	392	2,670		172	3,050	4,270	--	--	--	11,200	15.23	1,120	3,530	3,390	62
Feb. 20-28 -------	32.0	--	1,540	--	--	774	390	2,640		191	3,060	4,200	--	--	--	11,200	15.23	968	3,540	3,380	62
Mar. 1-10 --------	54.2	--	1,650	--	--	774	387	2,830		124	3,000	4,570	--	--	--	11,600	15.78	1,700	3,520	3,420	64
Mar. 11-20 -------	41.3	--	1,460	--	--	743	354	2,480		99	2,830	4,030	--	--	--	10,500	14.28	1,170	3,310	3,230	62
Mar. 21-31 -------	33.2	--	1,400	--	--	738	341	2,280		103	2,780	3,700	--	--	--	9,890	13.45	887	3,240	3,160	60
Apr. 1-10 --------	26.5	--	1,490	--	--	753	357	2,490		86	2,890	4,030	--	2.5	--	10,600	14.42	758	3,350	3,280	62
Apr. 11-20 -------	30.3	--	1,490	--	--	740	366	2,570		89	2,990	4,080	--	4.0	--	10,800	14.69	884	3,350	3,280	63
Apr. 21-30 -------	28.0	--	1,420	--	--	725	351	2,340		89	2,890	3,720	--	5.5	--	10,100	13.74	764	3,250	3,180	61
May 1-10 ---------	28.7	--	1,370	--	--	722	337	2,280		95	2,860	3,600	--	5.5	--	9,850	13.40	763	3,190	3,110	61
May 11-20 --------	43.8	--	1,240	--	--	651	299	1,990		121	2,500	3,180	--	3.0	--	8,680	11.80	1,030	2,850	2,760	60
May 21-31 --------	26.3	--	1,290	--	--	689	313	2,050		142	2,640	3,260	--	4.0	--	9,030	12.28	641	3,010	2,890	60

June 1-4	49.0	--	1,430	--	--	739	369	2,410	77	3,040	3,810	--	--	--	10,400	14.14	1,380	3,360	3,300	61
June 5	445	--	148	--	--	98	23	112	106	171	225	--	1.0	--	776	1.06	932	339	252	42
June 6-8	43.0	--	531	--	--	292	121	753	116	950	1,260	--	3.5	--	3,440	4.68	399	1,230	1,130	57
June 9-20	25.3	--	990	--	--	536	250	1,520	85	2,000	2,500	--	--	--	6,850	9.32	468	2,370	2,300	58
June 21-30	22.3	--	1,220	--	--	658	304	1,880	121	2,460	3,060	--	--	--	8,420	11.45	507	2,890	2,790	59
July 1-10	25.0	--	1,340	--	--	713	343	2,080	91	2,750	3,390	--	--	--	9,320	12.68	629	3,190	3,120	59
July 11-20	25.0	--	1,530	--	--	790	379	2,570	102	3,220	4,030	--	--	--	11,000	14.96	743	3,530	3,450	61
July 21-31	22.4	--	1,530	--	--	817	388	2,540	129	3,310	3,980	--	--	--	11,100	15.10	671	3,630	3,630	60
Aug. 1-10	19.5	--	1,420	--	--	791	354	2,430	105	3,250	3,720	--	--	--	10,800	14.42	558	3,430	3,340	61
Aug. 11-20	17.9	--	1,420	--	--	802	356	2,360	101	3,200	3,670	--	--	--	10,400	14.14	503	3,470	3,380	60
Aug. 21-31	17.7	--	1,420	--	--	803	356	2,420	121	3,260	3,720	--	--	--	10,600	14.42	507	3,470	3,370	60
Sept. 1-10	14.6	--	1,510	--	--	752	344	2,590	102	3,210	3,900	--	--	--	10,800	14.69	426	3,290	3,210	63
Sept. 11-20	14.5	7.2	1,510	19	.02	761	383	2,440 | 38	125	3,180	3,820	3.0	--	2.5	10,700	14.55	419	3,470	3,370	61
Sept. 21-30	14.0	--	1,500	--	--	742	338	2,580	111	3,180	3,650	--	--	--	10,700	14.55	404	3,240	3,150	63
Weighted average	28.2	--	1,380	--	--	709	336	2,290	134	2,770	3,630	--	--	--	9,800	13.33	746	3,150	3,040	61

PECOS RIVER NEAR GIRVIN, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 67, about half a mile downstream from Panhandle and Santa Fe Railway bridge, 2.1 miles east of Girvin, Pecos County, and 6½ miles downstream from Comanche Creek.
DRAINAGE AREA.--29,560 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1939 to June 1941, October 1946 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 14,300 parts per million Aug. 11-2 ; minimum, 4,900 parts per million June 10-15.
Total hardness: Maximum, 4,290 parts per million Aug. 11-20; minimum, 1,570 parts per million June 10-15.
EXTREMES, 1939-41, 1946-47.--Dissolved solids: Maximum, 14,300 parts per million Aug. 11-20, 1947; minimum, 1,060 parts per million May 29, 1941.
Total hardness: Maximum, 4,290 parts per million Aug. 11-20, 1947; minimum, 849 parts per million May 30, 1941.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088. Records of specific conductance of daily samples are available in district office at Austin, Tex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Specific conductance ($K \times 10^6$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-20, 1946 ----	41.8	1,700	747	464	3,060	181	3,400	4,770	--	12,500	17.00	1,410	3,770	3,620	64
Oct. 21-31 ---------	36.0	1,830	790	494	3,280	169	3,580	5,160	--	13,400	18.22	1,300	4,000	3,860	64
Nov. 1-10 ----------	33.6	1,830	790	483	3,310	191	3,600	5,140	--	13,400	18.22	1,220	3,960	3,800	65
Nov. 11-20 ---------	37.1	1,790	803	480	3,300	205	3,590	5,140	--	13,400	18.22	1,340	3,980	3,810	64
Nov. 21-30 ---------	40.2	1,790	791	480	3,300	205	3,620	5,090	--	13,400	18.22	1,450	3,950	3,780	64
Dec. 1-10 ----------	46.8	1,810	768	480	3,150	178	3,460	4,960	--	12,900	17.54	1,630	3,890	3,740	64
Dec. 11-20 ---------	59.2	1,730	686	452	3,120	175	3,270	4,820	--	12,400	16.86	1,980	3,570	3,430	65
Dec. 21-31 ---------	52.8	1,750	734	452	3,050	170	3,270	4,810	--	12,400	16.86	1,770	3,690	3,550	64
Jan. 1-10, 1947 ----	69.1	1,700	757	442	2,990	180	3,270	4,720	--	12,300	16.73	2,290	3,710	3,560	64
Jan. 11-20 ---------	61.1	1,750	766	457	3,150	182	3,360	4,960	--	12,800	17.41	2,110	3,790	3,640	64
Jan. 21-31 ---------	45.3	1,770	761	472	3,250	211	3,440	5,070	--	13,100	17.82	1,600	3,840	3,670	65
Feb. 1-10 ----------	46.5	1,890	782	483	3,280	193	3,470	5,180	--	13,300	18.09	1,670	3,940	3,780	64
Feb. 11-19 ---------	55.1	1,850	811	478	3,220	184	3,470	5,130	--	13,200	17.95	1,960	3,990	3,840	64
Feb. 20-28 ---------	52.8	1,830	790	463	3,260	189	3,450	5,110	--	13,200	17.95	1,870	3,880	3,720	65
Mar. 1-10 ----------	63.4	1,790	774	466	3,200	167	3,490	4,990	--	13,000	17.68	2,230	3,850	3,710	64
Mar. 11-20 ---------	58.4	1,790	768	449	3,290	157	3,380	5,160	--	13,100	17.82	2,070	3,760	3,630	66
Mar. 21-31 ---------	46.3	1,690	754	457	3,080	160	3,400	4,810	--	12,600	17.14	1,580	3,760	3,630	64

Apr. 1-10	36.8	1,890	785	476	3,270	105	3,550	5,130	--	13,300	18.09	1,320	3,920	3,830	64
Apr. 11-20	44.4	1,890	801	489	3,350	125	3,640	5,250	--	13,600	18.50	1,630	4,010	3,910	65
Apr. 21-30	45.6	1,900	783	483	3,270	67	3,580	5,150	--	13,300	18.09	1,640	3,940	3,880	64
May 1-10	46.5	1,860	784	487	3,250	99	3,600	5,110	--	13,300	18.09	1,670	3,960	3,880	64
May 11-20	115	1,570	721	408	2,720	97	3,150	4,270	--	11,300	15.37	3,510	3,480	3,400	63
May 21-31	53.8	1,670	723	426	2,850	74	3,250	4,470	--	11,800	16.05	1,710	3,560	3,500	64
June 1-9	121	1,720	697	430	2,910	74	3,200	4,560	1.5	11,800	16.05	3,860	3,510	3,450	64
June 10-15	45.0	750	334	179	1,150	80	1,390	1,810	1.5	4,900	6.66	595	1,570	1,500	61
June 16-20	41.0	1,260	498	317	2,210	77	2,470	3,340	1.5	8,870	12.06	982	2,550	2,480	65
June 21-30	65.7	1,430	590	366	2,450	77	2,800	3,780	1.5	10,000	13.60	1,770	2,980	2,910	64
July 1-10	41.9	1,780	714	489	3,220	89	3,510	5,010	--	13,000	17.68	1,470	3,790	3,720	65
July 11-20	48.4	1,690	714	469	3,060	83	3,410	4,790	--	12,500	17.00	1,630	3,710	3,640	64
July 21-31	39.1	1,890	787	518	3,470	75	3,830	5,380	--	14,000	19.04	1,480	4,090	4,030	65
Aug. 1-10	26.8	1,950	822	537	3,430	85	3,850	5,410	--	14,100	19.18	1,020	4,260	4,190	64
Aug. 11-20	21.5	1,940	829	540	3,490	87	3,940	5,460	--	14,300	19.45	830	4,290	4,220	64
Aug. 21-31	26.8	1,940	813	535	3,390	105	3,810	5,350	--	13,900	18.90	1,010	4,230	4,140	64
Sept. 1-10	26.2	1,910	817	540	3,430	101	4,000	5,300	--	14,100	19.18	997	4,260	4,180	64
Sept. 11-20	27.2	1,910	809	522	3,390	109	3,810	5,300	--	13,900	18.90	1,020	4,170	4,080	64
Sept. 21-30	22.8	1,920	814	515	3,470	111	3,890	5,360	--	14,100	19.18	868	4,150	4,060	65
Weighted average	48.0	1,740	745	458	3,090	136	3,390	4,830	--	12,600	17.14	1,630	3,740	3,630	64

PECOS RIVER NEAR SHEFFIELD, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 290, 3½ miles southeast of Sheffield, Pecos County, and about 4 miles upstream from Liveoak Creek.
DRAINAGE AREA.--31,660 square miles (contributing area).
RECORDS AVAILABLE.--Chemical analyses: November 1939 to June 1941, October to November 1946, March to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 10,900 parts per million Aug. 21-27; minimum, 2,540 parts per million June 28-30.
Total hardness: Maximum, 3,310 parts per million Aug. 21-27; minimum, 915 parts per million June 28-30.
EXTREMES, 1939-41, 1946-47.--Dissolved solids: Maximum, 12,000 parts per million Apr. 11-14, 1941; minimum, 1,590 parts per million June 10, 1941.
Total hardness: Maximum, 3,460 parts per million Apr. 11-14, 1941; minimum, 855 parts per million June 10, 1941.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1088. Records of specific conductance of daily samples are available in district office at Austin, Tex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Specific conductance ($K \times 10^6$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 12-20, 1946 ---	--	1,300	566	343	2,210	163	2,500	3,470	--	9,170	12.47	--	2,820	2,690	63
Oct. 22-31 ---------	--	1,340	566	355	2,310	131	2,600	3,610	--	9,510	12.93	--	2,870	2,760	64
Nov. 1-10 ----------	--	1,410	577	365	2,410	118	2,680	3,750	--	9,840	13.38	--	2,940	2,840	64
Mar. 1-20, 1947 ----	77.3	1,570	656	399	2,620	166	2,860	4,150	--	10,800	14.69	2,250	3,280	3,140	63
Mar. 21-31 --------	69.0	1,520	636	374	2,530	148	2,650	4,080	--	10,300	14.01	1,920	3,120	3,000	64
Apr. 1-10 ---------	59.9	1,480	610	370	2,440	139	2,630	3,900	--	10,000	13.60	1,620	3,040	2,930	64
Apr. 11-20 --------	57.9	1,440	609	373	2,410	119	2,690	3,830	--	9,970	13.56	1,560	3,050	2,960	63
Apr. 21-30 --------	61.1	1,390	585	363	2,360	105	2,590	3,760	--	9,710	13.21	1,600	2,950	2,870	63
May 1-10 ----------	112	1,480	593	368	2,440	72	2,620	3,910	--	9,970	13.56	3,010	2,990	2,930	64
May 11-12, 18-19 ---	418	932	436	262	1,770	92	1,940	2,780	3.5	7,240	9.85	8,170	2,170	2,090	64
May 13-17 ---------	113	679	270	140	892	128	981	1,460	3.5	3,810	5.18	1,160	1,250	1,140	61
May 20-31 ----------	74.3	792	356	189	1,230	128	1,380	1,980	2.5	5,200	7.07	1,040	1,670	1,560	62
June 1-3 ----------	58.7	792	370	191	1,230	88	1,480	1,960	2.5	5,280	7.18	837	1,710	1,640	61
June 4-10 ----------	124	1,200	537	323	2,040	99	2,360	3,230	1.5	8,540	11.61	2,860	2,670	2,590	62
June 11-23 ---------	63.5	1,460	624	384	2,520	82	2,830	3,970	--	10,400	14.14	1,780	3,140	3,070	64
June 24-27 ---------	287	830	370	192	1,280	112	1,470	2,040	2.5	5,410	7.36	4,190	1,710	1,620	62
June 28-30 ---------	72.0	416	202	100	561	121	680	940	1.2	2,540	3.45	494	915	816	57
July 1-6 ----------	57.3	727	274	182	1,150	124	1,260	1,780	3.0	4,710	6.41	729	1,440	1,330	64
July 7-20 ---------	51.5	1,080	406	276	1,800	91	1,980	2,780	3.0	7,290	9.91	1,010	2,150	2,070	65
July 21-31 ---------	36.9	1,300	519	353	2,210	98	2,510	3,440	--	9,080	12.35	905	2,750	2,670	64

Aug. 1-10 ----------	34.0	1,410	569	384	2,450	98	2,670	3,880	--	10,000	13.60	918	3,000	2,920	64
Aug. 11-20 --------	27.7	1,340	554	359	2,270	88	2,550	3,590	--	9,370	12.74	701	2,860	2,790	63
Aug. 21-27 --------	78.6	1,540	633	421	2,640	100	2,950	4,180	--	10,900	14.82	2,310	3,310	3,230	63
Aug. 28-31 --------	48.2	1,000	416	271	1,560	102	1,790	2,550	--	6,640	9.03	864	2,150	2,070	61
Sept. 1-10 ---------	38.1	1,320	589	345	2,440	123	2,580	3,830	--	9,840	13.38	1,010	2,890	2,790	65
Sept. 11-20 --------	36.0	1,220	552	322	2,100	116	2,440	3,290	--	8,760	11.91	851	2,700	2,610	63
Sept. 21-30 --------	32.1	1,400	610	374	2,440	103	2,760	3,830	--	10,100	13.74	875	3,060	2,980	63
Weighted average 1/	72.3	1,210	513	311	2,040	112	2,250	3,230	--	8,400	11.42	1,640	2,560	2,470	63

1/ For period Mar. 1 to Sept. 30.

RIO GRANDE BASIN--Continued

CARLSBAD PROJECT MAIN CANAL NEAR CARLSBAD, N. MEX.

LOCATION.--At head of Carlsbad project main canal at Avalon Dam, 1/ 5 miles north of Carlsbad, Tom Green County.
RECORDS AVAILABLE.--Chemical analyses: February 1939 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 4,960 parts per million Sept. 17-20; minimum, 1,410 parts per million Oct. 7-8.
Total hardness: Maximum, 2,560 parts per million Sept. 21-30; minimum, 772 parts per million Oct. 7-8.
EXTREMES, 1939-47.--Dissolved solids: Maximum, 5,570 parts per million June 1-10, 1945; minimum, 1,340 parts per million Sept. 2-4, 1946.
Total hardness: Maximum, 2,810 parts per million June 1-10, 1945; minimum, 744 parts per million Sept. 2-4, 1946.
REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 1-6, 9-10, 1946	7.7	380	20	446	114	334	130	1,390	535	0.4	2,900	3.94	1,580	1,480	31
Oct. 7-8	7.8	200	16	219	55	159	100	654	250	3.0	1,410	1.92	772	690	31
Oct. 11-15	7.7	456	23	546	144	420	146	1,710	685	2.3	3,600	4.90	1,950	1,840	32
Oct. 16-20	--	319	--	--	--	--	--	--	--	--	--	--	--	--	--
Oct. 21-31	--	396	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 1-10	--	458	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 11-19	--	492	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 20-25	--	497	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 26-30	7.7	501	20	606	153	475	146	1,870	785	.6	3,980	5.41	2,140	2,040	33
Dec. 1-10	7.7	500	20	604	157	462	144	1,860	780	3.1	3,960	5.39	2,150	2,030	32
Dec. 11-20	7.8	494	20	588	149	469	142	1,840	755	3.2	3,890	5.29	2,080	1,960	33
Dec. 21-31	--	484	--	--	--	--	--	--	--	--	--	--	--	--	--
Jan. 1-10, 1947	--	480	--	--	--	--	--	--	--	--	--	--	--	--	--
Jan. 11-20	--	483	--	--	--	--	--	--	--	--	--	--	--	--	--
Jan. 21-31	--	484	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 1-9	--	488	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 10-20	7.1	494	14	588	144	464	139	1,840	735	1.2	3,850	5.24	2,060	1,940	33
Feb. 21-28	7.2	495	11	588	146	464	138	1,830	750	1.2	3,860	5.25	2,070	1,950	33
Mar. 1-10	7.3	499	25	592	145	472	139	1,820	770	4.5	3,900	5.30	2,070	1,960	33
Mar. 11-20	--	502	--	--	--	--	--	--	--	--	--	--	--	--	--
Mar. 21-31	7.4	509	19	608	145	479	147	1,840	790	5.8	3,960	5.39	2,110	1,990	33

Apr. 1-10	7.5	499	15	608	138	458	141	1,840	740	6.9	3,880	5.28	2,080	1,970	32
Apr. 11-20	7.6	441	18	588	121	360	144	1,720	590	7.8	3,480	4.73	1,960	1,850	28
Apr. 21-30	7.6	502	16	610	137	459	144	1,800	770	7.2	3,870	5.26	2,090	1,970	32
May 1-10	7.6	513	20	614	143	494	140	1,870	800	6.1	4,020	5.47	2,120	2,010	34
May 11-16	7.5	582	16	638	162	584	130	1,980	960	5.9	4,410	6.00	2,260	2,150	36
May 17-20	--	576	--	--	--	--	--	--	--	--	--	--	--	--	--
May 21-30	--	570	--	--	--	--	--	--	--	--	--	--	--	--	--
May 31	7.5	573	24	646	167	578	141	1,960	990	5.2	4,440	6.04	2,300	2,180	35
June 1-10	7.5	604	19	666	170	638	141	2,020	1,080	6.9	4,670	6.35	2,360	2,240	37
June 11-12	7.8	575	21	632	167	600	153	1,930	1,010	9.8	4,450	6.05	2,260	2,140	37
June 13-20	--	579	--	--	--	--	--	--	--	--	--	--	--	--	--
June 21-30	--	614	--	--	--	--	--	--	--	--	--	--	--	--	--
July 1-4, 9	--	627	--	--	--	--	--	--	--	--	--	--	--	--	--
July 5-8, 10	7.9	628	25	704	183	649	116	2,180	1,100	5.4	4,900	6.66	2,510	2,410	36
July 11-20	7.9	365	21	558	103	264	139	1,680	370	5.2	3,070	4.18	1,820	1,700	24
July 21-27	7.9	393	23	574	186	162	105	1,740	460	3.0	3,200	4.35	2,200	2,110	14
July 28-31	--	468	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 1-10	--	516	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 11-20	7.4	580	21	690	175	563	100	2,180	930	1.7	4,610	6.27	2,440	2,360	33
Aug. 21-31	7.4	593	17	694	175	576	108	2,150	975	2.0	4,640	6.31	2,450	2,360	34
Sept. 1-10	7.5	608	18	696	177	627	120	2,200	1,020	1.9	4,800	6.53	2,460	2,370	36
Sept. 11-16	--	615	--	--	--	--	--	--	--	--	--	--	--	--	--
Sept. 17-20	7.6	626	18	728	177	649	117	2,270	1,060	1.8	4,960	6.75	2,540	2,450	36
Sept. 21-30	7.4	629	17	720	185	634	117	2,250	1,060	2.2	4,930	6.70	2,560	2,460	35

1/ Samples collected from the canal whenever there was flow in the canal; otherwise samples were collected from Lake Avalon at the head gates and are those for which specific conductance values only are given.

RIO GRANDE BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RIO GRANDE BASIN IN NEW MEXICO

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Specific conductance ($K \times 10^6$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids		Hardness as $CaCO_3$		Percent sodium
									Parts per million	Tons per acre-foot	Total	Non-carbonate	
MCMILLAN RESERVOIR NEAR LAKEWOOD													
Nov. 20, 1946	450	--	--	--	--	--	795	--	--	--	--	--	--
Jan. 11, 1947	448	--	--	--	--	--	860	--	--	--	--	--	--
Mar. 4	754	--	--	--	--	--	1,560	--	--	--	--	--	--
Apr. 23	368	--	--	--	--	--	395	--	--	--	--	--	--
June 12	1,550	1,270	439	2,330	164	4,490	3,710	--	12,300	16.7	4,970	4,840	50
July 31	640	810	171	626	68	2,540	980	3.2	5,160	7.02	2,720	2,670	33
PECOS RIVER AT FORD CROSSING IN MAJOR JOHNSON SPRING AREA NEAR LAKEWOOD													
Oct. 2, 1946	485	--	--	--	166	--	705	--	--	--	--	--	--
Nov. 20	477	--	--	--	--	--	675	--	--	--	--	--	--
Jan. 11, 1947	458	--	--	--	--	--	585	--	--	--	--	--	--
Mar. 4	483	--	--	--	--	--	715	--	--	--	--	--	--
Apr. 23	502	--	--	--	--	--	790	--	--	--	--	--	--
June 11	494	--	--	--	--	--	730	--	--	--	--	--	--
PECOS RIVER AT DAM SITE 3 NEAR LAKEWOOD													
Oct. 2, 1946	505	--	--	--	148	--	760	--	--	--	--	--	--
Nov. 20	508	604	163	704	148	1,880	800	0.9	4,220	5.74	1,680	1,560	48
Jan. 10, 1947	476	598	143	411	144	1,780	710	2.9	3,720	5.06	2,080	1,960	30
Mar. 4	495	592	140	446	147	1,790	735	1.2	3,780	5.14	2,050	1,930	32
Apr. 23	519	596	163	478	135	1,810	850	3.8	3,970	5.40	2,160	2,050	33
June 12	550	622	156	551	146	1,880	930	4.4	4,220	5.74	2,190	2,070	35
Aug. 1	533	618	126	551	136	1,870	850	1.9	4,080	5.55	2,060	1,950	37
Sept. 23	548	622	162	542	126	1,930	910	1.5	4,230	5.75	2,220	2,120	35
PECOS RIVER AT CARLSBAD													
Oct. 1, 1946	312	--	--	--	--	--	415	--	--	--	--	--	--
Nov. 21	444	--	--	--	--	--	655	--	--	--	--	--	--
Jan. 10, 1947	443	--	--	--	--	--	650	--	--	--	--	--	--
Mar. 4	350	--	--	--	--	--	470	--	--	--	--	--	--
Apr. 22	354	--	--	--	--	--	490	--	--	--	--	--	--
June 11	347	--	--	--	--	--	475	--	--	--	--	--	--

July 31	333	--	--	--	--	--	450	--	--	--	--	--	--
Sept. 23	307	334	104	263	217	1,030	412	2.8	2,250	3.06	1,260	1,080	31
SOUTH BERRENDO CREEK NEAR ROSWELL													
Apr. 22, 1947	319	251	96	328	155	819	530	9.3	2,110	2.87	1,020	894	41
Sept. 22	355	320	102	359	230	925	598	5.8	2,420	3.29	1,220	1,030	39
HAGERMAN CANAL AT DEXTER													
Nov. 20, 1946	182	--	--	--	--	--	66	--	--	--	--	--	--
Jan. 9, 1947	447	--	--	--	--	--	820	--	--	--	--	--	--
Mar. 4	468	--	--	--	--	--	945	--	--	--	--	--	--
Apr. 22	538	408	153	642	246	1,230	1,100	12	3,670	4.99	1,650	1,450	46
June 12	550	406	135	682	238	1,190	1,140	12	3,680	5.00	1,570	1,370	49
July 30	571	--	--	--	200	--	1,260	--	--	--	--	--	--
Sept. 22	595	392	136	815	209	1,180	1,350	5.8	3,980	5.41	1,540	1,370	54
BLACK RIVER AT FORELAND CROSSING NEAR MALAGA													
Oct. 1, 1946	188	--	--	--	199	--	17	--	--	--	--	--	--
Nov. 21	196	--	--	--	208	--	15	--	--	--	--	--	--
Jan. 10, 1947	200	427	75	7.1	214	1,140	18	2.0	1,770	2.41	1,370	1,200	1
Mar. 4	201	414	71	16	185	1,140	14	1.6	1,750	2.38	1,320	1,170	3
Apr. 22	213	440	85	3.2	180	1,230	18	1.1	1,870	2.54	1,450	1,300	1
June 11	215	444	80	26	163	1,280	18	1.2	1,930	2.62	1,440	1,300	4
July 31	190	379	64	20	166	1,050	17	.5	1,610	2.19	1,210	1,070	4
Sept. 23	189	382	70	16	169	1,070	16	.8	1,640	2.23	1,240	1,100	3

MISCELLANEOUS ANALYSES OF STREAMS IN RIO GRANDE BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Specific conductance ($K \times 10^6$ at 25° C.)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
										Total	Noncarbonate
TOYAH LAKE OUTLET NEAR PECOS											
Oct. 9-10, 1946	809	620	134	1,250	44	2,530	1,520	0.8	6,080	2,100	2,060
Oct. 11-20	1,060	756	177	1,770	42	3,380	2,060	--	8,160	2,610	2,58C
Oct. 21-25	1,340	895	247	2,370	51	4,240	2,800	--	10,600	3,250	3,21C
May 10-14, 1947	289	565	35	146	39	1,410	262	2.5	2,440	1,550	1,52C
May 15-21	426	667	66	340	36	1,700	620	1.2	3,410	1,940	1,910
May 22-30	680	992	118	596	37	2,540	1,120	2.5	5,390	2,960	2,930
Aug. 24-31	857	560	94	1,440	44	2,600	1,540	2.5	6,260	1,780	1,750
PECOS RIVER AT PECOS											
Oct. 9, 1946	862	552	227	1,240	112	1,940	2,050	--	6,060	2,310	2,220
Mar. 13, 1947	1,010	682	283	1,490	209	2,320	2,500	--	7,380	2,870	2,690

COLORADO RIVER MAIN STEM

COLORADO RIVER AT HOT SULPHUR SPRINGS, COLO.

LOCATION.--At bridge at Hot Sulphur Springs, Grand County, 2 miles upstream from Beaver Creek, and one mile downstream from gaging station.
DRAINAGE AREA.--782 square miles above gaging station.
RECORDS AVAILABLE.--Chemical analyses: April to September 1947.
EXTREMES, 1947.--Dissolved solids: Maximum, 83 parts per million Apr. 1-20; minimum, 38 parts per million June 21-30.
Total hardness: Maximum, 54 parts per million Apr. 11-20; minimum, 20 parts per million June 21-30.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1089. Records of specific conductance of daily samples are available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Apr. 1-10, 1947----	168	--	13.0	12	0.54	15	3.5	5.9	2.2	68	6.4	2.1	0.4	1.4	0.0	83	0.11	38	52	0	19
Apr. 11-20 --------	280	--	13.1	12	.26	16	3.5	5.6	1.6	70	6.1	2.2	.4	.9	.0	83	.11	63	54	0	18
Apr. 21-30 --------	492	--	11.3	12	.27	14	2.9	4.6	1.6	60	5.9	1.6	.4	.5	.0	73	.10	97	47	0	17
May 1-10 ----------	2,285	6.7	6.5	9.3	.04	7.3	1.7	4.8	1.9	32	6.1	2.6	.4	1.1	.0	51	.07	315	25	0	28
May 11-20 ---------	2,582	6.7	5.9	9.4	.08	7.2	1.5	4.3	2.2	30	5.9	2.6	.4	.9	.0	49	.07	342	24	0	26
May 21-31 ---------	1,869	6.8	6.4	10	.04	8.0	1.6	2.4	3.7	32	4.9	2.6	.4	.6	.0	50	.07	252	27	0	14
June 1-4, 6-7, 9-10	2,278	7.2	7.2	10	.23	7.7	2.0	5.0		36	3.9	2.1	.4	1.0	.0	50	.07	308	27	0	29
June 11-20---------	2,914	7.3	6.5	9.4	.21	7.4	1.8	3.8	1.3	34	3.0	2.1	.4	1.0	.0	47	.06	370	26	0	23
June 21-30---------	3,434	7.1	5.2	7.6	.14	5.8	1.3	3.0	1.4	26	2.6	1.6	.4	.9	.0	38	.05	352	20	0	23
July 1-10 ----------	2,376	7.1	5.8	7.6	.09	7.0	1.4	3.7	1.1	32	2.5	1.5	.4	.8	.0	42	.06	269	23	0	25
July 11-20 ---------	1,394	7.3	6.8	8.9	.15	9.6	1.5	1.8	1.4	35	2.6	1.8	.4	.9	.0	46	.06	173	30	1	11
July 21-31 ---------	583	7.7	9.6	11	.14	12	2.3	4.1	1.8	53	3.3	1.7	.4	.4	.0	63	.09	99	39	0	18
Aug. 1-10 ----------	547	7.2	9.6	11	.18	12	2.3	3.5	2.7	54	2.6	1.8	.2	.6	.1	63	.09	93	39	0	15
Aug. 11-20 ---------	482	7.1	9.5	11	.11	12	2.3	4.8	2.7	57	3.9	1.2	.2	.4	.1	67	.09	87	39	0	20
Aug. 21-31 ---------	289	7.1	10.7	12	.06	13	2.5	5.3	3.0	63	3.5	1.4	.2	.4	.1	72	.10	56	43	0	20
Sept. 1-10 ----------	214	7.2	11.4	12	.06	15	2.8	6.3	3.4	72	4.2	2.0	.2	.3	.1	82	.11	47	49	0	20
Sept. 11-20 ---------	236	7.3	11.0	12	.09	14	2.7	5.8	3.4	66	4.4	2.4	.2	.3	.1	78	.11	50	46	0	20
Sept. 21-30 ---------	199	7.2	9.8	9.1	.11	12	2.7	5.5	1.8	58	3.4	2.4	.2	.3	.1	66	.09	35	41	0	22
Weighted average -	1/1,251	--	6.9	9.3	0.13	8.2	1.8	3.9	1.9	36	3.9	2.0	0.4	0.8	0.0	50	0.07	169	28	0	22

1/ Runoff for period Apr. 1 to Sept. 30 was 91 percent of the total for the 1947 water year.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR GLENWOOD SPRINGS, COLO.

LOCATION.--At Shoshone power plant, 6 miles upstream from gaging station which is at Glenwood Springs, Garfield County, half a mile upstream from Roaring Fork.
DRAINAGE AREA.--Approximately 4,560 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1941 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 2,030 parts per million Aug. 10; minimum, 121 parts per million June 21-30.
Total hardness: Maximum, 1,480 parts per million Aug. 10; minimum, 77 parts per million July 1-10.
EXTREMES, 1941-47.--Dissolved solids: Maximum, 2,030 parts per million Aug. 10, 1947; minimum, 105 parts per million June 1-10, 1942.
Total hardness: Maximum, 1,480 parts per million Aug. 10, 1947; minimum, 72 parts per million June 1-20, 1942.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1089. Records of specific conductance of daily samples are available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1946 ---	1,048	7.6	83.9	13	0.01	70	16	78	2.4	139	134	113	0.2	0.5	0.1	496	0.67	1,400	240	126	41
Oct. 11-20 --------	1,161	7.7	75.2	11	.02	66	16	67	2.0	138	129	93	.2	.5	.1	453	.62	1,420	230	118	39
Oct. 21-31 --------	1,199	7.7	71.7	11	.01	62	16	63	2.0	134	121	88	.1	.4	.1	430	.58	1,390	220	110	38
Nov. 1-10 ---------	1,013	7.7	77.8	12	.02	64	16	72	2.0	134	123	104	.1	.5	.2	460	.63	1,260	226	116	41
Nov. 11-20 --------	805	7.7	85.2	12	.01	68	17	86	1.8	145	134	120	.1	.5	.1	511	.69	1,110	240	120	44
Nov. 21-30 --------	1,255	7.8	57.6	12	.03	49	12	52	2.0	117	91	68	.2	.5	.1	344	.47	1,170	172	76	39
Dec. 1-10 ---------	1,278	7.6	51.3	8.7	.04	46	11	42	1.6	109	77	59	.3	.2	.1	300	.41	1,040	160	70	36
Dec. 11-20 --------	1,260	7.7	48.7	13	.04	44	10	40	1.2	104	68	58	.3	.3	.1	286	.39	973	151	66	36
Dec. 21-31 --------	1,235	7.7	47.6	13	.05	44	10	40	1.6	104	70	57	.2	.4	--	287	.39	957	151	66	36
Jan. 1-10, 1947 ---	919	--	66.2	12	.01	51	12	72		121	93	97	.2	.5	.1	397	.54	985	176	78	47
Jan. 11-20 --------	745	--	84.6	12	.01	62	15	92		133	109	137	.2	.7	.1	493	.67	992	216	107	48
Jan. 21-31 --------	859	--	76.4	12	.01	58	13	86		131	101	122	.2	.5	.1	457	.62	1,060	198	90	49
Feb. 1-10 ---------	942	--	74.6	11	.01	56	14	78		126	96	116	.2	.8	.1	434	.59	1,100	197	94	46
Feb. 11-20 --------	1,009	--	76.3	10	.01	56	14	82		126	99	120	.2	.9	.1	444	.60	1,210	197	94	48
Feb. 21-28 --------	942	--	83.6	11	.01	62	14	92		136	107	134	.2	.9	.1	488	.66	1,240	212	100	49
Mar. 1-10 ---------	737	--	84.6	13	.01	62	14	96		136	108	138	.3	.8	.1	499	.68	993	212	100	50
Mar. 11-19 --------	745	--	84.9	13	.01	64	14	94		138	114	133	.3	1.0	.1	501	.68	1,010	217	104	48
Mar. 20-23, 25-31 -	1,698	--	51.0	12	.03	45	10	47		118	76	56	.4	.8	.0	305	.41	1,400	154	57	40

Apr. 1-10	1,880	--	47.8	12	.04	42	8.9	45	110	69	54	.4	.9	.1	286	.39	1,450	142	52	41
Apr. 11-20	1,670	--	54.0	11	.03	47	10	48	116	72	64	.4	.7	.1	310	.42	1,400	158	64	40
Apr. 21-30	2,662	--	40.5	11	.05	40	6.8	36	118	53	38	.4	.9	.1	244	.33	1,750	128	32	38
May 1-9	7,719	7.6	30.0	11	.17	39	16	6.4	118	36	16	.6	1.2	.1	184	.25	3,830	124	28	22
May 10-20	9,006	7.6	20.6	8.3	.15	25	4.7	12	80	24	11	.6	.9	.0	126	.17	3,060	82	16	24
May 21-31	6,956	7.6	21.6	9.3	.10	25	5.4	12	78	22	15	.6	.4	.0	128	.17	2,400	84	20	23
June 1-10	8,281	7.9	22.9	10	.02	26	4.8	13	81	27	12	.3	.5	.1	133	.18	2,970	84	18	25
June 11-20	10,780	7.8	22.0	9.7	.04	27	4.8	11	78	28	11	.3	.5	.1	131	.18	3,810	87	23	21
June 21-30	11,480	7.9	20.4	8.5	.05	25	4.9	9.2	71	28	10	.3	.4	.0	121	.16	3,750	82	24	20
July 1-10	10,330	7.2	20.1	7.8	.03	23	4.8	13	72	27	11	.6	.4	.0	123	.17	3,430	77	18	26
July 11-20	6,591	7.3	26.3	8.9	.03	26	6.4	20	76	40	20	.6	.4	.0	160	.22	2,850	92	29	32
July 21-31	3,878	7.5	36.8	9.2	.02	37	7.8	21	78	57	32	.6	.2	.0	203	.28	2,130	124	60	27
Aug. 1-9	1/2,763	7.3	42.7	10	.02	40	8.7	34	98	62	46	.4	.3	.0	250	.34	1,870	136	56	36
Aug. 10	(1/)	--	226	14	--	556	22	27	160	1,290	41	--	5.4	--	2,030	2.76	--	1,480	1,350	4
Aug. 11-20	2,352	7.5	49.7	11	.02	50	10	39	114	81	51	.4	.5	.0	299	.41	1,900	166	72	34
Aug. 21-31	1,874	7.5	51.9	10	.02	46	10	48	114	81	57	.4	.2	.0	309	.42	1,560	156	62	40
Sept. 1-10	1,114	7.7	73.5	11	.02	62	15	71	138	114	98	.4	.3	.1	440	.60	1,320	216	103	42
Sept. 11-20	1,601	7.9	61.1	10	.02	62	12	49	124	114	64	.2	.5	.0	373	.51	1,610	204	102	35
Sept. 21-30	1,290	8.0	61.8	9.7	.03	54	14	58	126	100	78	.3	.2	.0	376	.51	1,310	192	89	40
Weighted average	3,093	--	35.2	9.8	0.05	35	7.4	27	93	49	34	0.4	0.6	0.0	209	0.28	1,750	118	42	33

1/ Discharge for Aug. 10 included in discharge reported for Aug. 1-9.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR CAMEO, COLO.

LOCATION.--At diversion dam about 1½ miles upstream from Cameo, Mesa County and 5 miles downstream from gaging station.
DRAINAGE AREA.--8,055 square miles above gaging station.
RECORDS AVAILABLE.--Chemical analyses: October 1933 to September 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1089. Records of specific conductance of daily samples are available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-3, 6-10, 1946	1,885	--	128	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oct. 11-20	2,005	8.0	117	13	--	86	23	106	200	183	130	--	0.9	--	640	0.87	3,830	309	145	43
Oct. 21-31	2,068	--	111	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 2-7, 9-10	1,760	--	115	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 11, 13-20	1,505	7.9	124	13	--	84	23	149	187	186	198	--	1.7	--	747	1.02	3,060	304	151	52
Nov. 21-30	1,960	--	112	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec. 1-10	1,982	--	102	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec. 11-12, 15-20	1,929	8.0	99.7	11	--	67	18	120	157	144	158	--	1.3	--	597	.81	3,100	241	112	52
Dec. 21-30	1,970	--	101	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Jan. 1, 3-10, 1947	1,460	--	123	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Jan. 11-20	1,200	7.5	137	6.1	0.06	88	24	169	202	179	234	0.5	1.4	0.4	802	1.09	2,650	318	152	54
Jan. 21-31	1,359	--	126	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 1-10	1,435	--	119	--	--	--	--	--	182	--	--	--	--	--	--	--	--	--	--	--
Feb. 11-20	1,550	--	119	13	12	81	24	144	205	165	192	.3	2.2	.2	723	.98	3,060	300	132	51
Feb. 21-28	1,444	--	126	--	--	--	--	--	187	--	--	--	--	--	--	--	--	--	--	--
Mar. 1-10	1,275	--	138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mar. 11-20	1,423	--	135	12	--	91	27	160	204	198	220	--	2.2	--	811	1.10	3,200	338	171	51
Mar. 21-31	2,455	--	101	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 1-10	2,557	--	85.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 11-12, 14-20	2,358	--	95.1	11	--	63	18	112	171	128	142	--	.8	--	559	.76	3,600	231	91	51
Apr. 21-30, May 1-2	4,173	--	65.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
May 3-10	15,670	--	37.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
May 11-20	13,980	7.7	32.8	9.7	--	37	6.6	23	117	34	25	--	1.7	--	195	.27	7,700	120	24	29
May 22-31	12,090	--	31.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

June 1-10	14,500	--	32.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June 11, 13-20	17,480	8.3	30.5	9.6	--	34	7.3	20	106	39	22	--	.8	--	185	.25	8,870	115	28	28
June 21-25, 27-30	19,810	--	28.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 2-10	18,450	--	26.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 11-20	11,380	8.2	35.0	8.3	--	33	7.7	27	94	48	32	--	.7	--	203	28	6,450	114	37	34
July 21, 22, 24-31	6,457	--	50.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 1-10	4,684	--	62.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 11-20	3,975	7.6	73.3	10	--	64	15	70	154	114	90	--	1.5	--	440	.60	4,820	221	95	41
Aug. 21-28, 30-31	3,111	--	82.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sept. 1-10	1,992	--	105	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sept. 11-20	2,886	7.4	93.1	11	--	83	17	88	176	138	128	--	1.1	--	553	.75	4,380	277	133	41
Sept. 21-30	2,323	--	94.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Weighted average	5,175	--	53.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR CISCO, UTAH

LOCATION.--At bridge on U. S. Highway 160 near Moab, Grand County, Utah, 25 miles downstream from gaging station at Cisco, Grand County.
DRAINAGE AREA.--24,100 square miles, above gaging station.
RECORDS AVAILABLE.--Chemical analyses: October 1928 to September 1947.
Sediment records: May 1928 to September 1947.
EXTREMES, 1946-47.--Sediment loads: Maximum, 870,000 tons per day May 5; minimum, 300 tons per day Nov. 30.
EXTREMES, 1928-47.--Sediment loads: Maximum, 2,790,000 tons per day Oct. 14, 1941; minimum, less than 200 tons per day on many days.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1089. Records of specific conductance of daily samples are available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1946 ---	3,299	--	216	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oct. 11-14 --------	1/3,353	--	185	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oct. 14-20 --------	3,450	7.9	185	14	--	154	62	190	240	623	144	--	4.1	--	1,310	1.78	12,700	639	442	39
Oct. 22-31 --------	3,345	--	173	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 1-10 ---------	3,598	--	171	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 11-20 --------	3,197	7.9	172	15	--	132	56	184	231	537	147	--	5.9	--	1,190	1.62	10,600	560	370	42
Nov. 21-30 --------	3,605	--	162	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec. 1-10 ---------	3,587	--	149	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec. 11-20 --------	3,261	8.1	159	12	--	110	47	177	204	440	159	--	4.8	--	1,050	1.43	9,600	468	301	45
Dec. 21-28 --------	3,318	--	158	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Jan. 1-10, 1947 ----	2,390	--	175	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Jan. 11-20 --------	2,220	7.6	179	8.4	0.06	125	52	201	228	470	199	0.4	6.7	0.6	1,170	1.59	7,370	526	339	45
Jan. 21-31 --------	2,464	--	178	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 1-9 ----------	2,570	--	168	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 11-20 --------	2,870	7.6	159	7.7	.05	103	43	190	199	404	183	.4	5.8	.8	1,030	1.40	8,370	434	271	49
Feb. 21-28 --------	2,678	--	159	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mar. 1-10 ---------	2,498	--	180	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mar. 11-20 --------	2,578	--	177	11	--	114	50	209	211	451	211	--	6.3	--	1,160	1.58	8,350	490	317	48
Mar. 21-31 --------	4,051	--	135	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 1-4, 6-10 ----	4,328	--	108	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 11-20 --------	3,862	--	128	12	--	92	34	138	194	311	131	--	1.1	--	815	1.11	8,950	370	210	45
Apr. 21-30, May 1-4	9,070	--	77.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
May 5-10 ----------	31,320	--	45.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
May 11-20 ---------	25,040	7.8	44.3	11	--	50	11	29	141	84	20	--	2.2	--	277	.38	19,200	170	54	27
May 21-31 ---------	20,860	--	45.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

June 1-10	22,600	--	49.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June 11-18, 20	27,690	8.3	46.1	9.9	--	51	12	28	130	99	19	--	1.0	--	284	.39	22,000	176	70	26
June 22, 24-30	30,050	--	45.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 1-10	24,950	--	39.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 11-20	15,570	8.2	57.9	10	--	55	16	44	130	139	33	--	2.1	--	363	.49	15,600	203	96	32
July 21-31	8,290	--	83.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 1-10	5,721	--	115	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 11-17, 19-20	5,944	7.6	131	15	--	125	41	117	190	442	82	--	4.0	--	920	1.25	15,100	480	325	35
Aug. 21-31	6,320	--	133	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sept. 1-10	3,772	--	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sept. 11-16, 19	5,449	7.6	151	14	--	144	48	139	216	526	92	--	6.0	--	1,080	1.47	16,600	557	380	35
Sept. 21-30	3,839	--	145	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Weighted average	8,358	--	82.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

1/ Discharge for Oct. 14 included in discharge reported for Oct. 14-20.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR CISCO, UTAH--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day
1	2,190	--	--	3,830	--	--	3,680	--	--
2	3,210	--	--	3,990	0.07	7,540	3,600	--	--
3	3,970	--	--	3,890	--	--	3,570	0.03	2,890
4	3,070	--	--	3,340	.03	2,700	3,510	--	--
5	3,250	--	--	3,320	.02	1,790	3,320	.01	896
6	4,010	--	--	3,250	--	--	3,490	--	--
7	3,360	--	--	3,210	.07	6,070	3,600	.01	972
8	3,300	--	--	3,580	--	--	3,810	--	--
9	3,380	0.15	13,700	3,930	.12	12,700	3,780	--	--
10	3,250	--	--	3,640	--	--	3,510	.04	3,790
11	3,260	--	--	3,530	--	--	3,400	--	--
12	3,400	--	--	3,340	.06	5,410	3,250	.03	2,630
13	3,400	--	--	3,030	--	--	3,150	--	--
14	3,430	.03	2,780	3,070	.04	3,320	3,250	.02	1,760
15	3,260	.03	2,640	3,250	.05	4,390	3,350	--	--
16	3,400	--	--	3,250	.04	3,510	3,400	--	--
17	3,260	.03	2,640	3,320	--	--	3,490	.04	3,770
18	3,640	--	--	3,260	--	--	3,450	.03	2,790
19	3,580	.04	3,870	3,030	.04	3,270	3,160	.03	2,560
20	3,580	--	--	2,890	--	--	2,710	--	--
21	3,580	--	--	2,940	.04	3,180	2,900	.02	1,570
22	3,380	.04	3,650	2,990	--	--	3,100	.02	1,670
23	3,320	.03	2,690	3,300	.03	2,670	3,300	.02	1,780
24	3,120	.02	1,680	3,800	--	--	3,300	.01	891
25	3,340	--	--	4,200	--	--	3,400	--	--
26	3,360	.02	1,810	4,130	.28	31,200	3,500	.01	945
27	3,360	--	--	3,780	--	--	3,600	--	--
28	3,340	--	--	3,550	.05	4,790	3,700	.04	4,000
29	3,360	.02	1,810	3,660	--	--	3,600	--	--
30	3,380	.37	33,800	3,700	.003	300	3,250	--	--
31	3,250	.26	22,800	--	--	--	2,850	.07	5,390
Total load (tons)	--	--	1/253,000	--	--	1/197,000	--	--	1/85,000

Day	January			February			March		
1	2,200	--	--	2,450	0.02	1,320	2,710	0.04	2,930
2	2,100	0.04	2,270	2,200	.02	1,190	2,660	--	--
3	2,200	--	--	2,200	--	--	2,370	--	--
4	2,300	.05	3,100	2,500	.01	675	2,320	.02	1,250
5	2,400	--	--	2,650	.04	2,860	2,540	.03	2,060
6	2,450	.03	1,980	2,750	.02	1,480	2,490	.02	1,340
7	2,350	.06	4,130	2,800	--	--	2,420	--	--
8	2,550	--	--	2,800	.02	1,510	2,590	.02	1,400
9	2,550	.05	3,440	2,750	--	--	2,540	--	--
10	2,600	--	--	2,600	--	--	2,340	--	--
11	2,300	.06	3,730	2,600	.03	2,110	2,590	.02	1,400
12	2,300	.05	3,100	2,850	--	--	2,560	.01	691
13	2,300	.05	3,100	2,900	.05	3,920	2,500	.02	1,350
14	2,400	.03	1,940	2,900	--	--	2,590	--	--
15	2,500	--	--	2,900	.12	9,400	2,620	.03	2,120
16	2,300	.03	1,860	2,900	.08	6,260	2,440	--	--
17	2,100	.04	2,270	3,000	--	--	2,370	.02	1,280
18	2,000	.04	2,160	3,100	.11	9,210	2,390	.02	1,290
19	2,000	--	--	2,900	--	--	2,690	--	--
20	2,000	--	--	2,650	.12	8,590	3,030	.05	4,090
21	2,200	.05	2,970	2,550	--	--	3,430	--	--
22	2,300	--	--	2,450	.14	9,260	3,850	.16	16,600
23	2,400	.02	1,300	2,550	--	--	4,330	.18	21,000
24	2,450	--	--	2,850	--	--	4,930	--	--
25	2,500	.03	2,020	2,870	.09	6,970	4,890	.30	39,600
26	2,500	--	--	2,830	--	--	4,270	--	--
27	2,450	.05	3,310	2,710	.04	2,930	3,600	.15	14,600
28	2,500	.04	2,700	2,610	--	--	3,490	--	--
29	2,600	--	--	--	--	--	3,510	.07	6,630
30	2,600	.03	2,110	--	--	--	3,870	--	--
31	2,600	.03	2,110	--	--	--	4,390	.12	14,200
Total load (tons)	--	--	1/79,100	--	--	1/123,000	--	--	1/232,000

1/Includes loads estimated for missing days.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR CISCO, UTAH--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day
1	4,740	0.13	16,000	7,200	0.11	21,400	16,500	0.10	44,600
2	4,970	.16	21,500	9,040	.12	29,300	16,200	.12	52,500
3	4,680	.15	19,000	13,600	.48	176,000	17,500	.11	52,000
4	4,720	.14	17,800	20,000	1.12	605,000	21,300	.13	74,800
5	5,040	.12	16,300	26,200	1.23	870,000	24,300	.18	118,000
6	4,740	.11	14,100	29,700	.72	577,000	23,400	.13	82,100
7	4,190	.09	10,200	32,100	.54	468,000	21,200	.12	68,700
8	3,470	.08	7,500	32,700	.41	362,000	22,700	.09	55,200
9	3,280	.05	4,430	32,600	.34	299,000	28,400	.10	76,700
10	3,450	.04	3,730	34,600	.28	262,000	34,500	.19	177,000
11	3,570	.06	5,780	34,300	.28	259,000	35,800	.10	96,700
12	3,400	.05	4,590	34,200	.22	203,000	31,800	.11	94,400
13	3,190	.04	3,450	29,900	.18	145,000	31,500	.10	85,000
14	3,160	.04	3,410	25,800	.20	139,000	27,800	.11	82,600
15	2,850	.04	3,080	24,200	.23	150,000	24,800	.10	67,000
16	2,800	.04	3,020	22,500	.18	109,000	22,400	.10	60,500
17	3,700	.03	3,000	21,400	.15	86,700	22,700	.12	73,500
18	4,890	.06	7,920	19,800	.16	85,500	25,600	.10	69,100
19	5,230	.14	19,800	19,200	.15	77,800	27,200	.10	73,400
20	5,830	.20	31,500	19,100	.16	82,500	27,300	.14	103,000
21	5,830	.20	31,500	20,100	.10	54,300	30,300	.12	98,200
22	6,880	.23	42,700	21,200	.12	68,700	38,100	.10	103,000
23	9,190	.40	99,300	23,000	.14	86,900	37,900	.23	235,000
24	9,900	.78	208,000	23,200	.12	75,200	33,000	.10	89,000
25	9,160	.54	134,000	21,000	.12	68,000	28,500	.16	123,000
26	7,950	.32	68,700	19,100	.10	51,600	26,000	.12	84,200
27	6,790	.22	40,300	19,800	.11	58,800	25,600	.11	76,000
28	6,810	.18	33,100	21,000	.14	79,400	26,300	.09	63,900
29	7,530	.14	28,500	22,300	.07	42,100	26,900	.09	65,400
30	7,100	.14	26,800	21,000	.10	56,700	27,900	.06	45,200
31	--	--	--	17,800	.10	48,100	--	--	--
Total load (tons)	--	--	929,600	--	--	5,697,000	--	--	2,590,000
	July			August			September		
1	28,000	0.06	45,400	5,720	0.04	6,180	4,870	0.21	27,600
2	27,400	.06	44,400	5,390	.02	2,910	4,390	.13	15,400
3	26,500	.07	50,100	5,280	.03	4,280	3,890	.07	7,350
4	25,600	.07	48,400	5,190	.02	2,800	3,450	.05	4,660
5	25,600	.05	34,600	5,920	.50	79,900	3,160	.05	4,270
6	25,300	.08	54,600	5,280	.35	49,900	3,400	.10	9,180
7	23,400	.08	50,500	6,500	.27	47,400	3,530	.05	4,770
8	23,300	.08	50,300	6,040	.11	17,900	3,530	.16	15,200
9	22,400	.11	66,500	5,810	.09	14,100	3,410	.20	18,400
10	22,000	.11	65,300	6,080	.07	11,500	4,090	.38	42,000
11	21,600	.12	70,000	7,180	2/.24	46,500	4,870	.62	81,500
12	19,400	.06	31,400	6,380	.80	138,000	5,740	.54	83,700
13	17,700	.11	52,600	5,526	2/.60	89,700	6,220	.37	62,100
14	15,900	.07	30,100	6,520	.44	77,500	5,900	.33	52,600
15	14,400	.10	38,900	6,380	.29	50,000	5,780	.18	28,100
16	14,400	.09	35,000	5,900	.16	25,500	5,670	.13	19,900
17	14,900	.20	80,500	5,390	.20	29,100	5,540	.08	12,000
18	13,100	.08	28,300	5,450	.11	16,200	5,060	.08	10,900
19	12,400	.10	33,500	5,470	.06	8,860	4,740	.63	80,600
20	11,900	.06	19,300	5,250	.11	15,600	4,970	.11	14,800
21	10,900	.06	17,700	5,940	.08	12,800	4,910	.07	9,280
22	9,660	.08	20,900	8,900	1.69	406,000	4,810	.07	9,090
23	9,100	.06	14,700	7,660	1.95	403,000	4,410	.05	5,950
24	9,660	.09	23,500	7,980	1.58	340,000	4,070	.05	5,490
25	9,240	.08	20,000	7,300	1.11	219,000	3,830	.05	5,170
26	8,560	.13	30,000	6,220	.35	58,800	3,550	.05	4,790
27	7,740	.04	8,360	5,470	.15	22,200	3,360	.04	3,630
28	7,230	.05	9,760	5,140	.11	15,300	3,300	.04	3,560
29	6,640	.04	7,170	4,910	.07	9,280	3,140	.03	2,540
30	6,170	.03	5,000	5,000	.17	23,000	3,010	.03	2,440
31	6,290	.03	5,090	5,000	.23	31,000	--	--	--
Total load (tons)	--	--	1,092,000	--	--	2,274,000	--	--	647,000
Total load for year									tons-14,200,000

2/Estimated.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR GRAND CANYON, ARIZ.

LOCATION--At gaging station at Kaibab Bridge, a quarter of a mile upstream from Bright Angel Creek, 11 miles by trail northeast of Grand Canyon Village, Coconino County, and 267 miles upstream from Hoover Dam.
DRAINAGE AREA--137,800 square miles.
RECORDS AVAILABLE--Chemical analyses: August 1925 to November 1942, September 1943 to September 1947.
Water temperatures: October 1941 to September 1942, October 1943 to September 1947.
Sediment records: October 1925 to October 1942, September 1943 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 1,270 parts per million Oct. 11-20; minimum, 316 parts per million May 21-31.
Total hardness: Maximum, 603 parts per million Oct. 11-20; minimum, 187 parts per million July 1-5, 7-10.
Water temperatures: Maximum, 83° F. Aug. 8; minimum, freezing point Jan. 19, 20.
Sediment loads: Maximum, 9,220,000 tons per day Aug. 25; minimum, 2,130 tons per day Jan. 23, 25.
EXTREMES, 1925-47.--Dissolved solids: Maximum, 1,890 parts per million Sept. 21-30, 1934; minimum, 225 parts per million June 11-20, 1942.
Total hardness: Maximum, 792 parts per million Sept. 1-10, 1940; minimum, 127 parts per million June 11-17, 1926.
Water temperatures, 1941-42, 1943-47: Maximum, 88° F. June 17, 1944; minimum, freezing point Dec. 18, 1945, Jan. 19, 20, 1947.
Sediment loads: Maximum, 27,600,000 tons per day Sept. 13, 1927; minimum, 863 tons per day Dec. 27, 1928.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1089. Records of specific conductance of daily samples are available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 3-10, 1946 --	6,086	61	7.7	171	12	0.07	147	51	170	10	246	533	140	0.4	5.6	0.4	1,190	1.62	19,600	576	357	39
Oct. 11-20 ------	7,275	57	7.7	171	12	.05	156	52	181	12	240	592	137	.3	5.6	.4	1,270	1.73	24,900	603	406	39
Oct. 21-31 ------	7,049	55	7.7	163	12	.06	130	52	165	8.0	240	491	138	.5	5.8	.4	1,120	1.52	21,300	538	342	40
Nov. 1-10 -------	8,293	48	7.5	152	12	.02	122	46	158	4.8	242	444	125	.5	4.6	.5	1,040	1.41	23,300	500	301	41
Nov. 11-20 ------	8,582	46	7.5	144	12	.02	114	42	153	3.2	235	412	118	.3	4.2	.6	975	1.33	22,600	457	264	42
Nov. 21-30 ------	7,946	46	7.5	156	13	.02	120	44	170	3.6	255	436	132	.4	4.7	.5	1,050	1.43	22,500	480	272	43
Dec. 1-3, 5-10 --	8,256	44	7.5	148	16	.05	112	44	153	8.0	240	411	125	.3	2.0	.4	990	1.35	22,100	460	264	41
Dec. 11-20 ------	7,979	41	7.6	143	14	.03	104	44	148	9.6	237	384	127	.4	2.0	.4	950	1.29	20,500	440	246	42
Dec. 21-31 ------	6,689	39	7.6	146	14	.03	101	44	154	8.8	223	378	142	.3	2.3	.4	954	1.30	17,200	433	250	43
Jan. 1-3, 6-10, 1947	5,317	35	8.0	158	11	.02	114	47	171	4.6	253	394	166	.3	4.9	.5	1,040	1.41	14,900	478	270	43
Jan. 11-20 ------	4,919	35	7.9	168	11	.03	126	50	178	5.3	270	418	179	.3	4.9	.5	1,110	1.51	14,700	520	299	42
Jan. 21-31 ------	4,587	36	7.5	176	9.7	.09	122	53	197	7.6	278	430	198	.4	5.1	.4	1,160	1.58	14,400	523	294	45

Feb. 1-5, 7-10 ---	5,907	39	7.5	162	11	.09	118	48	177	6.4	260	396	180	.4	5.1	.4	1,070	1.46	17,100	492	279	43
Feb. 11-20 ------	6,911	44	7.6	154	11	.08	112	42	169	6.0	252	371	162	.4	5.5	.4	1,000	1.36	18,700	452	246	44
Feb. 21-28 ------	7,368	47	7.6	149	7.1	.07	114	43	154	6.0	244	372	150	.4	5.3	.4	972	1.32	19,300	462	262	42
Mar. 1-5, 7-10 --	7,975	48	7.4	141	13	.01	109	41	123	15	250	352	108	.2	2.5	.4	887	1.21	19,100	440	236	37
Mar. 11-20 ------	6,905	52	7.4	147	11	.03	104	43	146	8.8	239	357	138	.4	2.5	.3	928	1.26	17,300	436	240	41
Mar. 21-31 ------	16,420	55	7.5	129	11	.01	98	38	125	12	253	316	106	.4	.5	.5	832	1.13	36,900	400	193	39
Apr. 1-5, 7-10 --	13,110	55	7.6	104	9.6	.01	83	30	99	8.2	241	237	78	.4	.8	--	665	.90	23,500	330	133	39
Apr. 11-20 ------	10,270	58	7.6	101	8.7	.01	80	29	104	5.8	231	221	92	.4	1.6	--	656	.89	18,200	318	129	41
Apr. 21-30 ------	16,210	60	7.5	106	14	.01	84	31	108	6.8	240	247	88	.4	1.4	--	699	.95	30,600	337	140	40
May 1-3, 5-10 ---	33,640	67	7.4	75.1	10	.02	70	23	57	6.6	219	147	48	.4	1.4	--	471	.64	42,800	269	90	31
May 11-20 -------	67,320	62	7.4	51.3	15	.27	56	16	28	6.0	191	87	18	.4	1.5	--	322	.44	58,500	206	49	22
May 21-31 -------	49,750	67	7.4	49.8	8.6	.12	53	15	32	6.6	174	89	24	.4	1.8	--	316	.43	42,400	194	51	26
June 1-10 --------	47,500	67	7.4	55.1	14	.40	60	15	36	3.4	194	94	25	.4	.6	.4	344	.47	44,100	211	52	27
June 11-20 -------	57,230	68	7.5	54.1	9.4	.38	62	15	31	2.8	192	95	21	.2	1.0	.4	332	.45	51,300	216	58	24
June 21-30 -------	58,290	68	7.5	58.5	12	.20	62	15	42	3.0	189	117	23	.3	.7	.4	368	.50	57,900	216	61	29
July 1-5, 7-10 ---	45,330	72	7.5	51.9	11	.40	52	14	39	3.6	167	98	25	.3	.7	.4	326	.44	39,900	187	50	31
July 11-12, 15-20-	31,710	76	7.7	59.3	8.6	.06	61	15	44	4.4	186	111	32	.3	.8	.4	369	.50	31,600	214	61	30
July 21-31 -------	19,450	80	7.5	72.4	9.8	.08	67	19	63	4.2	186	158	49	.4	2.0	.5	464	.63	24,400	245	92	36
Aug. 1-4, 6-10 --	15,620	80	7.7	92.7	16	.11	92	25	70	9.0	226	214	62	.2	.6	.3	600	.82	25,300	332	148	31
Aug. 11-20 ------	18,850	77	7.7	124	16	.04	120	30	115	8.0	260	342	79	.4	.7	.3	839	1.14	42,700	423	210	37
Aug. 21-31 ------	29,570	75	7.6	139	20	.13	148	34	123	9.8	271	465	58	.5	.5	.3	992	1.35	79,200	510	288	34
Sept. 1-5, 7-10 --	12,360	77	7.6	134	17	.08	133	33	124	6.6	245	410	82	.4	.6	.3	927	1.26	30,900	468	266	36
Sept. 11-20 ------	9,888	72	7.6	139	15	.08	128	39	125	8.6	240	410	97	.3	1.5	.4	943	1.28	25,200	480	284	36
Sept. 21-30 ------	10,030	71	7.6	134	15	.07	124	38	118	8.0	226	395	95	.5	1.3	.4	906	1.23	24,500	466	280	35
Weighted average -	18,970	--	--	88.2	12	0.17	82	25	76	6.0	211	217	58	0.4	1.7	0.4	583	0.79	29,860	308	134	34

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR GRAND CANYON, ARIZ.--Continued

Temperature (° F.) of water, water year October 1946 to September 1947

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

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR GRAND CANYON, ARIZ.--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day
1	5,160	1/0.12	16,700	7,670	--	--	8,970	0.25	60,500
2	5,390	1/ .14	20,400	7,420	--	--	8,620	.23	53,500
3	5,630	.16	24,300	7,600	--	--	8,310	.20	44,900
4	5,320	.50	71,800	8,890	--	--	8,190	1/.19	42,000
5	5,160	.27	37,600	8,040	--	--	8,170	.18	39,700
6	5,450	.18	26,500	8,200	--	--	8,070	.18	39,200
7	6,170	.46	76,600	8,870	--	--	8,010	.18	38,900
8	7,490	.42	84,900	8,680	--	--	8,060	.17	37,000
9	7,930	.83	178,000	8,670	--	--	8,090	.15	32,800
10	7,160	.38	73,500	8,890	--	--	8,070	.16	34,900
11	7,580	.41	83,900	9,230	--	--	8,090	.14	30,600
12	8,120	.42	92,100	9,100	--	--	8,280	.14	31,300
13	7,560	.70	143,000	8,970	--	--	8,410	.15	34,100
14	7,400	1.06	212,000	9,230	--	--	8,440	.13	29,600
15	7,140	.72	139,000	8,590	--	--	8,430	.12	27,300
16	6,950	.62	116,000	8,330	--	--	8,120	.14	30,700
17	6,950	.52	97,600	8,170	--	--	7,720	.11	22,900
18	7,000	.54	102,000	7,840	--	--	7,380	.11	21,900
19	7,100	.47	90,100	8,010	--	--	7,340	.14	27,700
20	6,950	.39	73,200	8,350	--	--	7,580	.12	24,600
21	6,820	.32	58,900	7,980	--	--	7,640	.20	41,300
22	6,860	.27	50,000	7,740	--	--	7,580	.11	22,500
23	6,940	.26	48,700	7,700	--	--	7,420	.09	18,000
24	7,100	.22	42,200	7,380	--	--	6,960	.10	18,800
25	7,130	.20	38,500	6,950	--	--	6,410	.10	17,300
26	7,190	.17	33,000	6,940	--	--	6,090	.08	13,200
27	7,060	.20	38,100	7,490	--	--	5,980	.08	12,900
28	6,830	.17	31,300	8,760	--	--	6,030	.09	14,700
29	6,770	.17	31,100	9,110	--	--	6,120	.08	13,200
30	7,420	.17	34,100	9,410	--	--	6,470	.08	14,000
31	7,420	.31	62,100	--	--	--	6,880	.10	18,600
Total load (tons)	--	--	2,227,200	--	--	1,340,000	--	--	908,600

Day	January			February			March		
1	7,440	0.10	20,100	5,950	0.06	9,640	8,170	0.17	37,500
2	7,560	.11	22,500	6,120	.07	11,600	9,050	.30	73,300
3	7,140	.10	19,300	5,910	.08	12,800	9,210	.28	69,600
4	6,030	1/.09	14,700	5,840	.07	11,000	8,760	.27	63,900
5	4,950	1/.07	9,360	5,750	.06	9,320	8,360	.24	54,200
6	4,380	.05	5,910	5,740	1/.06	9,300	8,110	1/.22	48,200
7	4,070	.04	4,400	5,740	.06	9,300	7,670	.20	41,400
8	4,120	.04	4,450	5,910	.05	7,980	7,180	.17	33,000
9	3,880	.04	4,190	5,990	.06	9,700	6,660	.14	25,200
10	3,600	.04	3,890	6,120	.06	9,910	6,580	.12	21,300
11	4,050	.04	4,370	6,480	.08	14,000	6,770	.12	21,900
12	4,400	.04	4,750	6,770	.12	21,900	6,800	.12	22,000
13	4,570	.05	6,170	6,780	.11	20,100	6,820	.13	23,900
14	5,070	.05	6,840	6,760	.10	18,300	7,100	.11	21,100
15	5,590	.07	10,600	7,000	.10	18,900	7,130	.12	23,100
16	5,570	.06	9,020	6,950	.12	22,500	6,940	.10	18,700
17	5,590	.06	9,060	6,860	.11	20,400	6,830	.09	16,600
18	5,020	.05	6,780	7,000	.11	20,800	6,710	.09	16,300
19	4,700	.04	5,080	7,200	.15	29,200	6,890	.10	18,600
20	4,630	.04	5,000	7,310	.15	29,600	7,060	.12	22,900
21	4,300	.03	3,480	7,300	.14	27,600	7,070	.11	21,000
22	3,950	.03	3,200	7,340	.15	29,700	7,070	.10	19,100
23	3,950	.02	2,130	7,360	.14	27,800	9,360	.10	25,300
24	3,980	.02	2,150	7,360	.15	29,800	21,400	1.37	792,000
25	3,950	.02	2,130	7,360	.16	31,800	21,500	1.47	853,000
26	4,220	.03	3,420	7,250	.17	33,300	20,800	1.75	983,000
27	4,600	.03	3,730	7,370	.17	33,800	20,500	1.82	1,010,000
28	4,960	.04	5,360	7,600	.16	32,800	20,800	1.76	988,000
29	5,310	.05	7,170	--	--	--	19,700	1.64	872,000
30	5,530	.05	7,470	--	--	--	17,300	1.53	715,000
31	5,710	.07	10,800	--	--	--	15,100	1.32	538,000
Total load (tons)	--	--	227,510	--	--	562,850	--	--	7,489,100

1/Interpolated.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR GRAND CANYON, ARIZ.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day
1	13,600	1.07	393,000	18,600	0.56	281,000	49,900	0.39	525,000
2	12,700	.92	315,000	18,100	.52	254,000	47,300	.43	549,000
3	12,300	.82	272,000	18,100	.50	244,000	45,700	.32	395,000
4	12,000	.75	243,000	17,800	1/.48	231,000	44,600	.34	409,000
5	12,600	.70	238,000	18,500	.46	230,000	43,800	.38	449,000
6	13,800	1/.69	257,000	27,800	.66	495,000	46,100	.32	398,000
7	13,900	.68	255,000	41,900	1.40	1,580,000	49,800	.49	659,000
8	13,700	.56	207,000	53,300	1.96	2,820,000	50,900	.41	563,000
9	13,300	.53	190,000	59,500	1.62	2,600,000	48,100	.40	519,000
10	13,200	.44	157,000	62,800	1.48	2,510,000	48,800	.40	527,000
11	13,000	.44	154,000	65,200	1.56	2,750,000	54,300	.43	630,000
12	12,200	.41	135,000	71,800	1.17	2,270,000	61,800	.43	717,000
13	11,400	.32	98,500	76,400	1.15	2,370,000	65,000	.50	878,000
14	10,700	.30	86,700	77,400	1.10	2,300,000	63,600	.44	756,000
15	10,000	.28	75,600	72,700	1.09	2,140,000	63,300	.46	786,000
16	9,510	.26	66,800	67,800	.80	1,460,000	58,700	.39	618,000
17	9,260	.22	55,000	65,000	.78	1,370,000	54,900	.40	593,000
18	9,020	.22	53,600	62,500	.58	979,000	52,100	.33	464,000
19	8,890	.19	45,600	59,200	.55	879,000	49,500	.30	401,000
20	8,750	.19	44,900	55,200	.54	805,000	49,100	.40	530,000
21	8,440	.15	34,200	51,500	.58	806,000	49,500	.41	548,000
22	8,970	.15	36,300	49,500	.46	615,000	52,500	.37	524,000
23	10,700	.21	60,700	49,100	.46	610,000	56,400	.46	700,000
24	12,700	.31	106,000	50,200	.42	569,000	63,400	.57	976,000
25	14,900	.37	149,000	51,800	.50	699,000	67,400	.66	1,200,000
26	19,000	.60	308,000	52,600	.44	625,000	64,300	.63	1,090,000
27	21,500	.76	441,000	51,100	.36	497,000	62,100	.53	889,000
28	22,100	.76	453,000	47,300	.38	485,000	58,800	.43	683,000
29	22,900	.94	581,000	47,000	.49	622,000	55,400	.36	538,000
30	20,900	.70	395,000	48,000	.40	518,000	53,100	.43	616,000
31	--	--	--	49,200	.38	505,000	--	--	--
Total load (tons)	--	--	5,906,900	--	--	35,119,000	--	--	19,130,000
	July			August			September		
1	51,400	0.34	472,000	15,000	0.06	24,300	17,100	2.24	1,030,000
2	50,300	.36	489,000	14,400	.08	31,100	15,800	1.98	845,000
3	49,300	.30	399,000	13,700	.06	22,200	14,000	1.87	707,000
4	47,800	.28	361,000	13,500	.06	21,900	13,500	1.72	627,000
5	46,300	.28	350,000	17,700	1/.18	86,000	13,000	1.44	505,000
6	44,700	1/.25	302,000	19,300	.26	135,000	11,600	1/1.15	360,000
7	43,300	.22	257,000	14,000	1.53	578,000	10,800	.87	254,000
8	42,200	.21	239,000	13,200	.97	346,000	10,000	.60	162,000
9	40,000	.20	216,000	20,000	.83	448,000	9,160	.46	114,000
10	38,000	.21	215,000	15,400	2.13	886,000	8,680	.51	120,000
11	37,500	.19	192,000	15,900	.96	412,000	9,260	.39	97,500
12	36,000	.21	204,000	16,600	1.12	502,000	10,600	.42	120,000
13	35,800	1/.20	193,000	15,200	1.76	722,000	10,300	.61	170,000
14	35,000	1/.19	180,000	16,600	1.37	614,000	8,860	.58	139,000
15	33,000	.18	160,000	17,700	1.40	669,000	8,940	.89	215,000
16	30,900	.16	133,000	15,300	1.87	772,000	9,920	.52	139,000
17	28,800	.13	101,000	14,900	1.13	455,000	10,800	.59	172,000
18	27,200	.15	110,000	19,300	2.12	1,100,000	10,400	.54	152,000
19	26,400	.14	99,800	31,700	2.85	2,440,000	10,100	.38	104,000
20	26,500	.15	107,000	25,300	2.94	2,010,000	9,700	.33	86,400
21	24,400	.12	79,100	23,300	3.24	2,040,000	9,310	.31	77,900
22	22,800	.24	148,000	32,300	4.30	3,750,000	11,000	.37	110,000
23	22,000	.12	71,300	38,500	4.37	4,540,000	12,400	.55	184,000
24	21,100	.11	62,700	48,600	6.10	8,000,000	11,300	.56	171,000
25	19,500	.11	57,900	49,500	6.90	9,220,000	10,600	.90	258,000
26	18,500	.09	45,000	33,200	4.18	3,750,000	10,200	.55	151,000
27	18,300	.09	44,500	24,100	2.84	1,850,000	9,650	.45	117,000
28	18,100	.10	48,900	23,200	2.52	1,580,000	9,100	.31	76,200
29	17,400	.07	32,900	19,700	2.73	1,450,000	8,540	.18	41,500
30	16,400	.10	44,300	17,000	2.25	1,030,000	8,200	.14	31,000
31	15,500	.06	25,100	15,900	2.04	876,000	8,200	.14	31,000
Total load (tons)	--	--	5,439,500	--	--	50,360,500	--	--	7,336,500
Total load for year (tons)									136,000,000

1/ Interpolated.

COLORADO RIVER NEAR GRAND CANYON, ARIZ.--Continued

Size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Suspended sediment													1/ Remarks
		Mean daily concentration (percent)	Tons per day	Weight of material in tube (grams)	Percent finer than indicated size (in millimeters)										
					0.00195	0.00276	0.0039	0.0055	0.0078	0.0110	0.0156	0.0312	0.0625	0.125	0.250	0.500	
Oct. 3, 1946	5,630	0.16	16,700	0.9448	27	36	47	65	84	86	89	94	96	99	100	--	--
Oct. 5	5,160	.27	37,600	1.4351	--	21	25	39	86	87	93	96	98	100	--	--	--
Oct. 8	7,490	.42	84,900	.3490	--	49	59	71	78	83	87	93	95	97	100	--	--
Oct. 12	8,120	.42	92,100	.3678	--	42	56	68	76	81	86	94	99	100	--	--	--
Oct. 14	7,400	1.06	212,000	.4469	--	51	57	69	80	84	86	89	97	99	100	--	--
Oct. 14	7,400	1.06	212,000	.2040	--	25	28	54	--	80	81	85	92	97	100	--	B
Oct. 14	7,400	1.06	212,000	.3830	--	10	12	31	81	82	86	87	95	97	100	--	B
Oct. 14	7,400	1.06	212,000	.8050	--	7	9	16	35	85	89	91	98	99	100	--	B
Oct. 19	7,100	.47	90,100	.4322	--	43	57	68	76	79	86	89	96	98	100	--	--
Oct. 22	6,860	.27	50,000	.5998	--	54	66	76	82	84	85	88	97	98	100	--	--
Oct. 26	7,190	.17	33,000	.3008	--	41	44	52	60	64	66	72	82	94	99	100	A
Oct. 29	6,770	.17	31,000	.1779	--	40	44	50	60	70	75	82	91	97	100	--	--
Dec. 3	8,310	.20	44,900	.2346	--	38	50	61	67	68	69	77	82	95	98	100	--
Dec. 7	8,010	.18	38,900	.3260	--	37	40	45	51	52	56	64	78	89	100	--	A
Dec. 10	8,070	.16	34,900	.2655	--	5	6	13	16	--	20	29	41	65	96	100	A
Dec. 14	8,440	.13	29,600	.2069	--	17	19	20	23	27	32	44	63	87	100	--	A
Dec. 17	7,720	.11	22,900	.1944	--	27	32	41	49	55	57	63	80	89	98	100	A
Dec. 21	7,640	.20	41,300	.1840	--	28	33	36	47	54	60	66	78	90	93	100	A
Dec. 24	6,960	.10	18,800	.0749	--	30	36	36	37	--	41	52	76	81	--	88	A
Dec. 28	6,030	.09	14,700	.1307	--	23	25	36	45	49	52	65	90	97	98	98	A
Dec. 31	6,880	.10	18,600	.2152	--	20	24	28	34	37	42	51	58	83	95	100	A
Jan. 7, 1947	4,070	.04	4,400	.1128	--	59	64	65	66	--	--	82	90	97	99	100	--
Jan. 11	4,050	.04	4,370	.2162	--	53	65	74	80	83	88	91	95	96	98	100	--
Jan. 14	5,070	.05	6,840	.0894	--	--	47	56	66	73	76	87	92	98	100	--	--
Jan. 18	5,020	.05	6,780	.2508	--	--	59	66	74	80	83	90	95	96	99	100	--

1/ Analyses by the bottom-withdrawal tube method, samples dispersed and settled in distilled water except as indicated.
A. Sizes greater than 0.0625 by sieve method. B. Settled in native water.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR GRAND CANYON, ARIZ.--Continued

Size analyses of suspended sediment, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Suspended sediment													1/ Remarks
		Mean daily concentration (percent)	Tons per day	Weight of material in tube (grams)	Percent finer than indicated size (in millimeters)										
					0.00195	0.00276	0.0039	0.0055	0.0078	0.0110	0.0156	0.0312	0.0625	0.125	0.250	0.500	
Jan. 21, 1947	4,300	0.03	3,480	0.1826	--	--	54	63	73	79	83	92	96	97	99	100	--
Jan. 25	3,950	.02	2,130	.1663	--	--	78	86	91	93	96	97	99	100	--	--	--
Jan. 28	4,960	.04	5,360	.2008	--	53	58	67	74	77	80	89	95	99	100	--	--
Feb. 1	5,950	.06	9,640	.2567	--	--	30	34	44	53	61	70	84	95	98	98	A
Feb. 4, 8	5,875	.06	9,520	.5720	--	--	--	--	--	--	--	--	85	95	99	100	A
Feb. 11, 15	2,740	.09	6,660	.6814	--	28	31	36	42	47	55	65	80	95	100	--	A
Feb. 18	7,000	.11	20,800	.4274	--	32	35	42	51	55	60	72	86	98	100	--	A
Feb. 25	7,360	.16	31,800	.2617	--	--	40	46	49	57	61	73	80	93	100	--	A
Mar. 1, 4, 8, 11	7,720	.18	37,500	.6497	--	26	32	36	44	52	59	70	83	96	99	--	A
Mar. 15, 18, 22	6,970	.10	18,800	.6775	--	--	--	27	40	45	49	59	69	93	98	99	A, B
Mar. 15, 18, 22	6,970	.10	18,800	.7784	--	27	30	34	39	43	47	59	68	93	100	--	A
Mar. 25	21,500	1.47	853,000	.3941	--	--	12	17	25	31	34	47	64	92	100	--	A
Mar. 29	19,700	1.64	872,000	.3182	--	25	33	42	52	63	69	73	80	97	100	--	A
Apr. 1	13,600	1.07	393,000	.2354	--	23	33	43	51	60	65	80	83	92	99	100	A
Apr. 5	12,600	.70	238,000	.2886	20	30	34	44	54	62	64	75	82	94	100	--	A
Apr. 8, 12	12,700	.48	165,000	.3145	--	15	29	35	39	43	47	61	74	92	99	100	A
Apr. 15, 19	9,450	.23	58,700	.1643	--	3	7	17	29	44	49	69	70	82	--	89	A
Apr. 22	8,970	.15	36,300	.2621	--	28	31	38	43	46	50	59	69	82	97	100	A
Apr. 26, 29	20,950	.77	436,000	.6405	--	4	5	7	15	20	22	32	51	79	97	99	A
May 3	18,100	.50	244,000	.6124	--	8	11	18	25	31	37	46	55	83	99	100	A
May 3	18,100	.50	244,000	.4895	--	6	10	17	24	32	39	48	61	84	99	100	A
May 6	27,800	.66	495,000	.7794	--	--	3	4	7	10	13	20	32	67	96	100	A
May 10	62,800	1.48	2,510,000	.6737	--	--	2	6	12	16	20	30	43	68	96	100	A
May 13	76,400	1.15	2,370,000	.4118	--	--	3	4	9	12	14	22	36	64	93	100	A
May 17	65,000	.78	1,370,000	.2820	--	--	5	7	9	12	14	20	39	61	88	100	A

1/ Analyses by the bottom-withdrawal tube method, samples dispersed and settled in distilled water except as indicated.
A. Sizes greater than 0.0625 by sieve method. B. Settled in native water.

May 20	55,200	.54	805,000	.2472	--	--	9	14	16	18	20	31	48	68	92	100	A
May 24	50,200	.42	569,000	.1799	--	--	--	--	--	--	2	14	28	58	87	100	A
May 27	51,100	.36	497,000	.2966	--	--	--	--	--	2	4	16	32	63	91	99	A
May 31	49,200	.38	505,000	.3267	--	--	--	--	2	8	13	21	31	63	91	99	A
June 3	45,700	.32	395,000	.3000	--	--	--	--	--	5	8	17	30	62	92	100	A
June 7	49,800	.49	659,000	.4533	--	9	11	14	17	18	20	26	38	68	91	96	A
June 10	48,800	.40	527,000	.9326	--	4	6	7	8	11	14	20	32	57	90	99	A
June 14	63,600	.44	756,000	.8264	--	--	--	--	--	9	13	19	29	57	87	98	A
June 28	58,800	.43	683,000	1.7431	--	--	--	--	--	--	--	--	34	60	85	99	A
July 1	51,400	.34	472,000	1.472	--	--	--	--	--	--	--	--	49	71	91	99	A
July 5	46,300	.28	350,000	.986	--	--	--	--	--	--	--	--	35	61	90	100	A
July 8	42,200	.21	239,000	.885	--	--	--	--	--	--	--	--	40	70	90	100	A
July 12	36,000	.21	204,000	.751	--	--	--	--	--	--	--	--	46	74	95	100	A
July 15	33,000	.18	160,000	.625	--	--	--	--	--	--	--	--	49	80	97	100	A
July 16	30,900	.16	133,000	.1477	--	7	10	21	49	52	54	71	81	95	100	--	A
July 18	27,200	.15	110,000	.650	--	--	--	--	--	--	--	--	43	61	80	100	A
July 22	22,800	.24	148,000	.3333	17	18	19	37	45	48	51	68	77	90	98	100	A
July 26	18,500	.09	45,000	.0989	--	--	--	--	--	--	43	55	70	--	--	--	--
July 29	17,400	.07	32,900	.3226	10	11	21	34	42	46	50	62	73	89	97	100	A
Aug. 2	14,400	.08	31,100	.3034	23	28	38	54	65	70	76	83	92	97	--	--	--
Aug. 6	19,300	.26	135,000	1.0748	22	27	32	38	44	47	52	72	82	96	100	--	A
Aug. 9	20,000	.83	448,000	.3855	32	44	53	68	79	83	86	93	97	100	--	--	--
Aug. 9	20,000	.83	448,000	.2661	37	49	54	65	77	80	82	91	94	96	--	--	--
Aug. 12	16,600	1.12	502,000	.5458	35	40	50	60	66	70	73	85	92	98	--	--	--
Aug. 12	16,600	1.12	502,000	.4312	32	40	44	53	63	68	74	84	92	97	--	--	--

1/ Analyses by the bottom-withdrawal tube method, samples dispersed and settled in distilled water except as indicated.
A. Sizes greater than 0.0625 by sieve method. B. Settled in native water.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR GRAND CANYON, ARIZ.--Continued

Size analyses of suspended sediment, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Suspended sediment													1/ Remarks
		Mean daily concentration (percent)	Tons per day	Weight of material in tube (grams)	Percent finer than indicated size (in millimeters)										
					0.00195	0.00276	0.0039	0.0055	0.0078	0.0110	0.0156	0.0312	0.0625	0.125	0.250	0.500	
Aug. 16, 1947	15,300	1.87	772,000	0.4659	41	54	62	74	80	84	88	94	98	100	--	--	--
Aug. 19	31,700	2.85	2,440,000	.8663	25	27	29	42	49	53	57	67	76	95	99	100	A
Aug. 23	38,500	4.37	4,540,000	1.0000	32	38	44	55	60	64	69	78	84	95	99	100	A
Aug. 30	17,000	2.25	1,030,000	.6416	46	50	57	75	83	87	89	95	99	100	--	--	--
Sept. 3	14,000	1.87	707,000	1.0108	43	56	67	78	84	89	91	96	98	100	--	--	--
Sept. 13	10,300	.61	170,000	.6230	55	58	62	74	83	87	90	97	99	100	--	--	--
Sept. 16	9,920	.52	139,000	.4181	43	55	68	78	84	87	93	98	99	100	--	--	--
Sept. 20	9,700	.33	86,400	.2371	20	38	54	67	74	80	85	94	98	100	--	--	--
Sept. 23	12,400	.55	184,000	.7488	28	34	48	60	68	74	81	94	99	100	--	--	--
Sept. 27	9,650	.45	117,000	.2545	32	43	57	70	81	86	90	96	99	100	--	--	--
Sept. 30	8,200	.14	31,000	.3811	34	44	54	66	73	79	86	95	98	100	--	--	--

1/ Analyses by the bottom-withdrawal tube method, samples dispersed and settled in distilled water except as indicated.
A. Sizes greater than 0.0625 by sieve method. B. Settled in native water.

LAKE MEAD NEAR BOULDER CITY, NEV.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Depth (feet)	Elevation (feet)	Temperature (° F.)	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
MILE 276.5 (AT LINE OF DEMARCATION BETWEEN TURBID AND CLEAR WATER)														
Feb. 26, 1947	2	1,137	52.0	146	11	106	39	163	233	355	153	4.6	946	425
PIERCE FERRY BAY, MILE 279														
Oct. 31, 1946	5	1,149	67.0	113	--	94	30	111	165	323	89	2.8	731	358
Dec. 1	5	--	63	116	11	94	31	112	172	323	90	3.0	749	362
Feb. 26, 1947	5	1,134	--	113	11	92	30	121	154	355	86	.2	771	353
Mar. 30	5	--	--	112	13	94	31	107	176	310	91	.6	733	362
Apr. 29	5	--	--	96.4	11	70	27	102	182	229	84	2.5	615	286
May 20	5	--	72	42.8	11	50	14	22	122	96	20	1.7	275	182
June 30	5	1,165	68	40.4	12	42	13	24	110	85	21	2.3	254	158
July 21	5	--	78	48.9	9.6	46	17	33	118	112	31	1.3	308	185
Aug. 20	5	--	81	75.3	--	55	22	77	134	191	60	1.0	513	228
Sept. 20	5	--	76	84.4	--	74	24	76	146	234	58	2.8	557	283
ICEBERG CANYON, MILE 287.5														
Feb. 26, 1947	5	1,134	55.2	106	13	92	29	99	167	295	84	2.2	598	348
Feb. 26	50	1,089	53.5	105	--	--	--	--	164	--	--	--	--	--
Feb. 26	100	1,039	51.9	115	12	93	30	120	182	312	100	2.6	759	356
Feb. 26	150	989	51.6	120	--	--	--	--	192	--	--	--	--	--
Feb. 26	192	947	51.3	121	12	96	34	126	192	326	110	3.0	802	380
Feb. 26	193	946	51.6	138	23	122	45	133	364	316	106	2.5	927	490
VIRGIN CANYON, MILE 305.3														
Feb. 25, 1947	5	1,134	56.1	105	11	92	29	102	162	310	81	2.2	707	348
Feb. 25	50	1,089	54.0	105	--	--	--	--	163	--	--	--	--	--
Feb. 25	100	1,039	53.2	104	12	92	29	101	164	307	80	2.4	704	348
Feb. 25	150	989	52.8	106	--	--	--	--	164	--	--	--	--	--
Feb. 25	200	939	51.9	116	--	--	--	--	184	--	--	--	--	--
Feb. 25	250	889	51.2	120	14	98	34	121	188	332	103	3.1	798	384
Feb. 25	303	836	51.2	134	17	126	41	127	324	333	103	3.2	910	483

COLORADO RIVER MAIN STEM--Continued

LAKE MEAD NEAR BOULDER CITY, NEV.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Depth (feet)	Elevation (feet)	Temperature (° F.)	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
VIRGIN RIVER, ARM OF LAKE 29 MILES ABOVE MOUTH OF RIVER (at line of demarcation between turbid and clear water)														
Feb. 27, 1947	1	1,138	53.9	257	37	236	84	246	213	805	323	1.7	1,840	934
VIRGIN RIVER ARM OF LAKE OPPOSITE SALT MINE 22 MILES ABOVE MOUTH OF RIVER														
Feb. 27, 1947	Surface	1,139	--	106	8.7	94	28	102	160	311	81	1.8	705	350
VIRGIN RIVER, ARM OF LAKE OPPOSITE SALT MINE, 22 MILES ABOVE MOUTH OF RIVER														
Feb. 27, 1947	5	1,134	53.9	104	12	91	28	100	162	300	79	2.2	692	342
Feb. 27	50	1,089	53.2	104	--	--	--	--	162	--	--	--	--	--
Feb. 27	100	1,039	52.9	103	--	--	--	--	162	--	--	--	--	--
Feb. 27	150	989	52.0	104	11	92	28	96	159	297	80	1.5	684	344
Feb. 27	200	939	51.4	105	--	--	--	--	161	--	--	--	--	--
Feb. 27	239	900	51.5	105	--	--	--	--	158	--	--	--	--	--
Feb. 27	240	899	51.5	108	17	97	29	103	178	308	83	1.2	726	361
VIRGIN RIVER, ARM OF LAKE, 9.3 MILES ABOVE MOUTH OF RIVER (LOWER VIRGIN NARROWS)														
Feb. 24, 1947	5	1,134	55.4	102	11	90	27	101	157	305	77	1.9	690	336
Feb. 24	50	1,089	54.2	102	--	--	--	--	155	--	--	--	--	--
Feb. 24	100	1,039	53.8	102	--	--	--	--	157	--	--	--	--	--
Feb. 24	150	989	53.5	103	11	94	28	97	161	303	79	2.3	694	350
Feb. 24	200	939	53.5	104	--	--	--	--	162	--	--	--	--	--
Feb. 24	250	889	51.7	108	--	--	--	--	162	--	--	--	--	--
Feb. 24	300	839	51.7	110	13	94	30	119	169	339	88	2.4	769	358
Feb. 24	350	789	51.4	113	--	--	--	--	178	--	--	--	--	--
Feb. 24	378	761	51.5	114	13	94	32	118	181	324	96	2.6	769	366
Feb. 24	379	760	51.4	129	18	120	34	131	293	338	92	2.2	880	440

BOULDER CANYON, MILE 334.9

Feb. 24, 1947	5	1,134	55.4	102	11	90	27	101	157	305	77	1.9	690	336
Feb. 24	50	1,089	54.2	102	--	--	--	--	155	--	--	--	--	--
Feb. 24	100	1,039	53.8	102	--	--	--	--	157	--	--	--	--	--
Feb. 24	150	989	53.5	103	11	94	28	97	161	303	79	2.3	694	350
Feb. 24	200	939	53.5	104	--	--	--	--	162	--	--	--	--	--
Feb. 24	250	889	51.7	108	--	--	--	--	162	--	--	--	--	--
Feb. 24	300	839	51.7	110	13	94	30	119	169	339	88	2.4	769	358
Feb. 24	350	789	51.4	113	--	--	--	--	178	--	--	--	--	--
Feb. 24	378	761	51.5	114	13	94	32	118	181	324	96	2.6	769	366
Feb. 24	379	760	51.4	129	18	120	34	131	293	338	92	2.2	880	440

NEAR INTAKE TOWERS, MILE 353.5

Oct. 1, 1946	5	1,153	75.5	95.4	--	78	28	86	137	278	66	1.0	604	310
Oct. 1	50	1,108	75.1	96.4	--	--	--	--	138	--	--	--	--	--
Oct. 1	100	1,058	66.1	99.4	--	86	28	92	154	288	72	1.6	644	330
Oct. 1	150	1,008	58.1	100	--	--	--	--	159	--	--	--	--	--
Oct. 1	200	958	55.6	99.1	--	--	--	--	161	--	--	--	--	--
Oct. 1	250	908	53.7	102	--	92	28	89	159	289	74	1.7	652	344
Oct. 1	300	858	53.4	103	--	--	--	--	170	--	--	--	--	--
Oct. 1	350	808	53.0	103	--	--	--	--	166	--	--	--	--	--
Oct. 1	400	758	52.8	103	--	--	--	--	169	--	--	--	--	--
Oct. 1	431	727	53.3	104	--	--	--	--	166	--	--	--	--	--
Oct. 1	432	726	53.5	115	--	104	34	104	305	248	80	5.5	726	400
Oct. 31	5	1,149	65.6	97.8	--	84	28	87	149	281	70	1.9	625	324
Oct. 31	50	1,104	65.1	98.1	--	--	--	--	150	--	--	--	--	--
Oct. 31	100	1,054	64.9	98.1	--	--	--	--	152	--	--	--	--	--
Oct. 31	150	1,004	61.1	100	--	--	--	--	156	--	--	--	--	--
Oct. 31	200	954	56.5	100	--	--	--	--	158	--	--	--	--	--
Oct. 31	250	904	53.8	102	--	--	--	--	161	--	--	--	--	--
Oct. 31	300	854	53.1	103	--	93	28	94	167	293	76	2.2	668	347
Oct. 31	350	804	52.9	104	--	--	--	--	167	--	--	--	--	--
Oct. 31	400	754	52.4	104	--	--	--	--	172	--	--	--	--	--
Oct. 31	427	727	52.4	105	--	93	29	95	196	277	76	2.6	669	351
Oct. 31	428	726	52.6	124	--	113	39	115	424	219	79	6.1	780	422

COLORADO RIVER MAIN STEM--Continued

LAKE MEAD NEAR BOULDER CITY, NEV.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Depth (feet)	Elevation (feet)	Temperature (° F.)	Specific conductance (K×10⁶ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
	NEAR INTAKE TOWERS, MILE 353.5--Continued													
Dec. 3, 1946	5	1,147	61.0	98.7	12	88	28	84	148	281	72	1.5	639	334
Dec. 4	50	1,102	60.8	99.0	12	86	28	86	152	277	72	1.8	638	330
Dec. 4	100	1,052	60.6	98.7	11	84	27	88	150	275	72	1.5	632	320
Dec. 4	150	1,002	60.5	98.4	12	83	27	87	152	269	72	1.5	626	318
Dec. 4	200	952	57.3	101	13	88	28	85	148	285	71	1.8	645	334
Dec. 4	250	902	53.9	103	13	87	27	92	152	285	75	2.0	656	328
Dec. 4	300	852	53.6	103	12	91	27	93	162	286	77	2.0	668	338
Dec. 3	350	802	52.9	104	12	90	26	96	166	281	78	2.2	667	332
Dec. 3	400	752	52.5	103	14	90	29	92	168	285	77	2.2	672	344
Dec. 3	424	728	52.5	105	14	94	28	95	178	286	79	2.2	686	350
Dec. 4	425	727	52.5	114	13	99	33	103	252	259	91	2.5	725	382
Jan. 2, 1947	5	1,144	56.8	98.3	11	84	28	90	148	285	72	1.8	645	324
Jan. 2	50	1,099	56.5	99.3	--	--	--	--	144	--	--	--	--	--
Jan. 2	100	1,049	56.5	99.7	--	--	--	--	146	--	--	--	--	--
Jan. 2	150	999	56.4	99.3	--	--	--	--	151	--	--	--	--	--
Jan. 2	200	949	56.4	100	--	--	--	--	151	--	--	--	--	--
Jan. 2	250	899	54.8	102	12	88	29	94	161	291	76	1.5	671	338
Jan. 2	300	849	54.0	103	--	--	--	--	165	--	--	--	--	--
Jan. 2	350	799	53.4	103	--	--	--	--	165	--	--	--	--	--
Jan. 2	400	749	53.0	103	--	--	--	--	166	--	--	--	--	--
Jan. 2	421	728	52.7	105	12	89	30	97	180	288	76	2.0	683	346
Jan. 2	423	726	--	127	12	112	41	119	442	206	90	2.8	800	448
Jan. 31	5	1,138	53.6	101	14	86	30	93	157	294	74	1.8	670	338
Jan. 31	50	1,093	53.5	102	--	--	--	--	155	--	--	--	--	--
Jan. 31	100	1,043	53.4	102	--	--	--	--	158	--	--	--	--	--
Jan. 31	150	993	53.4	101	--	--	--	--	154	--	--	--	--	--
Jan. 31	200	943	53.4	102	--	--	--	--	157	--	--	--	--	--
Jan. 31	250	893	53.4	103	11	89	30	92	161	294	76	1.8	673	346
Jan. 31	300	843	53.4	103	--	--	--	--	160	--	--	--	--	--
Jan. 31	350	793	53.3	104	--	--	--	--	164	--	--	--	--	--
Jan. 31	400	743	53.0	104	--	--	--	--	166	--	--	--	--	--
Jan. 31	418	725	52.9	104	--	--	--	--	168	--	--	--	--	--
Jan. 31	419	724	53.4	111	9.3	91	32	109	185	315	82	1.5	731	358

Mar. 4	5	1,133	55.0	102	12	90	27	94	158	290	76	1.8	669	336
Mar. 4	50	1,088	54.0	103	--	--	--	--	156	--	--	--	--	--
Mar. 4	100	1,038	53.9	103	--	--	--	--	161	--	--	--	--	--
Mar. 4	150	988	53.5	102	--	--	--	--	158	--	--	--	--	--
Mar. 4	200	938	52.2	108	12	94	29	99	169	300	83	1.9	702	354
Mar. 4	250	888	51.7	110	17	94	28	108	174	304	88	2.3	727	350
Mar. 4	300	838	51.5	109	--	--	--	--	173	--	--	--	--	--
Mar. 4	350	788	51.3	110	--	--	--	--	173	--	--	--	--	--
Mar. 4	400	738	51.5	110	--	--	--	--	173	--	--	--	--	--
Mar. 4	413	725	52.0	104	12	91	27	98	161	295	78	1.9	682	338
Mar. 4	414	724	52.2	123	12	108	36	119	319	271	92	5.2	800	418
Mar. 31	5	1,130	57.6	103	12	90	28	96	158	297	77	.6	678	340
Mar. 31	50	1,085	55.7	103	--	--	--	--	160	--	--	--	--	--
Mar. 31	100	1,035	54.9	102	--	--	--	--	159	--	--	--	--	--
Mar. 31	150	985	54.6	103	--	--	--	--	162	--	--	--	--	--
Mar. 31	200	935	53.0	105	--	--	--	--	165	--	--	--	--	--
Mar. 31	250	885	51.8	110	14	92	31	109	175	312	88	.5	733	357
Mar. 31	300	835	51.5	111	--	--	--	--	175	--	--	--	--	--
Mar. 31	350	785	51.5	111	--	--	--	--	175	--	--	--	--	--
Mar. 31	400	735	51.4	104	12	90	28	99	160	299	79	1.9	688	340
Mar. 31	410	725	51.5	110	13	95	30	103	172	305	88	2.3	721	360
Mar. 31	412	723	52.4	121	18	106	37	112	281	282	94	5.7	793	416
Apr. 30	5	1,129	66.9	103	11	90	28	100	160	302	78	1.4	689	340
Apr. 30	50	1,084	61.6	102	--	--	--	--	158	--	--	--	--	--
Apr. 30	100	1,034	56.0	102	--	--	--	--	159	--	--	--	--	--
Apr. 30	150	984	53.6	103	--	--	--	--	160	--	--	--	--	--
Apr. 30	200	934	53.2	106	13	93	29	101	167	303	83	1.7	706	351
Apr. 30	250	884	51.9	109	--	--	--	--	173	--	--	--	--	--
Apr. 30	300	834	51.8	110	12	94	30	107	174	309	89	1.8	728	358
Apr. 30	350	784	51.6	103	--	--	--	--	160	--	--	--	--	--
Apr. 30	400	734	51.6	110	--	--	--	--	174	--	--	--	--	--
Apr. 30	411	723	52.0	110	--	--	--	--	173	--	--	--	--	--
Apr. 30	412	722	52.6	119	14	104	32	120	286	270	94	4.5	779	391

COLORADO RIVER MAIN STEM--Continued

LAKE MEAD NEAR BOULDER CITY, NEV.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Depth (feet)	Elevation (feet)	Temperature (° F.)	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
NEAR INTAKE TOWERS MILE 353.5--Continued														
May 28, 1947	5	1,145	66.2	102	11	82	30	106	154	306	80	1.6	692	328
May 28	50	1,100	64.5	102	--	--	--	--	154	--	--	--	--	--
May 28	100	1,050	59.3	103	--	--	--	--	157	--	--	--	--	--
May 28	150	1,000	55.8	102	--	--	--	--	161	--	--	--	--	--
May 28	200	950	52.4	104	--	--	--	--	168	--	--	--	--	--
May 28	250	900	52.0	107	12	95	30	102	172	305	86	2.3	717	360
May 28	300	850	51.9	108	--	--	--	--	174	--	--	--	--	--
May 28	350	800	51.8	105	--	--	--	--	166	--	--	--	--	--
May 28	400	750	51.8	109	13	96	32	105	180	310	90	2.2	737	371
May 28	426	724	51.8	103	--	--	--	--	154	--	--	--	--	--
May 28	427	723	52.3	137	25	134	47	123	626	136	96	5.5	875	528
June 30	5	1,164	73.2	102	12	86	28	99	151	298	78	1.6	677	330
June 30	50	1,119	71.3	103	--	--	--	--	152	--	--	--	--	--
June 30	100	1,069	68.0	102	--	--	--	--	152	--	--	--	--	--
June 30	150	1,019	57.4	103	11	92	28	97	160	300	78	2.5	687	344
June 30	200	969	54.7	104	--	--	--	--	161	--	--	--	--	--
June 30	250	919	52.7	107	12	93	32	98	168	305	85	3.1	711	364
June 30	300	869	52.0	109	--	--	--	--	172	--	--	--	--	--
June 30	350	819	52.0	109	--	--	--	--	172	--	--	--	--	--
June 30	400	769	51.9	110	13	96	29	106	176	307	88	3.1	729	358
July 31	5	1,172	78.7	94.7	11	80	28	82	146	273	63	1.5	610	314
July 31	50	1,127	75.1	95.6	--	--	--	--	144	--	--	--	--	--
July 31	100	1,077	69.2	99.0	12	84	26	95	153	281	73	1.9	648	316
July 31	150	1,027	63.9	104	--	--	--	--	159	--	--	--	--	--
July 31	200	977	57.2	104	12	89	30	96	160	298	79	2.2	685	346
July 31	250	927	53.4	107	--	--	--	--	172	--	--	--	--	--
July 31	300	877	52.8	109	--	--	--	--	172	--	--	--	--	--
July 31	350	827	52.4	109	11	93	30	107	176	306	88	2.5	724	356
July 31	400	777	52.4	109	--	--	--	--	172	--	--	--	--	--
July 31	450	727	52.4	109	--	--	--	--	174	--	--	--	--	--
July 31	456	721	52.8	143	21	137	50	129	727	91	95	3.6	885	548

Aug. 28	5	1,175	77.8	90.0	11	76	25	84	140	256	66	1.1	588	292
Aug. 28	50	1,130	77.4	90.3	--	--	--	--	142	--	--	--	--	--
Aug. 28	100	1,080	70.5	95.5	13	82	27	88	152	272	70	1.2	628	316
Aug. 28	150	1,030	62.7	103	11	91	28	98	158	301	78	1.9	687	342
Aug. 28	200	980	54.4	102	--	--	--	--	160	--	--	--	--	--
Aug. 28	250	930	53.2	108	--	--	--	--	170	--	--	--	--	--
Aug. 28	300	880	52.3	108	11	94	30	102	170	306	85	2.5	714	358
Aug. 28	350	830	52.3	109	--	--	--	--	172	--	--	--	--	--
Aug. 28	400	780	52.3	107	--	--	--	--	170	--	--	--	--	--
Aug. 28	450	730	56.4	119	--	--	--	--	288	--	--	--	--	--
Aug. 28	459	721	56.4	112	17	100	29	110	206	312	79	1.7	750	368

LOCATION.--At Hoover Dam, about 1 mile upstream from gaging station.
DRAINAGE AREA.--167,800 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1939 to September 1944.
Specific conductance determinations: October 1939 to September 1947.
Water temperatures: October 1941 to September 1941.
EXTREMES, 1946-47.--Specific conductance (Kx10^6 at 25° C.): Maximum, 108 on several days in March, April, May, July, and August; minimum, 96.0 Sept. 25.
Water temperatures: Maximum, 69° F. on several days in September; minimum, 54° F. on several days in March, April, and May.
EXTREMES, 1939-47.--Dissolved solids: Maximum, 824 parts per million Mar. 1-10, 1941; minimum, 621 parts per million Dec. 21-31, 1942.
Total hardness: Maximum, 307 parts per million Jan. 21-31, 1942; minimum, 307 parts per million Jan. 2-3, 6-10, 1947.
Water temperatures: Maximum, 69° F. Sept. 27, 1945, Sept. 11, 15-16, 23-26, 1947; minimum, 53° F. on several days in winter months.

Specific conductance (K×10^6 at 25° C.), water year October 1946 to September 1947

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	101	--	--	--	--	--	107	107	--	106	106	--
2	101	--	101	99.7	--	--	--	106	106	106	--	107
3	101	--	102	101	103	106	108	--	106	108	--	104
4	--	102	102	--	104	107	106	--	--	--	106	98.4
5	--	101	102	--	103	104	--	106	107	--	107	98.7
6	--	101	101	102	103	104	--	106	105	--	106	--
7	101	102	102	101	103	106	107	105	--	107	106	--
8	101	101	--	101	--	--	107	105	--	108	107	98.7
9	101	--	--	100	--	--	105	105	107	108	--	98.7
10	--	--	102	102	103	106	108	--	106	107	--	97.8
11	102	--	101	--	104	105	106	--	103	107	--	98.4
12	--	101	101	--	103	104	--	107	106	--	--	99.0
13	--	101	101	101	103	106	--	107	106	--	107	--
14	102	101	--	--	103	105	106	106	--	107	105	--
15	101	102	--	99.7	--	--	106	107	--	107	106	98.4
16	101	--	102	98.8	--	--	107	106	106	108	--	97.8
17	101	--	101	99.7	104	105	106	--	106	107	--	98.1
18	101	101	101	--	105	106	107	--	107	108	106	99.0
19	--	102	101	--	104	105	--	106	106	--	106	99.4
20	--	101	101	99.1	103	105	--	106	107	--	106	--
21	101	102	--	99.4	104	107	105	107	--	106	107	--
22	102	102	--	100	--	--	106	107	--	106	108	97.5
23	101	--	101	99.4	--	--	106	108	107	107	--	96.9
24	101	--	101	99.4	105	104	106	--	106	106	--	96.3
25	101	102	--	--	105	107	106	--	106	105	106	96.0
26	--	103	101	--	105	108	--	107	106	--	106	96.6
27	--	101	102	99.4	106	--	--	106	107	--	106	--
28	102	--	--	99.4	105	107	106	107	--	106	106	--
29	102	101	--	100	--	--	106	108	--	--	107	96.3
30	101	--	99.7	101	--	--	106	--	107	105	--	95.7
31	101	--	100	100	--	107	--	--	--	106	--	--

Temperature (° F.) of water, water year October 1946 to September 1947

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	56	--	--	--	--	--	54	54	--	55	55	--
2	57	--	56	57	--	--	--	54	55	55	--	55
3	55	--	57	57	55	55	54	--	55	55	--	60
4	56	55	56	--	55	55	55	--	--	--	56	67
5	--	56	57	--	55	55	--	54	55	--	55	67
6	--	56	57	56	55	55	--	54	55	--	56	--
7	56	56	57	56	55	55	54	54	--	55	55	--
8	56	57	--	56	--	--	54	55	--	55	55	68
9	56	--	--	56	--	--	54	54	55	55	--	68
10	--	--	57	56	55	55	54	--	55	55	--	68
11	55	--	57	--	56	55	54	--	55	55	--	69
12	--	56	56	--	55	55	--	54	55	--	--	68
13	--	56	57	56	55	54	--	54	55	--	55	--
14	56	56	--	--	55	55	54	54	--	55	55	--
15	56	57	--	56	--	--	54	54	--	55	56	69
16	57	--	57	56	--	--	54	54	55	55	--	69
17	55	--	57	55	55	55	54	--	55	55	--	68
18	56	56	58	--	55	55	54	--	55	55	55	67
19	--	55	57	--	55	55	--	54	55	--	55	67
20	--	56	58	55	55	55	--	54	55	--	55	--
21	57	56	--	55	55	55	55	55	--	55	55	--
22	56	56	--	55	--	--	55	54	--	55	55	68
23	56	--	57	56	--	--	54	54	55	55	--	69
24	56	--	57	55	55	55	54	--	58	55	--	69
25	57	56	--	--	55	55	54	--	55	58	55	69
26	--	56	57	--	55	55	--	55	55	--	55	69
27	--	56	56	56	55	--	--	55	55	--	55	--
28	57	--	--	55	55	54	54	54	--	55	55	--
29	56	57	--	56	--	--	54	54	--	--	55	68
30	55	--	58	55	--	--	54	--	55	55	--	68
31	55	--	56	56	--	55	--	--	--	55	--	--
Average	--	--	--	--	--	--	--	--	--	--	--	--

COLORADO RIVER MAIN STEM--Continued

MISCELLANEOUS ANALYSES OF COLORADO RIVER MAIN STEM

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
															Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
COLORADO RIVER NEAR GRAND LAKE, COLO.																				
June 14, 1947	260	--	4.8	--	--	--	--	--	24	4.3	1.5	--	--	--	--	--	--	--	--	--
COLORADO RIVER NEAR GRANDBY, COLO.																				
June 14, 1947	861	--	4.4	--	--	--	--	--	25	5.1	0.8	--	--	--	--	--	--	--	--	--
June 21	2,430	--	3.9	--	--	--	--	--	22	3.5	.4	--	--	--	--	--	--	--	--	--
COLORADO RIVER ABOVE MOUTH OF EAGLE RIVER AT DOTSERO, COLO.																				
Mar. 16, 1947	--	--	45.9	--	--	46	14	29	125	63	47	--	0.2	--	261	0.35	--	172	70	26
Sept. 17	--	--	34.5	--	--	--	--	--	108	50	28	--	--	--	--	--	--	--	--	--
COLORADO RIVER NEAR DOTSERO, COLO.																				
Mar. 16, 1947	538	--	62.1	--	--	66	17	42	141	127	55	--	0.6	--	377	0.51	548	234	119	28
COLORADO RIVER AT LEES FERRY, ARIZ.																				
June 29, 1947	--	--	48.6	--	--	56	15	27	136	116	18	--	1.5	--	300	0.41	--	201	90	22
Sept. 26	9,440	--	110	13	--	101	33	105	169	365	66	--	5.4	--	772	1.05	19,700	388	249	37
COLORADO RIVER BELOW HOOVER DAM, ARIZ.-NEV.																				
Jan. 2-3, 6-10, 1947	--	--	100	13	0.01	77	28	104	157	286	74	0.2	1.5	0.4	661	0.90	--	307	178	42
Jan. 13, 15-17, 20	--	--	99.7	14	.01	84	28	98	161	286	74	.2	2.3	.2	666	.91	--	324	192	40
Feb. 3-7, 10	--	--	103	13	.03	90	28	93	161	286	78	.2	1.6	.3	669	.91	--	340	208	37
Feb. 11-14, 17-20	--	--	103	12	.03	89	28	94	160	289	76	.2	1.7	.3	669	.91	--	337	206	38
Feb. 21, 24-28	--	--	105	12	.03	89	29	95	165	291	76	.2	1.7	.3	675	.92	--	341	206	38
Mar. 3-7, 10	--	--	106	14	.03	89	28	97	164	287	80	.2	1.6	.3	678	.92	--	337	202	39
July 11, 14-18	--	7.3	108	13	.02	92	28	104	166	300	84	.5	2.1	.4	705	.96	--	344	208	40

June 18, 1947 --------	--	--	120	--	--	102	31	124	173	335	114	--	1.4	--	793	1.08	--	382	240	41
July 9 ----------	--	--	133	--	--	108	35	143	184	354	145	--	1.1	--	877	1.19	--	414	262	43
July 31-Aug. 1 --------	--	7.7	114	--	--	94	32	109	166	314	97	0.6	1.4	0.5	730	.99	--	366	230	39
Aug. 8----------	--	7.6	111	--	--	88	31	109	148	312	96	.2	1.6	.5	711	.97	--	347	226	41
Sept. 8 ----------	--	7.5	115	--	--	95	32	113	172	315	101	.2	1.6	.5	742	1.01	--	368	228	40

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DIVERSIONS BELOW IMPERIAL DAM

YUMA MAIN CANAL BELOW COLORADO RIVER SIPHON AT YUMA, ARIZ.

LOCATION.--October 1942 to January 1943, at gaging station on Colorado River 1,800 feet downstream from highway bridge at Yuma, 5 miles downstream from Gila River, 19 miles downstream from Imperial Dam, and 7 and 29 miles upstream from international boundaries of California and Arizona with Mexico. February 1943 to September 1947 at gaging station on Yuma main canal below Colorado River siphon at Yuma, on Arizona side of river, 3 miles downstream from siphon-drop power plant.
DRAINAGE AREA.--242,900 square miles, including all closed basins entirely within the drainage boundary.
RECORDS AVAILABLE.--Chemical analyses: September 1926 to September 1928, October 1942 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 760 parts per million Apr. 21-26, 28-30; minimum, 687 parts per million Dec. 2-6, 9-10.
Total hardness: Maximum, 370 parts per million May 1-2, 5-9, 15-17, 19-20; minimum, 334 parts per million Oct. 1-5, 7-12, 14-19.
EXTREMES, 1926-28, 1942-47.--Dissolved solids: Maximum, 1,300 parts per million Jan. 11-20, 1927; minimum, 285 parts per million June 11-20, 1928.
Total hardness: Maximum, 567 parts per million Oct. 21-31, 1926; minimum, 163 parts per million June 11-20, 1928.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 given in Water-Supply Paper 1089. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 1-5, 7-10, 1946 -	596	7.6	107	14	0.01	86	29	105	3.0	153	305	87	0.2	0.9	0.6	706	0.96	1,140	334	208	40
Oct. 11-12, 14-19----	586	7.5	107	13	.00	86	29	108	5.8	158	314	84	.2	.8	.5	719	.98	1,140	334	204	41
Oct. 21-25, 28-31----	595	7.7	106	15	.00	88	29	103	4.8	160	305	84	.2	1.1	.5	709	.96	1,140	338	208	39
Nov. 1-2, 4-9 -------	567	7.8	107	13	.01	89	29	104	4.4	165	307	82	.3	1.1	.5	711	.97	1,090	341	206	39
Nov. 11-16, 18-20 ---	534	7.8	106	13	.00	88	29	103	4.6	162	307	82	.2	1.1	.6	708	.96	1,020	338	206	39
Nov. 21-23, 25-30 ---	492	7.8	101	9.8	.00	90	30	95	3.4	164	296	82	.3	1.3	.6	689	.94	915	348	214	37
Dec. 2-6, 9-10 ------	488	7.7	105	10	.00	91	30	94	3.2	164	293	83	.3	1.3	.6	687	.93	905	350	216	37
Dec. 11-14, 16-20 ---	465	7.7	104	9.5	.01	91	29	98	3.6	167	297	82	.2	1.4	.6	694	.94	871	346	209	38
Dec. 23-24, 26-28, 30-31----------	299	7.8	103	9.7	.00	90	29	98	3.8	163	296	84	.2	1.5	.6	692	.94	559	344	210	38
Jan. 1-4, 6-10, 1947 -	359	7.9	107	12	.01	93	31	91	4.8	160	301	83	.2	1.9	.5	697	.95	676	360	228	35
Jan. 11, 13-18, 20 ---	366	7.9	106	9.6	.01	95	31	89	3.7	165	298	82	.2	1.8	.5	692	.94	684	364	230	34
Jan. 21-25, 27-31----	507	7.9	106	12	.01	94	31	92	4.2	163	300	84	.2	1.7	.5	699	.95	957	362	228	35
Feb. 1, 3-8, 10------	519	7.9	105	10	.01	94	32	87	4.2	162	299	82	.2	1.7	.5	690	.94	967	366	234	34
Feb. 11-15, 17-20 ---	559	7.9	106	9.2	.03	94	30	98	2.4	168	303	85	.2	1.8	.5	706	.96	1,070	358	220	37
Feb. 21-22, 24-28 ---	551	8.0	107	12	.02	94	31	95	5.0	166	305	85	.3	1.6	.5	711	.97	1,060	362	226	36
Mar. 1, 3-8, 10 -----	504	8.1	108	12	.01	94	32	96	3.8	170	305	86	.2	1.7	.5	714	.97	972	366	226	36
Mar. 11-15, 17-20 ---	531	8.1	109	11	.02	94	31	98	4.0	162	311	87	.2	1.4	.5	717	.98	1,030	362	230	37
Mar. 21, 24-28, 31 --	537	7.4	111	9.0	.01	92	30	107	4.4	172	309	90	.3	1.8	--	728	.99	1,060	353	212	39

Apr. 1-10	562	7.7	112	8.6	.01	93	31	109	4.6	176	315	92	.2	1.8	--	742	1.01	1,130	360	216	39
Apr. 11-12, 14-19	584	7.7	113	12	.01	92	31	113	4.6	173	317	95	.3	1.8	--	752	1.02	1,190	357	215	40
Apr. 21-26, 28-30	598	7.7	114	13	.01	94	32	112	4.4	176	318	98	.3	1.8	--	760	1.03	1,230	366	222	40
May 1-2, 5-9	592	7.4	113	11	.02	94	33	106	3.7	174	312	95	.3	1.6	.5	742	1.01	1,190	370	228	38
May 12-13, 15-17, 19-20	580	7.6	113	9.0	.03	94	33	104	4.8	168	313	96	.3	1.5	.5	738	1.00	1,160	370	232	37
May 21-24, 26-29	549	7.4	113	11	.01	92	30	111	3.4	173	312	93	.2	1.3	.4	739	1.01	1,100	353	211	40
June 2-6, 9-10	544	7.5	114	12	.01	91	30	115	3.2	172	317	93	.1	1.3	.6	747	1.02	1,100	350	210	41
June 11-13, 16-20	521	7.6	114	13	.01	90	30	116	2.0	172	316	93	.2	1.3	.6	746	1.01	1,050	348	207	42
June 23-27, 30	506	7.6	114	12	.01	92	30	118	2.0	172	322	95	.2	1.4	.6	757	1.03	1,030	353	212	42
July 1-3, 5, 7-10	451	7.7	113	13	.01	90	30	114	2.2	168	316	93	.2	1.2	.6	742	1.01	904	348	210	41
July 11, 14-18	576	7.7	112	12	.01	90	30	111	2.0	163	315	92	.2	1.1	.6	734	1.00	1,140	348	214	41
July 21-25, 28-30	585	7.6	111	14	.02	92	31	106	5.6	160	319	93	.2	.5	.5	740	1.01	1,170	357	226	39
Aug. 4-8	480	7.6	111	16	.11	90	32	102	5.2	152	316	92	.1	.5	.8	729	.99	945	356	232	38
Aug. 11-15, 18-20	642	7.6	113	14	.08	93	31	104	5.8	159	317	94	.2	.4	.8	738	1.00	1,280	360	229	38
Aug. 21-22, 25-29	602	7.6	112	14	.09	93	31	100	5.4	161	309	92	.2	.5	.5	724	.98	1,180	360	228	37
Sept. 1-5, 8-10	639	7.7	112	14	.02	94	30	101	7.6	160	311	93	.3	1.5	1.1	731	.99	1,260	358	227	38
Sept. 11-12, 15-19	666	7.7	113	14	.02	94	31	104	4.8	159	315	95	.3	2.0	1.1	738	1.00	1,330	362	232	38
Sept. 22-26, 29-30	663	7.8	110	12	.00	94	31	106	3.0	159	318	94	.3	1.2	.2	738	1.00	1,320	362	232	39
Weighted average	538	--	110	12	0.02	92	31	104	4.1	165	310	89	0.2	1.3	0.6	726	0.99	1,050	357	222	38

TRIBUTARIES ABOVE GUNNISON RIVER

EAGLE RIVER BELOW GYPSUM, COLO.

LOCATION.--At bridge on State Highway 301 at Gypsum, Eagle County, just above Gypsum Creek, and about 150 feet upstream from gaging station which is below Gypsum Creek.
DRAINAGE AREA.--Approximately 849 square miles.
RECORDS AVAILABLE.--Chemical analyses: April to September 1947.
EXTREMES, 1947.--Dissolved solids: Maximum, 630 parts per million Sept. 1-10; minimum, 118 parts per million July 1-10.
Total hardness: Maximum, 348 parts per million Sept. 1-10; minimum, 80 parts per million July 1-10.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1089. Records of specific conductance of daily samples are available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947.

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Apr. 1-10, 1947	202	--	88.3	8.9	0.01	94	23	58	2.8	158	207	80	0.2	1.2	0.2	553	0.75	302	329	200	28
Apr. 11-20	236	--	78.4	8.7	.01	85	20	50	2.0	144	180	72	.2	1.2	.0	488	.66	311	294	176	27
Apr. 21-30	1/456	--	47.3	7.9	.13	52	13	25	1.6	112	97	32	.2	1.3	.0	285	.39	351	183	91	23
May 1	(1/)	--	41.0	--	--	--	--	--	--	110	100	24	--	.8	--	--	--	--	--	--	--
May 2-10	2,193	7.8	24.3	8.1	.09	35	6.3	6.7	1.9	102	35	6.0	.4	1.3	.1	151	.21	894	114	30	11
May 11-20	1,814	7.7	21.9	6.9	.02	29	6.2	7.1	2.9	86	33	7.5	.4	.6	.0	136	.18	666	98	28	13
May 21-31	1,866	7.6	20.4	6.6	.01	26	5.9	6.4	2.4	76	30	8.0	.4	.5	.0	124	.17	625	90	27	13
June 1-10	2,617	7.4	22.0	6.6	.07	28	5.6	6.0	1.1	76	31	8.0	.2	.4	.0	124	.17	876	93	30	12
June 11-20	2,958	7.4	22.0	6.4	.03	28	5.7	7.6	1.9	78	33	9.2	.2	.4	.0	131	.18	1,050	94	30	15
June 21-30	3,113	7.3	21.3	6.1	.05	27	5.6	6.4	2.6	74	33	8.5	.2	.6	.0	126	.17	1,060	90	30	13
July 1-10	2,927	7.4	20.0	5.3	.09	24	4.9	8.7	1.3	64	33	8.8	.2	.4	.0	118	.16	933	80	28	19
July 11-20	1,702	7.6	28.5	5.8	.02	33	6.8	15	1.9	78	51	19	.2	.4	.0	172	.23	790	110	46	22
July 21, 23-31	2/1,021	7.8	43.0	6.2	.03	49	10	23	3.4	100	86	32	.2	.4	.0	260	.35	717	164	82	23
July 22	(2/)	--	74.7	--	--	--	--	--	--	112	267	26	--	1.2	--	--	--	--	--	--	--
Aug. 1-10	703	7.8	53.3	7.5	.03	62	11	33	2.2	116	115	42	.1	.8	.1	331	.45	628	200	104	26
Aug. 11-20	520	7.8	68.7	9.8	.03	81	16	40	2.2	140	160	54	.1	1.0	.1	433	.59	606	268	154	24
Aug. 21-31	392	7.7	83.8	10	.05	97	20	53	3.4	160	196	76	.1	1.0	.1	535	.73	566	324	193	26
Sept. 1-10	286	7.8	97.6	8.6	.02	105	21	77	5.3	180	221	102	.3	1.5	.2	630	.86	486	348	201	32
Sept. 11-20	484	7.8	74.7	9.9	.03	84	17	56	2.7	156	166	72	.3	1.1	.2	486	.66	635	280	152	30
Sept. 21-30	329	7.8	92.0	9.4	.03	103	21	69	3.5	176	208	96	.3	1.3	.2	598	.81	531	344	200	30
Weighted average	3/1,310	--	30.8	6.8	0.05	37	7.7	15	2.1	89	56	19	0.2	0.6	0.0	188	0.26	665	124	51	20

1/Discharge for May 1 included with discharge reported for April 21-30.
2/Discharge for July 22 included with discharge reported for July 21, 23-31.
3/Runoff for period Apr. 1 to Sept. 30 was 87 percent of the total for the 1947 water year.

MISCELLANEOUS ANALYSES OF TRIBUTARIES ABOVE GUNNISON RIVER IN COLORADO

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
TROUBLESOME CREEK NEAR TROUBLESOME																	
Mar. 18, 1947	35	31.4	--	34	5.2	26	128	43	7	--	2.5	181	0.25	17	106	2	34
June 21	222	31.3	--	--	--	--	163	32	5.1	--	--	--	--	--	--	--	--
Sept. 18	23	46.0	42	55	6.8	42	228	56	8	--	.0	322	.44	20	165	0	36
BLUE RIVER AT DILLON																	
Mar. 17, 1947	24	22.4	--	32	8.7	1.4	62	61	3	--	0.5	137	0.19	8.9	116	65	3
EAGLE RIVER AT REDCLIFF																	
Sept. 18, 1947	20	3.4	--	--	--	--	20	2.5	0.8	--	--	--	--	--	--	--	--
EAGLE RIVER AT EAGLE																	
Mar. 17, 1947	191	96.9	--	86	22	86	151	176	131	--	1.8	577	0.78	298	305	182	38
Sept. 17	425	70.1	6.9	58	13	63	124	95	94	--	1.4	.392	.53	450	198	96	41
EAGLE RIVER AT MOUTH AT DOTSERO																	
Mar. 16, 1947	165	98.7	--	118	27	59	171	255	89	0.3	1.1	634	0.86	282	406	266	24
BRUSH CREEK AT EAGLE																	
Mar. 16, 1947	--	113	--	166	37	37	208	382	55	--	1.8	781	1.06	--	566	396	13
Sept. 17	--	99.3	14	155	30	27	212	337	30	--	1.7	699	.95	--	510	336	10
GYPSUM CREEK AT GYPSUM																	
Sept. 17, 1947	--	73.3	15	121	23	9.9	234	214	1	--	2.4	502	0.68	--	396	205	5
ROARING FORK AT GLENWOOD SPRINGS																	
Mar. 16, 1947	348	62.4	--	88	19	29	190	161	25	0.3	0.5	416	0.57	391	298	142	17
Sept. 17	982	57.4	12	79	16	18	170	121	26	--	1.5	357	.49	947	263	124	13

MISCELLANEOUS ANALYSES OF TRIBUTARIES ABOVE GUNNISON RIVER IN COLORADO--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
PLATEAU CREEK NEAR CAMEO																	
Mar. 15, 1947-----	76	76.2	--	56	33	78	337	140	14	0.3	2.5	490	0.67	101	275	0	38
Sept. 17 ----------	88	83.3	32	58	38	80	390	133	10	--	3.1	546	.74	130	300	0	37

GUNNISON RIVER NEAR GRAND JUNCTION, COLO.

LOCATION.--Half a mile upstream from point of diversion of Redlands power canal and 3 miles upstream from mouth and Grand Junction, Mesa County.
DRAINAGE AREA.--Approximately 8,020 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1931 to September 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1089. Records of specific conductance of daily samples are available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-3, 5-10, 1946	986	--	219	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oct. 11-20	1,225	7.8	181	21	--	182	73	161	256	829	21	--	0.9	--	1,410	1.92	4,900	754	544	32
Oct. 21-31	1,154	--	170	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 1-8	1,150	--	170	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 12-15, 18-20	1,099	7.6	162	9.5	0.10	155	68	141	243	716	19	0.6	.8	0.6	1,230	1.67	3,920	666	467	32
Nov. 21-30	1,127	--	160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec. 1-10	1,004	--	152	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec. 11-20	851	7.6	156	12	.10	139	64	138	236	662	18	.6	.5	.8	1,150	1.56	2,800	610	416	33
Dec. 21-31	869	--	160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Jan. 1, 3-10, 1947	756	--	173	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Jan. 11-20	734	7.6	157	12	.06	142	65	135	231	664	20	.6	6.6	.8	1,160	1.58	2,460	622	432	32
Jan. 21-31	723	--	155	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 1-5, 7-10	1/792	--	135	--	--	--	--	--	210	--	--	--	--	--	--	--	--	--	--	--
Feb. 6	(1/)	--	53.0	--	--	--	--	--	--	212	--	--	--	--	--	--	--	--	--	--
Feb. 11-20	948	--	139	16	.01	120	58	147	206	624	20	.5	13	.3	1,100	1.50	2,820	538	369	37
Feb. 21-28	783	--	144	--	--	--	--	--	202	--	--	--	--	--	--	--	--	--	--	--
Mar. 1-10	740	--	146	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mar. 11-12, 15-20	832	--	139	13	--	117	57	117	194	566	19	--	6.1	--	991	1.35	2,380	526	368	32
Mar. 21-31	1,109	--	113	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 1-10	982	--	111	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 11-20	1,105	--	112	16	--	107	42	89	181	442	17	--	1.3	--	804	1.09	2,530	440	291	31
Apr. 21-30, May 1-2	2,928	--	63.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
May 3-6, 8-10	9,952	--	36.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
May 11-20	7,279	7.6	46.0	14	--	48	13	33	119	134	5.0	--	1.1	--	307	.42	6,250	174	76	29
May 21-31	6,285	--	47.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

GUNNISON RIVER BASIN--Continued

GUNNISON RIVER NEAR GRAND JUNCTION, COLO.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
															Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
June 1-5, 7-10,1947	7,338	--	52.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June 11-20 -------	8,606	8.0	52.0	16	--	54	17	33	138	151	4.0	--	0.4	--	343	0.47	8,200	204	92	26
June 21, 23-30 ---	9,342	--	50.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 1-10 --------	6,380	--	47.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 11-20 -------	3,633	8.2	76.9	15	--	80	25	54	146	277	7.0	--	2.4	--	532	.72	5,340	302	183	28
July 21-31 -------	2,002	--	116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 1-10 -------	1,995	--	152	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 11-20 ------	1,977	7.7	144	21	--	157	54	110	209	630	15	--	5.2	--	1,100	1.50	6,190	614	442	28
Aug. 21-24, 26-31	1,895	--	140	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sept. 1-10 -------	1,389	--	168	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sept. 11-20 ------	2,202	7.3	142	19	--	153	53	115	212	623	18	--	3.9	--	1,090	1.48	6,900	600	426	30
Sept. 21-30 ------	1,222	--	164	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Weighted average	2,554	--	84.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

1/ Discharge for Feb. 6 included in discharge reported for Feb. 1-5, 7-10.

MISCELLANEOUS ANALYSES OF STREAMS IN DOLORES RIVER BASIN IN COLORADO

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
											Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
DOLORES RIVER AT DOLORES																
Aug. 13, 1947	188	28.6	7.4	41	6.6	12	136	28	10	0.2	172	0.23	87	130	18	16
DOLORES RIVER AT GLADEL																
Aug. 13, 1947	--	70.0	7.7	70	18	53	159	150	55	0.0	432	0.59	--	248	118	32
DOLORES RIVER ABOVE SAN MIGUEL RIVER NEAR URAVAN																
Aug. 13, 1947	--	1,240	6.5	474	129	2,350	115	1,690	3,520	--	8,230	11.2	--	1,710	1,620	75
SAN MIGUEL RIVER AT NATURITA																
Aug. 13, 1947	228	47.1	8.5	60	16	18	115	146	6	0.1	311	0.42	191	216	122	15
SAN MIGUEL RIVER AT MOUTH NEAR URAVAN																
Aug. 13, 1947	--	80.2	8.2	84	38	36	136	302	12	1.2	548	0.75	--	366	254	18
NATURITA CREEK NEAR NATURITA																
Aug. 13, 1947	--	210	12	166	128	158	216	977	64	0.0	1,610	2.19	--	940	764	27

TRIBUTARIES BETWEEN DOLORES AND GREEN RIVERS IN UTAH

MISCELLANEOUS ANALYSES OF TRIBUTARIES BETWEEN DOLORES AND GREEN RIVERS IN UTAH

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids		Hardness as $CaCO_3$		Percent sodium
												Parts per million	Tons per acre-foot	Total	Non-carbonate	
ONION CREEK NEAR MOAB																
Mar. 31, 1947	--	523	17	384	68	767	124	1,160	1,130	--	1.7	3,590	4.88	1,240	1,140	57
Apr. 19	--	536	16	396	65	769	148	1,150	1,140	0.2	1.2	3,610	4.91	1,260	1,130	57
ONION CREEK AT MOUTH NEAR MOAB																
Sept. 21, 1947	0.3	564	23	450	72	819	98	1,330	1,230	--	1.2	3,970	5.40	1,420	1,340	56
ROCK CREEK AT MOUTH NEAR MOAB																
Mar. 17, 1947	--	271	18	130	44	397	208	335	600	0.3	1.8	1,610	2.19	506	335	63
Sept. 21	0.4	712	20	154	56	1,390	201	372	2,180	--	.4	4,270	5.81	614	450	83
CASTLE CREEK AT MOUTH NEAR CASTLETON																
Mar. 17, 1947	--	183	20	142	46	200	206	386	286	0.6	1.6	1,160	1.58	544	374	44
Sept. 21	3.3	273	25	218	62	324	226	605	488	--	1.5	1,830	2.49	799	614	47
NIGGER BILL CREEK AT MOUTH NEAR MOAB																
Sept. 21, 1947	1.1	30.7	9.3	33	20	4.4	171	24	6	--	0.4	181	0.25	164	24	5
MILL CREEK NEAR MOAB																
Sept 22, 1947	5.5	131	21	168	63	52	360	429	34	--	2.2	946	1.29	678	383	14
INDIAN CREEK AT MOUTH NEAR MOAB																
June 22, 1947	19.7	121	--	40	23	208	297	240	108	--	1.0	766	1.04	194	0	70

GREEN RIVER AT GREEN RIVER, UTAH

LOCATION.-At gaging station, 1 mile southeast of Green River, Emery County, and 22 miles upstream from San Rafael River.
DRAINAGE AREA.-40,600 square miles.
RECORDS AVAILABLE.-Chemical analyses: October 1928 to September 1947.
Sediment Records: May 1929 to September 1947.
EXTREMES, 1946-47.-Sediment loads: Maximum, 821,00 tons per day Mar. 22, 23; minimum, 583 tons per day Jan. 4.
EXTREMES, 1929-47.-Sediment loads: Maximum, 2,230,000 tons per day July 11,1936; minimum, less than 100 tons per day on several days.
REMARKS:-Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1089. Records of specific conductance of daily samples are available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non carbonate	Percent sodium
Oct. 1-10, 1946	2,255	--	123	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oct. 11-20	2,391	7.7	110	14	--	90	32	100	263	315	30	--	0.4	--	714	0.97	4,930	368	153	37
Oct. 21-31	2,596	--	103	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 1-4, 6-10	3,220	--	101	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 11-20	2,653	8.0	112	11	--	86	39	118	264	335	46	--	.6	--	766	1.04	5,470	375	158	41
Nov. 21-30	2,714	--	108	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec. 1-10	2,949	--	103	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec. 11-20	2,771	8.1	102	13	--	78	35	102	241	291	41	--	1.2	--	680	.92	5,130	338	141	39
Dec. 21-31	1,856	--	107	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Jan. 1-10, 1947	1,278	--	121	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Jan. 11-20	1,510	7.6	122	6.9	0.07	96	46	118	289	349	58	0.6	.7	0.8	818	1.11	3,460	428	192	37
Jan. 21-31	1,656	--	112	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 1-7, 9-10	2,135	--	99.0	12	--	--	--	--	--	--	--	--	--	.8	--	--	--	--	--	--
Feb. 11-19	2,189	--	99.7	12	--	73	40	91	216	291	44	.2	1.5	.6	660	.90	4,070	346	170	36
Feb. 20-28	3,894	--	92.4	9.5	--	--	--	--	--	--	--	--	--	.6	--	--	--	--	--	--
Mar. 1-10	3,160	--	92.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mar. 11-20	4,413	--	99.4	11	--	88	35	86	251	274	41	--	3.0	--	662	.90	8,010	364	158	34
Mar. 21-31	11,960	--	84.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 1-10	7,116	--	69.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 12-20	4,892	--	77.3	11	--	62	25	73	210	193	30	--	.6	--	498	.68	6,630	258	86	38
Apr. 21-30	9,262	--	63.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
May 3-10	17,050	--	52.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
May 11-18, 20	29,020	7.9	43.4	12	--	50	12	29	182	69	11	--	1.7	--	274	.37	21,300	174	26	27
May 21-24, 26-31	22,280	--	36.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

GREEN RIVER BASIN--Continued

GREEN RIVER AT GREEN RIVER, UTAH--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_3)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non carbonate	Percent sodium
June 1-10, 1947	21,380	--	41.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June 11-20	23,000	8.3	47.3	11	--	51	14	32	184	81	12	--	0.8	--	292	0.40	18,500	184	34	27
June 21-25, 27-30	23,560	--	48.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 1-10	14,080	--	43.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 11-13, 15-20	10,720	8.2	46.3	11	--	43	14	37	160	90	14	--	.9	--	289	.39	8,450	165	34	33
July 21-27, 29-31	7,519	--	53.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 1-10	5,388	--	64.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 11-16, 18-20	6,801	8.0	79.0	12	--	67	24	74	192	213	32	--	2.0	--	519	.71	9,590	266	106	38
Aug. 21-31	5,665	--	95.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sept. 1-10	3,169	--	82.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sept. 11-20	2,579	7.6	90.4	8.8	--	67	30	91	216	247	38	--	.8	--	589	.80	4,140	290	114	40
Sept. 21, 23-28, 30	2,612	--	89.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Weighted average	7,574	--	61.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

GREEN RIVER BASIN--Continued

GREEN RIVER AT GREEN RIVER, UTAH--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day
1	1,520	0.05	2,050	3,240	0.26	22,700	2,620	0.04	2,830
2	2,180	.82	48,300	3,190	.84	72,300	2,710	.05	3,660
3	2,340	2.08	131,000	3,140	.47	39,800	2,800	.04	3,020
4	2,100	.65	36,900	3,490	.38	35,800	2,890	.04	3,120
5	2,300	1.11	68,900	3,490	.24	22,600	2,910	.04	3,140
6	2,160	.36	21,000	3,440	.20	18,600	2,960	.04	3,200
7	2,530	.72	49,200	3,120	.30	25,300	3,020	.04	3,260
8	2,700	.75	54,700	3,070	.27	22,400	3,000	.04	3,240
9	2,440	1.08	71,200	3,000	.20	16,200	3,340	.04	3,610
10	2,280	.42	25,900	3,020	.19	15,500	3,240	.46	40,200
11	2,280	.45	27,700	3,120	.12	10,100	3,070	.13	10,600
12	2,380	.36	23,100	3,020	.17	13,900	2,890	.05	3,900
13	2,410	.18	11,700	2,890	.16	12,500	2,860	.04	3,090
14	2,370	.12	7,680	2,750	.07	5,200	2,820	.03	2,280
15	2,370	.08	5,120	2,640	.06	4,280	2,820	.07	5,330
16	2,350	.10	6,340	2,560	.06	4,150	2,890	.06	4,680
17	2,370	.22	14,100	2,540	.05	3,430	2,800	.06	4,540
18	2,370	.18	11,500	2,470	.04	2,670	2,690	.06	4,360
19	2,470	.14	9,340	2,310	.07	4,370	2,580	.06	4,180
20	2,540	1/ .30	20,600	2,230	.07	4,210	2,290	.05	3,090
21	2,490	.21	14,100	2,310	.07	4,370	1,530	.05	2,070
22	2,540	.32	21,900	2,470	.07	4,670	1,670	.04	1,800
23	2,620	.15	10,600	2,640	.07	4,990	1,720	.04	1,860
24	2,690	.10	7,260	2,770	.07	5,240	1,700	.03	1,380
25	2,600	.09	6,320	2,730	.06	4,420	1,840	.03	1,490
26	2,540	.10	6,860	2,910	.07	5,500	2,230	.03	1,810
27	2,560	.09	6,220	2,960	.09	7,200	2,310	.04	2,490
28	2,540	.12	8,230	2,660	.24	16,500	2,270	.03	1,840
29	2,580	.35	24,400	2,800	.05	3,780	2,000	.02	1,060
30	2,580	.10	6,970	2,690	.05	3,630	1,650	.02	891
31	2,820	.19	14,500	--	--	--	1,500	.06	2,430
Total load (tons)	--	--	773,700	--	--	418,300	--	--	134,700
	January			February			March		
1	1,350	0.05	1,820	2,230	0.05	3,010	3,540	0.11	10,500
2	1,150	.03	932	2,170	.05	2,930	3,190	.09	7,750
3	1,150	.04	1,240	2,120	.04	2,290	2,960	.09	7,190
4	1,080	.02	583	2,060	.04	2,220	2,860	.08	6,180
5	1,080	.10	2,920	2,020	.04	2,180	2,980	.08	6,440
6	1,210	.13	4,250	2,000	.03	1,620	3,020	.07	5,710
7	1,250	.02	675	2,040	.04	2,200	3,120	.06	5,050
8	1,260	.06	2,040	2,190	1/ .05	2,960	3,260	.09	7,920
9	1,560	.08	3,370	2,270	.05	3,060	3,410	.10	9,210
10	1,690	.10	4,560	2,250	.02	1,220	3,260	.09	7,920
11	1,670	.06	2,710	2,270	.03	1,840	3,000	.10	8,100
12	1,670	.14	6,310	2,130	.03	1,730	2,960	.11	8,790
13	1,510	.10	4,080	2,130	.02	1,150	3,140	.12	10,200
14	1,460	.02	788	2,060	.02	1,110	3,240	.13	11,400
15	1,450	.04	1,570	2,060	.02	1,110	3,260	.19	16,700
16	1,510	.09	3,670	2,120	.03	1,720	3,360	.20	18,100
17	1,510	.07	2,850	2,190	.02	1,180	3,730	.20	20,100
18	1,450	.06	2,350	2,290	.03	1,850	4,250	.21	24,100
19	1,450	.05	1,960	2,450	.05	3,310	4,490	.30	36,400
20	1,420	.05	1,920	2,600	.06	4,210	12,700	1.76	604,000
21	1,420	.04	1,530	2,840	.07	5,370	15,800	1.84	785,000
22	1,420	.05	1,920	3,490	.14	13,200	16,000	1.90	821,000
23	1,420	.04	1,530	4,100	.22	24,400	15,600	1.95	821,000
24	1,460	.06	2,370	4,460	.26	31,300	14,200	2.01	771,000
25	1,560	.12	5,050	4,950	.57	76,200	14,000	1.61	609,000
26	1,620	.10	4,370	4,490	.32	38,800	13,500	1.43	521,000
27	1,700	.10	4,590	4,190	.18	20,400	11,400	1.18	363,000
28	1,790	.08	3,870	3,930	.15	15,900	9,490	1.00	256,000
29	1,790	.04	1,930	--	--	--	7,880	.84	179,000
30	2,000	.05	2,700	--	--	--	7,080	.68	130,000
31	2,040	.06	3,300	--	--	--	6,610	.52	92,000
Total load (tons)	--	--	83,760	--	--	268,500	--	--	6,181,000

1/ Interpolated.

GREEN RIVER BASIN--Continued

GREEN RIVER AT GREEN RIVER, UTAH--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration	Suspended sediment: Tons per day
1	6,610	0.38	67,800	9,100	0.32	78,600	23,000	0.26	161,000
2	7,350	.42	83,300	8,970	.23	55,700	21,900	.46	272,000
3	7,880	.39	83,000	8,630	.22	51,300	20,900	.35	198,000
4	7,790	.36	75,700	9,490	.39	99,900	20,600	.26	145,000
5	7,150	.31	59,800	13,700	.86	318,000	21,200	.27	155,000
6	7,110	.30	57,600	19,100	1.00	516,000	20,900	.26	147,000
7	7,430	.33	66,200	22,400	.76	460,000	21,200	.28	160,000
8	7,270	.27	53,000	24,200	.56	366,000	21,500	.27	157,000
9	6,690	.24	43,400	26,300	.67	476,000	20,800	.26	146,000
10	5,880	.20	31,800	28,600	.60	463,000	21,800	.25	147,000
11	5,180	.16	22,400	29,700	.52	417,000	23,000	.25	155,000
12	4,880	.13	17,100	30,100	.53	431,000	24,000	.25	162,000
13	4,720	.12	15,300	31,600	.44	375,000	25,600	.26	180,000
14	4,750	.11	14,100	32,600	.41	361,000	25,800	.21	146,000
15	4,950	.10	13,400	32,600	.55	484,000	26,700	.24	173,000
16	4,650	.10	12,600	30,600	.48	397,000	25,500	.28	193,000
17	4,340	.09	10,500	28,000	.45	340,000	22,000	.30	178,000
18	4,310	.10	11,600	24,800	.46	308,000	19,800	.28	150,000
19	4,820	.12	15,600	26,500	.42	301,000	19,000	.22	113,000
20	6,320	.18	30,700	23,700	.37	237,000	18,600	.27	136,000
21	6,880	.26	48,300	23,200	.35	219,000	20,000	.24	130,000
22	7,430	.32	64,200	23,100	.32	200,000	22,200	.31	186,000
23	8,420	.37	84,100	22,800	.32	197,000	23,700	.33	211,000
24	8,460	.28	64,000	22,200	.36	216,000	27,200	.31	228,000
25	10,200	.50	138,000	22,300	.28	169,000	30,000	.45	364,000
26	11,800	.56	178,000	22,000	.26	154,000	27,800	1/.38	285,000
27	11,400	.50	154,000	21,700	.28	164,000	24,600	.31	206,000
28	10,000	.41	111,000	21,000	.30	170,000	21,900	.25	148,000
29	9,060	.30	73,400	21,600	.30	175,000	19,800	.24	128,000
30	8,970	.25	60,500	22,200	.28	168,000	18,400	.22	109,000
31	--	--	--	23,000	.28	174,000	--	--	--
Total load (tons)	--	--	1,760,000	--	--	8,542,000	--	--	5,269,000

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration	Suspended sediment: Tons per day
1	17,400	0.21	98,700	6,170	0.06	10,000	3,870	0.18	18,800
2	16,800	.19	86,200	5,740	.04	6,200	3,790	.25	25,600
3	16,200	.18	78,700	5,350	.05	7,220	3,540	.10	9,560
4	15,200	.22	90,300	5,150	.05	6,950	3,340	.08	7,210
5	14,100	.20	76,100	5,050	.11	15,000	3,190	.06	5,170
6	13,300	.14	50,300	5,220	.08	11,300	3,020	.05	4,080
7	12,600	.18	61,200	5,280	.46	65,600	2,890	.08	6,240
8	11,800	.15	47,800	5,180	.28	39,200	2,770	.06	4,490
9	11,600	.11	34,500	5,250	.36	51,000	2,660	.04	2,870
10	11,800	.16	51,000	5,490	1.26	187,000	2,620	.05	3,540
11	11,900	.18	57,800	5,700	.47	72,300	2,600	.03	2,110
12	11,800	1/.18	57,300	5,740	.46	71,300	2,540	.03	2,060
13	11,600	.19	59,500	6,460	.60	105,000	2,520	.03	2,040
14	11,500	.17	52,800	6,320	.45	76,800	2,660	.04	2,870
15	11,400	.18	55,400	8,420	.84	191,000	2,540	.06	4,110
16	10,900	.15	44,100	8,120	.70	153,000	2,470	.10	6,670
17	10,200	.22	60,600	7,510	.92	187,000	2,600	.31	21,800
18	9,620	.12	31,200	7,000	1.19	225,000	2,660	.10	7,180
19	9,320	.14	35,200	6,650	.61	110,000	2,620	.08	5,660
20	8,930	.13	31,300	6,090	.51	83,900	2,580	.08	4,180
21	8,540	.13	30,000	6,020	.49	79,600	2,580	.10	6,970
22	8,330	.12	27,000	8,630	3.03	706,000	2,560	1/.09	6,220
23	8,080	.12	26,200	7,920	1.42	304,000	2,470	.08	5,340
24	7,830	.12	25,400	7,080	1.20	229,000	2,470	.11	7,340
25	7,630	.12	24,700	5,840	1.27	200,000	2,540	.10	6,860
26	7,470	.10	20,200	5,080	.61	83,700	2,730	.06	4,420
27	7,230	.06	11,700	4,650	.44	55,200	2,840	.06	4,600
28	7,110	.10	19,200	4,460	.30	36,100	2,770	.05	3,740
29	7,110	.09	17,300	4,340	.27	31,600	2,641	1/.05	3,560
30	6,880	.06	11,100	4,190	.21	23,800	2,520	.05	3,400
31	6,500	.09	15,800	4,100	.14	15,500	--	--	--
Total load (tons)	--	--	1,389,000	--	--	3,439,000	--	--	198,700

Total load for year (tons)---------- 28,460,000

1/ Interpolated.

GREEN RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN GREEN RIVER BASIN IN COLORADO

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
YAMPA RIVER AT MOUNT HARRIS																
Mar. 18, 1947	--	27.2	--	27	9.6	16	120	24	13	0.9	150	0.20	--	107	8	25
June 21	--	7.2	--	--	--	--	38	6.6	1.3	--	--	--	--	--	--	--
Sept. 18	--	25.6	9.3	32	7.6	14	124	26	10	.2	160	.22	--	111	10	22
YAMPA RIVER AT CRAIG																
June 22, 1947	--	9.8	--	--	--	--	50	12	2.0	--	--	--	--	--	--	--
Sept. 19	--	26.8	4.6	37	9.2	11	132	28	12	0.1	167	0.23	--	130	22	15
YAMPA RIVER NEAR MAYBELL																
June 22, 1947	7,540	13.4	--	14	4.7	10	61	22	2.0	0.8	84	0.11	1,710	54	4	29
YAMPA RIVER AT MOUTH NEAR GREYSTONE																
June 16, 1947	5,320	19.8	13	23	7.0	10	94	25	4	0.6	129	0.18	1,850	86	10	21
ELK RIVER NEAR MILNER																
June 21, 1947	--	6.2	--	--	--	--	35	3.6	0.5	--	--	--	--	--	--	--
Sept. 18	--	14.5	8.2	18	4.4	3.7	64	15	2	0.1	83	0.11	--	63	10	11
WILLIAMS FORK AT HAMILTON																
Mar. 19, 1947	--	36.6	--	37	19	14	155	63	4	2.7	216	0.29	--	170	44	15
Sept. 19	--	39.5	13	49	20	10	196	55	6	.0	250	.34	--	204	44	10
WHITE RIVER NEAR MEEKER																
Mar. 19, 1947	481	67.9	--	73	20	46	160	142	60	1.9	422	0.57	548	264	133	28
Sept. 19	384	64.4	17	62	16	55	160	119	61	.0	409	.56	424	220	90	35

GREEN RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN GREEN RIVER BASIN IN COLORADO--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
WHITE RIVER AT WHITE RIVER																
Mar. 19, 1947	--	67.3	--	69	24	44	172	159	40	2.8	424	0.58	--	270	130	26
Sept. 19	--	68.5	18	77	18	44	172	133	58	.2	433	.59	--	266	125	26
WHITE RIVER 8½ MILES ABOVE RANGELY																
May 13, 1947	2,810	34.5	--	43	10	16	140	47	14	1.5	200	0.27	1,520	148	34	19
Sept. 19	448	76.9	17	73	23	61	212	146	58	1.3	484	.66	585	276	103	32
WHITE RIVER AT RANGLEY																
Mar. 19, 1947	--	74.8	--	59	23	78	218	173	36	2.3	479	0.65	--	242	63	41
May 13	--	35.8	--	40	12	21	144	56	12	1.5	213	.29	--	150	32	23
Sept. 19	--	79.7	17	74	23	73	232	156	60	.9	518	.70	--	279	89	36
PICEANCE CREEK NEAR WHITE RIVER																
Mar. 19, 1947	--	69.4	--	28	19	111	301	115	16	1.7	439	0.60	--	148	0	62
Sept. 19	--	187	21	60	78	313	788	421	45	4.3	1,330	1.81	--	470	0	59
DOUGLAS CREEK NEAR RANGELY																
May 13, 1947	--	94.8	--	53	49	95	296	270	8	6.7	628	0.85	--	334	91	38
Sept. 19	--	137	27	104	59	144	374	456	24	1.0	999	1.36	--	502	196	38

MISCELLANEOUS ANALYSES OF STREAMS IN GREEN RIVER BASIN IN UTAH

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
GREEN RIVER NEAR LINWOOD																					
June 11, 1947 -----	10,600	--	51.4	12	--	53	21	29		186	104	15	--	0.5	--	326	0.44	9,330	218	66	23
GREEN RIVER NEAR JENSEN																					
Mar. 19, 1947 -----	11,800	--	64.4	--	--	64	17	58		178	165	24	0.5	2.4	--	419	0.57	13,300	230	84	35
May 12 ----------	26,700	--	26.5	--	--	34	12	12		126	45	6	--	1.3	--	172	.23	12,400	134	32	16
June 1-10 --------	15,580	7.9	34.4	11	0.11	37	12	18	1.6	146	50	7.0	.3	.8	0.1	210	.29	8,830	142	22	21
June 11-12, 15-20 -	17,040	8.0	38.0	11	.07	38	12	26	1.4	150	62	9.5	.3	.9	.1	235	.32	10,800	144	22	28
June 21-30 --------	17,900	7.9	38.6	11	.07	37	12	28	1.1	146	67	10	.3	1.1	.1	239	.33	11,600	142	22	30
July 1-5, 8-10 ----	10,600	7.9	38.3	11	.01	37	13	24	2.7	138	69	9.8	.2	1.9	.0	237	.32	6,780	146	33	26
July 11-16, 18-20--	8,527	7.7	39.2	10	.03	38	12	24	4.2	142	65	12	.4	.6	.1	236	.32	5,430	144	28	26
July 17 ----------	(1/)	--	62.8	--	--	--	--	--	--	168	170	14	--	3.1	--	--	--	--	--	--	--
July 21-22, 24-28, 30-31 ----------	5,923	7.9	45.5	9.2	.03	46	16	29	3.4	156	95	14	.3	.8	.2	291	.40	4,650	181	53	25
July 23 ----------	(2/)	--	88.3	--	--	--	--	--	--	228	264	22	--	--	--	--	--	--	--	--	--
Aug. 1-10 ---------	4,107	8.0	57.9	9.6	.04	52	19	47	3.8	184	129	20	.3	.7	.4	372	.51	4,130	208	56	33
Aug. 11, 15, 17-20	4,500	8.0	57.9	12	.16	53	17	49	2.9	182	128	20	.3	.8	.4	373	.51	4,530	202	53	34
Aug. 12-14 --------	6,403	--	118	16	--	98	32	124		220	347	74	--	.3	--	800	1.09	13,800	376	196	42
Aug. 21-25,30-31 --	2,875	8.0	60.4	8.5	.04	55	19	49	2.4	170	146	22	.3	.3	.3	386	.52	3,000	215	76	33
Sept. 1, 7-10 -----	1,949	7.9	71.2	8.1	.07	62	25	57	3.5	180	195	24	.3	1.2	.5	465	.63	2,450	258	110	32
Sept. 11-16, 18-20	1,776	7.9	66.4	8.3	.07	56	22	60	2.1	180	169	26	.4	1.0	.4	434	.59	2,080	230	82	36
Sept. 21-30 -------	1,844	7.9	73.2	7.9	.07	57	23	70	2.6	174	204	26	.3	.6	.6	477	.65	2,370	236	94	39
GREEN RIVER AT OURAY																					
Mar. 20, 1947 ----	--	--	67.8	--	--	66	17	66		216	163	22	--	0.6	--	441	0.60	--	234	58	38
May 13 ----------	--	--	30.4	--	--	34	10	23		138	51	6	--	2.0	--	194	.26	--	126	13	28
GREEN RIVER AT MOUTH NEAR MOAB																					
June 22, 1947 -----	1,440	--	49.2	--	--	.54	16	27		162	100	16	--	0.5	--	293	0.40	1,140	200	68	23

1/ Discharge for July 17 included in discharge reported for July 11-16, 18-20.
2/ Discharge for July 23 included in discharge reported for July 21-22, 24-28, 30-31.

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GREEN RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN GREEN RIVER BASIN IN UTAH--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
SHEEP CREEK AT MOUTH NEAR LINWOOD																				
June 12, 1947	79.5	--	22.0	6.9	--	27	9.0	1.6	54	54	5	--	1.1	--	131	0.18	28	104	60	3
RED CREEK AT MOUTH NEAR LINWOOD																				
June 13, 1947	4	--	115	17	--	67	61	111	294	344	43	--	0.6	--	788	1.07	8.5	418	177	37
BRUSH CREEK NEAR JENSEN																				
Mar. 19, 1947	23	--	122	--	--	197	31	42	191	516	8	--	6.6	--	895	1.22	56	619	462	13
May 12	216	--	32.4	--	--	55	11	1.4	114	81	4	--	2.1	--	211	.29	123	182	88	2
ASHLEY CREEK AT SIGN OF THE MAINE NEAR VERNAL																				
May 12, 1947	763	--	9.6	--	--	14	1.3	6.9	52	9.1	2	--	0.9	--	60	0.08	124	40	0	27
ASHLEY CREEK NEAR JENSEN																				
Mar. 19, 1947	53	--	168	--	--	178	94	90	272	739	21	--	6.2	--	1,260	1.71	180	830	608	19
May 12	451	--	52.5	--	--	56	25	20	118	174	6	--	1.2	--	340	.46	414	242	146	16
June 22	663	--	59.8	--	--	57	31	27	116	214	6.0	--	1.2	--	393	.53	704	270	174	18
Sept. 19	13	--	287	15	--	288	197	195	328	1,560	40	--	2.9	--	2,460	3.35	86	1,530	1,260	22
ASHLEY CREEK AT MOUTH NEAR JENSEN																				
June 18, 1947	520	--	64.7	8.2	--	66	30	31	128	229	8	--	0.5	--	436	0.59	612	288	183	19
DRY FORK NEAR VERNAL																				
May 12, 1947	--	--	5.8	--	--	9.0	1.3	0.9	28	3.3	2	--	0.9	--	31	0.04	--	28	5	7

DUCHESNE RIVER NEAR TABIONA

May 14, 1947 -----	725	--	22.8	--	--	30	8.7	5.8	118	22	2	--	1.5	--	128	0.17	251	111	14	10
Sept. 20 ----------	126	--	60.4	11	--	68	27	28	292	78	14	--	1.3	--	371	.50	126	280	41	18

DUCHESNE RIVER 3 MILES BELOW ROCK CREEK NEAR DUCHESNE

May 14, 1947 -----	--	--	18.3	--	--	24	7.2	3.9	92	18	2	--	1.5	--	102	0.14	--	90	14	9
Sept. 20 ----------	--	--	45.3	9.5	--	51	20	12	188	63	10	--	1.1	--	259	.35	--	209	55	11

DUCHESNE RIVER AT DUCHESNE

Mar. 20, 1947 ----	215	--	48.1	--	--	66	31	12	198	113	26	--	1.0	--	346	0.47	201	292	130	8
May 14 ----------	1,150	--	19.7	--	--	26	8.3	6.7	98	28	2	--	1.0	--	120	.16	373	99	18	13
June 22 ----------	1,380	--	19.0	--	--	21	7.9	8.7	88	27	3	--	.3	--	111	.15	414	85	13	18
Sept. 20 ----------	164	--	52.0	7.9	--	53	23	30	228	85	10	--	1.8	--	323	.44	143	226	40	22

DUCHESNE RIVER AT BRIDGELAND

Mar. 20, 1947 ----	--	--	61.8	--	--	58	26	40	249	105	16	--	2.4	--	370	0.50	--	252	48	26
May 11 ----------	--	--	30.7	--	--	35	13	12	140	44	4	--	1.3	--	178	.24	--	141	26	16
June 22 ----------	--	--	28.9	--	--	26	12	19	121	45	6.0	--	.5	--	168	.23	--	114	16	26
Sept. 20 ----------	--	--	80.3	12	--	68	36	65	296	181	20	--	.6	--	528	.72	--	318	75	31

DUCHESNE RIVER AT MYTON

Mar. 20, 1947 ----	420	--	80.4	--	--	65	36	58	248	185	27	--	1.9	--	495	0.67	561	310	107	29
May 11 ----------	2,520	--	43.0	--	--	42	17	26	150	91	10	--	1.3	--	261	.35	1,780	175	52	25
June 22 ----------	1,680	--	42.9	--	--	32	17	36	130	101	11	--	.5	--	262	.36	1,190	150	44	34
Sept. 20 ----------	83	--	138	13	--	97	57	148	320	454	44	--	1.5	--	972	1.32	218	476	214	40

DUCHESNE RIVER AT OURAY

Mar. 20, 1947 ----	--	--	96.4	--	--	70	40	83	243	243	46	--	1.9	--	604	0.82	--	339	140	35
May 13 ----------	--	--	49.4	--	--	43	21	32	150	113	16	--	1.6	--	300	.41	--	194	71	27

GREEN RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN GREEN RIVER BASIN IN UTAH--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
ROCK CREEK NEAR DUCHESNE																				
May 14, 1947	--	--	8.6	--	--	9.6	3.7	3.9	38	12	2	--	1.0	--	51	0.07	--	39	8	18
Sept. 20	--	--	18.8	4.7	--	22	7.1	20	112	26	6	--	.5	--	142	.19	--	84	0	34
STRAWBERRY RIVER AT DUCHESNE																				
Mar. 20, 1947	132	--	67.1	--	--	66	21	77	334	125	10	--	1.1	--	465	0.63	166	251	0	40
May 11	660	--	45.5	--	--	58	22	12	260	36	6	--	2.9	--	265	.36	472	235	22	10
June 22	177	--	64.7	--	--	54	30	56	356	63	16	--	.4	--	395	.54	189	258	0	32
Sept. 20	78	--	71.2	22	--	59	34	62	380	79	20	--	.9	--	464	.63	98	287	0	32
CURRANT CREEK NEAR FRUITLAND																				
May 11, 1947	260	--	30.6	--	--	50	11	3.4	180	16	8	--	2.6	--	180	0.24	126	170	22	4
RED CREEK NEAR FRUITLAND																				
May 11, 1947	--	--	41.5	--	--	67	19	10	226	29	12	--	1.8	--	240	0.33	--	245	60	--
June 22	--	--	89.4	--	--	54	42	92	414	68	68	--	.4	--	528	.72	--	307	0	39
LAKE FORK NEAR MYTON																				
May 14, 1947	40	--	133	--	--	86	30	179	226	433	64	--	1.8	--	905	1.23	98	338	153	54
UINTA RIVER AT FORT DUCHESNE																				
Mar. 20, 1947	96	--	49.0	--	--	55	21	37	167	142	12	--	1.4	--	351	0.48	91	224	86	26
May 11	721	--	19.7	--	--	26	7.9	2.3	72	32	6	--	1.7	--	111	.15	216	98	38	5
June 22	752	--	17.5	--	--	17	7.3	8.7	68	28	4.5	--	.4	--	99	.13	201	72	17	21
Sept. 20	30	--	92.5	11	--	76	48	66	288	245	28	--	1.4	--	617	.84	50	387	151	27
WHITE RIVER NEAR WATSON																				
May 13, 1947	2,810	--	36.1	--	--	38	12	20	140	53	12	--	1.6	--	206	0.28	1,560	144	30	23

WHITE RIVER NEAR OURAY																				
Mar. 20, 1947 ----	--	--	85.4	--	--	68	25	99	248	224	36	--	0.8	--	575	0.78	--	272	70	44
May 13 ----------	--	--	42.4	--	--	44	14	32	168	76	14	--	2.6	--	265	.36	--	168	30	30
EVACUATION CREEK AT WATSON																				
May 13, 1947 -----	--	--	454	--	--	152	198	770	398	2,360	44	--	27	--	3,750	5.10	--	1,190	867	58
BITTER CREEK NEAR RAINBOW																				
May 13, 1947 -----	--	--	581	--	--	332	456	699	420	3,600	74	--	35	--	5,400	7.34	--	2,700	2,360	36
WILLOW CREEK NEAR MOUTH NEAR OURAY																				
June 18, 1947 -----	1.2	--	321	20	--	84	121	562	596	1,280	76	--	0.2	--	2,440	3.32	7.9	707	218	63
MINNIE MAUDE CREEK AT MOUTH NEAR OURAY																				
June 19, 1947 -----	14.2	--	102	24	--	43	65	98	440	196	16	--	0.4	--	659	0.90	25	375	14	36
Sept. 18 ----------	14.0	--	106	26	--	47	69	108	444	243	13	--	.5	--	725	.99	27	401	37	37
ROCK CREEK AT MOUTH NEAR COLUMBIA																				
Sept. 19, 1947 ----	5.5	--	58.5	--	--	53	35	30	301	81	6	--	1.2	--	354	0.48	5.3	276	30	19
CHANDLER CREEK AT MOUTH NEAR COLUMBIA																				
Sept. 19, 1947 ----	0.97	--	80.5	--	--	65	40	66	303	203	7	--	1.2	--	532	0.72	1.4	326	78	31
RANGE CREEK AT MOUTH NEAR WOODSIDE																				
Sept. 20, 1947 ----	1	--	105	21	--	48	57	124	472	207	16	--	0.0	--	706	0.96	1.9	354	0	43

GREEN RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN GREEN RIVER BASIN IN UTAH--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
COAL CREEK AT MOUTH NEAR GREEN RIVER																					
Sept. 20, 1947 ---	0.2	--	301	17	--	108	127	478	388	1,390	46	--	0.0	--	2,360	3.21	1.3	792	474	57
RATTLESNAKE CREEK AT MOUTH NEAR GREEN RIVER																					
Sept. 20, 1947 ---	0.7	--	242	23	--	70	126	366	463	1,020	33	--	0.4	--	1,870	2.54	3.5	692	314	53
PRICE RIVER ABOVE WILLOW CREEK AT CASTLEGATE																					
April 25, 1947 ---	--	--	55.4	--	--	61	32	15	320	40	8	--	1.5	--	315	0.43	--	284	22	10
July 19 ----------	--	--	37.1	--	--	59	13	9.2	219	30	6.8	--	.5	--	226	.31	--	200	21	9
Aug. 14 ---------	156	--	39.2	9.3	--	50	19	5.8	197	42	7	--	.7	--	231	31	97	203	42	6
PRICE RIVER AT WELLINGTON																					
April 25, 1947 ---	--	--	217	--	--	155	111	226	381	932	35	--	4.5	--	1,650	2.24	--	843	531	37
July 20 ----------	--	--	335	--	--	235	177	389	388	1,690	58	--	1.4	--	2,740	3.73	--	1,310	996	39
PRICE RIVER AT WOODSIDE																					
Dec. 2, 1946 -----	--	--	564	--	--	--	--	--	360	--	105	--	--	--	--	--	--	--	--	--
Dec. 9, 16, 30 ---	--	--	453	--	--	--	--	--	361	2,490	90	--	--	--	--	--	--	--	--	--
Jan. 7, 14, 22, 28, 1947 ----------	--	--	572	--	--	314	298	844	482	3,140	121	0.3	11	--	4,970	6.76	--	2,010	1,610	48
Feb. 3, 12, 17, 24	--	--	459	3.7	--	242	217	658	380	2,380	88	.9	15	0.8	3,790	5.15	--	1,500	1,180	49
Mar. 3, 10 ------	--	--	453	10	--	226	226	669	355	2,430	88	--	4.0	--	3,830	5.21	--	1,490	1,200	49
Mar. 14 ---------	49	--	356	--	--	196	163	503	309	1,820	70	.2	8.2	--	2,910	3.96	385	1,160	906	49
Mar. 18, 21 -----	--	--	256	--	--	155	109	325	324	1,160	45	--	4.6	--	1,960	2.67	--	834	569	46
April 2, 7, 15, 28	--	--	304	7.8	--	151	139	424	336	1,450	57	--	5.3	--	2,400	3.26	--	948	672	49
April 25 ---------	--	--	214	--	--	119	103	248	322	900	38	--	7.7	--	1,570	2.14	--	720	456	43
May 9, 14, 20, 28	--	8.0	282	11	--	141	124	400	298	1,360	48	--	3.8	--	2,230	3.03	--	862	618	50
June 2, 9, 19, 24	--	--	392	8.0	--	176	181	618	279	2,110	69	--	3.6	--	3,300	4.49	--	1,180	954	53
July 9, 18 -------	--	--	392	3.7	--	174	193	605	252	2,140	75	--	1.9	--	3,320	4.52	--	1,230	1,020	52
July 20 ----------	--	--	391	--	--	208	179	561	295	2,040	78	--	.6	--	3,210	4.37	--	1,260	1,010	49
Aug. 4, 6 -------	--	--	439	12	--	254	205	591	296	2,300	86	--	3.1	--	3,600	4.90	--	1,480	1,230	47
Aug. 10, 12 -----	--	--	204	16	--	184	71	224	264	943	28	--	1.3	--	1,600	2.18	--	751	534	39

Aug. 14----------	96	--	230	15	--	236	69	234	146	1,160	37	--	1.8	--	1,820	2.48	472	872	753	37
Aug. 21, 28 -----	--	--	374	12	--	284	159	506	260	2,070	66	--	3.2	--	3,230	4.39	--	1,360	1,150	45
Aug. 22 ---------	3,350	--	172	16	--	153	61	315	242	1,040	26	--	.6	--	1,730	2.35	15,600	632	434	52
Sept. 4, 12, 17, 25	--	--	421	4.6	--	234	184	615	228	2,280	82	--	2.0	--	3,510	4.77	--	1,340	1,150	50
Sept. 15 ---------	38	--	422	4.8	--	222	196	610	274	2,250	82	--	3.9	--	3,500	4.76	359	1,360	1,140	49
PRICE RIVER AT MOUTH NEAR WOODSIDE																				
June 20, 1947 -----	35	--	429	6.4	--	194	202	662	222	2,360	82	--	0.3	--	3,620	4.92	342	1,310	1,130	52
Sept. 20 ---------	34.3	--	489	5.2	--	249	229	773	229	2,800	98	--	2.8	--	4,270	5.81	395	1,560	1,380	52
WILLOW CREEK AT CASTLEGATE																				
April 25, 1947 ---	--	--	58.8	--	--	56	33	34	306	82	7	--	2.0	--	365	0.50	--	275	24	21
July 19 ----------	--	--	74.7	--	--	44	42	73	312	141	24	--	.3	--	478	.65	--	282	27	36
Aug. 14 ---------	--	--	70.4	17	--	46	33	68	301	117	21	--	1.1	--	451	.61	--	250	4	37
SALERATUS WASH AT GREEN RIVER																				
Sept. 21, 1947 ---	0.1	--	372	14	--	469	124	402	200	2,210	63	--	1.1	--	3,380	4.60	.9	1,680	1,520	34
SAN RAFAEL RIVER NEAR GREEN RIVER																				
Nov. 29, 1946 ---	--	--	355	--	--	--	--	--	332	--	50	--	--	--	--	--	--	--	--	-
Dec. 5 ----------	--	--	332	--	--	--	--	--	324	--	45	--	--	--	--	--	--	--	--	--
Dec. 12, 19, 28 -	--	--	318	--	--	--	--	--	329	1,630	50	--	--	--	--	--	--	--	--	--
Jan. 3, 9, 16, 23, 30, 1947 --------	--	--	351	--	--	270	167	441	451	1,790	59	0.2	3.1	--	2,950	4.01	--	1,360	990	41
Feb. 7, 13, 20, 27	98.5	--	255	8.4	--	179	114	309	318	1,220	38	.6	2.5	0.8	2,030	2.76	540	915	654	42
Mar. 6, 14, 26 --	65.7	--	331	8.2	--	218	149	433	322	1,690	51	--	3.7	--	2,710	3.69	481	1,160	892	45
April 3, 9, 13, 17, 19 ----------	55.4	--	337	5.3	--	204	149	474	285	1,770	54	--	1.0	--	2,800	3.81	419	1,120	888	48
May 2 ----------	42	--	404	.3	--	212	188	589	230	2,210	66	--	.6	--	3,380	4.60	383	1,300	1,110	50
May 9, 23, 29 ---	771	--	101	5.9	--	84	43	86	241	342	13	--	2.8	--	695	.95	1,450	386	189	33

GREEN RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN GREEN RIVER BASIN IN UTAH--Continued

Chemical analysee, in parts per million, water year October 1946 to September 1947--Continued

	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
SAN RAFAEL RIVER NEAR GREEN RIVER--Continued																				
May 16, 1947 ----	339	--	171	7.4	--	127	74	193	299	733	22	--	3.6	--	1,310	1.78	1,200	622	376	40
June 6, 12, 20, 27	384	--	186	8.3	--	123	83	214	275	820	24	--	.8	--	1,410	1.92	1,460	648	423	42
July 3, 9, 17, 21, 23	83.6	--	334	7.2	--	194	169	451	240	1,820	48	--	.2	--	2,810	3.82	634	1,180	982	45
Aug. 8, 14 ------	138	--	301	15	--	350	87	354	196	1,710	43	--	.3	--	2,660	3.62	991	1,230	1,070	38
Aug. 24 ----------	600	--	350	10	--	432	111	384	188	2,060	46	--	5.9	--	3,140	4.27	5,090	1,530	1,380	35
Sept. 1, 9, 18, 23	60	--	404	7.8	--	324	179	540	252	2,320	66	--	5.8	--	3,570	4.86	578	1,540	1,340	43

MISCELLANEOUS ANALYSES OF TRIBUTARIES BETWEEN GREEN AND SAN JUAN RIVERS IN UTAH

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
DARK CANYON CREEK AT MOUTH NEAR HITE																				
June 25, 1947----	0.8	---	110	--	--	135	64	16		161	456	20	--	0.0	--	770	1.05	600	468	5
DIRTY DEVIL RIVER NEAR HANKSVILLE																				
Nov. 29, 1946 ---	--	--	235	--	--	--	--	--		217	--	220	--	--	--	--	--	--	--	--
Dec. 5----------	--	--	100	--	--	--	--	--		198	--	25	--	--	--	--	--	--	--	--
Dec. 12, 19------	--	--	176	--	--	--	--	--		202	619	148	--	--	--	--	--	--	--	--
Jan. 3, 9, 16, 23, 28 1947----------	--	--	111	--	--	150	35	53		204	395	38	0.4	2.0	--	774	1.05	518	352	18
Feb. 7, 13, 20, 27 -	--	--	175	33	--	193	49	162		192	655	136	.8	2.8	0.2	1,330	1.80	683	526	34
Mar. 6----------	--	--	88.0	--	--	130	29	38		202	319	20	--	1.2	--	637	.87	444	278	16
Mar. 14, 26------	--	--	263	19	--	242	72	248		172	907	250	--	3.3	--	1,830	2.49	900	759	38
Mar. 16----------	--	--	211	--	--	--	--	--		--	749	180	--	--	--	--	--	--	--	--
Apr. 3----------	--	--	145	--	--	--	--	--		202	704	108	--	.0	--	--	--	--	--	--
Apr. 9,17 -------	--	--	322	21	--	241	83	414		192	1,100	382	--	1.7	--	2,340	3.18	943	786	49
May 1-2----------	--	--	148	--	--	173	50	107		174	596	76	--	.6	--	1,090	1.48	637	494	27
May 3-10---------	--	7.6	306	21	0.07	301	87	336	11	196	1,250	275	.5	2.6	.4	2,380	3.24	1,110	948	39
May 11-20--------	--	7.6	307	21	.01	317	74	334	16	192	1,270	255	.5	3.0	.4	2,390	3.25	1,100	938	39
May 21-30--------	--	7.8	318	15	.15	278	92	380	6.0	212	1,260	295	.4	5.4	.4	2,440	3.32	1,070	898	43
May 31, June 1-3, 7-10 ----------	--	7.9	189	25	.36	251	56	131	6.2	184	848	80	.5	.7	.4	1,490	2.03	856	706	25
June 4-6 --------	--	7.6	306	21	--	338	85	316		200	1,300	256	.4	1.9	--	2,420	3.29	1,190	1,030	37

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TRIBUTARIES BETWEEN GREEN AND SAN JUAN RIVERS IN UTAH--Continued

MISCELLANEOUS ANALYSES OF TRIBUTARIES BETWEEN GREEN AND SAN JUAN RIVERS IN UTAH--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (Mg)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
DIRTY DEVIL RIVER NEAR HANKSVILLE--Continued																				
June 11-13, 15-20, 1947	--	7.8	156	30	0.23	193	62	82	4.4	184	659	58	0.4	0.6	0.4	1,180	1.60	736	586	19
June 21-30	--	7.6	312	18	.07	422	66	298	11	172	1,540	170	.3	2.7	.4	2,610	3.55	1,320	1,180	33
July 1-10	--	7.9	301	21	.17	336	81	297	14	161	1,340	215	.4	4.5	.4	2,390	3.25	1,170	1,040	35
July 11-17, 19	--	7.8	356	21	.03	362	97	414	12	169	1,610	282	.4	4.7	.4	2,890	3.93	1,300	1,160	41
July 21, 23, 26, 29-31	--	7.7	331	26	.03	368	110	353	13	238	1,720	118	.3	1.6	.4	2,830	3.85	1,370	1,180	36
Aug. 2, 6-10	--	7.9	337	24	.06	490	97	388	17	226	1,890	235	.3	.8	.4	3,250	4.42	1,620	1,440	34
Aug. 11	--	--	647	17	--	630	121	913		240	2,480	905	--	1.2	--	5,190	7.06	2,070	1,870	49
Aug. 12-20	--	7.8	338	20	.03	551	79	253	18	192	1,820	155	.4	1.8	.4	2,990	4.07	1,700	1,540	24
Aug. 21-31	--	7.8	357	18	.05	549	77	304	15	152	1,910	178	.5	2.0	.4	3,130	4.26	1,690	1,560	28
Sept 1-10	--	7.3	298	22	.08	438	69	250	11	148	1,480	190	.4	2.3	.8	2,540	3.45	1,380	1,260	28
Sept. 11-18, 20	--	7.5	267	25	.13	334	66	242	10	170	1,160	208	.3	2.1	.8	2,130	2.90	1,100	966	32
Sept. 21-23, 28-30	--	7.6	204	30	.04	285	51	139	8.0	168	863	138	.3	1.4	.8	1,600	2.18	920	783	25
DIRTY DEVIL RIVER AT MOUTH NEAR HITE																				
June 25, 1947	--	--	400	--	--	554	84	421		151	2,100	235	--	2.4	--	3,470	4.72	1,730	1,600	35
BLUE NOTCH CREEK NEAR HITE																				
Sept. 23, 1947	1.7	--	257	15	--	144	90	323		242	718	344	--	0.0	--	1,750	2.38	730	531	49
BULL FROG CREEK AT MOUTH NEAR HITE																				
June 26, 1947	0.3	--	132	--	--	135	31	129		170	567	9	--	2.3	--	957	1.30	464	325	38
ESCALANTE RIVER AT MOUTH NEAR HITE																				
June 29, 1947	35.6	--	64.0	--	--	62	25	36		176	133	38	--	0.0	--	381	0.52	258	114	23
Sept. 24	41.6	--	65.8	18	--	67	26	37		184	140	40	--	2.8	--	421	.57	274	123	23

SAN JUAN RIVER NEAR BLANCO, N. MEX.

LOCATION.--At bridge on State Highway 17 half a mile downstream from gaging station which is 1 mile upstream from Canyon Largo and 1½ miles east of Blanco, San Juan County.
DRAINAGE AREA.--3,320 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 1,030 parts per million Aug. 16; minimum, 89 parts per million June 1-6, 8-10.
Total hardness: Maximum, 680 parts per million Aug. 16; minimum, 54 parts per million June 1-6, 8-10.
EXTREMES, 1945-47.--Dissolved solids: Maximum, 1,030 parts per million Aug. 16, 1947; minimum, 89 parts per million June 1-6, 8-10, 1947.
Total hardness: Maximum, 680 parts per million Aug. 16, 1947; minimum, 54 parts per million June 1-6, 8-10, 1947.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1089.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1946 -	608	7.6	33.5	13	0.07	37	8.5	27	132	67	4.5	0.3	0.6	0.3	223	0.30	366	128	20	31
Oct. 11-20 -----	387	7.5	31.7	17	.03	33	7.5	28	117	67	4.5	.3	.6	.2	216	.29	226	387	18	35
Oct. 21-26, 28-31	427	7.4	37.5	14	.03	38	9.0	34	132	86	6.0	.2	.6	.1	253	.34	292	132	24	36
Nov. 4, 6, 8 ---	428	7.3	33.4	16	.05	35	7.8	29	113	77	5.5	.2	.5	.2	227	.31	262	120	27	34
Nov. 11-20 -----	311	7.4	39.2	14	.03	42	8.7	32	125	93	6.8	.2	.5	.2	259	.35	217	141	38	33
Nov. 21-25, 27-30	323	7.5	41.1	14	.03	42	9.1	34	127	100	6.0	.2	.6	.2	269	.37	235	142	38	34
Dec. 1-10 ------	347	7.5	34.2	5.4	.04	35	7.1	27	114	73	3.5	.3	.4	.1	208	.28	195	116	23	34
Dec. 11-20 -----	219	7.5	40.5	17	.00	42	8.5	31	127	91	5.2	.2	.3	.2	258	.35	153	140	36	32
Dec. 21-31 -----	242	7.5	42.8	16	.04	43	8.3	35	132	97	5.8	.2	.4	.1	271	.37	177	142	34	35
Jan. 1-10, 1947 -	212	7.6	47.6	16	.00	50	9.4	38	152	107	7.0	.2	.4	.2	303	.41	173	164	39	34
Jan. 11-20 -----	208	7.5	45.5	16	.00	47	8.6	37	145	101	6.0	.2	.6	.1	288	.39	162	153	34	34
Jan. 21-31 -----	225	7.8	40.8	15	.02	43	9.3	32	133	94	6.0	.2	.0	.2	265	.36	161	146	36	33
Feb. 1-10 -----	302	7.7	41.1	12	.03	42	8.6	36	129	98	7.5	.4	.6	.2	269	.37	219	140	35	36
Feb. 11-20 ----	406	7.9	46.2	10	.02	46	10	42	135	121	6.5	.4	2.0	.2	304	.41	333	156	46	37
Feb. 21-28 ----	304	7.9	43.6	14	.03	44	12	34	128	113	5.5	.3	1.0	.2	287	.39	236	160	54	31
Mar. 1-10 -----	286	7.9	44.3	16	.02	45	11	37	135	113	6.5	.3	.5	.2	296	.40	229	158	47	34
Mar. 11-20 ----	445	7.9	49.9	15	.02	51	15	37	140	140	5.5	.2	1.4	.2	335	.46	403	188	74	30
Mar. 21-31 ----	755	8.0	34.5	15	.12	39	9.4	22	123	72	3.8	.3	1.5	.1	224	.30	457	136	35	26
Apr. 1-10 -----	588	7.8	28.9	16	.03	31	7.0	22	105	59	3.1	.3	.6	.1	191	.26	303	106	20	31
Apr. 11, 13-20 -	574	7.7	29.1	18	.04	31	6.8	25	111	58	4.2	.3	.9	.2	199	.27	308	106	14	34
Apr. 21-30 ----	1,035	7.7	22.5	18	.13	24	4.9	19	94	38	2.9	.2	.4	.2	154	.21	430	80	3	34
May 1-7, 9 ----	2,742	7.8	23.5	21	.13	30	5.3	15	116	30	2.0	.3	.7	.0	162	.22	1,200	97	2	26
May 11-18, 20 --	3,466	7.6	19.3	12	.11	24	4.9	12	91	27	1.5	.3	.7	.0	127	.17	1,190	80	6	25
May 21-31 -----	2,919	7.5	14.9	13	.04	19	3.7	7.4	69	18	1.8	.2	.6	.0	98	.13	772	62	6	20

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLANCO, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
June 1-6, 8, 1947-	3,270	7.4	13.5	13	0.04	16	3.3	7.8	62	16	1.5	0.2	0.5	0.0	89	0.12	786	54	0.2	24
June 12-13, 15-20	2,101	7.4	15.1	16	.03	17	3.5	11	68	20	1.8	.2	.7	.0	104	.14	590	57	2	29
June 21-23, 25-28, 30	1,535	7.3	17.9	18	.03	20	4.3	10	72	26	2.2	.2	.4	.0	117	.16	485	68	8	25
July 1-2, 4-10 --	949	8.2	24.2	17	.01	25	4.4	22	105	35	3.2	.3	.5	.1	159	.22	407	80	0	37
July 11-16, 18, 20	537	8.2	28.7	16	.00	30	5.5	48	177	49	3.2	.3	.6	.1	240	.33	348	98	0	52
July 21-31 -----	334	7.4	33.4	17	.02	34	6.7	35	141	62	4.5	.3	.4	.2	229	.31	207	112	0	40
Aug. 1-5, 7-10 -	559	7.7	35.2	15	.09	38	6.3	32	143	63	4.5	.4	.8	.1	230	.31	347	121	4	36
Aug. 11-15, 17-22	1,638	7.7	37.2	14	.43	42	7.2	31	162	60	4.0	.4	1.0	.1	240	.33	1,060	134	2	34
Aug. 16 --------	991	--	142	--	--	220	32	88	472	446	15	--	--	--	1,030	1.40	2,760	680	294	22
Aug. 24-25, 27-31	1/1,794	7.6	22.5	15	.04	26	5.2	17	98	35	2.8	.3	.6	.1	150	.20	727	86	6	29
Sept. 1-6 ------	713	7.6	24.8	16	.04	28	4.6	23	109	42	3.2	.3	.6	.1	171	.23	329	89	0	36
Sept. 7-10 ----	594	7.7	37.6	16	--	37	6.2	39	141	78	4.2	--	.8	.1	251	.34	403	118	2	42
Sept. 11-20 ----	968	7.7	28.3	15	.05	30	5.8	24	119	49	1.2	.3	.6	.1	185	.25	484	99	2	35
Sept. 22-30 ----	1,019	7.6	20.7	13	.04	23	4.1	18	88	34	3.0	.3	.7	.1	139	.19	382	74	2	34
Weighted average	922	--	25.3	15	0.08	29	5.7	19	104	45	3.0	0.3	0.7	0.1	169	0.23	421	96	11	30

1/ Discharge for Aug. 23 included with discharge reported for Aug. 24-25, 27-31.

SAN JUAN RIVER NEAR BLUFF, UTAH

LOCATION.--At bridge on State Highway 47, 2,000 feet downstream from gaging station and 20 miles southwest of Bluff, San Juan County.
DRAINAGE AREA.--23,000 square miles above gaging station.
RECORDS AVAILABLE.--Chemical analyses: February to June 1927, October 1929 to September 1947.
Water temperatures: May 1944 to September 1947.
Sediment records: August to September 1928, July 1929 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 1,190 parts per million Aug. 23; minimum, 196 parts per million June 1-10.
Total hardness: Maximum, 626 parts per million Aug. 23; minimum, 122 parts per million June 1-10.
Water temperatures: Maximum, 82° F. July 2; minimum, freezing point on many days in December, January, and February.
Sediment loads: Maximum, 4,790,000 tons per day Aug. 23; minimum, 122 tons per day Jan. 6.
EXTREMES, 1929-47.--Dissolved solids: Maximum, 1,860 parts per million July 21-31, 1934; minimum 167 parts per million June 11-20, 1944.
Total hardness: Maximum, 874 parts per million July 21-31, 1934; minimum, 109 parts per million July 1-10, 1935.
Water temperatures: Maximum, 85° F. July 21, 1945; minimum, freezing point on many days in winter months.
Sediment loads: Maximum, 11,450,000 tons per day, Sept. 23, 1929; minimum, less than 50 tons per day on several days.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1089. Records of specific conductance of daily samples are available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1946 --	1,004	56	7.6	104	13	0.22	110	33	79	189	371	25	0.4	5.3	0.6	730	0.99	1,980	410	255	30
Oct. 11-20 ------	1,025	--	7.7	91.4	15	.17	101	27	80	197	326	23	.5	1.8	.4	671	.91	1,860	363	202	32
Oct. 21-31 ------	675	53	7.7	111	11	.02	116	35	100	199	418	27	.4	4.9	.4	810	1.10	1,480	424	260	34
Nov. 1-10 -------	1,302	44	7.7	93.4	14	.04	102	27	75	201	316	21	.4	4.1	.4	659	.90	2,320	366	201	31
Nov. 11-12, 14-20	906	42	7.8	112	13	.03	118	35	95	210	411	29	.5	3.8	.4	809	1.10	1,980	438	266	32
Nov. 21-30 -----	828	42	7.7	113	13	.04	116	35	97	208	414	26	.4	5.4	.3	809	1.10	1,810	434	263	33
Dec. 1-7, 9-10 --	844	40	7.7	104	13	.03	105	34	88	182	389	24	.4	5.0	.4	748	1.02	1,700	402	253	32
Dec. 11-20 ------	678	36	7.5	104	13	.03	102	32	91	183	379	24	.4	4.2	.4	736	1.00	1,350	386	236	34
Dec. 21-31 ------	707	35	7.5	108	12	.03	111	35	96	182	421	27	.4	5.2	.4	797	1.08	1,520	421	272	33
Jan. 1-2, 5-10, 1947	404	32	7.5	128	--	.02	132	40	117	231	479	34	.4	15	.2	931	1.27	1,020	494	304	34
Jan. 11-19 ------	438	32	7.5	119	7.5	.02	128	38	89	197	434	31	.4	13	.2	838	1.14	991	476	314	29
Jan. 21-31 ------	644	32	7.5	114	11	.02	120	35	92	206	413	28	.3	4.8	.4	806	1.10	1,400	444	274	31
Feb. 1-10 -------	776	35	7.7	109	11	.02	114	34	90	198	401	25	.3	5.2	.4	778	1.06	1,630	424	262	32
Feb. 11-20 ------	904	41	7.7	111	12	.02	112	34	96	189	419	23	.3	5.6	.4	795	1.08	1,940	420	264	33
Feb. 21-28 ------	749	44	7.8	106	11	.03	110	31	90	178	396	24	.3	5.8	.4	756	1.03	1,530	402	256	33
Mar. 1-10 -------	702	43	--	107	10	.03	113	35	81	176	401	26	.4	4.6	.2	758	1.03	1,440	426	282	29
Mar. 11-20 ------	684	49	--	104	11	.01	99	35	90	172	391	24	.4	3.5	.2	739	1.01	1,360	391	250	33
Mar. 21-31 ------	1,095	51	--	82.5	11	.01	82	25	63	151	281	18	.4	2.5	.1	557	.76	1,650	308	184	31

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLUFF, UTAH--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Apr. 1-5, 7-10,1947	1,033	51	--	69.8	14	0.02	74	21	50	152	222	15	0.3	2.5	0.2	474	0.64	1,320	271	146	29
Apr. 11-20 ------	754	53	--	83.0	13	.01	84	24	67	162	282	18	.2	3.2	.2	571	.78	1,160	308	176	32
Apr. 21-30 ------	1,642	57	--	60.6	14	.01	64	15	49	148	178	12	.3	2.6	.2	408	.55	1,810	221	100	32
May 1-5 ---------	2,160	69	--	61.5	14	.01	63	15	50	138	186	13	.3	1.9	.2	411	.56	2,400	218	106	33
May 6-10 --------	6,204	63	--	36.5	11	.03	44	6.8	25	116	82	6.5	.4	2.1	.2	235	.32	3,940	138	43	28
May 11-20 -------	6,712	63	8.2	50.0	14	.02	58	10	35	148	124	6.5	.3	2.2	.2	323	.44	5,850	186	64	29
May 21-31 -------	5,173	64	7.9	37.6	12	.01	47	8.2	20	122	81	5.0	.4	1.2	.1	235	.32	3,280	151	51	22
June 1-10 -------	5,579	65	8.0	31.4	12	.03	38	6.6	17	98	68	5.0	.4	.9	.1	196	.27	2,950	122	42	24
June 11-20 ------	4,895	67	8.0	34.1	12	.04	41	7.4	20	100	80	5.8	.4	1.2	.2	217	.30	2,870	133	51	24
June 21-30 ------	3,439	66	7.9	41.1	12	.04	46	9.8	25	104	107	8.0	.3	1.2	.4	261	.35	2,420	156	70	26
July 1-8 ---------	2,921	73	7.5	38.6	12	.03	41	8.5	27	95	101	7.5	.5	.6	.1	245	.33	1,930	138	60	30
July 11-14, 16, 19-20 ---------	1,711	75	7.5	48.9	12	.02	53	11	33	109	138	10	.5	1.4	.1	313	.43	1,450	177	88	29
July 21, 23-31 ---	814	78	7.6	65.8	9.7	.02	68	14	56	134	204	17	.6	.9	.2	436	.59	958	227	117	35
Aug. 1-10 -------	867	78	7.6	93.4	12	.02	92	22	90	170	326	24	.5	1.5	.2	652	.89	1,530	320	180	38
Aug. 11-20 ------	4,468	72	7.2	121	20	.23	124	27	126	260	442	14	.5	.3	.4	882	1.20	10,600	420	208	39
Aug. 21-22, 24-31	7,082	70	7.5	76.3	16	.08	77	15	71	200	219	10	.6	.8	.3	508	.69	9,710	254	90	38
Aug. 23 ---------	23,800	69	--	159	19	--	200	31	137	262	661	16	--	.3	--	1,190	1.62	76,500	626	412	32
Sept. 3-10 -------	2,215	73	7.8	80.8	15	.03	85	18	72	170	265	16	.5	4.0	.1	559	.76	3,340	286	146	35
Sept. 11-12, 14-17, 19-20 ---------	1,793	65	7.7	82.3	14	.02	92	19	66	158	285	16	.4	2.2	.2	572	.78	2,770	308	178	32
Sept. 21 ---------	3,920	63	--	117	15	--	154	29	88	172	505	20	--	.4	--	896	1.22	9,480	503	362	28
Sept. 23-30 ------	2,077	67	7.9	58.0	14	.02	63	14	42	122	180	11	.4	1.9	.2	386	.52	2,160	214	114	30
Weighted average-	2,056	--	--	69.8	14	0.05	76	17	57	157	225	12	0.4	2.1	0.2	481	0.65	2,670	260	131	32

Temperature (° F.) of water, water year October 1946 to September 1947

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

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLUFF, UTAH--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day
1	719	0.17	3,300	2,330	0.92	57,900	790	0.15	3,200
2	943	1.64	41,800	1,720	.73	33,900	810	.15	3,280
3	817	1.32	29,100	1,390	.58	21,800	859	.13	3,020
4	686	.58	10,700	1,120	.37	11,200	880	.11	2,610
5	732	.33	6,520	999	.35	9,440	894	.13	3,140
6	908	.38	9,320	936	.29	7,330	845	.10	2,280
7	964	.40	10,400	908	.26	6,370	852	.11	2,530
8	1,190	.33	10,600	1,330	.36	12,900	852	.14	3,220
9	1,700	.49	22,500	1,250	.60	20,200	817	.13	2,870
10	1,380	.92	34,300	1,040	.28	7,860	838	.10	2,260
11	1,270	.88	30,200	971	.25	6,550	784	.10	2,120
12	1,240	.74	24,800	1,010	.19	5,180	738	.11	2,190
13	1,150	.37	11,500	887	.16	3,830	686	.27	5,000
14	1,110	.33	9,890	831	.19	4,260	644	.11	1,910
15	1,010	.21	5,730	790	.19	4,050	656	.06	1,060
16	1,040	.16	4,490	873	.18	4,240	686	.12	2,220
17	999	.14	3,780	964	.22	5,730	674	.08	1,460
18	831	.11	2,470	964	.28	7,290	632	.09	1,540
19	831	.13	2,920	943	.35	8,910	620	.11	1,840
20	771	.11	2,290	824	.34	7,560	662	.16	2,860
21	738	.16	3,190	732	.27	5,340	614	.14	2,320
22	712	.16	3,080	732	.21	4,150	592	.09	1,440
23	650	.13	2,280	738	.23	4,580	586	.13	2,060
24	674	.16	2,910	859	.24	5,570	609	.11	1,810
25	609	.16	2,630	887	.43	10,300	592	.11	1,760
26	609	.14	2,300	894	.26	6,280	680	.25	4,590
27	632	.12	2,050	929	.27	6,770	771	.14	2,910
28	650	.15	2,630	915	.27	6,670	771	.18	3,750
29	632	.16	2,730	845	.20	4,560	915	.20	4,940
30	700	.15	2,840	745	.21	4,220	838	.32	7,240
31	824	.24	5,340	--	--	--	810	.13	2,840
Total load (tons)	--	--	308,590	--	--	304,940	--	--	88,260
	January			February			March		
1	644	0.08	1,390	620	0.46	7,700	732	0.17	3,360
2	515	.07	973	609	.37	6,080	824	.19	4,230
3	434	.06	703	603	.20	3,260	797	.21	4,520
4	338	.05	456	693	.26	4,860	700	.20	3,780
5	187	.04	202	700	.26	4,910	650	.19	3,330
6	226	.02	122	838	.36	8,140	626	.18	3,040
7	373	.07	705	901	.27	6,570	674	.15	2,730
8	351	.04	379	908	.36	8,830	712	.16	3,080
9	404	.08	873	943	.21	5,350	644	.24	4,170
10	564	.06	914	943	.40	10,200	656	.17	3,010
11	581	.08	1,250	971	.33	8,650	668	.16	2,890
12	500	.07	945	1,060	.34	9,730	680	.07	1,290
13	626	.14	2,370	887	.42	10,100	644	.12	2,090
14	581	.15	2,350	817	.44	9,710	644	.17	2,960
15	494	.09	1,200	810	.27	5,900	726	.21	4,120
16	484	.10	1,310	824	.26	5,780	693	.20	3,740
17	429	.05	579	810	.32	7,000	693	.21	3,930
18	325	.20	1,760	964	.47	12,200	700	.24	4,540
19	205	.04	221	1,010	.50	13,600	712	.26	5,000
20	154	1/ .03	125	887	.82	19,600	680	.23	4,220
21	313	.13	1,100	894	.70	16,900	845	.31	7,070
22	458	.10	1,240	817	.52	11,500	985	.43	11,400
23	662	.18	3,220	745	.43	8,650	1,100	.49	14,600
24	632	.05	853	738	.36	7,170	1,190	.67	21,500
25	662	.11	1,970	726	.24	4,700	1,420	.60	23,000
26	603	.13	2,120	686	.18	3,330	1,230	.40	13,300
27	693	.11	2,060	686	.21	3,890	1,140	.47	14,500
28	771	.15	3,120	700	.19	3,590	957	.30	7,750
29	887	.35	8,380	--	--	--	950	.21	5,390
30	745	.10	2,010	--	--	--	1,060	.14	4,010
31	662	.11	1,970	--	--	--	1,170	1/ .22	6,950
Total load (tons)	--	--	46,870	--	--	227,900	--	--	199,500

1/ Interpolated.

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLUFF, UTAH--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day
1	1,190	0.31	9,960	1,190	0.26	8,350	4,750	0.40	51,300
2	1,050	.25	7,090	1,120	.16	4,840	5,320	.34	48,800
3	1,030	.18	5,010	1,080	.16	4,670	4,880	.30	39,500
4	1,070	.21	6,070	2,580	.94	65,500	5,660	.33	50,400
5	1,070	.16	4,620	4,830	1.40	183,000	5,880	.36	57,200
6	1,140	.16	4,920	5,820	1.32	207,000	5,170	.28	39,100
7	1,080	.19	5,540	6,220	.93	156,000	5,170	.26	39,100
8	1,030	.19	5,280	6,710	.84	152,000	5,150	.30	41,700
9	880	.12	2,850	6,010	.55	89,200	6,370	.37	63,600
10	790	.12	2,560	6,260	.56	94,700	7,440	.52	104,000
11	859	.44	10,200	6,730	.75	136,000	7,460	.47	94,700
12	810	.14	3,060	10,800	1.36	397,000	7,060	.38	72,400
13	778	.09	1,890	9,690	1.46	382,000	5,920	.28	44,800
14	764	.12	2,480	6,980	.89	168,000	4,590	.28	34,700
15	693	.33	6,170	6,190	.66	110,000	3,690	.29	28,900
16	650	.09	1,580	6,190	.43	71,900	3,450	.19	17,700
17	548	.25	3,700	5,870	.56	88,800	3,810	.20	20,600
18	537	.05	725	5,290	.38	54,300	4,530	.25	30,600
19	810	.21	4,590	4,850	.46	60,200	4,420	.29	34,600
20	1,090	.19	5,590	4,530	.33	40,400	4,020	.25	27,100
21	1,450	.46	18,000	4,450	.43	51,700	3,660	.22	21,700
22	1,250	.40	13,500	4,720	.36	45,900	4,000	.46	49,700
23	1,720	.36	16,700	5,010	.38	51,400	4,290	.27	31,300
24	2,040	.52	28,600	5,340	.40	57,700	3,810	.23	23,700
25	1,980	.47	25,100	5,580	.43	64,800	3,160	.34	20,500
26	2,000	.43	23,200	4,780	.32	41,300	2,850	.18	13,900
27	1,790	.38	18,400	4,860	.34	44,600	2,800	.20	15,100
28	1,550	.28	11,700	5,530	.35	52,309	3,200	.21	18,100
29	1,390	.25	9,380	6,040	.46	75,000	3,310	.50	44,700
30	1,250	.20	6,750	5,850	.40	63,200	3,310	.30	26,800
31	--	--	--	4,740	.32	41,000	--	--	--
Total load (tons)	--	--	265,215	--	--	3,062,760	--	--	1,206,300

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day	Mean discharge (second-feet)	Suspended sediment: Mean concentration (percent)	Suspended sediment: Tons per day
1	3,360	0.35	31,800	448	0.04	484	2,950	4.84	386,000
2	3,200	.20	17,300	404	.05	545	2,460	1.55	103,000
3	3,020	.20	16,300	373	.05	504	2,290	1.15	71,100
4	2,890	.22	17,200	317	.03	257	2,020	1.05	57,300
5	2,570	.20	13,900	1,400	2.36	89,200	1,960	.88	46,600
6	2,760	.18	13,400	967	2.20	57,400	1,770	.78	37,300
7	2,620	.16	11,300	784	1.97	41,700	1,490	.50	20,100
8	2,900	.38	29,800	1,460	1.51	59,500	1,520	.39	16,000
9	3,110	.38	31,900	1,230	.68	22,600	1,880	1.21	61,400
10	2,780	.26	19,500	1,290	1.08	37,600	3,810	7.06	726,000
11	2,390	.22	14,200	1,910	3.61	186,000	2,130	2.41	139,000
12	2,270	.17	10,400	1,500	2.45	99,200	1,550	2.38	99,600
13	1,980	.14	7,480	1,020	3.02	83,200	1,690	1.31	59,800
14	1,830	.12	5,930	1,070	3.14	90,700	1,690	.69	31,500
15	1,610	.06	3,480	978	2.25	59,400	1,560	.48	20,200
16	1,530	.08	3,300	1,210	2.91	95,100	1,330	.39	14,000
17	1,520	.09	3,690	12,900	4.93	1,720,000	1,250	.32	10,800
18	1,510	.03	1,220	12,500	10.32	2,480,000	1,170	.31	9,790
19	1,290	.04	1,390	6,600	5.94	1,060,000	1,060	.30	8,590
20	1,180	.04	1,270	4,990	4.63	624,000	4,500	.27	32,800
21	1,140	.09	2,770	6,290	5.40	917,000	3,920	2.77	293,000
22	1,110	.08	2,400	19,200	6.04	3,130,000	3,470	.68	63,700
23	1,060	.24	6,870	23,800	7.46	4,790,000	2,760	1.51	113,000
24	929	.16	4,010	16,600	4.51	2,020,000	2,340	.51	32,200
25	859	.09	2,090	7,160	2.68	518,000	2,150	.42	24,400
26	852	.10	2,300	4,880	1.04	137,000	1,870	.32	16,200
27	726	.06	1,180	4,160	1.01	113,000	1,650	.25	11,100
28	644	.06	1,040	3,190	.83	71,500	1,560	.24	10,100
29	603	.06	977	2,770	1.08	80,800	1,480	.23	9,190
30	526	.06	852	2,730	1.17	86,200	1,410	.20	7,610
31	500	.05	675	3,840	2.39	248,000	--	--	--
Total load (tons)	--	--	279,924	--	--	19,918,890	--	--	2,531,380
Total load for year (tons)									28,440,000

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLUFF, UTAH--Continued

Size analyses of suspended sediment, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Suspended sediment														Remarks 1/
		Mean daily concentration (percent)	Tons per day	Weight of material in tube (grams)	Percent finer than indicated size (millimeters)											
					0.00195	0.00276	0.0039	0.0055	0.0078	0.0110	0.0156	0.0312	0.0625	0.125	0.250	0.500	
Oct. 2, 1946	943	1.64	41,800	0.2915	38	44	51	58	68	73	78	85	89	93	96	100	--
Nov. 2	1,720	.73	33,900	.7655	30	38	45	52	60	64	67	75	82	91	100	--	A
Nov. 6	936	.29	7,330	.3198	--	--	--	15	21	25	30	40	52	66	98	100	A
Nov. 10	1,040	.28	7,860	.1514	--	6	16	20	27	33	36	47	66	82	100	--	A
Nov. 13	887	.16	3,830	.2648	--	--	--	--	9	11	15	24	42	62	98	100	A
Nov. 17	964	.22	5,730	.2797	--	17	20	24	31	33	35	42	58	71	98	100	A
Nov. 24	859	.24	5,570	.1285	--	--	36	38	40	44	46	51	68	75	96	100	A
Nov. 27	929	.27	6,770	.1488	--	--	29	34	36	37	39	46	70	72	97	100	A
Nov. 30	745	.21	4,220	.1993	--	--	--	12	20	24	27	28	42	56	91	100	A
Dec. 8, 11	818	.12	2,650	.8988	--	--	--	--	--	--	--	--	35	50	95	100	A
Dec. 15, 18	644	.08	1,390	.8873	--	--	--	--	--	--	--	--	31	42	89	100	A
Dec. 22, 25, 29	700	.13	2,460	1.7192	--	--	--	--	--	--	--	--	34	45	85	99	A
Jan. 1, 5, 1947	416	.06	674	.5860	--	--	--	--	--	--	--	--	45	53	88	100	A
Jan. 8, 12	426	.06	690	.5651	--	--	--	--	--	--	--	--	33	41	78	99	A
Jan. 15, 19, 22	386	.08	834	.9588	--	--	--	--	--	--	--	--	26	36	76	98	A
Feb. 2, 5, 9	751	.28	5,680	2.4706	--	--	--	--	--	--	--	--	38	47	76	96	A
Feb. 12	1,060	.34	9,730	1.8605	--	13	16	18	20	23	24	27	31	38	52	87	A
Feb. 16	824	.26	5,780	.8333	30	33	39	44	46	47	48	--	53	67	90	97	A
Feb. 19	1,010	.50	13,600	1.1358	32	39	42	45	49	52	54	59	66	74	94	98	A
Feb. 26	686	.18	3,330	.3529	22	32	37	42	46	49	52	56	63	73	97	100	A
Feb. 26	686	.18	3,330	.3733	13	17	24	38	44	47	49	--	53	67	93	98	A, B
Mar. 2, 9, 12, 16	710	.18	3,450	2.2891	--	--	--	--	--	--	--	--	42	51	71	99	A
Mar. 19, 23, 26, 30	1,030	.32	8,900	1.4656	22	29	35	38	42	45	48	53	60	74	97	100	A
Apr. 2, 6, 9, 13	962	.16	4,160	1.8090	--	--	--	--	--	--	--	--	42	53	79	99	A
Apr. 16, 20, 23, 27	1,310	.26	9,200	.8942	--	15	18	20	26	30	34	44	56	71	95	100	A

1/ Analyses by the bottom-withdrawal tube method, samples dispersed and settled in distilled water except as indicated.
A. Size greater than 0.0625 mm determined by sieve method. B. Settled in native water. C. Not dispersed.

May 4	2,580	.94	65,500	1.1040	5	6	8	11	18	22	24	47	68	87	95	100	A
May 4	2,580	.94	65,500	1.1556	2	4	7	8	13	17	22	42	65	85	95	99	A, B
May 7	6,220	.93	156,000	3.6426	--	--	--	--	--	--	--	--	57	72	86	99	A
May 11	6,730	.75	136,000	3.3860	--	--	--	--	--	--	--	--	52	65	79	94	A
May 14	6,980	.89	168,000	2.8596	--	--	--	--	--	--	--	--	66	76	89	97	A
May 18	5,290	.38	54,300	1.8680	--	--	--	--	--	--	--	--	35	53	75	96	A
May 22	4,720	.36	45,900	1.8907	--	--	--	--	--	--	--	--	23	40	67	96	A
May 25, 28	5,560	.39	58,500	.7774	--	--	8	9	11	13	16	22	31	46	74	96	A
June 1, 4, 8	5,180	.34	47,600	4.5969	--	--	--	--	--	--	--	--	15	33	56	94	A
June 11, 15, 18	5,230	.34	48,000	.6617	--	7	9	10	13	14	17	21	30	50	70	92	A
June 22, 26, July 2	3,350	.38	34,400	4.4323	--	--	--	--	--	--	--	--	11	23	59	96	A
July 9	3,110	.38	31,900	.7502	--	--	27	32	37	40	43	46	54	67	86	99	A
July 9	3,110	.38	31,900	.7078	--	--	6	14	21	26	30	38	42	59	80	98	A, B
July 13	1,980	.14	7,480	.8363	--	10	12	13	15	16	17	20	26	47	93	100	A
July 16, 20	1,360	.06	2,200	.6722	--	--	--	--	--	--	--	--	27	53	91	96	A
July 23, 27	893	.15	3,130	.8238	--	--	--	--	--	--	--	--	20	41	83	98	A
July 30	526	.06	852	.1633	--	--	--	--	--	--	--	--	13	37	77	99	A, C
Aug. 3	373	.05	504	.0477	--	--	--	--	--	--	--	--	16	56	83	96	A, C
Aug. 5	1,400	2.36	89,200	.7143	11	12	14	21	37	43	48	64	72	94	99	100	A
Aug. 10	1,290	1.08	37,600	.6893	46	46	50	68	81	86	89	92	97	99	--	--	A
Aug. 11	1,910	3.61	186,000	.6125	36	41	43	54	74	78	79	87	92	96	--	--	--
Aug. 14	1,070	3.14	90,700	.4335	50	53	58	78	85	88	89	92	98	100	--	--	--
Aug. 17	12,900	4.93	1,720,000	.8234	28	29	31	42	48	50	51	62	72	94	99	100	A
Aug. 18	12,500	10.32	3,480,000	.8685	30	31	32	42	52	55	57	64	72	93	100	--	A
Aug. 21	6,290	5.40	917,000	.9465	44	49	57	64	76	82	84	91	95	98	--	--	--

1/ Analyses by the bottom-withdrawal tube method, samples dispersed and settled in distilled water except as indicated.
A. Size greater than 0.0625 mm determined by sieve method. B. Settled in native water. C. Not dispersed.

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLUFF, UTAH--Continued

Size analyses of suspended sediment, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	Suspended sediment													1/ Remarks
		Mean daily concentration (percent)	Tons per day	Weight of material in tube (grams)	Percent finer than indicated size (in millimeters)										
					0.00195	0.00276	0.0039	0.0055	0.0078	0.0110	0.0156	0.0312	0.0625	0.125	0.250	0.500	
Aug. 21, 1947	6,290	5.40	917,000	1.0197	45	52	56	60	72	76	80	85	94	95	--	--	--
Aug. 21	6,290	5.40	917,000	1.1869	--	3	7	10	43	57	83	88	93	98	--	--	B
Aug. 21	6,290	5.40	917,000	1.2022	--	3	6	21	51	74	83	90	93	98	--	--	B
Aug. 21	6,290	5.40	917,000	4.3566	--	--	2	3	8	16	61	87	92	98	--	--	B
Aug. 24	16,600	4.51	2,020,000	.3550	41	46	48	62	72	75	76	83	91	97	--	--	--
Aug. 27	4,160	1.01	113,000	.4397	32	37	40	58	66	69	70	76	81	90	95	99	A
Aug. 31	3,840	2.39	248,000	1.2381	28	31	32	44	52	56	62	77	90	99	100	--	A
Sept. 3	2,290	1.15	71,100	1.0850	33	37	42	49	53	56	57	61	64	89	100	--	A
Sept. 7	1,490	.50	20,100	.7301	45	48	54	66	71	74	76	80	89	96	--	--	--
Sept. 10	3,810	7.06	726,000	1.6708	25	29	31	35	43	48	52	68	76	94	98	100	A
Sept. 17	1,250	.32	10,800	.6015	--	--	--	--	--	--	--	--	38	70	99	100	A
Sept. 19	1,060	.30	8,590	.3675	30	39	45	56	66	68	74	80	89	95	--	--	--
Sept. 21	3,920	2.77	293,000	.6735	35	41	43	57	66	70	76	83	90	94	--	--	--
Sept. 25	2,150	.42	24,400	.3392	14	16	17	31	40	43	45	52	61	85	98	100	A

1/ Analyses by the bottom-withdrawal tube method, samples dispersed and settled in distilled water except as indicated.
A. Size greater than 0.0625 mm determined by sieve method. B. Settled in native water. C. Not dispersed.

SAN JUAN RIVER BASIN--Continued

ANIMAS RIVER AT FARMINGTON, N. MEX.

LOCATION.--At gaging station at bridge on State Highway 17, 0.6 mile southeast of Farmington, San Juan County, and 1.1 miles upstream from mouth.
DRAINAGE AREA.--1,360 square miles.
RECORDS AVAILABLE.--Chemical analyses: June 1940 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 571 parts per million Jan. 11-20; minimum, 140 parts per million June 1-10.
Total hardness: Maximum, 391 parts per million Jan. 11-20; minimum, 100 parts per million June 1-10, July 1-10.
EXTREMES, 1940-47.--Dissolved solids: Maximum, 1,500 parts per million Aug. 19, 1944; minimum, 111 parts per million June 11-17, 19-20, 1944.
Total hardness: Maximum, 613 parts per million Aug. 19, 1944; minimum, 82 parts per million June 21-30, 1944.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1089.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 1-10, 1946 --	301	7.4	66.0	9.2	0.04	89	14	39	171	189	18	0.4	1.0	0.2	444	0.60	361	280	140	23
Oct. 11-20 ------	294	7.6	63.1	10	.03	86	14	38	158	190	18	.4	.7	.3	435	.59	345	272	142	23
Oct. 21-23, 25-31	311	7.5	68.3	9.0	.03	93	15	40	173	201	19	.4	1.4	.2	464	.63	390	294	152	23
Nov. 1-10 -------	339	7.6	63.2	6.9	.03	87	14	36	166	183	17	.4	1.2	.2	427	.58	391	274	138	22
Nov. 11-20 ------	294	7.7	68.8	--	.01	98	18	30	182	197	19	.5	2.3	.2	455	.62	361	318	170	17
Nov. 21-30 ------	286	7.8	70.4	6.2	.02	100	18	30	179	205	18	.5	2.7	.2	469	.64	362	324	177	17
Dec. 1-10 -------	285	7.8	70.2	7.2	.01	100	19	26	172	207	17	.5	2.2	.2	464	.63	357	328	186	15
Dec. 11-20 ------	273	7.7	71.2	6.0	.02	102	18	31	184	206	19	.5	2.6	.2	476	.65	351	328	178	17
Dec. 21-31 ------	277	7.7	75.2	6.8	.01	107	18	34	185	222	20	.5	3.1	.2	503	.68	376	341	190	18
Jan. 1-10, 1947 --	235	7.6	79.7	6.3	.02	114	18	40	211	226	23	.5	3.2	.2	535	.73	339	358	186	19
Jan. 11-20 ------	214	7.6	83.8	7.3	.02	122	21	38	217	246	25	.5	4.6	.2	571	.78	330	391	213	18
Jan. 21-30 ------	1/238	7.6	75.6	--	.01	109	19	32	190	219	22	.6	4.8	.2	500	.63	321	350	194	17
Jan. 31, Feb. 1-10	1/235	7.8	75.5	8.4	.01	106	18	38	181	230	22	.2	2.5	.3	514	.70	326	338	190	20
Feb. 11-20 ------	244	7.7	76.3	8.2	.01	107	17	40	185	232	21	.4	2.0	.3	519	.71	342	337	186	21
Feb. 21-28 ------	236	7.7	75.4	6.6	.01	106	17	41	184	230	22	.4	1.6	.3	515	.70	328	334	184	21
Mar. 1-10 ------	238	7.8	76.1	6.8	.01	108	19	30	173	229	22	.4	1.5	.3	502	.68	323	348	206	16
Mar. 11-20 -----	239	7.3	79.1	5.6	.01	107	20	41	183	247	20	.6	1.6	.2	533	.72	344	349	199	20
Mar. 21-31 -----	289	7.4	63.8	5.9	.01	89	15	31	165	185	15	.7	1.1	.1	424	.58	331	284	148	19

SAN JUAN RIVER BASIN--Continued

ANIMAS RIVER AT FARMINGTON, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
															Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Apr. 1-10, 1947--	291	7.4	58.0	7.2	0.01	82	13	27	159	159	13	0.5	1.1	0.2	381	0.52	299	258	128	19
Apr. 11-20 -----	289	7.4	58.1	6.5	.01	80	13	32	156	162	17	.4	1.1	.2	389	.53	304	253	125	22
Apr. 21-30, May 1-2 ----------	572	7.6	45.8	7.5	.02	63	9.3	19	134	112	7.8	.2	1.7	.2	287	.39	443	195	85	19
May 3-10 -------	3,055	7.7	26.8	7.7	.08	39	5.5	7.6	92	52	3.1	.3	1.6	.1	162	.22	1,340	120	44	12
May 11-20 ------	2,446	7.1	33.0	6.6	.02	46	6.5	13	111	66	5.8	.4	1.0	.0	202	.27	1,330	142	50	17
May 21-31 ------	2,512	7.2	24.5	6.1	.03	36	5.5	7.6	89	47	3.8	.3	.9	.0	151	.21	1,020	112	40	13
June 1-10 -------	2,915	7.2	22.3	7.6	.04	32	4.9	8.0	79	44	3.5	.4	1.0	.0	140	.19	1,100	100	36	15
June 11-20 ------	2,316	7.2	24.6	6.5	.03	35	4.8	8.7	75	54	4.8	.4	.8	.0	152	.21	950	107	46	15
June 21-30 ------	2,142	7.1	24.7	6.1	.04	34	4.7	10	72	56	5.2	.4	1.0	.0	153	.21	885	104	46	18
July 1-10 --------	2,019	8.0	28.1	5.1	.09	33	4.4	12	69	58	5.2	.3	.4	.1	152	.21	829	100	44	20
July 11-20 ------	1,178	8.0	31.6	6.0	.02	42	5.6	15	83	79	5.8	.3	.4	.1	196	.27	623	128	60	20
July 21-31 ------	522	8.0	46.1	6.9	.01	61	8.6	23	113	122	12	.4	.3	.1	290	.39	409	188	95	21
Aug. 1-10 ------	407	8.1	53.7	7.8	.01	69	10	33	134	148	14	.4	.3	.2	349	.47	384	213	103	25
Aug. 11-20 -----	661	7.5	60.6	11	.32	81	11	35	164	162	14	.4	.9	.3	396	.60	707	247	112	24
Aug. 21-31 -----	2,129	7.6	38.4	8.8	.08	53	6.9	22	132	84	7.5	.4	.8	.2	248	.34	1,430	160	52	23
Sept. 1-10 ------	860	7.6	44.3	10	.02	62	8.7	21	134	106	10	.3	.8	.2	285	.39	662	190	80	19
Sept. 11-20 -----	723	7.6	43.1	8.0	.01	58	8.7	19	122	103	9.0	.2	1.0	.2	267	.36	521	180	80	18
Sept. 21-30 -----	694	7.6	42.3	7.5	.01	58	8.3	19	117	106	8.2	.3	.9	.3	266	.36	498	178	82	19
Weighted average -	840	--	38.3	7.1	0.04	53	8.0	18	112	94	8.3	0.4	1.1	0.1	245	0.33	556	165	73	19

1/ Discharge for Jan. 31 included in discharge for Jan. 21-30.

MISCELLANEOUS ANALYSES OF STREAMS IN SAN JUAN RIVER BASIN

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	Specific conductance (K×10 at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids		Hardness as $CaCO_3$		Percent sodium
											Parts per million	Tons per acre-foot	Total	Non-carbonate	
SAN JUAN RIVER AT MOUTH NEAR HITE, UTAH															
Sept. 25, 1947	2,450	56.1	13	65	12	44	122	183	11	1.7	390	0.53	212	112	31
LA PLATA RIVER NEAR FARMINGTON, N. MEX.															
Oct. 18, 1946	--	121	--	123	24	122	218	426	34	0.4	837	1.14	406	227	40

TRIBUTARIES BETWEEN SAN JUAN AND GILA RIVERS IN ARIZONA

MISCELLANEOUS ANALYSES OF TRIBUTARIES BETWEEN SAN JUAN AND GILA RIVERS

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Discharge (second-feet)	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids		Hardness as $CaCO_3$		Percent sodium
											Parts per million	Tons per acre-foot	Total	Non-carbonate	
NAVAJO CREEK AT MOUTH NEAR LEES FERRY															
June 29, 1947	4.0	30.0	--	32	15	7.6	166	13	5	1.8	156	0.21	142	6	10
WAHWEAP CREEK AT MOUTH NEAR LEES FERRY															
Sept. 26, 1947	6.6	126	16	92	47	126	329	49	119	0.4	812	1.10	423	154	39
PARIA RIVER AT MOUTH AT LEES FERRY															
June 30, 1947	--	78.6	--	51	32	71	94	300	17	0.1	517	0.70	258	182	37
BRIGHT ANGEL CREEK NEAR GRAND CANYON															
Oct. 15, 1946	--	36.2	--	--	--	--	223	--	--	--	--	--	--	--	--
Nov. 15	--	35.2	--	--	--	--	219	--	--	--	--	--	--	--	--
Dec. 16	--	36.1	--	--	--	--	222	--	--	--	--	--	--	--	--
Jan. 15, 1947	--	37.6	--	--	--	--	228	--	--	--	--	--	--	--	--
Feb. 15	--	35.6	--	--	--	--	222	--	--	--	--	--	--	--	--
Mar. 15	--	36.5	--	--	--	--	226	--	--	--	--	--	--	--	--
Apr. 15	--	29.4	--	--	--	--	189	--	--	--	--	--	--	--	--
May 16	--	30.3	--	--	--	--	192	--	--	--	--	--	--	--	--
June 14	--	31.3	--	--	--	--	200	--	--	--	--	--	--	--	--
July 20	--	33.3	--	--	--	--	212	--	--	--	--	--	--	--	--
July 29	--	31.2	--	--	--	--	199	--	--	--	--	--	--	--	--
Aug. 18	--	31.9	--	--	--	--	199	--	--	--	--	--	--	--	--
Sept. 16	--	38.0	--	--	--	--	214	--	--	--	--	--	--	--	--
BILL WILLIAMS RIVER NEAR PLANET															
Oct. 15, 1946	--	80.4	--	--	--	--	244	57	--	--	--	--	--	--	--

GILA RIVER NEAR SOLOMONSVILLE, ARIZ.

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LOCATION.--Half a mile downstream from gaging station, approximately 8 miles northeast of Solomonsville, and 13 miles downstream from San Francisco River.
DRAINAGE AREA.--Approximately 7,950 square miles.
RECORDS AVAILABLE.--Chemical analyses: June 1943 to September 1947.
EXTREMES, 1946-47.--Dissolved solids: Maximum, 1,060 parts per million Aug. 1-8; minimum, 298 parts per million Aug. 21-24, 26-31.
Total hardness: Maximum, 300 parts per million Aug. 1-8; minimum, 170 parts per million Nov. 3-10.
EXTREMES, 1943-47.--Dissolved solids: Maximum, 1,090 parts per million July 1-5, 7-10, 1946; minimum, 217 parts per million Sept. 25, 27-30, 1944.
Total hardness: Maximum, 300 parts per million Aug. 1-8, 1947; minimum, 118 parts per million Sept. 25, 27-30, 1944.
REMARKS.--Records of water discharge for water year October 1946 to September 1947 are given in Water-Supply Paper 1089.

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-3, 5-7, 9-10, 1946 -	136	7.5	98.7	44	0.04	64	15	113	209	37	178	1.6	1.0	0.4	557	0.76	205	221	50	53
Oct. 11-20 ----------	97.2	7.7	105	49	.03	68	17	131	214	40	215	1.6	.6	.4	628	.85	165	240	64	54
Oct. 21-25 ----------	1/ 94.9	7.7	110	45	.04	68	16	139	214	41	224	1.4	.3	.4	640	.87	164	236	60	56
Nov. 3-10 ----------	2/275	7.6	67.7	38	.02	50	11	76	177	32	108	1.4	1.1	.3	405	.55	301	170	25	49
Nov. 11-20 ----------	197	7.6	80.0	42	.02	56	12	97	207	37	133	1.6	.5	.3	481	.65	256	189	20	53
Nov. 21-30 ----------	191	7.8	84.0	48	.02	61	14	97	214	42	140	1.6	.4	.4	509	.69	262	210	34	50
Dec. 1-8 ----------	184	7.9	85.9	49	.02	62	14	104	221	44	146	1.6	.4	.4	530	.72	263	212	31	52
Dec. 12-20 ----------	162	7.8	89.4	44	.02	63	14	105	215	41	156	1.6	.4	.4	531	.72	232	214	38	52
Dec. 21-24, 27-28, 30-31 --	178	7.8	89.6	51	.02	65	14	107	221	45	156	1.6	.4	.4	549	.75	264	220	38	51
Jan. 1, 4-5, 7-10, 1947 ----	194	7.9	83.2	46	.02	60	13	99	211	44	138	1.8	.4	.4	506	.69	265	203	30	51
Jan. 11-18, 20 ----------	199	7.9	84.5	49	.02	60	13	100	213	42	140	1.6	.4	.4	511	.69	275	203	28	52
Jan. 21-31 ----------	190	7.9	87.0	47	.02	62	14	104	219	44	148	1.8	.4	.4	529	.72	271	212	32	52
Feb. 1-10 ----------	168	7.9	94.9	51	.01	62	15	117	221	47	167	1.6	.0	.2	570	.78	259	216	35	54
Feb. 11, 13-18, 20 -------	136	7.9	106	48	.01	66	15	137	225	49	201	1.6	.0	.2	628	.85	231	226	42	57
Feb. 21-28 ----------	110	7.9	118	46	.01	70	17	155	223	58	238	1.6	.0	.2	696	.95	207	244	62	58
Mar. 1, 3-7, 9-10---------	133	7.9	105	45	.01	66	16	134	219	49	203	1.6	.0	.2	623	.85	224	230	51	56
Mar. 11-20----------	118	7.8	116	44	.02	68	15	153	234	48	226	1.4	1.0	.3	672	.91	214	231	40	59
Mar. 21-26, 28-31 --------	102	7.9	123	39	.01	70	15	167	231	48	252	1.4	1.5	.4	708	.96	195	236	46	61

GILA RIVER BASIN--Continued

GILA RIVER NEAR SOLOMONSVILLE, ARIZ.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25 ° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Borate (BO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Apr. 1-10, 1947	99.6	7.8	120	34	0.01	66	16	161	224	48	242	1.6	1.0	0.4	680	0.92	183	230	47	60
Apr. 11-20	101	7.9	124	45	.02	67	16	168	223	50	254	1.6	1.5	.4	713	.97	194	233	50	61
Apr. 22-23, 25-30	84.9	7.6	130	48	.02	74	20	166	212	50	281	1.6	.9	.5	746	1.01	171	266	93	57
May 1-3, 5-10	67.2	7.6	142	43	.02	77	19	188	189	58	326	1.6	.6	.5	806	1.10	146	270	115	60
May 11-15, 17, 18, 20	66.4	7.7	139	44	.02	70	18	190	186	49	322	1.6	.5	.4	787	1.07	141	248	96	62
May 21-26, 28-31	49.8	7.7	150	43	.03	73	19	207	175	50	362	1.6	.5	.4	842	1.15	113	260	116	63
June 1-10	42.6	7.3	181	48	.01	76	19	256	158	53	450	1.6	2.5	.4	984	1.34	113	268	138	68
June 11-20	43.1	7.4	116	48	.01	78	19	260	156	50	462	1.6	2.4	.5	998	1.36	116	272	144	67
June 21-30	49.1	7.4	166	53	.01	76	17	240	182	46	410	1.6	2.5	.5	936	1.27	124	260	110	67
July 1-10	38.7	7.5	175	45	.01	80	18	251	166	57	438	1.6	2.3	.4	975	1.33	102	274	138	67
July 11-18, 20	37.5	7.6	179	52	.01	78	18	264	168	53	456	1.6	2.3	.3	1,010	1.37	102	268	131	68
July 21, 22, 25, 26, 28-31	3/55.9	7.5	155	63	.03	81	18	213	220	51	356	1.4	1.5	.2	893	1.21	135	276	96	63
July 24	(3/)	--	79.9	--	--	--	--	--	190	--	136	--	--	--	--	--	--	--	--	--
Aug. 1-8	38.5	7.6	187	64	.02	89	19	267	203	56	462	1.6	1.5	.4	1,060	1.44	110	300	134	66
Aug. 9-11, 14, 16-18, 20	217	7.7	89.3	39	.16	61	16	98	233	24	150	1.0	.6	.2	505	.69	296	218	27	49
Aug. 21-24, 26-31	990	7.7	54.4	36	.19	54	13	31	233	20	28	.9	.5	.1	298	.41	797	188	0	26
Sept. 1-3	316	7.7	67.9	35	.03	62	11	63	187	35	102	1.1	1.3	.0	403	.55	344	200	46	41
Sept. 13-15	4/316	7.5	74.0	37	.05	63	14	75	220	29	116	1.2	2.0	.0	446	.61	381	214	34	43
Sept. 16, 18-20	5/76.0	7.5	144	48	.02	90	18	189	242	44	327	1.2	1.5	.2	838	1.14	172	298	100	58
Sept. 21-28, 30	89.5	7.6	127	42	.03	80	16	160	218	43	273	1.2	1.4	.3	724	.98	175	266	87	57
Weighted average	157	--	90.6	43	0.06	62	14	105	214	38	158	1.4	0.8	0.3	528	0.72	224	212	36	52

1/ Includes discharge for Oct. 26-28.
2/ Includes discharge for Oct. 29-Nov. 2.
3/ Discharge for July 24 included with discharge reported for July 21-22, 25-26, 28-31.
4/ Includes discharge for Sept. 11-12, 18-20. Discharge for Sept. 15 included with discharge reported for Sept. 16, 18-20.
5/ Includes discharge for Sept. 15-17. Discharge for Sept. 18-20 included with discharge reported for Sept. 13-15.

MISCELLANEOUS ANALYSES OF STREAMS IN BEAR RIVER BASIN IN IDAHO AND UTAH

Chemical analyses, in parts per million, August 1947

Date of collection	Mean discharge (second-feet)	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
BEAR RIVER AT CLEVELAND, IDAHO																
Aug. 16, 1947 ------	--	84.5	17	50	62	46	410	72	48	3.0	500	0.68	--	380	44	21
BEAR RIVER NEAR SODA SPRINGS, IDAHO																
Aug. 16, 1947 ------	--	80.3	14	42	65	41	382	75	49	2.5	477	0.65	--	372	60	19
BEAR RIVER NEAR PRESTON, IDAHO																
Aug. 16, 1947 ------	744	88.1	17	54	59	61	426	74	58	2.2	535	0.73	1,070	377	28	26
BEAR RIVER NEAR COLLINSTON, UTAH																
Aug. 16, 1947 ------	792	84.8	21	59	49	58	380	63	68	3.0	508	0.69	1,090	348	37	27
BLOOMINGTON CREEK AT BLOOMINGTON, IDAHO																
Aug. 16, 1947 ------	--	34.7	6.4	46	18	6.4	232	3.7	5	2.4	202	0.27	--	189	0	7
SWAN CREEK NEAR GARDEN CITY, UTAH																
Aug. 16, 1947 ------	--	34.1	6.4	48	16	5.8	222	8.6	4	2.7	201	0.27	--	186	4	6
OUTLET CANAL FROM BEAR LAKE NEAR PARIS, IDAHO																
Aug. 16, 1947 ------	--	81.7	13	39	66	45	378	80	51	2.4	483	0.66	--	369	60	21
ST. CHARLES CREEK AT ST. CHARLES, IDAHO																
Aug. 16, 1947 ------	--	38.3	6.0	45	22	8.3	258	3.3	3	2.4	217	0.30	--	203	0	8
SODA CREEK NEAR SODA SPRINGS, IDAHO																
Aug. 16, 1947 ------	--	108	46	103	85	22	716	47	12	2.9	670	0.91	--	606	20	7

BEAR RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN BEAR RIVER BASIN IN IDAHO AND UTAH--Continued

Chemical analyses, in parts per million, August 1947--Continued

Date of collection	Mean discharge (second-feet)	Specific conductance ($K \times 10^5$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
											Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
LITTLE BEAR RIVER NEAR LOGAN, UTAH																
Aug. 16, 1947 ------	1/24	55.7	17	66	30	10	310	28	17	4.3	325	0.44	21	288	34	7
LOGAN RIVER NEAR LOGAN, UTAH																
Aug. 16, 1947 ------	49	37.1	4.9	47	22	4.1	252	5.3	2	2.3	212	0.29	28	208	2	4

1/ Discharge measured near Paradise, Utah, 10 miles upstream.

MISCELLANEOUS ANALYSES OF STREAMS IN JORDAN RIVER BASIN IN UTAH

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
CITY CREEK NEAR SALT LAKE CITY																	
May 5, 1947	--	--	36.2	8.7	56	12	5.8	220	10	6.5	0.1	1.2	209	0.28	189	8	6
Aug. 5	--	8.0	42.0	9.5	61	17	8.0	256	13	11	.2	.2	246	.33	222	12	7
BIG COTTONWOOD CREEK NEAR SALT LAKE CITY																	
May 5, 1947	--	--	14.5	7.4	20	5.9	2.1	70	15	3.5	0.1	0.7	89	0.12	74	17	6
Aug. 5	--	8.2	21.2	6.8	26	9.3	4.1	101	22	3.5	.3	.2	122	.17	103	20	8
LITTLE COTTONWOOD CREEK NEAR SALT LAKE CITY																	
May 5, 1947	--	--	11.8	6.3	17	3.8	1.2	44	18	3.5	0.2	0.7	72	0.10	58	22	4
Aug. 8	--	7.9	13.3	5.3	18	4.4	3.2	54	21	2.2	.4	.1	81	.11	63	19	10
EMIGRATION CREEK NEAR SALT LAKE CITY																	
May 5, 1947	--	--	51.1	12	84	17	3.7	270	47	12	0.1	0.3	309	0.42	280	58	3
Aug. 5	--	8.1	64.1	14	88	26	15	288	87	22	.2	.9	395	.54	326	90	9
RED BUTTE CREEK AT FORT DOUGLAS																	
May 5, 1947	--	--	54.4	13	86	23	4.4	274	72	13	0.1	0.3	347	0.47	309	84	3
Aug. 5	--	8.2	75.0	14	96	36	20	322	126	24	.2	.5	475	.65	388	124	10
PARLEYS CREEK NEAR SALT LAKE CITY																	
May 5, 1947	--	--	43.7	11	68	11	14	238	28	14	0.2	0.2	264	0.36	214	20	12
Aug. 5	--	7.9	55.7	13	76	21	17	265	66	18	.3	.2	342	.47	278	59	12
MILL CREEK NEAR SALT LAKE CITY																	
May 5, 1947	--	--	49.7	8.5	76	21	2.3	230	79	7.0	0.1	0.3	308	0.42	276	88	2
Aug. 8	--	7.7	70.0	12	98	33	7.8	272	150	12	.1	.4	447	.61	380	157	4

JORDAN RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN JORDAN RIVER BASIN IN UTAH--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1947--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids		Hardness as $CaCO_3$		Percent sodium
													Parts per million	Tons per acre-foot	Total	Non-carbonate	
DANIELS CREEK NEAR HEBER																	
May 14, 1947------	--	--	12.3	--	16	4.0	5.5	70	8.2	1	--	1.5	71	0.10	56	0	18
SPANISH FORK NEAR THISTLE																	
Mar. 14, 1947-----	104	--	62.8	--	62	29	38	295	59	35	0.5	1.8	371	0.50	274	32	23

MISCELLANEOUS ANALYSES OF STREAMS IN UPPER COLUMBIA RIVER BASIN IN WASHINGTON

Chemical analyses, in parts per million, water year October 1946 to September 1947

Date of collection	Mean discharge (second-feet)	Specific conductance ($K \times 10^6$ at 25° C.)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na + K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
COLUMBIA RIVER AT INTERNATIONAL BOUNDARY																
March 21, 1947	42,900	16.6	--	25	6.7	2.1	84	19	4.0	0.2	98	0.13	11,400	90	21	5
June 24	281,000	14.5	6.4	18	4.5	6.4	81	9.4	.7	.3	86	.12	65,200	64	0	18
PEND OREILLE RIVER BELOW Z CANYON NEAR METALINE FALLS																
Mar. 19, 1947	22,200	16.5	--	22	6.1	0.5	82	12	1.0	0.1	82	0.11	4,920	80	13	1
June 22	86,900	15.4	6.9	21	5.4	3.4	87	8.9	.7	.2	89	.12	20,900	74	3	9
KETTLE RIVER NEAR LAURIER																
Mar. 25, 1947	1,790	11.8	--	17	3.3	3.4	62	11	0.5	0.4	66	0.09	319	56	5	12
June 25	2,680	8.6	11	14	3.5	.0	48	6.9	2.1	.2	61	.08	441	50	10	0
SPOKANE RIVER AT SPOKANE																
June 20, 1947	6,110	8.3	9.5	10	3.8	1.6	42	7.1	1.2	0.8	55	0.07	907	40	6	8
Sept. 11	1,960	14.6	10	16	7.9	4.8	82	10	3.0	1.6	94	.13	497	72	6	13
SPOKANE RIVER AT LONG LAKE																
June 21, 1947	6,340	9.2	10	11	2.9	4.6	48	7.9	1.1	0.7	62	0.08	1,060	40	0	20
Sept. 10	2,800	19.4	9.7	22	9.9	4.6	109	9.5	2.9	2.3	115	.16	869	96	6	9
OKANAGAN RIVER AT OROVILLE																
Mar. 27, 1947	209	28.7	--	36	11	10	150	30	2.2	0.1	163	0.22	92	135	12	14
June 27	345	27.0	8.6	34	9.5	10	142	27	1.2	.1	160	.22	149	124	8	15
SIMILKAMEEN RIVER NEAR NIGHTHAWK																
Mar. 26, 1947	1,190	15.4	--	23	4.2	2.8	82	12	1.0	0.1	84	0.11	270	75	8	7
June 27	3,450	11.3	9.9	16	3.1	3.9	62	8.9	.4	.2	73	.10	680	52	2	14

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