Quality of Surface Waters of the United States 1951

Parts 9–14. Colorado River Basin to Pacific Slope Basins in Oregon and Lower Columbia River Basin

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GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1200

Prepared in cooperation with the State of California, U. S. Bureau of Reclamation, and with other agencies

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Parts 9–14. Colorado River Basin to Pacific Slope Basins in Oregon and Lower Columbia River Basin

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

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PREFACE

This report was prepared by the Geological Survey in cooperation with the State of California, the U. S. Bureau of Reclamation and other agencies by personnel of the Water Resources Division under the direction of:

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INTRODUCTION

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

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

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

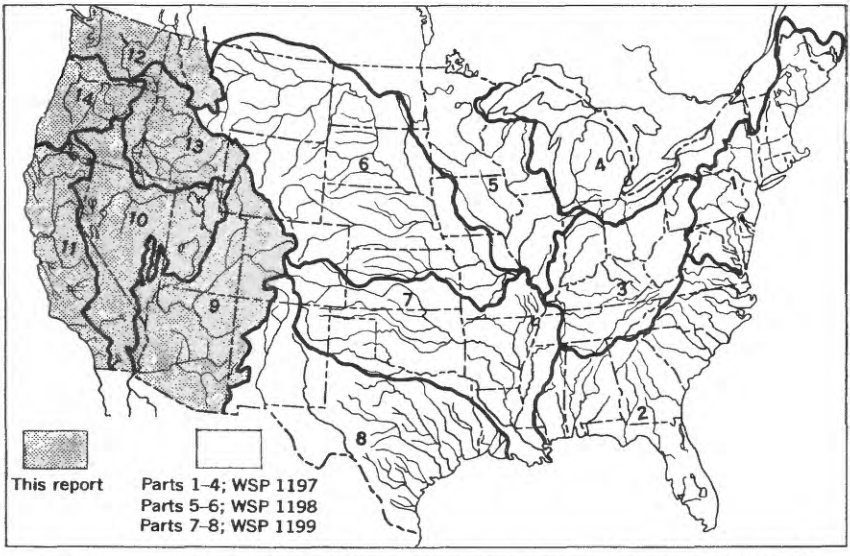

Figure 1. Map of the United States showing basins covered by the four water-supply papers on quality of surface waters in 1951. The shaded portion represents the section of the country covered by this volume; the unshaded portion represents the section of the country covered by other water-supply papers.

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

During the year ended September 30, 1951, 60 regular sampling stations on 41 streams for the study of the chemical character of surface waters were maintained by the Geological Survey in the area covered by this volume. Samples were collected less frequently during the year at many other points. Water temperatures were measured daily at 92 of the regular sampling stations. Not all analyses of samples of surface water collected during the year have been included. Single analyses of an incomplete nature generally have been omitted. Also, determinations made on the daily samples before compositing have not been reported. Specific conductance was usually determined on each daily sample, and pH, chloride, or other determinations were also made on many of the daily samples. As noted in the table headings these data are available for reference at the district offices listed under Division of Work, on page 17.

Quantities of suspended sediment are reported for 18 stations during the year ended September 30, 1951. The sediment samples were collected one or more times daily at most stations, depending on the rate of flow and changes in stage of the

stream. Sediment samples were collected less frequently during the year at many other points. In connection with measurements of sediment discharge, sizes of sediment particles were determined at 17 of the stations. As noted under "Remarks" in the table headings, suspended-sediment concentrations also were determined from the samples collected for chemical analysis in some parts of the country. The data do not provide a reliable basis for computing the loads of suspended sediment carried by the stream but may be of value for design and operation of filtration plants utilizing these stream waters. Records of these infrequent determinations are available for reference in the district offices listed.

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

COLLECTION AND EXAMINATION OF SAMPLES

CHEMICAL QUALITY

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

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

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

SUSPENDED SEDIMENT

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

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

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

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

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

In addition to the records of total quantities of sediment, records of the particle sizes of sediment are included also. The particle sizes of the suspended sediments were determined periodically for many of the stations. As much of the material carried in suspension can pass through the finest sieves, the bottom-withdrawal tube method (U. S. Inter-agency, 1943, p. 82-90) was used in most of the analyses. Generally, sieves were used in the determination of particle sizes for sediments which were predominantly coarser than 0. 062 mm. Size distribution for some sediments was determined by a combination of sieves and pipette methods in which the size fraction 0. 062 mm and larger was analyzed by sieves and that smaller than 0. 062 mm was analyzed by the pipette method (Kilmer and Alexander, 1949). Native or distilled water, as noted in the tables of analyses, was used as the settling medium. In some instances, chemical dispersing agents were added to the settling medium. As settling diameters of the clay and colloidal fractions are often affected by the chemical character of the settling medium, analyses made using native water may more nearly simulate particle sizes existing in the stream. Results of analyses using distilled water or using a settling medium containing dispersing agents approximate ultimate particle sizes of the finer fractions. The concentration of sediment suspension for analysis was reduced to less than 5,000 parts per million, where necessary, by means of a sample splitter, in order to stay within limits recommended for the bottom-withdrawal tube or pipette method. The concentration of suspended sediment used in the bottom-withdrawal tube or pipette cylinder was often different from the concentration in the original suspension. The concentration at which analyses were made is indicated in the appropriate tables.

TEMPERATURE

For most of the stations, daily water temperatures were obtained at the time that the chemical quality or sediment samples were collected. So far as practicable the water temperatures were observed at about the same time each day for an individual river station in order that the data would be relatively unaffected by diurnal variations in temperature. For most large, swiftly flowing streams the diurnal variation in water temperature is probably small, but for sluggish or shallow streams the daily range in temperature may amount to several degrees and may follow closely changes in air temperature. The thermometers used for determination of water temperature were accurate to plus or minus about 0. 5 °F.

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

EXPRESSION OF RESULTS

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

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

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

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

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

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

Specific conductance values are expressed in reciprocal ohms (micromhos at 25°C). The discharge of the streams is reported in second-feet (See Stream Flow, p. 18) and the temperature in degrees Fahrenheit. Color is expressed in units of the platinum-cobalt scale proposed by Hazen (1892, p. 427-428). Hydrogen-ion concentration (pH) is given as the negative logarithm of the number of moles of ionized hydrogen per liter of water.

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

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

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

COMPOSITION OF SURFACE WATERS

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

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

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

MINERAL CONSTITUENTS IN SOLUTION

Silica (SiO_2)

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

Aluminum (Al)

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

Manganese (Mn)

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

Iron (Fe)

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

Calcium (Ca)

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

Magnesium (Mg)

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

Sodium and potassium (Na and K)

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

Carbonate and bicarbonate (CO_3 and HCO_3)

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

Sulfate (SO_4)

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

Chloride (Cl)

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

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

Fluoride (F)

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

Nitrate (NO_3)

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

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

Boron (B)

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

Dissolved solids

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

PROPERTIES AND CHARACTERISTICS OF WATER

Oxygen consumed

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

Color

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

Hydrogen-ion concentration (pH)

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

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

Specific conductance (micromhos at 25 C)

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

Hardness

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

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

Total acidity

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

Corrosiveness

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

Percent sodium

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

SEDIMENT

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

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

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

PUBLICATIONS

Reports giving chemical analyses, suspended-sediment loads, and water temperatures of samples of surface water made by the Geological Survey have been published yearly since 1941. Records for the years ended September 30, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, and 1950, for many of the stations listed in this report are given in Water-Supply Papers 942, 950, 970, 1022, 1030, 1050, 1102, 1133, 1163, and 1189.

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

PROFESSIONAL PAPER

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

BULLETINS

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

WATER-SUPPLY PAPERS

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

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

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

COOPERATION

Financial assistance was furnished by the Bureau of Reclamation of the United States Department of the Interior, in the operation of some stations in Arizona, and New Mexico. Investigation of chemical quality in the Great Basin and Pacific Slope basins in California were initiated in 1951 in cooperation with the State of California.

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

In addition to the cooperative program, many of the stations were operated from funds appropriated directly to the Geological Survey for quality-of-water investigations. Investigation of the chemical quality and 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.

DIVISION OF WORK

The quality-of-water program was conducted by the water resources division of the Geological Survey, Carl G. Paulsen, chief hydraulic engineer, and S. K. Love, chief of the quality of water branch. The records were collected and prepared for publication under supervision of district or regional chemists as follows: In New Mexico--J. D. Hem; in Colorado (except that part in Missouri River basin), Nevada, Utah, California, Washington, and Idaho--C. S. Howard. Subsequent to the collection of the data in this report, one new district office was established in the area covered by this report. Any additional analytical data on file for the sampling stations can be obtained by writing or visiting the responsible Survey quality of water district office as listed in the following table.

District office	Drainage basin
University Station, Box 293 Albuquerque, N. Mex.	Colorado River basin (Arizona, New Mexico).
Post Office Box 2657 Fort Douglas Salt Lake City, Utah	Colorado River basin (Colorado, Utah, and Nevada). The Great Basin (Utah, Nevada).
2520 Marconi Avenue Sacramento, Calif.	The Great Basin (California). Pacific Slope basins in California.
Post Office Box 3418 Portland 8, Oreg.	Pacific Slope basins in Washington and upper Columbia River basin. Snake River basin. Pacific Slope basins in Oregon and lower Columbia River basin.

STREAM FLOW

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

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CHEMICAL ANALYSES, WATER TEMPERATURES, AND SUSPENDED SEDIMENT

PART 9. COLORADO RIVER BASIN

COLORADO RIVER MAIN STEM

COLORADO RIVER AT HOT SULPHUR SPRINGS, COLO.

LOCATION.--At bridge in Hot Sulphur Springs, Grand County, 1 mile downstream from gaging station which is 3 miles upstream from Beaver Creek.
DRAINAGE AREA.--782 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: April 1947 to September 1951.
Water temperatures: April 1949 to September 1951.
EXTREMES, 1950-51.--Specific conductance: Maximum daily, 159 micromhos Aug. 5; minimum daily, 65.7 micromhos June 28.
Water temperatures: Maximum, 61°F July 26, 31, Aug. 1, 5, 12; minimum, freezing point on many days during November to March.
EXTREMES, 1947-51.--Dissolved solids: (1947-50) Maximum, 109 ppm Aug. 11-20, 1950; minimum, 38 ppm June 21-30. 1947.
Hardness: (1947-50) Maximum, 71 ppm Aug. 11-20, 1950; minimum, 20 ppm June 21-30, 1947.
Specific conductance: Maximum daily, 186 micromhos Mar. 30, 1949; minimum daily, 47.6 micromhos June 27, 1947.
Water temperatures: Maximum, 65°F on several days in July and August 1950; minimum, freezing point on many days during winter months.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Oct 1-10, 1950 ...	97.8		--		--	--	--		--	--	--		--		83	0.11	22	--	--	--	125	--
Oct. 11-20	89.4		13		16	3.1	7.5		73	6.7	1.4		0.3		84	.11	20	53	0	24	128	7.3
Oct. 21-31	83.9		--		--	--	--		--	--	--		--		82	.11	19	--	--	--	122	--
Nov. 1-10	95.9		--		--	--	--		--	--	--		--		84	.11	22	--	--	--	125	--
Nov. 11-20	113		13		16	3.1	6.9		71	7.0	1.3		.4		83	.11	25	53	0	22	123	7.3
Nov. 21-30	122		14		15	3.8	4.5		66	6.5	1.1		.6		83	.11	27	53	0	16	124	7.5
Dec. 1-10	101		13		15	3.6	4.9		66	6.6	1.0		.8		82	.11	22	52	0	17	121	7.5
Dec. 11-20	101		14		14	3.7	5.3		65	6.3	1.0		.6		77	.10	21	50	0	19	116	7.5
Dec. 21-31	76.3		12		15	3.5	4.6		65	6.3	1.0		.7		81	.11	17	52	0	16	118	7.5
Jan. 1-10, 1951 ...	75.6		--		--	--	--		--	--	--		--		74	.10	15	--	--	--	117	--
Jan. 11-20	73.4		13		14	2.9	5.9		62	5.8	1.4		1.0		76	.10	15	47	0	21	113	7.3
Jan. 21-31	70.5		--		--	--	--		--	--	--		--		74	.10	14	--	--	--	112	--
Feb. 7-10	86.0		--		--	--	--		--	--	--		--		72	.10	17	--	--	--	111	--
Feb. 11-19	89.2		12		14	3.1	4.4		60	6.1	.9		.7		74	.10	18	48	0	16	111	--
Feb. 20-28	92.6		--		--	--	--		--	--	--		--		73	.10	18	--	--	--	114	--
Mar. 1-10	92.8		--		--	--	--		--	--	--		--		--	--	--	--	--	--	123	--
Mar. 11-20	95.6		13		14	2.4	8.1		65	6.6	1.3		.5		a78	.11	20	45	0	28	118	--
Mar. 21-31	107		--		--	--	--		--	--	--		--		--	--	--	--	--	--	118	--

a Sum of determined constituents.

Apr. 1-10	183		--		--	--	--	--	--	--		--		--	--	--	--	--	129	--
Apr. 11-20	260		11		--	--	--	72	9.1	2.0		.5		90	.12	63	--	--	--	129	7.0
Apr. 21-30	512		--		--	--	--	--	--	--		--		--	--	--	--	--	--	135	--
May 1-10	576		--		--	--	--	--	--	--		--		--	--	--	--	--	--	119	--
May 11-20	954		13		11	3.1	4.2	--	5.5	.5		.4		--	--	--	40	4	19	95.1	7.3
May 21-31	1,595		--		--	--	--	--	--	--		--		--	--	--	--	--	--	78.4	--
June 1-10	1,104		--		--	--	--	--	--	--		--		--	--	--	--	--	--	86.5	--
June 11-20	1,126		12		10	2.4	5.2	48	4.9	.8		.5		a59	.08	179	35	0	24	86.9	7.3
June 21-30	1,570		--		--	--	--	--	--	--		--		--	--	--	--	--	--	73.2	--
July 1-10	723		--		--	--	--	--	--	--		--		58	.08	113	--	--	--	91.4	--
July 11-20	381		13		15	3.1	4.7	64	4.9	1.8		.5		72	.10	74	50	0	17	116	7.2
July 21-31	312		--		--	--	--	--	--	--		--		85	.12	72	--	--	--	134	--
Aug. 1-10	256		--		--	--	--	--	--	--		--		106	.14	73	--	--	--	154	--
Aug. 11-20	160		13		18	3.5	7.9	82	5.4	2.2		.5		94	.13	41	59	0	22	143	7.5
Aug. 21-31	178		--		--	--	--	--	--	--		--		90	.12	43	--	--	--	143	--
Sept. 1-10	109		--		--	--	--	--	--	--		--		90	.12	26	--	--	--	138	--
Sept. 11-20	97.6		14		17	2.8	8.6	79	5.2	1.6		.4		a88	.12	23	54	0	26	138	7.8
Sept. 21-30	99.1		14		18	3.1	8.3	82	5.8	1.5		.3		a91	.12	24	58	0	24	141	7.1
Weighted average	b335		--		--	--	--	--	--	--		--		--	--	--	--	--	--	101	--

a Sum of determined constituents.
b Represents more than 99 percent of runoff for water year October 1950 to September 1951.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT HOT SULPHUR SPRINGS, COLO.--Continued

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

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

EAGLE RIVER BELOW GYPSUM, COLO.

LOCATION.--At bridge on State Highway 301 at Gypsum, Eagle County, just above Gypsum Creek, about 150 feet upstream from gaging station which is below Gypsum Creek.
DRAINAGE AREA.--894 square miles (approximately).
RECORDS AVAILABLE.--Chemical analyses: April 1947 to September 1951.
Water temperatures: April 1949 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 1,100 ppm Sept. 21-30; minimum, 126 ppm June 21-30.
Specific conductance: Maximum daily, 1,590 micromhos Sept. 26; minimum daily, 182 micromhos June 27.
Water temperatures: Maximum, 68°F Aug. 3; minimum, freezing point on several days in January and February.
EXTREMES, 1947-51.--Dissolved solids: Maximum, 1,100 ppm Sept. 21-30, 1951; minimum, 108 ppm May 21-31, 1948.
Hardness (1947-50): Maximum, 511 ppm Sept. 21-30, 1948; minimum, 78 ppm June 1-10, 1948.
Specific conductance: Maximum daily, 1,850 micromhos Aug. 6, 1949; minimum, 156 micromhos June 4, 1948.
Water temperatures (1949-51): Maximum, 76°F Aug. 24, 1949; minimum, freezing point on many days during winter months.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Oct. 5, 7-9, 1950...	254		--		--	--	--	--	373	99		--			918	1.25	630	--	--	--	1,260	--
Oct. 11, 14-17....	223		--		--	--	--	--	385	117		--			973	1.32	586	--	--	--	1,340	--
Oct. 21-31.....	196		16		188	40	78	221	446	109		4.0			1,040	1.41	550	634	452	21	1,400	7.8
Nov. 1-10	217		--		--	--	--	--	365	106		--			912	1.24	534	--	--	--	1,260	--
Nov. 11-20	234		13		161	35	65	177	374	107		2.4			904	1.23	571	546	400	21	1,260	7.8
Nov. 21-30	233		--		--	--	--	--	365	106		--			912	1.24	574	--	--	--	1,260	--
Dec. 1-10	217		10		122	28	67	172	251	114		2.0			734	1.00	430	420	278	26	1,090	7.8
Dec. 11-20	214		11		116	27	63	172	251	95		1.5			678	.92	392	400	260	25	1,010	7.9
Dec. 21-31	188		11		122	28	73	176	265	111		1.6			734	1.00	373	420	276	27	1,100	7.9
Jan. 1-10, 1951 ...	180		--		--	--	--	--	--	--		--			701	.95	341	--	--	--	1,070	--
Jan. 11-20	189		12		120	28	72	175	260	110		1.8			716	.97	365	414	271	27	1,070	--
Jan. 21-31.....	186		--		--	--	--	--	--	--		--			666	.91	334	--	--	--	1,040	--
Feb. 1-10	172		--		--	--	--	--	--	--		--			670	.91	311	--	--	--	997	--
Feb. 11-19	177		10		108	26	68	161	238	102		1.5			652	.89	312	376	244	28	997	--
Feb. 20-28	178		--		--	--	--	--	--	--		--			715	.97	344	--	--	--	1,100	--
Mar. 1-10	189		--		--	--	--	--	--	--		--			715	.97	365	--	--	--	1,100	--
Mar. 11-20.....	182		9.5		112	24	86	168	249	119		1.5			695	.95	342	378	240	33	1,070	7.8
Mar. 21-31	186		--		--	--	--	--	--	--		--			655	.89	329	--	--	--	1,000	--
Apr. 1-10	201		--		--	--	--	--	--	--		--			614	.84	333	--	--	--	935	--
Apr. 11-20	228		8.9		80	11	66	140	165	71		1.3			488	.66	300	244	130	37	763	7.4
Apr. 21-30	450		--		--	--	--	--	--	--		--			284	.39	345	--	--	--	460	--

EAGLE RIVER BELOW GYPSUM, COLO.--Continued

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
May 1-3, 1951	412		--		--	--	--		--	--	--		--		328	0.45	365	--	--	--	507	--
May 4-10	728		--		--	--	--		--	--	--		--		188	.26	370	--	--	--	298	--
May 11-20	1,143		8.3		31	9.4	30		86	--	11		1.3		161	.22	497	116	46	5	252	7.6
May 21-31	2,245		--		--	--	--		--	--	--		--		143	.19	867	--	--	--	218	--
June 1-10	1,793		--		--	--	--		--	--	--		--		142	.19	687	--	--	--	238	--
June 11-20.....	2,582		6.1		26	5.7	7.8		72	33	8.1		.7		131	.18	913	88	30	16	212	7.5
June 21-30	3,213		--		--	--	--		--	--	--		--		126	.17	1,090	--	--	--	203	--
July 1-10	2,250		--		--	--	--		--	--	--		--		153	.21	929	--	--	--	239	--
July 11-20	1,432		6.2		37	8.4	16		80	64	21		.6		207	.28	800	127	62	22	321	7.6
July 21-31	1,006		--		--	--	--		--	--	--		--		288	.39	782	--	--	--	465	--
Aug. 1-10	812		--		--	--	--		--	--	--		--		336	.46	737	--	--	--	545	--
Aug. 11-20	378		9.3		88	17	50		151	163	74		.9		494	.67	504	290	166	27	762	7.8
Aug. 21-31	326		--		--	--	--		--	--	--		--		650	.88	572	--	--	--	938	--
Sept. 1-10	268		--		--	--	--		--	--	--		--		678	.92	491	--	--	--	1,020	--
Sept. 11-20	220		10		123	24	104		199	274	130		1.1		780	1.06	463	406	242	36	1,180	8.0
Sept. 21-30	210		16		220	40	52		233	517	68		2.6		1,100	1.50	624	714	522	14	1,400	7.8
Weighted average.	a 654		--		--	--	--		--	--	--		--		298	0.41	526	--	--	--	453	--

a Represents 99 percent of the runoff for the water year October 1950 to September 1951.

EAGLE RIVER BASIN--Continued

EAGLE RIVER BELOW GYPSUM, COLO.--Continued

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

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

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 power plant at Glenwood Springs, Garfield County, and a half a mile upstream from Roaring Fork.
DRAINAGE AREA.--4,560 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1941 to September 1951.
Water temperatures: May 1949 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 606 ppm Oct. 11-31; minimum, 142 ppm June 21-30.
Hardness: Maximum, 292 ppm Oct. 11-20; minimum, 90 ppm June 21-30, July 11-20.
Specific conductance: Maximum daily, 1,110 micromhos Oct. 18, Nov. 3; minimum daily, 199 micromhos June 1.
Water temperatures: Maximum, 69°F July 31; minimum, freezing point Feb. 1-2.
EXTREMES, 1941-51.--Dissolved solids: Maximum, 2,030 ppm Aug. 10, 1947; minimum, 105 ppm June 1-10, 1942.
Hardness: Maximum, 1,480 ppm Aug. 10, 1947; minimum, 72 ppm June 1-20, 1942.
Specific conductance: Maximum daily, 1,370 micromhos Jan. 20, 1943; minimum daily, 153 micromhos May 24, 1948.
Water temperatures (1949-51): Maximum, 69°F July 31, 1951; minimum, freezing point Feb. 1-2, 1951.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Discharge records for gaging station at Glenwood Springs, for water year October 1950 to September 1951 given in Water-Supply Paper 1213. No appreciable inflow between sampling point and gaging station except during periods of heavy local rains.

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Oct. 1-10, 1950 ...	900		12		80	19	83		152	150	132		0.8		560	0.76	1,360	278	153	39	918	
Oct. 11-20	748		12		84	20	90		160	163	132		1.2		606	.82	1,220	292	160	40	983	
Oct. 21-31	731		13		83	20	93		162	164	132		1.2		606	.82	1,200	289	156	41	991	
Nov. 1-10	810		12		79	19	81		158	151	115		1.2		554	.75	1,210	275	146	39	904	
Nov. 11-20	899		12		72	17	74		150	135	112		1.2		504	.69	1,220	250	126	39	829	
Nov. 21-30	965		13	0.02	66	15	64		142	125	96	0.2	.6		472	.64	1,230	226	110	38	767	7.8
Dec. 1-10.....	795		13		74	16	89		154	135	132		.5		548	.75	1,180	250	124	44	911	
Dec. 11-13, 18	861		13		67	15	84		141	121	126		.6		a496	.67	1,150	228	113	44	856	
Dec. 14-17, 19-20..	1,127		13		51	11	45		121	88	65		.5		342	.47	1,040	172	73	36	573	
Dec. 21-31	896		13		62	14	71		137	111	106		.5		460	.63	1,110	212	100	42	764	
Jan. 1-10, 1951 ...	764		13		63	15	87		140	111	132		.6		500	.68	1,030	218	104	46	841	
Jan. 11-20	1,016		12		56	12	67		125	94	101		.6		412	.56	1,130	189	86	43	699	
Jan. 21, 24-29, 31 .	1,200		11		48	10	47		114	78	70		.6		328	.45	1,060	161	68	39	560	
Jan. 22-23, 30 b....	846		13		--	--	--		129	102	128		.7		--	--	--	--	--	--	812	
Feb. 1-10.....	1,135		11		50	12	57		116	84	85		.8		367	.50	1,120	174	80	42	612	
Feb. 11-18	1,039		12		54	13	60		120	93	87		.7		391	.53	1,100	188	90	41	641	
Feb. 19-20 b	842		--		--	--	--		133	111	130		--		--	--	--	--	--	--	834	
Feb. 21-28.....	990		13		51	13	52		116	85	75		.7		356	.48	952	180	86	39	591	

a Sum of determined constituents.
b Not included for computation of weighted averages.

Mar. 1-4, 7-10.....	1,034	13	47	12	51	116	83	75	1.0	351	.48	980	167	72	40	630
Mar. 5-6 b	750	--	--	--	--	132	102	140	.5	--	--	--	c 200	92	51	839
Mar. 11-20	928	13	53	14	72	130	99	108	.6	431	.59	1,080	190	83	45	744
Mar. 21-31	920	12	53	13	66	131	98	97	.7	416	.57	1,030	186	78	44	709
Apr. 1-10	1,081	11	53	14	64	133	95	94	.8	407	.55	1,190	190	80	42	693
Apr. 11-20.....	1,419	10	45	11	49	124	78	74	.5	336	.46	1,290	158	56	40	575
Apr. 21-30	2,759	11	38	9.0	25	112	52	33	1.2	230	.31	1,710	132	40	29	385
May 1-10	3,644	13	37	8.0	20	108	46	24	1.1	204	.28	2,010	126	37	26	336
May 11-20	5,058	15	31	7.3	16	100	34	20	1.2	184	.25	2,510	108	26	25	291
May 21-31	9,564	12	29	6.3	12	98	28	10	1.1	155	.21	4,000	98	18	21	241
June 1-10	8,187	11	27	6.6	13	83	30	18	.8	150	.20	3,320	94	26	23	235
June 11-20	8,536	10	28	6.6	13	87	34	13	.8	160	.22	3,690	97	26	23	251
June 21-30	10,280	9.8	27	5.5	9.9	79	30	11	.6	142	.19	3,940	90	25	19	225
July 1-10	5,983	8.7	27	6.1	15	76	33	19	.6	161	.22	2,600	92	30	26	262
July 11-20	4,294	8.5	29	4.4	19	82	25	27	.6	a 154	.21	1,790	90	24	31	314
July 21-31	3,708	10	39	9.6	24	98	63	33	.6	239	.33	2,390	137	56	28	384
Aug. 1-10	3,097	12	44	8.7	28	116	63	38	1.0	240	.33	2,010	146	51	29	420
Aug. 11-20	1,743	12	52	11	52	124	89	77	.8	368	.50	1,730	174	73	39	606
Aug. 21-31	1,663	14	58	12	54	134	103	77	.8	398	.54	1,790	194	84	38	643
Sept. 1-10	1,290	13	61	14	62	138	111	92	.9	437	.59	1,520	210	96	39	715
Sept. 11-20	1,290	12	58	13	62	130	103	94	.8	421	.57	1,470	198	92	41	698
Sept. 21-30	1,295	12	63	12	69	130	106	102	.9	419	.57	1,470	206	100	42	727
Weighted average .	d 2,586	11	39	8.7	29	103	56	41	0.8	244	0.33	1,700	134	49	32	403

a Sum of determined constituents.
b Not included for computation of weighted averages.
c Determined by Schwarzenbach method.
d Represents 99 percent of runoff for water year October 1950 to September 1951.

COLORADO RIVER MAIN STEM.--Continued

COLORADO RIVER NEAR GLENWOOD SPRINGS, COLO.--Continued

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

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

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR CAMEO, COLO.

LOCATION.--At Grand Valley project diversion dam, 3.7 miles upstream from Cameo, Mesa County, 0.4 mile upstream from Plateau Creek, and 3 miles downstream from gaging station.
DRAINAGE AREA.--8,060 square miles, approximately (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1933 to September 1951.
Water temperatures: April 1949 to September 1951.
EXTREMES, 1950-51.--Specific conductance: Maximum daily, 1,760 micromhos Jan. 11; minimum daily, 257 micromhos June 20.
Water temperatures: Maximum, 71°F July 30-31, Aug. 2-3, 7; minimum, freezing point on many days in January and February.
EXTREMES, 1933-51.--Dissolved solids (1933-43): Maximum, 1,050 ppm Dec. 21-31, 1939; minimum, 143 ppm June 11-20, 1935.
Hardness (1933-35): Maximum, 399 ppm July 21-31, 1934; minimum, 98 ppm June 21-30, 1935.
Specific conductance (1941-51): Maximum daily, 1,850 micromhos Jan. 8, 1944; minimum daily, 244 micromhos July 2, 1947.
Water temperatures (1949-51): Maximum, 71°F Aug. 4-6, 1949, July 30-31, Aug. 2-3, 7, 1951; minimum, freezing point on many days during winter months.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Oct. 1-10, 1950	1,740		--		--	--	--		--	--	--		--		794	1.08	3,730	--	--	--	1,290	--
Oct. 11-20	1,509		10		101	30	180		209	231	250		2.2		925	1.26	3,770	376	204	51	1,500	7.5
Oct. 21-31	1,467		--		--	--	--		--	--	--		--		901	1.23	3,570	--	--	--	1,460	--
Nov. 1-10	1,561		--		--	--	--		--	--	--		--		910	1.24	3,840	--	--	--	1,480	--
Nov. 11-20	1,685		11		95	26	153		197	209	210		3.3		819	1.11	3,730	344	182	49	1,320	7.4
Nov. 21-30	1,700		--		--	--	--		--	--	--		--		799	1.09	3,670	--	--	--	1,280	--
Dec. 1-10	1,539		--		--	--	--		--	--	--		--		853	1.16	3,540	--	--	--	1,370	--
Dec. 11-20	1,677		10		84	25	144		186	188	195		2.8		752	1.02	3,400	312	160	50	1,230	7.5
Dec. 21-31	1,565		--		--	--	--		--	--	--		--		759	1.03	3,210	--	--	--	1,300	--
Jan. 1-10, 1951	1,453		--		--	--	--		--	--	--		--		802	1.09	3,150	--	--	--	1,360	--
Jan. 11-20	1,570		12		86	22	165		198	182	220		3.2		793	1.08	3,360	305	143	54	1,330	--
Jan. 21-31	1,668		--		--	--	--		--	--	--		--		642	.87	2,890	--	--	--	1,100	--
Feb. 1-10	1,620		--		--	--	--		--	--	--		--		703	.96	3,070	--	--	--	1,210	--
Feb. 11-20	1,575		10		74	21	138		174	168	179		2.7		686	.93	2,920	271	128	53	1,140	--
Feb. 21-28	1,569		--		--	--	--		--	--	--		--		714	.97	3,020	--	--	--	1,210	--
Mar. 1-10	1,637		--		--	--	--		--	--	--		--		717	.98	3,170	--	--	--	1,190	--
Mar. 11-19	1,616		12		76	25	150		184	182	195		2.6		735	1.00	3,210	292	142	53	1,220	--
Mar. 20 a	1,450		13		--	--	--		198	--	278		2.7		--	--	--	b315	153	--	1,530	--
Mar. 21-31	1,589		--		--	--	--		--	--	--		--		760	1.03	3,260	--	--	--	1,290	--

a Not included for computation of weighted averages.
b Hardness determined by Schwarzenbach method.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR CAMEO, COLO.--Continued

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Apr. 1-10, 1951	1,756		--		--	--	--		--	--	--		--		665	0.90	3,150	--	--	--	1,130	--
Apr. 11-20	2,071		9.5		65	19	124		158	141	165		1.9		615	.84	3,440	240	110	53	1,030	7.5
Apr. 21-30	3,789		--		--	--	--		--	--	--		--		395	.54	4,040	--	--	--	666	--
May 1-10	4,884		--		--	--	--		--	--	--		--		343	.47	4,520	--	--	--	576	--
May 11-20	6,963		14		42	8.7	36		123	52	45		.7		266	.36	5,000	141	40	36	446	7.3
May 21-31	13,820		--		--	--	--		--	--	--		--		210	.29	7,840	--	--	--	341	--
June 1-10	12,180		--		--	--	--		--	--	--		--		213	.29	7,000	--	--	--	335	--
June 11-20	13,590		8.3		34	8.2	19		96	39	28		1.2		209	.28	7,670	118	40	26	323	7.6
June 21-30	17,450		--		--	--	--		--	--	--		--		179	.24	8,430	--	--	--	294	--
July 1-10	10,580		--		--	--	--		--	--	--		--		202	.27	5,770	--	--	--	347	--
July 11-20	6,817		9.4		39	9.5	38		102	58	53		1.3		265	.36	4,880	137	53	38	457	7.6
July 21-31	5,787		--		--	--	--		--	--	--		--		371	.50	5,800	--	--	--	600	--
Aug. 1-10	4,876		--		--	--	--		--	--	--		--		437	.59	5,750	--	--	--	710	--
Aug. 11-20	2,752		9.2		62	16	96		144	118	132		2.9		510	.69	3,790	220	102	49	866	7.5
Aug. 21-31	2,572		--		--	--	--		--	--	--		--		612	.83	4,250	--	--	--	1,010	--
Sept. 1-10	2,103		--		--	--	--		--	--	--		--		630	.86	3,580	--	--	--	1,040	--
Sept. 11-20	1,760		10		79	19	132		166	158	184		2.8		686	.93	3,260	275	139	51	1,130	7.3
Sept. 21-30	1,735		--		--	--	--		--	--	--		--		680	.92	3,190	--	--	--	1,130	--
Weighted average	4,030		--		--	--	--		--	--	--		--		389	0.53	4,230	--	--	--	642	--

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR CAMEO, COLO.--Continued

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

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

GUNNISON RIVER BASIN

GUNNISON RIVER NEAR GRAND JUNCTION, COLO.

LOCATION.--At road bridge about half a mile downstream from gaging station, 1 mile downstream from point of diversion of Redlands power canal, and 1½ miles upstream from mouth and Grand Junction, Mesa County.
DRAINAGE AREA.--8,020 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1931 to September 1951.
Water temperatures: April 1949 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 2,310 ppm Nov. 1-10; minimum, 360 ppm May 21-22, 24, 26-28, 31.
Hardness: Maximum, 1,150 ppm Nov. 1-10; minimum, 234 ppm May 11-20.
Specific conductance: Maximum daily, 2,680 micromhos Nov. 5; minimum daily, 455 micromhos May 31.
Water temperatures: Maximum, 80°F July 20; minimum, freezing point on several days during December to February.
EXTREMES, 1931-51.--Dissolved solids: Maximum, 2820 ppm Sept. 11-20, 1934 (rev.) ; minimum, 203 ppm May 11-20, 1944.
Hardness (1931-35, 1943-51): Maximum, 1,370 ppm Sept. 1-20, 1934; minimum, 143 ppm June 1-10, 1933, and May 11-20, 1948.
Specific conductance (1941-51): Maximum daily, 2,680 micromhos Nov. 5, 1950; minimum daily, 280 micromhos May 23, 1948.
Water temperatures (1949-51): Maximum, 80°F July 20, 1951; minimum, freezing point on several days during winter months.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Oct. 1-10, 1950 ...	706		19		237	100	183		230	1,110	26		9.9		1,800	2.45	3,430	1,000	814	28	2,250	--
Oct. 11-20.....	549		20		261	114	226		264	1,300	30		15		2,100	2.86	3,110	1,120	903	31	2,500	--
Oct. 21-31	538		19		256	112	228		286	1,240	32		8.4		2,040	2.77	2,960	1,100	864	31	2,520	--
Nov. 1-10	534		19		270	115	229		306	1,280	30		15		2,110	2.87	3,040	1,150	896	30	2,580	--
Nov. 11-20	758		20		214	91	167		277	955	24		14		1,620	2.20	3,320	908	681	29	2,060	--
Nov. 21-30	1,183		19		160	67	144		238	728	18		8.1		1,260	1.71	4,020	674	480	32	1,640	--
Dec. 1-10.....	1,054		19		163	71	143		235	751	21		9.7		1,290	1.75	3,670	698	506	31	1,720	--
Dec. 11-20	1,055		17		148	66	130		231	692	18		11		1,200	1.63	3,420	641	452	31	1,590	--
Dec. 21-31	835		19		162	71	149		243	762	21		11		1,310	1.78	2,950	696	497	32	1,730	--
Jan. 1-10, 1951 ...	787		19		150	64	131		228	690	18		10		1,190	1.62	2,530	638	450	31	1,590	--
Jan. 11-20.....	746		20		154	68	135		239	710	20		11		1,240	1.69	2,500	664	468	31	1,640	--
Jan. 21-31	765		18		140	64	132		219	658	18		13		1,150	1.56	2,380	612	433	32	1,510	--
Feb. 1-10	671		20		142	67	146		235	682	19		12		1,200	1.63	2,170	630	438	34	1,570	--
Feb. 11-19	979		17		136	66	139		222	666	20		12		1,170	1.59	3,090	611	429	33	1,540	--
Feb. 20-28	853		18		133	65	129		216	640	18		11		1,120	1.52	2,580	600	422	32	1,510	--
Mar. 1-10	839		18		125	62	122		208	609	17		8.4		1,060	1.44	2,400	567	396	32	1,450	--
Mar. 11-20.....	876		16		114	53	102		197	521	15		8.1		926	1.26	2,190	502	341	31	1,280	--
Mar. 21-31	969		16		99	45	92		185	449	14		6.5		813	1.11	2,130	432	280	32	1,140	--

Apr. 1-10	858		16		101	43	94		179	460	16		5.8		824	1.12	1,910	429	282	32	1,150	--
Apr. 11-20	658		14		122	52	109		192	568	21		4.9		986	1.34	1,750	518	361	31	1,350	--
Apr. 21-30	1,621		15		78	27	53		160	268	10		3.4		533	.72	2,330	306	174	27	784	--
May 1-10 a	2,202		--		--	--	--		--	--	--		--		b477	.65	2,840	--	--	--	692	--
May 11-20	3,727		15		66	17	31		154	169	5.0		2.5		381	.52	3,830	234	108	22	579	--
May 21-22, 24, 26-28, 31 a	7,729		--		--	--	--		--	--	--		--		b360	.49	7,510	--	--	--	539	--
June 1-10	4,926		17		68	19	34		139	192	7.5		2.9		409	.56	5,440	248	134	23	603	--
June 11-20	5,688		17		68	17	34		134	187	6.0		3.0		398	.54	6,110	240	130	24	592	--
June 21-30	5,689		16		60	21	19		123	161	5.5		1.1		344	.47	5,280	236	135	15	527	--
July 1-10	2,685		15		80	27	44		146	268	9.0		2.3		517	.70	3,750	310	191	24	754	--
July 11-20	989		13		133	46	97		174	550	14		2.4		941	1.28	2,510	521	378	29	1,280	--
July 21-31	906		19		188	65	145		224	802	20		3.8		1,350	1.84	3,300	736	553	30	1,740	--
Aug. 1-10	1,211		21		167	55	119		216	672	14		4.7		1,160	1.58	3,790	642	466	29	1,510	--
Aug. 11-20	533		17		170	64	159		176	816	22		1.7		1,340	1.82	1,930	687	543	33	1,710	--
Aug. 21, 26-31	790		16		188	66	157		195	853	20		5.5		1,400	1.90	2,990	740	580	32	1,770	7.6
Sept. 1-10	606		16		175	68	165		172	847	23		4.3		1,380	1.88	2,260	716	575	33	1,770	7.6
Sept. 11-20	524		16		223	85	206		198	1,110	29		4.9		1,770	2.41	2,500	906	744	33	2,170	7.7
Sept. 21-30	755		18		241	89	205		227	1,130	26		10		1,830	2.49	3,730	968	782	32	2,210	7.8
Weighted average	c1,378		17		114	43	86		178	466	13		5.4		832	1.13	3,100	462	316	29	1,120	--

a Not included for computation of weighted averages.
b Residue on evaporation.
c Represents 82 percent of the runoff for water year October 1950 to September 1951.

GUNNISON RIVER BASIN--Continued

GUNNISON RIVER NEAR GRAND JUNCTION, COLO.--Continued

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

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

DOLORES RIVER AT GATEWAY, COLO.

LOCATION.--At bridge on State Highway 141, 500 feet upstream from gaging station, which is 0.3 mile northwest of Gateway, Mesa County, 0.3 mile downstream from Colorado-Utah State line.
DRAINAGE AREA.--4,350 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1951.
Water temperatures: April 1949 to September 1951.
EXTREMES, 1950-51.--Specific conductance: Maximum daily, 8,690 micromhos Dec. 27; minimum daily, 476 micromhos June 1.
Water temperatures: Maximum, 76°F July 26, 29-30; minimum, freezing point on several days during December to February.
EXTREMES, 1947-51.--Dissolved solids (1947-50): Maximum, 4,900 ppm Sept. 11-20, 1950; minimum, 198 ppm June 1-10, 1948.
Hardness, (1947-50): Maximum, 1,140 ppm Sept. 11-20, 1950; minimum, 130 ppm June 11-15, 17-20, 1948.
Specific conductance: Maximum daily, 10,000 micromhos Sept. 22, 1949; minimum daily, 227 micromhos May 17, 1949.
Water temperatures (1949-51): Maximum, 78°F Sept. 1, 1949; minimum, freezing point on several days during winter months.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

Chemical analyses, in parts per million, water year October 1950 to September 195.

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Oct. 1-10, 1950	68.9		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	4,520	--
Oct. 11-20	81.4		7.5		142	75	729	161	563	1,080	9.5		2,690	3.66	591	663	531	71	4,400	7.7		
Oct. 21-31	82.3		--		--	--	--	--	--	--	--		--	--	--	--	--	--	4,880	--		
Nov. 1-10	87.1		--		--	--	--	--	--	--	--		--	--	--	--	--	--	5,150	--		
Nov. 11-20	88.7		9.1		133	73	925	171	499	1,400	12		3,140	4.27	752	632	492	76	5,190	7.5		
Nov. 21-30	94.3		--		--	--	--	--	--	--	--		--	--	--	--	--	--	5,020	--		
Dec. 1-3, 5-10	94.1		--		--	--	--	--	--	--	--		--	--	--	--	--	--	5,320	--		
Dec. 4	96.0		--		--	--	--	--	--	--	--		--	--	--	--	--	--	8,410	--		
Dec. 11-14	118		8.6		128	66	942	170	468	1,420	13		3,130	4.26	997	591	452	78	5,230	7.4		
Dec. 15-20	125		8.7		148	64	687	176	575	975	9.2		2,550	3.47	861	632	488	70	4,140	7.5		
Dec. 21-26, 30	89.4		--		--	--	--	--	--	--	--		--	--	--	--	--	--	4,670	--		
Dec. 27-29, 31	86.2		--		--	--	--	--	--	--	--		--	--	--	--	--	--	8,120	--		
Jan. 1, 1951	100		--		--	--	--	--	--	--	--		--	--	--	--	--	--	6,960	--		
Jan. 2-10	88.3		--		--	--	--	--	--	--	--		--	--	--	--	--	--	4,990	--		
Jan. 11, 14, 17, 19-20	120		11		119	54	733	196	379	1,100	8.6		2,500	3.40	810	519	358	75	4,270	7.6		
Jan. 12-13, 18	125		11		141	76	1,240	208	482	1,900	10		3,960	5.39	1,340	664	494	80	6,730	7.4		
Jan. 21-29, 31	138		--		--	--	--	--	--	--	--		--	--	--	--	--	--	3,820	--		
Jan. 30	120		--		--	--	--	--	--	--	--		--	--	--	--	--	--	5,310	--		
Feb. 1-3, 7-10	131		--		--	--	--	--	--	--	--		--	--	--	--	--	--	4,920	--		
Feb. 4-6	136		--		--	--	--	--	--	--	--		--	--	--	--	--	--	7,210	--		
Feb. 11-16, 20.....	166		8.4		103	51	636	180	343	950	5.5		2,190	2.98	982	466	319	75	3,710	--		
Feb. 17-19	149		7.4		108	55	990	188	332	1,520	5.5		3,110	4.23	1,250	496	342	81	5,360	--		
Feb. 21-28	130		--		--	--	--	--	--	--	--		--	--	--	--	--	--	4,460	--		

DOLORES RIVER BASIN--Continued

DOLORES RIVER AT GATEWAY, COLO.--Continued

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Mar. 1-10, 1951 ..	112		--		--	--	--		--	--	--		--		--	--	--	--	--	--	5,050	--
Mar. 11-20	130		7.4		104	53	744		179	350	1,120		6.2		2,470	3.36	867	478	331	77	4,200	7.6
Mar. 21-31	121		--		--	--	--		--	--	--		--		--	--	--	--	--	--	3,860	--
Apr. 1-10	98.9		--		--	--	--		--	--	--		--		--	--	--	--	--	--	4,840	--
Apr. 11-20	91.2		7.3		118	73	1,040		167	487	1,570		9.0		3,390	4.61	835	594	458	79	5,620	7.8
Apr. 21-30	133		--		--	--	--		--	--	--		--		--	--	--	--	--	--	4,060	--
May 1, 3-5	166		--		--	--	--		--	--	--		--		--	--	--	--	--	--	3,200	--
May 2	165		--		--	--	--		--	--	--		--		--	--	--	--	--	--	6,070	--
May 6-7	285		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,890	--
May 9-10	590		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,170	--
May 11-20	507		10		70	21	137		158	150	192		1.7		660	.90	903	261	132	53	1,160	7.6
May 21-23, 26-28...	774		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,190	--
May 24-25, 29-31 ..	1,196		--		--	--	--		--	--	--		--		--	--	--	--	--	--	720	--
June 1-10	900		--		--	--	--		--	--	--		--		--	--	--	--	--	--	667	--
June 11-20.....	805		8.2		52	13	72		116	104	95		2.5		404	.55	878	183	88	46	686	8.0
June 21-30	676		--		--	--	--		--	--	--		--		--	--	--	--	--	--	753	--
July 1-10	279		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,380	--
July 11-20	127		5.0		86	38	305		108	298	448		4.5		1,240	1.69	425	370	282	64	2,130	7.8
July 21-31	122		--		--	--	--		--	--	--		--		--	--	--	--	--	--	2,940	--
Aug. 1-6	268		--		--	--	--		--	--	--		--		--	--	--	--	--	--	2,690	--
Aug. 7-8, 10	174		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,730	--
Aug. 11-20	108		6.6		122	42	327		128	394	473		6.6		1,430	1.94	417	477	372	60	2,380	7.7
Aug. 21-31	268		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,920	--
Sept. 1	404		--		--	--	--		--	--	--		--		--	--	--	--	--	--	867	--
Sept. 2-7, 9-10	126		--		--	--	--		--	--	--		--		--	--	--	--	--	--	2,130	--
Sept. 8	99.0		--		--	--	--		--	--	--		--		--	--	--	--	--	--	3,700	--
Sept. 11-20.....	63.2		6.8		132	41	526		128	426	770		7.7		1,970	2.68	336	498	393	70	3,240	7.7
Sept. 21-30	48.2		--		--	--	--		--	--	--		--		--	--	--	--	--	--	5,390	--
Weighted average .	a218		--		--	--	--		--	--	--		--		--	--	--	--	--	--	2,260	--

a Represents 99 percent of runoff for water year October 1950 to September 1951.

DOLORES RIVER BASIN--Continued

DOLORES RIVER AT GATEWAY, COLO.--Continued

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

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

DOLORES RIVER BASIN--Continued

DOLORES RIVER NEAR CISCO, UTAH

LOCATION.--At gaging station, 9 miles upstream from mouth and 14 miles southeast of Cisco, Grand County.
RECORDS AVAILABLE.--Chemical analyses: March to September 1951.
Water temperatures: March to September 1951.
Sediment records: March to September 1951.
EXTREMES, 1951.--Specific conductance: Maximum daily, 6,760 micromhos Mar. 8; minimum daily, 504 micromhos June 1.
Water temperatures: Maximum observed 80°F July 19.
Sediment concentrations: Maximum daily, not determined; maximum observed, 127,000 ppm Aug. 22; minimum daily, 13 ppm July 15.
Sediment loads: Maximum daily, 150,000 tons, estimated, Aug. 30; minimum daily, 4 tons Apr. 13 and July 15.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for December 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 8, 11-13, 1951	138	6.9		123	62	1,040		174	398	1,610		5.7		3,330	4.53	1,240	562	420	80	5,760	7.5	
Mar. 9-10, 14-16, 18-19	130	6.9		109	52	671		183	365	1,000		5.8		2,300	3.13	807	486	336	75	3,950	7.5	
Mar. 21-31	129	--		--	--	--		--	--	--		--		--	--	--	--	--	--	4,070	--	
Apr. 1-10	113	--		--	--	--		--	--	--		--		--	--	--	--	--	--	4,780	--	
Apr. 11-20	103	4.0		120	67	1,000		178	473	1,500		6.2		3,260	4.43	907	575	429	79	5,520	7.7	
Apr. 21-30	152	--		--	--	--		--	--	--		--		--	--	--	--	--	--	3,970	--	
May 3	183	--		--	--	--		186	429	1,400		3.2		--	--	--	--	--	--	5,160	8.1	
May 4, 6-7	249	9.3		100	51	448		180	360	645		5.8		1,710	2.33	1,150	459	312	68	2,920	7.7	
May 9-10	586	--		--	--	--		192	125	135		5.1		--	--	--	--	--	--	928	7.7	
May 11-18	512	11		66	22	133		170	145	178		3.4		642	.87	888	255	116	53	1,080	7.9	
May 22-27	719	9.8		76	20	125		174	146	175		3.0		640	.87	1,240	272	129	50	1,070	7.8	
May 28-31	1,628	12		62	14	69		179	85	90		1.3		422	.57	1,850	212	66	42	687	7.8	
June 1-10	944	8.2		60	12	68		141	102	88		1.9		410	.56	1,050	199	84	43	682	7.7	
June 11-20	793	7.4		52	16	84		134	104	112		2.2		444	.60	951	196	86	48	715	7.9	
June 21-30	683	7.9		50	14	81		104	105	116		1.7		427	.58	787	182	98	49	749	7.6	
July 1-10	322	7.4		65	22	182		100	178	268		2.3		774	1.05	673	252	170	61	1,340	7.4	
July 24-28	121	--		--	--	--		--	--	--		--		--	--	--	--	--	--	3,390	--	
Aug. 24-28	126	12		122	32	302		180	321	430		6.2		1,310	1.78	446	436	288	60	2,150	7.7	
Sept. 1-8, 10	105	11		180	38	229		136	563	282		9.8		1,380	1.88	391	605	494	60	2,030	7.9	
Sept. 9	80	--		--	--	--		--	--	--		--		--	--	--	--	--	--	--	--	
Sept. 11-20	56.2	7.4		132	40	474		130	422	690		6.0		1,840	2.50	279	494	388	68	3,010	8.1	
Sept. 21-30	34.2	--		--	--	--		--	--	--		--		--	--	--	--	--	--	4,990	--	
Weighted average	a 347	--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,440	--	

a Analyses represent 70 percent of the runoff for the period December 1950 to September 1951.

DOLORES RIVER BASIN--Continued

DOLORES RIVER NEAR CISCO, UTAH--Continued

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

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

DOLORES RIVER BASIN--Continued

DOLORES RIVER NEAR CISCO, UTAH--Continued

Suspended sediment, March to September 1951

Day	January			February			March		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1							--	--	--
2							--	--	--
3							--	--	--
4							--	--	--
5							--	--	--
6							--	--	--
7							--	--	--
8							115	140	43
9							107	80	23
10							111	53	16
11							139	190	71
12							152	200	82
13							147	107	42
14							143	120	46
15							139	100	38
16							143	98	38
17							135	105	38
18							135	100	36
19							131	150	53
20							115	198	61
21							115	149	46
22							131	110	39
23							139	100	38
24							135	159	58
25							135	90	33
26							123	36	12
27							123	120	40
28							135	80	29
29							139	58	22
30							123	80	27
31							119	87	28
Total							3,129	--	959

Day	April			May			June		
1	127	90	31	188	100	51	1,490	3,250	13,100
2	119	85	27	193	100	52	1,440	2,000	7,780
3	123	79	26	183	89	44	1,210	1,450	4,740
4	107	94	27	172	70	33	978	680	1,800
5	104	99	28	183	100	49	776	480	1,010
6	107	64	18	256	210	145	634	300	514
7	123	61	20	320	300	259	640	260	449
8	115	60	19	434	600	a703	660	330	588
9	107	170	49	592	1,130	1,810	750	330	668
10	101	250	68	579	1,180	1,840	860	550	1,280
11	104	100	28	565	1,090	1,660	978	470	1,240
12	95	22	6	504	960	1,310	962	390	1,010
13	92	16	4	504	950	1,290	776	254	532
14	92	35	9	541	924	1,350	702	170	322
15	88	60	14	579	900	1,410	647	136	238
16	92	82	20	565	820	1,250	606	110	180
17	98	50	13	456	490	603	620	250	418
18	111	50	15	384	422	438	761	320	658
19	127	61	21	394	400	a426	866	460	1,080
20	135	65	24	394	400	a426	1,010	460	1,250
21	143	80	31	414	400	a447	1,030	390	1,080
22	143	120	46	579	1,310	2,050	914	280	691
23	143	75	29	761	1,690	3,470	914	180	444
24	139	100	38	835	1,700	3,830	746	120	242
25	139	100	38	717	1,480	2,870	675	63	115
26	162	90	39	647	1,180	2,060	541	63	92
27	157	90	38	776	1,020	2,140	541	61	89
28	162	59	26	1,600	11,200	48,400	517	67	94
29	157	66	28	1,760	9,850	46,800	480	68	88
30	172	74	34	1,620	8,750	38,300	468	110	139
31	--	--	--	1,530	5,550	22,900	--	--	--
Total	3,684	--	814	19,225	--	188,416	24,192	--	41,931

a Computed from estimated concentration graph.

DOLORES RIVER BASIN--Continued

DOLORES RIVER NEAR CISCO, UTAH--Continued

Suspended sediment, March to September 1951--Continued

Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	456	79	97	127	--	b 32	198	15,000	8,020
2	414	50	56	115	--	b 24	119	13,000	4,180
3	364	--	b 45	183	--	b 100	100	7,000	1,890
4	354	--	b 40	412	--	b 1,200	95	4,000	1,030
5	336	--	b 35	364	--	b 850	92	1,760	437
6	304	--	b 30	230	--	b 200	90	400	97
7	279	--	b 25	167	--	b 75	90	340	83
8	250	--	b 20	152	--	b 60	85	290	67
9	244	--	b 18	157	--	b 65	80	227	49
10	224	--	b 15	139	--	b 33	76	230	47
11	198	--	b 12	127	--	b 32	72	167	32
12	183	--	b 10	115	80	25	69	130	24
13	162	--	b 8	107	60	17	67	124	22
14	152	--	b 6	98	80	21	69	100	19
15	127	13	4	85	90	21	67	100	18
16	123	24	8	82	100	22	53		
17	123	16	5	79	90	19	47		
18	107	23	7	76	75	15	43		
19	111	25	7	74	80	16	40	47	5
20	107	28	8	76	100	21	35		
21	119	55	18	218	2,080	s 1,400	35		
22	127	24	8	188	7,850	s 6,440	34		
23	139	50	19	230	8,500	5,280	32		
24	139	40	15	147	3,000	1,190	33		
25	135	60	22	172	4,000	1,860	39		
26	131	90	32	104	1,280	359	36	65	6
27	107	73	21	107	904	261	32		
28	95	144	37	98	770	204	31		
29	115	--	b 24	349	--	b 50,000	34		
30	111	--	b 22	711	--	b 150,000	36		
31	127	--	b 32	492	--	b 50,000	--	--	--
Total	5,963	--	706	5,781	--	269,842	1,929	--	16,098

Total discharge for period (cfs-days) 63,903

Total load for period (tons) ..... c 518,766

s Computed by subdividing day.

b Computed from water-sediment discharge curves.

c Includes estimated loads for missing days.

DOLORES RIVER BASIN--Continued

DOLORES RIVER NEAR CISCO, UTAH--Continued

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

Date of collection	Time	Water discharge (cfs)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
May 7, 1951	3:30 p.m.	336	357	786	68	71	77	90	96	99	--					BWCM
May 27	6:40 a.m.	661	655	725	--	68	--	91	--	--	--					PWCM
June 1	6:00 a.m.	1,530	3,480	4,040	--	42	--	65	--	--	--					PWCM
June 13	11:30 a.m.	761	406	695	48	54	62	70	77	81	88	93		98		BSWCM
Aug. 21	3:50 p.m.	237	1,430	2,020	--	56	--	92	--	99	100					PSWCM
Aug. 22	8:00 a.m.	143	2,950	3,390	--	64	--	98	--	100	--					PSWCM
Aug. 22	6:40 p.m.	224	11,000	2,280	--	76	--	97	--	100	--					PSWCM
Aug. 23	8:00 a.m.	230	3,640	4,015	--	81	--	95	--	--	--					PWCM

COLORADO RIVER NEAR CISCO, UTAH

LOCATION.--At gaging station, 1 mile downstream from Dolores River, 11 miles south of Cisco, Grand County.
DRAINAGE AREA.--24,100 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: August 1928 to September 1951.
Water temperatures: April 1949 to September 1951.
Sediment records: May 1930 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 1,820 ppm Oct. 12, 17-20; minimum, 295 ppm June 21-30.
Hardness: Maximum, 828 ppm Oct. 12, 17-20; minimum, 170 ppm June 21-30.
Specific conductance: Maximum daily, 2,370 micromhos Oct. 20; minimum daily, 396 micromhos May 31.
Water temperatures: Maximum observed, 76°F July 16, 28, 31; minimum, freezing point Jan. 6-7, 9.
Sediment concentrations: Maximum daily, 30,000 ppm Aug. 30; minimum daily, 20 ppm Nov. 5, Dec. 20, Apr. 15-16.
Sediment loads: Maximum daily, 559,000 tons Aug. 29; minimum daily, 84 tons Apr. 16.
EXTREMES, 1928-51.--Dissolved solids: Maximum, 2,670 ppm Aug. 11-20, 1940; minimum, 202 ppm June 11-20, 1933.
Hardness (1928-35, 1943-51): Maximum, 1,090 ppm Sept. 1-10, 1934; minimum, 132 ppm June 11-20, 1933
Specific conductance (1941-51): Maximum daily, 4,100 micromhos Sept. 30, 1946; minimum daily, 340 micromhos May 29, 1942.
Water temperatures (1949-51): Maximum observed, 81°F Aug. 5, 1949; minimum, freezing point on several days during winter months.
Sediment concentrations (1930-51): Maximum daily, 50,300 ppm Sept. 24, 1931; minimum daily, 14 ppm Nov. 21, 1949.
Sediment loads (1930-51): Maximum daily, 2,790,000 tons Oct. 14, 1941; minimum daily, 84 tons Apr. 16, 1951.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Oct. 1, 9-10, 1950 ..	2,183		12		165	79	220		202	755	185		8.6		1,600	2.18	9,430	736	571	39	2,130	--
Oct. 12, 17-20.....	1,932		12		187	88	244		228	872	200		9.5		1,820	2.48	9,490	828	642	39	2,370	--
Oct. 21-25.....	1,954		11		180	84	253		236	810	220		9.6		1,780	2.42	9,390	794	601	41	2,360	--
Nov. 1-10	2,173		12		160	71	244		232	690	220		11		1,630	2.22	9,560	691	501	43	2,220	--
Nov. 11-20	2,825		15		155	66	204		232	638	190		7.9		1,440	1.96	10,980	658	400	40	1,990	--
Nov. 21-30	3,137		14		142	56	185		226	565	165		7.8		1,300	1.77	11,010	585	400	41	1,780	--
Dec. 1-10	2,687		14		137	59	205		232	575	195		8.0		1,380	1.88	10,010	584	394	43	1,880	--
Dec. 11-20	3,010		13		125	53	188		222	517	180		7.8		1,260	1.71	10,240	530	348	44	1,740	--
Dec. 21-31	2,495		14		121	55	195		216	484	190		8.2		1,220	1.66	8,220	528	351	45	1,760	--
Jan. 1-10, 1951.....	2,369		15		122	56	218		221	489	228		8.7		1,310	1.78	8,380	535	354	47	1,870	--
Jan. 11-20	2,279		16		124	56	226		229	486	235		9.7		1,310	1.78	8,060	540	352	48	1,910	--
Jan. 21-22, 24.....	a2,753		--		--	--	--		--	--	--		--		1,140	1.55	8,470	--	--	--	1,710	--
Feb. 10-19	2,973		12	0.03	100	44	178		196	402	188		8.8		1,070	1.46	8,590	430	270	47	1,600	7.6
Feb. 20-28	2,722		14		108	45	181		206	409	205		6.6		1,100	1.50	8,080	454	286	46	1,620	--
Mar. 2, 6, 8-10.....	2,700		15		108	46	189		209	432	193		6.4		1,130	1.54	8,240	458	287	47	1,660	--
Mar. 11-20.....	2,639		14		100	43	173		196	391	176		6.3		1,050	1.43	7,480	426	266	47	1,570	--
Mar. 21-31.....	2,607		11		97	44	169		190	380	187		6.3		1,040	1.41	7,320	423	268	46	1,560	--

a Not included for computation of weighted averages.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR CISCO, UTAH--Continued

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Apr. 1-10, 1951	2,520		13		100	43	164		190	377	169		6.5		999	1.36	6,800	426	271	46	1,500	--
Apr. 11-20	1,924		10		104	46	189		186	422	197		6.5		1,110	1.51	5,770	448	296	48	1,650	--
Apr. 21-30	4,268		15		83	32	110		174	252	111		5.0		728	.99	8,390	338	196	41	1,100	--
May 1-7.....	a 5,024		--		--	--	--		--	--	--		--		671	.91	9,100	--	--	--	1,030	--
May 11-20.....	10,160		14		58	19	50		132	142	42		4.1		437	.59	11,990	222	114	33	641	--
May 21-31	a 19,900		--		--	--	--		--	--	--		--		334	.45	17,950	--	--	--	523	--
June 1-10	17,810		18		52	14	34		134	111	26		1.7		332	.45	15,960	187	77	28	512	--
June 11-20	18,330		16		52	15	34		128	120	25		1.9		336	.46	16,630	191	86	28	517	--
June 21-30	23,010		16		48	12	28		118	99	24		1.4		295	.40	18,330	170	73	26	457	--
July 1, 5-10	12,180		15		52	16	43		112	144	39		1.8		386	.52	12,690	196	104	32	588	--
July 11, 13, 15-16, 20	7,342		15		65	24	65		130	214	56		2.5		531	.72	10,530	260	154	35	794	--
July 22-26, 31	6,582		17		90	29	81		149	298	62		4.1		688	.94	12,230	344	222	34	996	--
Aug. 1-4, 9	5,048		15		101	36	109		170	342	96		4.0		822	1.12	11,200	400	260	37	1,200	7.6
Aug. 11-20	2,662		14		131	56	155		180	549	125		6.7		1,170	1.59	8,410	558	410	38	1,600	7.6
Aug. 21-31	3,425		15		177	59	174		208	677	134		6.3		1,410	1.92	13,040	684	514	36	1,860	7.5
Sept. 1-10	2,750		14		154	59	183		204	614	138		6.7		1,330	1.81	9,880	626	460	39	1,770	7.5
Sept. 11-20	1,733		14		184	80	228		208	818	175		9.4		1,680	2.28	7,860	788	618	39	2,180	7.7
Sept. 21-30.....	2,086		12		180	80	217		208	790	163		10		1,630	2.22	9,230	778	608	38	2,120	7.8
Weighted average ..	b 5,152		15		85	32	99		159	291	90		4.3		726	0.99	10,100	344	213	38	1,040	--

a Not included for computation of weighted averages.

b Represents 74 percent of the runoff for water year October 1950 to September 1951.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR CISCO, UTAH--Continued

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

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

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR CISCO, UTAH--Continued

Suspended sediment, water year October 1950 to September 1951

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	2,350	332	2,110	1,930	45	234	2,660	200	1,440
2	2,220	300	a 1,800	2,110	50	a 285	2,800	200	1,510
3	2,200	270	a 1,600	2,040	35	193	2,740	150	a 1,110
4	2,400	260	a 1,680	2,140	30	a 173	2,810	100	759
5	2,370	240	a 1,540	2,030	20	110	2,660	60	431
6	2,320	210	a 1,320	2,300	50	310	2,520	30	204
7	2,300	180	a 1,120	2,440	110	725	2,520	25	170
8	2,190	140	a 828	2,200	70	416	2,520	45	306
9	2,110	110	627	2,200	60	297	2,590	80	559
10	2,090	100	564	2,340	40	253	3,050	70	576
11	1,980	100	a 535	2,500	30	202	3,070	107	887
12	1,700	110	505	2,690	40	291	3,070	99	821
13	1,820	120	a 590	2,690	70	508	2,960	80	639
14	1,990	130	a 698	2,830	70	535	2,800	70	529
15	1,770	120	a 573	2,590	70	490	2,850	50	385
16	1,780	110	a 529	2,920	90	a 710	3,190	60	517
17	1,800	100	486	2,900	80	626	3,260	85	748
18	2,140	140	809	2,810	70	531	3,250	50	439
19	1,980	100	535	2,940	1,100	a 8,730	2,990	60	484
20	2,040	100	551	3,380	5,430	49,600	2,680	20	144
21	1,990	90	484	3,570	1,500	14,500	2,740	42	311
22	1,980	90	481	3,250	400	3,510	2,830	72	550
23	1,860	80	402	3,230	270	2,530	2,760	80	596
24	1,980	70	a 374	3,550	260	2,490	2,560	40	276
25	1,960	60	318	3,470	190	1,780	2,450	40	a 265
26	2,010	60	326	3,080	100	832	2,420	30	196
27	1,700	50	230	2,850	150	1,150	2,280	30	185
28	1,780	50	240	2,990	400	a 3,230	2,220	30	180
29	2,040	45	248	2,740	210	1,550	2,250	35	213
30	2,090	45	a 254	2,640	236	1,680	2,470	45	300
31	2,200	55	a 327	--	--	--	2,470	26	173
Total	63,140	--	22,684	81,350	--	98,291	84,420	--	15,903
	January			February			March		
1	2,640	54	385	1,600	140	a 605	2,440	280	1,840
2	2,690	56	407	1,400	146	552	2,660	320	a 2,300
3	2,400	48	311	1,600	200	864	2,660	250	a 1,800
4	2,300	54	335	1,900	200	a 1,030	2,640	200	a 1,430
5	2,370	50	320	2,300	200	a 1,240	2,760	100	745
6	2,730	58	428	2,950	1,050	8,360	2,640	80	570
7	2,490	33	222	3,300	750	a 6,680	2,320	60	376
8	2,200	42	249	3,600	500	a 4,860	2,640	160	1,140
9	2,070	52	291	3,300	400	a 3,560	2,710	610	4,460
10	1,800	50	a 243	3,200	300	2,590	2,850	600	4,620
11	1,780	68	327	3,300	260	2,320	2,800	374	2,830
12	2,190	110	650	3,400	250	2,300	2,830	366	2,80(
13	2,200	78	463	3,250	232	2,040	2,810	350	2,660
14	2,250	80	a 486	3,000	212	1,720	2,560	200	1,380
15	2,300	82	509	2,750	149	1,110	2,450	150	992
16	2,270	94	576	2,650	168	1,200	2,800	111	839
17	2,250	160	972	2,570	236	1,640	2,710	88	644
18	2,350	160	a 1,020	2,740	200	a 1,480	2,540	60	411
19	2,500	160	1,080	2,760	172	1,330	2,610	50	352
20	2,700	119	868	2,960	175	1,400	2,280	40	246
21	2,700	137	999	2,660	161	1,160	2,300	35	217
22	2,780	110	a 826	2,500	220	1,480	2,400	30	194
23	2,800	100	756	2,680	150	1,090	2,760	35	261
24	2,780	130	976	2,800	130	983	2,730	55	405
25	2,810	130	a 986	2,730	128	943	2,620	61	432
26	3,010	130	a 1,060	2,810	148	1,120	2,520	50	340
27	3,140	140	a 1,190	2,800	140	a 1,060	2,520	41	279
28	2,980	130	a 1,050	2,560	140	a 968	2,570	47	326
29	3,030	140	a 1,150	--	--	--	2,740	100	740
30	2,500	130	a 878	--	--	--	2,900	180	1,410
31	2,000	140	a 756	--	--	--	2,620	152	1,080
Total	77,010	--	20,769	76,180	--	55,685	81,390	--	38,119

a Computed from estimated concentration graph.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR CISCO, UTAH--Continued

Suspended sediment, water year October 1950 to September 1951--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day
1	2,620	114	806	6,220	980	16,500	25,500	700	48,200
2	2,620	131	927	5,850	950	15,000	24,900	1,050	70,600
3	2,490	126	847	5,170	570	7,960	21,500	1,100	63,900
4	2,250	60	364	4,430	260	3,110	18,200	915	45,000
5	2,220	60	360	3,950	190	2,030	15,700	500	21,200
6	2,500	210	1,420	4,190	320	3,620	14,200	500	19,200
7	2,830	220	1,680	5,360	400	5,790	13,400	400	a 14,500
8	2,710	110	805	7,430	680	a 13,600	18,800	400	14,900
9	2,590	110	769	9,270	1,110	a 27,800	15,100	240	9,780
10	2,370	80	512	9,690	1,200	a 31,400	15,800	190	8,110
11	1,950	55	290	9,630	1,220	a 31,700	16,200	310	13,600
12	1,960	40	212	9,720	1,250	32,800	16,000	400	17,300
13	1,800	40	194	10,300	1,250	34,800	14,700	300	11,900
14	1,700	30	138	10,500	1,110	31,500	14,300	192	7,410
15	1,640	20	89	10,400	900	25,300	15,000	200	8,100
16	1,560	20	84	9,360	720	18,200	16,000	200	8,640
17	1,640	25	a 111	9,040	550	13,400	18,200	210	10,300
18	1,960	30	159	9,780	551	14,500	22,000	940	55,800
19	2,390	100	645	11,000	1,300	a 38,600	25,100	1,150	77,900
20	2,640	100	713	11,900	1,800	a 57,800	25,800	1,560	109,000
21	2,900	110	861	14,300	2,820	109,000	27,700	1,980	148,000
22	3,170	138	1,180	15,900	2,820	121,000	28,400	1,130	86,600
23	3,950	171	1,820	16,300	2,080	91,500	28,800	1,100	a 85,500
24	3,760	297	3,020	16,200	1,400	61,200	25,400	770	52,800
25	3,680	430	4,270	16,600	1,340	60,100	21,900	470	27,800
26	4,510	500	6,090	16,600	1,500	67,200	20,500	200	11,100
27	5,080	900	12,300	18,000	1,360	66,100	20,700	174	9,720
28	5,230	1,170	16,500	22,100	1,510	90,100	20,200	350	a 19,100
29	4,970	870	11,700	27,400	3,400	252,000	19,000	420	21,500
30	5,430	800	11,700	29,100	4,000	a 314,000	17,500	230	10,900
31	--	--	--	26,400	1,850	132,000	--	--	--
Total	87,120	--	80,566	382,090	--	1,789,610	591,500	--	1,108,360

Day	July			August			September		
1	16,600	160	7,170	4,890	410	5,410	4,800	8,000	104,000
2	15,700	120	a 5,090	4,810	450	5,840	3,700	4,200	a 42,000
3	14,000	110	a 4,160	4,870	600	7,890	3,250	2,000	a 17,600
4	13,600	130	a 4,770	5,780	3,200	49,900	2,900	800	6,260
5	13,400	210	7,600	7,720	3,500	73,000	2,600	540	3,790
6	12,700	220	7,540	6,860	3,300	a 61,100	2,400	340	2,200
7	11,400	230	7,080	6,060	1,330	a 21,800	2,110	269	1,530
8	10,900	200	5,890	5,500	610	a 9,060	1,980	266	1,420
9	10,500	130	3,690	4,890	360	4,750	1,920	200	1,040
10	9,750	180	4,740	4,470	300	a 3,620	1,840	169	840
11	9,040	168	4,100	4,050	250	a 2,730	1,750	180	850
12	8,030	100	2,170	3,700	210	2,100	1,590	180	773
13	7,460	80	1,610	3,280	189	1,670	1,630	160	704
14	7,100	60	a 1,150	2,590	170	1,190	1,560	108	455
15	6,640	50	896	2,440	250	1,650	1,630	100	440
16	6,340	110	1,880	2,340	250	1,580	1,750	100	472
17	6,080	150	2,460	2,200	100	594	1,750	56	265
18	6,400	105	1,810	2,110	60	342	1,840	67	333
19	7,000	190	3,590	1,980	59	315	1,870	80	404
20	7,230	1,490	29,100	1,930	57	297	1,960	64	339
21	7,180	3,080	59,700	2,150	730	4,240	2,060	140	779
22	6,880	700	13,000	2,370	1,590	10,200	1,990	66	355
23	7,530	1,830	37,200	2,760	980	7,300	1,990	80	a 430
24	7,300	1,390	27,400	2,980	838	6,740	2,140	80	462
25	6,690	370	6,680	3,010	720	5,850	2,190	90	532
26	5,970	257	4,140	2,740	820	6,070	2,140	96	555
27	5,250	200	a 2,640	2,690	820	5,960	2,010	53	288
28	4,870	310	a 4,080	2,620	630	4,460	1,950	50	263
29	5,190	675	a 9,460	5,410	22,400	s 559,000	2,030	125	685
30	5,060	820	a 11,200	6,640	30,000	538,000	2,470	970	6,470
31	5,120	710	a 9,820	4,300	16,800	195,000	--	--	--
Total	266,910	--	292,016	120,140	--	1,597,658	65,800	--	196,534

Total discharge for year (cfs-days) 1,977,050
Total load for year (tons) 5,316,195

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

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR CISCO, UTAH--Continued

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

Date of collection	Time	Water discharge (cfs)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Apr. 25, 1951	5:00 p.m.	3,780	666	1,480	30	37	46	54	67	83	96	100		--		BWCM
May 13	7:55 a.m.	10,300	1,030	1,480	17	23	25	36	53	70	75	82		89		BSWCM
May 23	6:40 a.m.	16,600	1,850	2,380	17	23	31	38	48	58	76	85		100		BSWCM
June 2	10:30 a.m.	25,400	1,100	1,490	22	25	35	40	49	60	76	95		99		BSWCM
June 18	1:00 p.m.	22,900	650	1,270	20	24	26	37	56	77	--	--		--		BWCM
June 22	11:15 a.m.	28,700	865	865	--	--	--	--	--	57	71	89		100		S
July 16	7:00 p.m.	6,380	880	1,930	--	50	--	75	--	98	--	--		--		PSWCM
July 21	6:45 a.m.	7,100	2,370	2,320	--	62	--	95	--	--	--	--		--		PWCM
Aug. 3	6:30 p.m.	4,870	455	663	45	49	58	63	69	74	92	98		100		BSWCM
Aug. 4	4:00 p.m.	6,270	1,810	2,620	--	51	--	75	--	87	97	99		100		PSWCM
Aug. 5	8:00 a.m.	7,850	1,720	612	--	11	--	28	--	33	--	--		--		PWCM
Aug. 22	9:45 a.m.	2,300	948	1,880	--	71	--	85	--	91	96	99		100		PSWCM
Aug. 29	2:45 p.m.	7,660	29,100	2,880	--	51	--	78	--	99	99	100		--		PSWCM
Aug. 29	6:20 p.m.	10,900	45,700	2,320	--	41	--	71	--	95	99	100		--		PSWCM
Aug. 30	5:10 p.m.	7,030	19,800	1,960	--	35	--	80	--	98	--	--		--		PSWCM

GREEN RIVER NEAR GREEN RIVER, WYO.

LOCATION.--At bridge on Green River-Linwood highway, about 1 mile upstream from gaging station near Green River, Sweetwater County, which is a quarter of a mile downstream from Bitter Creek, 1 mile southeast of Green River, and 4 miles upstream from high-water line of proposed Flaming Gorge Reservoir.
DRAINAGE AREA.--10,000 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: May to September 1951.
Water temperatures: May to September 1951.
Sediment records: May to September 1951.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge from April to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
May 5-10, 1951	3,102	--	--	--	--	--	--	--	--	--	--	--		314	0.43	2,630	--	--	--	503	--	--
May 11-20	4,151	10	--	52	16	19	--	204	71	4.2	--	0.3		272	.37	3,050	196	28	17	440	--	--
May 21-31	7,904	--	--	--	--	--	--	--	--	--	--	--		229	.31	4,890	--	--	--	377	--	--
June 1-10	9,885	--	--	--	--	--	--	--	--	--	--	--		222	.30	5,930	--	--	--	363	--	--
June 11-20	7,122	9.6	--	41	14	14		169	46	3.2	--	.3		217	.30	4,170	160	22	16	358	7.7	--
June 21-30	9,601	--	--	--	--	--	--	--	--	--	--	--		182	.25	4,720	--	--	--	303	--	--
July 1-10	6,480	9.3	0.01	35	12	12	2.7	148	37	2.4	0.3	4.5		182	.25	3,180	137	16	16	307	7.4	5
July 11-20	5,384	9.1	.01	36	13	13	3.0	152	40	2.6	.3	4.2		191	.26	2,780	144	19	13	323	7.4	5
July 21-31	5,227	8.1	.02	35	13	14	3.4	149	43	3.0	.3	4.7		189	.26	2,670	141	19	17	322	7.6	5
Aug. 1-10	4,910	7.8	.04	36	12	14	2.9	145	47	3.2	.3	4.5		190	.26	2,520	140	20	18	324	7.6	5
Aug. 11-20	3,063	6.5	.02	36	13	18	1.6	135	62	2.8	.3	.4		204	.28	1,690	144	33	21	338	7.5	5
Aug. 21-31	2,290	7.3	.03	42	15	24	1.9	151	85	4.0	.2	.6		249	.34	1,540	166	43	24	407	7.5	5
Sept. 1-10	1,976	7.3	.02	45	16	29	1.9	158	101	5.0	.2	.6		286	.39	1,530	178	49	26	449	7.7	5
Sept. 11-20	1,365	6.8	.03	47	19	32	2.1	158	121	6.0	.2	.2		313	.43	1,150	196	66	26	490	7.8	5
Sept. 21-30	1,262	7.9	.03	52	20	38	2.9	168	142	6.0	.2	.2		359	.49	1,220	212	74	28	549	8.1	5

GREEN RIVER BASIN--Continued

GREEN RIVER NEAR GREEN RIVER, WYO.--Continued

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

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

GREEN RIVER BASIN--Continued

GREEN RIVER NEAR GREEN RIVER, WYO.--Continued

Suspended sediment, May to September 1951

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1				3,680	--	e2,000	13,100	518	18,300
2				3,450	--	e1,300	13,500	326	11,900
3				3,040	--	e800	13,500	370	13,500
4				2,700	--	e500	12,600	277	9,420
5				2,490	50	336	11,000	224	6,650
6				2,440	80	527	9,260	279	6,980
7				2,860	150	1,160	7,760	232	4,860
8				3,410	216	1,990	6,700	197	3,560
9				3,680	253	2,510	5,910	181	2,890
10				3,730	226	2,280	5,520	220	3,280
11				3,730	294	2,960	5,120	200	2,760
12				3,800	199	2,040	5,020	195	2,640
13				4,020	280	3,040	5,000	130	1,760
14				4,400	435	5,170	5,250	120	1,700
15				4,380	400	4,730	5,800	175	2,740
16				4,280	300	3,470	6,640	210	3,760
17				4,140	380	4,250	7,570	270	5,520
18				4,140	310	3,470	8,720	380	8,950
19				4,190	212	2,400	10,200	400	11,000
20				4,430	220	2,630	11,900	270	8,680
21				4,950	470	6,280	12,200	258	8,500
22				5,430	680	9,970	12,200	235	7,740
23				5,820	664	10,400	11,900	240	7,710
24				6,200	590	9,880	11,000	175	5,200
25				6,580	580	10,300	10,100	130	3,550
26				7,150	600	11,600	8,980	150	3,640
27				8,050	664	14,400	8,140	137	3,010
28				8,780	540	12,800	7,500	154	3,120
29				9,680	510	13,300	7,060	124	2,360
30				11,500	530	16,500	6,930	123	2,300
31				12,800	455	15,700	--	--	--
Total				159,930	--	178,693	266,080	--	177,980

	July			August			September		
1	6,960	112	2,100	4,820	65	846	2,190	250	1,480
2	6,900	140	2,610	4,750	45	577	2,510	390	2,640
3	6,740	130	2,370	4,750	38	487	2,280	1,120	6,890
4	6,450	120	2,090	5,000	180	2,430	2,120	240	1,370
5	6,170	95	1,580	5,120	510	7,050	2,010	129	700
6	6,140	85	1,410	5,330	190	2,730	1,900		
7	6,320	80	1,370	5,230	96	1,360	1,770		
8	6,450	78	1,360	4,950	71	949	1,730	35	166
9	6,380	73	1,260	4,700	50	634	1,650		
10	6,290	80	1,360	4,450	43	517	1,600		
11	6,170	67	1,120	4,210	40	455	1,510		
12	6,080	73	1,200	3,850	40	416	1,440	16	63
13	6,290	70	1,190	3,500	50	472	1,400		
14	6,170	69	1,150	3,220	49	426	1,390		
15	5,490	82	1,220	2,990	58	468	1,380		
16	5,000	90	1,210	2,860	48	371	1,360		
17	4,720	91	1,160	2,740	37	274	1,340	13	47
18	4,800	103	1,280	2,580	39	272	1,300		
19	4,600	91	1,130	2,420	29	189	1,280		
20	4,720	80	1,020	2,260	30	183	1,250		
21	4,920	67	890	2,210	21	125	1,240		
22	5,600	95	1,440	2,240	31	187	1,240	14	47
23	6,080	165	2,710	2,300	50	310	1,240		
24	6,050	123	2,010	2,460	70	465	1,270		
25	5,710	80	1,230	2,560	140	968	1,280		
26	5,120	67	926	2,490	70	471	1,290		
27	4,780	70	903	2,420	40	261	1,270		
28	4,620	55	686	2,280	25	154	1,260	9	31
29	4,780	61	787	2,120	24	137	1,260		
30	4,920	60	797	2,030	24	132	1,270		
31	4,920	69	917	2,080	60	337	--	--	--
Total	176,140	--	42,486	104,920	--	24,653	46,030	--	14,715

Total discharge for period (cfs-days) 753,100
Total load for period (tons) 438,500

e Estimated.

GREEN RIVER BASIN--Continued

GREEN RIVER NEAR GREEN RIVER, WYO.--Continued

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

Date of collection	Time	Water discharge (cfs)	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
May 11, 1951	10:30 a.m.	3,750	315							3	38	82		91		S
May 29	9:15 a.m.	9,460	376							45	56	75		96		S
June 11	9:00 a.m.	5,150	130							44	68	88		96		S
June 22	9:20 a.m.	12,200	237							38	48	64		95		S
July 1	9:45 a.m.	6,960	148							22	32	46		84		S
July 9	9:15 a.m.	6,380	82							30	54	75		96		S
July 21	7:45 a.m.	4,880	59							31	43	59		89		S
Aug. 3	9:30 a.m.	4,750	39							63	74	83		95		S
Aug. 10	7:15 a.m.	4,450	50							53	71	81		89		S
Aug. 19	8:30 a.m.	2,440	22							58	73	78		98		S
Aug. 29	7:45 a.m.	2,140	26							48	74	89		98		S
Sept. 9	7:15 a.m.	1,670	25							68	78	88		96		S

BLACKS FORK NEAR GREEN RIVER, WYO.

LOCATION.--At county highway bridge about 75 yards downstream from gaging station, which is 200 feet downstream from Dry Creek, 14.3 miles (revised) upstream from mouth, and 12.5 miles southwest of Green River, Sweetwater County.
DRAINAGE AREA.--3,670 square miles.
RECORDS AVAILABLE.--Chemical analyses: March to September 1951.
Water temperatures: March to September 1951.
EXTREMES, March to September 1951.--Dissolved solids: Maximum, 1,730 ppm Sept. 21-22, 24-30; minimum, 329 ppm May 21, 28-29, 31.
Hardness: Maximum, 730 ppm Sept. 21-22, 24-30; minimum, 164 ppm May 21, 28-29, 31.
Specific conductance: Maximum daily, 2,330 micromhos Sept. 29-30; minimum daily, 482 micromhos June 2.
Water temperatures: Maximum, 74°F July 23.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 13-17, 19-20, 1951	180	10	0.05	101	39	111	10	269	324	70	0.2	1.1		838	1.14	407	412	192	36	1,230	7.5	6
Mar. 21-24, 26-31	679	13	.15	64	20	86	7.6	211	188	44	.2	.7		547	.74	1,000	242	68	43	839	7.7	10
Apr. 2-7, 9-10	999	11	.09	58	22	55	6.4	212	140	35	.4	.8		438	.60	1,180	235	62	33	689	7.6	20
Apr. 11-14,16-20	1,019	9.6	.05	58	19	32	5.2	214	95	19	.4	1.5		351	.48	966	222	47	23	559	7.5	20
Apr. 21, 23-28, 30.	927	12	.04	62	19	34	8.6	226	92	23	.2	1.1		358	.49	896	232	48	23	582	7.7	10
May 1-5, 7-10	847	12	.03	69	22	39	8.0	246	112	27	.2	.6		408	.55	933	262	61	24	656	7.5	10
May 11-12, 14-19	1,239	13	.04	58	17	34	10	219	91	18	.2	.8		345	.47	1,150	214	35	25	560	7.8	10
May 21, 28-29, 31	2,578	15	.05	44	13	47	6.6	191	81	19	.3	.9		329	.45	2,290	164	7	37	513	7.9	10
May 22-26	1,880	15	.03	63	20	64	7.4	232	140	36	.2	1.2		460	.63	2,330	239	49	36	718	7.8	10
June 1-2, 4-9	2,085	14	.06	64	19	48	2.6	224	117	25	.2	.4		398	.54	2,240	238	54	30	614	7.6	25
June 11-16, 18-20	926	13	.05	78	23	65	2.6	241	170	35	.2	.3		517	.70	1,290	289	92	33	783	7.5	20
June 21-23, 25-30	917	14	.05	80	25	70	4.0	250	188	35	.4	.5		550	.75	1,360	302	98	33	814	7.6	15
July 2-3, 5-7, 9-10.	359	13	.06	100	37	115	4.4	261	347	50	.5	.6		831	1.13	805	402	188	38	1,160	7.8	20
July 11-14, 16-20	147	12	.07	112	47	157	4.8	243	509	62	.4	.4		1,080	1.48	429	473	274	42	1,460	7.7	20
July 23-24, 27-29,31	206	17	.09	116	46	208	5.4	242	578	94	.6	.6		1,240	1.69	690	478	280	48	1,680	7.9	20
Aug. 1 a	412	22	--	--	--	--	--	256	745	91	--	2.0		--	--	--	b 566	356	--	1,950	--	--
Aug. 2-3, 6-10	395	32	.03	90	29	170	5.8	272	389	59	.7	1.2		915	1.24	976	344	120	51	1,290	8.0	10
Aug. 4 a	821	39	--	--	--	--	--	329	84	24	--	.8		--	--	--	--	--	--	713	--	--
Aug. 11, 13-18, 20	154	12	.03	104	47	157	4.2	227	493	61	.6	.8		1,020	1.39	424	453	267	43	1,390	8.0	10
Aug. 21-23, 25, 27-31	109	12	.03	110	50	165	5.8	208	553	60	.5	1.0		1,090	1.48	321	480	310	42	1,480	8.0	10
Aug. 24 a	189	20	--	--	--	--	--	201	554	30	--	1.2		--	--	--	b 216	52	--	890	--	--

a Not included for computation of weighted averages.
b Determined by Schwarzenbach method.

GREEN RIVER BASIN--Continued

BLACKS FORK NEAR GREEN RIVER, WYO.--Continued

Chemical analyses, in parts per million, March to September 1951--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Sept. 1, 5-8, 10, 1951	89.2	11	0.04	108	46	197	5.2	202	603	70	0.6	1.1		1,170	1.59	282	458	293	48	1,600	8.0	10
Sept. 4 a	149	15	--	--	--	--	--	191	279	36	--	1.3		--	--	--	b 224	68	--	934	--	--
Sept. 11-15, 17-20.	35.0	11	.13	132	64	226	8.0	211	745	90	.6	.5		1,440	1.96	136	592	420	45	1,880	7.2	20
Sept. 21-22, 24-30.	22.8	8.9	.10	156	83	260	6.8	205	933	106	.6	.3		1,730	2.35	106	730	562	43	2,190	7.2	20
Weighted average	c 691	13	0.06	68	22	63	6.0	226	162	32	0.3	0.8		486	0.66	907	260	75	34	737	--	--

a Not included for computation of weighted averages.
b Determined by Schwarzenbach method.
c Represents 74 percent of the runoff for water year October 1950 to September 1951.

GREEN RIVER BASIN--Continued

BLACKS FORK NEAR GREEN RIVER, WYO.--Continued

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

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

HENRYS FORK AT LINWOOD, UTAH

LOCATION.--About 75 yards upstream from gaging station, which is in Sweetwater County, 300 feet north of Wyoming-Utah State line at Linwood, Daggett County, Utah.
DRAINAGE AREA.--531 square miles.
RECORDS AVAILABLE.--Chemical analyses: March to September 1951.
Water temperatures: March to September 1951.
EXTREMES, March to September 1951.--Dissolved solids: Maximum, 1,330 ppm Sept. 21-30; minimum, 445 ppm May 27-31.
Hardness: Maximum, 806 ppm Sept. 21-30; minimum, 305 ppm May 27-31.
Specific conductance: Maximum daily, 1,750 micromhos July 17; minimum daily, 492 micromhos May 30.
Water temperatures: Maximum, 65°F July 28.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C) Parts per million	Dissolved solids (residue at 180°C) Tons per acre-foot	Dissolved solids (residue at 180°C) Tons per day	Hardness as $CaCO_3$ Calcium, magnesium	Hardness as $CaCO_3$ Noncarbonate	Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
Mar. 13-20, 1951 ..	42.4	19	0.05	149	78	75	12	281	540	42	0.2	0.9		1,120	1.52	128	692	462	19	1,440	7.7	20
Mar. 21-31.....	71.3	21	.10	125	64	70	13	260	446	35	.3	1.4		954	1.30	184	575	362	20	1,270	7.7	13
Apr. 1-10.....	61.4	21	.04	116	62	66	8.0	260	412	32	.3	.7		888	1.21	147	544	332	21	1,200	7.8	10
Apr. 11-20	44.0	21	.04	124	67	68	8.4	270	439	37	.3	.4		942	1.28	112	585	364	20	1,250	7.7	10
Apr. 21-30	47.5	22	.04	134	76	79	11	295	507	42	.2	.2		1,070	1.46	137	647	406	21	1,380	7.9	10
May 1-10	31.7	24	.06	153	89	68	9.4	285	587	48	.4	.4		1,230	1.67	105	748	514	16	1,530	7.9	10
May 11-20	28.6	24	.05	152	90	77	10	263	617	52	.4	.6		1,250	1.70	97	749	534	18	1,570	7.9	25
May 21-26	99.2	29	.06	126	63	71	8.6	261	450	34	.4	1.2		918	1.25	246	574	360	21	1,200	7.8	15
May 27-31	329	25	.13	81	25	24	6.4	205	170	11	.3	.7		a445	.61	395	305	137	14	591	7.6	45
June 1-10	234	21	.10	86	36	33	6.8	217	230	16	.4	.7		a537	.73	339	362	184	16	729	7.6	30
June 11-20	200	22	.09	80	31	31	8.8	226	191	14	.5	2.9		496	.67	268	327	142	17	714	7.5	20
June 21-30	156	22	.04	84	35	36	7.6	229	225	16	.5	3.2		558	.76	235	354	166	18	782	7.7	20
July 1-10	58.4	25	.03	111	49	53	10	253	344	24	.5	2.9		768	1.04	121	478	271	19	1,040	7.8	20
July 11-20	6.4	27	.05	168	82	97	13	306	653	44	.6	2.4		1,270	1.73	22	756	506	21	1,580	7.8	20
July 21-31	78.5	28	.05	148	58	65	13	287	480	26	.6	3.0		988	1.34	209	608	373	18	1,270	7.8	20
Aug. 1 b	79.0	33	--	--	--	--	--	297	470	25	--	1.2		--	--	--	c582	338	24	1,300	--	--
Aug. 2-10	134	30	.14	109	40	49	8.4	268	284	18	.6	1.4		690	.94	250	436	217	19	934	7.9	25
Aug. 11-20	31.9	24	.08	128	56	60	8.2	260	409	26	.5	.5		864	1.18	74	550	337	19	1,150	7.9	20
Aug. 21-31	46.7	26	.03	128	55	55	7.2	274	389	25	.5	1.1		832	1.13	105	546	321	18	1,120	7.9	15
Sept. 1-10	53.8	25	.03	133	59	66	8.4	252	450	27	.5	.5		928	1.26	135	574	368	20	1,210	8.0	10
Sept. 11-20	19.9	23	.03	154	83	90	8.4	274	604	41	.5	.4		1,190	1.62	64	726	501	21	1,480	8.0	10
Sept. 21-30	16.5	24	.04	168	94	92	9.2	280	681	45	.5	.3		1,330	1.81	59	806	576	20	1,630	7.9	10
Weighted average..	d78.8	24	0.08	107	48	49	8.6	246	328	23	0.4	1.5		733	1.00	156	464	263	18	977	--	--

a Sum of determined constituents.
b Not included for computation of weighted averages.
c Determined by Schwarzenbach method.
d Represents 69 percent of the runoff for water year October 1950 to September 1951.

GREEN RIVER BASIN--Continued

HENRYS FORK AT LINWOOD, UTAH,--Continued

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

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

GREEN RIVER BASIN--Continued

YAMPA RIVER NEAR MAYBELL, COLO.

LOCATION.--At county bridge 1 mile north of Maybell, Moffat County, and about 3½ miles downstream from gaging station.
DRAINAGE AREA.--3,410 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: November 1950 to September 1951.
Water temperatures: November 1950 to September 1951.
Sediment records: December 1950 to September 1951.
EXTREMES, November 1950 to September 1951.--Dissolved solids: Maximum, 322 ppm Mar. 1-10; minimum, 72 ppm June 21-30.
Hardness: Maximum, 184 ppm Mar. 1-10; minimum, 45 ppm June 21-30, July 1-10.
Specific conductance: Maximum daily, 571 micromhos Mar. 7; minimum daily, 97.5 micromhos June 21.
Water temperatures: Maximum observed, 81°F July 30; minimum, freezing point on several days during December to March.
Sediment concentrations: Maximum daily, 6,000 ppm July 22; minimum daily, 2 ppm Jan. 21 to Feb. 4.
Sediment loads: Maximum daily, 20,100 tons July 22; minimum daily, 1 ton Jan. 21 to Feb. 4.
REMARKS.--Prior to Jan. 30, 1951, samples were collected at bridge on U.S. Highway 40, 100 feet upstream from gaging station. Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water Supply Paper 1213. No appreciable inflow between gaging station and sampling point.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Nov. 29-30, Dec. 1-10, 1950	257	13	0.03	39	17	37	3.4	173	70	22	0.4	0.1		273	0.37	189	168	26	32	466	7.7	10
Dec. 11-20	330	13	.04	37	16	36	3.1	166	67	20	.4	.4		261	.35	233	158	22	33	442	7.9	8
Dec. 21-31	227	13	.04	41	17	42	2.6	183	73	26	.4	.3		300	.41	184	172	22	34	502	7.9	8
Jan. 1-10, 1951	224	15	.04	42	17	42	3.3	191	72	27	.4	.3		302	.41	183	175	18	34	509	7.9	10
Jan. 11-20	246	15	.04	40	17	38	3.1	186	68	21	.4	.3		286	.39	190	170	18	32	475	7.9	8
Jan. 21-31	234	14	.03	39	16	37	3.0	182	67	22	.3	.6		282	.38	178	164	14	32	469	7.7	7
Feb. 1-10	258	14	.02	40	17	40	3.2	182	70	24	.3	.8		296	.40	206	170	21	33	486	7.7	8
Feb. 11-19	269	13	.05	39	17	41	3.7	176	81	23	.3	.4		300	.41	218	168	24	34	485	7.9	8
Feb. 20-28	278	13	.05	42	17	40	3.5	183	83	24	.3	.3		317	.43	238	175	25	33	511	7.8	10
Mar. 1-10	499	12	.06	47	16	40	5.6	175	94	21	.2	.6		322	.44	434	184	40	31	516	7.7	20
Mar. 11-20	509	12	.05	41	15	34	4.3	165	78	17	.5	.8		281	.38	386	164	29	30	460	7.9	15
Mar. 21-31	585	11	.07	40	16	35	4.3	166	86	15	.4	.7		289	.39	456	166	30	31	461	7.5	15
Apr. 1-10	1,097	13	.11	42	17	31	4.6	159	94	10	.4	3.3		299	.41	886	175	44	27	467	7.6	25
Apr. 11-20	1,318	15	.10	39	14	22	4.6	146	68	8.2	.5	3.4		250	.34	890	155	36	23	385	7.5	30
Apr. 21-30	3,141	13	.10	31	10	14	5.4	120	45	4.0	.6	2.5		194	.26	1,650	118	20	20	288	7.7	55
May 1-10	3,402	13	.09	26	8.3	9.7	3.6	104	31	3.5	.6	1.7		160	.22	1,470	99	14	17	234	7.8	45
May 11-20	5,017	12	.19	19	6.1	5.8	3.8	80	17	1.8	.6	.9		113	.15	1,530	72	7	14	161	7.2	40
May 21-31	7,440	11	.16	16	5.0	4.8	3.2	66	14	1.2	.6	1.0		94	.13	1,890	60	6	14	132	7.0	40
June 1-10	5,114	11	.15	14	4.6	5.5	2.7	60	14	2.0	.6	.8		89	.12	1,230	54	5	17	128	7.1	30
June 11-20	5,274	9.1	.11	13	4.6	5.2	2.9	58	13	1.8	.6	.7		82	.11	1,170	52	4	17	119	7.1	30
June 21-30	5,508	8.9	.11	11	4.2	4.6	2.7	52	9.5	1.8	.6	.8		72	.10	1,070	45	2	17	105	7.1	45

July 1-10	3,034	7.9	.08	11	4.2	5.1	2.0	50	12	3.5	.5	.6	75	.10	614	45	4	19	114	7.5	20
July 11-20	1,357	8.8	.04	16	5.9	8.7	2.4	70	18	7.4	.5	.7	107	.15	392	64	7	22	171	7.3	20
July 21-31	972	9.5	.07	25	8.1	13	4.0	104	29	9.9	.5	.6	161	.22	423	96	11	22	223	7.5	20
Aug. 1-10	692	6.0	.05	25	8.6	14	2.4	108	29	11	.5	.7	162	.22	303	98	10	23	267	7.8	20
Aug. 11-20	399	2.3	.04	28	11	20	4.4	128	30	16	.5	.9	192	.26	207	115	10	27	327	7.9	20
Aug. 21-31	346	5.1	.03	34	12	30	4.8	152	50	22	.3	1.0	231	.31	216	134	10	32	384	8.0	12
Sept. 1-10	308	9.3	.05	33	12	29	3.8	146	47	21	.3	.8	228	.31	190	132	12	32	374	8.0	12
Sept. 11-20	161	6.1	.07	36	14	39	4.2	165	60	32	.3	.8	278	.38	121	148	12	36	461	7.7	10
Sept. 21-30	174	5.9	.04	34	15	45	4.5	164	63	34	.3	.8	279	.38	131	146	12	39	463	7.7	8
Weighted average	a 1,622	11	0.12	21	7.2	11	3.4	86	27	5.0	0.6	1.1	133	0.18	582	82	12	22	200	--	--

a Represents 97 percent of runoff for water year October 1950 to September 1951.

GREEN RIVER BASIN--Continued

YAMPA RIVER NEAR MAYBELL, COLO.--Continued

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

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

GREEN RIVER BASIN--Continued

YAMPA RIVER NEAR MAYBELL, COLO.--Continued

Suspended sediment, December 1950 to September 1951

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1							298		
2							321		
3							285		
4							240		
5							262	7	5
6							125		
7							170		
8							254		
9							254		
10							290		
11							366		
12							390		
13							370		
14							357		
15							352	7	6
16							362		
17							316		
18							228		
19							232		
20							330		
21							294		
22							208		
23							215		
24							230		
25							236		
26							236	7	4
27							228		
28							190		
29							210		
30							230		
31							225		
Total							8,304	--	154

Day	January			February			March		
1	220			145			280		
2	210			190			310		
3	220			250	2	1	290	6	5
4	230	9	6	270			320		
5	240			290			430		
6	235			310			550	600	891
7	230			290			660	2,800	4,990
8	210			280			772	2,290	4,770
9	225			270			688	1,760	3,270
10	225			280	6	5	688	1,160	2,150
11	255	9	6	290			640	550	950
12	240			295			583	360	567
13	220			265			530	300	429
14	220			245			452	290	354
15	260			240			474	185	237
16	250			250			474	170	218
17	245	4	3	280			518	173	242
18	250			280			491	100	133
19	255			280	4	3	474	60	77
20	260			285			458	65	80
21	230			255			442	102	122
22	265			265			565	200	305
23	260			260			583	150	236
24	260	2	1	285			595	290	466
25	255			280	5	4	565	180	275
26	240			285			547	140	207
27	240			295			608	100	164
28	235			295			674	110	200
29	220	2	1	--	--	--	654	178	314
30	200			--	--	--	589	100	159
31	170			--	--	--	614	50	83
Total	7,275	--	113	7,505	--	104	16,518	--	21,914

YAMPA RIVER NEAR MAYBELL, COLO.--Continued

Suspended sediment, December 1950 to September 1951--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	654	30	53	3,360	160	1,450	8,120	140	3,070
2	779	53	111	3,240	141	1,230	8,020	110	2,380
3	800	71	153	2,990	90	727	6,500	71	1,250
4	863	100	233	2,570	63	437	4,910	76	1,010
5	1,060	180	515	2,350	65	412	4,050	80	875
6	1,150	220	683	2,630	80	568	3,550	68	652
7	1,330	210	754	3,470	360	3,370	3,540	60	573
8	1,450	200	783	4,190	450	5,090	3,920	75	794
9	1,630	410	1,800	4,630	380	4,750	4,190	80	905
10	1,250	210	709	4,590	250	3,100	4,340	82	961
11	1,060	100	286	4,390	180	2,130	4,390	57	676
12	870	47	110	4,460	183	2,200	4,100	50	554
13	772	64	133	4,910	250	3,310	3,710	100	1,000
14	709	27	52	4,860	300	3,940	4,100	80	886
15	950	50	128	4,500	350	4,250	4,610	60	747
16	1,450	100	392	4,320	400	4,670	5,040	69	939
17	1,400	130	491	5,580	490	7,380	5,780	100	1,560
18	1,560	150	632	5,930	320	5,120	6,650	140	2,510
19	1,890	200	1,020	5,400	180	2,620	7,180	90	1,740
20	2,520	500	3,400	5,820	160	2,510	7,180	110	2,130
21	2,860	520	4,020	6,680	190	3,430	7,320	140	2,770
22	3,350	580	5,250	7,280	270	5,310	7,040	130	2,470
23	2,960	300	2,400	6,990	240	4,530	6,570	90	1,600
24	2,740	190	1,410	7,490	330	6,670	5,780	80	1,250
25	3,050	400	3,290	7,590	130	2,660	5,140	98	1,360
26	3,570	620	5,980	7,300	93	1,830	4,930	95	1,260
27	3,410	370	3,410	6,940	96	1,800	4,970	100	1,340
28	3,220	130	1,130	6,870	95	1,760	4,730	80	1,020
29	3,050	115	947	7,730	118	2,460	4,500	60	729
30	3,200	170	1,470	8,460	250	5,710	4,100	37	410
31	--	--	--	8,510	200	4,600	--	--	--
Total	55,557	--	41,745	166,030	--	109,024	158,960	--	39,421

Day	July			August			September		
1	3,980	38	408	688			496	150	20
2	3,550	33	316	674			447	80	a 97
3	3,470	31	290	681	34	63	370	38	3
4	3,180	25	215	660			330	150	13
5	3,160	23	196	723			294	130	10
6	3,050			765	150	310	272	70	5
7	2,740			793	180	a 385	249	74	50
8	2,640			674			228	42	2
9	2,430			654			208	130	73
10	2,140	18	111	608	77	121	186	175	8
11	1,940			553			172	70	3
12	1,730			508			162	15	7
13	1,660			480			156	15	6
14	1,480			436			159	17	7
15	1,320			405			165	95	42
16	1,160			370			168	60	27
17	1,090	10	32	339	25	24	162	50	22
18	1,070			321			156		
19	1,100			294			156		
20	1,020			285			150	21	9
21	977	10	a 26	272	54	40	162		
22	1,240	6,000	c 20,100	290	18	14	176		
23	1,680	700	3,180	357	33	32	179		
24	1,240	150	a 502	370			182		
25	968			366	144	144	186		
26	863			362			182	18	9
27	779			380			172		
28	716	20	43	339	130	a 119	165		
29	751			334	250	a 225	165		
30	765			375	600	c 608	176		
31	709			362	600	586	--	--	--
Total	54,598	--	26,646	14,718	--	4,104	6,431	--	1,122

Total discharge for period (cfs-days) 495,893
Total load for period (tons) 235,347

a Computed from estimated concentration graph.
c Computed from partly estimated concentration graph.

YAMPA RIVER NEAR MAYBELL, COLO.--Continued

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

Date of collection	Time	Water discharge (cfs)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Apr. 21, 1951	5:30 p.m.	2,620	420	880	69	72	80	91	98	100	--					BWCM
May 29	5:30 p.m.	8,090	114	--	--	--	--	--	--	94	96	99		100		S
Aug. 6	6:30 p.m.	800	381	913	63	72	80	89	94	97	98					BWCM

GREEN RIVER BASIN--Continued

LITTLE SNAKE RIVER NEAR LILY, COLO.

LOCATION.--About 2 miles upstream from gaging station, which is 6 miles north of Lily, Moffat County, and 10 miles upstream from mouth.
DRAINAGE AREA.--3,730 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: December 1950 to August 1951.
Water temperatures: December 1950 to August 1951.
EXTREMES, December 1950 to August 1951.--Dissolved solids: Maximum, 644 ppm Aug. 9-10, 16-17, 24-25; minimum, 129 ppm June 11-20.
Specific conductance: Maximum daily, 1,530 micromhos July 20; minimum daily, 154 micromhos June 1.
Water temperatures: Minimum, freezing point on many days during December to March.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Dec. 5-11, 1950 ...	60.3	21	0.02	65	20	75	3.8	251	156	25	0.3	0.7		476	0.65	77	244	38	40	744	7.8	8
Dec. 12-20	83.1	19	.03	50	15	49	3.4	205	100	16	.4	.2		342	.47	77	186	18	36	551	7.7	8
Dec. 21-31	69.3	22	.02	66	18	69	4.2	254	149	22	.4	.5		463	.63	87	238	30	38	719	7.9	10
Jan. 1-10, 1951 ...	54.4	23	.02	63	19	65	5.8	260	129	20	.3	.5		443	.60	65	235	22	37	690	7.7	8
Jan. 11-20	62.3	23	.02	56	16	54	4.0	234	106	16	.2	.4		386	.52	65	206	14	36	602	7.8	8
Jan. 21-31	64.8	21	.03	51	13	45	2.2	205	91	14	.2	.8		355	.48	62	180	12	35	554	7.7	7
Feb. 1-3, 10	74.8	20	.06	51	12	65		221	104	20	.2	.8		388	.53	78	176	0	45	602	7.6	7
Feb. 11-20.....	146	16	.03	42	11	67	1.6	195	106	20	.2	1.1		370	.50	146	150	0	49	577	8.0	7
Feb. 21-28	186	15	.04	40	8.3	67	2.4	186	92	20	.3	1.4		338	.46	170	134	0	52	532	7.9	15
Mar. 1-10	175	17	.04	41	12	59	1.9	190	102	18	.2	.9		350	.48	165	152	0	45	552	8.0	7
Mar. 11-20	206	14	.03	49	12	69	4.2	201	118	22	.4	1.6		395	.54	220	172	8	46	618	7.6	10
Mar. 21-30	324	16	.05	49	13	65	4.8	205	123	15	.4	2.0		396	.54	346	176	8	44	608	7.7	12
Mar. 31 a	370	--	--	--	--	--	--	--	117	18	--	--		--	--	--	--	--	--	428	--	--
Apr. 1-10.....	408	18	.10	50	14	31	3.6	186	81	7.9	.2	1.3		308	.42	339	182	30	27	464	7.7	15
Apr. 11-20.....	441	19	.05	48	13	27	3.7	182	73	7.4	.5	1.0		289	.39	344	174	24	25	433	7.9	15
Apr. 21-30	942	22	.02	40	9.6	21	2.7	157	46	5.0	.3	1.8		226	.31	575	140	11	24	347	7.8	10
May 1-10	1,318	22	.02	38	8.8	16	2.4	146	39	4.5	.3	1.1		206	.28	733	131	12	21	315	7.8	15
May 11-20	2,036	18	.02	31	6.1	11	2.4	124	19	3.0	.3	1.1		156	.21	858	102	1	19	237	7.6	30
May 21-31	2,504	16	.04	29	5.9	10	3.2	112	18	2.8	.3	1.6		143	.19	967	97	5	18	213	7.6	30
June 1 a	2,850	12	--	--	--	--	--	76	23	3.0	--	1.2		--	--	--	b60	0	--	154	--	--
June 2-10	1,681	18	.08	26	5.4	11	3.4	103	22	2.8	.5	.5		141	.19	640	87	2	21	213	7.4	30

a Not included for computation of weighted averages.

b Determined by Schwarzenbach method.

June 11-20.....	1,449	14	.08	22	5.3	11	3.2	94	20	3.0	.5	0.8		129	.18	505	77	0	23	202	7.3	30
June 21-30	1,108	15	.06	24	5.7	19	3.8	112	27	4.9	.5	1.5		158	.21	473	84	0	32	245	7.7	30
July 1, 6-10	309	15	.03	30	7.8	27	5.6	129	49	7.0	.5	1.2		204	.28	170	107	2	34	317	7.6	30
July 11-14 a	117	18	--	--	--	--	--	212	82	13	--	1.3		--	--	--	b 137	0	--	445	--	--
July 15-19	60.0	16	.05	58	15	76	5.8	186	178	23	.4	1.0		472	.64	76	206	54	44	715	7.9	15
July 20 a	43.0	26	--	--	--	--	--	460	506	18	--	.5		--	--	--	b 588	211	--	1,530	7.9	--
July 21 a	90.0	--	--	--	--	--	--	--	--	18	--	--		--	--	--	--	--	--	1,320	--	--
July 22-31	49.5	19	.03	76	17	96	5.6	228	240	32	.4	1.3		604	.82	81	260	72	44	892	7.7	10
Aug. 9-10, 16-17, 24-25	10.0	14	.02	67	18	120	7.5	224	260	44	.4	1.3		644	.88	117	241	58	51	970	7.8	8
Weighted average .	c 601	18	0.05	33	7.6	20	3.1	132	39	5.5	0.4	1.2		194	0.26	315	114	6	27	297	--	--

a Not included for computation of weighted averages.
b Determined by Schwarzenbach method.
c Represents 92 percent of runoff for water year October 1950 to September 1951.

GREEN RIVER BASIN--Continued

LITTLE SNAKE RIVER NEAR LILY, COLO.--Continued

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

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

GREEN RIVER BASIN--Continued

GREEN RIVER NEAR JENSEN, UTAH

LOCATION.--At gaging station, 1 mile below Cub Creek, 6½ miles northeast of Jensen, Uintah County, and 12 miles upstream from Brush Creek.
RECORDS AVAILABLE.--Sediment records: May 1948 to September 1951.
EXTREMES, 1950-51.--Sediment concentrations: Maximum daily, 7,950 ppm Mar. 27; minimum daily, 22 ppm Sept. 21-30.
Sediment loads: Maximum daily, 138,000 tons June 1; minimum daily, 66 tons Jan. 1-6.
EXTREMES, 1948-51.--Sediment concentrations: Maximum daily, 11,100 ppm Apr. 11, 1950; minimum daily, 22 ppm Sept. 21-30, 1951.
Sediment loads: Maximum daily, 367,000 tons June 5, 1949; minimum daily, 66 tons Jan. 1-6, 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213. For records of chemical analyses and water temperatures see Green River at Jensen, Utah, p.71-73.

Suspended sediment, water year October 1950 to September 1951

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	1,700	450	a 2,070	1,610	89	387	1,940		
2	1,730	350	a 1,630	1,650	68	303	1,920		
3	1,730	250	a 1,170	1,700	75	344	1,780		
4	1,720	173	803	1,730	118	551	1,660		
5	1,720	107	497	1,730	113	528	1,600	96	386
6	1,730	112	523	1,720	93	432	1,380		
7	1,730	111	518	1,740	110	517	1,160		
8	1,720	105	488	1,740	126	592	1,010		
9	1,710	56	259	1,730	107	500	940		
10	1,700	61	280	1,670	105	473	1,170		
11	1,690	60	274	1,550	100	418	1,420		
12	1,690	57	260	1,410	75	286	1,530		
13	1,700	49	225	1,460			1,970		
14	1,690	76	347	1,390			2,130	144	680
15	1,680	90	408	1,240			2,070		
16	1,670	80	361	1,110	94	377	1,950		
17	1,650	87	388	1,460			1,810		
18	1,620	74	324	1,660			1,700		
19	1,610	78	339	1,740			1,610	110	a 478
20	1,610	80	a 348	1,830			1,450		
21	1,610	83	360	2,070			1,540		
22	1,610	83	a 361	2,390			1,700	68	259
23	1,600	82	a 354	2,410			1,430		
24	1,580	82	350	2,390			1,240		
25	1,580	88	375	2,340	295	1,770	1,120		
26	1,550	94	393	2,290			1,110		
27	1,530	95	392	2,290			1,130		
28	1,550	109	456	2,160			1,030		
29	1,540	176	732	2,000			1,040	31	c 89
30	1,560	189	796	1,940			1,060		
31	1,580	120	a 512	--	--	--	1,000		
Total	51,090	--	16,593	54,150	--	26,047	45,600	--	12,071

a Computed from estimated concentration graph.
c Computed from partly estimated concentration graph.

GREEN RIVER BASIN--Continued

GREEN RIVER NEAR JENSEN, UTAH--Continued

Suspended sediment, water year October 1950 to September 1951--Continued

Day	January			February			March		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	860			1,100	--		1,840	240	1,190
2	800			1,000	--		1,770	230	1,100
3	770			1,100	--	e 400	1,700	230	1,060
4	760	31	c 66	1,200	--		1,600	190	821
5	760			1,300	--		1,660	200	896
6	760			1,400	--		1,710	210	970
7	770			1,500	--		1,820	380	1,870
8	790	87	186	1,550	--		1,870	400	2,020
9	810			1,620	--	e 1,600	2,220	810	4,860
10	850			1,700	--		2,330	830	5,220
11	880	70	a 168	1,770	--		2,190	737	4,360
12	940			1,850	496	2,480	1,920	520	2,700
13	1,000			1,940	--		2,000	480	2,590
14	1,080	54	157	2,020	--		2,080	500	a 2,810
15	1,150			2,100	--		2,150	560	3,250
16	1,220			2,000	--	e 2,700	2,110	490	2,790
17	1,280	149	511	1,920	--		1,920	410	2,130
18	1,310			1,950	--		1,750	380	1,800
19	1,350	--		1,950	--		1,570	360	1,530
20	1,400	--		1,900			1,670	380	1,710
21	1,450	--		1,880			2,160	1,120	6,530
22	1,450	--		1,890	297	1,520	2,400	1,420	9,200
23	1,450	--		1,860			2,340	1,140	7,200
24	1,450	--		1,950			2,880	2,970	a 23,100
25	1,500	--	e 550	1,900			3,470	5,090	a 47,700
26	1,500	--		1,870	300	a 1,520	3,840	7,120	a 73,800
27	1,450	--		1,910	305	1,570	3,680	7,950	79,000
28	1,400	--		1,890	239	1,220	3,580	5,690	55,000
29	1,350	--		--	--	--	3,790	5,530	56,600
30	1,300	--		--	--	--	4,140	5,520	61,700
31	1,200	--		--	--	--	3,890	3,290	34,600
Total-	35,040	--	10,610	48,020	--	46,410	74,050	--	500,107

	April			May			June		
1	3,590	2,760	26,800	7,970	1,110	a 23,900	25,500	2,000	a 138,000
2	3,460	2,850	26,600	8,330	1,430	32,200	26,000	1,850	a 130,000
3	3,380	2,790	a 25,500	8,560	1,600	37,000	26,600	1,750	a 126,000
4	3,410	2,800	a 25,800	7,910	1,220	26,100	25,200	1,600	a 107,000
5	3,620	2,940	a 28,700	6,810	760	14,000	22,700	1,500	a 91,900
6	4,140	3,180	a 35,500	6,180	440	a 7,340	19,800	1,350	a 72,200
7	5,000	3,310	a 44,700	6,370	520	8,940	17,000	1,200	a 55,100
8	5,270	3,250	a 46,200	8,020	530	11,500	15,000	1,100	a 44,600
9	5,330	3,080	a 44,300	9,380	690	17,500	13,800	1,020	38,000
10	5,530	2,900	a 43,300	10,400	1,070	30,000	13,000	861	30,200
11	5,480	2,800	41,400	10,500	1,100	31,200	12,600	775	26,400
12	5,200	2,280	a 32,000	10,200	2,770	76,300	12,100	767	25,100
13	5,020	1,850	a 25,100	10,400	2,610	73,300	11,700	900	a 28,400
14	4,720	1,550	a 19,800	11,300	1,000	30,500	11,200	1,000	a 30,200
15	4,330	1,410	a 16,500	11,500	500	15,500	11,200	1,090	33,000
16	4,100	1,350	a 14,900	11,800	1,180	37,600	12,200	988	32,500
17	4,840	1,390	a 18,200	11,900	1,670	53,700	14,000	1,110	42,000
18	5,460	1,750	25,800	12,800	1,800	a 62,200	15,500	1,390	58,200
19	5,840	1,930	30,400	13,400	2,630	95,200	17,000	1,220	56,000
20	6,160	1,960	32,600	13,600	2,480	91,100	18,800	1,200	a 60,900
21	6,940	2,000	a 37,500	14,000	2,590	97,900	20,100	1,100	a 59,700
22	7,690	2,000	a 41,500	14,400	3,000	a 117,000	21,300	1,100	63,300
23	8,450	2,000	a 45,600	15,400	2,700	112,000	21,100	870	49,600
24	8,190	2,030	44,900	16,600	2,480	111,000	20,600	830	a 46,200
25	7,490	880	17,800	17,600	2,700	128,000	19,300	800	a 41,700
26	7,710	1,320	27,500	18,200	2,300	113,000	18,000	780	a 37,900
27	8,620	1,930	44,900	18,600	2,180	109,000	16,600	760	a 34,100
28	8,500	1,540	a 35,300	19,100	2,410	124,000	15,300	740	a 30,600
29	8,270	1,230	a 27,500	20,100	2,230	121,000	14,200	710	a 27,200
30	7,710	1,050	a 21,900	21,700	2,150	a 126,000	13,400	690	a 25,000
31	--	--	--	24,000	2,100	a 136,000	--	--	--
Total-	173,450	--	948,500	397,030	--	2,069,980	520,800	--	1,643,000

e Estimated.
a Computed from estimated concentration graph.
c Computed from partly estimated concentration graph.

GREEN RIVER BASIN--Continued

GREEN RIVER NEAR JENSEN, UTAH--Continued

Suspended sediment, water year October 1950 to September 1951--Continued

Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	12,400	670	a 22,400	6,490	1,360	a 23,800	2,670	200	1,440
2	12,100	650	a 21,200	6,400	2,230	38,500	2,580	210	1,460
3	11,700	630	a 19,900	6,090	1,310	21,500	2,800	380	a 2,870
4	11,400	620	a 19,100	6,120	720	a 11,900	3,060	800	a 6,610
5	10,900	605	17,800	6,230	1,590	26,700	3,100	1,470	a 12,300
6	10,300	599	16,700	6,910	3,310	61,800	2,820	870	6,620
7	10,000	580	a 15,700	6,760	4,290	78,300	2,610	250	1,760
8	9,530	562	14,500	6,990	2,790	52,700	2,460	185	1,230
9	9,530	592	15,200	6,910	1,810	33,800	2,340	190	1,200
10	9,380	750	19,000	6,180	1,050	17,500	2,190	190	1,120
11	8,910	515	12,400	5,750	728	11,300	2,090	160	903
12	8,560	535	12,400	5,350	700	a 10,100	2,050	140	a 775
13	8,190	522	11,500	4,980	650	8,740	1,970	119	633
14	7,910	476	10,200	4,570	400	4,940	1,890		
15	7,990	448	9,660	4,150	280	3,140	1,820		
16	7,690	400	8,310	3,820	250	a 2,580	1,780		
17	6,880	350	a 6,500	3,560	220	a 2,110	1,760	51	244
18	6,210	300	a 5,030	3,350	200	a 1,810	1,750		
19	5,860	250	a 3,960	3,210	230	a 1,990	1,730		
20	5,660	200	a 3,060	3,110	300	2,520	1,690		
21	5,770	238	3,710	2,990	230	a 1,860	1,660		
22	5,950	270	4,340	2,970	760	6,090	1,600		
23	6,540	310	5,470	2,790	700	a 5,270	1,570		
24	7,170	180	3,480	2,780	470	a 3,530	1,560		
25	7,990	130	2,800	2,840	400	a 3,070	1,530	22	93
26	7,550	115	2,340	2,950	200	1,590	1,490		
27	6,990	180	a 3,400	3,020	305	2,490	1,500		
28	6,250	210	a 3,540	2,960	330	2,640	1,540		
29	5,660	390	5,960	2,930	200	1,580	1,570		
30	5,590	450	6,790	2,880	100	778	1,530	22	a 91
31	6,400	1,070	18,500	2,800	160	a 1,210	--	--	--
Total	252,960	--	324,850	138,840	--	445,838	60,710	--	41,557

Total discharge for year (cfs-days) 1,851,740
Total load for year (tons) 6,085,563

a Computed from estimated concentration graph.

GREEN RIVER BASIN--Continued

GREEN RIVER NEAR JENSEN, UTAH--Continued

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

Date of collection	Time	Water discharge (cfs)	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Apr. 24, 1951	7:00 p. m.	7,880	2,560	1,180	25	27	31	36	38	40	49	63		98		BSWCM
May 5	5:30 p. m.	6,350	943	577	17	19	22	24	29	33	44	59		91		BSWCM
May 25	7:30 p. m.	17,700	2,160	2,980	--	21	--	36	--	57	74	88		97		PSWCM
June 15	7:00 p. m.	11,200	1,070	--	--	--	--	--	--	27	50	86		97		S
July 15	6:30 p. m.	7,990	949	--	--	--	--	--	--	20	44	94		99		S
Aug. 5	8:00 p. m.	6,400	2,500	3,140	--	77	--	92	--	--	--	--		--		PWCM
Aug. 27	6:30 p. m.	3,000	333	828	57	76	87	89	92	94	--	--		--		BWCM
Sept. 6	5:30 p. m.	2,780	1,390	2,100	--	80	--	91	--	--	--	--		--		PWCM

GREEN RIVER AT JENSEN, UTAH

LOCATION.--At bridge on U.S. Highway 40 at Jensen, Uintah County, 15 miles below gaging station, which is 1 mile below Cub Creek and Chew Ranch, 4 miles southeast of Dinosaur National Monument headquarters, 6½ miles northeast of Jensen, and 12 miles upstream from Brush Creek.
RECORDS AVAILABLE.--Chemical analyses: June 1947 to September 1951.
Water temperatures: March 1949 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 627 ppm Mar. 11-20; minimum, 208 ppm June 11-20.
Hardness: Maximum, 331 ppm Dec. 11-20, Mar. 11-20; minimum, 135 ppm June 11-20. Specific conductance: Maximum daily, 958 micromhos Mar. 25; minimum daily, 324 micromhos Apr. 26.
Water temperatures: Maximum observed, 73°F Aug. 1, 3; minimum observed, 33°F Jan. 4-7.
EXTREMES, 1947-51.--Dissolved solids: Maximum, 867 ppm Dec. 1-10, 1949; minimum, 161 ppm June 1-10, 1948.
Hardness: Maximum, 494 ppm Nov. 11-20, 1949; minimum, 111 ppm June 1-10, 1948. Specific conductance: Maximum daily, 1,750 micromhos Nov. 18, 1949; minimum daily, 237 micromhos May 30, 1948.
Water temperatures (1949-51): Maximum observed, 75°F on several days in August 1949; minimum observed, 33°F on several days in January 1950 and 1951.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for gaging station near Jensen, Utah, for water year October 1950 to September 1951 given in Water-Suppy Paper 1213. No appreciable inflow between water sampling point and gaging station except during periods of heavy local runoff.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Oct. 1-10, 1950	1,719	8.9	0.02	62	27	58	4.8	192	196	28	0.3	2.2		498	0.68	2,310	266	108	32		751	7.6	--
Oct. 11-20	1,661	8.9	.02	63	28	58	4.2	186	200	27	.3	2.0		506	.69	2,270	272	120	31		759	7.5	--
Oct. 21-31	1,572	8.8	.02	63	28	60	5.0	202	203	27	.3	1.0		515	.70	2,190	272	106	32		769	7.6	--
Nov. 1-10	1,702	9.4	.02	68	29	69	5.6	224	204	31	.3	.4		537	.73	2,470	288	105	34		807	7.9	--
Nov. 11-20	1,485	9.8	.02	68	29	72	6.8	234	205	32	.3	.3		543	.74	2,180	288	97	35		820	7.9	--
Nov. 21-30	2,228	12	.03	68	30	62	3.8	214	205	30	.2	2.2		527	.72	3,170	293	118	31		793	7.9	5
Dec. 1-10	1,456	12	.03	69	30	62	4.2	211	205	30	.2	2.8		528	.72	2,080	296	122	31		788	8.0	6
Dec. 11-20	1,764	12	.03	80	32	67	4.0	224	242	30	.2	2.4		598	.81	2,850	331	148	30		866	--	--
Dec. 21-31	1,218	11	.03	73	29	62	3.8	211	220	28	.2	2.1		544	.74	1,790	301	128	31		806	7.7	6
Jan. 1-10, 1951	793	10	.03	56	24	61	5.0	180	184	27	.2	1.0		462	.63	989	238	90	35		702	7.8	5
Jan. 11-20	1,161	10	.03	57	24	63	4.6	182	192	28	.2	1.0		478	.65	1,500	240	92	36		722	7.8	7
Jan. 21-31	1,409	10	.05	63	28	81	4.8	178	242	38	.4	1.5		568	.77	2,160	272	126	39		844	7.8	7
Feb. 1-10	1,347	10	.03	64	28	84	4.3	194	244	39	.4	4.3		596	.81	2,170	274	116	39		873	7.7	15
Feb. 11-19	1,944	10	.03	70	28	81	3.5	196	242	39	.4	4.6		600	.82	3,150	290	129	37		890	7.7	15
Feb. 20-28	1,894	11	.02	61	26	66	2.4	195	198	31	.3	1.0		518	.70	2,650	259	99	35		771	7.9	11
Mar. 1-10	1,852	11	.02	76	29	70	4.0	205	247	30	.4	1.5		614	.84	3,070	308	140	33		870	7.7	10
Mar. 11-20	1,936	11	.04	80	32	75	3.0	211	275	32	.4	3.5		627	.85	3,280	331	158	33		920	7.7	10
Mar. 21-31	3,288	12	.04	68	25	48	3.2	209	171	20	.4	3.2		466	.63	4,140	272	101	27		690	7.7	20
Apr. 1-10	4,273	12	.07	53	18	25	4.2	192	83	10	.5	4.4		310	.42	3,580	206	48	20		488	7.7	20
Apr. 11-20	5,115	14	.03	57	20	27	4.4	204	94	10	.4	3.1		332	.45	4,590	224	57	20		524	7.7	15
Apr. 21-30	7,957	12	.05	46	15	24	4.8	170	71	9.0	.5	3.0		272	.37	5,840	176	37	22		433	7.8	15

GREEN RIVER BASIN--Continued

GREEN RIVER AT JENSEN, UTAH--Continued

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
May 1-10, 1951....	a7,993	--	--	--	--	--	--	--	--	--	--	--		269	0.37	5,810	--	--	--		437	--	--
May 11-20.....	11,740	13	--	44	11	22	--	160	50	11	--	1.7		243	.33	7,700	155	24	24		407	--	--
May 21-31.....	a19,970	--	--	--	--	--	--	--	--	--	--	--		260	.35	14,020	--	--	--		415	--	--
June 1-10.....	20,460	12	0.03	43	13	19	5.8	162	59	10	0.5	4.1		245	.33	13,530	161	28	20		395	7.4	20
June 11-20.....	13,630	9.7	.02	36	11	19	4.8	132	53	8.9	.4	4.1		208	.28	7,650	135	27	23		341	7.5	20
June 21-30.....	17,990	10	.07	37	12	18	6.4	137	53	9.4	.4	5.3		212	.29	10,300	142	30	21		348	7.3	10
July 1-10.....	10,720	9.0	.02	41	14	28	4.8	161	69	10	.4	3.5		254	.35	7,350	160	28	27		415	7.5	10
July 11-20.....	7,386	8.8	.02	41	14	28	4.8	161	70	9.8	.4	3.3		252	.34	5,030	160	28	27		413	7.6	10
July 21-31.....	6,533	15	.03	48	14	36	6.8	179	92	12	.2	1.2		313	.43	5,520	178	31	30		485	7.4	10
Aug. 1-10.....	6,508	9.5	.02	54	17	46	8.0	174	134	20	.2	3.2		376	.51	6,610	204	62	32		585	7.6	10
Aug. 11-20.....	4,185	8.6	.01	54	20	47	5.4	170	143	20	.2	2.5		387	.53	4,370	216	77	31		599	8.0	10
Aug. 21-31.....	2,901	7.8	.03	56	19	44	5.8	175	141	19	.2	2.6		386	.52	3,020	218	74	30		598	7.8	10
Sept. 1-10.....	2,663	8.6	.02	62	22	52	6.0	182	175	19	.2	1.9		442	.60	3,180	245	96	31		677	7.7	10
Sept. 11-20.....	1,853	6.7	.02	54	22	50	5.8	168	160	21	.2	1.9		410	.56	2,050	225	88	32		638	7.8	10
Sept. 21-30.....	1,555	11	.01	56	22	70	5.8	176	192	26	.2	1.8		477	.65	2,000	230	86	39		732	7.8	10
Weighted average	b4,570	11	0.03	49	17	35	5.3	169	104	15	0.4	3.2		325	0.44	4,010	192	54	28		509	--	--

a Not included for computation of weighted averages.
b Represents 85 percent of the runoff for water year October 1950 to September 1951.

GREEN RIVER BASIN--Continued

GREEN RIVER AT JENSEN, UTAH--Continued

Temperature (°F) of water, water year October 1950 to September 1951
/Once-daily temperature measurement at approximately 12 m./

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

GREEN RIVER BASIN--Continued

DUCHESNE RIVER NEAR RANDLETT, UTAH

LOCATION.--At gaging station, a quarter of a mile downstream from Uinta River, 1¼ miles southeast of Randlett, and 6½ miles southeast of Fort Duchesne, Uintah County.
DRAINAGE AREA.--3,920 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1951.
Water temperatures: December 1950 to September 1951.
EXTREMES, December 1950 to September 1951.--Specific conductance: Maximum daily, 2,610 micromhos Sept. 27, 29; minimum daily, 291 micromhos May 29.
Water temperatures: Maximum, 72°F July 28-29; minimum, freezing point on many days during December to March.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Dec. 2-10, 1950	571		16		98	60	166		278	467	96		2.1		1,040	1.41	1,600	491	263	42	1,530	7.8
Dec. 11-20	575		18		99	60	160		292	451	92		2.2		1,030	1.40	1,600	494	254	41	1,480	7.8
Dec. 22, 28, 30	441		--		--	--	--		296	412	79		--		--	--	--	--	--	--	1,400	--
Jan. 1-10, 1951	436		17		102	60	163		320	443	92		2.3		1,040	1.41	1,220	501	239	41	1,490	7.9
Jan. 11	420		--		--	--	--		310	395	89		4.1		--	--	--	--	--	--	1,420	--
Jan. 13-20	420		13		70	38	76		270	219	32		1.4		582	.79	660	330	110	33	889	8.1
Jan. 21-31	420		--		--	--	--		--	--	--		--		--	--	--	--	--	--	862	--
Feb. 1, 5-10	470		--		--	--	--		--	294	59		--		--	--	--	--	--	--	1,060	--
Feb. 2-3	470		--		--	--	--		--	445	95		--		--	--	--	--	--	--	1,510	--
Feb. 4	470		--		--	--	--		--	196	22		--		--	--	--	--	--	--	782	--
Feb. 11-20	470		15		94	59	165		274	450	100		1.8		1,020	1.39	1,290	477	252	43	1,480	7.8
Feb. 21-28	470		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,630	--
Mar. 1-10	468		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,640	--
Mar. 11-20	359		14		113	72	187		314	543	114		1.7		1,200	1.63	1,160	578	320	41	1,710	--
Mar. 21-31	294		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,650	--
Apr. 1-10	224		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,760	--
Apr. 11-20	220		13		108	65	231		303	573	137		1.3		1,280	1.74	760	537	288	48	1,860	7.1
Apr. 21-30	278		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,720	--
May 1-10	276		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,710	--
May 11-20	634		16		93	50	164		270	423	93		1.4		973	1.32	1,670	438	216	45	1,440	7.9
May 21-24	1,518		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,170	--
May 25-28, 30-31	3,357		--		--	--	--		--	--	--		--		--	--	--	--	--	--	557	--
May 29	4,600		--		--	--	--		--	--	--		--		--	--	--	--	--	--	291	--
June 1	3,500		--		--	--	--		--	--	--		--		--	--	--	--	--	--	437	--
June 2-10	1,726		--		--	--	--		--	--	--		--		--	--	--	--	--	--	804	--
June 11-20	2,308		12		60	31	83		187	224	50		.9		553	.75	3,450	277	124	39	864	7.8
June 21-30	2,044		--		--	--	--		--	--	--		--		--	--	--	--	--	--	893	--

July 1-10	613	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	981	--
July 11-20	460	11	91	54	180	250	455	114	.9	1,030	1.40	1,280	449	244	47	1,550	7.7
July 21-31	460	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1,760	--
Aug. 1-10	699	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1,390	--
Aug. 11-20	251	13	107	61	216	284	548	130	1.6	1,220	1.66	827	518	286	48	1,780	7.8
Aug. 21, 24	330	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,370	--
Aug. 22-23, 25-31	343	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1,570	--
Sept. 1-10	226	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1,900	--
Sept. 11-20	133	15	132	94	256	295	740	184	2.7	1,570	2.14	564	716	474	44	2,260	7.9
Sept. 21-30	127	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,250	--
Weighted average	a 657	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1,140	--

a Represents 88 percent of runoff for water year October 1950 to September 1951

GREEN RIVER BASIN--Continued

DUCHESNE RIVER NEAR RANDLETT, UTAH--Continued

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

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

GREEN RIVER NEAR OURAY, UTAH

LOCATION.--At gaging station, 2¾ miles upstream from Willow Creek and 3 miles southwest of Ouray, Uintah County.
RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1951.
Water temperatures: December 1950 to September 1951.
Sediment records: December 1950 to September 1951.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Dec. 1-10, 1950	2,736		--		--	--	--		--	--	--		--		625	0.85	4,620	--	--	--	914	--
Dec. 11-20	2,903		13		74	35	79		237	240	40		0.9		623	.85	4,880	328	134	34	902	7.7
Dec. 21-23, 26	2,432		--		--	--	--		--	--	--		--		626	.85	4,110	--	--	--	908	--
Jan. 6-8, 1951	1,107		14		--	--	--		258	--	49		--		--	--	--	a 366	154	--	1,050	7.8
Feb. 5-7, 10	2,212		14		--	--	--		239	--	39		--		--	--	--	a 320	124	--	908	8.0
Feb. 11-20	3,400		13		66	29	86		227	222	37		1.6		557	.76	5,110	284	98	40	843	7.7
Feb. 21, 23-24, 26	3,438		12		--	--	--		206	--	40		--		--	--	--	a 276	107	--	858	7.7
Mar. 1-3, 8-9	3,252		--		--	--	--		--	--	--		--		614	.84	5,390	--	--	--	900	--
Mar. 14, 16-19	3,092		15		68	29	86		212	232	41		1.9		582	.79	4,860	288	115	39	882	8.2
Mar. 24, 28-29, 31	4,568		--		--	--	--		--	--	--		--		616	.84	7,600	--	--	--	933	--
Apr. 1-5, 7-8	4,773		--		--	--	--		--	--	--		--		548	.75	7,060	--	--	--	818	--
Apr. 11-18	5,632		21		58	24	43		197	138	22		.9		419	.57	6,370	243	82	28	636	7.3
June 11-12, 19	17,900		13		43	15	19		163	58	10		1.6		255	.35	12,320	169	36	19	404	7.6
July 16-19	7,962		12		38	14	21		142	62	12		.6		235	.32	5,050	152	36	23	382	7.7
July 23, 25-28, 30-31	7,939		--		--	--	--		--	--	--		--		308	.42	6,600	--	--	--	486	--
Aug. 1-10	8,010		--		--	--	--		--	--	--		--		363	.49	7,850	--	--	--	546	--
Aug. 11, 13	6,925		12		54	15	44		180	114	18		1.1		b 347	.47	6,490	196	48	33	560	7.8
Aug. 21-31	4,170		--		--	--	--		--	--	--		--		474	.64	5,340	--	--	--	713	--
Sept. 1-10	3,567		--		--	--	--		--	--	--		--		447	.61	4,310	--	--	--	682	--
Sept. 11-20	2,485		9.8		59	24	64		181	184	31		.6		485	.66	3,250	246	97	36	734	7.7
Sept. 21-30	2,000		--		--	--	--		--	--	--		--		532	.72	2,870	--	--	--	779	--

a Determined by Schwarzenbach method.
b Sum of determined constituents.

GREEN RIVER BASIN--Continued

GREEN RIVER NEAR OURAY, UTAH--Continued

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

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

GREEN RIVER BASIN--Continued

GREEN RIVER NEAR OURAY, UTAH--Continued

Suspended sediment, December 1950 to September 1951

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1							2,990		
2							2,960		
3							2,960		
4							2,980		
5							2,900		
6							2,800	512	3,780
7							2,650		
8							2,500		
9							2,400		
10							2,220		
11							2,240		
12							2,540		
13							2,610		
14							2,960		
15							3,320		
16							3,420	520	4,080
17							3,300		
18							3,060		
19							2,840		
20							2,740		
21							2,600		
22							2,490		
23							2,540		
24							2,570	267	1,760
25							2,320		
26							2,100		
27							1,950	--	
28							1,900	--	
29							1,850	--	b840
30							1,800	--	
31							1,650	--	
Total-							80,160	--	93,360

	January			February			March		
1	1,600	--	--	1,950	--	b900	3,300	574	5,110
2	1,400	--	--	1,850	--	b850	3,200	517	4,470
3	1,300	--	--	1,800	--	b800	3,100	510	4,270
4	1,150	--	--	1,700	--	b700	3,100	510	a4,270
5	1,100	--	--	1,850			3,100	500	a4,180
6	1,100			2,000	175	c950	3,060	500	a4,130
7	1,100	121	362	2,200			3,040	500	a4,100
8	1,120			2,450	220	1,460	3,170	600	5,140
9	1,160	--	--	2,600	--	b1,700	3,490	750	7,070
10	1,200	--	--	2,800			3,470	--	b8,000
11	1,250	--	--	2,900	300	c2,350	3,600	--	b12,000
12	1,350	--	--	3,000			3,420	--	b11,000
13	1,450	--	--	3,150	371	3,160	3,070	1,100	9,120
14	1,600	--	--	3,300	320	c2,850	3,010	1,120	9,100
15	1,750	--	--	3,500			3,140	1,100	a9,320
16	1,900	--	--	3,600			3,250	1,100	9,650
17	2,000	--	--	3,750			3,280	1,160	10,300
18	2,100	--	--	3,700	283	2,750	3,120	1,110	9,350
19	2,200	--	--	3,600			2,800	850	6,430
20	2,250	--	--	3,500			2,600	820	5,760
21	2,300	--	--	3,500			2,580	800	a5,570
22	2,250	--	--	3,500	--	b3,500	2,720	950	a6,980
23	2,250	--	--	3,400			3,370	1,450	a13,200
24	2,220	--	--	3,350	658	6,060	3,420	1,500	13,900
25	2,220	--	--	3,400			3,460	1,590	14,000
26	2,220	--	--	3,500			4,360	2,400	a28,300
27	2,260	--	--	3,450	--	b6,000	4,960	3,210	43,000
28	2,300	--	--	3,400	--	b5,800	5,110	5,600	77,300
29	2,200	184	1,090	--	--	--	4,740	5,670	72,600
30	2,150	--	--	--	--	--	4,700	--	b70,000
31	2,100	--	--	--	--	--	5,000	6,190	83,600
Total-	54,550	--	d24,306	82,700	--	81,110	107,740	--	571,220

a Computed from estimated concentration graph.
b Computed from water-sediment discharge curve.
c Computed from partly estimated concentration graph.
d Includes loads for missing days computed from water-sediment discharge curves.

GREEN RIVER BASIN--Continued

GREEN RIVER NEAR OURAY, UTAH--Continued

Suspended sediment, December 1950 to September 1951--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	5,130	4,780	66,200	9,000	1,600	38,900	30,000	--	--
2	4,780	4,680	60,400	9,090	1,310	32,200	28,700	--	--
3	4,490	3,660	44,400	9,200	1,330	33,000	28,300	--	--
4	4,340	2,600	30,500	9,540	--	--	28,200	--	--
5	4,340	2,350	27,500	9,030	--	--	27,100	--	--
6	4,510	2,300	a 28,000	7,980	--	--	24,500	--	--
7	4,780	2,450	31,600	7,270	--	--	22,000	--	--
8	5,550	3,500	52,400	7,220	--	--	19,900	1,580	84,900
9	6,180	4,300	a 71,700	8,500	--	--	18,600	--	--
10	6,360	4,400	75,600	10,400	--	--	17,200	--	--
11	6,520	4,180	73,600	11,600	1,720	53,900	16,300	1,100	48,400
12	6,390	3,560	61,400	11,900	--	--	15,800	1,100	a 46,900
13	6,000	2,880	46,700	11,800	--	--	15,400	1,120	46,600
14	5,770	2,400	a 37,400	12,200	--	--	14,800	1,230	49,200
15	5,460	2,060	30,400	13,800	--	--	14,900	--	--
16	5,090	1,650	22,700	14,000	--	--	15,300	--	--
17	4,760	1,550	19,900	14,100	--	--	17,000	--	--
18	5,070	1,350	18,500	14,100	--	--	18,900	--	--
19	6,320	1,410	24,100	15,600	--	--	21,600	1,160	67,700
20	6,870	2,360	43,800	15,800	--	--	24,100	--	--
21	7,010	2,700	a 51,100	15,600	--	--	26,400	--	--
22	7,630	2,970	61,200	16,700	--	--	27,900	2,400	181,000
23	8,870	3,600	a 86,200	18,800	--	--	27,400	--	--
24	9,930	4,100	a 110,000	20,200	--	--	26,100	--	--
25	9,510	3,800	a 97,600	20,700	2,960	165,000	24,900	1,360	91,400
26	8,950	3,300	a 79,700	21,900	--	--	23,800	--	--
27	8,870	2,700	64,700	23,500	--	--	22,200	--	--
28	9,960	2,280	61,300	25,600	--	--	20,400	--	--
29	9,690	1,890	49,400	28,100	--	--	19,000	1,130	58,000
30	9,460	1,600	40,900	29,700	--	--	18,100	--	--
31	--	--	--	30,200	2,410	197,000	--	--	--
Total	198,590	--	1,568,900	473,130	--	d2,882,000	654,800	--	d2,930,100

Day	July			August			September		
1	16,800	--	--	7,010	520	9,840	4,180	5,770	65,100
2	15,800	857	36,600	7,680	1,970	40,800	3,840	2,800	a 29,000
3	15,200	--	--	7,510	3,600	73,000	3,580	1,350	13,000
4	14,500	--	--	7,750	4,000	83,700	3,490	900	8,480
5	14,000	--	--	8,580	3,980	92,200	3,670	732	7,250
6	13,400	--	--	8,380	3,880	87,800	3,860	1,010	10,500
7	12,600	--	--	8,450	3,930	89,700	3,640	800	7,860
8	12,100	--	--	8,400	2,110	47,900	3,340	800	7,210
9	11,400	--	--	8,320	1,550	34,800	3,110	800	a 6,720
10	11,300	--	--	8,020	1,480	32,000	2,960	900	7,190
11	11,200	--	--	7,370	1,520	30,200	2,840	640	a 4,910
12	10,300	--	--	6,920	1,150	a 21,500	2,700	600	a 4,370
13	9,750	--	--	6,480	824	14,400	2,600	500	3,510
14	9,230	--	--	6,090	800	a 13,200	2,560	400	2,760
15	8,790	--	--	5,530	610	a 9,100	2,470	370	2,470
16	8,730			5,090	430	a 5,910	2,410	320	2,080
17	8,500	433	9,310	4,630	352	4,400	2,360	314	2,000
18	7,680			4,340	330	a 3,870	2,330	297	1,870
19	6,940			4,120	300	a 3,340	2,310	292	1,820
20	6,640	400	a 7,170	3,990	250	a 2,690	2,270	255	1,560
21	6,850	450	a 8,320	4,160	950	a 10,700	2,200	200	1,190
22	7,880	5,200	s 115,000	4,220	2,700	30,800	2,140	183	1,060
23	7,780	6,100	a 128,000	4,240	4,690	52,700	2,070	184	1,030
24	7,900	3,700	a 78,900	4,400	6,800	80,800	2,010	120	651
25	8,220	2,800	62,100	4,100	6,120	a 67,700	2,000	126	680
26	9,110	2,100	51,900	3,840	3,200	a 33,200	1,960	149	789
27	8,730	1,400	33,000	3,840	2,080	21,600	1,890	111	566
28	8,220	800	17,800	3,820	1,800	18,600	1,860	114	573
29	7,460	616	12,400	3,860	2,050	a 21,400	1,910	126	650
30	6,920	474	8,860	5,460	9,200	as 145,000	1,960	130	688
31	6,590	538	9,570	3,930	11,800	s 171,000	--	--	--
Total	310,320	--	d929,860	180,000	--	1,353,850	80,520	--	197,537

Total discharge for period (cfs-days)..... 2,223,040
Total load for period (tons)..... d 10,632,243

s Computed by subdividing day.
a Computed from estimated concentration graph.
d Includes loads for missing days computed from water-sediment discharge curves.

GREEN RIVER NEAR OURAY, UTAH--Continued

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

Date of collection	Time	Water discharge (cfs)	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Apr. 19, 1951	3:30 p.m.	6,500	1,720	1,650	23	26	31	41	48	53	62	90		99		BSWCM
May 1	3:30 p.m.	9,000	1,670	1,300	11	20	28	33	39	44	54	76		99		BSWCM
May 31	2:30 p.m.	29,700	3,250	3,830	33	38	40	45	54	65	79	96		100		BSWCM
June 11	2:45 p.m.	16,200	1,240	681	3	5	7	15	19	31	50	90		99		BSWCM
Aug. 10	2:05 p.m.	7,980	1,990	1,940	35	47	58	68	95	97	99	100		--		PSWCM
Sept. 1	4:15 p.m.	4,120	5,060	5,250	--	67	--	93	--	100	--	--		--		PWCM

GREEN RIVER BASIN--Continued

WHITE RIVER NEAR WATSON, UTAH

LOCATION.--At gaging station, just downstream from Evacuation Creek, 250 feet downstream from highway bridge, 7 miles north of Watson, Uintah County.
DRAINAGE AREA.--4,020 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1951.
Water temperatures: December 1950 to September 1951.
EXTREMES, December 1950 to September 1951.--Dissolved solids: Maximum, 811 ppm July 21-22; minimum, 230 ppm June 21-30.
Specific conductance: Maximum daily, 1,210 micromhos July 21; minimum daily, 319 micromhos June 29.
Water temperatures: Maximum, 80°F July 30; minimum, freezing point on many days during December to March.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Dec. 4-10, 1950	353		18		76	26	83		222	189	70		0.8		574	0.78	547	296	114	38	902	7.9
Dec. 11-20	394		18		72	25	83		214	189	64		.7		560	.76	596	282	107	39	870	7.9
Dec. 21-31	346		18		75	26	88		222	193	72		.5		588	.80	549	294	112	39	914	7.9
Jan. 1-10, 1951	277		--		--	--	--		--	--	--		--		666	.91	498	--	--	--	1,000	--
Jan. 11-20	289		20		84	28	96		238	207	87		1.0		660	.90	515	324	130	39	994	7.8
Jan. 21-31	317		--		--	--	--		--	--	--		--		596	.81	510	--	--	--	910	--
Feb. 1-10	346		--		--	--	--		--	--	--		--		638	.87	596	--	--	--	1,010	--
Feb. 11-20	446		16		69	27	92		218	200	68		1.8		580	.79	698	283	104	42	906	7.8
Feb. 21-28	493		--		--	--	--		--	--	--		--		574	.78	764	--	--	--	896	--
Mar. 1-10	527		--		--	--	--		--	--	--		--		585	.80	832	--	--	--	907	--
Mar. 11-20	414		18		79	30	95		241	222	69		1.6		630	.86	704	320	123	39	974	8.0
Mar. 21-31	375		--		--	--	--		--	--	--		--		610	.83	618	--	--	--	969	--
Apr. 1-10 a	368		--		--	--	--		--	--	--		--		--	--	--	--	--	--	932	--
Apr. 11-20	374		17		73	24	85		199	190	73		.6		b 561	.76	566	280	118	40	871	7.9
Apr. 21-30	575		--		--	--	--		--	--	--		--		520	.71	807	--	--	--	772	--
May 1-10	684		--		--	--	--		--	--	--		--		414	.56	765	--	--	--	639	--
May 11-20	1,123		17		56	14	25		171	71	25		1.8		314	.43	952	197	57	22	492	7.8
May 21-31	1,980		--		--	--	--		--	--	--		--		259	.35	1,380	--	--	--	405	--
June 1-10	1,735		--		--	--	--		--	--	--		--		255	.35	1,190	--	--	--	399	--
June 11-20	1,663		15		49	13	24		166	62	19		1.5		275	.37	1,230	176	40	23	439	7.8
June 21-30	2,269		--		--	--	--		--	--	--		--		230	.31	1,410	--	--	--	366	--

a Not included for computation of the weighted averages.
b Sum of determined constituents.

July 1-10	1,244		--		--	--	--	--	--	--		--		274	.37	920	--	--	--	442	--
July 11-20	606		20		56	17	44	170	105	39		.7		372	.51	609	210	70	31	588	7.9
July 21-22	1,220		--		--	--	--	--	--	--		--		811	1.10	2,670	--	--	--	1,190	--
July 23, 25-30	536		--		--	--	--	--	--	--		--		494	.67	715	--	--	--	751	--
July 31 a	459		--		--	--	--	--	--	--		--		--	--	--	--	--	--	1,060	--
Aug. 1 a	640		--		--	--	--	--	--	--		--		--	--	--	--	--	--	1,070	--
Aug. 2-10	598		--		--	--	--	--	--	--		--		527	.72	851	--	--	--	825	--
Aug. 11-20	342		17		70	24	54	194	145	56		1.1		482	.66	445	273	114	30	749	7.6
Aug. 21-29	642		--		--	--	--	--	--	--		--		547	.74	948	--	--	--	840	--
Aug. 30 a	3,350		--		--	--	--	--	--	--		--		--	--	--	--	--	--	932	--
Aug. 31 a	911		--		--	--	--	--	--	--		--		--	--	--	--	--	--	930	--
Sept. 1-10	438		--		--	--	--	--	--	--		--		483	.66	571	--	--	--	773	--
Sept. 11-20	343		17		68	24	63	191	151	65		.6		504	.69	467	268	112	34	785	7.7
Sept. 21-30	290		--		--	--	--	--	--	--		--		540	.73	423	--	--	--	858	--
Weighted average.	c 702		--		--	--	--	--	--	--		--		403	0.55	764	--	--	--	627	--

a Not included for computation of the weighted averages.
c Represents 85 percent of runoff for water year October 1950 to September 1951.

GREEN RIVER BASIN--Continued

WHITE RIVER NEAR WATSON, UTAH--Continued

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

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

WILLOW CREEK NEAR OURAY, UTAH

LOCATION .--At gaging station 8 miles upstream from mouth and 10 miles south of Ouray, Uintah County.
DRAINAGE AREA.--967 square miles.
RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1951.
Water temperatures: December 1950 to September 1951.
EXTREMES, December 1950 to September 1951.--Specific conductance: Maximum daily, 8,770 micromhos July 8; minimum daily, 1,100 micromhos Mar. 23.
Water temperatures: Maximum, 89°F July 14; minimum, freezing point on many days during December to March.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Dec. 1-6, 8-10, 1950	34.7		21		86	87	210		a488	562	27		5.6		1,240	1.69	116	572	172	44	1,690	8.2
Dec. 7	24.0		--		--	--	--		b624	989	48		--		--	--	--	--	--	--	2,580	--
Dec. 11-20	31.0		21		85	85	213		c478	568	26		5.5		1,240	1.69	104	562	170	45	1,700	8.3
Dec. 21-31	19.3		21		109	128	353		605	958	47		8.1		1,920	2.61	100	798	302	49	2,530	8.1
Jan. 1-10, 1951	17.0		--		--	--	--		--	--	--		--		--	--	--	--	--	--	2,600	--
Jan. 11-20	17.0		23		106	113	297		581	802	40		8.8		1,680	2.28	77	729	253	47	2,240	8.1
Jan. 21-31	16.8		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,940	--
Feb. 1-7	18.1		--		--	--	--		--	--	--		--		--	--	--	--	--	--	2,260	--
Feb. 9-10	23.0		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,500	--
Feb. 11-19	23.0		19		86	81	199		452	546	26		5.2		1,180	1.60	73	548	177	44	1,650	--
Feb. 20-28	27.6		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,640	--
Mar. 1-10	38.7		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,510	--
Mar. 11-20	40.0		18		80	74	174		438	468	23		4.6		1,060	1.44	114	504	145	43	1,470	--
Mar. 21-31	48.2		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,340	--
Apr. 1-10	44.5		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,370	--
Apr. 11-20	40.5		19		80	69	161		417	440	23		2.5		1,000	1.36	109	483	142	42	1,430	7.5
Apr. 21-25, 30	27.7		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,710	--
Apr. 26-29	13.8		--		--	--	--		--	--	--		--		--	--	--	--	--	--	2,240	--
May 1-10	9.6		--		--	--	--		--	--	--		--		--	--	--	--	--	--	3,260	--
May 11-19	4.4		14		102	178	782		624	1,970	88		.5		3,440	4.68	41	986	475	63	4,310	8.2
May 20	14.0		--		--	--	--		--	--	42		--		--	--	--	--	--	--	2,510	--
May 21-31	7.6		--		--	--	--		--	--	--		--		--	--	--	--	--	--	3,370	--
June 1-3, 6-10	4.3		--		--	--	--		--	--	--		--		--	--	--	--	--	--	3,990	--
June 11-20	2.3		13		122	256	868		770	2,360	110		.7		4,110	5.59	26	1,360	726	58	5,020	8.0
June 21-30	1.5		--		--	--	--		--	--	--		--		--	--	--	--	--	--	5,250	--
July 1-7, 9-10	.3		--		--	--	--		--	--	--		--		--	--	--	--	--	--	6,070	--
July 8	.1		--		--	--	--		--	--	--		--		--	--	--	--	--	--	8,770	--
July 11-20	.2		19		119	302	1,170		753	3,120	154		.6		5,260	7.15	3	1,540	922	62	6,250	8.0

a Includes equivalent of 14 parts per million of carbonate (CO_3).
b Includes equivalent of 24 parts per million of carbonate (CO_3).
c Includes equivalent of 12 parts per million of carbonate (CO_3).

GREEN RIVER BASIN--Continued

WILLOW CREEK NEAR OURAY, UTAH--Continued

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Aug. 3, 9-10, 1951	1.5		--		--	--	--		--	--	--		--		--	--	--	--	--	--	4,580	--
Aug. 4	11.0		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,810	--
Aug. 5-8	4.0		--		--	--	--		--	--	--		--		--	--	--	--	--	--	3,170	--
Aug. 11-20	.5		14		98	278	1,070		810	2,740	133		0.6		4,730	6.43	6	1,390	724	63	5,720	8.1
Aug. 21-22, 25-31	3.1		--		--	--	--		--	--	--		--		--	--	--	--	--	--	5,600	--
Aug. 23-24	2.0		--		--	--	--		--	--	--		--		--	--	--	--	--	--	3,550	--
Sept. 2-3	3.0		--		--	--	--		--	--	--		--		--	--	--	--	--	--	3,030	--
Sept. 4-10	1.1		--		--	--	--		--	--	--		--		--	--	--	--	--	--	5,200	--
Sept. 11-20	1.3		14		92	267	995		835	2,530	122		.5		4,430	6.02	16	1,330	644	62	5,420	8.1
Sept. 21-30	1.5		--		--	--	--		--	--	--		--		--	--	--	--	--	--	5,210	--
Weighted average	d16.8		--		--	--	--		--	--	--		--		--	--	--	--	--	--	1,880	--

d Represents 75 percent of runoff for water year October 1950 to September 1951.

GREEN RIVER BASIN--Continued

WILLOW CREEK NEAR OURAY, UTAH--Continued

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

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

GREEN RIVER BASIN--Continued

PRICE/RIVER AT WOODSIDE, UTAH

LOCATION.--At gaging station at bridge on U. S. Highway 50 at Woodside, Emery County, and 20 miles upstream from mouth.
DRAINAGE AREA.--1,500 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: December 1946 to September 1949, February to September 1951.
Water temperatures: February to September 1951.
EXTREMES, February to September 1951.--Dissolved solids: Maximum, 4,560 ppm Apr. 11-20; minimum, 2,490 ppm Mar. 21-31.
Hardness: Maximum, 1,720 ppm Apr. 11-20; minimum, 710 ppm May 16.
Specific conductance: Maximum daily, 6,190 micromhos Apr. 17; minimum daily, 2,430 micromhos May 16.
Water temperatures: Maximum, 87°F July 16.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

Chemical analyses in parts per million, February to September 1951

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Feb. 15-20, 1951	60.0	8.7	0.04	226	201	599	7.8	356	2,230	76	0.2	11		3,540	4.81	573	1,390	1,100	48	4,200	7.7	13
Feb. 21-28	68.5	9.0	.04	230	212	650	8.2	370	2,380	82	.2	15		3,770	5.13	697	1,450	1,140	49	4,430	7.8	13
Mar. 1-10	67.6	13	.55	245	229	697	8.4	388	2,570	90	.1	13		4,060	5.52	741	1,550	1,240	49	4,690	7.6	18
Mar. 11-20	81.9	12	.21	180	151	447	8.8	338	1,650	59	.2	4.5		2,680	3.64	593	1,070	793	47	3,280	7.7	25
Mar. 21-31	94.4	11	.32	182	136	410	15	321	1,510	57	.3	5.3		2,490	3.39	635	1,010	750	46	3,100	7.7	25
Apr. 1-10	53.7	11	.05	226	217	687	--	368	2,410	86	.3	9.3		3,830	5.21	560	1,460	1,160	50	4,580	8.0	15
Apr. 11-20	32.4	11	.03	260	260	809	12	335	2,930	109	.4	6.7		4,560	6.20	399	1,720	1,440	50	5,240	7.8	20
Apr. 21-30	67.0	11	.10	214	211	734	11	328	2,570	85	.5	6.3		4,000	5.44	724	1,400	1,130	53	4,710	7.8	20
May 1-10 a	54.0	--	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--	4,720	--	--
May 11-13, 15, 17-20	109	14	--	172	157	519	--	324	1,760	60	--	8.9		2,850	3.88	839	1,070	809	51	3,480	--	--
May 14 a	69.0	--	--	--	--	--	--	--	2,590	--	--	--		--	--	--	b 1,460	--	--	4,740	--	--
May 16 a	202	--	--	--	--	--	--	--	1,090	--	--	--		--	--	--	b 710	--	--	2,430	--	--
May 21-31a	84.4	--	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--	4,100	--	--
June 1-10	84.2	14	.05	183	179	556	8.8	310	1,970	63	.5	5.2		3,130	4.26	712	1,190	938	50	3,850	7.5	30
June 11-20	103	13	.31	197	156	491	8.4	298	1,790	57	.4	3.6		2,860	3.89	795	1,130	889	48	3,510	7.6	30
June 21-30	114	9.8	.25	218	164	536	8.4	278	1,980	63	.5	3.5		3,120	4.24	656	1,220	990	49	3,770	7.6	30
July 1-10	39.4	6.8	.10	206	207	667	9.6	249	2,400	79	.4	4.5		3,700	5.03	394	1,360	1,160	51	4,430	7.6	30
July 11-20	61.3	5.6	.16	188	188	587	10	250	2,130	71	.5	1.5		3,300	4.49	546	1,240	1,040	50	4,010	7.6	30
July 21-31	106	12	.23	303	136	453	9.6	258	1,930	56	.5	2.9		3,030	4.12	867	1,320	1,100	43	3,580	7.6	30
Aug. 1-10	722	15	--	357	143	471	10	278	2,060	57	.5	1.6		3,250	4.42	6,340	1,480	1,250	41	3,760	7.4	55
Aug. 11-20	53.4	10	.03	276	221	728	11	248	2,720	91	.5	3.8		4,180	5.68	603	1,600	1,390	50	4,770	7.5	35
Aug. 21-31	181	13	--	332	137	448	11	256	1,980	57	.5	3.7		3,110	4.23	1,520	1,390	1,180	41	3,570	7.5	70
Sept. 1-10	51.0	7.2	.04	240	216	739	11	259	2,660	86	.3	4.1		4,090	5.56	563	1,490	1,280	52	4,700	7.6	30
Sept. 11-20	53.8	10	.49	219	203	678	9.6	278	2,440	84	.6	2.9		3,780	5.14	549	1,380	1,150	51	4,380	7.5	40
Sept. 21-30	59.2	9.4	.64	201	191	620	9.2	272	2,210	74	.6	1.6		3,450	4.69	551	1,290	1,060	51	4,050	7.4	40
Weighted average	c 109	12	--	273	165	533	10	292	2,090	65	0.4	4.1		3,300	4.49	971	1,360	1,120	46	3,870	--	--

a Not included for computation of weighted averages.
b Determined by Schwarzenbach method.
c Represents 74 percent of runoff for water year October 1950 to September 1951.

GREEN RIVER BASIN--Continued

PRICE RIVER AT WOODSIDE, UTAH--Continued

Temperature (°F) of water February to September 1951
/Once-daily temperature measurement at approximately 1 p. m./

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

GREEN RIVER BASIN--Continued

GREEN RIVER AT GREEN RIVER, UTAH

LOCATION.--At gaging station, 1 mile southeast of town of Green River, Emery County, 22 miles upstream from San Rafael River.
DRAINAGE AREA.--40,600 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: August 1928 to September 1951.
Water temperatures: April 1949 to September 1951.
Sediment records: May 1930 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 913 ppm Jan. 11-20; minimum, 267 ppm July 1-10.
Hardness: Maximum, 446 ppm Jan. 11-20; minimum, 164 ppm July 1-10.
Specific conductance: Maximum daily, 1,370 micromhos Jan. 9; minimum daily, 364 micromhos June 30.
Water temperatures: Maximum observed, 81°F July 26, 31; minimum, freezing point on several days during December to February.
Sediment concentrations: Maximum daily, 38,800 ppm Aug. 4; minimum daily, 34 ppm Sept. 27.
Sediment loads: Maximum daily, 1,200,000 tons Aug. 4; minimum daily, 151 tons Jan. 14.
EXTREMES, 1928-51.--Dissolved solids: Maximum, 2,010 ppm Sept. 29, 1943; minimum, 194 ppm June 21-30, 1933.
Hardness: Maximum, 488 ppm Dec. 21-31, 1932; minimum, 128 ppm June 21-30, 1933.
Specific conductance (1941-51): Maximum daily, 2,420 micromhos Sept. 29, 1943; minimum daily 321 micromhos May 30, 1948.
Water temperatures (1949-51): Maximum observed, 82°F July 31, Aug. 5-6, 1949; minimum, freezing point on several days during winter months.
Sediment concentrations (1930-51): Maximum daily, 63,600 ppm July 11, 1936; minimum daily, 34 ppm Sept. 27, 1951.
Sediment loads (1930-51): Maximum daily, 2,230,000 tons July 11, 1936, minimum daily, less than 100 tons on several days.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Oct. 1-10, 1950	2,614		11		76	38	97		222	304	40		1.0		704	0.96	4,970	346	164	38	1,020	--
Oct. 11-20	2,528		10		74	39	98		222	299	40		.6		693	.94	4,730	345	163	38	1,000	--
Oct. 21-31	2,349		9.7		74	41	105		226	322	42		.2		717	.98	4,550	353	168	39	1,040	--
Nov. 1-10	2,486		11		78	43	106		234	330	42		.9		741	1.01	4,970	372	180	38	1,070	--
Nov. 11-20	2,532		11		79	42	105		244	325	42		.9		741	1.01	5,070	370	170	38	1,060	--
Nov. 21-30	3,358		13		80	38	93		252	301	40		1.6		713	.97	6,460	356	149	36	1,040	7.5
Dec. 1-10	2,991		13		74	37	91		234	294	40		1.3		686	.93	5,540	336	145	37	987	7.6
Dec. 11-20	2,899		12		78	40	93		243	310	41		1.6		714	.97	5,590	359	160	36	1,050	--
Dec. 21-31	2,478		13		80	38	92		242	306	41		1.6		711	.97	4,760	356	157	36	1,050	--
Jan. 1-10, 1951	1,434		14		91	47	115		279	374	50		1.9		847	1.17	3,320	420	192	37	1,230	--
Jan. 11-20	1,671		15		98	49	121		297	390	55		1.4		913	1.24	4,120	446	202	37	1,290	--
Jan. 21-31	2,371		14		89	41	98		266	323	46		1.4		765	1.04	4,900	390	172	35	1,120	--
Feb. 1-10	2,085		14		81	41	96		258	299	41		1.6		732	1.00	4,120	370	159	36	1,050	--
Feb. 11-19	3,339		12		73	37	92		226	280	38		1.7		676	.92	6,090	334	149	37	976	--
Feb. 20-28	3,713		11		66	35	93		206	272	38		1.5		642	.87	6,440	308	140	40	943	--
Mar. 1-10	3,210		13		77	36	92		238	289	39		1.7		688	.94	5,960	340	145	37	1,020	--
Mar. 11-20	3,306		13		78	36	87		242	277	38		1.9		681	.93	6,080	342	144	36	994	--
Mar. 21-31	3,451		12		80	36	87		247	278	37		2.9		684	.93	6,370	348	145	35	1,010	--

Apr. 1-10	a 4,709		--		--	--	--		--	--	--		--		669	.91	8,510	--	--	--	993	--
Apr. 11-20	5,746		13		70	26	62		235	180	24		1.4		497	.68	7,710	282	89	32	761	--
Apr. 21-30	a 8,286		--		--	--	--		--	--	--		--		438	.60	9,800	--	--	--	681	--
May 1-10	a 8,480		--		--	--	--		--	--	--		--		390	.53	8,930	--	--	--	611	--
May 11-20	12,810		13		58	19	35		213	106	13		1.3		349	.47	12,070	222	48	25	546	--
May 21-31	a 21,070		--		--	--	--		--	--	--		--		306	.42	17,410	--	--	--	488	--
June 1-10	26,050		14		50	13	22		182	66	10		.8		285	.39	20,050	178	30	21	428	--
June 11-20	16,570		11		48	15	26		170	82	10		1.0		331	.45	14,810	182	42	24	480	--
June 21-30	23,380		11		48	13	23		176	64	9		.6		287	.39	18,120	174	30	22	420	--
July 1-10	13,860		12		44	13	24		162	65	10		.8		267	.36	9,990	164	31	24	403	--
July 11-20	9,207		12		42	15	28		158	77	13		.9		294	.40	7,310	166	37	27	432	--
July 21-31	7,776		12		61	21	43		204	134	17		1.6		413	.56	8,670	238	72	28	622	--
Aug. 1-2, 5-10	8,159		12		72	22	60		192	204	21		1.8		521	.70	11,480	270	112	33	744	--
Aug. 4	a 11,100		--		--	--	--		--	--	23		--		--	--	--	--	--	--	1,930	--
Aug. 11-20	5,904		12		64	18	50		216	143	22		1.9		441	.60	7,030	234	56	32	653	--
Aug. 21-31	4,334		12		81	22	72		208	231	28		1.4		587	.80	6,870	292	122	35	851	--
Sept. 1-10	4,133		11		74	28	73		222	232	28		1.9		563	.77	6,280	300	118	35	838	--
Sept. 11-20	2,709		9.2		68	29	80		199	238	34		1.7		571	.78	4,180	288	126	38	845	--
Sept. 21-30	2,116		8.6		71	33	85	3.5	195	268	36		.4		623	.85	3,560	312	152	37	914	--
Weighted average	b 5,948		12		61	23	51	--	201	157	21		1.2		449	0.61	7,210	246	82	31	662	--

a Not included for computation of weighted averages.
b Represents 80 percent of the runoff for the water year October 1950 to September 1951.

GREEN RIVER BASIN--Continued

GREEN RIVER AT GREEN RIVER, UTAH--Continued

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

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

GREEN RIVER BASIN--Continued

GREEN RIVER AT GREEN RIVER, UTAH--Continued

Suspended sediment, water year October 1950 to September 1951

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	2,760	1,250	9,320	2,370	92	589	3,400	232	2,130
2	2,660	728	5,230	2,370	92	589	3,260	351	3,090
3	2,610	540	3,810	2,400	84	544	3,130	199	1,680
4	2,580	398	2,770	2,460	60	399	3,050	319	2,630
5	2,610	383	2,700	2,460	66	438	3,050	176	1,450
6	2,610	378	2,660	2,510	50	339	3,100	218	1,820
7	2,610	287	2,020	2,580	59	411	2,920	206	1,620
8	2,560	245	1,690	2,610	46	324	2,680	191	1,380
9	2,560	217	1,500	2,560	60	a 415	2,710	141	1,030
10	2,580	188	1,310	2,540	63	432	2,610	96	677
11	2,610	136	958	2,540	68	466	2,580	89	620
12	2,580	118	822	2,540	66	453	2,440	97	639
13	2,580	132	920	2,490	74	498	2,460	96	638
14	2,560	116	802	2,490	88	592	2,610	100	a 705
15	2,540	117	802	2,510	72	488	2,710	102	746
16	2,510	90	610	2,560	70	484	2,990	120	969
17	2,490	87	585	2,710	81	593	3,320	148	1,330
18	2,460	59	392	2,580	116	808	3,400	160	1,470
19	2,490	46	309	2,440	121	797	3,320	134	1,200
20	2,460	61	405	2,460	103	684	3,160	153	1,310
21	2,420	48	314	2,860	360	2,780	2,990	102	823
22	2,370	49	314	3,050	396	3,260	2,890	109	851
23	2,370	41	262	3,100	340	2,850	2,760	65	484
24	2,370	110	704	3,210	186	1,610	2,640	58	413
25	2,350	99	628	3,490	232	2,190	2,640	65	463
26	2,330	91	572	3,680	243	2,410	2,640	65	463
27	2,330	127	799	3,650	246	2,420	2,460	53	352
28	2,300	106	658	3,570	178	1,720	2,400	42	272
29	2,300	78	484	3,510	197	1,870	2,300	97	602
30	2,330	102	642	3,460	191	1,780	2,040	143	788
31	2,370	99	634	--	--	--	1,500	109	441
Total	77,260	--	45,626	83,760	--	33,233	86,160	--	33,086

Day	January			February			March		
1	1,480	85	340	2,110	138	786	3,680	370	3,680
2	1,450	110	431	2,050	121	670	3,630	377	3,690
3	1,500	122	494	2,020	111	605	3,460	326	3,050
4	1,480	83	332	2,000	98	529	3,180	337	2,890
5	1,460	58	229	1,930	92	479	3,070	384	3,180
6	1,480	53	212	1,770	55	263	2,920	287	2,260
7	1,290	46	160	1,830	37	183	2,860	266	2,050
8	1,300	45	158	2,130	39	224	3,020	298	2,430
9	1,400	51	193	2,370	58	371	3,070	397	3,290
10	1,500	91	369	2,640	66	470	3,210	434	3,760
11	1,600	68	294	2,970	149	1,190	3,460	760	7,100
12	1,480	62	248	2,860	208	1,610	3,510	753	7,140
13	1,490	43	163	3,130	247	2,090	3,600	750	7,290
14	1,430	39	151	3,180	167	1,430	3,460	749	7,000
15	1,550	62	259	3,350	261	2,360	3,160	640	5,460
16	1,700	72	330	3,430	175	1,620	3,100	720	6,030
17	1,800	86	418	3,630	243	2,380	3,240	1,080	9,450
18	1,900	62	318	3,650	202	1,990	3,240	794	6,950
19	1,850	79	395	3,850	304	3,160	3,240	644	5,630
20	2,000	99	535	3,770	262	2,670	3,050	571	4,700
21	2,100	114	646	3,680	283	2,810	2,740	481	3,560
22	2,370	154	985	3,740	247	2,490	2,560	493	3,410
23	2,370	149	953	3,770	262	2,670	2,560	1,410	9,750
24	2,400	137	888	3,680	416	4,130	2,610	880	6,200
25	2,400	116	752	3,650	443	4,370	3,070	784	6,500
26	2,400	105	680	3,630	369	3,620	3,160	600	5,120
27	2,500	93	628	3,710	355	3,560	3,240	600	a 5,250
28	2,580	144	1,000	3,790	343	3,510	4,020	700	7,600
29	2,460	145	963	--	--	--	4,690	1,400	18,100
30	2,300	128	795	--	--	--	4,750	1,500	19,200
31	2,200	107	636	--	--	--	4,560	2,600	32,000
Total	57,130	--	14,955	84,320	--	52,240	103,120	--	213,720

a Computed from estimated concentration graph.

GREEN RIVER BASIN--Continued

GREEN RIVER AT GREEN RIVER, UTAH--Continued

Suspended sediment, water year October 1950 to September 1951--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	4,780	4,940	63,800	9,110	1,980	48,700	28,700	4,040	313,000
2	5,000	4,100	55,400	8,860	1,450	34,700	30,000	3,410	276,000
3	4,870	3,650	48,000	8,820	1,240	29,500	30,300	3,150	258,000
4	4,500	3,200	38,900	9,070	1,270	31,100	30,200	2,660	217,000
5	4,320	3,620	42,200	9,200	1,140	28,300	29,500	2,430	194,000
6	4,200	3,000	34,000	9,030	966	23,600	27,600	2,960	221,000
7	4,260	2,180	25,100	8,180	593	13,100	24,600	2,840	189,000
8	4,410	1,580	18,800	7,380	734	14,600	21,800	2,530	149,000
9	4,940	1,420	18,900	7,160	651	12,600	19,600	2,530	134,000
10	5,810	1,900	29,800	7,990	530	11,400	18,200	1,630	80,100
11	6,160	2,600	43,200	9,920	900	24,100	17,300	1,740	81,300
12	6,330	3,450	59,000	11,400	1,400	43,100	16,500	1,810	80,600
13	6,400	2,900	50,100	11,900	1,150	36,900	15,800	1,550	66,100
14	6,160	2,830	47,100	11,800	2,020	64,400	15,200	1,500	61,600
15	5,850	1,820	28,700	12,300	2,150	71,400	14,600	780	30,700
16	5,610	1,770	26,800	13,500	1,700	62,000	14,600	650	25,600
17	5,380	1,590	23,100	13,900	2,100	78,800	15,400	2,650	110,000
18	5,060	1,130	15,400	13,800	2,050	76,400	16,900	3,500	160,000
19	4,900	982	13,000	14,200	2,170	83,200	18,800	1,450	73,600
20	5,610	971	14,700	15,400	3,700	154,000	20,600	2,150	120,000
21	6,650	1,270	22,800	15,700	3,400	144,000	22,500	2,250	137,000
22	6,870	1,300	24,100	15,500	2,850	119,000	25,200	4,200	286,000
23	7,120	1,300	25,000	16,800	3,800	172,000	26,400	3,600	257,000
24	7,990	1,670	36,000	18,800	4,100	221,000	26,500	2,870	205,000
25	9,070	2,180	53,400	20,000	3,000	181,000	25,700	2,350	163,000
26	9,240	2,070	a 51,600	20,700	3,700	207,000	24,400	2,000	132,000
27	8,700	2,250	52,900	22,000	3,680	219,000	23,100	900	56,100
28	8,660	2,000	46,800	23,400	3,670	232,000	21,500	450	26,100
29	9,280	1,750	43,800	25,000	3,350	226,000	19,900	430	23,100
30	9,280	1,970	49,400	26,500	3,400	a 243,000	18,600	580	29,100
31	--	--	--	27,400	4,800	355,000	--	--	--
Total	187,410	--	1,101,800	444,720	--	3,257,520	660,000	--	4,155,000

	July			August			September		
1	17,500	1,150	54,300	6,720	920	16,700	6,120	1,150	19,000
2	16,400	1,040	46,100	7,300	6,380	s 172,000	4,870	9,550	126,000
3	15,300	1,210	50,000	7,830	7,760	s 169,000	4,260	12,700	146,000
4	14,600	1,160	45,700	11,100	38,800	s1,200,000	3,910	5,630	59,400
5	14,000	1,020	38,600	10,100	30,300	s 962,000	3,680	2,900	28,800
6	13,500	1,100	40,100	8,580	10,000	232,000	3,650	1,220	12,000
7	12,800	930	32,100	8,420	6,750	153,000	3,820	602	6,210
8	12,200	826	27,200	8,100	5,870	128,000	3,940	577	6,140
9	11,500	800	24,800	8,060	4,900	107,000	3,680	525	5,220
10	10,800	450	13,100	7,990	3,900	84,100	3,400	436	4,000
11	10,600	350	10,000	7,870	3,800	80,700	3,180	580	4,980
12	10,500	500	14,200	7,380	2,820	56,200	3,020	700	5,710
13	10,100	550	15,000	6,900	1,900	35,400	2,890	580	4,530
14	9,620	500	13,000	6,470	1,500	26,200	2,790	578	4,350
15	9,200	500	12,400	6,050	990	a 16,200	2,710	463	3,390
16	8,820	400	9,530	5,610	400	6,060	2,640	400	2,850
17	8,740	600	14,200	5,220	326	4,590	2,580	240	1,670
18	8,780	560	13,300	4,780	457	5,900	2,490	205	1,380
19	8,220	600	13,300	4,500	440	5,350	2,420	157	1,030
20	7,490	616	12,500	4,260	400	4,600	2,370	160	1,020
21	7,420	2,300	46,100	4,050	322	3,520	2,300	82	509
22	7,190	1,000	19,400	4,140	980	11,000	2,260	73	445
23	7,450	700	14,100	4,290	1,050	12,200	2,210	59	352
24	8,140	3,400	74,700	4,780	6,620	s 85,800	2,170	71	416
25	7,680	10,500	218,000	4,530	5,000	61,200	2,100	54	306
26	7,720	6,550	137,000	4,470	4,500	54,300	2,060	45	a 250
27	8,540	2,900	66,900	4,050	4,000	43,700	2,040	34	187
28	8,580	2,200	51,000	3,880	4,520	47,400	2,020	43	235
29	8,140	1,720	37,800	4,750	9,270	s 128,000	2,020	65	355
30	7,600	1,350	27,700	4,320	6,850	79,900	1,980	49	262
31	7,080	1,560	29,800	4,410	2,230	26,600	--	--	--
Total	316,210	--	1,221,930	190,910	--	4,018,620	89,580	--	446,997

Total discharge for year (cfs-days) 2,380,580
Total load for year (tons) 14,594,727

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

GREEN RIVER AT GREEN RIVER, UTAH--Continued

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

Date of collection	Time	Water discharge (cfs)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Apr. 24, 1951	1:50 p.m.	8,030	1,940	2,030	--	32	--	53	--	71	81	88		97		PSWCM
May 6	4:30 p.m.	8,910	900	1,520	29	32	40	50	61	69	80	95		100		BSWCM
May 21	5:40 p.m.	15,600	2,960	1,980	--	28	--	41	--	62	75	93		99		PSWCM
May 27	4:55 p.m.	22,400	3,450	3,760	--	25	--	41	--	--	--	--		--		PWCM
June 5	11:20 a.m.	29,600	1,730	1,640	22	27	31	37	41	43	78	96		99		BSWCM
June 11	9:25 a.m.	17,400	1,550	1,420	14	15	17	21	30	43	65	89		100		BSWCM
June 19	9:00 a.m.	18,600	1,510	1,720	15	22	26	34	39	48	76	96		100		BSWCM
July 2	9:00 a.m.	16,600	1,230	1,060	13	15	18	21	26	35	60	93		98		BSWCM
July 13	5:45 p.m.	10,000	816	--	--	--	--	--	--	26	49	91		100		S
July 19	3:20 p.m.	8,100	578	1,050	34	46	58	70	76	80	86	96		97		BSWCM
July 26	5:30 p.m.	5,880	4,450	5,480	--	64	--	98	--	--	--	--		--		PWCM
Aug. 5	4:30 p.m.	8,420	13,900	3,820	41	55	64	--	--	93	98	100		--		PSWCM
Aug. 5	4:30 p.m.	8,420	13,900	3,420	38	49	60	72	86	93	98	100		--		BSWCM
Aug. 13	9:00 a.m.	6,980	1,830	2,060	--	40	--	59	--	69	84	93		99		PSWCM
Aug. 19	9:00 a.m.	4,440	414	--	--	--	--	--	--	69	83	94		99		S
Aug. 23	4:30 p.m.	4,260	1,540	2,640	--	88	--	96	--	--	--	--		--		PWCM

GREEN RIVER BASIN--Continued

SAN RAFAEL RIVER NEAR GREEN RIVER, UTAH

LOCATION.--At gaging station just downstream from bridge on State Highway 24, 15 miles southwest of Green River, Emery County, and 35 miles upstream from mouth.
DRAINAGE AREA.--1,690 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: November 1946 to September 1949, November 1950 to September 1951.
Water temperatures: July to September 1949, October 1950 to September 1951.
Sediment records: March 1948 to September 1949, October 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 5,010 ppm May 1-10; minimum, 670 ppm June 1-3.
Hardness: Maximum, 2,000 ppm May 1-10; minimum, 368 ppm June 1-3.
Specific conductance: Maximum daily, 6,120 micromhos May 13; minimum daily, 897 micromhos May 31.
Water temperatures: Maximum observed, 90°F July 19; minimum, freezing point on many days during December to February.
Sediment concentrations: Maximum daily, 115,000 ppm Aug. 4; minimum daily, 18 ppm July 20.
Sediment loads: Maximum daily, 786,000 tons Aug. 4; minimum daily, 1 ton July 20.
EXTREMES, 1949-51.--Dissolved solids: Maximum, 5,010 ppm May 1-10, 1951; minimum, 670 ppm June 1-3, 1951.
Hardness: Maximum, 2,000 ppm May 1-10, 1951; minimum, 368 ppm June 1-3, 1951.
Specific conductance: Maximum daily, 6,120 micromhos May 13, 1951; minimum daily, 849 micromhos June 19, 1949.
Water temperatures: Maximum observed, 90°F July 19, 1951; minimum, freezing point on many days during winter months.
Sediment concentrations (1948-51): Maximum daily, 115,000 ppm Aug. 4, 1951; minimum daily, 0 ppm (no flow) Sept. 5 to Oct. 3, 1948.
Sediment loads (1948-51): Maximum daily, 786,000 tons Aug. 4, 1951; minimum daily, 0 tons Sept. 5 to Oct. 3, 1948.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Nov. 14-20, 1950....	32.7	11	0.02	320	250	709	10	345	2,820	79	0.4	4.0		4,370	5.94	386	1,830	1,540	46	4,910	7.8	10
Nov. 21-30.....	54.4	11	.02	268	207	582	11	330	2,340	63	.4	4.4		3,650	4.96	536	1,520	1,250	45	4,220	7.8	10
Dec. 1-2, 4, 7, 9.....	43.4	10	.03	258	207	538	8.4	336	2,230	61	.4	3.5		3,480	4.73	408	1,490	1,220	44	4,060	7.7	10
Dec. 11-20.....	49.5	11	.06	258	189	489	7.6	342	2,040	54	.5	4.1		3,220	4.38	430	1,420	1,140	43	3,790	7.8	8
Dec. 21-31.....	45.0	10	.03	278	207	560	8.0	378	2,260	65	.4	4.1		3,580	4.87	435	1,540	1,240	44	4,130	7.9	8
Jan. 1, 3-5, 8-9, 1951	40.0	11	.05	297	211	565	8.4	413	2,310	67	.2	4.7		3,680	5.00	397	1,610	1,270	43	4,240	7.8	8
Jan. 11-20.....	40.0	12	.05	311	210	545	6.8	449	2,290	70	.2	4.4		3,670	4.99	396	1,640	1,270	42	4,220	7.8	10
Jan. 21-31.....	40.0	11	.03	252	168	439	8.4	399	1,820	53	.2	4.3		2,950	4.01	319	1,320	992	42	3,510	7.7	7
Feb. 1-10.....	48.8	11	.04	273	177	487	8.0	419	2,010	59	.1	5.0		3,240	4.41	427	1,410	1,070	43	3,800	7.7	7
Feb. 11-19.....	53.9	10	.04	204	127	360	7.6	318	1,430	40	.1	4.2		2,340	3.18	341	1,030	770	43	2,890	7.8	4
Feb. 20-28.....	51.6	10	.04	238	150	436	7.4	332	1,740	46	.2	3.7		2,790	3.79	389	1,210	939	44	3,360	7.8	7
Mar. 2-3, 5-7, 9.....	52.5	11	.12	260	187	545	18	338	2,160	61	.0	3.9		3,410	4.64	483	1,420	1,140	45	4,010	7.7	15
Mar. 12, 14, 16, 19-20	32.2	9.5	.16	296	212	637	24	340	2,540	71	.0	2.0		3,960	5.39	344	1,610	1,330	46	4,500	7.7	13
Mar. 21-31.....	25.9	8.2	.10	310	227	680	25	334	2,710	81	.0	2.5		4,210	5.73	294	1,710	1,430	46	4,760	7.9	13
Apr. 1-10.....	25.3	8.8	.04	322	261	805	15	323	3,110	93	.3	1.5		4,780	6.50	327	1,880	1,610	48	5,380	7.8	15
Apr. 11-20.....	13.9	7.6	.03	322	267	809	12	315	3,160	103	.5	1.0		4,840	6.58	182	1,900	1,640	48	5,450	7.8	15
Apr. 21-30.....	21.8	6.3	.05	320	265	794	13	305	3,060	92	.6	.5		4,700	6.39	277	1,890	1,640	48	5,320	7.8	15

May 1-10	14.0	6.0	.04	340	279	817	15	314	3,290	103	.3	.8		5,010	6.81	189	2,000	1,740	47	5,630	7.8	15
May 11-16, 18-20	36.5	9.4	--	312	259	849	--	314	3,190	92	--	1.0		4,870	6.62	480	1,840	1,590	50	5,500	--	--
May 17	a 69.0	--	--	--	--	--	--	--	1,930	--	--	--		--	--	--	b 1,180	--	--	3,660	--	--
May 21-24	a 129	--	--	--	--	--	--	302	2,270	53	--	--		--	--	--	--	--	--	4,070	--	--
May 25-27	a 301	--	--	--	--	--	--	278	1,080	29	--	--		--	--	--	--	--	--	2,300	--	--
May 28-31	a 1,270	--	--	--	--	--	--	244	370	10	--	--		--	--	--	--	--	--	1,050	--	--
June 1-3	734	11	.07	85	38	77	5.6	249	317	12	.6	.8		670	.91	1,330	368	164	31	1,010	7.6	20
June 4-10	323	11	.04	120	72	175	5.6	284	684	20	.4	1.0		1,230	1.67	1,070	596	363	39	1,690	7.7	20
June 11-20	412	12	.11	115	71	173	5.2	274	693	21	.4	.7		1,230	1.67	1,370	579	354	39	1,660	7.7	20
June 21-30	283	11	.10	128	86	215	6.0	276	863	26	.4	.8		1,470	2.00	1,120	673	447	41	1,930	7.7	20
July 1-10	64.2	11	.06	190	142	413	6.8	256	1,650	44	.4	1.2		2,580	3.51	447	1,060	848	46	3,150	7.7	20
July 11-20	27.5	9.2	.07	240	206	591	11	240	2,320	64	.4	.8		3,560	4.84	264	1,450	1,250	47	4,120	7.8	10
July 21	a 100	17	--	--	--	--	--	212	1,300	25	--	1.1		--	--	--	b 1,010	836	35	2,470	--	--
July 22-31, Aug. 1	36.4	15	.04	320	184	616	15	253	2,500	64	.7	.8		3,840	5.22	377	1,560	1,350	46	4,320	8.0	10
Aug. 6-10	179	13	.08	268	119	387	11	228	1,670	39	.6	1.9		2,620	3.56	1,270	1,160	971	42	3,070	8.0	10
Aug. 11-20	36.0	14	.13	288	194	562	14	240	2,350	59	.4	1.5		3,600	4.90	350	1,520	1,320	44	4,080	7.7	10
Aug. 21-22, 24-28, 30-31	88.6	15	--	398	145	400	14	261	2,070	44	.5	.9		3,220	4.38	770	1,590	1,380	35	3,600	7.6	10
Aug. 23, 29	a 81.5	13	--	--	--	--	--	214	1,230	31	--	.6		--	--	--	b 960	784	36	2,410	--	--
Sept. 1	a 58.0	--	--	--	--	--	--	--	--	36	--	--		--	--	--	--	--	--	2,700	--	--
Sept. 3-10	27.6	13	.05	304	201	633	7.2	265	2,540	69	.3	1.7		3,900	5.30	291	1,580	1,370	46	4,390	7.9	20
Sept. 11-20	14.5	8.5	.04	326	230	700	5.6	265	2,830	83	.2	1.7		4,320	5.88	169	1,760	1,540	46	4,790	7.9	15
Sept. 21-30	12.4	6.5	.04	332	244	758	5.6	268	3,000	90	.4	1.9		4,570	6.22	153	1,830	1,610	47	5,050	7.9	15
Weighted average	c 76.6	11	0.07	193	124	342	8.0	292	1,390	39	0.4	1.7		2,250	3.06	465	992	752	43	2,740	--	--

a Not included for computation of weighted averages.
b Determined by Schwarzenbach method.
c Represents 63 percent of the runoff for the water year October 1950 to September 1951.

GREEN RIVER BASIN--Continued

SAN RAFAEL RIVER NEAR GREEN RIVER, UTAH--Continued

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

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

GREEN RIVER BASIN--Continued

SAN RAFAEL RIVER NEAR GREEN RIVER, UTAH--Continued

Suspended sediment, water year October 1950 to September 1951

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	11	--		27	635	46	45	990	120
2	11	--		27	640	a 47	49	1,080	143
3	11	--		26	666	47	42	1,020	a 116
4	13	--		27	645	47	39	1,050	111
5	13	--		26	620	a 44	37	1,100	a 110
6	13	--					39	1,080	a 114
7	13	--					42	1,150	130
8	14	--		26	640	45	35	1,110	105
9	14	--					42	1,200	136
10	13	--	b 14	21	600	a 34			
11	13	--		21	703	40			
12	16	--		22	760	a 45			
13	16	--		26	839	59			
14	15	--		26	923	65			
15	15	--		26	968	68	50	1,500	202
16	14	--		33	1,220	109			
17	16	--		34	1,110	101			
18	16	520	22	34	1,035	95			
19	16	453	20	36	730	71			
20	16	457	20	40	880	95			
21	17	499	23	64	2,990	517			
22	19	467	24	69	3,820	712			
23	20	430	23	61	2,880	474			
24	22	537	32	59	2,590	413			
25	22	582	35	53	1,630	233	45	780	95
26	23	600	a 37	48	1,000	130			
27	25	620	a 42	47	900	114			
28	26	600	a 42	50	1,300	176			
29	27	556	41	49	1,050	139			
30	26	580	a 41	44	960	114			
31	26	600	a 42	--	--	--			
Total	532	--	682	1,100	--	4,215	1,410	--	4,245

Day	January			February			March		
1				35	611	58	44	1,000	119
2				35	564	53	52	1,490	209
3				36	540	a 52	54	1,390	203
4				38	520	a 53	50	1,200	a 162
5				40	506	55	50	1,070	144
6				44	372	44	52	2,110	296
7				50	456	62	55	1,380	205
8							55	1,100	a 163
9							52	867	122
10				70	1,650	312	48	858	111
11							43	820	a 95
12							40	795	86
13							36	495	48
14				50	2,170	293	32	715	62
15							33	650	a 58
16	40	400	43				34	583	54
17							33	578	51
18				45	3,200	389	33	500	a 45
19							27	386	28
20							28	387	29
21				50	2,500	338	27	458	33
22				55	2,350	349	30	610	49
23				55	2,390	355	28	490	37
24				56	2,090	316	26	350	25
25				55	1,740	258	26	320	a 22
26				51	1,500	207	25	313	21
27				45	1,480	180	24	200	13
28				52	1,210	170	24	280	18
29				--	--	--	25	300	20
30				--	--	--	24	300	19
31				--	--	--	26	1,590	112
Total	1,240	--	1,333	1,437	--	7,049	1,136	--	2,659

a Computed from estimated concentration graph.
b Computed from water-sediment discharge curve.

GREEN RIVER BASIN--Continued

SAN RAFAEL RIVER NEAR GREEN RIVER, UTAH--Continued

Suspended sediment, water year October 1950 to September 1951--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	26	1,560	110	18	232	11	975	8,550	22,500
2	29	860	67	18	274	13	736	7,200	14,300
3	35	420	40	19	187	10	531	6,600	9,460
4	32	294	25	16	175	8	411	3,800	4,220
5	25	280	19	15	150	6	339	3,200	2,930
6	22	395	23	14	153	6	311	4,180	3,510
7	24	311	20	12	154	5	301	4,550	3,700
8	23	314	19	9.9	171	5	291	4,000	3,140
9	20	215	12	9.0	190	5	328	3,700	3,280
10	17	238	11	9.5	130	3	325	3,300	2,900
11	18	288	14	9.9	247	7	332	2,940	2,640
12	18	230	11	9.9	170	5	328	3,810	3,370
13	18	176	9	10	200	5	353	3,680	3,510
14	13	154	5	21	2,860	s217	346	3,120	2,910
15	11	130	4	35	3,900	369	371	3,500	3,510
16	11	130	4	69	6,710	s1,340	437	3,120	3,680
17	11	125	4	69	12,900	2,400	445	2,800	3,360
18	11	159	5	67	7,950	1,440	519	5,650	7,920
19	13	175	6	55	4,000	594	555	5,550	8,320
20	15	225	9	52	2,400	337	476	4,130	5,310
21	29	560	44	59	3,450	550	460	3,150	3,910
22	24	340	22	130	8,400	2,950	426	2,550	2,930
23	24	288	19	220	12,300	s9,090	393	3,100	3,290
24	22	222	13	287	21,000	c16,300	325	1,830	1,610
25	19	186	10	245	10,800	7,140	284	2,200	1,690
26	19	148	8	378	13,500	13,800	268	2,430	1,760
27	19	274	14	643	20,600	35,800	225	2,400	1,460
28	21	356	20	1,130	19,200	58,600	200	2,600	1,400
29	21	222	13	1,310	18,600	65,800	182	2,000	983
30	20	251	14	1,230	13,200	43,800	165	2,800	1,250
31	--	--	--	1,190	9,700	31,200	--	--	--
Total	610	--	594	7,360.2	--	291,816	11,638	--	134,753

Day	July			August			September		
1	138	1,780	663	62	4,600	s934	58	14,800	2,240
2	108	1,100	321	55	2,600	386	45	7,900	a960
3	85	756	174	287	17,800	sc21,900	38	3,290	338
4	67	963	174	2,250	115,000	sa786,000	33	1,400	125
5	52	294	41	1,130	68,800	s241,000	31	1,000	84
6	45	406	49	331	23,000	20,600	28	820	62
7	47	313	40	207	10,000	5,590	23	520	32
8	36	267	26	154	3,750	1,560	25	239	16
9	33	232	21	117	2,900	916	22	104	6
10	31	232	19	85	2,100	482	21	105	6
11	30	173	14	72	1,500	292	19	230	12
12	30	154	12	59	1,110	177	16	59	3
13	27	129	9	45	1,000	122	15	148	6
14	26	157	11	37	600	60	15	137	6
15	25	157	11	30	227	18	15	121	5
16	24	75	5	26	550	39	14	140	a5
17	26	82	6	23	550	34	14	160	6
18	27	35	3	22	238	14	13	192	7
19	30	42	3	22	244	14	12	100	a3
20	30	18	1	24	650	42	12	102	3
21	100	4,300	1,160	22	500	30	12	100	3
22	40	9,700	1,050	57	15,900	sc3,170	11	141	4
23	35	11,500	1,090	100	23,700	c6,400	10	122	3
24	32	17,300	1,490	102	26,200	c7,220	10	123	3
25	29	9,500	744	164	40,000	17,700	11	146	4
26	26	2,300	161	72	57,000	11,100	13	144	5
27	29	3,400	s328	52	45,100	6,330	12	139	5
28	38	4,350	sc703	40	28,800	3,110	14	113	4
29	54	6,700	977	63	32,800	s6,390	16	271	12
30	30	3,400	275	186	39,600	s23,700	15	138	6
31	40	2,800	302	98	24,000	6,350	--	--	--
Total	1,370	--	9,883	5,994	--	1,171,680	593	--	3,974

Total discharge for year (cfs-days) 34,420.2
Total load for year (tons) 1,632,883

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

SAN RAFAEL RIVER NEAR GREEN RIVER, UTAH--Continued

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

Date of collection	Time	Water discharge (cfs)	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Apr. 30, 1951	2:40 p. m.	19	214	2,390	53	56	75	86	93	98	99	--		--		BWCM
May 14	2:20 p. m.	59	27,400	3,630	43	51	57	69	79	87	94	99		100		PSWCM
May 14	2:20 p. m.	59	27,400	3,380	42	50	60	70	79	87	94	99		100		BSWCM
May 21	3:15 p. m.	54	3,680	4,200	--	81	--	94	--	--	--	--		--		PWCM
May 28	3:00 p. m.	1.160	18,300	3,910	--	23	--	43	--	72	88	99		100		PSWCM
June 5	2:30 p. m.	335	3,050	3,420	15	18	26	29	40	57	80	96		100		BSWCM
June 11	3:55 p. m.	325	2,510	2,780	12	15	19	24	34	53	91	98		100		BSWCM
June 18	3:05 p. m.	464	4,820	2,740	--	16	--	28	--	57	79	94		99		PSWCM
July 2	3:15 p. m.	94	854	1,020	18	24	30	37	43	54	82	99		100		BSWCM
July 25	3:15 p. m.	35	7,110	4,440	--	89	--	97	--	98	99	100		--		PSWCM
Aug. 6	11:00 a. m.	325	23,300	9,100	--	61	--	86	--	95	99	100		--		PSWCM
Aug. 13	4:00 p. m.	48	807	1,120	5	8	9	31	39	59	84	99		100		BSWCM
Aug. 28	3:00 p. m.	40	26,200	3,210	--	82	--	86	--	98	99	100		--		PSWCM

DIRTY DEVIL RIVER BASIN

DIRTY DEVIL RIVER NEAR HITE, UTAH

LOCATION.--Samples collected near the mouth, above backwater of the Colorado River, about 9 miles upstream from Hite, Garfield County, and 3 miles downstream from gaging station.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1951.
Water temperatures: May 1949 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 6,070 ppm July 12, 17, 19; minimum, 1,240 ppm Dec. 21-31, Jan. 21-31.
Hardness: Maximum, 3,030 ppm July 12, 17, 19; minimum, 730 ppm Feb. 1-10.
Specific conductance: Maximum daily, 8,530 micromhos July 10; minimum daily, 1,440 micromhos Jan. 20.
Water temperatures: Maximum observed, 93°F Aug. 18; minimum observed, freezing point Jan. 8, Feb. 2-4.
EXTREMES, 1947-51.--Dissolved solids: Maximum, 6,310 ppm June 21-30, 1950; minimum, 708 ppm March 21-24, 26-31, 1948.
Hardness: Maximum, 3,030 ppm July 12, 17, 19, 1951; minimum, 454 ppm March 21-24, 26-31, 1948.
Specific conductance: Maximum daily, 9,070 micromhos June 23, 1950; minimum daily, 898 micromhos Feb. 17, 1948.
Water temperatures: Maximum observed, 97°F July 2, 1950; minimum observed, freezing point on several days during winter months.
REMARKS.--Prior to July 8, 1948, samples were collected at gaging station near Hanksville. Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Water discharge records are not published.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Oct. 1-10, 1950..		23	0.04	364	59	126	9.2	186	1,070	110	0.4	1.3		1,850	2.52		1,150	998	19		2,260	7.4	8
Oct. 11-20		23	.05	318	56	121	8.4	184	956	105	.5	1.4		1,680	2.28		1,020	873	20		2,100	7.5	8
Oct. 21-31		25	.04	308	56	128	6.8	186	919	114	.5	1.0		1,650	2.24		999	846	22		2,080	7.5	8
Nov. 1-10.....		23	.03	286	53	110	6.0	194	847	88	.3	1.5		1,510	2.05		932	772	20		1,920	7.5	8
Nov. 11-20.....		22	.06	282	56	108	6.0	206	840	86	.3	2.1		1,500	2.04		934	765	20		1,890	7.6	8
Nov. 21-30.....		26	.05	298	61	137	6.0	222	868	127	.3	3.1		1,640	2.23		994	812	23		2,080	7.6	8
Dec. 1-10.....		28	.05	255	54	113	8.0	208	759	116	.2	2.4		1,440	1.96		858	688	22		1,870	7.6	8
Dec. 11, 14-15, 18-20.....		26	.04	250	56	132	6.8	202	777	128	.2	2.9		1,480	2.01		854	689	25		1,950	7.7	8
Dec. 21-31.....		28	.06	219	49	103	6.0	207	629	106	.3	2.3		1,240	1.69		748	578	23		1,660	7.8	8
Jan. 3-8, 1951...		28	.05	236	56	129	8.8	214	705	144	.2	3.0		1,420	1.93		820	644	25		1,880	7.6	7
Jan. 9-10		29	--	301	82	273		256	900	378	--	2.9		2,090	2.84		1,090	878	35		2,860	7.9	--
Jan. 11-20		33	.06	228	55	100	9.2	213	671	101	.2	2.9		1,310	1.78		795	620	21		1,710	7.8	7
Jan. 21-31		28	.07	222	45	99	11	187	644	98	.3	2.8		1,240	1.69		739	586	22		1,620	7.9	7
Feb. 1-10.....		24	.08	212	49	135	12	188	654	132	.3	3.1		1,310	1.78		730	576	28		1,760	7.9	10
Feb. 11-13, 20..		28	.07	236	49	134	10	181	717	125	.4	2.9		1,390	1.89		790	642	27		1,840	7.2	10
Feb. 21-28.....		28	.06	230	49	132	9.6	194	697	134	.4	3.0		1,380	1.88		776	616	27		1,830	7.2	10
Mar. 1-10.....		30	.05	218	49	141	6.4	206	667	137	.2	3.2		1,350	1.84		746	576	29		1,830	7.7	10
Mar. 11-20.....		31	.05	221	54	150	7.6	211	691	139	.3	2.9		1,400	1.90		774	600	29		1,890	7.6	10
Mar. 21-31.....		34	.04	209	53	153	8.4	202	658	154	.3	1.9		1,370	1.86		740	574	31		1,870	7.7	10

Apr. 1-10.....	21	.08	233	61	204	9.8	192	777	215	.4	2.0	1,620	2.20	832	675	34	2,240	7.2	15
Apr. 11, 15-17, 20	24	.07	237	65	175	9.3	212	775	185	.4	1.1	1,580	2.15	859	686	30	2,130	7.1	10
Apr. 22-24, 29-30	32	.07	245	70	181	19	208	855	192	.4	.4	1,700	2.31	900	729	30	2,220	7.7	10
Apr. 25-28.....	31	.07	331	88	376	18	237	1,220	400	.4	.7	2,580	3.51	1,190	994	40	3,360	7.4	10
May 1-10.....	32	.06	270	75	196	19	190	970	198	.4	.2	1,850	2.52	982	826	30	2,410	7.6	10
May 13, 15-16 ...	27	.04	273	82	194	10	194	976	185	.5	4.4	1,850	2.52	1,020	859	29	2,390	7.3	10
May 17-20.....	25	.05	490	117	486	8.0	200	1,910	398	.6	2.8	3,540	4.81	1,700	1,540	38	4,290	7.2	10
May 21-31.....	26	.08	464	110	436	7.8	184	1,870	315	.6	4.8	3,320	4.52	1,610	1,460	37	3,970	7.3	15
June 1-10	25	.07	576	128	476	12	210	2,180	380	.9	5.7	3,890	5.29	1,800	1,790	34	4,490	7.4	15
June 11-20	34	.03	614	170	632	30	300	2,270	755	.6	1.3	4,650	6.32	2,230	1,980	38	5,690	7.6	10
June 21-25	38	.04	570	163	532	21	226	2,380	450	.8	2.5	4,270	5.81	2,090	1,910	35	4,960	7.7	30
June 28-30	26	.05	704	213	903	46	532	2,360	1,280	1.0	1.8	5,800	7.89	2,630	2,200	42	7,380	7.5	10
July 3-4, 6.....	20	.04	246	83	345	22	311	678	528	.4	1.6	2,080	2.83	956	700	43	3,100	7.7	10
July 1-2, 5, 9 ...	20	.03	278	111	440	25	294	866	678	.5	1.6	2,560	3.48	1,150	909	45	3,780	7.6	10
July 7-8, 10-11 ..	23	.05	538	183	831	44	505	1,640	1,300	.5	2.0	4,810	6.54	2,100	1,680	46	6,600	7.4	5
July 12, 17, 19 ..	31	.09	755	278	835	52	535	2,750	1,100	.7	1.5	6,070	8.26	3,030	2,590	37	7,310	7.4	15
July 26-31.....	25	.06	582	130	371	24	310	2,080	265	.7	1.2	3,630	4.94	1,990	1,730	29	4,150	7.3	30
Aug. 1, 3-6, 10..	22	.04	610	108	324	13	284	2,020	215	.5	1.4	3,450	4.69	1,970	1,730	26	3,850	7.4	20
Aug. 11-20.....	34	.03	640	92	254	20	150	1,990	225	.5	1.2	3,330	4.53	1,980	1,850	22	3,650	7.7	15
Aug. 21, 23-27, 29, 31.....	20	.04	577	87	308	9.2	209	1,950	210	.5	.8	3,270	4.45	1,800	1,630	27	3,670	7.6	20
Aug. 22, 30	16	--	300	47	128		180	919	82	--	1.3	1,580	2.15	942	794	23	1,980	8.1	--
Aug. 28.....	16	--	660	122	534		300	2,400	400	--	.8	4,280	5.82	2,150	1,900	35	4,750	7.0	--
Sept. 1-10.....	23	.05	600	76	271	17	165	1,890	225	.6	1.4	3,190	4.34	1,810	1,670	24	3,570	7.5	15
Sept. 11-20.....	29	.03	495	70	167	16	158	1,450	170	.5	.7	2,480	3.37	1,520	1,390	19	2,870	7.7	10
Sept. 21-22, 27-28	27	.06	407	66	153	14	155	1,210	150	.5	.3	2,110	2.87	1,290	1,160	20	2,530	7.6	10

DIRTY DEVIL RIVER BASIN--Continued

DIRTY DEVIL RIVER NEAR HITE, UTAH--Continued

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	56	46	33	33	41	53	59	66	91	74	77
2	58	54	41	34	32	41	59	68	70	89	77	81
3	66	54	40	34	32	38	60	68	72	83	85	--
4	67	55	43	37	32	40	59	72	73	90	74	--
5	66	52	43	35	33	46	56	75	75	82	78	80
6	65	51	40	36	34	49	64	70	78	82	80	78
7	--	48	39	33	34	47	62	71	79	89	--	81
8	--	49	40	32	36	45	65	73	81	85	--	85
9	59	46	41	37	37	--	66	75	81	87	--	80
10	70	41	41	37	39	47	60	74	77	81	86	79
11	71	40	40	34	43	47	62	--	88	83	79	76
12	68	40	--	36	44	49	66	--	86	86	86	78
13	69	41	--	35	42	51	68	64	82	--	84	79
14	67	--	38	33	--	54	69	62	90	--	88	77
15	56	--	40	33	--	56	66	58	92	--	89	78
16	--	40	38	34	--	54	64	60	92	--	88	79
17	63	46	39	35	--	50	68	67	91	78	92	80
18	67	47	39	38	42	54	--	71	85	--	93	79
19	59	49	41	35	43	53	--	73	88	75	83	81
20	60	53	41	33	43	55	67	76	70	--	--	80
21	61	53	38	35	45	--	66	78	78	--	74	72
22	63	51	38	37	44	--	73	66	84	--	77	72
23	60	48	37	--	44	52	72	67	87	--	72	67
24	63	46	36	--	43	55	67	74	84	--	74	--
25	64	45	--	38	44	59	66	74	76	--	76	--
26	58	41	35	--	43	58	62	79	--	89	80	--
27	60	44	33	40	43	56	63	78	--	84	79	73
28	59	38	33	43	41	48	69	74	89	87	74	70
29	59	43	35	35	--	54	63	--	91	82	67	67
30	--	39	37	33	--	53	57	65	82	87	69	67
31	--	--	33	34	--	53	--	72	--	90	70	--
Average	63	47	39	35	39	50	64	70	82	--	80	77

COLORADO RIVER AT HITE, UTAH

LOCATION.--At gaging station at Hite, Garfield-San Juan County line, a quarter of a mile upstream from Trachyte Creek, 1 mile downstream from White Canyon, 8 miles downstream from Dirty Devil River, and 84 miles upstream from San Juan River.
DRAINAGE AREA.--76,600 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1951.
Water temperatures: May 1949 to September 1951.
Sediment records: October 1948 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 1,220 ppm Jan. 11-20; minimum, 287 ppm June 21-30.
Hardness: Maximum, 534 ppm Jan. 11-20; minimum, 164 ppm June 21-30.
Specific conductance: Maximum daily, 1,820 micromhos Jan. 18, 20; minimum daily, 398 micromhos June 3.
Water temperatures: Maximum observed, 83°F July 31; minimum, freezing point Feb. 2-5.
Sediment concentrations: Maximum daily, 34,300 ppm Aug. 4; minimum daily, 49 ppm Jan. 10.
Sediment loads: Maximum daily, 1,770,000 tons Aug. 4; minimum daily, 447 tons Jan. 10.
EXTREMES, 1948-51.--Water temperatures (1949-51): Maximum observed 83°F July 31, 1951; minimum, freezing point on several days during winter months.
Sediment concentrations: Maximum daily, 34,300 ppm Aug. 4, 1951; minimum daily, 49 ppm Jan. 10, 1951.
Sediment loads: Maximum daily, 1,770,000 tons Aug. 4, 1951; minimum daily, 447 tons Jan. 10, 1951.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Dec. 1-10, 1950 ..	6,162	13	0.06	111	51	138	4.0	231	424	105	0.4	5.0		1,000	1.36	16,640	486	297	38		1,420	7.7	7
Dec. 11-20.....	6,051	15	.05	116	54	159	4.6	237	453	131	.4	5.4		1,090	1.48	17,810	512	318	40		1,550	8.0	7
Dec. 21,24,26-28, 30-31	5,484	15	.05	108	50	143	4.4	226	414	114	.4	4.6		994	1.35	14,720	475	290	39		1,420	8.0	7
Jan. 1-10, 1951...	4,329	14	.05	120	54	165	5.0	238	465	151	.4	6.2		1,130	1.54	13,210	522	326	40		1,620	8.0	7
Jan. 11-20	3,795	15	.04	120	57	193	8.4	236	484	175	.3	5.5		1,220	1.66	12,500	534	340	44		1,730	8.1	10
Jan. 21-31	5,295	15	.04	108	49	156	6.4	227	421	135	.3	5.1		1,050	1.43	15,010	471	285	41		1,490	8.0	8
Feb. 1-12.....	4,742	16	.04	112	48	161	7.2	232	400	147	.2	5.1		1,050	1.43	13,440	477	287	42		1,510	7.9	10
Feb. 18-28.....	6,808	13	.06	94	42	135	6.0	212	373	102	.3	4.5		905	1.23	16,640	407	234	41		1,290	7.7	10
Mar. 3, 5-7, 10..	6,126	14	.07	90	42	142	4.6	217	367	109	.3	3.5		903	1.23	14,940	397	219	43		1,320	7.7	10
Mar. 11-20	6,168	13	.05	90	42	149	4.4	218	361	112	.3	3.3		902	1.23	15,020	397	218	45		1,330	7.7	10
Mar. 21-31.....	5,887	13	.05	82	41	131	4.2	200	338	107	.3	3.0		834	1.13	13,260	373	209	43		1,250	8.1	10
Apr. 1-10.....	7,417	11	.08	89	35	126	5.3	214	328	100	.4	5.0		814	1.11	16,300	366	190	42		1,230	7.5	10
Apr. 11-20.....	7,807	11	.05	76	33	103	5.3	204	263	80	.5	4.5		697	.95	14,690	325	158	40		1,060	7.5	10
Apr. 21-30	11,120	14	.04	67	30	77	6.2	194	206	56	.6	2.8		564	.77	16,930	290	132	36		852	7.9	23
May 1-10	14,090	17	.03	64	23	64	3.0	188	166	44	.4	4.0		492	.67	18,720	254	100	35		751	7.3	20
May 11-20	21,320	17	.03	56	19	47	2.4	164	135	30	.4	4.4		399	.54	22,970	218	83	32		623	7.6	20
May 21-31	37,760	16	.03	59	18	40	2.8	166	125	25	.4	4.4		376	.51	38,330	221	85	28		582	7.5	20

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT HITE, UTAH--Continued

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
June 1-10, 1951...	46,010	14	.04	48	14	29	2.8	156	86	15	.4	3.3		295	.40	36,650	178	50	26		464	7.5	20
June 11-20	32,950	18	.01	51	15	34	3.4	153	111	19	.2	1.7		334	.45	29,710	188	63	28		519	7.7	--
June 21-30	47,280	18	.01	44	13	28	3.4	138	90	16	.2	1.5		287	.39	36,640	164	50	27		443	7.7	--
July 1-10	28,080	16	.02	47	14	31	3.6	136	98	21	.2	1.3		311	.42	23,580	175	64	27		477	7.7	--
July 11-20.....	17,140	13	.05	62	17	44	2.4	173	131	33	.3	1.0		404	.55	18,700	224	82	30		607	7.9	10
July 26, 28-31....	14,300	16	.07	78	23	64	3.6	187	210	41	.5	3.7		552	.75	21,310	289	136	32		802	8.0	10
Aug. 1-2, 5, 10 ..	15,200	14	.08	101	27	78	4.0	191	292	49	.4	2.0		683	.93	28,030	363	206	32		963	7.9	10
Aug. 11-20.....	10,040	16	.04	78	27	80	4.4	183	251	51	.3	3.4		618	.84	16,750	306	156	36		881	7.7	10
Aug. 21-31.....	7,854	13	.03	109	36	107	3.2	195	375	72	.4	4.8		837	1.14	17,750	420	260	35		1,200	7.8	10
Sept. 1-10	8,055	14	.03	133	41	121	3.6	197	482	75	.4	5.5		1,000	1.36	21,750	500	339	34		1,360	7.9	20
Sept. 11-20	4,915	11	.03	106	42	128	4.4	190	419	90	.4	3.8		942	1.28	12,500	437	282	39		1,310	8.0	10
Sept. 21-22, 27-30	4,317	11	.02	124	52	153	4.4	198	521	111	.4	4.6		1,120	1.52	13,050	524	362	39		1,530	8.1	10
Weighted average	a 13,910	15	0.03	68	24	66	3.7	174	195	47	0.3	3.2		521	0.71	19,570	268	126	34		773	--	--

a Represents 86 percent of the runoff for water year October 1950 to September 1951

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT HITE, UTAH--Continued

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

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

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT HITE, UTAH--Continued

Suspended sediment, water year October 1950 to September 1951

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	6,230	1,360	a 22,900	4,630	195	2,440	6,530	392	6,910
2	6,000	1,220	19,800	4,710	325	4,130	6,410	385	6,660
3	5,720	1,120	17,300	4,710	300	3,820	6,350	346	5,930
4	5,410	1,110	16,200	4,690	259	3,280	6,370	360	6,190
5	5,260	1,050	14,900	4,710	244	3,100	6,290	339	5,760
6	5,240	1,070	15,100	4,740	225	2,880	6,150	332	5,510
7	5,240	980	13,900	4,790	207	2,680	6,060	330	5,400
8	5,170	700	9,770	4,820	207	2,690	5,870	273	4,330
9	5,150	573	7,970	5,100	240	3,300	5,870	324	5,210
10	5,120	540	7,460	5,060	220	3,010	5,720	309	4,770
11	5,010	450	6,090	4,930	178	2,370	5,570	340	5,110
12	5,010	391	5,290	5,030	162	2,200	5,830	450	a 7,080
13	5,000	325	4,390	5,150	134	1,860	6,090	420	a 6,910
14	4,840	284	3,710	5,340	160	a 2,310	6,080	350	5,750
15	4,630	300	3,750	5,470	180	a 2,660	5,810	273	4,280
16	4,810	350	4,550	5,480	198	2,930	5,740	341	5,280
17	4,770	211	2,720	5,400	210	3,060	5,750	322	5,000
18	4,520	138	1,680	5,610	230	3,480	6,150	379	6,290
19	4,500	116	1,410	5,770	249	3,880	6,570	315	5,590
20	4,660	169	2,130	5,850	244	3,850	6,920	317	5,920
21	4,840	200	2,610	5,680	210	3,220	6,800	313	5,750
22	4,710	125	1,590	6,080	325	5,340	6,370	315	5,420
23	4,770	160	2,060	6,310	610	10,400	6,130	317	5,250
24	4,660	71	893	6,550	783	13,800	6,090	301	4,950
25	4,600	111	1,380	6,630	758	13,600	5,940	300	a 4,810
26	4,530	150	1,830	6,900	699	13,000	5,590	294	4,440
27	4,550	252	3,100	7,130	690	13,300	5,280	260	3,710
28	4,530	219	2,680	7,040	492	9,350	5,050	217	2,960
29	4,440	200	a 2,400	6,820	363	6,680	5,000	200	2,700
30	4,300	180	a 2,090	6,860	372	6,890	4,810	161	2,090
31	4,390	190	a 2,250	--	--	--	4,770	200	2,580
Total	152,610	--	203,903	167,990	--	155,510	183,960	--	158,540

Day	January			February			March		
1	4,930	217	2,890	4,930	430	5,720	6,880	500	9,290
2	4,890	240	3,170	3,770	352	3,580	6,740	450	8,190
3	4,520	210	2,560	2,580	217	1,510	6,410	370	6,400
4	4,520	132	1,610	2,850	167	1,290	6,490	290	5,080
5	4,500	130	1,580	3,210	130	1,130	6,550	384	6,790
6	4,600	140	1,740	3,990	100	1,080	6,110	372	6,140
7	4,110	109	1,210	4,930	440	5,860	6,020	379	6,160
8	3,970	100	1,070	5,590	735	11,100	5,900	370	5,890
9	3,870	100	1,040	6,530	815	14,400	5,480	360	a 5,330
10	3,380	49	447	6,230	820	13,800	5,540	350	5,240
11	2,920	60	473	5,960	784	12,600	5,980	376	6,070
12	2,970	62	497	6,330	778	13,300	6,060	359	5,870
13	3,570	100	964	6,680	771	13,900	6,270	680	11,500
14	3,920	200	2,120	6,740	770	a 14,000	6,490	833	14,600
15	4,060	190	2,080	6,650	770	a 13,800	6,630	837	15,000
16	4,020	160	1,740	6,630	780	a 14,000	6,370	738	12,700
17	3,940	130	1,380	6,530	800	a 14,100	6,060	836	10,400
18	3,920	150	1,590	6,510	830	14,600	5,920	536	8,570
19	4,160	200	2,250	6,410	845	14,600	5,980	526	8,490
20	4,470	230	2,780	6,860	971	18,000	5,920	454	7,260
21	4,770	290	3,730	7,110	1,040	20,000	6,000	520	a 8,420
22	4,960	320	4,290	7,210	1,140	22,200	5,740	610	a 9,450
23	4,910	320	a 4,240	6,980	1,380	26,000	5,470	706	10,400
24	4,880	320	a 4,220	6,610	1,420	25,300	5,260	770	10,900
25	5,120	331	4,580	6,720	1,590	28,800	5,450	780	11,500
26	5,400	330	a 4,810	6,880	1,330	24,700	5,660	895	13,700
27	5,560	332	4,980	6,800	1,060	19,500	5,770	972	15,100
28	5,450	380	5,590	6,800	970	17,800	6,060	1,040	17,000
29	5,750	523	8,120	--	--	--	6,040	993	16,200
30	5,880	590	9,370	--	--	--	6,230	856	14,400
31	5,560	547	8,210	--	--	--	7,080	825	15,800
Total	139,480	--	95,331	165,020	--	386,670	188,560	--	307,840

a Computed from estimated concentration graph.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT HITE, UTAH--Continued

Suspended sediment, water year October 1950 to September 1951--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	7,910	743	15,900	14,600	1,810	71,400	55,300	3,120	466,000
2	7,750	729	15,300	14,700	1,460	57,900	55,100	2,950	439,000
3	7,510	863	17,500	15,200	1,450	59,500	54,700	3,300	487,000
4	7,710	942	19,600	14,700	1,450	57,600	52,200	3,300	465,000
5	7,730	990	20,700	14,000	1,610	60,900	48,700	3,060	402,000
6	7,320	957	18,900	13,500	1,540	56,100	45,800	2,800	346,000
7	6,940	1,040	19,500	13,200	1,550	55,200	42,100	2,560	291,000
8	6,920	1,240	23,200	13,000	1,610	56,500	38,100	2,400	a247,000
9	7,080	1,590	30,400	12,200	1,550	55,200	34,700	1,990	186,000
10	7,300	1,580	31,100	14,800	1,700	67,900	33,400	1,580	142,000
11	7,270	1,600	31,400	16,500	2,050	a91,300	33,400	1,490	134,000
12	7,860	1,670	35,400	17,800	2,000	a96,100	32,800	1,530	135,000
13	8,160	1,570	34,600	20,200	1,930	105,000	32,200	1,300	113,000
14	8,440	1,310	29,900	21,800	2,030	119,000	30,700	1,210	100,000
15	8,440	1,490	34,000	22,400	2,150	130,000	29,000	1,290	101,000
16	8,210	2,020	44,800	22,700	2,270	139,000	28,800	1,200	93,300
17	7,820	2,200	46,500	23,000	3,280	204,000	29,800	1,350	109,000
18	7,470	1,880	a37,900	22,900	3,480	215,000	32,100	1,770	153,000
19	7,250	1,430	a28,000	22,400	3,230	195,000	37,600	1,780	181,000
20	7,150	1,220	23,600	23,500	2,610	166,000	43,100	1,820	212,000
21	7,270	1,110	21,800	25,600	1,920	133,000	46,300	2,210	276,000
22	7,820	1,080	22,800	28,300	1,790	137,000	50,000	2,250	304,000
23	9,080	1,200	29,400	31,300	2,300	194,000	53,000	2,190	313,000
24	9,880	1,240	33,100	32,400	3,530	309,000	55,200	2,330	347,000
25	10,800	1,190	34,700	34,200	3,450	319,000	52,400	2,560	362,000
26	12,000	1,400	45,400	35,800	3,500	338,000	47,900	2,710	a350,000
27	13,200	1,800	a64,200	36,900	3,590	358,000	44,900	2,350	a285,000
28	13,700	1,820	67,300	39,200	4,020	425,000	43,200	1,780	208,000
29	13,500	1,970	71,800	44,400	3,830	a459,000	41,100	1,870	208,000
30	13,900	2,400	90,100	51,600	3,530	492,000	38,800	1,830	192,000
31	--	--	--	55,700	3,470	522,000	--	--	--
Total	263,390	--	1,038,800	769,500	--	5,744,600	1,262,400	--	7,647,300

Day	July			August			September		
1	36,200	1,650	161,000	12,900	1,980	69,000	11,500	15,800	491,000
2	33,700	1,600	146,000	12,800	2,550	s86,900	9,380	18,700	474,000
3	31,800	1,610	138,000	12,300	2,750	91,300	9,540	15,800	a407,000
4	29,400	1,570	125,000	19,000	34,300	s1,770,000	9,030	11,100	a271,000
5	27,700	1,150	86,000	21,300	18,500	s1,060,000	7,980	4,600	99,100
6	26,900	1,250	90,800	22,000	22,500	1,340,000	7,270	4,130	81,100
7	25,800	1,200	83,600	18,600	12,100	a608,000	6,840	4,000	73,900
8	24,600	1,110	73,700	16,200	9,450	a413,000	6,530	5,100	89,900
9	22,900	1,370	84,700	14,600	8,300	a327,000	6,290	4,100	69,600
10	21,800	1,140	67,100	13,800	7,600	283,000	6,190	3,300	55,200
11	21,000	1,000	56,700	12,800	5,600	194,000	5,960	1,550	24,900
12	20,000	1,000	a54,000	12,300	3,650	121,000	5,540	1,330	19,900
13	19,100	1,000	a51,600	11,900	3,200	103,000	5,170	1,390	19,400
14	17,900	990	47,800	11,100	2,750	82,400	4,890	1,120	14,800
15	16,800	990	44,900	10,300	2,600	72,300	4,760	1,100	14,100
16	16,100	820	35,600	9,380	1,450	36,700	4,680	805	10,200
17	15,600	720	30,300	8,800	900	21,400	4,500	770	9,360
18	15,100	710	28,900	8,350	900	20,300	4,600	560	6,960
19	14,800	690	27,600	7,980	1,200	25,900	4,580	630	7,790
20	15,000	1,000	40,500	7,490	2,000	40,400	4,470	734	8,860
21	15,000	990	a40,100	7,170	2,660	51,500	4,450	650	7,810
22	14,800	1,000	a40,000	7,110	2,580	49,500	4,380	440	5,200
23	14,800	1,040	a41,600	6,840	3,700	68,300	4,400	420	a4,990
24	14,200	1,060	a40,600	7,020	4,200	79,600	4,340	390	a4,570
25	15,100	1,210	a49,300	6,980	3,800	71,600	4,220	370	a4,220
26	15,600	1,220	a51,400	7,510	3,480	70,600	4,210	341	3,880
27	14,800	1,280	51,100	7,660	2,820	58,300	4,260	239	2,750
28	14,200	2,810	108,000	7,440	2,550	51,200	4,270	227	2,620
29	14,300	5,490	212,000	7,340	6,500	129,000	4,300	563	6,540
30	13,900	3,180	119,000	8,120	9,600	210,000	4,240	720	8,240
31	13,500	1,600	58,300	13,200	9,280	331,000	--	--	--
Total	612,400	--	2,285,200	350,290	--	7,936,200	172,770	--	2,298,890

Total discharge for year (cfs-days) 4,428,370
Total load for year (tons) 28,258,784

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

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT HITE, UTAH--Continued

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

Date of collection	Time	Water discharge (cfs)	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Apr. 25, 1951	4:30 p.m.	11,100	1,040	2,800	--	81	--	93	--	--	--	--		--		PWCM
May 5	9:15 a.m.	14,100	1,200	1,080	--	52	--	71	--	--	--	--		--		PWCM
May 17	11:00 a.m.	23,000	2,880	1,950	--	31	--	46	--	63	84	94		99		PSWCM
May 28	9:45 a.m.	38,700	4,220	1,500	--	16	--	38	--	88	97	98		99		PSWCM
June 7	9:15 a.m.	42,900	3,290	2,540	--	35	--	60	--	68	90	94		100		PSWCM
June 18	9:45 a.m.	31,300	1,580	1,190	4	7	10	15	26	36	65	95		99		BSWCM
June 23	9:15 a.m.	52,900	1,890	4,680	25	29	38	47	55	73	86	95		--		BWCM
July 3	9:00 a.m.	31,900	1,010	927	9	10	14	26	30	41	64	92		100		BSWCM
July 10	4:30 p.m.	21,600	1,130	--	--	--	--	--	--	27	56	94		99		S
July 17	6:10 p.m.	15,400	800	--	--	--	--	--	--	25	41	70		97		S
July 28	5:30 p.m.	14,000	3,150	3,000	--	60	--	76	--	--	--	--		--		PWCM
Aug. 4	5:30 p.m.	21,800	27,600	2,870	--	45	--	74	--	100	--	--		--		PSWCM
Aug. 11	10:45 a.m.	12,800	7,080	4,320	--	67	--	86	--	--	--	--		--		PWCM
Aug. 20	7:00 p.m.	7,250	1,890	4,160	--	48	--	94	--	98	--	--		--		PSWCM

ESCALANTE RIVER AT MOUTH NEAR ESCALANTE, UTAH

LOCATION.--At gaging station in Kane County, 5.1 miles upstream from mouth, 2.2 miles down stream from Davis Gulch, and about 50 miles southeast of Escalante, Garfield County.
RECORDS AVAILABLE.--Chemical analyses: March to September 1951.
Water temperatures: March to September 1951.
EXTREMES, 1951.--Dissolved solids: Maximum, 495 ppm Aug. 1, 4-10; minimum, 284 ppm May 21-23, 25-31.
Hardness: Maximum, 299 ppm Aug. 1, 4-10; minimum, 195 ppm May 21-23, 25-31.
Specific conductance: Maximum daily, 863 micromhos Aug. 4; minimum daily, 356 micromhos June. 1.
Water temperatures: Maximum observed, 90°F June 27, July 3.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Water discharge records are not published.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Mar. 1-10, 1951...		22	0.02	50	19	23	4.0	173	72	26	0.3	0.7		301	0.41		203	61	19		490	7.7	5
Mar. 11-20.....		21	.02	50	19	24	3.8	172	75	28	.3	.4		308	.42		203	62	20		491	7.6	5
Mar. 21-31.....		20	.03	50	20	25	4.3	177	80	28	.1	.7		330	.45		207	62	20		506	7.3	5
Apr. 1-10.....		18	.04	52	22	27	5.1	179	88	31	.2	.8		339	.46		220	74	21		528	7.4	5
Apr. 11-20.....		17	.03	52	24	28	7.0	180	95	33	.2	.6		349	.47		228	80	20		552	7.8	5
Apr. 21-30.....		16	.04	52	23	28	5.3	180	91	33	.2	.6		344	.47		224	76	21		546	7.8	5
May 1-10.....		14	.04	52	24	30	5.6	178	97	35	.2	.7		356	.48		228	82	22		558	7.8	5
May 11-20.....		18	.03	56	21	28	4.0	188	89	28	.2	.8		344	.47		226	72	21		548	7.5	12
May 21-23, 25-31..		18	.05	50	17	21	5.1	186	59	21	.3	1.0		284	.39		195	42	18		460	7.7	12
May 24.....		--	--	--	--	--	--	--	--	--	--	--		--	--		--	--	--		717	--	--
June 1-10.....		18	.03	50	19	27	4.8	172	77	29	.3	.4		308	.42		203	62	22		498	7.7	10
June 11-20.....		19	.04	56	26	35	6.1	179	117	41	.3	.6		398	.54		246	100	23		633	7.7	5
June 21-30.....		16	.02	54	28	36	5.9	176	124	44	.4	.8		401	.55		250	106	23		643	7.6	10
July 1-10.....		15	.02	48	30	37	5.6	160	132	46	.4	.6		410	.56		244	112	24		651	7.8	10
July 11-20.....		19	.02	48	28	36	6.4	155	126	45	.4	.4		394	.54		235	108	24		624	7.8	10
July 21-31.....		21	.18	57	27	43	7.5	196	136	42	.4	1.4		453	.62		253	92	26		703	7.8	15
Aug. 1, 4-10.....		16	--	82	23	34	11	221	174	22	.3	.8		495	.67		299	118	19		713	7.7	25
Aug. 11-20.....		19	.01	72	26	35	8.8	201	150	36	.3	.5		470	.64		286	122	20		690	7.8	20
Aug. 21-31.....		14	.18	77	22	27	8.8	200	146	22	.3	1.2		431	.59		282	118	17		635	7.7	20
Sept. 1-10.....		14	.02	60	22	33	7.2	189	136	22	.3	.7		410	.56		240	85	22		619	7.8	25
Sept. 11-20.....		20	.03	64	24	32	5.8	189	130	34	.2	.5		411	.56		258	103	21		629	7.9	10
Sept. 21-30.....		17	.04	61	22	31	4.8	178	123	32	.2	.8		385	.52		242	96	21		597	7.9	9

ESCALANTE RIVER BASIN--Continued

ESCALANTE RIVER AT MOUTH NEAR ESCALANTE, UTAH--Continued

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

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

SAN JUAN RIVER NEAR BLANCO, N. MEX.

LOCATION.--At highway bridge, 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.--3,560 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1951.
Water temperatures: March 1949 to September 1951.
Sediment records: March 1949 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 471 ppm Aug. 15-20; minimum, 111 ppm June 1-10.
Hardness: Maximum, 222 ppm Nov. 1-10; minimum, 56 ppm June 11-20.
Specific conductance: Maximum daily, 820 micromhos Aug. 20; minimum daily, 129 micromhos May 30.
Water temperatures: Maximum observed, 78°F on several days; minimum, freezing point on several days.
Sediment concentrations: Maximum daily, 11, 300 ppm Aug. 26; minimum daily, 11 ppm Sept. 20-25.
Sediment loads: Maximum daily, 52,900 tons May 27; minimum daily, 1 ton Sept. 20-25.
EXTREMES, 1945-51.--Dissolved solids: Maximum, 1,030 ppm Aug. 16, 1947; minimum, 80 ppm July 1-8, 1949.
Hardness: Maximum 680 ppm Aug. 16, 1947; minimum, 48 ppm July 1-8, 1949.
Specific conductance: Maximum daily, 1,420 micromhos Aug. 16, 1947; minimum daily, 108 micromhos June 9, 1948.
Water temperatures (1949-51): Maximum observed, 78°F on several days; minimum, freezing point on several days.
Sediment concentrations (1949-51): Maximum daily, 17,800 ppm Aug. 9, 1949; minimum daily, 11 ppm Sept. 20-25, 1951.
Sediment loads (1949-51): Maximum daily, 141,000 tons July 11, 1949; minimum daily, 1 ton Sept. 20-25, 1951.
REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Values reported for dissolved solid concentrations are residue on evaporation. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Oct. 1-10, 1950..	344	13	0.00	40	8.9	24	6.8	144	71	5.2	0.4	1.4	0.0	237	0.32	220	136	18	26		377	7.5	7
Oct. 11-20.....	195	--	--	45	9.1	35	--	--	--	--	--	--	--	268	.36	141	150	--	34		439	--	--
Oct. 21-31.....	148	--	--	50	10	42	--	--	--	--	--	--	--	311	.42	124	166	--	36		498	--	--
Nov. 1-10.....	105	--	--	66	14	64	--	--	--	--	--	--	--	442	.60	125	222	--	39		640	--	--
Nov. 11-20.....	112	--	--	62	13	57	--	--	--	--	--	--	--	404	.55	122	208	--	37		603	--	--
Nov. 21-30.....	139	--	--	58	12	50	--	--	--	--	--	--	--	360	.50	138	194	--	36		558	--	--
Dec. 1-10.....	151	--	--	60	14	52	--	--	--	--	--	--	--	385	.52	157	207	--	35		579	--	--
Dec. 11-20.....	155	--	--	54	12	44	--	--	--	--	--	--	--	339	.46	142	184	--	34		511	--	--
Dec. 21-31	116	--	--	58	12	51	--	--	--	--	--	--	--	380	.52	119	194	--	36		563	--	--
Jan. 1-10, 1951..	112	17	.01	60	11	50	4.4	182	138	10	.3	.4	.1	398	.54	120	194	46	35		590	7.4	3
Jan. 11-20.....	124	--	--	58	14	61	--	--	--	--	--	--	--	368	.50	123	202	--	40		555	--	--
Jan. 21-31.....	140	--	--	54	14	48	--	--	--	--	--	--	--	330	.45	125	192	--	35		512	--	--
Feb. 1-10.....	160	--	--	56	14	49	--	--	--	--	--	--	--	353	.48	152	197	--	35		547	--	--
Feb. 11-20.....	215	--	--	48	9.5	40	--	--	--	--	--	--	--	304	.41	176	159	--	35		481	--	--
Feb. 21-28.....	141	--	--	48	10	48	--	--	--	--	--	--	--	339	.46	129	161	--	39		533	--	--

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLANCO, N. MEX.--Continued

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Mar. 1-10, 1951..	139	--	--	52	10	44	--	--	--	--	--	--	--	346	.47	130	170	--	36		541	--	--
Mar. 11-20	375	--	--	56	15	35	--	--	--	--	--	--	--	352	.48	356	201	--	27		538	--	--
Mar. 21-31	367	--	--	46	10	26	--	--	--	--	--	--	--	274	.37	272	156	--	27		423	--	--
Apr. 1-10	300	19	.04	47	10	33	2.9	143	107	3.2	.2	.6	.1	299	.41	242	158	42	31		451	7.7	2
Apr. 11-20.....	386	--	--	40	8.3	25	--	--	--	--	--	--	--	238	.32	248	134	--	29		376	--	--
Apr. 21-30.....	710	--	--	32	5.9	17	--	--	--	--	--	--	--	178	.24	341	104	--	26		278	--	--
May 1-10	1,040	--	--	31	5.1	16	--	--	--	--	--	--	--	169	.23	475	98	--	26		260	--	--
May 11-20	1,346	--	--	25	3.8	12	--	--	--	--	--	--	--	136	.18	494	78	--	25		206	--	--
May 21-31	2,913	--	--	24	3.2	8.0	--	--	--	--	--	--	--	125	.17	983	73	--	19		185	--	--
June 1-10.....	1,956	--	--	--	--	8.8	--	--	--	--	--	--	--	111	.15	586	--	--	40		155	--	--
June 11-20.....	1,585	--	--	17	3.2	10	--	--	--	--	--	--	--	116	.16	496	56	--	28		162	--	--
June 21-30.....	897	--	--	22	4.5	16	--	--	--	--	--	--	--	155	.21	375	74	--	32		225	--	--
July 1-10	267	11	.03	34	6.8	29	4.2	126	71	4.5	.1	1.0	.1	228	.31	164	113	10	35		354	7.8	25
July 11-20	96.6	--	--	46	17	45	--	--	--	--	--	--	--	308	.42	80.3	185	--	35		476	--	--
July 21-31	120	--	--	42	11	43	--	--	--	--	--	--	--	321	.44	104	150	--	38		502	--	--
Aug. 1-14	323	--	--	46	9.5	34	--	--	--	--	--	--	--	292	.40	255	154	--	32		448	--	--
Aug. 15-20.....	47.3	--	--	62	13	74	--	--	--	--	--	--	--	471	.62	60.2	208	--	44		705	--	--
Aug. 21-25.....	265	--	--	60	13	49	--	--	--	--	--	--	--	383	.52	274	203	--	34		589	--	--
Aug. 26-31, Sept. 1-3	682	--	--	32	8.0	22	--	--	--	--	--	--	--	199	.27	366	113	--	30		313	--	--
Sept. 4-10	235	--	--	40	8.6	36	--	--	--	--	--	--	--	256	.35	162	136	--	37		404	--	--
Sept. 11-20	77.9	--	--	49	10	47	--	--	--	--	--	--	--	338	.46	71.1	164	--	38		532	--	--
Sept. 21-30	45.9	--	--	59	13	68	--	--	--	--	--	--	--	430	.58	53.3	200	--	42		667	--	--
Weighted average	458	--	--	34	6.6	20	--	--	--	--	--	--	--	193	0.26	239	112	--	28		291	--	--

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLANCO, N. MEX.--Continued

Temperature (°F) of water, water year October 1950 to September 1951
(Once daily temperature measurement, generally at or after 5 p.m.)

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

a Between 11 a.m. and 5 p.m.
b Before 11 a.m.

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLANCO, N. MEX.--Continued

Suspended sediment, water year October 1950 to September 1951

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	283	284	217	119	64	21	172	22	8
2	345	250	233	119			206		
3	560	4,700	7,110	113			177		
4	421	1,010	1,150	103			142		
5	365	154	152	100			155		
6	329	131	116	98	32	9	138	41	17
7	309	90	75	100			98		
8	291	61	48	100			128		
9	273	66	49	98			126		
10	266	50	36	103			172		
11	252	52	27	98	61	19	172	36	15
12	233			96			160		
13	224			95			162		
14	206			101			167		
15	192			151			157		
16	177			155			167		
17	172			119			160		
18	172			98			140		
19	162			92			126		
20	160			117			136		
21	162	36	15	144	22	8	126	88	25
22	169			138			110		
23	179			136			106		
24	160			134			101		
25	144			128			115		
26	136			130			113		
27	155			130			110		
28	134			138			100		
29	128			153			90		
30	126			155			90		
31	130	64	21	--	--	--	100		
Total-	7,015	--	9,627	3,561	--	385	4,222	--	578

Day	January			February			March		
1	110	88	25	90	72	21	113	52	18
2	100	100	27	110			98		
3	100	55	15	120			105		
4	110	50	15	150	77	31	113		
5	120	45	15	170	55	25	113		
6	120	120	39	180	116	56	147		
7	120	125	40	190	258	132	149		
8	110	110	33	190	126	65	162		
9	110	170	50	200	71	38	174		
10	120	140	45	200	68	37	215	200	116
11	120	135	44	210	57	32	398	1,000	1,070
12	120	130	42	230	61	38	440	3,000	3,560
13	130	142	50	260	88	62	369	2,000	1,990
14	120	290	94	230	97	60	341	1,040	958
15	120	150	52	190	189	97	377	874	890
16	110			190	73	37	416	1,120	1,260
17	110			200			455	1,260	1,550
18	130			209			394	1,580	1,680
19	140			212			301	900	731
20	140			215			259	732	512
21	130	72	28	198	54	24	250	400	280
22	130			157			283	168	128
23	140			130			353	164	156
24	140			134			357	350	337
25	140			134			337	410	373
26	140			130			377	210	214
27	130			121			500	289	390
28	140			121			500	191	258
29	160			--	--	--	435	178	209
30	160			--	--	--	337	120	109
31	130			--	--	--	301	136	111
Total-	3,900	--	1,250	4,871	--	1,061	9,178	--	17,044

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLANCO, N. MEX.--Continued

Suspended sediment, water year October 1950 to September 1951--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	294	74	59	674	78	126	2,850	452	3,480
2	227	67	41	602			2,200	341	2,030
3	195	60	32	530			2,000	156	842
4	212	100	57	590			1,800	205	996
5	345	500	a 466	745	650	a 1,310	1,700	160	734
6	341	550	a 506	1,160	1,250	a 3,920	1,600	155	670
7	390	487	513	1,460	1,450	a 5,720	1,710	195	900
8	349	484	456	1,560	1,650	6,950	1,860	262	1,320
9	341	478	440	1,560	1,680	7,080	1,920	123	638
10	309	428	357	1,510	1,000	4,080	1,920		
11	341	337	310	1,510	1,630	6,650	1,810		
12	276	210	156	1,560	1,000	4,210	1,710	129	593
13	230	171	106	1,710	670	3,090	1,560		
14	243	103	68	1,610	602	2,620	1,510		
15	333	187	168	1,330	380	1,360	1,510		
16	435	200	235	1,240	244	817	1,510	104	438
17	460			1,080	311	907	1,610		
18	530			1,040	162	455	1,610		
19	505			1,000	150	405	1,560		
20	505	192	276	1,380	862	3,210	1,460		
21	590			1,920	1,500	7,780	1,460	87	325
22	608			2,140	1,950	11,300	1,420		
23	638			1,810	700	3,420	1,200		
24	808			1,810	576	2,810	1,010		
25	920	611	1,280	2,030	800	4,380	850	68	153
26	738			2,850	4,340	33,400	780		
27	773			3,700	5,300	52,900	692		
28	638	177	334	4,310	3,050	35,500	602		
29	680			4,310	2,500	29,100	510	33	46
30	704			3,780	1,050	10,700	450		
31	--	--	--	3,380	800	7,300	--	--	--
Total-	13,958	--	12,082	55,891	--	251,878	44,384	--	18,815

Day	July			August			September		
1	400	39	42	117	545	172	794	1,000	2,140
2	350	57	54	224	1,900	1,150	566	391	598
3	317			512	5,610	s 8,380	470	250	a 317
4	280			470	5,200	6,600	390	180	190
5	287	35	27	721	11,200	s 23,100	300	140	113
6	269			614	9,700	16,100	236	40	25
7	236	31	a 20	426	3,800	4,370	212	66	38
8	192	23	12	346	1,000	932	184	111	55
9	174	38	18	252	493	335	169	38	17
10	162	42	18	212	233	133	155	35	15
11	136	46	17	187	218	110	121	36	12
12	110	119	35	177	136	65	113		
13	101	16	4	155	144	60	96		
14	94	15	4	108	128	37	82		
15	90	25	6	75	42	9	77	22	5
16	88	17	4	53	60	9	70		
17	86	26	6	45	--	e 8	62		
18	82	23	5	40	68	7	56		
19	83	26	6	37	48	5	54		
20	96	700	181	34	78	7	48		
21	134	1,550	561	32	84	7	41		
22	206	1,300	723	49	627	s 137	40	11	1
23	119	680	218	132	1,300	a 463	42		
24	105	350	a 99	345	2,500	2,330	40		
25	112	250	76	767	8,800	s 22,200	50		
26	121	136	44	808	11,300	s 27,100	47	20	3
27	106	104	30	430	1,700	1,970	46	17	2
28	117	99	31	353	346	330	39	31	3
29	112	92	28	377	344	350	44	30	4
30	95	100	a 26	960	1,790	s 6,280	70	40	8
31	88	100	a 24	1,380	3,700	13,800	--	--	--
Total-	4,948	--	2,400	10,437	--	136,556	4,714	--	3,586

Total discharge for year (cfs-days)..... 167,079
Total load for year (tons)..... 455,262

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

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLANCO, N. MEX.--Continued

Particle-size analyses of suspended sediment, October 1950 to August 1951
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Water discharge (cfs)	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Oct. 3, 1950	6:50 p.m.	515	5,150	1,280	84	92	97	98	99	100	--	--		--		BWCM
Jan. 15, 1951	4:40 p.m.	150	389	2,450	13	16	21	30	48	78	97	99		100		SBWCM
Feb. 22	3:30 p.m.	144	63	401	26	49	74	89	93	97	99	100		--		BWCM
Mar. 21	9:45 a.m.	252	302	944	79	90	95	97	98	99	100	--		--		BWCM
Apr. 17	1:30 p.m.	460	281	2,480	42	56	68	80	84	95	100	--		--		BWCM
May 8	10:30 p.m.	1,810	1,650	1,170	30	38	40	62	77	95	100	--		--		BWCM
May 9	2:30 a.m.	1,760	1,570	1,000	26	34	45	63	79	94	100	--		--		BWCM
May 28	7:10 p.m.	4,890	3,390	1,630	24	30	43	55	72	79	91	97		100		BSWCM
May 31	1:00 p.m.	3,620	1,040	--	--	--	--	--	--	45	66	87		99		S
June 12	10:45 a.m.	1,610	134	--	--	--	--	--	--	39	52	71		99		S
June 28	4:25 p.m.	570	40	--	--	--	--	--	--	56	86	93		98		S
Aug. 3	10:30 a.m.	710	6,050	6,020	--	84	--	94	--	--	--	--		--		PWCM
Aug. 7	12:30 p.m.	408	3,940	2,340	70	88	95	97	99	100	--	--		--		SPWCM
Aug. 7	12:30 p.m.	408	3,940	2,170	13	64	90	96	98	100	--	--		--		SPN
Aug. 7	12:30 p.m.	408	3,940	1,880	72	88	97	99	100	--	--	--		--		SBWCM
Aug. 7	12:30 p.m.	408	3,940	1,910	12	41	--	--	--	--	--	--		--		SBN
Aug. 7	10:00 p.m.	421	1,850	4,110	--	84	--	96	--	100	--	--		--		SPWCM
Aug. 8	1:00 a.m.	421	2,150	3,050	--	83	--	97	--	98	--	--		--		SPWCM
Aug. 8	7:00 a.m.	381	1,690	4,180	--	82	--	87	--	100	--	--		--		SPWCM
Aug. 8	10:00 a.m.	353	830	524	75	86	97	98	98	100	--	--		--		BWCM
Aug. 8	4:00 p.m.	305	461	1,160	--	59	--	94	--	100	--	--		--		SPWCM
Aug. 25	11:45 a.m.	638	17,500	2,180	--	95	--	97	--	100	--	--		--		SPWCM
Aug. 26	8:45 a.m.	892	15,600	3,120	68	77	92	96	98	100	--	--		--		SPWCM
Aug. 26	8:45 a.m.	892	15,600	4,120	8	28	81	97	98	100	--	--		--		SPN
Aug. 26	8:45 a.m.	892	15,600	4,650	77	83	92	99	100	100	--	--		--		BWCM
Aug. 26	8:45 a.m.	892	15,600	3,940	17	19	29	--	--	100	--	--		--		SBN
Aug. 28	5:20 p.m.	337	557	1,430	--	86	--	97	--	100	--	--		--		SPWCM
Aug. 30	6:25 p.m.	1,050	6,300	2,420	--	76	--	96	--	100	--	--		--		SPWCM

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 1.3 miles (revised) upstream from San Juan River.
DRAINAGE AREA.--1,360 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: June 1940 to September 1951.
Water temperatures: December 1950 to September 1951.
Sediment records: December 1950 to September 1951.
EXTREMES, 1950-51.--Specific conductance: Maximum daily, 1,110 micromhos Aug. 20-22; minimum daily, 239 micromhos June 18.
Water temperatures: Maximum observed, 88°F July 29; minimum freezing point Jan. 14, Feb. 1-2.
Sediment concentrations: Maximum daily, 7,850 ppm May 27; minimum daily, 9 ppm Sept. 28-30.
Sediment loads: Maximum daily, 59,800 tons May 27; minimum daily, 1 ton on several days.
EXTREMES, 1940-51.--Specific conductance (1941-51): Maximum daily, 1,980 micromhos Aug. 19, 1944; minimum daily, 170 micromhos June 27, 1944.
Water temperatures (1950-51): Maximum observed, 88°F July 29, 1951; minimum, freezing point Jan. 14, Feb. 1-2, 1951.
Sediment concentrations (1950-51): Maximum daily, 7,850 ppm May 27, 1951; minimum daily, 9 ppm Sept. 28-30, 1951.
Sediment loads (1950-51): Maximum daily, 59,800 tons May 27, 1951; minimum daily, 1 ton on several days.
REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Values reported for dissolved solids are sums of determined constituents. Records of discharge for water year October 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Oct. 1-10, 1950	341		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	751	--
Oct. 11-20	242		9.6		110	20	44	--	188	247	24		0.8		548	0.75	358	356	202	21	833	7.3
Oct. 21-31	189		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	918	--
Nov. 1-10	134		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	1,010	--
Nov. 11-20	189		9.4		126	21	62		226	296	30		.2		656	.89	335	401	216	25	968	7.4
Nov. 21-30	219		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	912	--
Dec. 1-10	217		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	893	--
Dec. 11-20	213		9.2		115	18	52		197	265	26		.9		583	.79	335	361	200	24	878	7.7
Dec. 21-31	205		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	902	--
Jan. 1-10, 1951	204		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	905	--
Jan. 11-20	193		9.9		122	19	55		209	279	28		2.1		618	.84	322	382	211	24	917	7.6
Jan. 21-31	201		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	871	--
Feb. 1-10	225		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	886	--
Feb. 11-20	186		7.7		120	19	58		197	290	28		.8		620	.84	311	378	216	25	915	7.8
Feb. 21-28	181		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	933	--
Mar. 1-10	170		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	938	--
Mar. 11-20	176		11		122	20	53		198	278	28		.8		611	.83	290	386	224	23	933	7.3
Mar. 21-31	199		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	870	--

SAN JUAN RIVER BASIN--Continued

ANIMAS RIVER AT FARMINGTON, N. MEX.--Continued

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Apr. 1-10, 1951	155		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	860	--
Apr. 11-20	109		8.8		111	17	46	--	170	266	20		0.6		553	0.75	163	347	208	22	836	7.5
Apr. 21-30	181		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	710	--
May 1-10	352		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	670	--
May 11-20	683		9.5		69	10	22		132	129	12		1.9		318	.43	586	213	105	18	497	7.7
May 21-28	1,616		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	423	--
May 29-31, June 1-10	2,201		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	292	--
June 11-20	1,894		7.6		38	6	10		80	62	7.5		1.3		171	.23	874	120	54	16	280	7.8
June 21-30	1,523		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	309	--
July 1-10	638		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	467	--
July 11-20	285		8.6		88	14	42		166	193	21		1.1		450	.61	346	277	141	25	692	7.8
July 21-31	151		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	788	--
Aug. 1-10	387		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	699	--
Aug. 11-20	635		11		130	24	51		206	318	23		1.1		659	.90	113	423	254	21	974	7.5
Aug. 21-30	110		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	977	--
Aug. 31, Sept. 1-10	272		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	756	--
Sept. 11-20	39.8		13		138	24	51		244	304	25		2.1		677	.92	72.7	443	243	20	983	7.7
Sept. 21-30	85.0		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	1,030	--
Weighted average	407		--		--	--	--	--	--	--	--		--		--	--	--	--	--	--	542	--

SAN JUAN RIVER BASIN--Continued

ANIMAS RIVER AT FARMINGTON, N. MEX.--Continued

Temperature (°F) of water, December 1950 to September 1951
/Once-daily temperature measurement generally between 4 p.m. and 6 p.m./

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

a During forenoon.

SAN JUAN RIVER BASIN--Continued

ANIMAS RIVER AT FARMINGTON, N. MEX.--Continued

Suspended sediment, December 1950 to September 1951

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1							--	--	--
2							--	--	--
3							--	--	--
4							--	--	--
5							--	--	--
6							--	--	--
7							--	--	--
8							--	--	--
9							--	--	--
10							--	--	--
11							--	--	--
12							--	--	--
13							--	--	--
14							--	--	--
15							220	144	86
16							220	75	45
17							224	67	41
18							216	56	33
19							208	54	30
20							208	50	28
21							212	56	32
22							200	58	31
23							204	77	42
24							204	90	50
25							204	74	41
26							200	78	42
27							200	74	40
28							196	80	42
29							210	107	61
30							210	101	57
31							216	76	44
Total-							3,552	--	745

Day	January			February			March		
1	220	74	44	210			170		
2	220	80	48	180			153		
3	204	124	68	166	144	81	140		
4	192	63	33	236			149		
5	200	62	33	252			173	32	15
6	196	51	27	260			180		
7	200	86	46	248			188		
8	196	125	66	248			184		
9	192	102	53	236			180		
10	216	235	138	212			184		
11	196	83	44	208	129	76	180		
12	200	76	41	220			188		
13	212	150	86	200			192	99	49
14	196	149	79	188			177		
15	216	164	96	173			180		
16	177	131	63	163	61	27	184		
17	150	382	155	156	61	26	177		
18	185	235	117	177	49	23	170	415	190
19	196	94	50	188	72	37	160	153	66
20	204	71	39	192			153	153	63
21	188	62	31	200			160	198	86
22	188	108	55	166			173	157	73
23	188	58	29	163			184	153	76
24	188	86	44	173	37	18	192	162	84
25	192	101	52	188			196	121	64
26	208	98	55	188			200	110	59
27	204			196			220	156	93
28	204			177			232	189	118
29	208	144	82	--	--	--	228	149	92
30	216			--	--	--	216	158	92
31	228			--	--	--	184	144	72
Total-	6,180	--	2,002	5,564	--	1,440	5,647	--	1,755

SAN JUAN RIVER BASIN--Continued

ANIMAS RIVER AT FARMINGTON, N. MEX.--Continued

Suspended sediment, December 1950 to September 1951--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	184	94	47	216	73	43	2,640	1,500	10,700
2	180	103	50	208	--	e 39	1,980	1,240	6,630
3	165	82	37	163	--	e 22	1,530	673	2,780
4	146	92	36	104	--	e 11	1,310	560	a 1,980
5	140	87	33	109	--	e 59	1,330	800	2,870
6	149	120	a 48	212	--	e 570	1,350	1,000	3,640
7	146	133	52	508	2,600	3,570	1,620	1,120	4,900
8	156	97	41	653	1,420	2,500	1,920	1,340	6,950
9	143	84	32	684	1,590	2,940	2,090	1,060	5,980
10	140	103	39	660	1,100	1,960	2,150	700	a 4,060
11	118	104	33	716	1,120	2,170	1,940	450	a 2,360
12	115	218	68	829	1,400	3,130	1,640	600	2,660
13	93	95	24	928	1,940	4,860	1,700	670	3,080
14	77			892	1,110	2,670	1,660	460	a 2,060
15	77			732	682	1,350	1,490	400	a 1,610
16	85			604	460	750	1,590	520	a 2,230
17	87			508	280	384	2,150	500	2,900
18	115	94	29	478	237	306	2,310	460	2,870
19	149			508	274	376	2,230	488	2,940
20	170			639	963	1,660	2,230	560	a 3,370
21	160			1,010	1,680	4,580	2,100	540	3,060
22	153			1,130	1,100	3,360	2,080	276	1,550
23	146			937	630	1,590	1,810	260	1,270
24	163			838	599	1,360	1,610	220	a 956
25	240			856	1,200	a 2,770	1,450	180	a 705
26	228	162	80	1,540	6,870	s 31,700	1,350	120	a 437
27	208			2,820	7,850	59,800	1,330	100	a 359
28	177			3,800	3,670	37,700	1,250	66	223
29	134			4,010	2,800	30,300	1,180	--	e 190
30	200			3,490	1,620	15,300	1,070	--	e 170
31	--	--	--	3,190	1,440	12,400	--	--	--
Total	4,444	--	1,492	33,972	--	230,230	52,090	--	85,490

Day	July			August			September		
1	964	--	e 140	112	100	30	562	287	435
2	820	--	e 120	153	830	343	390	70	74
3	740	--	e 100	281	1,900	s 1,870	330	60	a 53
4	692	--	e 93	555	2,480	3,720	260	51	36
5	639	--	e 86	660	1,410	2,510	196	50	26
6	576	--	e 70	700	780	1,470	143		
7	478	--	e 51	534	300	433	130	21	7
8	490	--	e 110	390	194	204	101		
9	520	--	e 140	284	120	92	95		
10	460	--	e 99	200	68	37	82		
11	406	--	e 77	143	20	8	73	33	7
12	355	--	e 62	112	23	7	68		
13	296	60	48	93	24	6	42		
14	305	500	412	73	63	12	35		
15	280	260	197	75	20	4	32	24	2
16	272	88	65	42	20	2	30		
17	264	102	73	29	79	6	32		
18	252	60	41	27	50	4	30		
19	212	94	54	19	38	2	29		
20	204	70	39	22	14	1	27	17	1
21	180	70	34	22	89	5	28		
22	180	92	45	36	20	2	35		
23	188	144	73	46	13	2	82		
24	188	168	85	77	100	a 21	109		
25	204	84	46	127	180	a 62	107	13	3
26	146	180	71	121	120	a 39	98		
27	137	690	255	127	67	23	87		
28	112	230	70	115	52	16	85		
29	109	138	41	166	74	33	98	9	2
30	112	63	19	260	650	456	121		
31	104	31	9	707	1,910	s 3,560	--	--	--
Total	10,885	--	2,825	6,308	--	14,980	3,537	--	709

Total discharge for period (cfs-days) Dec. 15-Sept. 30 132,179
Total load for period (tons) Dec. 15-Sept. 30 341,668

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

SAN JUAN RIVER BASIN--Continued

ANIMAS RIVER AT FARMINGTON, N. MEX.--Continued

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

Date of collection	Time	Water discharge (cfs)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
May 29, 1951	7:45 p.m.	4,230	1,670	--	--	--	--	--	--	49	68	89		96		S
May 31	11:20 a.m.	3,100	1,390	--	--	--	--	--	--	28	49	78		93		S
June 12	5:30 p.m.	1,724	531	--	--	--	--	--	--	24	37	58		88		S
June 28	2:00 p.m.	1,070	66	--	--	--	--	--	--	34	47	66		89		S
Aug. 4	5:30 p.m.	604	1,650	1,790	--	57	--	84	--	--	--	--		--		PWCM
Aug. 6	5:25 p.m.	646	548	908	21	44	48	67	78	85	92	96		98		SBWCM
Aug. 7	3:25 p.m.	514	417	754	43	49	52	67	75	87	93	96		98		SBWCM
Aug. 31	10:45 a.m.	804	1,470	2,290	--	64	--	84	--	--	--	--		--		PWCM

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER AT SHIP ROCK, N. MEX.

LOCATION.--At gaging station on left bank 3 miles northwest of Ship Rock, San Juan County, and about 6 miles downstream from Chaco River.
DRAINAGE AREA.--12,900 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: December 1950 to September 1951.
Sediment records: December 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum observed, 82°F July 2, 22; minimum, freezing point on several days.
Sediment concentrations: Maximum daily, 64,800 ppm Aug. 25; minimum daily, 8 ppm July 13.
Sediment loads: Maximum daily, 578,000 tons Aug. 25; minimum daily, 5 tons, Aug. 21, Sept. 12-24.
REMARKS.--Flow affected by ice Feb. 1-7. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213, and revision of discharge for Aug. 31 given in WSP 1243.

Temperature (°F) of water, December 1950 to September 1951
(Once-daily temperatures, generally observed between 1 p. m. and 7 p. m.)

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

a Reading obtained prior to 12 m.

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER AT SHIP ROCK, N. MEX.--Continued

Suspended sediment, December 1950 to September 1951

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1							--	--	--
2							--	--	--
3							--	--	--
4							--	--	--
5							--	--	--
6							--	--	--
7							--	--	--
8							--	--	--
9							--	--	--
10							--	--	--
11							--	--	--
12							--	--	--
13							--	--	--
14							--	--	--
15							--	--	--
16							520		
17							520		
18							532		
19							496		
20							457		
								146	188
21							474		
22							452		
23							446		
24							435		
25							430		
26							446	250	301
27							420	175	198
28							415	175	196
29							380	175	180
30							430	150	174
31							395	125	133
Total-							7,248	--	3,062

	January			February			March		
1	440	163	194	400	350	a 378	405	110	120
2	435	200	a 235	300	290	a 235	395	100	107
3	457	150	185	350	300	a 284	380	100	103
4	430	175	203	400	370	a 400	362	100	a 98
5	435	230	270	450	520	632	385	110	114
6	430	200	232	500	700	945	380	115	118
7	372	170	171	600	800	1,300	380	90	92
8	336	145	132	622	850	1,430	430	100	116
9	336	190	172	622	861	1,450	420	90	102
10	344	255	237	570	720	1,110	440	125	148
11	415	250	280	544	425	624	484	185	242
12	457	325	401	563	325	494	664	425	762
13	468	300	a 379	608	750	1,230	752	850	1,730
14	446	263	317	602	650	1,060	664	1,820	3,260
15	340	150	138	538	250	363	596	1,280	2,060
16	367	175	173	526	200	284	643	900	1,560
17	376	230	233	490	200	265	664	925	1,660
18	410	360	399	502	180	244	692	1,020	1,910
19	479	475	614	508	150	206	657	1,100	1,950
20	496	375	502	508	120	165	538	875	1,270
21	474	306	392	520	125	176	468	765	967
22	462	275	343	484	131	171	474	625	800
23	474	250	320	430	134	156	502	450	610
24	484	240	314	415	134	150	576	400	622
25	508	425	583	395	125	133	643	400	694
26	496	325	435	425	140	a 161	622	350	588
27	484	250	327	410	130	a 144	664	400	a 717
28	452	200	244	400	120	a 130	808	600	1,310
29	462	250	312	--	--	--	865	650	1,520
30	514	310	a 430	--	--	--	752	451	916
31	479	350	a 453	--	--	--	615	325	540
Total-	13,558	--	9,620	13,682	--	14,320	17,320	--	26,806

a Computed from estimated concentration graph.

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER AT SHIP ROCK, N. MEX.--Continued

Suspended sediment, December 1950 to September 1951--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	550	230	342	824	500	1,110	6,120	2,300	38,000
2	556	210	315	832	475	1,070	4,810	1,980	25,700
3	532	200	287	722	325	634	3,730	1,650	16,600
4	484	180	235	629	220	374	3,010	1,300	10,600
5	462	180	225	544	110	162	3,320	1,050	9,410
6	576	275	428	657	780	1,380	3,040	1,050	8,620
7	643	400	694	1,570	5,550	s24,500	3,190	1,050	9,040
8	615	350	581	2,090	4,800	27,100	3,790	1,150	11,800
9	576	275	428	2,400	4,050	26,200	4,310	1,550	18,000
10	538	300	a936	2,110	3,420	19,500	4,140	1,300	14,500
11	514	450	625	2,030	2,750	15,100	4,280	1,150	13,300
12	508	550	754	1,990	2,200	11,800	3,960		
13	457	375	463	2,320	3,080	19,300	3,730	1,040	10,100
14	362	175	171	2,400	2,900	18,800	3,570		
15	354	125	119	2,140	2,450	14,200	3,100		
16	376	125	127	1,790	1,320	6,380	2,790	950	7,160
17	474	200	256	1,620	1,350	5,900	3,790	1,150	11,800
18	526	250	355	1,400	800	3,020	4,070	1,500	16,500
19	615	375	623	1,380	700	2,610	3,630	1,200	11,800
20	671	475	861	1,430	950	3,670	3,930	1,070	11,400
21	643	375	651	2,050	2,200	12,200	3,760	1,180	12,000
22	700	370	699	3,070	4,320	35,800	3,700	900	8,990
23	715	456	880	2,320	3,350	21,000	3,630	875	8,580
24	657	500	887	2,680	1,850	13,400	2,870	700	5,420
25	840	1,000	2,270	2,980	1,850	14,900	2,320	500	3,130
26	1,080	1,580	4,610	3,630	3,550	34,800	1,800	200	a972
27	832	1,200	a2,700	6,120	6,200	102,000	1,820	250	1,230
28	824	775	1,720	7,900	7,400	158,000	1,740	300	1,410
29	671	400	a725	8,500	4,500	103,000	1,640	300	1,330
30	715	350	a676	7,700	3,600	74,800	1,490	350	1,410
31	--	--	--	6,700	2,600	47,000	--	--	--
Total	18,066	--	24,143	84,528	--	819,710	101,080	--	319,102

Day	July			August			September		
1	1,380	300	1,120	91	350	86	2,490	15,400	a104,000
2	1,200	275	891	89	241	58	1,620	6,000	a26,200
3	997	350	942	297	23,900	s20,400	1,130	1,900	5,800
4	916	150	371	1,520	41,600	s190,000	806	1,000	2,180
5	824	150	334	2,280	42,800	s284,000	576	250	389
6	792	125	267	1,700	35,600	s173,000	435	200	a235
7	664	67	120	1,200	9,500	30,800	358	147	142
8	636	35	60	840	4,750	10,800	331	55	49
9	715	74	143	685	2,750	5,090	308	47	39
10	615	42	70	508	1,100	1,510	271	20	15
11	526	27	38	354	750	717	238	15	a10
12	496	16	21	271	293	214	190	10	5
13	435	8	9	227	207	127	132	13	.5
14	331	19	17	190	139	71	130		
15	367	35	35	120	100	32	121		
16	304	80	66	80	78	17	119		
17	248	51	34	74	64	a13	116		
18	196	30	16	66	54	10	93	20	5
19	187	54	27	57	50	8	85		
20	160	23	10	60	40	a6	80		
21	132	15	5	43	42	5	74		
22	168	23	10	31	156	13	76		
23	208	18	10	35	2,200	s531	78		
24	196	20	a11	121	15,000	a4,900	87	20	a5
25	165	24	11	2,760	64,800	s578,000	114		
26	173	29	14	2,190	61,500	s407,000	119	30	a10
27	150	25	a10	980	18,500	49,000	123		
28	154	21	9	560	11,000	a16,600	121	68	22
29	137	6,000	a2,220	475	6,000	a7,700	240	4,800	as10,600
30	116	23,000	7,200	533	3,500	5,040	607	18,800	s40,500
31	93	4,000	1,000	b2,090	15,800	as114,000	--	--	--
Total	13,681	--	15,091	b20,527	--	1,899,748	11,268	--	190,276

Total discharge for period (cfs-days) Dec. 16, 1950-Sept. 30, 1951 300,958
Total load for period (tons) 3,321,878

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

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER AT SHIP ROCK, N. MEX.--Continued

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

Date of collection	Time	Water discharge (cfs)	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Jan. 16, 1951	2:05 p.m.	420	234	--	--	--	--	--	--	23	36	76		98		S
Feb. 22	7:30 a.m.	496	121	--	--	--	--	--	--	32	43	77		95		S
Mar. 20	12:00 m.	556	935	2,660	68	73	81	83	84	85	87	94		97		SBWCM
May 12	12:30 p.m.	2,030	1,660	2,350	22	29	36	45	54	67	85	97		99		SBWCM
May 29	7:05 a.m.	9,100	5,880	1,920	13	18	23	34	42	54	68	84		99		SBWCM
June 1	10:20 a.m.	6,310	2,070	--	--	--	--	--	--	29	46	78		98		S
June 12	2:15 p.m.	3,960	955	--	--	--	--	--	--	10	18	37		62		S
July 1	6:15 p.m.	1,370	168	--	--	--	--	--	--	17	34	52		91		S
Aug. 4	2:00 p.m.	5,280	36,700	5,280	--	75	--	98	--	--	--	--		--		PWCM
Aug. 7	7:00 p.m.	1,030	8,720	4,290	68	82	92	96	97	99	99	100		--		SPWCM
Aug. 7	7:00 p.m.	1,030	8,720	4,430	3	12	86	95	97	99	99	100		--		SPN
Aug. 7	7:00 p.m.	1,030	8,720	4,230	64	79	90	96	98	99	99	100		--		SBWCM
Aug. 25	6:58 a.m.	2,380	89,600	5,310	--	70	--	89	--	98	98	99		100		SPWCM
Aug. 25	12:40 p.m.	4,620	41,800	2,190	--	53	--	75	--	92	95	98		99		SPWCM
Aug. 27	3:20 p.m.	818	16,400	3,450	66	71	88	95	95	98	100	--		--		SPWCM
Aug. 27	3:20 p.m.	818	16,400	3,260	9	13	45	93	96	98	100	--		--		SPN
Aug. 27	3:20 p.m.	818	16,400	4,540	68	75	87	93	96	98	100	--		--		SBWCM
Sept. 10	5:30 p.m.	255	63	--	--	--	--	--	--	73	85	89		98		S

SAN JUAN RIVER NEAR BLUFF, UTAH

LOCATION.--At bridge on State Highway 47, 1,800 feet downstream from gaging station and 20 miles southwest of Bluff, San Juan County.
DRAINAGE AREA.--23,000 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: February to June 1927, October 1929 to September 1951.
Water temperatures: May 1944 to September 1951.
Sediment records: August to September 1928. July 1929 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum 1,190 ppm July 21, 23-26, 28; minimum 241 ppm June 11-14, 19-20.
Hardness: Maximum, 610 ppm July 21, 23-26, 28; minimum, 148 ppm June 11-14, 19-20.
Specific conductance: Maximum daily, 1,870 micromhos Feb. 9, July 24; minimum daily, 352 micromhos June 20.
Water temperatures: Maximum observed, 82°F July 20; minimum, freezing point Feb. 2.
EXTREMES, 1929-51.--Dissolved solids: Maximum, 1,860 ppm July 21-31, 1934; minimum, 167 ppm June 11-20, 1944.
Hardness: Maximum, 874 ppm July 21-31, 1934; minimum, 109 ppm July 1-10, 1935.
Specific conductance (1941-51): Maximum daily, 2,070 micromhos Aug. 26, 1943; minimum daily, 228 micromhos June 18, 1948.
Water temperatures (1941-51): Maximum observed, 85°F July 21, 1945; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 309,000 ppm September 21, 1929; minimum daily, 0 ppm July 3-13, 1934, Aug. 24-27, 29, 1939.
Sediment loads: Maximum daily, 12,000,000 tons Oct. 14,1941 (rev.); minimum daily, 0 tons July 3-13, 1934, Aug. 24-27, 29, 1939.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Oct. 1-10, 1950 ..	702	15	0.01	104	27	78		194	331	24	0.4	2.9		706	0.96	1,340	370	212	32		979	7.7	
Oct. 11-20	453	13	.02	104	29	97		182	382	28	.4	1.8		768	1.04	939	378	230	36		1,060	7.7	
Oct. 21-31	324	8.9	.03	120	41	129		177	528	37	.3	2.4		1,010	1.37	884	468	323	38		1,330	7.8	
Nov. 1-10.....	309	9.0	.02	132	46	141		192	583	40	.4	3.4		1,110	1.51	926	518	361	37		1,460	7.6	
Nov. 11-20.....	412	13	.03	145	49	144		208	620	40	.4	5.0		1,170	1.59	1,300	564	393	36		1,510	7.8	
Nov. 21-30.....	526	11	.03	126	42	120		198	513	34	.4	3.6		985	1.34	1,400	487	325	35		1,320	7.9	
Dec. 1-10.....	524	12	.06	128	45	113		198	514	35	.4	4.2		995	1.35	1,410	504	342	33		1,320	8.1	
Dec. 11-20.....	566	11	.05	126	41	111		182	500	35	.4	4.2		967	1.32	1,480	483	334	33		1,280	8.0	
Dec. 21-31.....	497	13	.04	124	42	108		187	493	33	.4	4.3		953	1.30	1,280	482	329	33		1,260	7.9	
Jan. 1-10, 1951 ..	464	13	.05	126	40	113		198	490	34	.4	4.3		970	1.32	1,220	479	317	34		1,270	7.8	
Jan. 11-20.....	448	14	.05	128	39	114		202	490	34	.4	4.3		965	1.31	1,170	480	314	34		1,280	7.9	
Jan. 22, 24, 26, 29-31	544	14	.10	126	40	110		194	490	32	.4	4.9		960	1.31	1,410	479	320	33		1,260	7.9	
Feb. 1-9	460	15	.04	147	43	135		207	558	59	.3	4.8		1,110	1.51	1,380	544	374	35		1,470	7.6	
Feb. 10-13, 17, 19	608	14	.04	130	41	113		186	501	43	.4	4.7		973	1.32	1,600	493	340	33		1,320	7.7	
Feb. 20-28.....	511	12	.04	128	42	121		185	531	34	.3	3.3		1,010	1.37	1,390	492	340	35		1,340	7.7	
Mar. 1-3, 7-9 ...	434	12	.04	128	41	126		190	534	34	.3	3.2		1,020	1.39	1,200	488	332	36		1,350	7.7	
Mar. 11-20	573	13	.05	114	35	102		182	440	29	.4	2.7		863	1.17	1,340	428	280	34		1,150	7.8	
Mar. 21-31	624	15	.03	101	28	87		183	354	25	.4	2.0		715	.97	1,200	367	217	34		1,000	7.8	

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLUFF, UTAH--Continued

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Apr. 2-7, 1951	536	15	.10	94	26	83		172	331	24	.3	2.1		673	.92	974	342	200	35		968	7.7	
Apr. 11-20	442	14	.04	94	24	89		173	335	24	.3	.9		677	.92	808	333	191	37		978	7.7	
Apr. 21-30	719	16	.05	82	19	74		172	261	19	.4	2.2		560	.76	1,090	282	142	36		808	7.9	
May 1-10	918	16	.03	81	19	65		148	262	18	.4	1.4		548	.75	1,360	280	158	34		795	7.9	
May 11-20	1,924	16	.04	64	13	35		140	152	10	.3	2.8		365	.50	1,900	213	98	27		549	8.0	
May 21-31	3,901	20	.19	65	12	27		170	111	9.0	.4	1.7		336	.46	3,540	212	72	22		505	7.4	
June 1, 6-10	3,507	15	.20	52	9.4	23		130	95	7.0	.3	1.3		270	.37	2,560	168	62	23		418	7.5	
June 11-14, 19-20	3,507	12	.03	45	8.5	22		112	88	7.0	.4	1.8		241	.33	2,280	148	56	25		375	7.5	
June 21, 23, 25, 27-29	2,492	12	.02	49	10	27		108	115	9.0	.3	1.2		285	.39	1,920	164	75	27		432	7.3	
July 5-7, 9-10	691	14	.02	74	14	55		148	204	17	.5	1.1		462	.63	862	242	120	33		675	7.4	
July 11-20	401	10	.02	89	22	88		142	330	29	.5	.7		654	.89	708	312	196	38		923	7.4	
July 21, 23-26, 28	241	13	.07	185	36	137		180	672	38	.6	5.4		1,190	1.62	774	610	462	33		1,530	7.4	
Aug. 6-7, 9, 11, 15-16	787	15	.04	111	27	117	3.0	180	433	33	.5	.8		835	1.14	1,770	388	240	39		1,160	7.5	
Aug. 31	a 1,320	--	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--		699	--	
Weighted average	b 888	15	0.08	85	22	65		161	271	20	0.4	2.4		578	0.79	1,390	302	170	32		808	--	

a Not included for computation of weighted averages.

b Represents 71 percent of the runoff for the water year October 1950 to September 1951.

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLUFF, UTAH--Continued

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

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

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLUFF, UTAH--Continued

Suspended sediment, water year October 1950 to September 1951

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	756	2,500	5,100	276	390	291	471	439	558
2	738	3,050	6,080	273	534	394	510	557	767
3	617	2,100	3,500	284	625	479	542	680	995
4	595	1,850	2,970	307	576	477	526	957	1,360
5	720	2,020	3,930	311	259	217	557	331	498
6	858	2,500	5,790	335	457	413	557	1,080	1,620
7	774	1,950	4,080	335	466	421	531	834	1,200
8	708	1,680	3,210	340	465	427	516	814	1,130
9	628	1,750	2,970	315	357	304	516	500	a697
10	628	1,100	1,870	315	159	135	516	363	506
11	542	1,320	1,900	323	119	104	510	1,020	1,400
12	536	720	1,040	352	200	190	505	750	a1,020
13	500	990	1,340	364	649	638	568	550	a843
14	480	1,330	1,720	382	259	267	584	349	550
15	476	600	771	378	793	809	579	251	392
16	451	318	387	391	789	833	579	1,070	1,670
17	432	243	283	409	726	802	584	500	a788
18	400	800	864	485	892	1,170	590	185	295
19	382	600	619	526	593	842	579	321	502
20	335	508	459	510	973	1,340	579	259	405
21	331	554	495	495	1,000	1,340	568	155	238
22	344	900	836	485	929	1,220	552	201	300
23	331	550	492	574	475	736	542	173	253
24	340	484	444	640	1,350	2,330	485	270	354
25	352	731	695	542	676	989	476	250	a321
26	348	641	602	531	330	473	451	219	267
27	335	564	510	521	248	349	446	205	247
28	311	438	368	505	430	586	428	400	462
29	292	371	292	490	1,080	1,430	418	220	248
30	273	306	226	476	1,140	1,470	563	423	643
31	303	221	181	--	--	--	536	300	a434
Total	15,116	--	54,024	12,470	--	21,476	16,364	--	20,963
	January			February			March		
1	552	238	355	601	266	432	451	219	267
2	531	290	416	284	104	80	485	159	208
3	437	112	132	183	352	174	428	227	262
4	471	302	384	166	78	35	461	400	a498
5	471	264	336	266	300	215	451	350	a426
6	466	301	379	461	900	1,120	420	300	a340
7	446	350	a421	651	1,100	1,930	382	514	530
8	446	458	552	816	1,350	2,970	428	133	154
9	395	231	246	708	770	1,470	432	109	127
10	428	92	106	662	1,200	2,140	451	49	60
11	348	86	81	656	1,100	1,950	461	440	548
12	373	121	122	623	1,300	2,190	485	300	a393
13	480	300	a389	606	980	1,600	480	150	194
14	536	350	a507	612	1,000	a1,650	568	200	307
15	536	354	512	623	1,100	a1,850	645	450	784
16	442	292	348	601	700	a1,140	628	620	1,050
17	418	411	464	547	500	a738	590	950	1,510
18	391	187	197	552	450	a671	601	1,100	a1,780
19	446	205	247	552	400	a596	617	1,150	1,920
20	510	253	348	563	350	a532	651	1,100	a1,930
21	526	350	a497	542	300	a439	651	1,000	a1,760
22	542	432	632	531	250	a358	601	900	a1,460
23	521	540	760	536	230	a333	595	800	a1,290
24	552	395	589	516	203	283	612	700	a1,160
25	536	280	a405	485	157	206	606	600	a982
26	531	189	271	476	191	245	601	500	811
27	516	200	a279	471	158	201	640	480	a829
28	495	300	a401	480	172	223	590	460	733
29	521	494	695	--	--	--	584	550	867
30	531	346	496	--	--	--	656	750	1,330
31	590	390	621	--	--	--	726	700	1,370
Total	14,984	--	12,188	14,770	--	25,771	16,977	--	25,880

a Computed from estimated concentration graph.

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLUFF, UTAH--Continued

Suspended sediment, water year October 1950 to September 1951--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day
1	762	850	a 1,750	697	800	a 1,510	6,040	1,900	31,000
2	628	1,380	2,340	750	750	a 1,520	5,410	--	b 23,000
3	595	500	803	858	620	1,440	4,240	--	b 12,000
4	547	480	709	810	580	1,270	3,310	--	b 6,000
5	536	300	434	662	482	862	2,900	--	b 4,500
6	485	200	262	595	350	a 562	2,760	--	b 3,500
7	428	220	254	542	210	307	2,590	--	b 3,000
8	490	400	a 529	702	3,300	6,250	2,850	--	b 5,000
9	568	500	a 767	1,680	4,200	19,100	3,230	--	b 9,000
10	547	400	a 591	1,880	3,630	18,400	3,570	1,330	12,800
11	552	200	298	1,910	3,860	19,900	3,700	950	9,490
12	500	174	235	1,880	3,830	19,400	3,660	700	6,920
13	476	600	771	2,000	3,580	a 19,300	3,170	420	3,590
14	490	442	585	2,310	3,400	21,200	3,020	720	5,870
15	461	580	a 722	2,460	3,300	21,900	3,090	--	b 6,000
16	356	539	518	2,140	3,500	a 20,200	2,850	--	b 4,500
17	352	299	284	1,820	3,700	18,200	2,660	--	b 3,500
18	319	200	172	1,670	3,650	16,500	3,340	--	b 9,700
19	413	400	446	1,580	3,480	14,800	3,810	--	b 8,400
20	500	450	a 608	1,470	3,600	a 14,300	3,680	472	4,690
21	557	500	752	1,470	3,600	14,300	3,340	440	3,970
22	640	550	a 950	2,050	4,100	22,700	3,170	400	3,420
23	634	540	924	2,580	5,700	39,700	3,210	600	5,200
24	612	800	1,320	2,550	5,150	35,500	3,110	--	b 5,000
25	651	830	1,460	2,390	3,800	24,500	2,750	400	2,970
26	656	350	620	2,400	3,600	23,300	2,380	--	b 2,570
27	928	990	2,480	3,070	4,910	s 41,000	2,040	400	2,200
28	888	1,310	3,140	5,380	4,800	a 69,700	1,910	450	2,320
29	816	1,200	a 2,640	6,990	4,600	a 86,800	1,700	297	1,360
30	810	1,100	a 2,410	7,290	4,350	85,600	1,570	--	b 1,200
31	--	--	--	6,740	2,200	40,000	--	--	--
Total	17,197	--	29,774	71,326	--	720,021	95,060	--	202,670

Day	July			August			September		
1	1,410			138			1,340		
2	1,270			140			1,940		
3	1,120			501			1,360		
4	984			1,520			956		
5	852			1,060			858		
6	786			1,340			720		
7	697			1,380			521		
8	656			1,050			495		
9	584			900			437		
10	536			786			432		
11	617			674			331		
12	574			552			315		
13	531			395			250		
14	476			305			200		
15	391			231			160		
16	352			195			130		
17	319			183			110		
18	296			174			106		
19	244			155			116		
20	208			130			114		
21	335			157			116		
22	390			517			109		
23	476			70			99		
24	180			154			94		
25	177			1,240			99		
26	166			1,680			88		
27	148			1,630			102		
28	112			998			119		
29	100			1,070			1,180		
30	100			4,250			9,720		
31	90			1,320			--		
Total	15,177		e 8,410	24,895		e 1,160,000	22,617		e 1,850,000

Total discharge for year (cfs-days) 336,953
Total load for year (tons) ..... c 4,131,000

e Estimated.
s Computed by subdividing day.
a Computed from estimated concentration graph.
b Computed from estimated water-sediment discharge curve.
c Includes estimated loads for missing days.

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLUFF, UTAH--Continued

Particle-size analyses of suspended sediment, October 1950 to July 1951
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Water discharge (cfs)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Oct. 4, 1950	8:45 a.m.	600	1,930	--	--	--	--	--	--	55	72	98		100		S
Oct. 10	10:10 a.m.	584	912	1,880	23	29	36	46	--	71	90	98		99		DS
Oct. 13	4:35 p.m.	485	1,140	--	--	--	--	--	--	38	58	94		99		S
Oct. 17	4:15 p.m.	418	334	991	30	38	46	60	--	89	--	--		--		DS
Oct. 20	9:45 a.m.	352	515	--	--	--	--	--	--	42	66	97		100		S
Nov. 3	3:15 p.m.	284	347	--	--	--	--	--	--	47	73	89		93		S
Nov. 7	3:20 p.m.	335	643	--	--	--	--	--	--	26	48	83		99		S
Nov. 10	3:35 p.m.	307	163	669	11	16	30	49	--	89	--	--		--		DS
Nov. 14	7:55 a.m.	364	555	1,960	5	22	27	35	--	55	76	99		--		DS
Nov. 21	10:20 a.m.	500	990	--	--	--	--	--	--	30	57	95		100		S
Nov. 28	10:30 a.m.	495	359	1,430	19	21	24	34	--	55	80	100		--		DS
Dec. 1	1:45 p.m.	490	498	2,040	14	17	21	30	--	53	84	100		--		DS
Dec. 5	4:00 p.m.	590	454	1,600	18	22	31	43	--	66	83	100		--		DS
Dec. 8	11:00 a.m.	515	726	2,300	11	12	15	23	--	40	57	91		--		DS
Dec. 15	12:00 m.	579	264	768	31	40	45	61	--	95	--	--		--		DS
Jan. 9, 1951																
Jan. 12																
Jan. 16		464	131	415	47	51	58	66	76	84	95	98		--		BSWCM
Jan. 19																
Jan. 24																
Jan. 26																
Feb. 9																
Feb. 13																
Feb. 16		612	237	760	61	62	64	70	76	84	89	94		99		BSWCM
Feb. 20																
Feb. 23																
Mar. 7																
Mar. 10																
Mar. 16		566	611	2,590	53	65	79	87	93	100	--	--		--		BWCM
Mar. 28																
Mar. 30																
Apr. 3																

Apr. 28	8:20 a.m.	907	2,310	2,290	--	55	--	73	--	91	97	99		99	PSWCM
May 8	10:00 a.m.	601	4,250	3,700	--	38	--	57	--	83	95	99		100	PSWCM
May 19	2:00 p.m.	1,630	4,040	4,130	--	38	--	67	--	94	97	98		100	PSWCM
May 28	11:30 a.m.	4,470	3,890	3,930	--	47	--	82	--	100	--	--		--	PWCM
May 30	1:30 p.m.	6,820	3,000	2,060	26	38	49	64	80	93	99	100		--	PSWCM
May 30	1:30 p.m.	6,820	3,000	1,630	30	36	50	61	80	93	99	100		--	BSWCM
June 9	1:30 p.m.	3,250	1,150	900	--	38	--	60	--	76	94	97		100	PSWCM
June 21	1:30 p.m.	3,170	387	--	--	--	--	--	--	61	83	91		98	S
June 29	4:30 p.m.	1,830	184	--	--	--	--	--	--	64	87	92		98	S
July 23	10:10 a.m.	697	1,460	1,600	--	80	--	93	--	98	100	--		--	PSWCM

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT LEES FERRY, ARIZ.

LOCATION.--At gaging station, at head of Marble Gorge at Lees Ferry, Coconino County, just upstream from Paria River, 28 miles downstream from Utah-Arizona State line, 61.5 miles upstream from Little Colorado River, and 79 miles downstream from San Juan River.
DRAINAGE AREA.--107,900 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: January to July 1926, October 1926 to June 1927, October 1928 to September 1930, October 1942 to October 1945, October 1947 to September 1951.
Water temperatures: July 1949 to September 1951.
Sediment records: October 1928 to December 1933, November 1942 to September 1944, October 1947 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 1,180 ppm Nov. 1-10; minimum, 283 ppm June 1-10.
Hardness: Maximum, 632 ppm Aug 5-11; minimum, 182 ppm June 1-10 and July 1-10.
Specific conductance: Maximum daily, 1,790 micromhos Jan. 23; minimum daily, 400 micromhos June 24.
Water temperatures: Maximum observed, 82°F July 22-23, 31, Aug. 4; minimum, freezing point Jan. 9-10.
Sediment concentrations: Maximum daily, 31,900 ppm Aug. 6; minimum daily, 320 ppm Jan. 15.
Sediment loads: Maximum daily, 2, 090, 000 tons Aug. 6; minimum daily, 3,140 tons Jan. 15.
EXTREMES, 1928-30, 42-45, 47-51.--Dissolved solids: Maximum 1,410 ppm Oct. 11-20, 1928; minimum, 209 ppm June 11-20, 1929.
Hardness: Maximum, 720 ppm Oct. 11-20, 1928; minimum, 132 ppm June 11-20, 1944.
Specific conductance: (1942-45, 1947-51): Maximum daily, 2,280 micromhos Oct. 15, 1945; minimum daily, 318 micromhos June 9, 1948.
Water temperatures: (1949-51): Maximum observed, 82°F July 22-23, 31, Aug. 4, 1951; minimum, freezing point Jan. 3-5, 7, 1950, Jan. 9-10, 1951.
Sediment concentrations: (1928-33, 1942-44, 1947-51): Maximum daily, 83,300 ppm Aug. 11, 1930; minimum daily, 300 ppm Jan. 8, 1949.
Sediment loads: (1928-33, 1942-44, 1947-51): Maximum daily 9,450,000 tons Aug. 7, 1929; minimum daily, 1,220 tons Jan. 8, 1949.
REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213. Values reported for dissolved solids are sums of determined constituents.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Oct. 1-10, 1950...	6,426	13	0.01	129	48	150	8.0	222	514	94	0.5	4.4	0.4	1,070	1.46	18,600	520	338	38		1,550	7.7	8
Oct. 11-20.....	5,366	11	.01	121	50	147	8.2	215	502	102	.4	4.1	.4	1,050	1.43	15,200	508	332	38		1,540	7.8	7
Oct. 21-31.....	4,935	8.8	.02	122	56	163	8.0	206	538	115	.4	4.1	.4	1,120	1.52	14,900	535	366	39		1,620	7.9	7
Nov. 1-10	4,931	8.7	.03	127	58	174	8.6	216	563	128	.4	3.6	.3	1,180	1.60	15,700	556	378	40		1,710	7.9	8
Nov. 11-20	5,660	9.1	.01	124	57	169	9.2	231	533	130	.4	3.6	.3	1,150	1.56	17,600	544	354	40		1,680	7.4	7
Nov. 21-30	7,046	12	.02	126	56	152	8.0	238	511	117	.4	4.1	.3	1,100	1.50	20,900	545	350	37		1,610	7.8	7
Dec. 1-10	7,098	12	.00	108	48	135	5.6	227	428	96	.4	4.1	.1	949	1.29	18,200	467	281	38		1,400	7.9	5
Dec. 11-20	6,525	11	.01	113	53	147	4.0	229	446	114	.3	4.2	.1	1,010	1.37	17,800	500	312	39		1,500	7.9	5
Dec. 21-31	6,640	11	.01	106	50	139	5.2	229	414	106	.3	4.0	.1	949	1.29	17,000	470	282	39		1,420	7.9	5
Jan. 1-10, 1951...	5,261	12	.02	112	47	147	5.2	230	435	118	.2	4.3	.2	994	1.35	14,100	473	284	40		1,500	7.3	3
Jan. 11-20.....	4,314	12	.02	121	50	162	7.0	244	460	140	.3	4.5	.4	1,080	1.47	12,600	508	308	41		1,630	7.5	4
Jan. 21-31.....	5,745	12	.02	120	51	167	6.2	249	457	140	.2	4.8	.3	1,080	1.47	16,800	509	305	41		1,620	7.3	4
Feb. 1-10	4,954	12	.02	108	45	144	4.6	a 231	394	116	.2	4.1	.4	942	1.28	12,600	454	265	40		1,430	7.4	4
Feb. 11-20	7,268	12	.01	108	43	147	5.6	b 223	404	122	.3	4.4	.3	956	1.30	18,800	446	264	41		1,450	7.3	4
Feb. 21-28	7,445	9.5	.01	95	42	132	4.8	208	371	97	.2	3.3	.4	857	1.17	17,200	410	239	41		1,310	7.3	4

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

Mar. 1-10	7,105	15	.02	94	42	131	5.8	207	364	102	.2	4.1	.1	860	1.17	16,500	407	238	41		1,310	7.7	5
Mar. 11-20	6,844	16	.01	99	45	141	6.0	221	381	113	.4	4.0	.1	914	1.24	16,900	432	251	41		1,390	7.7	5
Mar. 21-31	6,459	16	.04	94	42	132	3.2	218	353	107	.4	3.7	.1	858	1.17	15,000	407	228	41		1,320	7.8	5
Apr. 1-10	7,978	14	.02	88	40	124	3.8	218	333	98	.4	2.6	.1	811	1.10	17,500	384	206	41		1,250	7.8	5
Apr. 11-20	8,309	16	.01	84	38	115	5.2	207	310	86	.4	3.0	c.1	760	1.03	17,100	366	196	40		1,170	7.8	5
Apr. 21-30	10,490	15	.04	79	33	94	4.0	207	255	74	.5	2.9	c.1	659	.90	18,700	332	163	38		1,030	7.8	7
May 1-10	15,100	16	.02	69	28	63	4.6	201	180	48	.5	2.5	c.1	511	.69	20,800	287	122	32		804	7.8	8
May 11-20	23,070	15	.03	65	22	51	3.8	181	158	39	.4	2.3	c.1	446	.61	27,800	252	104	30		703	7.8	10
May 21-31	40,710	16	.08	58	18	37	4.6	167	129	25	.4	1.0	c.1	371	.50	40,800	218	82	26		593	7.7	17
June 1-10	54,770	15	.02	50	14	23	4.6	154	81	17	.4	1.8	c.1	283	.38	41,800	182	56	21		459	7.8	17
June 11-20	37,020	13	.04	56	16	34	2.6	166	110	20	.2	1.0	c.1	335	.46	33,500	206	70	26		531	8.0	18
June 21-30	53,730	12	.03	52	13	28	2.9	156	90	16	.6	1.3	c.1	293	.40	42,500	183	55	25		467	8.1	18
July 1-10	32,310	13	.04	50	14	29	3.5	154	90	19	.2	.9	c.1	296	.40	25,800	182	56	25		476	7.9	15
July 11-20	19,000	11	.02	54	16	40	3.7	150	122	28	.4	1.3	c.1	350	.48	18,000	200	78	30		563	7.8	15
July 21-31	15,540	12	.02	71	21	54	3.8	170	188	38	.4	2.0	.1	474	.64	19,900	264	124	30		746	8.0	10
Aug. 1-4	15,600	17	.17	88	28	61	10	224	228	40	.4	1.0	.1	584	.79	24,600	334	151	28		873	7.8	20
Aug. 5-11	19,130	17	.21	184	42	104	9.8	217	583	57	.1	.7	.1	1,100	1.50	56,800	632	454	26		1,500	7.9	15
Aug. 12-20	11,160	15	.01	96	26	77	5.2	195	285	43	.2	2.4	.1	646	.88	19,500	346	186	32		961	7.8	17
Aug. 21-31	9,091	12	.02	104	30	90	8.4	192	340	58	.1	1.9	.1	739	1.01	18,100	383	226	33		1,090	7.8	10
Sept. 1-10	10,370	16	.21	156	40	107	8.4	219	503	67	.4	2.2	.14	1,010	1.37	28,300	554	374	29		1,440	7.6	25
Sept. 11-20	5,643	13	.05	116	41	103	7.8	210	393	72	.4	4.0	.11	853	1.16	13,000	458	286	32		1,250	7.5	15
Sept. 21-30	4,691	12	.02	123	50	136	8.6	200	498	101	.4	3.0	.14	1,030	1.40	13,000	512	348	36		1,470	7.8	10
Weighted average	13,560	14	0.04	79	27	72	4.9	185	235	52	0.4	2.2	--	578	0.79	21,200	308	156	33		877	--	--

c Reported boron concentration is less than figure indicated.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT LEES FERRY, ARIZ.--Continued

Temperature (°F) of water, water year October 1950 to September 1951
(Once daily temperature measurement, generally prior to 11 a. m.:)

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

a Observed between 11 a. m. and 6 p. m.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT LEES FERRY, ARIZ.--Continued

Suspended sediment, water year October 1950 to September 1951

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	7,250	3,310	64,800	4,640	610	7,640	6,460	1,550	31,200
2	7,280	2,700	53,100	4,640	710	8,890	7,380	1,500	29,900
3	6,910	2,270	42,400	4,760	620	7,970	7,350	1,220	24,200
4	6,700	1,810	32,700	4,990	920	12,400	7,040	970	18,400
5	6,410	1,810	31,300	5,020	840	a 11,400	7,110	1,280	24,600
6	6,050	1,500	24,500	4,970	760	10,200	7,180	1,280	24,800
7	5,810	1,540	24,200	4,970	800	10,700	7,080	1,160	22,200
8	5,960	1,620	26,100	5,050	780	10,600	6,840	1,520	28,100
9	6,020	1,560	25,400	5,120	890	12,300	6,770	1,370	25,000
10	5,870	1,310	20,800	5,150	930	12,900	6,770	1,160	21,200
11	5,720	1,290	19,900	5,260	1,060	15,100	6,700	1,090	19,700
12	5,720	1,160	17,900	5,520	1,150	17,100	6,570	1,000	17,700
13	5,720	1,090	16,800	5,490	910	13,500	6,310	980	16,700
14	5,520	1,050	15,600	5,430	690	10,100	6,340	1,090	18,700
15	5,400	980	14,300	5,460	770	11,400	6,570	1,220	21,600
16	5,260	960	13,600	5,660	870	13,300	6,740	1,260	a 22,900
17	5,070	1,880	25,700	5,870	970	15,400	6,670	1,300	23,400
18	5,020	970	13,100	5,960	900	14,500	6,440	1,260	21,900
19	5,180	1,010	14,100	5,990	990	16,000	6,340	1,300	22,300
20	5,050	810	11,000	5,960	1,140	18,300	6,570	1,100	19,500
21	4,890	850	11,200	6,280	1,020	17,300	7,040	1,150	21,900
22	4,890	640	8,450	6,500	1,230	21,600	7,460	1,230	24,800
23	5,100	640	8,800	6,500	1,290	a 22,600	7,560	1,240	25,300
24	5,180	650	9,090	6,470	1,350	23,600	7,180	1,110	21,500
25	5,050	730	9,950	6,940	1,350	25,300	6,770	1,220	22,300
26	5,070	800	11,000	7,320	1,130	22,300	6,670	960	17,300
27	4,940	690	9,200	7,350	1,500	29,800	6,670	980	17,600
28	4,820	790	10,300	7,490	1,810	36,600	6,370	980	16,900
29	4,760	790	10,200	7,840	1,930	40,900	6,020	1,140	18,500
30	4,790	720	9,310	7,770	1,460	30,600	5,750	850	13,200
31	4,790	780	10,100	--	--	--	5,550	1,140	17,100
Total	172,200	--	614,900	176,370	--	520,300	209,270	--	670,400
	January			February			March		
1	5,430	970	14,200	6,810	1,150	21,100	7,380	1,500	29,900
2	5,350	1,070	15,400	6,400	1,170	21,200	7,380	1,200	23,900
3	5,370	780	11,300	6,120	1,280	21,200	7,490	1,210	24,500
4	5,490	1,050	15,600	4,820	820	10,700	7,520	1,230	25,000
5	5,430	1,120	16,400	3,550	560	5,370	7,210	1,000	19,500
6	5,230	1,090	a 15,400	3,060	510	4,210	7,040	990	18,800
7	5,320	1,060	15,200	3,320	490	4,400	7,150	890	17,200
8	5,210	1,000	14,100	3,970	600	6,430	6,870	890	16,500
9	5,020	1,020	13,800	5,070	1,040	14,200	6,570	780	13,800
10	4,760	1,220	15,700	6,120	1,220	20,200	6,440	810	14,100
11	4,520	770	9,400	7,080	1,210	23,100	6,240	1,130	19,000
12	4,270	590	6,800	7,420	1,310	26,200	6,020	950	15,400
13	3,790	420	4,300	6,940	1,550	29,000	6,500	900	15,800
14	3,600	370	a 3,600	7,010	1,460	27,600	7,080	970	18,500
15	3,640	320	3,140	7,380	1,470	29,300	6,980	1,050	19,800
16	4,250	460	5,280	7,460	1,360	27,400	7,040	870	16,500
17	4,690	560	7,100	7,380	1,360	27,100	7,350	1,030	20,400
18	4,860	590	7,740	7,380	1,440	28,700	7,490	1,050	a 21,200
19	4,860	720	9,450	7,420	1,350	27,000	7,040	1,070	20,300
20	4,660	580	7,300	7,210	1,460	28,400	6,700	1,040	18,800
21	4,690	520	6,580	7,040	1,130	21,500	6,700	1,080	19,500
22	4,920	680	9,030	7,110	1,240	a 23,800	6,770	1,100	20,100
23	5,260	1,360	19,300	7,660	1,370	28,300	6,770	1,270	23,200
24	5,630	1,330	20,200	7,950	1,390	29,800	6,770	1,160	21,200
25	5,840	1,160	18,300	7,920	1,340	28,600	6,440	1,190	a 20,700
26	5,810	810	12,700	7,380	1,360	27,100	6,150	1,230	20,400
27	5,810	980	15,400	7,180	1,280	24,800	5,960	1,090	17,500
28	6,020	820	13,300	7,320	1,090	21,500	6,080	1,240	20,400
29	6,310	1,010	17,200	--	--	--	6,240	1,040	17,500
30	6,370	1,160	20,000	--	--	--	6,470	1,120	19,600
31	6,540	1,190	21,000	--	--	--	6,700	1,110	20,100
Total	158,950	--	384,220	181,780	--	608,210	210,540	--	609,100

a Computed from estimated concentration graph.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT LEES FERRY, ARIZ.--Continued

Suspended sediment, water year October 1950 to September 1951--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	6,840	1,030	19,000	14,900	3,080	124,000	66,200	5,540	990,000
2	7,700	1,480	30,800	15,400	3,000	125,000	63,900	5,080	876,000
3	8,850	1,530	36,600	15,700	3,200	136,000	63,900	4,800	828,000
4	8,930	1,500	36,200	16,200	2,950	129,000	61,700	4,100	683,000
5	8,280	1,390	31,100	16,200	2,800	122,000	58,300	3,620	570,000
6	8,100	1,730	37,800	15,400	2,470	103,000	54,000	4,000	583,000
7	8,280	1,580	35,300	14,600	2,290	90,300	50,200	3,530	478,000
8	8,060	1,860	40,500	14,400	2,210	85,900	46,600	3,320	418,000
9	7,490	2,400	48,500	14,100	1,900	72,300	43,100	3,000	349,000
10	7,250	2,520	49,300	14,100	2,010	76,500	39,800	3,400	365,000
11	7,280	2,310	45,400	15,700	2,060	87,300	38,800	2,910	305,000
12	7,600	2,300	47,200	18,000	2,390	116,000	38,800	2,860	300,000
13	7,660	2,340	48,400	20,100	2,970	161,000	37,900	2,460	252,000
14	8,060	2,250	49,000	22,700	3,420	210,000	37,000	2,580	258,000
15	8,700	2,140	50,300	25,300	3,730	255,000	35,200	2,270	216,000
16	8,930	1,950	47,000	26,400	3,840	274,000	33,800	2,400	219,000
17	9,040	2,090	51,000	26,000	3,760	264,000	33,400	2,020	182,000
18	8,770	2,100	49,700	26,000	3,660	257,000	34,300	1,990	184,000
19	8,540	2,330	53,700	25,600	3,600	249,000	37,400	2,240	226,000
20	8,510	2,390	54,900	24,900	3,050	205,000	43,600	2,830	333,000
21	8,100	2,340	51,200	25,300	2,880	195,000	49,700	3,150	423,000
22	7,700	2,120	44,100	28,000	3,120	236,000	52,900	3,800	543,000
23	7,810	1,830	38,600	32,100	3,580	310,000	57,200	2,950	456,000
24	7,920	1,660	35,500	37,000	4,380	438,000	60,600	3,300	540,000
25	8,850	1,750	41,800	37,900	4,860	497,000	61,700	3,310	551,000
26	10,400	2,050	57,600	39,300	5,100	541,000	58,300	3,800	598,000
27	11,500	2,420	75,100	41,200	4,600	512,000	54,000	3,530	515,000
28	13,100	2,650	93,700	42,100	4,620	525,000	50,200	3,020	409,000
29	14,600	2,800	110,000	47,100	5,020	638,000	47,600	2,740	352,000
30	14,900	3,160	127,000	55,000	5,490	815,000	45,100	2,480	302,000
31	--	--	--	62,800	5,500	933,000	--	--	--
Total	267,750	--	1,536,300	829,500	--	8,782,300	1,455,200	--	13,304,000

	July			August			September		
1	43,100	2,180	254,000	14,100	5,400	a 206,000	13,900	20,100	754,000
2	39,300	1,770	188,000	13,600	4,150	152,000	14,400	14,400	560,000
3	37,000	1,970	197,000	13,600	5,400	198,000	12,200	12,400	408,000
4	34,700	1,860	174,000	21,100	31,200	s1,850,000	11,100	16,500	494,000
5	31,600	1,980	169,000	22,400	25,200	1,520,000	11,100	16,800	503,000
6	30,000	1,560	126,000	23,400	31,900	s2,090,000	9,930	12,300	330,000
7	29,200	1,560	123,000	22,700	17,200	s1,070,000	8,730	9,750	230,000
8	28,000	1,500	a 113,000	18,300	16,200	800,000	8,060	6,840	149,000
9	26,000	1,500	105,000	16,800	18,500	839,000	7,380	5,080	a 101,000
10	24,200	1,330	86,900	15,700	18,800	797,000	6,910	5,330	99,400
11	23,100	1,280	79,800	14,600	14,000	552,000	6,570	6,120	109,000
12	21,700	1,200	70,300	14,100	9,700	369,000	6,600	4,880	87,000
13	21,100	1,320	75,200	13,600	7,600	279,000	6,500	3,610	63,400
14	20,400	1,230	67,700	12,900	5,200	181,000	6,150	2,540	42,200
15	19,200	1,240	64,300	12,000	4,970	161,000	5,750	2,110	32,800
16	18,000	1,100	53,500	11,100	4,300	129,000	5,430	1,610	23,600
17	17,700	1,100	52,600	10,200	3,570	98,300	5,070	1,330	18,200
18	17,100	1,100	50,800	9,400	2,860	72,600	4,940	1,270	16,900
19	16,000	990	42,800	8,770	2,610	61,800	4,760	1,110	14,300
20	15,700	970	41,100	8,360	1,990	44,900	4,660	1,090	13,700
21	15,700	1,080	45,800	8,130	1,700	37,300	4,660	1,010	12,700
22	16,500	1,120	49,900	8,020	2,030	44,000	4,590	1,090	13,500
23	16,200	1,100	48,100	7,840	1,430	30,300	4,560	1,070	13,200
24	15,400	2,150	89,400	7,320	2,210	43,700	4,560	1,030	12,700
25	15,400	2,000	83,200	7,320	1,320	26,100	4,540	870	10,700
26	15,100	2,320	94,600	7,770	2,210	46,400	4,590	920	11,400
27	16,500	2,380	106,000	7,420	4,360	87,300	4,490	850	10,300
28	15,700	2,030	86,000	9,080	5,520	s 141,000	4,390	790	9,360
29	15,100	1,720	70,100	11,500	14,700	459,000	4,690	2,540	s 33,000
30	14,400	2,400	93,300	13,400	20,200	731,000	5,840	3,750	s 58,400
31	14,900	3,000	121,000	12,200	15,500	511,000	--	--	--
Total	684,000	--	3,021,400	396,730	--	13,627,000	207,050	--	4,234,760

Total discharge for year (cfs-days) 4,949,340
Total load for year (tons) 47,913,590

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

COLORADO RIVER AT LEES FERRY, ARIZ.--Continued

Particle-size analyses of suspended sediment, water year October 1950 to September 1951
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Water discharge (cfs)	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Oct. 2, 1950	10:00 a.m.	7,280	2,740	4,660	20	31	41	49	--	67	89	99		100		SDWCM
Oct. 5	9:15 a.m.	6,540	1,670	1,270	32	42	54	61	68	77	92	99		100		BSWCM
Oct. 9	9:00 a.m.	6,050	1,750	4,140	19	26	34	42	--	61	87	100		--		SDWCM
Oct. 12	9:15 a.m.	5,720	1,150	2,530	14	20	28	35	--	56	87	99		100		SDWCM
Oct. 16	8:15 a.m.	5,290	1,000	2,280	17	23	28	35	--	54	83	100		--		SDWCM
Oct. 19	9:15 a.m.	5,180	1,020	--	--	--	--	--	--	48	80	99		100		S
Oct. 23	10:15 a.m.	5,070	1,040	1,450	10	13	16	21	--	36	70	99		100		SDWCM
Oct. 26	1:30 p.m.	5,100	1,150	--	--	--	--	--	--	32	65	98		100		S
Oct. 30	8:30 a.m.	4,760	998	--	--	--	--	--	--	37	73	99		100		S
Nov. 2	9:00 a.m.	4,590	1,060	--	--	--	--	--	--	31	61	98		100		S
Nov. 6	9:45 a.m.	4,990	1,090	3,910	12	14	17	25	--	39	70	99		100		DSWCM
Nov. 13	12:15 p.m.	5,490	1,530	6,430	8	10	13	20	--	34	56	95		100		DSWCM
Nov. 16	11:30 a.m.	5,660	1,290	--	--	--	--	--	--	33	66	96		100		S
Nov. 20	10:30 a.m.	5,930	1,100	4,520	11	14	18	28	--	44	81	100		--		DSWCM
Nov. 24	11:30 a.m.	6,440	1,980	--	--	--	--	--	--	25	52	99		100		S
Nov. 27	11:45 a.m.	7,380	1,530	6,430	10	13	18	27	--	47	75	100		--		DSWCM
Nov. 30	9:30 a.m.	7,770	1,790	7,750	11	16	22	29	--	50	76	100		--		DSWCM
Dec. 4	2:45 p.m.	6,940	1,270	--	--	--	--	--	--	43	70	97		99		S
Dec. 7, 11, 14,18, 21, 25	(Composite)	6,720	1,320	1,820	11	14	17	20	24	29	52	96		100		SBWCM
Dec. 28, 1950, Jan. 1, 4, 8, 1951	(Composite)	5,620	1,060	--	--	--	--	--	--	27	55	94		99		S
Jan. 11, 15, 18, 22,	(Composite)	4,480	930	708	18	20	25	28	33	40	65	97		100		SBWCM
Jan. 25, 29, Feb. 1, 5, 8.	(Composite)	5,300	1,230	1,150	17	20	23	26	31	36	57	96		100		SBWCM
Feb. 15, 19, 23, 26, Mar. 1, 5, 8, 12	(Composite)	7,160	1,350	3,180	12	16	19	23	28	34	56	90		100		SBWCM
Apr. 1	9:00 a.m.	6,870	1,010	719	12	[illegible]	16	17	20	31	50	94		100		SBWCM
Apr. 11	11:30 a.m.	7,250	2,140	3,710	54	58	64	67	70	73	81	96		100		SBWCM
Apr. 21	12:30 p.m.	8,060	2,110	1,770	38	51	63	70	73	75	81	96		100		SBWCM

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT LEES FERRY, ARIZ.--Continued

Particle-size analyses of suspended sediment, water year October 1950 to September 1951--Continued
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Water discharge (cfs)	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
May 1, 1951	8:50 a.m.	14,700	2,960	3,930	20	25	34	42	51	64	80	98		100		SBWCM
May 11	10:20 a.m.	15,500	--	3,160	--	27	--	42	--	61	76	93		99		SPWCM
May 21	11:15 a.m.	24,900	2,370	1,280	--	34	--	44	--	53	78	95		99		SPWCM
May 24	10:15 a.m.	36,500	4,100	2,660	--	24	--	48	--	55	76	92		99		SPWCM
May 29	9:30 a.m.	46,900	4,800	2,720	16	19	23	31	41	52	74	92		99		SPWCM
May 29	9:30 a.m.	46,900	4,800	1,270	14	19	23	29	40	52	74	92		99		SBWCM
May 31	10:30 a.m.	62,800	5,000	2,350	21	24	27	35	48	60	72	90		99		SPWCM
May 31	10:30 a.m.	62,800	5,000	1,770	18	23	29	37	47	60	72	90		99		SBWCM
June 1	9:15 a.m.	65,900	5,700	3,050	16	20	26	31	44	55	73	92		100		SPWCM
June 1	9:15 a.m.	65,900	5,700	1,700	16	21	26	32	43	55	73	92		100		SBWCM
June 5	4:30 p.m.	57,500	3,240	1,540	--	14	--	26	--	41	61	84		99		SPWCM
June 9	5:00 p.m.	42,200	3,500	1,630	--	7	--	24	--	44	59	91		99		SPWCM
June 19	11:20 a.m.	36,700	1,780	892	10	12	15	20	27	34	61	89		98		SBWCM
June 23	9:30 a.m.	57,700	2,900	1,700	--	32	--	54	--	56	61	92		99		SPWCM
June 25	10:40 a.m.	62,300	3,210	3,440	--	13	--	21	--	39	60	85		99		SPWCM
July 5	10:00 a.m.	32,500	1,690	1,240	16	18	20	24	28	38	66	93		98		SBWCM
July 15	10:00 a.m.	19,200	1,310	--	--	--	--	--	--	28	48	84		97		S
July 26	11:45 a.m.	15,000	1,620	1,880	--	34	--	64	--	--	--	--		--		PWCM
Aug. 1	9:30 a.m.	14,200	6,300	3,650	--	65	--	87	--	94	96	99		100		SPWCM
Aug. 6	7:30 p.m.	23,600	31,000	2,760	40	57	69	82	92	95	97	99		100		SPWCM
Aug. 6	7:30 p.m.	23,600	31,000	2,460	16	17	32	81	92	95	97	99		100		SPN
Aug. 6	7:30 p.m.	23,600	31,000	2,260	44	58	71	82	92	95	97	99		100		SBWCM
Aug. 6	7:30 p.m.	23,600	31,000	2,230	12	18	25	81	94	95	97	99		100		SBN
Aug. 7	11:45 a.m.	23,800	15,100	4,190	--	55	--	83	--	--	--	--		--		PWCM
Aug. 8	6:15 a.m.	18,900	17,400	5,600	--	49	--	72	--	87	93	99		100		SPWCM
Aug. 18	10:15 a.m.	9,400	3,240	2,810	--	59	--	81	--	85	93	98		100		SPWCM
Aug. 28	10:30 a.m.	8,620	4,030	4,150	--	69	--	86	--	--	--	--		--		PWCM

Sept. 1	1:45 p. m.	14,300	19,700	4,160	--	60	--	69	--	--	--	--	--		PWCM
Sept. 1	6:30 p. m.	15,600	20,900	2,810	49	60	73	82	89	91	96	99	100		SPWCM
Sept. 1	6:30 p. m.	15,600	20,900	3,260	5	9	27	81	90	91	96	99	100		SPN
Sept. 1	6:30 p. m.	15,600	20,900	2,680	46	60	72	81	88	91	96	99	100		SBWCM
Sept. 1	6:30 p. m.	15,600	20,900	2,880	7	9	15	88	89	91	96	99	100		SBN
Sept. 2	10:50 a. m.	14,500	15,000	4,060	--	78	--	99	--	--	--	--	--		PWCM
Sept. 13	12:00 m.	6,570	4,240	4,640	--	59	--	71	--	--	--	--	--		PWCM
Sept. 29	4:30 p. m.	4,690	4,630	3,720	--	67	--	84	--	--	--	--	--		PWCM
Sept. 30	4:00 p. m.	5,810	4,080	4,540	--	61	--	66	--	--	--	--	--		PWCM

PARIA RIVER BASIN

PARIA RIVER AT LEES FERRY, ARIZ.

LOCATION.--At gaging station, half a mile upstream from mouth and one mile northwest of Lees Ferry, Coconino County.
DRAINAGE AREA.--1,570 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to February 1950.
Sediment records: October 1947 to September 1951.
EXTREMES, 1950-51.--Sediment concentrations: Maximum daily, 209,000 ppm Aug. 4; minimum daily, 2 ppm Oct. 21 to Nov. 13.
Sediment loads: Maximum daily, 713,000 tons Aug. 4; minimum daily, less than 0.05 ton Oct. 11-31.
EXTREMES, 1947-51.--Sediment concentrations: Maximum daily, 332,000 ppm June 19, 1949; minimum daily, 1 ppm June 1-10, 1950.
Sediment loads: Maximum daily, 775,000 tons Aug. 5, 1948; minimum daily, less than 0.05 ton on many days.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

Suspended sediment, water year October 1950 to September 1951

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	4.7			8.0			23	80	5.0
2	4.7			8.4			22	140	8.3
3	5.0			8.0			21	180	10
4	5.0			8.8			19	80	4.1
5	5.0	7	0.1	9.6	2	0.1	20	120	6.5
6	5.4			10			20	150	8.1
7	6.1			11			19	80	4.1
8	6.1			10			20	100	5.4
9	6.9			10			20	80	4.3
10	7.3			10			19	100	5.1
11	8.0			9.6			20	100	5.4
12	7.3			9.2	2	.1	21	110	6.2
13	6.1			13			22	30	1.8
14	5.8			18	120	5.8	20	40	2.2
15	5.4	3	(t)	23	195	12	22	80	4.8
16	5.0			25	210	14	22	70	4.2
17	4.7			22	280	a17	21	60	3.4
18	6.1			22	265	16	20	40	2.2
19	6.1			23	180	11	19	30	1.5
20	5.8			25	230	16	21	30	1.7
21	6			26	230	16	20	75	4.0
22	6			23	215	a13	20	90	4.9
23	6			22	200	12	20	183	s11
24	6			21	185	10	20	267	s17
25	6			20	170	9.2	21	400	s27
26	6.1	2	(t)	20	115	6.2	22	724	s54
27	6.5			20	50	2.7	20	563	s34
28	6.9			20	60	3.2	20	702	s42
29	7.7			21	130	7.4	24	687	s47
30	7.7			22	50	3.0	25	598	s43
31	7.7			--	--	--	23	790	49
Total	189.1	--	1.9	498.6	--	175.8	646	--	127.2

s Computed by subdividing day.
t Less than 0.05 ton.
a Computed from estimated concentration graph.

PARIA RIVER BASIN--Continued

PARIA RIVER AT LEES FERRY, ARIZ.--Continued

Suspended sediment, water year October 1950 to September 1951--Continued

Day	January			February			March		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	25	580	39	7	550	10	23	540	34
2	16	450	19	8	600	s13	22	450	27
3	11	353	10	8	400	s9.5	24	760	49
4	9.2	170	4.2	10	200	5.4	23	720	45
5	21	490	28	35	2,520	s306	22	780	46
6	25	460	sa34	46	2,720	338	23	600	37
7	16	470	20	32	2,350	203	27	700	51
8	7	340	6.4	29	1,600	125	25	640	43
9	12	540	s19	25	900	61	25	600	40
10	9	300	7.3	23	780	48	23	1,500	93
11	11	220	6.5	23	460	29	20	3,000	162
12	18	450	22	22	390	23	16	2,050	89
13	14	300	11	20	450	24	14	3,050	115
14	14	200	7.6	14	330	12	17	850	39
15	18	360	17	12	110	3.6	16	560	24
16	19	345	18	15	160	6.5	15	570	23
17	18	380	18	16	120	5.2	13	400	14
18	23	380	24	18	200	9.7	11	300	a8.9
19	28	475	36	19	470	24	10	300	8.1
20	35	2,520	s245	16	520	22	14	290	11
21	23	2,590	s174	16	370	16	14	240	9.1
22	19	1,110	s60	18	420	20	12	320	10
23	30	1,460	s139	16	470	20	11	270	8.0
24	37	2,050	s236	16	300	13	12	160	5.2
25	31	1,880	s190	17	350	16	12	110	a3.6
26	28	1,150	87	19	370	19	11	60	1.8
27	26	700	49	21	300	17	10	90	2.4
28	25	550	37	23	460	29	8.8	75	a1.8
29	28	950	72	--	--	--	8.8	60	1.4
30	32	1,000	86	--	--	--	8.8	60	1.4
31	25	950	64	--	--	--	13	60	2.1
Total	652.2	--	1,786.0	544	--	1,427.9	504.4	--	1,005.8

Day	April			May			June		
1	48	6,700	s1,000	32	8,220	s688	3.2	145	1.2
2	25	4,300	a290	22	14,800	879	3.8	79	.8
3	17	1,200	a55	20	18,800	1,020	4.1		
4	13	430	15	16	9,700	419	4.7		
5	12	350	a11	11	3,800	a113	4.1		
6	11	350	10	9.2	1,500	37	4.1		
7	14	450	17	4.3	310	6.1	4.1		
8	11	240	7.1	5.0	160	2.2	4.1	27	.3
9	9.2	310	7.7	4.7	100	1.3	4.1		
10	7.7	160	3.3	5.0	80	1.1	3.8		
11	6.5	70	1.2	4.7	30	.4	3.2		
12	6.9			4.4	50	.6	3.5		
13	6.5			4.1	30	.3	3.5		
14	5.4			5.4	20	.3	4.1		
15	5.0	30	.5	59	42,500	s16,100	4.4		
16	5.4			65	38,000	s7,350	4.7		
17	5.4			39	32,500	3,550	4.7		
18	6.1			24	28,000	1,810	3.8	25	.3
19	6.5			17	18,000	826	3.5		
20	17	2,410	s304	25	9,000	608	4.1		
21	26	3,700	206	18	5,000	243	4.1		
22	21	3,900	221	13	12,000	421	4.1		
23	16	950	41	12	19,500	632	4.1		
24	12	750	24	32	37,500	3,360	4.4		
25	8.4	650	a15	22	70,000	4,310	4.1		
26	7.7	500	a10	14	31,000	1,170	3.8		
27	6.9	330	6.1	8.8	11,000	261	3.8	17	.1
28	9.6	210	5.4	5.8	1,920	30	3.2		
29	10	250	6.8	3.8	480	4.9	3.5		
30	28	2,950	s358	3.8	240	2.5	3.2		
31	--	--	--	3.5	175	1.6	--		
Total	384.2	--	2,672.6	516.5	--	43,848.3	117.9	--	8.8

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

PARIA RIVER BASIN--Continued

PARIA RIVER AT LEES FERRY, ARIZ.--Continued

Suspended sediment, water year October 1950 to September 1951--Continued

Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	3.8			5.0	35	0.5	25	57,200	4,000
2	3.8			4.4	59	.7	17	34,800	1,660
3	3.2			41	22,100	s17,200	13	19,000	667
4	3.5			762	209,000	s713,000	10	6,650	180
5	3.2	12	0.1	126	91,700	s34,000	8.8	430	10
6	2.9			44	78,800	s10,100	7.5	240	4.9
7	3.5			18	64,000	3,220	5.8	210	3.3
8	3.5			12	64,000	2,150	4.9	130	1.7
9	3.2			7.8	35,000	764	4.3	85	a1.0
10	3.2			5.6	8,500	129	4.0	44	.5
11	2.9			4.5	1,000	12	3.8		
12	3.2			3.7	300	3.0	3.5		
13	3.5			3.7	220	2.0	3.8		
14	3.8			3.7	160	1.6	4.0		
15	3.8	16	.2	4.0	110	1.2	4.0	17	.2
16	4.1			4.0	100	1.1	3.8		
17	5.0			4.2	80	.9	4.0		
18	4.1			4.0			4.0		
19	4.4			4.0			4.0		
20	7.2	8,240	s341	4.0	22	.2	4.0		
21	22	19,700	s2,710	4.0			3.8		
22	6.1	6,000	99	18	6,200	s485	3.8		
23	4.4	1,000	12	16	36,000	1,560	4.0		
24	7.7	1,370	28	12	97,000	3,380	4.3	22	.2
25	5.8	1,500	23	7.8	59,000	1,290	4.3		
26	4.7	120	1.5	5.0	19,800	267	4.3		
27	4.4	72	.9	4.5	7,600	92	4.3		
28	4.7	61	.8	5.3	1,400	20	5.8	80	1.2
29	4.7	63	.8	758	105,000	s428,000	105	24,400	s13,300
30	4.4	54	.6	503	131,000	s208,000	69	38,600	s 8,480
31	4.4	63	.7	65	81,300	15,700	--	--	--
Total	149.1	--	3,221.1	2,464.2	--	1,439,380.8	347.8	--	28,313.0

Total discharge for year (cfs-days) 7,014.0
Total load for year (tons) 1,522,269.2

s Computed by subdividing day.
a Estimated or interpolated.

LITTLE COLORADO RIVER AT WOODRUFF, ARIZ.

LOCATION.--At gaging station at county bridge in Woodruff, Navajo County, 3¾ miles downstream from Silver Creek.
DRAINAGE AREA.--8,100 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: June 1950 to September 1951.
Water temperatures: June 1950 to September 1951.
Sediment records: June 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 546 ppm Aug. 20; minimum, 283 ppm July 11-17.
Hardness: Maximum, 218 ppm Feb. 11-20 and May 1-10; minimum, 60 ppm Aug. 20.
Specific conductance: Maximum daily, 890 micromhos Aug. 7; minimum daily, 318 micromhos Aug. 1.
Water temperatures: Maximum observed, 82°F July 17, and Aug. 13, minimum observed, 33°F Dec. 31.
Sediment concentrations: Maximum daily, 66,400 ppm Aug. 4; minimum daily, no flow on many days.
Sediment loads: ; Maximum daily, 409,000 tons Aug. 28; minimum daily, 0 tons on many days.
EXTREMES, June 1950 to September 1951. --Dissolved solids: Maximum, 838 ppm July 11-12, 1950; minimum 233 ppm Sept. 21-30, 1950.
Hardness: Maximum, 218 ppm Feb. 11-20, and May 1-10; minimum, 60 ppm Aug. 20, 1951.
Specific conductance: Maximum daily, 2,110 micromhos July 11, 1950; minimum daily, 318 micromhos Aug. 1, 1951.
Water temperatures: Maximum observed, 82°F July 17 and Aug. 13, 1951, minimum observed, 33°F Dec. 31, 1950.
Sediment concentrations: Maximum daily, 66,400 ppm Aug. 4, 1951; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 409,000 tons Aug. 28, 1951; minimum daily, 0 tons on many days.
REMARKS.--Records of specific conductance available in district office at Albuquerque, N. Mex. Values reported for dissolved solid concentrations are sums of determined constituents. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Oct. 1-10, 1950.....	1.04	16	0.01	44	14	31	9.0	181	--	62	20	0.3	0.8	0.1	286	0.39	0.80	168	19	27	462	7.5
Oct. 11-14, 17-20...	1.06	16	.02	48	19	28	8.0	199	--	67	22	.4	.8	.1	307	.42	.88	198	35	23	497	7.3
Oct. 21-31.....	1.05	16	.01	47	20	28	7.8	198	--	69	22	.4	.6	.1	309	.42	.88	200	38	23	499	7.2
Nov. 1-10.....	1.16	16	.02	46	21	27	7.0	198	--	68	22	.3	.6	.1	306	.42	.96	202	40	22	495	7.8
Nov. 11-20.....	5.93	20	.02	49	21	26	8.4	211	5	63	21	.1	.3	.1	318	.43	5.09	209	28	20	510	7.6
Nov. 21-30.....	7.21	17	.01	49	22	24	7.8	214	5	58	19	.1	.3	.1	307	.42	5.98	213	30	19	495	7.5
Dec. 1-10.....	6.20	17	.01	48	22	24	8.2	199	7	63	20	.1	.8	.1	308	.42	5.16	210	36	19	502	7.7
Dec. 11, 13-20.....	5.67	17	.01	48	22	26	8.8	218	--	62	21	.2	.5	.1	313	.43	4.79	210	32	20	499	7.5
Dec. 21-31.....	4.11	18	.01	48	22	25	5.6	208	--	64	21	.3	.5	.1	306	.42	3.40	210	40	20	501	7.4
Jan. 1-10, 1951.....	6.31	18	.01	49	23	27	5.0	231	--	61	20	.3	.4	.1	318	.43	5.42	217	28	21	526	7.4
Jan. 11-20.....	5.93	18	.02	49	23	25	5.0	215	6	57	19	.2	.5	.1	309	.42	4.95	217	31	20	518	7.4
Jan. 21-22, 24-31...	5.42	17	.01	46	21	25	6.0	195	6	62	20	.3	.3	.1	300	.41	4.39	204	34	21	496	7.5
Feb. 1-10.....	6.76	15	.02	46	22	29	4.6	218	--	62	20	.3	.5	.1	306	.42	5.59	206	27	23	512	7.5
Feb. 11-20.....	6.53	20	.01	48	24	28	4.0	200	8	65	24	.2	.9	.1	320	.44	5.64	218	42	21	521	8.0
Feb. 21-28.....	6.16	20	0	48	22	27	3.7	210	--	64	22	.2	.5	.1	310	.42	5.16	210	38	21	506	8.0
Mar. 1, 3-10.....	5.42	20	.01	48	22	26	3.4	194	6	65	23	.2	.6	.1	309	.42	4.52	210	42	21	505	8.1
Mar. 11-20.....	4.99	19	.01	49	22	29	3.5	210	--	69	23	.2	.6	.1	318	.43	4.28	213	41	22	512	8.0
Mar. 21-31.....	5.46	19	.01	47	23	28	3.4	216	--	65	22	.2	.8	.1	314	.43	4.63	212	35	22	515	7.9

LITTLE COLORADO RIVER BASIN--Continued

LITTLE COLORADO RIVER AT WOODRUFF, ARIZ.--Continued

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Apr. 1-10, 1951	2.90	20	0	48	22	30	4.3	216	--	64	22	0.3	0.5	0.1	317	0.43	2.48	210	34	23	519	8.0
Apr. 11-20 a	.45	19	0	46	24	32	4.8	205	--	75	28	.5	1.2	.1	332	.45	.40	214	46	24	539	8.1
Apr. 21-30	.20	18	0	45	23	35	4.3	198	--	78	27	.4	1.0	.1	330	.45	.18	207	45	26	535	8.1
May 1-10.....	.32	18	0	46	25	37	4.0	205	--	85	30	.4	1.2	.1	348	.47	.30	218	50	27	568	8.2
May 11-20.....	1.41	17	0	45	25	35	4.5	209	--	79	28	.4	.9	.1	338	.46	1.29	216	44	26	555	8.1
May 21-31 a	.16	18	.02	40	26	34	4.6	214	--	74	24	.5	.8	.1	327	.44	.14	207	32	26	555	8.1
June 1-10 a	--	16	.03	39	27	41	4.8	209	--	88	30	.5	.7	.1	350	.48	--	208	37	29	585	8.1
June 11-20 a.....	--	13	.02	33	25	45	4.5	161	--	104	34	.5	.9	.1	339	.46	--	186	54	34	569	8.1
June 21-30 a	--	11	.02	28	24	50	5.3	137	--	115	39	.5	.7	.1	341	.46	--	168	56	38	568	8.1
July 1-10 a	.01	12	.01	26	22	44	7.2	100	6	113	35	.4	.4	.1	315	.43	.01	156	64	37	527	8.1
July 11-17 a	16.5	13	.03	30	18	36	7.6	121	--	92	26	.2	.4	.1	283	.38	12.6	149	50	33	471	8.1
July 20-28.....	47.9	18	.03	50	9.0	41	7.8	152	--	95	23	.4	1.0	.1	320	.44	41.4	162	38	34	501	8.0
July 29-31.....	14.0	19	.07	60	9.2	83	10	224	--	150	30	.6	1.1	.28	473	.64	17.9	188	4	47	727	8.0
Aug. 1-3, 5-6,8-10 ..	93.5	18	.07	42	8.2	44	6.8	188	--	57	22	.6	1.7	.1	293	.40	74.0	138	0	39	471	7.9
Aug. 4, 7	218	22	.14	28	6.1	153	--	244	--	110	80	.8	.6	--	521	.71	307	95	0	77	826	8.0
Aug. 11-19	.28	17	.02	29	7.3	66	7.8	145	--	79	34	.6	1.8	.1	314	.43	.24	102	0	56	504	8.1
Aug. 20	34	21	.10	20	2.6	180		295	--	110	67	--	.8	--	546	.74	50.1	60	0	87	883	8.0
Aug. 21-26, Sept. 1 .	667	15	.05	24	5.8	66	4.2	159	--	66	24	.6	1.5	.27	285	.39	513	84	0	62	465	8.0
Sept. 2-10.....	13.3	18	.02	46	14	33	5.0	202	7	46	16	.2	1.1	.1	285	.39	10.2	172	0	29	466	8.1
Sept. 11-20.....	4.36	22	.01	53	19	20	5.8	198	12	55	18	0	.6	.1	302	.41	3.56	210	28	17	495	8.2
Sept. 21-24, 26-30...	2.42	18	.02	50	20	27	5.0	193	13	61	20	.2	.9	.1	310	.42	2.03	207	28	22	504	8.2
Weighted average ..	30.2	16	0.05	29	7.8	63	5.2	170	--	69	26	0.6	1.4	--	302	0.41	24.6	104	0	55	488	--

a Flow less than 0.05 cfs Apr. 18, 19, May 26-June 31, July 2-13.

LITTLE COLORADO RIVER BASIN--Continued

LITTLE COLORADO RIVER AT WOODRUFF, ARIZ.--Continued

Temperature (°F) of water, water year October 1950 to September 1951
/Once daily temperature measurement usually between 3 p. m. and 7 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a 58	59	45	37	37	42	56	50		76	73	70
2	a 49	60	42	35	35	41	57	66		--	73	71
3	a 52	56	42	38	36	39	56	70		--	71	72
4	a 59	55	45	40	36	44	50	69		--	73	72
5	a 55	56	43	40	42	48	50	67		--	72	74
6	a 55	54	40	38	47	48	51	60		--	72	71
7	a 53	54	42	38	49	51	56	63		--	--	b79
8	a 52	55	48	37	51	49	50	67		--	71	73
9	a 54	47	48	a 35	55	50	60	72		--	75	75
10	a 53	43	48	--	55	52	50	75		--	75	75
11	a 53	44	45	35	52	49	58	65		--	78	70
12	a 52	45	47	36	49	50	56	72		--	79	69
13	a 54	45	45	37	45	52	64	55		--	82	69
14	a 53	44	44	38	45	54	62	52		77	78	71
15	a 55	48	46	39	45	55	64	51		74	79	72
16	a 52	49	46	38	45	52	64	55		76	73	70
17	a 55	50	44	39	48	49	59	66		82	79	72
18	a 54	49	42	42	44	46	--	70		--	76	69
19	a 52	54	43	43	45	50	--	72		--	72	75
20	a 51	56	42	45	47	55	59	70		72	71	68
21	a 52	54	40	45	44	67	64	65		74	71	68
22	a 53	54	39	42	49	57	69	71		74	71	66
23	a 52	51	38	45	45	56	64	72		74	71	66
24	a 52	49	39	46	44	56	62	76		76	74	66
25	a 52	50	38	46	45	56	56	81		71	75	66
26	a 50	50	38	46	48	50	61	--		79	71	a 64
27	a 50	48	39	45	42	50	66	--		79	65	68
28	a 48	46	39	47	47	50	47	--		74	61	64
29	a 46	45	39	44	--	54	47	--		78	61	63
30	a 49	46	38	39	--	49	45	--		75	70	68
31	a 59	--	33	39	--	49	--	--		76	70	--
Aver-age	53	51	42	40	45	50	58	66		--	73	70

a Reading obtained between 6 a. m and 10 a. m.
b Reading obtained between 10 a. m. and 3 p. m.

LITTLE COLORADO RIVER BASIN--Continued

LITTLE COLORADO RIVER AT WOODRUFF, ARIZ.--Continued

Suspended sediment, water year October 1950 to September 1951

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	0.9	75	0.2	1.0	51	0.1	6.6	174	3.1
2	.6	78	.1	1.0	46	.1	6.6	105	1.9
3	.8	59	.1	.8	78	.2	6.6	65	1.2
4	.9	66	.2	.8	59	.1	6.1	55	.9
5	1.1	73	.2	.8	54	.1	6.1	68	1.1
6	1.5	102	.4	.8	55	.1	6.1	64	1.1
7	1.4	112	.4	1.4	61	.3	6.1	46	.8
8	1.2	101	.3	2.0	74	.4	6.1	50	.8
9	1.0	83	.2	1.8	92	.4	6.1	61	1.0
10	1.0	68	a.2	1.2	61	a.2	5.6	69	a1.0
11	1.0	52	.1	1.2	61	.2	5.6	78	1.2
12	1.0	67	.2	1.6	60	.3	6.1	61	1.0
13	1.2	105	.3	2.4	81	.5	6.6	58	1.0
14	1.4	78	.3	6.6	336	6.0	6.1	73	1.2
15	1.0	73	.2	5.1	107	1.5	6.1	98	1.6
16	1.0	68	.2	5.1	90	1.2	5.6	59	.9
17	.8	70	.2	5.1	99	1.4	5.6	78	1.2
18	1.0	66	.2	7.2	92	1.8	5.6	59	.9
19	1.0	63	.2	14	163	6.2	5.1	45	.6
20	1.2	63	a.2	11	142	a4.2	4.3	38	a.4
21	1.2	62	.2	7.8	120	2.5	4.3	32	.4
22	1.4	86	.3	7.2	112	2.2	4.0	42	.4
23	1.2	94	.3	7.2	101	2.0	4.0	33	.4
24	1.0	72	.2	8.5	90	2.1	3.3	35	.3
25	1.0	59	.2	7.8	205	4.3	3.6	26	.3
26	.8	73	.2	7.2	87	1.7	3.6	42	.4
27	.8	24	.1	6.6	76	1.4	4.7	40	.5
28	.8	66	.1	6.6	66	1.2	4.3	41	.5
29	1.0	58	.2	6.6	74	1.3	4.0	43	.5
30	1.2	76	a.2	6.6	124	a2.2	4.7	70	a.9
31	1.2	76	.2	--	--	--	4.7	98	1.2
Total	32.6	--	6.6	143.0	--	46.2	163.9	--	28.7

Day	January			February			March		
1	5.6	52	0.8	6	28	0.5	5.6	94	1.4
2	6.6	39	.7	6	49	.8	6.1	158	2.6
3	5.1	32	.4	6	32	.5	6.1	60	1.0
4	6.1	28	.5	6	27	.4	6.1	49	.8
5	7.2	32	.6	7	24	.5	5.6	67	1.0
6	6.6	46	.8	7.2	48	.9	5.1	92	1.3
7	6.6	46	.8	7.2	68	1.3	4.7	116	1.5
8	6.1	38	.6	6.6	94	1,7	4.7	116	1.5
9	6.6	46	.8	7.8	107	2.3	5.1	144	2.0
10	6.6	44	a.8	7.8	115	2.4	5.1	177	2.4
11	5.6	41	.6	7.2	119	2.3	4.7	160	2.0
12	6.1	44	.7	6.6	135	2.4	4.7	107	1.4
13	7.2	45	.9	5.6	137	2.1	4.7	68	.9
14	6.3	52	.9	6.1	97	1.6	5.1	91	1.3
15	6.1	25	.4	6.1	53	.9	5.1	135	1.9
16	5.1	75	1.0	6.1	67	1.1	5.6	188	2.8
17	5.6	37	.6	6.6	67	1.2	5.1	171	2.4
18	5.6	40	.6	7.2	110	2.1	4.7	154	2.0
19	6.1	85	1.4	7.2	90	1.7	5.1	114	1.6
20	5.6	71	a1.1	6.6	56	1.0	5.1	95	1.3
21	5.6	58	.9	6.6	79	1.4	5.6	133	2.0
22	5.6	64	1.0	6.6	142	2.5	4.7	130	a1.6
23	5.6	56	.8	6.1	178	2.9	4.7	130	a1.6
24	5.6	58	.9	6.1	131	2.2	5.1	130	a1.8
25	5.1	62	.9	6.6	130	2.3	5.1	130	1.8
26	5.1	60	.8	6.1	116	1.9	5.6	170	2.6
27	5.1	80	1.1	5.6	194	2.9	7.2	185	3.6
28	5.1	102	1.4	5.6	135	2.0	6.6	179	3.2
29	5.6	118	1.8	--	--	--	6.1	203	3.4
30	5.6	128	1.9	--	--	--	5.1	265	3.6
31	5.6	53	.8	--	--	--	4.3	234	2.7
Total	182.0	--	27.3	182.2	--	45.8	164.2	--	61.0

a Computed from estimated concentration graph.

LITTLE COLORADO RIVER BASIN--Continued

LITTLE COLORADO RIVER AT WOODRUFF, ARIZ.--Continued

Suspended sediment, water year October 1950 to September 1951--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	6.6	187	3.3	0.2	77	(t)			
2	6.1	206	3.4	.3	36	(t)			
3	4.7	205	2.6	.3	51	(t)			
4	2.2	196	1.2	.3	77	0.1			
5	1.8	142	.7	.3	85	.1			
6	1.8	104	.5	.4	117	.1			
7	1.8	105	.5	.4	116	.1			
8	1.6	106	.5	.3	120	.1			
9	1.4	95	.4	.3	77	.1			
10	1.0	120	.3	.4	69	.1			
11	.8	96	.2	.3	124	.1			
12	.7	71	.1	.3	186	.2			
13	.8	59	.1	.4	107	.1			
14	.6	71	.5	.5	83	.1			
15	.6	142	.2	.6	79	.1			
16	.5	119	.2	.8	83	.2			
17	.1	94	(t)	1.0	85	.2			
18	0	--	0	1.6	174	.8			
19	0	--	0	5.6	166	2.5			
20	.4	165	.2	3.0	182	1.5			
21	.4	54	.1	1.0	164	.4			
22	.2	55	(t)	.4	121	.1			
23	.2	102	.1	.2	69	(t)			
24	.1	109	(t)	.1	80	(t)			
25	.1	81	(t)	.1	54	(t)			
26	.2	93	.1	0	--	0			
27	.2	76	(t)	0	--	0			
28	.2	95	.1	0	--	0			
29	.2	142	.1	0	--	0			
30	.2	80	(t)	0	--	0			
31	--	--	--	0	--	0			
Total	35.5	--	15.0	19.1	--	7.2	0		0

Day	July			August			September		
1	0.1	116	(t)	6.2	2,970	s 190	65	1,100	193
2	0	--	0	257	23,900	s23,700	37	450	45
3	0	--	0	289	39,800	31,100	23	410	25
4	0	--	0	415	66,400	s86,400	14	190	7.2
5	0	--	0	124	33,900	s12,900	12	70	2.3
6	0	--	0	55	23,000	3,420	8.6	57	1.3
7	0	--	0	20	7,800	a421	7.2	48	.9
8	0	--	0	12	3,000	97	6.5	35	.6
9	0	--	0	3.4	1,100	10	5.8		
10	0	--	0	1.3	500	1.8	5.2		
11	0	--	0	.6	227	.4	5.2		
12	0	--	0	.6	175	.3	3.5	39	.6
13	0	--	0	.2	115	.1	3.0		
14	.1	125	(t)	.2	117	.1	7.9		
15	.7	103	s 6	.1	134	(t)	6.5		
16	100	10,800	s3,430	.2	246	.1	3.5		
17	15	2,590	s 108	.2	247	.1	3.0		
18	175	29,000	s17,500	.2	216	.1	4.0		
19	131	26,500	as10,600	.2	244	.1	4.0		
20	170	24,800	s15,000	34	32,500	s 6,070	3.0	30	.3
21	26	7,700	541	19	9,700	498	2.5		
22	14	5,200	197	3.7	1,000	10	2.2		
23	2	595	3.2	16	18,400	s1,090	1.8		
24	1	452	1.2	14	15,000	567	1.8		
25	.4	288	.3	13	11,600	s 519	1.8		
26	.3	180	.1	5.6	4,000	60	1.8	31	.2
27	.6	10	.3	4.6	1,640	s 69	1.8		
28	6.1	5,200	s 359	4,740	31,300	s409,000	1.8		
29	14	27,000	1,020	2,820	36,800	s294,000	3.5	106	1.0
30	21	31,400	s1,900	200	21,000	11,300	5.2	22	.3
31	7.0	7,900	149	100	7,200	1,940	--	--	--
Total	684.3	--	50,815.1	9,155.3	--	883,364.1	252.1	--	284.1

Total discharge for year (cfs-days) 11,014.2
Total load for year (tons) 934,701.1

s Computed by subdividing day.
t Less than 0.05 ton.
a Computed from estimated concentration graph.

LITTLE COLORADO RIVER AT WOODRUFF, ARIZ.--Continued

Particle-size analyses of suspended sediment, November 1950 to August 1951
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Water discharge (cfs)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Nov. 20, 1950	4:00 p. m.	12	194	563	72	82	100	--	--	--	--	--		--		BWCM
Jan. 19, 1951	2:15 p. m.	6.1	183	1,490	43	56	82	87	91	--	--	--		--		BWCM
Mar. 1	3:00 p. m.	5.6	101	693	54	66	95	95	96	--	--	--		--		BWCM
Apr. 2	9:15 a. m.	6.1	192	1,748	77	95	99	100	--	--	--	--		--		BWCM
Apr. 16	10:15 a. m.	.5	120	1,320	59	70	97	100	--	--	--	--		--		BWCM
July 16	8:00 p. m.	28	7,000	2,560	--	74	--	82	--	100	--	--		--		PSWCM
July 18	10:55 a. m.	313	38,600	3,940	--	68	--	89	--	99	99	99		100		PSWCM
Aug. 2	10:00 a. m.	850	33,600	3,100	--	65	--	85	--	95	98	99		99		PSWCM
Aug. 2	2:40 p. m.	138	32,100	4,550	50	64	85	88	92	99	100	--		--		PSWCM
Aug. 2	6:30 p. m.	53	36,200	3,560	--	75	--	93	--	99	100	--		--		PSWCM
Aug. 3	8:30 a. m.	300	32,800	2,750	--	65	--	93	--	98	99	100		--		PSWCM
Aug. 3	2:00 p. m.	127	30,300	2,720	--	60	--	99	--	99	99	100		--		PSWCM
Aug. 4	6:30 a. m.	850	71,300	2,770	--	53	--	80	--	95	98	100		--		PSWCM
Aug. 4	6:30 p. m.	127	50,000	2,330	--	73	--	98	--	100	--	--		--		PSWCM
Aug. 28	2:50 p. m.	7,000	30,000	2,510	--	49	--	80	--	91	94	98		100		PSWCM
Aug. 28	6:00 p. m.	7,600	30,000	2,270	--	72	--	87	--	91	94	98		99		PSWCM
Aug. 29	6:30 a. m.	4,230	41,900	3,500	--	70	--	72	--	88	91	94		99		PSWCM
Aug. 29	11:00 a. m.	1,850	43,600	2,720	--	60	--	78	--	86	89	95		98		PSWCM
Aug. 29	3:00 p. m.	1,030	38,300	3,230	--	73	--	78	--	89	90	92		97		PSWCM
Aug. 29	6:00 p. m.	682	34,700	2,740	--	72	--	75	--	86	87	90		98		PSWCM
Aug. 30	11:00 a. m.	159	20,600	3,610	--	88	--	93	--	94	95	96		99		PSWCM
Aug. 31	6:30 p. m.	60	6,940	2,260	--	94	--	96	--	97	98	99		100		PSWCM

LITTLE COLORADO RIVER AT CAMERON, ARIZ.

LOCATION.--At bridge on U. S. Highway 89 at Cameron, Coconino County, 12 miles upstream from gaging station which is 9.5 miles downstream from Moenkopi Wash.
DRAINAGE AREA.--26,500 square miles, approximately (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Values reported for dissolved solids are sums of determined constituents. Records for station near Cameron (below Moenkopi Wash) for water year October 1950 to September 1951 given in Water-Supply Paper 1213. No appreciable inflow between sampling site and gaging station except during periods of storm runoff from Moenkopi Wash and several small arroyos.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Apr. 6-10, 1951 a..	8.34	21	0.03	37	9.0	179	7.2	166	--	63	230	0.5	2.1	0.15	631	0.86	14.2	130	0	74	1,120	
Apr. 19-25.....	17.9	21	.02	32	7.6	151	8.0	148	6	60	180	.6	2.4	.25	542	.74	26.2	111	0	73	962	
May 1-10 a.....	29.2	20	.03	40	9.6	218	9.2	223	--	131	210	.6	1.7	.38	750	1.02	59.1	140	0	76	1,270	
May 15 a	24	--	.04	28	6.1	98		172	--	36	89	.6	1.8	--	345	.47	22.4	95	0	69	631	
July 19-20 a.....	28.5	--	.06	22	7.4	140		286	--	75	50	2.0	.8	--	438	.60	33.7	86	0	78	738	
July 27-29	335	23	.17	7.5	4.4	127	8.0	240	13	63	28	1.4	1.9	.50	395	.54	357	36	0	86	588	
July 30-31.....	457	21	.03	52	11	164	8.8	176	7	245	85	1.0	1.4	--	683	.93	843	174	19	66	1,060	
Aug. 1, 8-10, 30	776	25	.05	54	11	236	6.4	320	--	209	159	.8	1.4	.35	861	1.17	1,800	180	0	73	1,390	
Aug. 2-3	394	20	.16	272	61	150	11	318	--	897	45	.3	1.2	--	1,610	2.19	1,710	930	660	27	2,060	
Aug. 29, 31	3,412	18	.16	25	3.7	106	7.2	188	14	75	45	1.2	1.8	--	389	.53	3,580	78	0	73	631	
Sept. 1-4, 7-11 a ..	757	15	.04	26	5.5	94	3.6	172	--	47	71	.5	2.4	.09	350	.48	715	88	0	69	592	

a No flow at sampling site Oct. 1-Apr. 5; no flow at sampling site or gaging station Apr. 13, May 7-8, May 23-July 18, Sept. 15-28.

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, 26 miles downstream from Little Colorado River, and 267 miles upstream from Hoover Dam.
DRAINAGE AREA.--137,800 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: August 1925 to November 1942, September 1943 to September 1951.
Water temperatures: October 1936 to October 1942, September 1943 to September 1951.
Sediment records: October 1925 to November 1942, September 1943 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 1,320 ppm Nov. 1-10; minimum, 348 ppm June 1-10.
Hardness: Maximum, 668 ppm Aug. 11; minimum 196 ppm July 7-10.
Specific conductance: Maximum daily, 1,920 micromhos Oct. 2; minimum daily, 470 micromhos June 25.
Water temperatures: Maximum observed, 82°F July 27, 30-31, Aug. 1-2; minimum observed, 36°F Jan. 9-10, 13-14, Feb. 5.
Sediment concentrations: Maximum daily, 61,800 ppm Aug. 31; minimum daily, 131 ppm Nov. 2.
Sediment loads: Maximum daily, 3,460,000 tons Aug. 31; minimum daily, 1,590 tons Jan. 17.
EXTREMES, 1925-51.--Dissolved solids: Maximum, 1,890 ppm Sept. 21-30, 1934; minimum, 225 ppm June 11-20, 1942.
Hardness: Maximum, 792 ppm Sept. 1-10, 1940; minimum, 127 ppm June 11-17, 1926.
Specific conductance (1937-51): Maximum daily, 2,900 micromhos Sept. 6, 1940; minimum daily, 341 micromhos June 15, 1942.
Water temperatures (1936-51): Maximum observed, 88°F on July 17, 1944; minimum, freezing point on several days during winter months.
Sediment concentrations: Maximum daily, 138,000 ppm Sept. 13, 1927; minimum daily, 100 ppm on many days.
Sediment loads: Maximum daily 27,600,000 tons Sept. 13, 1927; minimum daily, 497 tons July 22, 1934.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1950	6,764	15	0.05	151	51	185	6.0	276	519	145	0.4	2.0		1,260	1.71	23,010	586	360	40	1,710	7.3	10
Oct. 11-20	5,686	13	.09	128	50	169	5.2	256	483	140	.5	2.9		1,180	1.60	18,120	525	315	41	1,650	7.4	10
Oct. 21-31	5,143	11	.06	128	55	182	4.4	246	502	170	.5	3.6		1,250	1.70	17,360	546	344	42	1,720	7.4	15
Nov. 1-10	5,057	9.6	.04	126	59	195	5.6	244	546	162	.3	4.3		1,320	1.80	18,020	562	362	43	1,850	7.3	10
Nov. 11-20	5,812	10	.05	134	59	200	5.2	262	528	180	.4	4.0		1,310	1.78	20,560	577	362	43	1,800	7.3	--
Nov. 21-30	7,037	12	.06	130	55	183	5.6	256	499	162	.4	4.6		1,240	1.69	23,560	550	340	42	1,700	7.5	10
Dec. 1-10	7,438	13	.06	117	49	159	3.6	253	449	122	.4	4.1		1,100	1.50	22,090	494	286	41	1,560	7.5	15
Dec. 11-20	6,794	13	.04	118	49	165	15	261	429	148	.3	4.0		1,070	1.46	19,630	496	282	41	1,590	7.4	10
Dec. 21-31	6,969	14	.04	115	49	168	14	259	410	153	.3	4.0		1,080	1.47	20,320	488	276	42	1,600	7.4	10
Jan. 1-10, 1951	5,633	13	.04	112	47	166	15	254	395	154	.3	4.3		1,050	1.43	15,970	473	265	42	1,560	7.4	10
Jan. 11-20	4,526	14	.04	125	54	202	9.2	262	451	198	.4	5.3		1,230	1.67	15,030	534	320	45	1,790	7.4	10
Jan. 21-31	5,724	14	.02	126	54	201	10	269	454	194	.4	5.4		1,230	1.67	19,010	536	316	44	1,770	7.8	5
Feb. 1-10	5,181	14	.02	116	49	174	8.8	258	395	176	.4	4.4		1,120	1.52	15,670	491	280	43	1,610	7.8	5
Feb. 11-20	7,289	14	.02	115	47	171	7.6	247	403	162	.4	4.5		1,090	1.48	21,450	480	278	43	1,570	7.9	5
Feb. 21-28	7,495	12	.03	102	43	155	8.4	230	371	138	.4	4.1		990	1.35	20,030	432	243	43	1,440	7.9	5
Mar. 1-10	7,369	13	.03	97	42	157	8.0	221	372	138	.4	3.2		974	1.32	19,380	414	234	44	1,420	7.9	7
Mar. 11-20	6,951	11	.11	108	42	157	19	260	367	155	.3	2.4		1,020	1.39	19,140	442	229	42	1,520	7.3	22
Mar. 21-27	6,760	10	.10	103	42	161	16	256	360	155	.3	4.0		1,000	1.36	18,250	430	220	44	1,500	7.6	18

Apr. 1-10	8,140	14	.13	103	41	145	12	259	341	135	.5	1.9	941	1.28	20,680	426	214	42	1,410	7.4	15
Apr. 11-13, 17-19	8,507	14	.13	95	37	139	10	248	319	122	.5	1.7	882	1.20	20,260	389	186	43	1,330	7.6	15
Apr. 21-30	10,310	14	.05	88	35	119	10	244	265	104	.6	1.8	770	1.05	21,430	364	164	41	1,170	7.6	15
May 1-10	15,160	16	.40	78	29	84	5.4	234	194	69	.6	2.5	602	.82	24,640	314	122	36	932	7.4	10
May 11-20	22,440	16	.29	76	28	67	6.0	228	169	59	.6	2.9	536	.73	32,480	304	118	32	836	7.3	10
May 21-31	36,940	16	.33	70	21	48	5.2	208	140	34	.6	2.5	436	.59	43,490	261	90	28	671	7.3	10
June 1-10	53,370	15	.20	61	16	31	6.0	210	83	25	.4	1.6	348	.47	50,150	218	46	23	535	7.8	30
June 11-20	36,740	12	.22	66	16	39	4.8	206	106	31	.3	1.1	393	.53	38,980	230	62	26	583	7.8	30
June 21-30	51,060	13	.38	62	15	32	5.6	199	90	23	.4	1.0	355	.48	48,940	216	53	24	543	7.8	30
July 7-10	28,000	11	.12	54	15		44	165	103	34	.3	1.0	350	.48	26,460	196	61	33	543	7.8	30
July 11-20	19,960	11	.34	55	17	49	6.0	166	118	46	.3	.6	394	.54	21,230	207	71	33	599	7.8	30
July 21-31	15,890	14	.03	84	21	75	6.8	202	203	65	.5	.8	584	.79	25,060	296	130	35	884	8.0	10
Aug. 1-3, 6-10	18,790	17	.06	136	34	103	7.6	224	411	66	.4	.6	906	1.23	45,960	480	296	31	1,250	7.8	10
Aug. 11	a 15,900	--	--	--	--	--	--	226	785	76	--	--	--	--	--	b 668	483	--	1,710	--	--
Aug. 13-20	11,760	15	.04	104	31	103	7.2	211	324	70	.4	1.7	771	1.05	24,480	387	214	36	1,110	7.8	10
Aug. 21-30	8,569	14	.05	96	31	110	6.4	214	299	94	.4	1.9	761	1.03	17,610	367	192	39	1,140	7.9	10
Aug. 31	a 19,400	--	--	--	--	--	--	308	507	185	--	--	--	--	--	b 440	188	--	1,840	--	--
Sept. 1-10	11,940	15	.05	150	38	146	6.8	226	496	104	.3	2.5	1,100	1.50	35,460	530	346	37	1,520	7.8	10
Sept. 11-20	5,979	10	.08	119	37	140	5.6	239	374	118	.4	2.3	979	1.33	15,800	449	253	40	1,400	7.4	10
Sept. 21-30	4,854	11	.04	124	46	172	6.8	244	431	161	.4	4.5	1,130	1.54	14,810	498	298	42	1,600	7.5	10
Weighted average	c 13,270	14	0.18	88	29	91	7.0	221	241	77	0.4	2.2	677	0.92	24,260	338	158	36	994	--	--

a Not included for computation of weighted averages.
b Determination by Schwarzenbach method.
c Represents 93 percent of the runoff for the water year October 1950 to September 1951.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR GRAND CANYON, ARIZ.--Continued

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

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

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR GRAND CANYON, ARIZ.--Continued

Suspended sediment, water year October 1950 to September 1951

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	7,660	4,050	83,800	5,050	158	2,150	7,910	1,240	26,500
2	7,380	4,500	89,700	4,870	131	1,720	7,660	695	14,400
3	7,280	2,550	50,100	4,750	135	a1,730	7,660	639	13,200
4	7,100	2,200	a42,200	4,830	140	a1,820	7,580	575	a11,800
5	6,890	1,700	31,600	5,100	145	a2,000	7,320	515	a10,200
6	6,590	1,270	22,600	5,160	149	2,080	7,300	450	a8,870
7	6,260	984	16,600	5,120	185	2,560	7,360	390	7,750
8	6,040	880	14,400	5,190	225	3,150	7,320	326	6,440
9	6,200	803	13,400	5,220	231	3,260	7,170	349	6,760
10	6,240	769	13,000	5,280	214	3,050	7,100	324	6,210
11	6,160	683	11,400	5,380	226	3,280	6,910	323	6,030
12	6,040	767	12,500	5,530	236	3,520	6,860	328	6,080
13	5,970	614	9,900	5,730	281	4,350	6,760	351	6,410
14	5,870	634	10,000	5,650	274	4,180	6,580	367	6,520
15	5,730	540	8,350	5,640	318	4,840	6,610	323	5,760
16	5,650	488	7,440	5,740	288	4,460	6,910	340	6,340
17	5,510	520	7,740	5,910	282	4,500	7,010	492	9,310
18	5,280	418	5,960	6,120	271	4,480	6,890	396	7,370
19	5,260	402	5,710	6,210	310	5,200	6,730	351	6,380
20	5,390	384	5,590	6,210	326	5,470	6,680	341	6,150
21	5,270	327	4,650	6,190	299	5,000	6,940	314	5,880
22	5,100	318	4,380	6,450	296	5,150	7,360	304	6,040
23	5,100	314	4,320	6,700	303	5,480	7,680	344	7,130
24	5,230	256	3,620	6,680	369	6,660	7,700	369	7,670
25	5,300	262	3,750	6,690	346	6,250	7,310	342	6,750
26	5,180	238	3,330	7,050	420	7,990	7,050	318	6,050
27	5,210	316	4,440	7,420	411	8,230	6,940	279	5,230
28	5,100	189	2,600	7,540	446	9,080	6,830	277	5,110
29	5,020	139	1,880	7,680	531	11,000	6,560	247	4,370
30	5,010	134	1,810	7,970	666	14,300	6,260	228	3,850
31	5,050	144	1,960	--	--	--	6,030	238	3,870
Total	181,070	--	498,730	179,060	--	146,940	218,980	--	240,430
	January			February			March		
1	5,940	212	3,400	6,720	352	6,390	7,600	418	8,580
2	5,830	194	3,050	6,930	346	6,470	7,600	420	a8,620
3	5,730	211	3,260	6,750	347	a6,320	7,540	420	a8,550
4	5,730	190	a2,940	6,060	348	5,690	7,610	420	a8,630
5	5,820	170	a2,670	4,970	393	5,270	7,580	425	8,700
6	5,650	147	2,240	3,930	319	3,380	7,300	400	7,880
7	5,470	161	2,380	3,420	265	2,450	7,150	387	7,470
8	5,470	248	3,660	3,590	198	1,920	7,280	344	6,760
9	5,470	206	3,040	4,170	184	2,070	7,100	360	6,900
10	5,220	176	2,480	5,270	189	2,690	6,930	356	6,660
11	4,910	184	2,440	6,370	272	4,680	6,820	357	6,570
12	4,810	136	1,770	7,280	332	6,530	6,580	344	6,110
13	4,580	301	3,720	7,490	407	8,230	6,340	343	5,870
14	4,150	229	2,570	7,030	530	10,100	6,650	314	5,640
15	3,870	186	1,940	7,100	480	9,200	6,840	316	5,840
16	3,850	156	1,620	7,480	538	10,900	6,970	333	6,270
17	4,390	134	1,590	7,600	589	12,100	7,140	320	6,170
18	4,780	152	1,960	7,580	527	10,800	7,440	388	7,790
19	4,950	162	2,170	7,540	483	9,830	7,540	389	7,920
20	4,970	166	2,230	7,420	440	a8,810	7,190	447	8,680
21	4,780	162	2,090	7,280	400	a7,860	6,870	473	8,770
22	4,790	163	2,110	7,210	361	7,030	6,910	414	7,720
23	5,050	161	2,200	7,360	354	7,030	6,940	401	7,510
24	5,490	170	2,520	7,760	445	9,320	6,910	438	8,170
25	5,820	219	3,440	7,840	457	9,670	6,900	463	8,630
26	5,970	280	4,510	7,730	480	10,000	6,550	412	7,290
27	5,900	369	5,880	7,400	434	8,670	6,240	352	5,930
28	5,950	265	4,260	7,380	412	8,210	6,140	404	6,700
29	6,160	234	3,890	--	--	--	6,340	428	7,330
30	6,470	243	4,240	--	--	--	6,480	419	7,330
31	6,580	265	4,710	--	--	--	6,730	410	7,450
Total	164,550	--	90,980	184,660	--	201,620	216,210	--	228,440

Total discharge for year (cfs-days) 4,960,220
Total load for year (tons) 48,729,070

a Computed from estimated concentration graph.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR GRAND CANYON, ARIZ.--Continued

Suspended sediment, water year October 1950 to September 1951--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	6,900	406	7,560	15,000	2,410	97,600	61,900	8,300	1,390,000
2	7,070	372	7,100	15,100	2,320	94,600	61,900	7,820	1,310,000
3	7,880	383	8,150	15,800	2,270	a 96,800	60,200	6,110	993,000
4	8,810	700	a 16,600	15,800	2,200	93,900	59,600	6,000	966,000
5	8,870	915	21,900	16,200	2,400	105,000	57,400	5,260	815,000
6	8,500	729	16,700	15,900	2,140	91,900	53,000	5,120	733,000
7	8,550	678	15,800	15,000	1,870	75,700	49,900	4,210	567,000
8	8,690	894	21,000	14,500	1,720	a 67,300	46,000	3,920	487,000
9	8,280	843	18,800	14,300	1,560	a 60,200	43,200	3,920	457,000
10	7,850	865	18,300	14,000	1,400	52,900	40,600	2,970	326,000
11	7,660	1,780	36,800	14,600	1,450	57,200	39,300	2,540	270,000
12	7,730	1,760	36,700	16,500	2,060	91,800	38,800	2,560	268,000
13	8,080	1,550	33,800	18,900	2,630	134,000	38,400	2,590	269,000
14	8,120	1,540	a 33,800	20,900	3,300	186,000	38,000	2,220	228,000
15	8,490	1,520	a 34,800	23,800	4,640	298,000	36,400	2,260	222,000
16	8,950	1,500	a 36,200	26,500	5,560	398,000	34,800	1,780	167,000
17	9,230	1,490	37,100	26,300	4,950	351,000	33,600	1,940	176,000
18	9,260	1,360	34,000	26,000	3,970	279,000	34,000	1,650	151,000
19	9,080	1,250	30,600	25,800	3,700	258,000	34,800	1,800	169,000
20	8,810	1,360	32,400	25,100	3,850	261,000	39,300	2,250	239,000
21	8,610	1,440	33,500	24,500	3,400	225,000	46,000	3,220	400,000
22	8,230	1,870	41,600	25,600	4,200	290,000	49,900	4,060	547,000
23	8,000	2,120	45,800	28,400	3,700	284,000	53,000	3,600	515,000
24	8,030	1,640	35,600	32,800	5,500	487,000	56,300	3,520	535,000
25	8,450	1,300	29,700	35,700	6,120	590,000	58,500	4,750	750,000
26	9,810	1,170	31,000	36,800	5,700	566,000	56,300	3,900	593,000
27	11,000	1,610	47,800	38,000	5,580	572,000	52,000	3,300	463,000
28	12,100	1,840	60,100	38,800	5,760	603,000	48,400	3,400	444,000
29	13,800	2,090	77,900	41,400	5,320	595,000	46,000	2,910	361,000
30	15,100	2,330	95,000	48,000	5,970	774,000	44,200	2,760	329,000
31	--	--	--	56,300	6,700	1,020,000	--	--	--
Total	269,940	--	996,110	782,300	--	9,156,100	1,411,700	--	15,140,000
	July			August			September		
1	42,300	2,100	240,000	15,000	3,100	126,000	18,300	33,600	s 1,710,000
2	39,700	1,620	a 174,000	14,200	3,640	140,000	17,100	20,800	960,000
3	37,200	1,700	a 171,000	14,700	5,600	222,000	14,100	17,300	659,000
4	35,200	1,720	a 163,000	18,200	8,690	s 485,000	12,600	13,000	a 442,000
5	32,800	1,700	a 151,000	21,300	13,000	743,000	11,500	9,700	301,000
6	30,600	1,410	116,000	23,800	13,900	s 900,000	11,300	13,400	409,000
7	29,700	950	76,200	24,000	12,100	784,000	10,000	14,400	389,000
8	28,800	936	72,800	22,300	16,800	s1,010,000	8,900	11,100	267,000
9	27,700	929	69,500	18,800	18,500	939,000	8,130	8,800	193,000
10	25,800	801	55,800	17,500	17,700	836,000	7,510	5,620	114,000
11	24,300	809	53,100	15,900	15,600	670,000	7,080	4,000	76,500
12	23,400	746	47,100	14,900	10,700	430,000	6,730	3,550	64,500
13	22,300	622	37,400	14,200	7,200	276,000	6,600	4,810	85,700
14	21,200	660	37,800	13,700	5,900	218,000	6,480	4,820	84,300
15	20,300	584	32,000	13,100	4,910	174,000	6,170	3,130	52,100
16	19,200	456	23,600	12,200	4,490	148,000	5,820	2,300	36,100
17	18,400	464	23,100	11,400	3,700	114,000	5,570	1,500	22,600
18	17,600	450	21,400	10,600	2,000	57,200	5,280	1,100	15,700
19	16,800	386	17,500	9,740	1,750	46,000	5,130	828	11,500
20	16,100	366	15,900	9,150	2,030	a 50,200	4,930	708	9,420
21	15,900	342	14,700	8,660	1,900	44,400	4,820	643	8,370
22	16,200	391	17,100	8,290	1,200	26,900	4,820	727	9,460
23	16,800	632	28,700	8,020	1,060	23,000	4,790	520	6,730
24	16,100	602	26,200	7,720	852	17,800	4,750	490	6,280
25	15,700	7,130	302,000	7,320	1,000	19,800	4,740	470	6,020
26	15,200	1,310	53,800	7,360	1,300	25,800	4,710	476	6,050
27	15,700	800	33,900	7,660	1,600	33,100	4,740	508	6,500
28	16,800	2,860	s 130,000	7,510	1,000	20,300	4,730	424	5,410
29	15,700	3,300	s 143,000	9,950	4,200	s 117,000	4,700	353	4,480
30	15,400	8,950	372,000	13,200	27,300	s 924,000	5,740	3,110	a 50,900
31	15,300	5,250	217,000	19,400	61,800	s3,460,000	--	--	--
Total	704,200	--	2,936,600	419,780	--	13,080,500	227,770	--	6,012,620

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

COLORADO RIVER NEAR GRAND CANYON, ARIZ.--Continued

Particle-size analyses of suspended sediment, water year October 1950 to September 1951
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Water discharge (cfs)	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Oct. 3, 1950	7:40 a.m.	7,240	2,500	2,410	--	76	--	89	--	--	--	--		--		PWCM
Oct. 6	8:45 a.m.	6,690	1,250	986	60	71	85	93	95	98	99	--		--		BWCM
Oct. 10	8:40 a.m.	6,300	738	2,500	29	46	67	80	--	--	--	--		--		DWCM
Oct. 13	9:15 a.m.	6,000	648	2,490	26	49	64	85	--	--	--	--		--		DWCM
Oct. 17	7:40 a.m.	5,570	499	1,990	32	52	65	82	--	--	--	--		--		DWCM
Oct. 21	9:45 a.m.	5,320	362	1,410	39	52	63	82	--	--	--	--		--		DWCM
Oct. 24	8:15 a.m.	5,190	298	1,090	34	49	57	75	--	100	--	--		--		DSWCM
Oct. 27	8:40 a.m.	5,230	266	974	39	52	63	82	--	--	--	--		--		DWCM
Nov. 7	8:40 a.m.	5,140	241	930	39	46	54	77	--	--	--	--		--		DWCM
Nov. 10	2:15 p.m.	5,300	256	1,040	28	40	51	72	--	99	--	--		--		DSWCM
Nov. 14	8:30 a.m.	5,680	325	1,330	35	47	60	77	--	--	--	--		--		DWCM
Nov. 17	8:30 a.m.	5,880	345	1,290	38	50	63	79	--	--	--	--		--		DWCM
Nov. 21	8:15 a.m.	6,130	346	1,410	28	44	57	74	--	98	--	--		--		DSWCM
Nov. 24	8:30 a.m.	6,720	386	1,570	29	39	56	72	--	99	--	--		--		DSWCM
Nov. 28	8:30 a.m.	7,540	493	1,860	26	37	53	72	--	98	--	--		--		DSWCM
Dec. 1	8:40 a.m.	7,910	1,290	4,980	16	44	59	73	--	99	--	--		--		DSWCM
Dec. 29, 1950; Jan. 2, 9, 12, 16, 19, 23, 26, 30, 1951; Feb. 2, 6	Composite	5,440	219	1,890	40	55	67	79	89	95	--	--		--		BWCM
Feb. 9, 13, 16, 23, 27, Mar. 6	Composite	7,400	396	1,920	47	56	70	81	91	98	--	--		--		BWCM
Apr. 10	8:45 a.m.	8,030	a 900	2,700	--	42	--	64	--	--	--	--		--		PWCM
Apr. 20	8:45 a.m.	8,900	b 1,360	2,170	--	72	--	81	--	--	--	--		--		PWCM
Apr. 30	1:45 p.m.	15,300	a 2,420	2,150	--	26	--	44	--	74	86	89		92		SPWCM
May 11	8:30 a.m.	14,000	a 1,650	2,140	--	32	--	47	--	79	93	99		100		SPWCM
May 14	9:20 a.m.	20,300	b 3,050	2,110	--	23	--	41	--	71	71	92		98		SPWCM
May 24	8:40 a.m.	32,200	4,960	2,590	--	12	--	20	--	32	49	90		99		SPWCM
May 29	2:35 p.m.	41,000	b 5,320	1,630	--	22	--	31	--	42	64	84		92		SPWCM
May 31	8:30 a.m.	55,200	9,000	3,560	--	12	--	20	--	38	66	92		99		SPWCM

a Estimated.
b Concentration from another set of samples taken at same time.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR GRAND CANYON, ARIZ.--Continued

Particle-size analyses of suspended sediment, water year October 1950 to September 1951--Continued
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Water discharge (cfs)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
June 1, 1951	4:40 p. m.	63,100	b7,040	2,960	--	20	--	39	--	38	60	87		99		SPWCM
June 10	9:30 a. m.	41,000	3,350	2,600	6	9	12	15	21	34	52	75		95		SBWCM
June 18	8:40 a. m.	33,600	2,150	2,390	24	27	31	34	38	52	70	91		99		SBWCM
June 21	8:25 a. m.	45,100	a4,300	1,420	--	23	--	25	--	27	38	65		100		SPWCM
June 28	8:30 a. m.	48,900	3,400	4,470	--	56	--	62	--	--	--	--		--		PWCM
July 1	9:15 a. m.	42,800	2,830	2,600	23	24	26	29	32	40	55	87		99		SBWCM
July 6	8:40 a. m.	31,000	1,060	1,010	11	13	16	22	30	40	60	93		97		SBWCM
July 28	7:40 a. m.	18,400	2,940	5,100	--	48	--	91	--	--	--	--		--		PWCM
July 29	10:00 a. m.	15,200	3,500	4,280	--	75	--	91	--	--	--	--		--		PWCM
Aug. 7	9:00 a. m.	23,700	11,800	3,680	43	58	69	82	91	94	98	100		--		SPWCM
Aug. 7	9:00 a. m.	23,700	11,800	3,610	4	7	31	79	92	94	98	100		--		SPN
Aug. 7	9:00 a. m.	23,700	11,800	3,930	44	56	64	74	86	94	98	100		--		SBWCM
Aug. 7	9:00 a. m.	23,700	11,800	3,010	3	3	12	--	93	94	98	100		--		SBN
Aug. 10	8:30 a. m.	17,600	16,700	3,220	--	65	--	89	--	98	99	100		--		SPWCM
Aug. 15	8:30 a. m.	13,100	b4,910	5,480	--	61	--	81	--	--	--	--		--		PWCM
Aug. 22	8:20 a. m.	8,340	2,140	6,160	--	76	--	89	--	92	--	--		--		PWCM
Aug. 31	9:00 a. m.	22,000	75,800	4,160	43	49	59	69	81	89	93	99		100		PSWCM
Aug. 31	9:00 a. m.	22,000	75,800	3,970	42	55	60	71	80	89	93	99		100		BSWCM
Sept. 10	10:00 a. m.	7,600	a6,100	3,950	--	87	--	91	--	--	--	--		--		PWCM
Sept. 20	8:30 a. m.	5,000	616	1,450	71	75	90	97	99	100	--	--		--		BWCM

a Estimated.
b Concentration from another set of samples taken at same time.

VIRGIN RIVER AT VIRGIN, UTAH

LOCATION.--At gaging station, 1½ miles southwest of Virgin, Washington County, and about 2 miles downstream from North Creek.
DRAINAGE AREA.--934 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
Water temperatures: October 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 940 ppm Aug. 23-24, 29; minimum, 437 ppm May 1-10.
Specific conductance: Maximum daily, 1,460 micromhos Aug. 29; minimum daily, 559 micromhos May 15.
Water temperatures: Maximum, 88°F July 18, 28-30; minimum, freezing point Mar. 2.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Oct. 1-10, 1950	71.4		--		--	--	--		--	--	--		--		589	0.80	114	--	--	--	912	--
Oct. 11-20	73.1		15		86	36	56		217	205	64		2.0		599	.81	118	362	184	25	910	7.4
Oct. 21-31	81.4		--		--	--	--		--	--	--		--		605	.82	133	--	--	--	925	--
Nov. 1-10	93.0		--		--	--	--		232	--	61		--		606	.82	152	--	--	--	912	7.7
Nov. 11-20	120		15		86	35	53		235	194	55		2.1		577	.78	187	358	166	24	872	7.8
Nov. 21-30	126		--		--	--	--		--	--	--		--		546	.74	186	--	--	--	847	7.9
Dec. 1-10	119		--		--	--	--		237	--	58		--		543	.74	174	--	--	--	833	7.9
Dec. 11-20	115		15		76	35	53		235	165	59		1.6		536	.73	166	334	141	26	829	7.9
Dec. 21-31	110		--		--	--	--		--	--	--		--		526	.72	156	--	--	--	821	--
Jan. 1-10, 1951	108		--		--	--	--		--	--	--		--		534	.73	156	--	--	--	835	--
Jan. 11-20	120		14		79	33	53		246	156	58		2.0		526	.72	170	332	131	26	804	8.0
Jan. 21-31	128		--		--	--	--		--	--	--		--		519	.71	179	--	--	--	802	--
Feb. 1-10	126		--		--	--	--		--	--	--		--		515	.70	175	--	--	--	796	--
Feb. 11-19	121		13		70	31	36		217	135	43		2.7		475	.65	155	302	124	21	768	7.8
Feb. 20-28	121		--		--	--	--		--	--	--		--		484	.66	158	--	--	--	757	--
Mar. 1-10	132		--		--	--	--		--	--	--		--		492	.67	175	--	--	--	764	--
Mar. 11-20	123		13		69	33	48		230	137	57		1.5		477	.65	158	308	119	25	755	--
Mar. 21-31	117		--		--	--	--		--	--	--		--		475	.65	150	--	--	--	763	--
Apr. 1-10	128		--		--	--	--		--	--	--		--		470	.64	162	--	--	--	760	--
Apr. 11-20	120		9.9		80	30	--		214	--	52		1.5		495	.67	160	323	148	--	802	--
Apr. 21-30	161		--		--	--	--		--	--	--		--		490	.67	213	--	--	--	773	--
May 1-10	164		--		--	--	--		--	--	--		--		437	.59	194	--	--	--	697	--
May 11-20	151		--		--	--	--		--	--	--		--		493	.67	201	--	--	--	748	--
May 21-31	106		--		--	--	--		--	--	--		--		534	.73	153	--	--	--	818	--
June 1-10	75.2		--		--	--	--		--	--	--		--		578	.79	117	--	--	--	885	--
June 11-20	60.2		13		78	34	67		211	202	68		1.5		590	.80	96	334	162	30	904	7.8
June 21-30	55.6		--		--	--	--		--	--	--		--		608	.83	91	--	--	--	925	--

VIRGIN RIVER AT VIRGIN, UTAH--Continued

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
July 1-10, 1951	51.0		--		--	--	--		--	--	--		--		616	0.84	85	--	--	--	943	--
July 11-20	53.4		16		92	35	57		227	208	67		1.2		616	.84	89	374	188	25	929	7.6
July 21-31	59.3		--		--	--	--		--	--	--		--		597	.81	96	--	--	--	919	--
Aug. 1-10	114		--		--	--	--		--	--	--		--		575	.78	177	--	--	--	883	--
Aug. 11-20	54.9		13		80	35	55		215	182	68		1.5		565	.77	84	344	168	26	873	7.7
Aug. 21-22, 27-28, 30-31	111		--		--	--	--		--	--	--		--		549	.75	165	--	--	--	862	--
Aug. 23-24, 29	302		--		--	--	--		--	--	--		--		940	1.28	766	--	--	--	1,240	--
Aug. 25-26	47.5		--		--	--	--		--	--	--		--		633	.86	81	--	--	--	975	--
Sept. 1-10	70.1		15		97	30	41		209	178	68		1.9		558	.76	106	366	194	20	850	7.8
Sept. 11-20	57.6		14		78	31	49		198	163	68		1.7		553	.75	86	322	160	25	834	8.0
Sept. 21-27, 29-30	69.1		14		85	32	60		203	201	68		1.8		591	.80	110	344	177	27	884	7.9
Sept. 28 a	171		13		354	25	--		b 204	--	54		2.2		--	--	--	988	847	--	1,790	--
Weighted average	c 103		--		--	--	--		--	--	--		--		540	0.73	150	--	--	--	833	--

a Not included for computation of weighted averages.
b Includes equivalent of 16 parts per million of carbonate (CO_3).
c Represents more than 99 percent of runoff for water year October 1950 to September 1951.

VIRGIN RIVER BASIN--Continued

VIRGIN RIVER AT VIRGIN, UTAH--Continued

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

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

VIRGIN RIVER BASIN--Continued

WASHINGTON FIELDS CANAL NEAR WASHINGTON, UTAH

LOCATION.--At gaging station, about 1½ miles southeast of Washington, Washington County.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
REMARKS.--Values reported for dissolved solids are sums of determined constituents.

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Oct. 9, 23, 30, 1950			22		175	65	415		251	574	568		3.7		1,950	2.65		704	498	56	2,940	7.3
Nov. 6, 14, 22, 27..			20		146	52	244		277	404	325		4.0		1,330	1.81		578	352	48	2,090	7.6
Dec. 5, 11, 18, 24 .			20		136	47	247		268	381	320		3.0		1,290	1.75		533	314	50	2,000	7.8
Jan. 3, 8, 15, 23, 29, 1951			18		134	48	217		278	343	295		3.4		1,200	1.63		532	304	47	1,890	7.9
Feb. 5			17		123	44	193		273	309	255		3.9		1,080	1.47		488	264	46	1,730	7.6
Feb. 13, 19, 26 ...			30		139	51	240		276	380	322		2.5		1,300	1.77		556	330	48	2,080	7.8
Mar. 5, 12, 19, 27 .			18		127	47	227		272	344	298		3.0		1,200	1.63		510	288	49	1,900	7.7
Apr. 2, 9, 23, 27...			17		147	55	282		245	428	395		3.8		1,450	1.97		593	392	51	2,280	7.3
Apr. 29			--		--	--	--		--	233	70		--		--	--		--	--	--	917	--
May 6, 16, 21			14		122	38	172		236	300	230		3.9		996	1.35		460	267	45	1,590	7.7
May 28			--		--	--	--		--	572	570		--		--	--		--	--	--	3,010	--
June 4, 11, 18, 25..			25		187	71	466		246	633	645		3.1		2,150	2.92		758	557	57	3,380	7.7
July 1, 12, 16, 24, 30			25		194	72	540		238	696	732		4.2		2,380	3.24		780	585	60	3,690	7.9
Aug. 6, 13, 23, 28 .			23		294	65	401		242	868	545		2.4		2,320	3.16		1,000	802	47	3,290	7.5
Sept. 4, 11, 17, 24 .			23		182	67	489		226	633	670		2.8		2,180	2.96		730	544	59	3,310	7.7

SANTA CLARA RIVER ABOVE WINSOR DAM, NEAR SANTA CLARA, UTAH

LOCATION.--At gaging station 2 miles upstream from Winsor Dam, 2½ miles downstream from Sandy Wash, 8 miles downstream from Magotsu Creek, and 9 miles northwest of Santa Clara, Washington County.
DRAINAGE AREA.--338 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Oct. 2, 9, 23, 31, 1950	10.4		34		47	14	24		204	28	22		0.4		269	0.37	8	175	8	23	428	7.6
Nov. 6, 13, 21, 27...	13.0		37		52	18	23		230	29	24		.9		293	.40	10	204	16	19	464	7.9
Dec. 4, 11, 19, 24..	13.2		36		55	18	12		206	31	25		.4		290	.39	10	211	42	11	478	7.9
Jan. 3, 8, 15, 23, 30, 1951	13.8		35		56	17	12		206	30	24		1.1		292	.40	11	210	40	11	471	7.8
Feb. 5, 13, 20, 26 .	14.0		33		58	18	16		225	32	24		1.6		298	.41	11	218	34	14	498	7.8
Mar. 5, 12, 19, 26 .	14.0		36		58	21	12		230	33	24		1.3		308	.42	12	231	42	10	506	7.8
Apr. 2, 9, 16, 23, 30	13.6		31		52	20	10		209	30	22		1.3		278	.38	10	212	41	10	446	7.8
May 8, 15, 21, 28 ..	17.0		27		44	16	19		200	25	19		.6		236	.32	11	176	12	19	379	8.0
June 4, 12, 25	10.6		31		46	19	20		206	32	24		.4		273	.37	8	193	24	19	448	7.9
July 1, 16, 25, 30 ..	5.5		34		46	18	20		200	33	23		.6		278	.38	4	189	25	18	438	8.0
Aug. 6, 12, 23, 28 .	7.3		38		51	18	11		197	31	22		.6		288	.39	6	201	40	11	472	7.7
Sept. 4,11, 17, 24, 30	7.1		36		52	21	21		220	39	28		.8		306	.42	6	216	36	17	494	7.8

VIRGIN RIVER BASIN--Continued

SANTA CLARA RIVER AT ST. GEORGE, UTAH

LOCATION.--At gaging station half a mile above mouth and 2 miles south of St. George, Washington County.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride[4] (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Oct. 2, 9, 23, 30, 1950	0.4		41		331	102	142		428	1,040	86		0.1		1,950	2.65	2	1,250	895	20	2,340	7.3
Nov. 6, 13, 21, 27 ..	3.7		39		204	63	76		338	559	53		.8		1,160	1.58	12	768	491	18	1,540	7.8
Dec. 4, 12, 18, 24 ..	6.1		36		173	47	64		340	403	46		.8		937	1.27	15	625	346	18	1,310	7.7
Jan. 3, 8, 15, 22, 29, 1951	3.5		37		250	68	88		412	648	58		1.3		1,350	1.84	13	904	566	17	1,740	7.9
Feb. 5.....	3.5		33		--	--	--		336	465	41		2.6		--	--	--	--	--	--	1,390	7.8
Feb. 13, 19, 26	1.3		37		351	102	133		480	1,040	77		.7		1,980	2.69	7	1,300	902	18	2,430	7.8
Mar. 5, 12, 19	7.0		34		141	42	45		311	298	40		1.9		755	1.03	14	525	270	16	1,080	7.5
Mar. 26	1.4		--		--	--	--		--	1,050	81		--		--	--	--	--	--	--	2,380	--
Apr. 3, 10, 16, 23, 29	1.8		39		319	99	119		445	952	75		.5		1,820	2.48	9	1,200	838	18	2,250	7.7
May 7, 14, 22, 28 ...	1.4		40		334	106	113		416	1,020	79		.4		1,900	2.58	7	1,270	928	16	2,310	7.7
June 5, 11, 18, 25 ...	1.1		44		332	107	132		428	1,050	79		.5		1,960	2.67	6	1,270	918	18	2,370	7.7
July 1, 12, 16, 24, 28, 30.....	15.2		38		420	92	121		354	1,250	69		.7		2,170	2.95	89	1,430	1,140	16	2,510	7.9
Aug. 6, 13, 22, 28 ..	.5		44		395	98	127		347	1,210	85		1.9		2,130	2.90	3	1,390	1,100	17	2,500	7.6
Sept. 4, 11, 17, 24, 28	28.9		36		440	97	115		297	1,350	70		.4		2,250	3.06	176	1,500	1,250	14	2,570	7.6

VIRGIN RIVER NEAR ST. GEORGE, UTAH

LOCATION.--At gaging station 8 miles southwest of St. George, Washington County.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Record of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1243. (Includes records for period 1950-52).

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Oct. 2, 9, 23, 30, 1950	26.8		21		434	115	488		255	1,410	665		3.9		3,260	4.43	236	1,560	1,350	41	4,340	7.2
Nov. 6, 13, 21, 27..	105		21		325	71	297		259	938	395		5.0		2,180	2.96	618	1,100	891	37	3,010	7.5
Dec. 4, 11, 18, 24..	97.2		20		252	70	296		270	756	390		2.4		1,920	2.61	504	916	696	41	2,720	7.8
Jan. 3, 8, 15, 22, 29, 1951	125		21		216	65	272		274	642	355		4.3		1,710	2.33	577	806	582	42	2,470	7.9
Feb. 5, 12, 19, 24..	95.8		20		208	67	279		257	654	360		3.4		1,720	2.34	445	794	584	43	2,510	7.7
Mar. 5, 12, 19, 26 .	111		20		209	73	274		268	663	358		3.1		1,730	2.35	518	822	602	42	2,550	7.6
Apr. 2, 9, 16, 23, 29	74.9		21		288	109	332		231	978	480		3.9		2,330	3.17	471	1,170	977	38	3,270	7.5
Apr. 30.....	362		--		--	--	--		--	527	165		--		--	--	--	--	--	--	1,660	--
May 7, 14, 21, 28 ..	38.4		19		264	96	293		225	833	450		4.6		2,070	2.82	215	1,050	868	38	2,970	7.8
July 17, 30	21.8		33		609	92	232		492	1,610	228		1.8		3,050	4.15	180	1,900	1,500	21	3,520	7.8
Aug. 4, 8, 24	915		24		603	90	279		197	1,780	330		1.4		3,200	4.35	7,910	1,870	1,710	24	3,680	7.3
Sept. 7, 28.....	222		21		336	87	389		236	1,070	520		1.8		2,540	3.45	1,520	1,200	1,000	41	3,470	7.8

VIRGIN RIVER BASIN--Continued

VIRGIN RIVER AT LITTLEFIELD, ARIZ.

LOCATION.--At gaging station, three-eighths of a mile downstream from Beaverdam Wash and three-eighths of a mile upstream from Littlefield, Mohave County.
DRAINAGE AREA.--5,090 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: July 1949 to September 1951.
Water temperatures: October 1947 to September 1951.
Sediment records: October 1947 to September 1951.
EXTREMES, 1950-51.--Specific conductance: Maximum daily, 3,780 micromhos Aug. 24; minimum daily, 1,930 micromhos Apr. 30.
Water temperatures: Maximum observed, 86°F Sept. 1; minimum observed, 41°F Feb. 1.
Sediment loads: Maximum daily, 706,000 tons Aug. 4; minimum daily, 47 tons June 25.
EXTREMES, 1947-51.--Specific conductance (1949-51): Maximum daily, 3,950 micromhos Aug. 12, 1950; minimum daily, 1,450 micromhos Feb. 8, 1950.
Water temperatures: Maximum observed, 90°F June 30, 1950; minimum observed, 35°F Jan. 4, 1949, Jan. 4, 1950.
Sediment concentrations: Maximum daily, 84,600 ppm July 18, 1950; minimum daily, 150 ppm Oct. 13, 1948.
Sediment loads: Maximum daily, 706,000 tons Aug. 4, 1951; minimum daily, 30 tons Oct. 3, 1947 (revised).
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Oct. 1-10, 1950 ...	68.5		--		--	--	--		--	--	--		--		--	--	--	--	--	--	3,150	7.4
Oct. 11-20	76.3		23		344	122	282		259	1,150	400		1.4		2,450	3.33	505	1,360	1,150	31	3,200	7.5
Oct. 21-31	91.1		--		--	--	--		--	--	--		--		--	--	--	--	--	--	3,470	7.5
Nov. 1-10	108		--		--	--	--		--	--	--		--		--	--	--	--	--	--	3,320	7.5
Nov. 11-20	162		19		358	96	274		303	1,040	390		3.2		2,330	3.17	1,020	1,290	1,040	32	3,150	7.6
Nov. 21-30	175		--		--	--	--		--	--	--		--		--	--	--	--	--	--	2,920	7.7
Dec. 1-10	169		--		--	--	--		--	--	--		--		--	--	--	--	--	--	2,880	--
Dec. 11-20	168		24		298	88	289		296	930	370		1.9		2,150	2.92	975	1,110	863	36	2,900	7.7
Dec. 21-31	163		--		--	--	--		--	--	--		--		--	--	--	--	--	--	2,910	--
Jan. 1-10, 1951....	181		--		--	--	--		--	--	--		--		--	--	--	--	--	--	2,840	--
Jan. 11-20	188		21		280	86	264		313	840	350		1.9		2,000	2.72	1,020	1,050	796	35	2,750	7.7
Jan. 21-31	171		--		--	--	--		--	--	--		--		--	--	--	--	--	--	2,750	--
Feb. 1-10	162		--		--	--	--		--	--	--		--		--	--	--	--	--	--	2,740	--
Feb. 11-19	126		22		296	97	251		307	934	325		2.1		2,080	2.83	708	1,140	886	32	2,990	7.7
Feb. 20-28	127		--		--	--	--		--	--	--		--		--	--	--	--	--	--	2,990	--
Mar. 1-10	157		--		--	--	--		--	--	--		--		--	--	--	--	--	--	2,810	--
Mar. 11-20	163		21		268	87	258		308	819	340		2.5		1,950	2.65	858	1,030	774	35	2,760	7.9
Mar. 21-31	77.1		--		--	--	--		--	--	--		--		--	--	--	--	--	--	3,180	--
Apr. 1-10	76.2		--		--	--	--		--	--	--		--		--	--	--	--	--	--	3,260	--
Apr. 11-20	85.2		24		354	74	342		294	1,120	370		1.5		2,430	3.30	559	1,190	946	38	3,220	7.8
Apr. 21-30	189		--		--	--	--		--	--	--		--		--	--	--	--	--	--	3,000	--

May 1-10	207		--		--	--	--	--	--	--		--		--	--	--	--	--	--	2,520	--
May 11-20	174		23		308	92	251	298	930	340		1.9		2,090	2.84	982	1,150	903	32	2,830	7.8
May 21-31	101		--		--	--	--	--	--	--		--		--	--	--	--	--	--	3,040	--
June 1-10	65.0		--		--	--	--	--	--	--		--		--	--	--	--	--	--	3,280	--
June 11-20	60.3		24		354	125	262	250	1,170	385		.9		2,440	3.32	397	1,400	1,190	29	3,230	7.7
June 21-30	62.4		--		--	--	--	--	--	--		--		--	--	--	--	--	--	3,320	--
July 1-10	59.0		--		--	--	--	--	--	--		--		--	--	--	--	--	--	3,230	--
July 11-20	59.7		27		354	128	266	284	1,160	388		.9		2,460	3.35	397	1,410	1,180	29	3,260	7.5
July 21-31	161		--		--	--	--	--	--	--		--		--	--	--	--	--	--	3,270	--
Aug. 1-10	527		--		--	--	--	--	--	--		--		--	--	--	--	--	--	3,180	--
Aug. 11-20	64.2		24		354	128	245	266	1,140	380		1.1		2,400	3.26	416	1,410	1,190	27	3,220	7.5
Aug. 21-31	228		--		--	--	--	--	--	--		--		--	--	--	--	--	--	3,260	--
Sept. 1-10	99.8		--		--	--	--	--	--	--		--		--	--	--	--	--	--	3,200	--
Sept. 11-20	66.0		24		350	128	251	293	1,130	375		1.3		2,400	3.26	428	1,400	1,160	28	3,220	7.5
Sept. 21-30	145		--		--	--	--	--	--	--		--		--	--	--	--	--	--	3,080	--
Weighted average	138		--		--	--	--	--	--	--		--		--	--	--	--	--	--	3,020	--

VIRGIN RIVER BASIN--Continued

VIRGIN RIVER AT LITTLEFIELD, ARIZ.--Continued

Temperature (°F) of water, water year October 1950 to September 1951
/Once-daily temperature measurement, generally between 7 a. m. and 9 a. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	60	62	53	48	41	52	69	55	64	69	72	a86
2	a73	62	52	46	43	51	60	57	64	70	74	70
3	60	62	52	47	47	51	a65	60	a75	75	75	69
4	61	60	53	52	50	51	a66	63	66	71	72	68
5	62	59	a57	48	51	53	a72	62	67	67	76	67
6	66	59	a58	a48	51	56	65	64	76	68	72	68
7	63	a68	54	45	54	57	--	62	a80	73	70	68
8	62	58	56	a48	55	57	63	63	77	69	68	69
9	67	58	54	44	54	a61	65	65	67	69	69	68
10	67	52	55	45	55	58	a71	67	67	a84	70	66
11	65	51	55	48	57	51	--	66	65	69	70	68
12	--	49	55	50	56	a59	62	68	66	68	70	69
13	63	52	53	48	55	a58	62	63	67	a85	72	64
14	65	57	54	48	54	58	a78	65	69	70	72	66
15	68	54	55	a55	a64	58	65	63	69	72	71	66
16	66	a61	55	a52	54	58	65	60	76	75	a80	67
17	67	55	54	49	52	a62	a73	67	73	74	72	67
18	65	55	53	49	55	49	65	67	a76	74	72	a83
19	63	58	53	53	52	53	a70	67	69	75	73	68
20	66	58	52	50	59	55	a77	67	70	74	72	70
21	a73	59	52	47	50	a67	a77	68	67	73	74	a74
22	62	59	52	51	a63	58	65	67	68	70	77	64
23	62	55	a56	51	57	--	66	66	69	73	77	63
24	62	54	51	51	53	a71	65	68	68	74	a76	68
25	65	54	50	52	52	56	66	70	68	74	67	67
26	63	54	48	51	57	a76	a68	71	a78	73	67	66
27	66	53	47	52	55	61	63	69	66	74	71	66
28	64	52	48	54	55	56	64	69	68	a82	72	a69
29	62	53	49	58	--	59	a69	a83	69	74	71	67
30	a66	52	51	48	--	--	a54	68	71	76	69	68
31	63	--	53	42	--	60	--	66	--	73	72	--
Average	65	56	53	49	54	58	66	66	70	73	72	69

a Between 10 a. m. and 5 p. m.

VIRGIN RIVER BASIN--Continued

VIRGIN RIVER AT LITTLEFIELD, ARIZ.--Continued

Suspended sediment, water year October 1950 to September 1951

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	66	1,230	219	99	1,670	446	171	2,480	1,140
2	66	906	161	101	2,500	682	158	2,140	913
3	64	795	137	104	2,220	623	171	2,480	1,140
4	66	1,450	258	110	2,280	677	166	2,290	1,030
5	69	730	136	110	3,200	950	173	2,090	976
6	69	804	150	110	2,560	760	171	2,380	1,100
7	69	951	177	108	2,650	773	184	2,390	1,190
8	71	718	138	112	2,640	798	179	3,410	1,650
9	71	593	114	114	2,800	862	168	2,650	1,200
10	74	745	149	116	2,300	720	153	2,390	987
11	74	1,060	212	119	2,890	929	163	2,000	880
12	74	801	160	119	2,940	945	166	2,300	1,030
13	72	559	109	121	2,670	872	179	2,580	1,250
14	74	631	126	136	3,550	1,300	182	2,450	1,200
15	75	725	147	168	5,180	2,350	182	2,360	1,160
16	74	561	112	193	4,720	2,460	171	2,590	1,200
17	75	614	124	179	3,750	1,810	166	2,270	1,020
18	80	847	183	179	4,200	2,030	160	1,910	825
19	82	1,000	221	182	3,660	1,800	160	1,970	851
20	83	1,300	291	226	7,380	4,500	153	1,780	735
21	82	936	207	226	7,120	4,340	155	1,790	749
22	83	1,530	343	187	4,230	2,140	166	2,150	964
23	88	1,380	328	176	3,190	1,520	166	2,100	941
24	93	1,500	377	173	3,570	1,670	150	2,280	923
25	95	1,940	498	176	2,690	1,280	166	2,010	901
26	90	2,000	486	160	2,790	1,210	182	2,100	1,030
27	90	1,290	313	166	2,630	1,180	176	2,430	1,150
28	88	1,840	437	160	2,560	1,110	163	2,020	889
29	95	2,060	528	160	2,590	1,120	155	1,900	795
30	101	2,050	559	166	2,670	1,200	153	1,730	715
31	97	2,120	555	--	--	--	163	2,040	898
Total	2,450	--	7,955	4,456	--	43,057	5,171	--	31,432
	January			February			March		
1	168	2,000	907	168	2,230	1,010	134	1,720	622
2	182	2,160	1,060	150	1,860	753	166	2,110	946
3	182	3,100	1,520	158	2,350	1,000	207	3,370	1,880
4	179	2,230	1,080	182	2,360	1,160	179	2,340	1,130
5	190	2,450	1,260	201	2,850	1,550	168	2,510	1,140
6	201	2,940	1,600	173	3,250	1,520	150	1,890	765
7	193	2,200	1,150	160	2,460	1,060	148	1,970	787
8	173	2,510	1,170	148	2,350	940	148	2,370	947
9	171	3,070	1,420	145	2,350	920	145	1,810	709
10	168	2,020	916	134	1,780	644	127	2,020	693
11	184	2,690	1,340	132	1,750	624	166	2,280	1,020
12	204	3,140	1,730	134	1,850	669	187	3,010	1,520
13	207	3,080	1,720	125	1,900	641	173	2,180	1,020
14	179	2,870	1,390	121	1,500	490	168	2,150	975
15	176	3,170	1,510	119	1,770	569	163	2,090	920
16	182	2,450	1,200	123	1,220	405	163	1,920	845
17	190	2,790	1,430	132	1,950	695	168	2,440	1,110
18	187	2,490	1,260	125	1,340	452	155	1,930	808
19	187	4,070	2,050	125	1,320	446	150	1,680	680
20	184	2,600	1,290	145	2,840	1,110	138	1,630	607
21	179	5,420	2,620	143	4,280	1,650	110	1,310	389
22	176	3,250	1,540	114	1,330	409	95	1,080	277
23	176	2,360	1,120	112	1,620	490	77	1,030	214
24	179	2,470	1,190	125	1,600	540	74	834	167
25	176	2,160	1,030	129	1,490	519	75	1,100	223
26	163	2,530	1,110	125	1,360	459	72	726	141
27	153	3,840	1,590	125	1,500	506	69	753	140
28	148	1,760	703	129	1,400	488	68	871	160
29	153	1,880	777	--	--	--	68	1,100	202
30	184	2,960	1,470	--	--	--	66	936	167
31	190	2,770	1,420	--	--	--	74	977	195
Total	5,564	--	41,573	3,902	--	21,719	4,051	--	21,399

VIRGIN RIVER BASIN--Continued

VIRGIN RIVER AT LITTLEFIELD, ARIZ.--Continued

Suspended sediment, water year October 1950 to September 1951--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	90	1,420	345	337	7,000	6,370	64	663	115
2	90	906	220	261	4,600	3,240	65	602	106
3	78	581	122	232	2,670	1,670	66	663	118
4	75	556	113	198	2,490	1,330	66	671	120
5	72	600	117	229	3,900	2,410	65	661	116
6	71	622	119	248	4,250	2,850	66	620	110
7	72	727	141	196	4,050	2,140	66	561	100
8	74	938	187	158	2,800	1,190	66	716	128
9	72	601	117	125	1,550	523	64	537	93
10	68	614	113	85	914	210	62	702	118
11	65	511	90	77	693	144	61	656	108
12	65	473	83	75	632	128	61	545	90
13	74	621	124	75	672	136	62	510	85
14	68	551	100	77	899	187	61	609	100
15	66	342	61	267	7,500	s13,100	59	390	62
16	68	648	119	434	10,700	s14,700	58	456	71
17	69	593	110	196	3,620	1,920	58	351	55
18	69	844	157	193	3,150	1,640	59	445	71
19	106	13,800	s9,920	187	2,560	1,290	62	453	76
20	202	5,170	s4,180	158	2,380	1,020	62	367	61
21	258	7,000	4,880	132	1,580	563	61	343	56
22	160	2,910	1,260	148	2,000	799	62	332	56
23	121	1,740	568	155	2,400	1,000	62	328	55
24	82	872	193	150	2,400	972	62	304	51
25	74	770	154	112	2,290	692	61	285	47
26	85	891	204	83	1,400	314	62	324	54
27	110	2,100	624	69	723	135	64	369	64
28	104	1,970	553	68	528	97	64	534	92
29	295	6,450	s15,400	68	610	112	64	504	87
30	598	13,800	22,300	65	612	107	62	758	127
31	--	--	--	64	615	106	--	--	--
Total	3,501	--	62,674	4,922	--	61,095	1,877	--	2,592

Day	July			August			September		
1	62	476	80	68	945	174	173	12,500	5,840
2	61	768	126	72	866	168	124	3,500	1,170
3	57	670	103	1,170	70,800	s281,000	118	1,810	577
4	57	858	132	3,230	56,000	s706,000	103	1,200	334
5	58	694	109	248	21,200	s14,400	94	806	205
6	58	697	109	141	15,000	5,710	87	816	192
7	58	831	130	99	4,680	1,250	85	845	194
8	59	949	151	85	1,200	275	76	637	131
9	59	899	143	80	1,310	283	72	629	122
10	61	714	118	74	1,450	290	66	508	91
11	61	800	132	69	746	139	62	532	89
12	59	833	133	68	723	133	66	391	70
13	61	815	134	63	644	110	67	484	88
14	61	889	146	61	673	111	67	1,750	317
15	61	948	156	63	714	121	67	800	145
16	59	589	94	65	838	147	66	919	164
17	58	800	125	65	434	76	67	715	129
18	58	706	111	65	511	90	66	703	125
19	58	832	130	60	469	76	66	608	108
20	61	876	144	63	561	95	66	713	127
21	57	1,790	275	66	1,300	232	65	555	97
22	349	49,200	s77,700	66	902	161	65	618	108
23	146	33,900	s15,000	88	8,330	s2,790	63	661	112
24	90	14,000	3,400	86	11,500	2,670	65	457	80
25	71	2,000	383	73	918	181	63	377	64
26	71	2,520	483	68	606	111	65	766	134
27	68	893	164	61	543	89	63	639	109
28	66	960	171	62	525	88	293	19,900	s32,800
29	578	56,200	s111,000	66	429	76	559	36,700	s60,800
30	207	13,600	s17,300	1,580	61,400	s297,000	152	14,000	5,750
31	71	3,500	671	290	23,500	18,400	--	--	--
Total	2,961	--	229,053	8,415	--	1,332,446	3,111	--	110,272

Total discharge for year (cfs-days) 50,381
Total load for year (tons) 1,965,267

s Computed by subdividing day.

VIRGIN RIVER AT LITTLEFIELD, ARIZ.--Continued

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

Date of collection	Time	Water discharge (cfs)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000
May 16, 1951	8:00 a. m.	473	12,200	2,760	25	37	44	53	58	68	81	97		100		PSWCM
May 16	8:00 a. m.	473	12,200	1,960	26	35	45	51	59	68	81	97		100		BSWCM
May 16	4:30 p. m.	313	5,260	3,060	--	47	--	65	--	--	--	--		--		PWCM
May 20	8:00 a. m.	190	3,300	6,120	45	48	54	57	69	--	--	--		--		BWCM
June 5	8:00 a. m.	65	576	--	--	--	--	--	--	--	22	37		79		97	S
June 30	8:00 a. m.	59	531	--	--	--	--	--	--	--	33	52		82		97	S
July 22	9:00 a. m.	1,000	164,000	2,850	26	36	48	68	77	80	86	93		99		PSWCM
July 22	9:00 a. m.	1,000	164,000	3,250	4	9	21	64	72	80	86	93		99		PSN
July 22	9:00 a. m.	1,000	164,000	2,420	28	30	53	67	76	80	86	93		99		BSWCM
July 22	9:00 a. m.	1,000	164,000	2,810	7	10	13	--	--	80	86	93		99		BSN
July 22	6:00 p. m.	405	58,000	3,180	--	47	--	85	--	--	--	--		--		PWCM
July 29	7:00 a. m.	350	47,700	2,780	--	41	--	82	--	--	--	--		--		PWCM
July 29	5:00 p. m.	1,440	82,800	4,580	--	33	--	61	--	80	86	89		99		PSWCM
July 29	7:30 p. m.	1,160	89,100	3,080	--	39	--	66	--	95	96	100		--		PSWCM
July 30	7:00 a. m.	245	30,000	4,110	36	53	69	81	88	94	94	100		--		PSWCM
July 30	7:00 a. m.	245	30,000	3,570	38	53	70	85	90	94	94	100		--		BSWCM
Aug. 3	6:00 a. m.	1,260	73,800	3,620	--	31	--	50	--	82	89	97		99		PSWCM
Aug. 3	12:00 m.	874	65,000	3,720	--	30	--	67	--	85	88	96		100		PSWCM
Aug. 3	5:00 p. m.	1,790	72,500	3,260	--	37	--	63	--	81	88	97		99		PSWCM
Aug. 4	7:00 a. m.	8,970	73,300	3,660	--	35	--	59	--	79	87	98		100		PSWCM
Aug. 4	10:30 a. m.	2,460	72,100	2,750	--	28	--	60	--	79	86	96		100		PSWCM
Aug. 4	3:00 p. m.	1,220	50,300	4,870	--	54	--	81	--	--	--	--		--		PWCM
Aug. 5	8:00 a. m.	259	22,800	3,640	--	62	--	90	--	98	--	--		--		PWCM
Aug. 30	10:00 a. m.	1,720	86,700	2,360	--	43	--	70	--	75	80	89		100		PSWCM
Aug. 30	6:00 p. m.	758	42,700	4,360	--	45	--	69	--	86	91	97		100		PSWCM

VIRGIN RIVER BASIN--Continued

VIRGIN RIVER AT LITTLEFIELD, ARIZ.--Continued

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

Date of collection	Time	Water discharge (cfs)	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Sept. 28, 1951	1:00 p. m.	330	39,600	5,600	--	59	--	88	--	--	--	--		--		PWCM
Sept. 29	7:00 a. m.	480	41,500	4,000	--	71	--	85	--	90	--	--		--		PWCM
Sept. 29	9:00 a. m.	816	44,600	3,660	--	50	--	67	--	74	79	87		99		PSWCM
Sept. 29	1:00 p. m.	670	53,300	2,840	27	38	55	66	76	88	92	95		99		PSWCM
Sept. 29	1:00 p. m.	670	53,300	2,830	3	9	18	55	80	88	92	95		99		PSN
Sept. 29	1:00 p. m	670	53,300	2,650	30	41	55	69	82	88	92	95		99		BSWCM
Sept. 29	6:00 p. m.	351	32,100	3,520	--	49	--	82	--	93	95	98		100		PSWCM

MISCELLANEOUS ANALYSES OF STREAMS IN VIRGIN RIVER BASIN IN UTAH

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
FORT PIERCE WASH NEAR ST. GEORGE																						
Sept. 7, 1950			21		621	51	45		166	1,630	16		1.1		2,470	3.36		1,760	1,620	5	2,590	--
July 19, 28, 29, 1951			24		650	49	49		274	1,590	23		.7		2,510	3.41		1,820	1,600	5	2,600	7.9
Aug. 3-4			23		626	49	40		158	1,630	16		3.0		2,460	3.35		1,760	1,630	5	2,530	7.8
Sept. 28			18		604	77	74		146	1,750	30		.6		2,630	3.58		1,820	1,700	8	2,720	7.4

COLORADO RIVER MAIN STEM--Continued

LAKE MEAD NEAR BOULDER CITY, NEV.

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

/The miles given below represent distances measured along the Colorado River downstream from the gaging station at Lees Ferry, Ariz. A resistance thermometer was used in measuring the temperature of the water/

Date of collection	Depth (feet)	Elevation (feet)	Temperature (°F)	Specific conductance (micromhos 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 (sum)	Total hardness as $CaCO_3$
AT LINE OF DEMARCATION BETWEEN TURBID AND CLEAR WATER														
Sept. 19, 1951	8	1,165	75.0	1,340	17	125	39	129	238	395	102	2.7	927	472
PIERCE FERRY BAY, MILE 279														
Oct. 1, 1950	5		76	1,100	13	86	35	118	171	322	98	1.3	758	358
Nov. 1.....	5		66	1,040	--	--	--	--	166	--	--	--	--	--
Dec. 1.....	5		63	1,080	11	112	32	76	171	304	84	2.0	705	411
Jan. 1, 1951	5		56	997	--	--	--	--	170	--	--	--	--	--
Jan. 31.....	5		51	1,180	12	92	36	--	192	--	102	3.0	--	378
Mar. 1	5		50	1,270	12	96	38	130	209	328	116	3.1	826	396
Apr. 2	5		57	1,290	--	93	40	141	219	333	125	--	840	396
May 1	5		63	1,120	--	--	--	--	195	--	--	--	--	--
July 2	5		74	435	--	--	--	--	121	--	--	--	--	--
Aug. 1.....	5		85	668	--	--	--	--	141	--	--	--	--	--
Sept. 1	5		79	1,040	--	--	--	--	167	--	--	--	--	--
GRAND WASH, MILE 284.7														
Sept. 18, 1951	5	1,161	81.8	835	9.6	73	25	72	100	263	60	1.2	553	285
Sept. 18	50	1,116	77.8	1,030	--	--	--	--	166	--	--	--	--	--
Sept. 18	100	1,066	70.4	1,030	15	94	30	91	182	308	60	2.4	690	358
Sept. 18	150	1,016	60.8	1,050	--	--	--	--	182	--	--	--	--	--
ICEBERG CANYON, MILE 287														
Sept. 19, 1951.....	5	1,160	80.5	811	11	71	24	70	132	231	56	1.1	529	276
Sept. 19	50	1,115	78.1	1,090	--	--	--	--	156	--	--	--	--	--
Sept. 19	100	1,065	70.0	1,090	--	--	--	--	182	--	--	--	--	--
Sept. 19	150	1,015	59.4	1,070	8.5	89	30	110	180	302	86	2.4	717	346
Sept. 19	175	990	58.5	1,060	--	--	--	--	178	--	--	--	--	--
Sept. 19	183	982	65.3	1,300	--	--	--	--	436	--	--	--	--	--
SANDY POINT, MILE 293.5														
Sept. 18, 1951.....	5	1,161	80.9	791	14	70	25	77	146	230	60	1.0	549	278
Sept. 18	50	1,116	79.1	1,040	--	--	--	--	143	--	--	--	--	--

Sept. 18	100	1,066	70.5	1,040	--	--	--	--	166	--	--	--	--	--
Sept. 18	150	1,016	59.8	1,030	--	--	--	--	174	--	--	--	--	--
Sept. 18	200	966	56.9	1,030	15	88	33	93	166	290	84	2.1	687	355
Sept. 18	244	922	55.6	1,040	--	--	--	--	168	--	--	--	--	--
Sept. 18	245	921	55.6	1,120	--	--	--	--	220	--	--	--	--	--
VIRGIN CANYON, MILE 305.3														
Sept. 18, 1951	5	1,161	79.2	769					138					
Sept. 18	50	1,116	78.8	899					158					
Sept. 18	100	1,066	68.1	888					160					
Sept. 18	150	1,016	59.3	944					168					
Sept. 18	200	966	56.5	995					178					
Sept. 18	250	916	54.9	916	11	83	28	83	162	262	68	1.8	617	322
Sept. 18	300	866	54.6	987					174					
Sept. 18	320	846	56.0	989					174					
Sept. 18	321.5	844	56.9	1,170					244					
OVERTON ARM OF LAKE OPPOSITE SALT MINE, 15 MILES ABOVE MOUTH OF VIRGIN RIVER														
Sept. 20, 1951	0	1,165	80	855	11	74	25	68	136	230	58	2.3	535	288
OVERTON ARM OF LAKE, 9.3 MILES ABOVE MOUTH OF VIRGIN RIVER (LOWER VIRGIN NARROWS)														
Sept. 20, 1951	5	1,160	79.7	690	--	--	--	--	134	--	--	--	--	--
Sept. 20	50	1,115	77.7	692	14	61	23	46	136	186	28	1.2	426	246
Sept. 20	100	1,065	67.9	800	--	--	--	--	152	--	--	--	--	--
Sept. 20	150	1,015	60.7	951	--	--	--	--	164	--	--	--	--	--
Sept. 20	200	965	56.2	958	--	--	--	--	174	--	--	--	--	--
Sept. 20	250	915	54.8	953	--	--	--	--	178	--	--	--	--	--
Sept. 20	265	900	54.6	937	15	83	32	95	190	276	72	2.1	669	338
BOULDER CANYON, MILE 335														
Sept. 17, 1951	5	1,161	80.4	683	11	60	24	47	134	169	45	0.8	423	248
Sept. 17	50	1,116	78.6	865	--	--	--	--	142	--	--	--	--	--
Sept. 17	100	1,066	66.5	841	--	--	--	--	158	--	--	--	--	--

COLORADO RIVER MAIN STEM--Continued

LAKE MEAD NEAR BOULDER CITY, NEV.--Continued

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

Date of collection	Depth (feet)	Elevation (feet)	Temperature (°F)	Specific conductance (micromhos 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 (sum)	Total hardness as $CaCO_3$
BOULDER CANYON, MILE 335--Continued														
Sept. 17, 1951.....	150	1,016	60.0	936	--	--	--	--	174	--	--	--	--	--
Sept. 17	200	966	55.7	965	12	85	31	80	166	263	72	2.6	627	340
Sept. 17	250	916	54.2	989	--	--	--	--	168	--	--	--	--	--
Sept. 17	300	866	54.0	994	--	--	--	--	168	--	--	--	--	--
Sept. 17	350	816	53.9	1,010	--	--	--	--	178	--	--	--	--	--
Sept. 17	400	766	53.9	997	--	--	--	--	178	--	--	--	--	--
Sept. 17	405	761	55.0	1,090	--	--	--	--	216	--	--	--	--	--
NEAR INTAKE TOWERS, MILE 354.7														
Oct. 31, 1950	5	1,160	70.4	830	11	71	24	75	145	231	56	0.7	540	276
Oct. 31	50	1,115	70.6	822	--	--	--	--	144	--	--	--	--	--
Oct. 31	100	1,065	68.7	839	--	--	--	--	146	--	--	--	--	--
Oct. 31	150	1,015	61.6	896	11	82	26	75	154	251	61	1.4	583	312
Oct. 31	200	965	56.3	916	--	--	--	--	157	--	--	--	--	--
Oct. 31	250	915	53.5	956	11	87	28	89	166	274	73	1.6	645	332
Oct. 31	300	865	52.4	906	11	84	26	89	165	263	71	1.6	627	316
Oct. 31	350	815	51.9	940	--	--	--	--	168	--	--	--	--	--
Oct. 31	400	765	51.6	--	13	86	28	91	172	271	74	--	648	330
Oct. 31	431	734	51.6	959	12	88	28	90	176	269	74	2.0	650	334
Oct. 31	432	733	52.7	997	--	--	--	--	304	--	--	--	--	--
Nov. 29	5	1,155	65.5	846	12	70	24	78	146	233	57	1.0	547	273
Nov. 29	50	1,110	65.2	845	--	--	--	--	144	--	--	--	--	--
Nov. 29	100	1,060	65.0	844	--	--	--	--	144	--	--	--	--	--
Nov. 29	150	1,010	64.0	885	9.9	76	26	78	150	245	61	1.5	571	296
Nov. 29	200	960	58.2	920	15	81	25	83	156	257	63	1.9	603	305
Nov. 29	250	910	53.5	979	11	85	30	89	164	280	72	2.1	650	336
Nov. 29	300	860	52.9	985	--	--	--	--	167	--	--	--	--	--
Nov. 29	350	810	52.2	1,010	38	84	28	97	180	270	75	1.9	683	324
Nov. 29	400	760	52.0	946	--	--	--	--	160	--	--	--	--	--
Nov. 29	427	733	51.8	946	12	80	27	87	164	258	67	1.6	613	310
Nov. 29	429	731	53.0	1,130	36	103	35	107	408	175	78	10	745	401
Dec. 28	5	1,152	61.0	853	11	75	25	74	146	240	57	1.3	555	290
Dec. 28	50	1,107	61.0	851	--	--	--	--	148	--	--	--	--	--
Dec. 28	100	1,057	61.0	841	--	--	--	--	147	--	--	--	--	--

Dec. 28	150	1,007	60.0	845	--	--	--	--	148	--	--	--	--	--
Dec. 28	200	957	58.0	901	52	70	29	88	a 143	265	65	1.4	641	294
Dec. 28	250	907	54.0	975	--	--	--	--	173	--	--	--	--	--
Dec. 28	300	857	53.0	994	16	88	28	95	172	280	76	2.1	670	334
Dec. 28	350	807	53.0	991	--	--	--	--	172	--	--	--	--	--
Dec. 28	400	757	52.0	989	13	86	29	92	173	275	73	2.0	655	334
Dec. 28	425	732	52.0	986	--	--	--	--	178	--	--	--	--	--
Dec. 28	426	731	53.0	1,280	--	--	--	--	300	--	--	--	--	--
Feb. 8, 1951	5	1,146	56.4	903	--	--	--	--	152	--	--	--	--	--
Feb. 8	50	1,101	56.0	894	--	--	--	--	155	--	--	--	--	--
Feb. 8	100	1,051	55.4	889	12	79	25	78	152	249	61	1.0	580	300
Feb. 8	150	1,001	55.4	885	--	--	--	--	155	--	--	--	--	--
Feb. 8	200	951	55.4	893	--	--	--	--	156	--	--	--	--	--
Feb. 8	250	901	54.9	991	12	87	27	95	171	278	74	2.0	659	328
Feb. 8	300	851	53.6	1,000	--	--	--	--	172	--	--	--	--	--
Feb. 8	350	801	52.7	994	15	88	28	89	172	270	74	2.4	651	334
Feb. 8	400	751	52.7	1,000	--	--	--	--	177	--	--	--	--	--
Feb. 8	418	733	52.7	1,010	13	80	28	103	182	272	75	1.3	662	314
Feb. 8	419	732	53.0	1,020	--	--	--	--	180	--	--	--	--	--
Feb. 28	5	1,143	54.6	915	--	--	--	1-	158	--	--	--	--	--
Feb. 28	50	1,098	54.6	905	--	--	--	--	155	--	--	--	--	--
Feb. 28	100	1,048	54.6	905	11	85	26	74	155	251	64	1.2	589	319
Feb. 28	150	998	54.6	908	--	--	--	--	156	--	--	--	--	--
Feb. 28	200	948	54.6	991	12	96	28	77	169	272	71	1.0	640	354
Feb. 28	250	898	53.4	1,010	13	90	29	91	174	279	76	.6	664	344
Feb. 28	300	848	52.9	994	--	--	--	--	170	--	--	--	--	--
Feb. 28	350	798	52.6	1,000	--	--	--	--	172	--	--	--	--	--
Feb. 28	400	748	52.6	994	--	--	--	--	176	--	--	--	--	--
Feb. 28	416	732	52.6	1,000	13	105	33	62	180	269	73	1.2	645	398
Feb. 28	417	731	52.9	1,120	27	100	28	117	294	259	75	3.8	755	364
Mar. 29	5	1,139	57.3	930	12	79	29	87	158	267	68	1.3	621	316
Mar. 29	50	1,094	56.1	923	11	79	30	80	156	259	68	1.3	605	320
Mar. 29	100	1,044	55.7	921	11	81	29	84	161	267	66	1.3	619	321
Mar. 29	150	994	54.8	923	11	82	29	79	161	257	67	1.5	606	324

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

COLORADO RIVER MAIN STEM--Continued

LAKE MEAD NEAR BOULDER CITY, NEV.--Continued

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

Date of collection	Depth (feet)	Elevation (feet)	Temperature (°F)	Specific conductance (micromhos 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 (sum)	Total hardness as $CaCO_3$
NEAR INTAKE TOWERS, MILE 354.7--Continued														
Mar. 29, 1951	200	944	54.0	975	11	85	29	96	174	276	76	2.3	661	331
Mar. 29	250	894	53.7	989	12	86	30	92	171	280	75	2.0	661	338
Mar. 29	300	844	53.4	972	12	85	31	90	167	279	76	2.0	657	340
Mar. 29	350	794	53.2	1,000	14	84	30	98	b 174	281	78	2.2	673	333
Mar. 29	400	744	52.8	989	15	81	30	99	175	278	76	1.9	667	326
Mar. 29	412	732	52.8	948	14	82	28	87	154	271	71	1.6	630	320
Mar. 29	413	731	53.0	1,040	--	90	32	101	160	314	82	1.9	700	356
Apr. 26	5	1,137	57.9	960	--	--	--	--	152	--	--	--	--	--
Apr. 26	50	1,092	57.1	951	--	--	--	--	162	--	--	--	--	--
Apr. 26	100	1,042	55.1	954	13	80	29	86	160	267	68	1.6	623	318
Apr. 26	150	992	54.3	969	--	--	--	--	166	--	--	--	--	--
Apr. 26	200	942	53.4	1,020	--	--	--	--	174	--	--	--	--	--
Apr. 26	250	892	53.4	1,040	--	--	--	--	176	--	--	--	--	--
Apr. 26	300	842	53.4	1,030	--	--	--	--	178	--	--	--	--	--
Apr. 26	350	792	53.1	1,040	--	--	--	--	176	--	--	--	--	--
Apr. 26	400	742	53.1	1,040	--	--	--	--	180	--	--	--	--	--
Apr. 26	410	732	53.1	1,000	11	84	31	89	170	275	73	2.7	649	337
Apr. 26	411	731	53.1	1,090	19	91	37	97	212	289	79	5.3	722	379
Aug. 2	5	1,163	81.8	918	12	76	28	89	142	271	71	.9	618	304
Aug. 2	50	1,118	75.5	939	--	--	--	--	149	--	--	--	--	--
Aug. 2	100	1,068	63.4	941	--	--	--	--	160	--	--	--	--	--
Aug. 2	150	1,018	57.8	936	--	--	--	--	162	--	--	--	--	--
Aug. 2	200	968	55.2	941	13	85	29	85	162	273	69	1.6	635	331
Aug. 2	250	918	54.1	962	--	--	--	--	166	--	--	--	--	--
Aug. 2	300	868	53.3	1,000	--	--	--	--	174	--	--	--	--	--
Aug. 2	350	818	53.1	1,000	--	--	--	--	174	--	--	--	--	--
Aug. 2	400	768	53.0	1,000	16	86	30	97	176	281	78	2.2	677	338
Aug. 2	436	732	53.4	1,000	--	--	--	--	151	--	--	--	--	--
Aug. 2	437.5	731	54.3	1,040	--	--	--	--	204	--	--	--	--	--
Aug. 31	5	1,162	77.0	903	--	--	--	--	152	--	--	--	--	--
Aug. 31	50	1,117	77.0	902	--	--	--	--	145	--	--	--	--	--
Aug. 31	100	1,067	67.8	934	--	--	--	--	159	--	--	--	--	--
Aug. 31	150	1,017	59.5	932	--	--	--	--	160	--	--	--	--	--
Aug. 31	200	967	55.2	944	--	--	--	--	164	--	--	--	--	--

b Includes equivalent of 10 parts per million of carbonate (CO_3).

Aug. 31	250	917	53.7	980	--	--	--	--	171	--	--	--	--	--
Aug. 31	300	867	53.5	997	14	86	30	97	172	284	79	1.8	676	338
Aug. 31	350	817	53.5	992	--	--	--	--	172	--	--	--	--	--
Aug. 31	400	767	53.4	1,010	--	--	--	--	176	--	--	--	--	--
Aug. 31	435	732	53.3	1,010	--	--	--	--	176	--	--	--	--	--
Aug. 31	437	730	53.3	1,050	32	94	33	105	297	222	82	9.0	723	370
Sept. 27	5	1,159	76.7	885	11	72	27	88	144	255	69	.7	594	290
Sept. 27	50	1,114	76.7	874	--	--	--	--	142	--	--	--	--	--
Sept. 27	100	1,064	68.8	926	--	--	--	--	158	--	--	--	--	--
Sept. 27	150	1,014	60.2	934	--	--	--	--	161	--	--	--	--	--
Sept. 27	200	964	56.1	954	12	85	28	91	163	280	--	1.9	647	327
Sept. 27	250	914	54.2	1,000	--	--	--	--	174	--	--	--	--	--
Sept. 27	300	864	53.8	1,000	14	86	30	95	172	284	76	2.1	672	338
Sept. 27	350	814	53.6	991	--	--	--	--	172	--	--	--	--	--
Sept. 27	400	764	53.5	1,000	--	--	--	--	175	--	--	--	--	--
Sept. 27	432	732	53.7	1,010	--	--	--	--	179	--	--	--	--	--
Sept. 27	433	731	53.9	1,040	26	92	32	99	202	283	80	5.2	717	361

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER BELOW HOOVER DAM, ARIZ.-NEV.

LOCATION.--At Hoover Dam, Ariz.-Nev. State line between Mohave County, Ariz., and Clark County, Nev., about 1 mile upstream from gaging station.
DRAINAGE AREA.--167,800 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1939 to September 1951.
Water temperatures: October 1941 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 692 ppm Apr. 23-27, 30; minimum, 625 ppm Jan. 2-5, 8-10.
Hardness: Maximum, 340 ppm July 2-3, 5, 9-10, 23-27, 30; minimum, 299 ppm Feb. 12-16, 19.
Specific conductance: Maximum daily, 1,020 micromhos Mar. 5; minimum daily, 910 micromhos Jan. 23.
EXTREMES, 1939-51.--Dissolved solids (1939-44, 1950-51): Maximum, 824 ppm Mar. 1-10, 1941; minimum, 621 ppm Dec. 21-31, 1942.
Hardness (1939-44, 1950-51): Maximum, 426 ppm Jan. 21-31, 1941; minimum, 299 ppm Feb. 12-16, 19, 1951.
Specific conductance: Maximum daily, 1,250 micromhos Mar. 2, 1941; minimum daily, 824 micromhos Nov. 14, 1949.
Water temperatures (1941-50): Maximum, 69°F Sept. 27, 1945 and several days in 1947 and 1948; minimum, 50°F Mar. 23, 28, 30, 1949.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
Oct. 2-6, 9-10, 1950	16,030		13		85	28	82		162	263	69		2.5		650	0.88	28,130	327	194	35	970	7.4
Oct. 11-13, 16-20 ..	15,340		13		84	28	85		161	266	70		2.2		658	.89	27,250	324	192	36	973	7.6
Oct. 23-27, 30-31 ..	14,860		14		86	29	80		160	265	69		2.4		660	.90	26,480	334	202	34	973	7.4
Nov. 1-3, 6-10	15,390		13		84	28	84		163	264	69		2.1		656	.89	27,260	324	191	36	976	7.3
Nov. 13-17, 20	15,800		13		84	28	84		161	265	69		2.3		656	.89	27,980	324	192	36	973	7.4
Nov. 21-22, 24, 27-30	14,390		13		84	26	89		160	264	72		2.1		640	.87	24,870	316	186	38	968	7.6
Dec. 1, 4-8	14,630		12		87	26	87		164	235	72		2.4		634	.86	25,040	324	190	37	963	7.7
Dec. 11-15, 18-20 ..	16,480		12		85	26	87		165	261	71		2.2		631	.86	28,080	319	184	37	957	7.7
Dec. 21-22, 26-29 ..	16,750		12		87	26	86		163	265	71		2.1		632	.86	28,580	324	190	37	949	7.7
Jan. 2-5, 8-10,1951 .	18,410		14		85	26	84		162	261	68		2.0		625	.85	31,070	319	186	36	939	7.7
Jan. 11-12, 15-19 .	16,810		12		78	27	94		164	265	70		1.8		656	.89	29,770	306	171	40	965	7.6
Jan. 22-26, 29-31 .	14,980		13		76	27	91		163	256	68		1.7		632	.86	25,560	300	167	40	931	7.7
Feb. 1-2, 5-9	13,910		12		78	26	90		161	257	68		1.8		635	.86	23,850	302	170	39	936	7.7
Feb. 12-16, 19	14,500		12		77	26	93		162	261	68		1.8		643	.87	25,170	299	166	40	947	7.6
Feb. 20-21,23, 26-28	17,650		12		76	27	98		166	264	71		1.8		658	.89	31,360	300	164	41	971	7.7
Mar. 1-2, 5-9	16,630		12		84	27	95		174	266	74		2.2		676	.92	30,350	320	178	39	1,000	7.8
Mar. 12-16, 19-20 .	15,140		12		83	27	93		172	265	72		2.0		664	.90	27,140	318	177	39	972	7.8
Mar. 21-23, 26-30 .	15,320		12		88	--	--		166	269	72		1.8		676	.92	27,960	--	--	--	1,000	8.0
Apr. 2-6, 9-10	14,890		12		88	--	--		168	264	73		1.6		678	.92	27,260	--	--	--	997	7.5
Apr. 11-13, 16-20 .	15,380		12		86	--	--		169	267	76		1.8		690	.94	28,650	--	--	--	1,010	7.4
Apr. 23-27, 30.....	13,700		13		88	--	--		176	268	75		1.7		692	.94	25,600	--	--	--	1,010	7.7

May 1-5	16,090	13	82	30	100	184	274	76	1.6	680	.92	29,540	328	177	40	1,010	7.3
May 11-12, 15-18 ..	15,850	14	82	29	95	171	271	76	1.7	676	.92	28,930	324	184	39	997	8.1
May 21-25, 28-29, 31	15,650	13	83	29	94	171	271	76	1.7	674	.92	28,480	326	186	39	991	7.8
June 1, 4-8	13,180	14	84	29	90	168	271	74	1.5	667	.91	23,740	328	191	37	988	7.8
June 11-15, 18-20 ..	12,740	14	81	29	94	172	268	74	1.7	669	.91	23,010	321	180	39	985	7.7
June 21-22, 25-29 ..	12,740	13	84	29	91	168	271	74	1.7	676	.92	23,250	328	191	37	982	7.7
July 2-3, 5, 9-10...	13,560	14	82	33	87	174	269	74	1.7	685	.93	25,080	340	198	36	985	7.9
July 11-13, 16-20 ..	14,280	13	83	31	90	170	271	76	1.7	676	.92	26,060	334	195	37	991	7.8
July 23-27, 30	14,730	13	85	31	90	173	274	75	1.7	665	.90	26,450	340	198	36	988	7.7
Aug. 1, 3, 6-10 ...	15,270	13	86	30	89	173	272	74	1.5	677	.92	27,910	338	196	36	991	7.9
Aug. 13-17, 20	16,980	14	86	28	91	168	272	74	2.0	681	.93	31,220	330	192	37	980	7.6
Aug. 21-24, 27-31 .	16,980	13	86	26	96	169	275	73	2.7	682	.93	31,270	322	183	39	983	7.6
Sept. 4-7, 10	17,280	13	85	29	88	167	270	73	2.5	676	.92	31,540	331	194	37	980	7.6
Sept. 11-14, 17-20 .	17,790	13	86	28	91	169	272	73	2.4	680	.92	32,660	330	191	37	980	7.6
Sept. 21, 24-28	15,280	14	86	29	90	167	275	73	2.4	676	.92	27,890	334	196	37	978	7.6
Weighted average .	a 15,440	13	84	28	90	167	267	72	2.0	663	0.90	27,640	324	188	38	977	--

a Represents 77 percent of runoff for water year October 1950 to September 1951.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER BELOW HOOVER DAM, ARIZ.-NEV.--Continued

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	56	56	--	57	56	--	55	56	--	56	--
2	55	56	--	57	57	55	55	55	--	56	--	--
3	55	56	--	57	--	--	55	55	--	56	56	--
4	55	--	56	57	--	--	55	55	56	--	--	56
5	55	--	55	57	57	55	55	55	56	56	--	56
6	55	56	56	--	57	55	55	--	56	--	56	56
7	--	56	56	--	57	55	--	--	56	--	56	56
8	--	56	56	57	57	55	--	55	56	--	56	--
9	56	56	--	57	57	55	55	55	--	56	56	--
10	56	56	--	57	--	--	55	55	--	56	56	56
11	56	--	56	57	--	--	55	55	56	56	--	56
12	56	--	56	57	56	56	55	55	56	56	--	56
13	55	56	56	--	57	56	55	--	56	56	56	56
14	--	56	56	--	57	55	--	--	56	--	56	56
15	--	55	56	57	57	55	--	--	56	--	56	--
16	56	55	--	57	57	55	55	56	--	56	56	--
17	55	56	--	57	--	--	55	55	--	56	56	56
18	55	--	56	58	--	--	55	55	56	56	--	56
19	55	--	56	58	57	55	55	--	56	56	--	56
20	55	56	56	--	57	55	56	--	56	56	56	56
21	--	56	56	--	57	56	--	55	56	--	56	56
22	--	56	56	57	--	55	--	55	56	--	56	--
23	55	--	--	57	56	56	56	55	--	56	56	--
24	56	56	--	57	--	--	56	55	--	56	60	56
25	56	--	--	57	--	--	56	55	56	56	--	56
26	60	--	57	57	56	55	55	--	56	56	--	56
27	56	60	57	--	56	56	56	--	56	56	60	58
28	--	56	57	--	55	55	--	55	56	--	56	56
29	--	56	57	57	--	55	--	56	56	--	56	--
30	56	56	--	57	--	55	55	--	--	56	56	--
31	56	--	--	57	--	--	--	56	--	--	56	--
Average	--	--	--	--	--	--	--	--	--	--	--	--

GILA RIVER AT KELVIN, ARIZ.

LOCATION.--Just above mouth of Mineral Creek, and 1,200 feet upstream from gaging station at Kelvin, Pinal County, 17 miles downstream from San Pedro River, and 19½ miles upstream from Ashurst-Hayden Dam.
DRAINAGE AREA.--18,000 square miles, approximately, at gaging station.
RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1951.
Water temperatures: December 1950 to September 1951.
EXTREMES, 1950-1951.--Dissolved solids: Maximum, 1,740 ppm June 1-10; minimum, 343 ppm Aug. 26-28.
Hardness: Maximum, 1,070 ppm June 1-10; minimum, 180 ppm Sept. 6-12.
Specific conductance: Maximum daily, 2,460 micromhos Jan. 16; minimum daily, 554 micromhos Aug. 27.
Water temperatures: Maximum observed, 94° July 30.
REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Values reported for dissolved solids are sums of determined constituents. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213. No appreciable inflow from Mineral Creek, between sampling point and gaging station, except during periods of heavy local runoff.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Dec. 1-10, 1950...	6.97	30	0.00	182	46	229	6.8	264	554	256	1.7	0.1	0.1	1,440	1.96	27	643	426	43		2,100	7.9	5
Dec. 11-20.....	13.0	28	.01	144	43	226	7.6	255	426	262	1.7	.1	.1	1,260	1.71	44	836	328	47		1,950	7.9	5
Dec. 21-31.....	12.2	32	.01	152	38	210	6.2	256	461	228	1.9	1.7	.20	1,270	1.73	42	535	325	47		1,900	7.9	3
Jan. 1-10, 1951...	20.1	30	.02	144	38	219	6.0	264	407	258	1.9	1.8	.38	1,240	1.69	67	516	299	48		1,920	7.9	5
Jan. 11-20.....	69.9	23	.01	150	49	300	10	274	368	438	1.2	2.7	.36	1,480	2.01	279	576	352	53		2,390	7.7	5
Jan. 21-31.....	80.6	23	.01	147	44	267	8.6	270	361	386	1.3	2.5	.39	1,370	1.86	298	548	327	51		2,220	7.7	5
Feb. 1-10.....	85.2	28	.01	152	43	245	7.0	264	348	355	1.1	2.4	.59	1,310	1.78	301	556	340	49		2,110	7.5	3
Feb. 11-20.....	87.8	28	.01	142	41	242	6.8	268	311	350	1.2	1.5	.32	1,260	1.71	299	523	304	50		2,060	7.4	2
Feb. 21-28.....	95.9	28	.01	136	35	238	9.2	262	285	340	1.4	1.9	.14	1,200	1.63	311	484	269	51		1,980	7.6	3
Mar. 1-10.....	103	29	.03	135	36	234	7.6	261	272	345	1.5	1.8	.40	1,190	1.62	331	485	271	51		1,970	7.5	8
Mar. 11-20.....	99.8	30	.01	132	37	252	6.0	263	267	370	1.5	1.6	.36	1,230	1.67	331	482	266	53		2,030	7.5	2
Mar. 21-31.....	110	35	.02	136	37	247	7.2	257	315	350	.9	2.0	.89	1,260	.89	374	492	281	52		2,060	7.9	4
Apr. 1-10.....	121	35	.01	152	40	246	9.8	a 258	356	350	.9	2.1	.35	1,320	1.80	431	544	332	49		2,110	7.9	4
Apr. 11-19.....	71.7	28	.01	118	35	278	7.4	247	270	400	.9	7.0	.89	1,270	1.73	246	438	236	57		2,120	7.9	4
Apr. 20.....	195	--	--	89	20	93		295	121	97	--	1.6	--	567	.77	299	304	62	40		961	7.2	--
Apr. 21-30.....	79.1	30	.00	115	35	282	10	233	256	420	1.6	2.7	.34	1,270	1.73	271	431	240	58		2,150	7.6	2
May 1-10.....	55.3	34	.00	112	36	300	11	b 224	273	435	1.6	2.0	.36	1,310	1.78	196	428	244	60		2,230	7.9	3
May 11-20.....	25.8	34	.00	126	39	308	10	238	322	430	1.6	1.5	.43	1,390	1.89	97	475	280	58		2,280	7.9	2
May 21-31.....	5.15	37	.01	177	47	265	10	c 249	495	345	1.3	1.4	.38	1,500	2.04	21	635	431	47		2,290	7.8	2

a Includes equivalent of 7 parts per million of carbonate (CO_3).
b Includes equivalent of 6 parts per million of carbonate (CO_3).
c Includes equivalent of 5 parts per million of carbonate (CO_3).

GILA RIVER BASIN--Continued

GILA RIVER AT KELVIN, ARIZ.--Continued

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
June 1-10, 1951	0.91	43	0.01	307	73	142	7.0	d 317	814	195	0.81	2.2	0.40	1,740	2.37	4.3	1,070	806	22		2,280	7.8	2
June 11-20	.58	39	.01	295	70	136	8.4	321	740	200	.9	2.8	.30	1,650	2.24	2.6	1,020	761	22		2,250	7.6	2
June 21-30	.64	42	.03	302	74	136	6.6	303	807	190	.8	1.8	.32	1,710	2.33	3.0	1,060	810	22		2,280	7.5	3
July 4-7	56.6	43	.17	107	28	121	8.0	419	224	55	1.0	2.4	.30	796	1.08	122	382	38	40		1,180	7.8	33
July 1-3, 8-15	16.7	41	.01	272	66	148	5.4	306	704	190	1.1	2.2	.32	1,580	2.15	6.5	950	700	25		2,150	7.6	3
July 16-20	118	29	.17	195	25	94	9.6	229	486	75	0.5	2.1	.18	1,030	1.40	328	590	402	25		1,410	7.3	45
July 21-23	3.63	32	--	162	28	136	17	247	368	168	1.1	2.5	--	1,040	1.41	10	519	316	35		1,550	--	--
July 24-31	66.0	32	1.9	115	21	58	11	443	86	41	.7	5.9	.10	590	.80	105	374	10	25		925	7.4	45
Aug. 1-7	1,134	36	1.1	106	23	100	10	455	42	121	.7	6.0	.12	670	.91	2,050	359	0	37		1,110	7.6	45
Aug. 8-10	159	46	--	111	32	325	18	227	232	485	1.4	6.4	--	1,370	1.86	588	408	222	62		2,280	--	--
Aug. 11-20	237	28	.24	137	30	180	11	233	326	229	1.0	3.1	.22	1,060	1.44	678	466	274	45		1,660	7.5	32
Aug. 21-25, 29-31	188	28	.22	108	20	128	9.6	254	208	146	1.0	2.4	.15	776	1.06	394	352	144	43		1,230	7.6	25
Aug. 26-28	1,198	25	--	60	11	44		215	62	34	.6	.8	--	343	.47	1,110	194	18	33		559	--	--
Sept. 1-5	112	28	.01	130	26	138	5.8	236	284	180	1.0	3.5	.19	912	1.24	276	432	238	41		1,440	7.7	18
Sept. 6-12	253	21	.01	54	11	103	8.0	184	87	122	.9	1.8	.32	500	.68	342	180	28	54		853	7.7	18
Sept. 13-20	163	24	.01	84	19	110	6.4	204	177	133	.9	1.2	.28	656	.89	289	288	120	45		1,080	7.8	18
Sept. 21-30	20.0	32	.01	161	37	174	6.6	277	360	230	1.3	1.2	.20	1,140	1.55	62	554	326	40		1,840	8.0	15
Weighted average	e 107	29	0.38	113	27	160	9.1	296	196	211	1.0	3.2	0.28	896	1.22	259	393	150	46		1,460	--	--

d Includes equivalent of 11 parts per million of carbonate (CO_3).
e Mean discharge for water year October 1950 to September 1951 was 90.9 cfs. Runoff Dec. 1, 1950 to Sept. 30, 1950 was 98 percent of total for water year.

GILA RIVER BASIN--Continued

GILA RIVER AT KELVIN, ARIZ.--Continued

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			--	52	51	48	59	63	--	79	88	84
2			65	45	49	49	62	76	--	82	90	73
3			55	50	50	47	80	67	--	84	76	84
4			52	42	50	51	65	78	88	80	76	82
5			58	45	49	49	64	87	89	82	89	83
6			51	45	46	61	60	77	85	86	87	80
7			60	46	52	57	64	85	82	79	88	84
8			50	47	55	59	65	82	73	83	--	84
9			60	45	54	60	75	83	90	81	88	86
10			60	49	62	69	70	79	88	81	90	86
11			64	49	59	67	60	87	81	--	89	86
12			51	48	56	64	62	80	82	--	86	85
13			46	47	62	60	58	80	82	--	89	83
14			52	46	46	65	67	59	74	--	87	82
15			41	47	47	51	73	60	75	--	84	85
16			60	51	51	69	69	81	81	--	82	84
17			58	51	52	64	80	85	80	83	85	85
18			55	43	50	59	82	91	75	90	86	86
19			56	47	50	64	63	89	90	84	87	66
20			46	45	49	55	60	85	84	80	82	83
21			45	49	55	71	79	85	80	84	81	80
22			43	51	58	57	66	86	80	85	87	80
23			45	50	59	71	71	88	82	82	86	79
24			46	59	53	67	80	90	86	84	77	78
25			41	50	59	70	63	76	80	87	86	80
26			56	57	56	67	65	--	83	90	--	78
27			50	52	56	62	73	77	88	90	73	80
28			42	43	49	69	69	90	--	80	73	79
29			48	53	--	55	56	92	88	90	75	76
30			57	55	--	59	57	89	83	94	84	76
31			54	51	--	60	--	--	--	89	85	--
Average			52	49	53	61	67	81	83	84	84	81

GILA RIVER BASIN--Continued

SALT RIVER AT STEWART MOUNTAIN DAM, ARIZ.

LOCATION.--Just below dam, 3½ miles above gaging station, which is 6 miles upstream from Verde River, Maricopa County.
DRAINAGE AREA.--6,218 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1951.
Water temperatures: December 1950 to September 1951.
EXTREMES, 1950-51--Dissolved solids: Maximum, 1,300 ppm Aug. 21-28; minimum, 631 ppm Sept. 11-20.
Hardness: Maximum, 256 ppm Aug. 21-28; minimum, 151 ppm Aug. 29-31, Sept. 1-10.
Specific conductance: Maximum daily, 2,490 micromhos Aug. 20; minimum daily, 1,110 micromhos Sept. 4-6.
REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Values reported for dissolved solids are residue on evaporation. Records of discharge for water year October 1950 to September 1951 are given in Water-Supply Paper 1213. No inflow between sampling point and gaging station except during periods of heavy rainfall.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Dec. 9-20, 1950..	346	11	0.01	53	17	196	5.0	167	48	310	0.4	3.1	0.24	736	1.00	688	202	65	67		1,350	7.6	3
Jan. 1-10, 1951..	155	13	.01	55	17	193	7.2	174	49	310	.4	1.9	.20	746	1.01	312	207	64	66		1,360	7.3	3
Jan. 11-20	10.3	14	.01	59	18	199	7.0	183	45	320	.3	2.1	.79	a754	1.03	21	221	71	65		1,410	7.3	3
Jan. 21-31	11.1	14	.01	57	19	197	8.0	182	49	320	.3	2.1	.54	a756	1.03	23	220	71	65		1,420	7.2	3
Feb. 1-10.....	11.1	14	.01	58	20	199	7.2	181	59	320	.4	1.7	.49	a768	1.04	23	226	78	65		1,430	7.3	3
Feb. 11-20.....	13.7	14	.00	58	19	208	6.8	183	55	345	.4	2.8	.40	a799	1.09	30	222	72	66		1,490	7.8	--
Feb. 21-28.....	166	12	.01	57	17	215	5.2	180	52	350	.4	2.9	.17	821	1.12	368	212	64	68		1,500	8.0	4
Mar. 1-10.....	327	12	.00	56	17	216	5.8	179	54	350	.4	2.8	.30	824	1.12	728	210	63	68		1,510	7.7	4
Mar. 11-20.....	928	11	.01	60	19	250	5.8	184	58	405	.3	3.1	.21	928	1.26	2,330	228	76	70		1,700	7.8	4
Mar. 21-31.....	1,027	12	.01	62	20	282	6.2	192	63	460	.3	2.7	.20	1,030	1.40	2,860	236	79	71		1,880	7.9	3
Apr. 1-10.....	640	12	.01	60	20	296	6.6	195	64	465	.3	1.7	.20	a1,040	1.41	1,800	232	72	73		1,910	7.9	2
Apr. 11-20.....	2,360	10	.01	60	20	286	7.0	194	63	455	.3	1.7	.26	1,020	1.39	2,360	232	72	72		1,880	7.8	2
Apr. 21-30.....	404	10	.01	60	20	284	6.6	195	62	450	.4	1.6	.20	989	1.35	1,080	232	72	72		1,850	7.8	3
May 1-10.....	254	14	.01	61	21	285	7.0	200	64	455	.4	1.5	.28	1,020	1.39	700	238	74	71		1,860	7.9	3
May 11-20.....	290	14	.01	61	21	281	6.4	196	63	450	.3	1.6	.20	a993	1.35	778	238	78	71		1,840	8.0	3
May 21-31.....	640	12	.01	59	20	278	7.2	194	62	450	.3	1.5	.20	997	1.36	1,720	229	71	72		1,820	7.9	3
June 1-10	1,081	12	.01	59	20	277	6.8	193	63	445	.3	1.8	.28	1,000	1.36	2,920	229	71	72		1,820	8.0	2
June 11-20	1,195	11	.00	59	20	282	6.8	191	62	450	.4	1.6	.20	1,000	1.36	3,230	229	72	72		1,840	7.7	2
June 21-30	1,452	11	.00	60	21	287	5.6	190	63	450	.4	1.3	.19	1,010	1.37	3,960	236	80	72		1,860	7.9	4
July 1-10.....	1,348	14	.00	59	21	294	6.8	191	64	470	.4	1.3	.19	a1,040	1.41	3,790	234	77	73		1,890	7.8	3
July 11-20.....	1,676	25	.00	58	22	301	7.0	192	66	475	.4	1.4	.14	a1,060	1.44	4,800	235	78	73		1,920	7.9	4
July 21-31.....	1,208	--	.00	48	23	321	7.8	177	70	495	.5	4.4	.30	1,130	1.54	3,690	214	70	76		1,980	8.2	4

a Computed as sum of dissolved constituents.

Aug. 1-10.....	570	22	.01	58	23	327	7.0	185	65	515	.5	1.6	.30	1,140	1.55	1,750	239	88	74	2,090	7.4	2
Aug. 11-20.....	1,426	20	.01	61	25	380	8.4	180	78	600	.5	2.3	.32	a1,280	1.74	4,930	255	108	76	2,330	7.5	2
Aug. 21-28.....	1,291	21	.01	60	26	382	8.8	175	80	610	.5	2.8	.35	1,300	1.77	4,530	256	113	76	2,340	7.5	2
Aug. 29-31, Sept. 1-10.....	23.8	18	.03	39	13	168	8.0	112	44	270	.5	2.7	.24	636	.86	41	151	59	69	1,160	7.7	30
Sept. 11-20.....	9.40	21	.02	41	15	173	--	118	45	275	--	3.2	--	a631	.86	16	164	68	70	1,170	--	--
Sept. 21-30.....	8.68	21	.01	44	16	194	8.0	133	46	308	.5	4.9	.35	713	.97	17	176	67	69	1,290	7.6	25
Weighted average	b612	18	0.01	58	21	297	6.9	187	65	472	0.4	2.1	0.23	1,050	1.43	1,740	231	78	73	1,910	--	--

a Computed as sum of dissolved constituents.
b Mean discharge for water year October 1950 to September 1951 was 564 cfs. Runoff for period Dec. 9-20, 1950, Jan. 1, Sept. 30, 1951 was 85 percent of total for water year.

GILA RIVER BASIN--Continued

SALT RIVER AT STEWART MOUNTAIN DAM, ARIZ.--Continued

Temperature (°F) of water, December 1950 to September 1951
[Once-daily temperature measurement between 6 a. m. and 8:30 a. m.]

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

VERDE RIVER BELOW BARTLETT DAM, ARIZ.

LOCATION.--At gaging station 2½ miles downstream from Bartlett Dam, Maricopa County, and 3½ miles upstream from Camp Creek.
DRAINAGE AREA.--6,160 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1951.
Water temperatures: December 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 450 ppm July 11-20; minimum, 190 ppm Sept. 11-20.
Hardness: Maximum, 277 ppm Mar. 11-20; minimum, 120 ppm Sept. 1-10.
Specific conductance: Maximum daily, 725 micromhos June 28; minimum daily, 251 micromhos Sept. 17.
Water temperatures: Maximum observed, 90°F July 18, Aug. 14.
REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Values reported for dissolved solids are residue on evaporation. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
															Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Noncarbonate				
Dec. 7-10, 1950	26.5	21	0.02	46	39	41	2.4	292	0	79	29	0.2	2.2	0.3	a 404	0.55	29	276	36	24	653	8.0	2
Dec. 11-20	147	22	.01	44	39	40	3.0	287	0	80	31	.3	1.3	.25	a 402	.55	160	270	36	24	642	8.0	3
Dec. 21-31	396	23	.02	48	38	38	2.6	300	0	74	28	.4	1.2	.42	392	.53	429	276	30	23	648	8.0	2
Jan. 1-10, 1951	208	22	.01	43	39	39	6.2	271	10	73	27	.3	.4	.27	a 393	.53	221	268	30	24	638	8.0	2
Jan. 11-20	206	22	0	43	38	38	6.2	269	10	70	27	.2	.3	.13	a 387	.53	215	264	26	23	622	8.1	2
Jan. 21-31	199	22	.01	43	37	37	5.2	267	10	67	25	.3	.3	.19	370	.50	199	260	24	23	615	8.1	2
Feb. 1-10	119	20	.01	47	35	35	5.6	261	12	67	24	.3	.6	.15	365	.50	117	262	28	22	611	8.1	2
Feb. 11-20	258	24	.01	44	38	36	6.0	265	11	72	28	.3	1.3	.27	400	.54	279	266	31	22	641	7.9	3
Feb. 21-28	213	24	.01	48	38	35	6.8	279	8	73	27	.3	1.0	.44	398	.54	229	276	34	21	651	8.1	2
Mar. 1-10	282	24	.01	48	35	34	5.0	280	6	66	25	.3	.6	.37	384	.52	292	264	24	21	629	8.0	2
Mar. 11-20	439	24	.01	50	37	32	6.0	287	0	69	27	.3	1.3	.34	390	.53	462	277	42	20	630	8.0	3
Mar. 21-31	214	26	.01	48	35	33	4.4	286	0	66	25	.3	.9	.17	384	.52	222	264	30	21	624	7.9	2
Apr. 1-10	88.9	22	.01	46	36	32	7.0	281	0	71	25	.3	.9	.17	383	.52	92	263	32	20	626	7.8	2
Apr. 11-20	209	24	.01	44	37	33	4.2	268	6	73	24	.3	1.0	.52	a 379	.52	214	262	32	21	635	8.0	3
Apr. 21-30	210	24	.01	45	37	40	5.0	285	0	78	27	.3	.8	.08	a 397	.54	225	264	31	24	647	8.0	2
May 1-10	427	26	.01	42	36	40	3.5	247	13	76	28	.4	.9	.25	381	.52	439	253	30	25	626	8.2	5
May 11-20	338	23	.01	42	30	32	4.5	231	10	60	22	.3	1.0	.21	a 339	.46	309	228	23	23	551	8.2	6
May 21-31	274	24	.01	44	33	36	3.0	267	0	70	25	.3	1.0	.22	367	.50	272	246	26	24	602	8.2	6
June 1-10	98.2	29	.01	45	38	47	5.2	263	10	91	30	.3	1.5	.26	426	.58	113	268	36	27	683	8.2	2
June 11-20	84.6	33	.01	44	39	48	5.6	274	6	98	33	.2	1.2	.27	437	.59	100	270	36	27	700	8.0	2
June 21-30	99.4	26	.01	42	40	51	6.0	266	8	102	35	.4	.6	.32	449	.61	121	270	38	29	701	8.2	2
July 1-10	123	24	.01	40	40	51	5.6	250	10	106	37	.4	.8	.38	438	.60	145	264	44	29	710	8.2	2
July 11-20	81.4	27	.01	40	41	48	6.0	250	9	107	38	.4	.9	.27	450	.61	99	268	49	27	718	8.3	2
July 21-31	78.8	29	.01	35	38	53	6.4	242	0	106	37	.5	1.3	.18	416	.57	89	244	45	31	681	8.2	6

a Computed as sum of dissolved constituents.

GILA RIVER BASIN--Continued

VERDE RIVER BELOW BARTLETT DAM, ARIZ.--Continued

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Aug. 1-10, 1951	81.0	33	0.03	39	36	48	7.0	235	10	96	30	0.6	1.3	0.22	a 417	0.57	91	246	136	29	658	8.1	6
Aug. 11-20	126	33	.02	43	36	43	7.0	250	10	86	29	.4	1.5	.22	a 412	.56	140	256	34	26	649	8.2	6
Aug. 21-30	127	24	.01	44	30	40	6.4	249	0	77	26	.4	1.9	.17	364	.50	125	234	30	26	601	8.0	10
Sept. 1-10	498	20	.04	30	11	14	4.5	134	0	25	8.0	.6	5.6	.08	191	.26	257	120	10	19	296	7.8	45
Sept. 11-20	1,664	22	.04	32	11	10	5.2	141	0	21	7.0	.4	3.1	.09	190	.26	854	125	10	14	289	7.8	35
Sept. 21-30	819	22	.03	34	14	12	4.2	162	0	27	8.5	.4	1.0	.09	218	.30	482	142	10	15	330	7.9	45
Weighted average	b 275	23	0.02	40	27	28	4.9	231	--	56	20	0.4	1.7	0.21	319	0.43	236	211	22	22	513	--	--

a Computed as sum of dissolved constituents.

b Mean discharge for water year October 1950 to September 1951 was 256 c f s. Runoff for period December 7, 1950 to September 30, 1951 was 88 percent of total for water year.

GILA RIVER BASIN--Continued

VERDE RIVER BELOW BARTLETT DAM, ARIZ.--Continued

Temperature (°F) of water, December 1950 to September 1951
[Once-daily temperature measurement generally between 3 p. m. and 4 p. m.]

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

a Measured between 8 a. m. and 10 a. m.
b Measured before 8 a. m.

GILA RIVER BASIN--Continued

AGUA FRIA RIVER BELOW LAKE PLEASANT DAM, ARIZ.

LOCATION.--At water-stage recorder on canal 1¼ miles downstream from Lake Pleasant Dam on Agua Fria River, 19 miles north of Marinette, Maricopa County, and 23 miles upstream from New River.
DRAINAGE AREA.--1,460 square miles approximately (above Lake Pleasant Dam).
RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1951.
REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Values reported for dissolved solids are residue on evaporation. Samples for which no discharge is shown were collected at surface of the lake at the dam during periods of no release. The only flow during period was Aug. 24-27. There was no spill over dam. Records of discharge for water year October 1950 to September 1951 furnished by Surface Water Branch, Tucson District. Records of inflow to Lake Pleasant are published as Agua Fria River at Lake Pleasant Dam in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Dec. 8, 14, 21, 29, 1950		12	0.15	73	43	136	8.0	386	95	169	0.3	1.1	0.35	749	1.02		359	42	44		1,260	7.7	8
Jan. 5, 12, 19, 1951		11	.01	81	44	137	6.4	401	97	174	.3	2.9	.32	776	1.06		383	54	43		1,310	7.5	7
Feb. 9, 16, 23		8.8	--	44	20	51	5.2	137	99	65	.3	5.9	.65	383	.52		192	80	36		633	7.2	4
Mar. 2, 9, 16, 23, 30		9.2	--	44	22	63	5.8	163	98	77	.3	1.7	.20	421	.57		200	67	40		702	7.3	7
Apr. 6, 10, 20, 27		9.3	.01	58	26	75	7.0	220	107	88	.3	1.4	.20	492	.67		252	71	38		822	7.3	4
May 4, 11, 18, 25		8.5	.03	64	32	81	6.4	267	119	96	.4	.6	.33	553	.75		291	72	37		935	7.9	8
June 1, 8, 15, 29		7.4	.21	70	35	98	7.0	300	134	116	.4	.1	.28	632	.86		318	72	39		1,060	7.8	15
July 6, 13, 20, 27		13	.16	70	39	106	8.2	309	144	116	.8	.5	.42	691	.94		335	82	40		1,140	7.8	23
Aug. 3, 10-11		13	.05	41	12	28	4.8	179	32	25	.6	.8	a.1	242	.33		152	6	28		389	7.4	55
Aug. 24-27	57.0	12	.25	35	9.0	13	3.6	149	16	14	.3	.9	.05	190	.26	29.2	124	2	18		301	7.3	55
Sept. 7, 14, 21, 28		29	.07	31	5.5	10	3.2	b113	20	5	.6	2.3	a.1	176	.24		100	8	17		237	8.4	45

a Reported boron concentration is less than figure indicated.
b Includes equivalent of 6 parts per million of carbonate (CO_3).

GILA RIVER BELOW GILLESPIE DAM, ARIZ.

LOCATION.--About 1 mile below gaging station on Gila Bend Canal which is 200 feet below Gillespie Dam, Maricopa County, and 8 miles downstream from Hassayampa River. Gila Bend Canal diverts from left bank and Enterprise Canal diverts from right bank at Gillespie Dam.
DRAINAGE AREA.--49,600 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1951.
Water temperatures: December 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 6,000 ppm Sept. 21-30; minimum, 262 ppm Sept. 1.
Hardness: Maximum, 1,810 ppm Sept. 21-30; minimum, 135 ppm Sept. 1
Specific conductance: Maximum daily, 9,580 micromhos Sept. 30; minimum daily, 420 micromhos Sept. 1.
Water temperatures: Maximum observed, 95°F July 19.
REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Values reported for dissolved solids are sums of determined constituents. Samples from canal are believed to be representative of total flow passing Gillespie Dam including spill and amounts diverted into Gillespie and Enterprise canals. Record of separate and combined discharge for the river and canals for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Dec. 1-10, 1950..	39.9	32	0.02	386	153	1,400	3.0	403	1,150	2,230	1.6	40	2.8	5,590	7.60	602	1,590	1,260	66		8,670	7.3	4
Dec. 11-20.....	44.9	30	.02	382	156	1,390	1.4	401	1,150	2,200	2.4	39	3.1	5,550	7.55	673	1,590	1,270	65		8,580	7.6	6
Dec. 21-31	44.6	30	.02	372	152	1,370	1.6	367	1,140	2,190	2.4	39	2.8	5,480	7.45	660	1,550	1,250	66		8,420	7.8	5
Jan. 1-10, 1951 ..	51.5	32	.01	380	170	1,410	7.6	394	1,170	2,190	2.4	41	2.4	5,600	7.62	779	1,650	1,320	65		8,620	7.4	4
Jan. 11-20.....	56.5	28	.01	356	161	1,330	7.6	378	1,100	2,070	2.2	42	2.5	5,280	7.18	805	1,550	1,240	65		8,140	7.6	5
Jan. 21-30.....	64.7	29	.01	366	164	1,350	7.2	386	1,120	2,120	2.2	43	2.3	5,390	7.33	942	1,590	1,270	65		8,330	7.7	4
Jan. 31.....	370	16	--	156	45	388	--	218	356	630	--	2.2	1.0	1,700	2.31	1,700	574	396	60		2,860	--	--
Feb. 1-4.....	147	20	--	198	86	684	7.2	236	562	1,070	1.2	27	1.2	2,770	3.77	1,100	848	654	63		4,570	7.5	18
Feb. 5-10	83.7	28	.01	352	152	1,290	9.4	375	1,040	1,990	2.0	40	2.3	5,090	6.92	1,150	1,500	1,200	65		7,860	7.5	7
Feb. 11-20	68.0	34	0	367	157	1,300	5.2	384	1,090	2,060	2.4	40	2.9	5,240	7.13	962	1,560	1,250	64		8,330	7.7	5
Feb. 21-28.....	63.6	32	0	365	156	1,310	6.0	379	1,100	2,110	2.4	54	3.3	5,320	7.24	914	1,550	1,240	65		8,400	7.8	4
Mar 1-10	60.4	34	0	359	156	1,330	6.0	369	1,060	2,150	2.4	44	3.2	5,320	7.24	868	1,540	1,230	65		8,450	7.7	3
Mar. 11-20.. ...	56.3	33	0	369	154	1,330	3.6	328	1,110	2,170	2.4	47	3.4	5,380	7.32	818	1,550	1,280	65		8,510	7.7	4
Mar. 21-27, 29-31	58.6	29	0	360	151	1,320	5.2	365	1,080	2,120	2.4	40	3.0	5,290	7.19	837	1,520	1,220	65		8,330	7.7	4
Mar. 28	94	27	--	202	80	710		225	592	1,100	1.2	26	--	2,850	3.88	723	833	648	65		4,610	--	--
Apr. 1-10.....	52.5	30	.01	384	156	1,380	9.2	388	1,130	2,160	2.2	22	2.5	5,460	7.43	774	1,600	1,280	65		8,460	7.7	2
Apr. 11-20.....	52.8	32	.00	378	156	1,380	9.0	382	1,110	2,160	2.2	24	2.6	5,440	7.40	776	1,580	1,270	65		8,410	7.7	3
Apr. 21-30	49.8	37	.00	376	156	1,370	7.0	384	1,120	2,130	2.2	21	2.5	5,410	7.36	727	1,580	1,260	65		8,360	7.8	2
May 1-10.....	46.0	33	.01	386	156	1,360	9.2	372	1,130	2,170	2.2	22	2.5	5,450	7.41	677	1,600	1,300	65		8,460	7.6	2
May 11-20	43.0	37	.01	378	156	1,390	6.8	367	1,150	2,160	2.6	24	2.6	5,490	7.47	637	1,580	1,280	65		8,430	7.7	2
May 21-31	35.7	39	.02	368	155	1,390	7.0	339	1,140	2,150	2.4	23	2.5	5,440	7.40	524	1,560	1,280	66		8,360	7.7	2

GILA RIVER BASIN--Continued

GILA RIVER BELOW GILLESPIE DAM, ARIZ.--Continued

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
June 1-10, 1951.	29.8	27	0.01	360	163	1,370	6.6	336	1,130	2,160	2.2	48	3.2	5,430	7.38	437	1,570	1,290	65		8,430	7.6	2
June 11-20.....	23.3	28	.01	356	159	1,360	8.2	330	1,120	2,150	2.2	42	2.7	5,390	7.33	339	1,540	1,270	66		8,370	7.6	2
June 21-30.....	18.0	23	.01	350	157	1,380	6.0	313	1,140	2,190	2.2	36	2.8	5,440	7.40	264	1,520	1,260	66		8,410	7.7	2
July 1-10.....	17.7	24	.01	356	156	1,380	7.4	314	1,160	2,180	2.2	44	2.9	5,460	7.43	261	1,530	1,270	66		8,500	7.7	3
July 11-20.....	21.8	33	.01	346	156	1,400	7.8	297	1,140	2,190	2.2	31	3.0	5,450	7.41	321	1,500	1,260	67		8,410	7.6	2
July 21-27, Aug. 2	29.9	59	.01	310	130	1,150	4.8	262	988	1,840	2.0	23	2.5	4,640	6.31	375	1,310	1,090	66		7,310	7.8	18
July 28-31.....	457	72	.01	130	36	319	9.6	a 235	290	480	1.2	5.8	1.0	1,460	1.99	1,800	472	280	59		2,380	8.6	65
Aug. 1, 3.....	207	95	0	130	46	437	9.6	b 252	403	600	1.4	14	--	1,860	2.53	1,040	514	307	64		2,980	8.5	45
Aug. 4, 5.....	2,075	52	.01	59	11	85	8.8	c 189	67	110	.8	.5	--	487	.66	2,730	192	37	48		810	8.3	55
Aug. 6-10	734	37	.02	62	13	224	6.0	235	200	215	1.0	3.0	.75	877	1.19	1,740	208	16	69		1,450	7.9	45
Aug. 11-15, 18-26	86.7	31	.02	376	153	1,290	6.8	350	1,090	2,080	1.8	24	2.4	5,220	7.10	1,220	1,570	1,280	64		8,140	7.5	15
Aug. 16, 17	176	23	0	164	63	511	8.8	202	420	815	1.0	8.3	--	2,110	2.87	1,000	688	502	62		3,540	7.7	16
Aug. 27.....	586	30	0	101	26	178	8.8	298	108	280	.6	1.4	.75	881	1.20	1,390	379	115	51		1,550	7.2	55
Aug. 28-31	8,500	14	.02	55	9.2	77	5.6	158	70	105	.6	3.0	.32	417	.57	9,570	175	46	48		727	7.2	22
Sept. 1.....	4,640	20	--	41	7.9	39		167	39	27	--	6.0	--	262	.36	3,280	135	0	39		420	--	--
Sept. 2.....	2,540	23	--	42	9.6	137	--	180	121	115	--	6.1	--	543	.74	3,720	144	0	67		900	--	--
Sept. 3, 4	507	25	--	167	58	526	8.5	300	403	790	1.4	12	--	2,140	2.91	2,930	655	409	63		3,570	7.9	30
Sept. 5-10.....	248	34	.01	408	181	1,410	5.6	424	1,060	2,320	1.8	26	2.4	5,660	7.70	3,790	1,760	1,410	63		8,880	7.9	8
Sept. 11-20.....	174	39	.01	408	185	1,440	9.2	379	1,100	2,390	2.0	28	2.8	5,790	7.87	2,720	1,780	1,470	64		9,070	7.7	8
Sept. 21-30	100	36	.01	402	196	1,510	7.6	348	1,190	2,450	2.2	37	3.0	6,000	8.16	1,620	1,810	1,520	64		9,370	7.6	6
Weighted average	d 231	25	0.02	135	48	407	6.4	221	336	620	1.1	11	--	1,700	2.31	1,060	534	354	62		2,710	--	--

a Includes equivalent of 18 parts per million of carbonate (CO_3).
b Includes equivalent of 26 parts per million of carbonate (CO_3).
c Includes equivalent of 7 parts per million of carbonate (CO_3).
d Runoff for period Dec. 1, 1950 to Sept. 30, 1951 was 97 percent of total for water year.

GILA RIVER BASIN--Continued

GILA RIVER BELOW GILLESPIE DAM, ARIZ.--Continued

Temperature (°F) of water, December 1950 to September 1951
[Once-daily temperature measurement at approximately 8 a. m.]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			50	35	48	53	62	53	69	80	85	76
2			53	36	45	54	62	56	67	80	85	76
3			53	40	47	50	60	64	68	80	83	75
4			54	43	49	50	64	65	69	80	78	75
5			53	45	52	52	60	66	70	78	80	77
6			52	44	54	55	61	68	68	81	80	78
7			50	46	57	56	65	72	70	81	81	77
8			51	45	57	58	64	75	72	82	80	77
9			50	45	58	60	65	70	70	82	81	76
10			53	46	59	60	66	71	72	80	80	76
11			53	45	59	60	63	70	71	80	79	76
12			53	52	59	60	63	68	72	80	80	76
13			52	43	57	56	64	68	73	82	83	76
14			53	45	55	56	64	60	72	85	83	76
15			54	46	54	57	65	60	72	85	80	76
16			53	46	54	60	67	64	75	86	80	76
17			52	49	57	61	67	65	74	85	83	76
18			52	49	57	55	67	78	74	85	84	76
19			53	49	56	60	68	72	76	a95	83	76
20			51	51	56	55	56	73	77	85	83	76
21			50	51	56	57	65	72	75	85	83	81
22			50	51	56	58	67	70	72	85	80	81
23			50	52	56	60	67	70	74	85	80	76
24			49	54	59	60	66	71	72	85	80	75
25			48	55	57	62	67	74	75	85	75	78
26			36	54	55	62	65	75	75	83	79	76
27			36	55	56	60	65	78	75	85	80	71
28			36	55	52	61	68	75	75	80	80	72
29			36	57	--	59	62	76	75	81	80	75
30			38	57	--	61	50	76	80	85	80	74
31			48	47	--	60	--	74	--	85	80	--
Average			49	48	55	58	64	69	73	83	81	76

a Temperature reading made at 3:30 p. m.

DIVERSIONS AND RETURN FLOWSAT AND BELOW IMPERIAL DAM

YUMA MAIN CANAL BELOW COLORADO RIVER SIPHON, AT YUMA, ARIZ.

LOCATION.--At gaging station on Yuma Main Canal below Colorado River siphon at Yuma, Yuma County, on Arizona side of river, a quarter of a mile downstream from highway bridge over Colorado River at Yuma, and 3 miles downstream from siphon drop power plant.
DRAINAGE AREA.--242,900 square miles, including all closed basins within drainage boundary.
RECORDS AVAILABLE.--Chemical analyses: September 1926 to September 1928, October 1942 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 735 ppm May 21-25, 28-29, 31; minimum, 650 ppm Sept. 3-7, 10.
Hardness: Maximum, 350 ppm May 1-4, 7-10; minimum, 303 ppm Sept. 3-7, 10.
Specific conductance: Maximum daily, 1,090 micromhos on several days during May to August; minimum daily, 921 micromhos Sept. 4.
EXTREMES, 1926-28, 1942-51.--Dissolved solids: Maximum, 1,300 ppm Jan. 11-20, 1927; minimum, 285 ppm June 11-20, 1928.
Hardness: Maximum, 567 ppm Oct. 21-31, 1926; minimum, 163 ppm June 11-20, 1928.
Specific conductance (1943-51): Maximum daily, 1,150 micromhos on several days in May and June 1944 and June 1947; minimum daily, 828 micromhos Nov. 21, 1949.
REMARKS.--Samples collected prior to February 1943 were from gaging station on the Colorado River at Yuma. Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1213.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 2-6, 9-10, 1950	617	14	0.02	82	26	93	6.0	165	268	80	0.2	0.9		684	0.93	1,140	312	176	39	1,010	7.6	--
Oct. 11-13, 16-20	661	14	.02	82	26	95	6.8	165	273	81	.2	.7		692	.94	1,240	312	176	39	1,000	7.6	--
Oct. 23-27, 30-31	627	12	.02	82	27	97	5.6	170	274	84	.2	.8		691	.94	1,170	316	176	40	1,010	7.8	--
Nov. 1-3, 6-10	580	13	.02	84	26	98	4.8	170	272	83	.2	.8		696	.95	1,090	316	177	40	1,020	7.6	--
Nov. 11, 13-16,20	536	17	.02	86	27	98	4.0	169	277	84	.2	1.2		701	.95	1,010	326	187	39	1,030	8.0	--
Nov. 21-22, 24, 27-30	487	15	.02	85	27	95	4.4	171	274	83	.2	1.0		697	.95	916	323	183	39	1,030	7.8	--
Dec. 1, 4-8	361	13	.02	86	27	97	5.2	178	276	83	.2	1.0		701	.95	683	326	180	39	1,030	8.1	--
Dec. 11-15, 18-20	400	13	.02	88	27	97	5.2	171	279	84	.2	.8		695	.95	751	330	190	39	1,040	8.1	--
Dec. 21-22, 25-29	324	13	.06	86	28	97	5.6	172	278	85	.4	1.3		700	.95	612	330	188	39	1,030	8.1	--
Jan. 1-6, 9-10, 1951	347	13	.05	87	28	98	4.0	170	280	84	.4	1.3		702	.95	658	332	192	39	1,040	8.1	--
Jan. 11-12, 15-19	282	14	.05	88	28	96	4.4	173	278	85	.4	1.2		697	.95	531	334	192	38	1,040	8.1	--
Jan. 22-26, 29-31	449	13	.06	86	29	99	5.6	175	277	85	.4	1.3		702	.95	851	334	190	39	1,040	8.1	--
Feb. 1-2, 5-9	596	13	.08	88	26	98	8.2	174	277	88	.2	.9		698	.95	1,120	326	184	39	1,040	8.1	7
Feb. 15-16, 19-21	554	14	.07	92	27	100	6.2	176	283	88	.2	1.1		707	.96	1,060	340	196	38	1,050	7.9	5
Feb. 22-23, 26-28	583	15	--	--	27	99	8.0	177	287	92	.2	.9		--	--	--	--	--	37	1,060	8.1	7
Mar. 1-2, 5-9	535	13	.09	87	29	99	3.6	175	281	85	.3	1.4		702	.95	1,010	336	192	39	1,060	8.1	5

Mar. 12-14, 16, 19-20	545	11	.06	88	27	102	8.3	176	280	88	.4	1.4	709	.96	1,040	330	186	39	1,070	8.0	7
Mar. 21-23, 26-30	517	8.5	.05	88	27	104	7.5	173	285	90	.3	1.5	708	.96	988	330	188	40	1,070	8.0	7
Apr. 2-6, 9-10	536	8.9	.06	88	28	102	5.0	170	286	80	.2	1.8	708	.96	1,020	334	195	39	1,060	7.7	10
Apr. 11-12, 16-20	554	10	.07	90	28	91	4.8	172	283	80	.4	1.8	704	.96	1,050	340	198	36	1,060	7.7	8
Apr. 23-27, 30	500	14	.04	88	30	103	6.0	185	287	86	--	1.0	714	.97	964	343	192	39	1,070	8.1	15
May 1-4, 7-10	622	14	.05	89	31	104	5.6	176	287	89	.4	1.4	726	.99	1,220	350	206	39	1,080	8.0	4
May 11, 14-18	609	14	.02	88	31	107	5.0	180	289	90	.4	1.3	728	.99	1,200	347	200	40	1,090	8.1	6
May 21-25, 28-29, 31	664	15	.03	88	30	107	5.4	177	288	89	.4	1.3	735	1.00	1,320	343	198	40	1,080	8.1	3
June 1, 4-8	690	15	.07	87	29	107	3.2	176	288	95	.4	.8	719	.98	1,340	336	192	41	1,100	8.0	6
June 11-15, 18	671	15	.06	87	29	106	2.9	179	289	88	.4	.8	717	.98	1,300	336	190	40	1,080	8.1	6
June 25-29	734	14	.05	88	29	109	4.0	178	292	90	.4	1.1	730	.99	1,450	338	192	41	1,090	8.2	6
July 2-3, 5-6, 9-10	750	15	.05	86	28	108	3.0	177	288	95	.4	.8	721	.98	1,460	330	184	41	1,080	8.2	7
July 11-20	711	17	.05	86	28	107	4.2	172	284	95	.4	.8	714	.97	1,370	330	188	41	1,070	8.3	7
July 23-27, 30-31	787	15	.06	84	28	107	3.7	172	289	90	.4	.8	718	.98	1,530	324	184	41	1,070	8.3	7
Aug. 2-3, 6-10	781	15	.07	84	28	109	4.0	188	288	85	.4	1.1	706	.96	1,490	324	170	42	1,070	8.3	7
Aug. 13-17, 20	764	17	.05	84	28	103	3.4	147	286	95	.4	.7	703	.96	1,450	324	204	41	1,060	8.3	7
Aug. 21-22, 28-29, 31	537	12	.07	83	27	101	3.4	163	278	88	.4	.9	689	.94	999	318	184	40	1,050	8.3	7
Sept. 3-7, 10	541	16	.04	77	27	95	6.4	162	254	80	.4	1.7	650	.88	949	303	170	40	969	7.8	--
Sept. 11-14, 17-20	697	16	.04	79	29	100	6.2	162	276	84	.4	1.3	689	.94	1,300	316	184	40	1,030	8.0	10
Sept. 21, 24-28	751	18	.04	82	30	103	7.4	162	283	86	.4	1.2	709	.96	1,440	328	196	40	1,050	8.1	--
Weighted average	a 579	14	0.05	86	28	101	5.2	172	281	87	0.3	1.1	706	0.96	1,100	330	188	40	1,050	--	--

a Represents 73 percent of runoff for water year October 1950 to September 1951.

PART 10. THE GREAT BASIN

SEVIER LAKE BASIN

SEVIER RIVER NEAR LYNNDYL, UTAH

LOCATION.--At bridge on State Highway 125, 1¼ miles upstream from gaging station, which is 3½ miles southwest of Lynndyl, Millard County.
DRAINAGE AREA.--6,270 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: March to September 1951.
Water temperatures: March to September 1951.
EXTREMES, March to September 1951.--Dissolved solids: Maximum, 2,040 ppm Sept. 21-30; minimum, 1,490 ppm Mar. 22-31.
Hardness: Maximum, 702 ppm Sept. 21-30; minimum, 598 ppm Apr. 21-30.
Specific conductance: Maximum daily, 3,710 micromhos Sept. 24; minimum daily, 1,510 micromhos Apr. 18.
Water temperatures: Maximum, 80°F July 30-31.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1214.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 22-31, 1951	46.1	20	0.03	105	96	279	8.8	324	370	450	0.0	2.4		1,490	2.03	185	656	391	48	2,420	7.9	5
Apr. 1-10.....	49.8	17	.04	102	95	289	11	312	372	455	.0	1.8		1,500	2.04	202	645	390	49	2,440	7.8	5
Apr. 11-17,19-20	96.3	21	.05	98	96	296	16	311	383	460	.1	3.9		1,530	2.08	398	639	384	49	2,450	7.9	6
Apr. 18 a.....	176	--	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--	1,510	--	--
Apr. 21-30.....	395	29	--	88	92	340	--	314	423	465	--	10		1,600	2.18	1,710	598	340	55	2,560	7.8	--
May 1-10 a.....	527	--	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--	2,610	--	--
May 11-20	505	29	--	90	95	369	--	323	442	490	--	9.7		1,680	2.28	2,290	615	350	57	2,690	--	--
May 21-31 a....	305	--	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--	2,750	--	--
June 1-10	468	28	.06	88	96	357	10	308	441	485	.4	16		1,670	2.27	2,110	614	362	55	2,680	7.6	15
June 11-20	318	27	.05	84	96	359	10	298	433	490	.4	16		1,660	2.26	1,430	604	360	56	2,660	7.7	5
June 21-30	442	29	.05	84	96	352	10	292	439	495	.4	16		1,670	2.27	1,990	604	364	55	2,680	7.9	5
July 1-10.....	606	26	.02	83	99	377	10	294	462	515	.4	16		1,730	2.35	2,830	614	373	57	2,790	7.8	5
July 11-20.....	557	25	.02	82	101	387	12	294	471	538	.4	16		1,780	2.42	2,680	620	379	57	2,840	7.8	5
July 21-31.....	174	25	.03	81	104	390	8.0	288	473	550	.4	14		1,790	2.43	841	630	394	57	2,890	7.9	5
Aug. 1-10.....	162	27	.04	84	106	409	12	282	502	582	.2	5.2		1,870	2.54	818	646	414	57	2,980	7.8	5
Aug. 11-20.....	291	26	.05	76	107	422	12	288	499	588	.2	5.6		1,880	2.56	1,480	630	394	59	2,940	7.9	5
Aug. 21-31.....	278	27	.08	81	102	430	12	294	500	590	.2	5.4		1,890	2.57	1,410	622	380	59	2,970	7.9	5
Sept. 1-10.....	212	26	.03	80	108	437	12	296	509	610	.2	5.3		1,930	2.62	1,100	644	401	59	3,030	7.8	5
Sept. 11-20.....	187	25	.03	80	111	467	14	306	516	635	.3	4.8		2,000	2.72	1,010	656	406	60	3,120	7.9	5
Sept. 21-30.....	125	21	.09	90	116	461	12	322	519	660	.3	5.4		2,040	2.77	688	702	438	58	3,210	7.9	5
Weighted average	b 256	27	0.04	85	100	381	11	301	461	527	0.3	12		1,750	2.38	1,210	623	376	57	2,790	--	--

a Not included for computation of weighted averages.
b Represents 75 percent of runoff for water year October 1950 to September 1951

SEVIER LAKE BASIN--Continued

SEVIER RIVER NEAR LYNNDYL, UTAH--Continued

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

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

SALTON SEA BASIN

MISCELLANEOUS ANALYSES OF STREAMS IN SALTON SEA BASIN IN CALIFORNIA

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

Date of collection	Mean discharge (cfs) a	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
ALAMO RIVER NEAR CALIPATRIA																						
Oct. 11, 1950	849.4	79	38		130	64	335	190	508	445		3.5		1,620	2.20	3,720	588	432	55	2,430		
Nov. 16	928	64	13		144	69	323	195	514	458		6.1		1,620	2.20	4,060	643	483	52	2,520		
Dec. 21	689.2	55	14		159	85	394	204	563	600		5.3		1,920	2.61	3,570	746	579	53	3,030		
Jan. 29, 1951	897.6	56	13		146	76	334	196	516	495		8.5		1,690	2.30	4,100	677	516	52	2,650		
Feb. 27	931.3	50	16		144	75	345	205	507	508		5.7		1,700	2.31	4,270	668	500	53	2,690		
Mar. 16	737.3	60	11		146	73	325	200	505	480		5.9		1,640	2.23	3,260	664	500	52	2,590		
Apr. 26	926.0	--	--		145	79	379	192	547	555		2.1		1,800	2.45	4,500	687	530	55	2,830		
May 25	768.1	78	13		142	77	374	207	534	535		5.4		1,780	2.42	3,690	671	502	55	2,810		
June 25	826.5	--	12		132	72	332	196	486	480		4.0		1,610	2.19	3,590	626	465	54	2,540		
July 12	875.5	--	--		124	80	386	136	551	562		.7		1,770	2.41	4,180	638	527	57	2,860		
Aug. 9	857.0	--	15		141	78	382	197	547	545		4.1		1,810	2.46	4,190	672	511	55	2,850		
Sept. 6	780.4	--	18		176	100	492	194	629	780		6.4		2,300	3.13	4,850	850	691	56	3,610		
Oct. 18	1,083.1	72	--		--	--	--	194	499	428		--		--	--	--	b 616	457	--	2,500		
NEW RIVER NEAR WESTMORELAND																						
Oct. 11, 1950	570.5	78	19		137	59	388	203	435	570		4.5		1,710	2.33	2,630	584	418	59	2,750		
Nov. 16	719	64	23		130	60	340	206	426	492		4.1		1,580	2.15	3,070	571	402	56	2,520		
Dec. 21	569.1	56	15		157	74	472	208	479	745		4.0		2,050	2.79	3,150	696	526	60	3,350		
Jan. 29, 1951	568.8	56	13		154	72	483	213	466	755		8.4		2,060	2.80	3,160	680	506	61	3,350		
Feb. 27	595.4	50	12		145	66	407	211	435	632		2.7		1,800	2.45	2,890	634	460	58	2,960		
Mar. 16	671.7	60	14		168	78	538	225	506	848		3.2		2,270	3.09	4,120	740	555	61	3,660		
Apr. 26	768.2	--	7.6		131	56	358	204	416	520		3.3		1,590	2.16	3,300	558	390	58	2,590		
May 25	600.0	79	17		146	66	419	219	463	625		4.1		1,850	2.52	3,000	636	456	59	2,970		
June 25	464.0	--	14		160	76	491	219	490	770		4.0		2,110	2.87	2,640	712	532	60	3,450		
July 12	558	--	--		116	61	381	142	454	552		.7		1,640	2.23	2,470	540	424	60	2,700		
Aug. 9	480.4	--	28		155	74	516	217	498	790		3.5		2,170	2.95	2,810	691	513	62	3,470		
Sept. 6	535.9	--	14		145	70	498	203	486	750		3.6		2,070	2.82	3,000	650	484	62	3,360		
Oct. 18	669.7	72	--		--	--	--	203	436	540		--		--	--	--	b 536	370	--	2,730		

a Discharge measurements by U. S. Bureau of Reclamation.
b Determined by Schwarzenbach method.

MISCELLANEOUS ANALYSES OF STREAMS IN HUMBOLDT RIVER BASIN IN NEVADA

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Noncarbonate				
HUMBOLDT RIVER NEAR DEETH																						
Jan. 20, 1951		40		48	19	57		253	83	19		0.3		391	0.53		198	0	38	622		
Apr. 6								224	50	19							159	0		496		
MARY'S RIVER NEAR DEETH																						
Jan. 20, 1951		42		34	10	37		218	17	7		0.5		255	0.35		126	0	39	379		
Apr. 6								146	11	5.0							75	0		238		
HUMBOLDT RIVER AT ELKO																						
Jan. 20, 1951	74	32		50	13	42		255	41	12		0.4		316	0.43	63	178	0	34	489		
Apr. 6	602	38		34	8.6	32		186	23	10		.2		237	.32	385	120	0	37	346		
HUMBOLDT RIVER AT PALISADE																						
Jan. 20, 1951	140	38		55	15	49		278	47	19		0.5		360	0.49	136	198	0	35	558		
Apr. 7	833							184	33	12							128	0		380		
HUMBOLDT RIVER AT BEOWAWE																						
Jan. 20, 1951		39		55	15	55		278	51	25		0.9		378	0.51		198	0	37	577		
Apr. 7								192	34	14							134	0		398		
HUMBOLDT RIVER NEAR DUNPHY																						
Dec. 6, 1950		34		39	12	57		215	49	30		2.2		329	0.45		147	0	46	501		
Jan. 20, 1951		36		54	15	56		278	49	28		.4		375	.51		196	0	38	578		
Apr. 7		--		--	--	--		191	35	16		--		--	--		134	0	--	408		
HUMBOLDT RIVER NEAR BATTLE MOUNTAIN																						
Jan. 19, 1951	214	36		54	14	56		274	49	27		0.3		371	0.50	214	192	0	39	568		
Apr. 7	883							197	34	17							134	0		412		

HUMBOLDT RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN HUMBOLDT RIVER BASIN IN NEVADA--Continued

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
HUMBOLDT RIVER AT COMUS																						
Dec. 6, 1950	160	39		46	14	79		294	52	35		0.5		410	0.56	177	172	0	50	621		
Jan. 19, 1951	234	37		53	16	58		278	52	30		.6		384	.52	243	198	0	39	589		
Apr. 7	733	--		--	--	--		208	42	24		--		--	--	--	138	0	--	460		
HUMBOLDT RIVER AT WINNEMUCCA																						
Jan. 19, 1951	278	36		55	15	63		286	54	32		0.5		396	0.54	297	198	0	41	604		
Apr. 7	642							212	44	23							142	0		479		
HUMBOLDT RIVER NEAR IMLAY																						
Dec. 6, 1950	136	31		40	16	83		266	62	45		0.9		409	0.56	150	166	0	52	657		
Jan. 19, 1951	210	37		54	16	69		287	60	38		.4		416	.57	236	201	0	43	638		
Apr. 7	637	34		--	--	--		236	44	28		.3		--	--	--	154	0	--	523		
HUMBOLDT RIVER BELOW LOVELOCK																						
Dec. 6, 1950		54		74	22	576		416	175	712		1.0		1,820	2.48		275	0	82	3,030		
Jan. 19, 1951		47		76	23	519		405	169	640		1.3		1,670	2.27		284	0	80	2,810		

MISCELLANEOUS ANALYSES OF STREAMS IN PYRAMID AND WINNEMUCCA LAKES BASIN IN CALIFORNIA

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

Date of collection	Instantaneous discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
LAKE TAHOE, SOUTH END, (BIJOU)																						
Apr. 17, 1951			--		--	--	--	--	53	--	2.0		--	--	--	--		34	0	--	93.1	7.4
May 15			16		9.2	2.4	5.6	1.6	55	2.4	21		0.5	0.02	86	0.12		34	0	25	96.5	7.4
Sept. 19			12		9.2	2.4	6.6	1.1	53	3.0	2.5	0.0	.0	.07	63	.09		33	0	30	97.4	6.9
LAKE TAHOE, NORTH END, (TAHOE VISTA)																						
May 1, 1951			--		--	--	--	--	56	--	2.5		--	--	--	--		34	0	--	96.9	7.4
May 15			12		9.6	2.9	5.0	1.7	56	2.1	2.2		0.0	0.20	63	0.09		35	0	22	101	8.1
Sept. 19			13		9.2	2.4	7.6	1.5	55	3.9	2.2	0.0	.0	.05	67	.09		33	0	32	99.2	6.9
LAKE TAHOE, WEST SIDE, (TAHOE CITY)																						
Apr. 19, 1951							7.5		56		2.5							35	0		96.7	7.4
Sept. 19			12		9.6	2.2	7.2	0.9	54	2.2	1.8	0.0	0.2	0.04	63	0.09		33	0	31	96.4	6.9
TRUCKEE RIVER NEAR TRUCKEE																						
Apr. 18, 1951	276								36		1.0							26	0		68.3	7.0
Sept. 19	204		13		10	2.4	7.0	1.1	55	3.4	1.8	0.0	0.2	0.09	66	0.09		35	0	30	99.3	7.3
TRUCKEE RIVER AT FARAD																						
Apr. 18, 1951	a 821								37		1.2							28	0		67.8	6.9
Sept. 19			18		8.8	3.2	5.5	0.8	51	3.0	1.8	0.0	0.6	0.04	67	0.09		35	0	25	74.0	6.9

a Mean daily discharge (cfs).

Part 11. PACIFIC SLOPE BASINS IN CALIFORNIA

TULARE LAKE BASIN

MISCELLANEOUS ANALYSES OF STREAMS IN TULARE LAKE BASIN IN CALIFORNIA

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

Date of collection	Instantaneous discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
KAWEAH RIVER NEAR THREE RIVERS																						
Apr. 15, 1951	1,010		--		--	--	2.5	--	25	--	0.8		--	--	--	--		18	0	--	45.7	6.8
May 10	1,030		11		6.0	0.5	2.7	0.9	10	11	1.0		1.6	0.04	40	0.05		18	10	23	56.4	6.3
Sept. 11	37		13		15	1.7	16	1.8	67	7.7	15	0.0	.4	.10	104	.14		44	0	43	171	7.3
KINGS RIVER ABOVE NORTH FORK																						
May 10, 1951	2,790		7.8		3.0	0.4	1.9	1.2	14	2.5	0.6		0.1	0.02	25	0.03		10	0	27	28.5	6.9
Sept. 11	150		9.4		6.0	1.2	6.3	1.0	28	7.8	3.8	0.0	.0	.04	49	.07		20	0	39	74.4	7.2
KINGS RIVER AT PIEDRA																						
Apr. 14, 1951	4,950		--		--	--	2.0	--	12	--	1.8		--	--	--	--		12	2	--	37.2	6.0
May 10	4,330		9.1		3.0	0.4	1.9	1.2	14	2.3	.8		0.4	0.02	26	0.04		9	0	27	31.1	7.0
Sept. 11	162		11		7.6	2.7	5.4	1.2	34	7.0	3.8	0.0	.4	.00	56	.08		30	2	27	78.2	7.2
KINGS RIVER AT PEOPLES WEIR																						
Apr. 15, 1951	700		--		--	--	3.0	--	21	--	1.2		--	--	--	--		14	0	--	41.1	6.6
May 10	385		10		4.3	0.9	2.7	0.8	20	4.0	1.3		6.2	0.03	41	0.06		17	1	24	45.9	6.9
Sept. 11	--		19		24	7.3	24	2.6	130	16	14	0.0	1.3	.00	172	.23		90	0	36	276	8.2

SAN JOAQUIN RIVER NEAR VERNALIS, CALIF.

LOCATION.--At gaging station in El Pescadero Grant, at Durham Ferry highway bridge, 3 miles downstream from Stanislaus River and 3.4 miles northeast of Vernalis, San Joaquin County.
DRAINAGE AREA.--14,010 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: March to September 1951.
Water temperatures: March to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 477 ppm Aug. 1-10; minimum, 69 ppm May 23-31.
Hardness: Maximum, 193 ppm Aug. 1-10; minimum, 30 ppm May 23-31.
Specific conductance: Maximum daily, 851 micromhos Aug. 3; minimum daily, 81.8 micromhos May 30.
Water temperatures: Maximum, 78°F July 19.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Sacramento, Calif. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1215.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Dec. 2, 1950	10,800	13	--	10	4.3	15		51	9.9	15	--	1.7		a 94	0.13	2,740	43	1	43	136	--	--
Mar. 1-10, 1951	8,803	19	0.02	14	6.4	21	3.6	63	18	28	0.4	.8		141	.19	3,350	61	10	41	228	7.4	8
Mar. 11-20	7,825	19	.02	16	7.3	25	3.8	70	23	35	.4	.6		159	.22	3,360	70	13	42	265	7.4	8
Mar. 21-30	6,980	17	.03	16	8.2	26	4.2	67	24	37	.2	.8		170	.23	3,200	74	19	42	285	7.1	10
Mar. 31, Apr. 1-10	3,010	21	.04	28	14	55		100	41	86	.2	1.7		315	.43	2,560	127	45	49	528	7.3	10
Apr. 11-12	1,820	24	--	--	--	--		121	49	121	.2	2.2		--	--	--	b 161	62	--	686	7.3	20
Apr. 13-20	3,020	20	.03	20	9.4	39		81	23	58	.1	.9		214	.29	1,740	89	22	49	356	7.5	15
Apr. 21-22, 27-28	1,928	24	.04	30	15	59		114	36	94	.3	1.8		336	.46	1,750	137	43	49	560	7.4	25
Apr. 23-26, 29-30	2,618	21	.04	21	9.6	39		85	23	58	.2	1.4		221	.30	1,560	92	22	48	374	7.4	18
May 1-10	5,733	18	.04	13	5.5	18	2.6	60	10	25	.1	1.1		122	.17	1,890	55	6	40	197	7.4	6
May 11-20	3,901	20	.03	18	8.0	29	2.6	73	20	44	.1	1.0		177	.24	1,860	78	18	44	298	7.5	12
May 21-22	5,660	--	--	15	c 5.1	--		60	14	35	--	--		--	--	--	b 58	9	--	239	7.6	--
May 23-31	10,510	13	.04	7.2	3.0	8.1	1.8	34	5.4	12	.1	.6		69	.09	1,960	30	2	35	101	7.1	8
June 1-3	7,677	14	--	--	--	--		46	9.4	18	--	.7		--	--	--	b 40	2	--	156	6.8	--
June 4-5	3,635	20	--	--	--	--		72	19	36	--	1.4		--	--	--	b 70	11	--	269	7.4	--
June 6-15	2,649	23	.06	22	10	42	4.5	88	28	62	.1	1.3		239	.33	1,710	96	24	47	406	7.1	3
June 16-20	3,854	14	--	--	--	--		44	11	24	--	.9		--	--	--	b 42	6	--	175	7.1	--
June 21-23	3,317	15	--	--	--	--		58	15	36	--	1.1		--	--	--	b 80	32	--	245	7.0	--
June 24-29	2,127	22	--	27	13	51	3.6	98	31	84	--	1.9		a 282	.38	1,620	121	40	47	496	7.1	4

a Sum of determined constituents.
b Determined by direct hardness titration.
c Calculated from hardness and calcium values.

SAN JOAQUIN RIVER BASIN--Continued

SAN JOAQUIN RIVER NEAR VERNALIS, CALIF.--Continued

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
June 30, July 1-10, 1951	1,160	29	0.02	42	19	84	4.5	144	45	142	0.2	1.8		446	0.61	1,400	183	65	49		764	7.4	3
July 11-20	897	29	.12	42	19	86	3.8	154	41	144	.2	.7		448	.61	1,090	183	57	50		777	7.5	4
July 21-31	602	33	.22	41	19	80	5.4	152	29	151	.3	.8		451	.61	733	180	56	48		768	7.5	8
Aug. 1-10	572	33	.04	46	19	81	5.2	160	37	149	.3	.7		477	.65	737	193	62	47		792	7.5	8
Aug. 11-20	746	34	.06	43	18	82	3.8	164	42	136	.2	1.1		451	.61	908	182	47	49		765	7.5	8
Aug. 21-31	942	34	.05	41	18	80	5.0	167	40	129	.3	1.5		437	.59	1,110	176	44	49		739	7.5	7
Sept. 1-10	1,006	33	.06	39	17	76	4.8	160	41	117	.3	1.6		410	.56	1,110	168	36	49		699	7.5	7
Sept. 11-20	930	35	.04	40	17	81	4.4	160	42	121	.3	2.0		426	.58	1,070	170	39	50		724	7.6	15
Sept. 21-30	1,168	34	.05	38	17	74	5.4	159	41	113	.3	2.5		408	.55	1,290	165	34	48		690	7.6	8

SAN JOAQUIN RIVER BASIN--Continued

SAN JOAQUIN RIVER NEAR VERNALIS, CALIF.--Continued

Temperature (°F) of water, March to September 1951
(Once-daily temperature measurement at approximately 8 a. m.)

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

SAN JOAQUIN RIVER BASIN.--Continued

STOCKTON DIVERTING CANAL AT STOCKTON, CALIF.

LOCATION.--Just upstream from bridge on Sanguinetti Lane, at north edge of Stockton, San Joaquin County, in Campo de Los Franceses Grant, and about 200 feet upstream from gaging station.
RECORDS AVAILABLE.--Chemical analyses: March to September 1951.
Water temperatures: March to July 1951.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Sacramento, Calif. No flow on many days in November, April to July, and entire months of October, August and September. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1215.

Chemical analyses, March to September 1951

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 1-10, 1951 ...	1,413	21	0.02	14	7.1	5.0	3.0	80	10	3.4	0.4	0.9		103	0.14	393	64	0	14	156	7.4	25
Mar. 11-17, 19-20 .	443	23	.02	16	7.6	5.6	2.7	88	12	4.0	.4	.8		116	.16	139	71	0	14	176	7.4	25
Mar. 21-31	123	24	.03	19	8.5	6.2	2.7	96	15	4.1	.4	.4		122	.17	41	82	4	14	186	7.6	25
Apr. 1-5, 7-9	6.8	21	.03	21	9.9	7.0	4.2	105	15	5.8	.3	.2		133	.18	2	93	7	13	209	7.4	20
Apr. 30, May 1-2, 5-7	1.6	18	.06	25	11	7.2	4.6	118	19	8.1	.2	1.0		151	.21	1	108	11	12	245	7.4	15
June 14-16,18-19 ...	11.5	26	.03	23	9.1	8.6	2.4	119	12	4.5	.4	.9		146	.20	5	95	0	16	221	8.2	10
June 21, 23-24, 26, 28	4.9	23	.03	23	9.4	8.5	2.4	120	13	5.5	.3	.5		146	.20	2	96	0	16	224	8.2	10
July 13, 15, 23-24 ..	11.1	18	.06	24	9.8	8.9	2.7	123	13	6.0	.3	.5		146	.20	4	100	0	16	234	8.2	10

SAN JOAQUIN RIVER BASIN--Continued

STOCKTON DIVERTING CANAL AT STOCKTON, CALIF.--Continued

Temperature (°F) of water, March to July 1951

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

SAN JOAQUIN RIVER BASIN

MOKELUMNE RIVER AT WOODBRIDGE, CALIF.

LOCATION.--At dam of Woodbridge Irrigation District, San Joaquin County, 0.4 mile upstream from gaging station at bridge.
DRAINAGE AREA.--644 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: March to September 1951.
Water temperatures: March to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 53 ppm Mar. 21-31, Apr. 1-10; minimum, 39 ppm Sept. 11-20.
Hardness: Maximum, 26 ppm Mar. 21-31, Apr. 1-10; minimum, 13 ppm Dec. 1.
Specific conductance: Maximum daily, 74.1 micromhos Sept. 4; minimum daily, 33.1 micromhos Dec. 1.
Water temperatures: Maximum, 83°F July 17.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Sacramento, Calif. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1215.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Dec. 1, 1950 ...	2,380	8.3	--	--	--	--	--	19	4.4	2.0	--	0.7		--	--	--	a13	0	--	33.1	--	--
Mar. 1-10, 1951.	1,392	14	0.11	6.0	2.3	2.9	5.2	32	6.2	2.8	0.3	.4		51	0.07	192	24	0	17	64.6	7.4	20
Mar. 11-20	1,690	13	.07	6.2	2.1	2.8	4.0	30	5.2	3.0	.3	.4		51	.07	233	24	0	17	62.7	7.4	20
Mar. 21-31	1,643	13	.25	6.3	2.4	2.6	3.5	29	4.8	2.1	.3	.7		53	.07	235	26	2	16	63.3	7.0	20
Apr. 1-10	543	12	.22	6.3	2.6	2.2	3.4	29	4.9	2.1	.3	.8		53	.07	78	26	3	14	63.2	6.8	18
Apr. 11-20	810	12	.21	6.0	2.3	2.2	3.4	28	4.0	2.1	.3	.7		50	.06	109	24	1	14	59.3	6.8	20
Apr. 21-30	1,018	13	.10	6.1	2.1	2.5	2.2	29	3.8	2.0	.1	.6		43	.06	118	24	0	17	56.1	7.3	15
May 1-31	1,347	13	.08	5.7	1.9	2.4	1.3	26	3.4	1.8	.1	.4		40	.06	145	22	1	18	50.8	7.0	6
June 1-10	748	12	.07	5.0	1.6	3.0	2.6	25	3.2	1.9	.1	.4		40	.05	81	19	0	22	51.2	6.9	7
June 11-20.....	344	12	.05	5.5	1.5	2.8	2.7	25	3.4	1.7	.1	.3		41	.06	38	20	0	21	50.5	6.9	7
June 21-30.....	70.9	12	.10	6.0	1.6	2.8	2.4	26	4.0	2.0	.1	.5		44	.06	8	22	0	20	55.2	7.0	7
July 1-10	20.0	12	.11	6.2	1.7	3.0	3.2	27	5.2	2.2	.1	.5		45	.06	2	22	0	20	57.7	6.9	7
July 11-20	23.3	12	.13	6.4	2.0	3.0	3.0	23	11	2.2	.1	.5		47	.06	3	24	5	19	61.3	7.0	7
July 21-31	23.9	13	.18	5.5	2.1	2.1	1.8	24	6.7	2.4	.1	.8		47	.06	3	22	3	16	61.6	6.6	8
Aug. 1-10	23.9	13	.10	5.5	2.1	2.1	1.8	24	7.2	2.3	.1	.7		45	.06	3	22	3	16	57.7	6.8	6
Aug. 11-20	23.1	12	.18	5.6	2.2	2.1	2.4	20	10	2.5	.2	.5		47	.06	3	23	7	15	59.0	6.6	8
Aug. 21-31	24.1	11	.09	5.4	2.1	2.1	1.4	18	11	2.5	.2	.5		45	.06	3	22	7	16	59.8	6.6	4
Sept. 1-10	32.4	12	.15	5.8	2.3	2.1	1.8	18	12	2.2	.2	.7		49	.07	43	24	9	15	63.0	6.6	6
Sept. 11-20	223	11	.00	4.7	2.0	2.4	1.6	24	5.2	1.6	.1	.1		39	.05	23	20	0	19	49.9	6.8	10
Sept. 21-30	315	11	.00	4.7	3.1	2.5	1.6	23	7.2	1.8	.1	.3		40	.05	34	24	6	17	55.2	7.1	10

a Determination by Schwarzenbach method.

SAN JOAQUIN RIVER BASIN--Continued

MOKELUMNE RIVER AT WOODBRIDGE, CALIF.--Continued

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

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

SAN JOAQUIN RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN SAN JOAQUIN RIVER BASIN IN CALIFORNIA

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

Date of collection	Instantaneous discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
SAN JOAQUIN RIVER BELOW FRIANT																						
Apr. 14, 1951	2,050		--		--	--	3.5	--	17	--	3.0		--	--	--	--		14	0	--	52.0	6.8
May 9	1,330		9.8		3.7	0.7	3.5	0.8	14	5.8	2.2		2.8	0.03	36	0.05		14	3	34	46.8	6.6
Sept. 12	361		7.4		2.0	.7	3.1	.6	15	2.1	1.5	0.0	.2	.03	25	.03		8	0	44	33.9	7.0
SAN JOAQUIN RIVER NEAR MENDOTA																						
Apr. 13, 1951	276		--		--	--	4.5	--	23	--	3.5		--	--	--	--		15	0	--	53.4	6.6
May 9	153		10		4.3	0.8	4.4	0.8	24	2.4	2.5		0.4	0.02	38	0.05		15	0	37	50.7	7.2
Sept. 12	175		11		13	6.3	24	1.8	57	20	29	0.4	.8	.03	134	.18		58	12	46	236	7.2
SAN JOAQUIN RIVER NEAR DOS PALOS																						
Apr. 13, 1951	4.7		--		--	--	8.5	--	38	--	9.5		--	--	--	--		29	0	--	98.9	6.8
May 9	2.8		10		11	2.5	9.6	1.4	48	5.8	12		0.4	0.05	76	0.10		37	0	35	128	7.0
Sept. 12	0.7		6.6		8.8	.5	8.1	.2	36	3.6	6.2	0.0	.3	.09	52	.07		24	0	42	87.9	6.9
SAN JOAQUIN RIVER NEAR GRAYSON																						
Apr. 12, 1951	885		--		--	--	95	--	114	--	123		--	--	--	--		169	76	--	726	7.2
May 7	1,800		14		18	6.5	32	2.1	83	24	35		1.9	0.05	176	0.24		76	8	47	300	7.4
Sept. 13	530		24		35	15	81	2.3	151	67	95	0.0	2.1	.21	396	.54		149	26	54	678	7.4
TUOLUMNE RIVER ABOVE LA GRANGE DAM, NEAR LA GRANGE																						
Apr. 12, 1951	3,120						2.5		28		1.5							22	0		59.6	6.8
May 8	3,470		7.6		3.4	0.8	1.2	0.5	15	2.8	.9		0.7	0.05	25	0.03		12	0	17	33.9	6.9
TUOLUMNE RIVER AT HICKMAN																						
Apr. 12, 1951	72						57		101		107							123	40		535	7.2
May 8	1,060		8.7		4.9	1.5	3.5	0.7	24	1.9	5.2		0.1	0.01	38	0.05		19	0	28	58.6	7.3
TUOLUMNE RIVER AT TUOLUMNE CITY																						
Apr. 11, 1951	694						65		131		112							148	40		620	7.4
May 7	1,110		9.1		8.0	2.2	8.8	1.1	26	5.1	18		1.4	0.04	66	0.09		30	8	38	116	6.9

SAN JOAQUIN RIVER AT MAZE ROAD

Apr. 11, 1951	1,180						93		118		151							204	107		820	7.3
May 7	6,210		9.9		12	4.1	19	1.5	54	11	27		0.9	0.03	113	0.15		49	5	45	196	7.5

STANISLAUS RIVER AT MOUTH

Apr. 11, 1951			--		--	--	11	--	103	--	7.5		--	--	--	--		81	0	--	205	7.2
May 7			13		7.3	2.7	3.0	0.8	41	3.1	1.2		0.4	0.02	52	0.07		30	0	17	74.1	7.4
Sept. 14			37		26	10	19	2.0	146	10	15	0.0	2.6	.09	194	.26		106	0	28	279	7.6

SAN JOAQUIN RIVER NEAR VERNALIS

Apr. 11, 1951	1,800		--		--	--	76	--	114	--	116		--	--	--	--		139	46	--	676	7.1
May 7	6,840		13		10	3.9	13	1.3	50	8.6	17		1.1	0.06	93	0.12		42	1	39	154	7.4
Sept. 14	884		31		44	15	79	3.3	163	40	120	0.0	2.1	.22	415	.56		172	38	49	718	7.6

MOKELUMNE RIVER AT LANCHA PLANA

Apr. 10, 1951	647		--		--	--	2.5	--	25	--	1.8		--	--	--	--		21	0	--	54.5	7.3
May 14	973		10		4.7	1.4	2.2	0.8	24	3.6	1.4		0.1	0.02	36	0.05		20	0	19	48.3	7.4
Sept. 18	636		10		4.0	1.7	2.4	.6	20	3.8	1.2	0.0	.7	.03	34	.05		17	1	23	44.9	7.1

MOKELUMNE RIVER AT WOODBRIDGE

Apr. 10, 1951	90		--		--	--	3.5	--	30	--	3.0		--	--	--	--		27	2	--	74.1	6.7
May 14	1,250		12		4.9	1.4	2.5	0.9	26	3.0	1.5		1.0	0.03	40	0.05		18	0	22	48.4	7.4
Sept. 18	86		13		6.0	2.2	3.7	.8	30	6.0	2.2		.0	.10	49	.07		24	0	24	67.0	6.8

SAN JOAQUIN RIVER AT ANTIOCH

Apr. 20, 1951			--		--	--	19	--	64	--	24		--	--	--	--		63	11	--	220	7.3
May 15			16		16	7.6	23	2.3	67	20	36		0.2	0.09	155	0.21		75	20	39	263	7.5
Sept. 20			18		29	23	162	7.5	106	61	272	0.0	4.1	.18	629	.85		167	80	67	1,160	7.1

SACRAMENTO RIVER BASIN

SACRAMENTO RIVER AT DELTA, CALIF.

LOCATION.--Temperature recorder at gaging station 0.2 mile downstream from Dog Creek, 0.6 mile southeast of Delta, Shasta County, and 2.8 miles south of La Moine.
DRAINAGE AREA.--427 square miles.
RECORDS AVAILABLE.--June 1951 to September 1951.
EXTREMES, 1951.--Water temperatures: Maximum, 75°F Aug. 20.
REMARKS.--Records of discharge for water year 1950-51 given in Water-Supply Paper 1215.

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

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1																	--	--	72	68	73	68	64	60
2																	--	--	72	67	72	67	65	60
3																	--	--	70	66	72	66	66	61
4																	--	--	67	64	71	66	67	62
5																	--	--	68	63	70	65	66	62
6																	--	--	67	62	70	64	65	61
7																	--	--	69	63	70	64	66	61
8																	--	--	71	64	72	65	66	61
9																	--	--	72	66	72	66	67	61
10																	--	--	72	66	73	67	67	62
11																	--	--	72	66	72	67	66	62
12																	--	--	72	67	72	66	64	60
13																	--	--	72	66	72	66	64	60
14																	--	--	71	66	72	66	64	59
15																	--	--	71	65	73	67	65	60
16																	--	--	72	66	73	67	62	61
17																	--	--	73	67	73	67	65	61
18																	70	--	74	67	72	67	67	62
19																	69	65	74	68	73	67	68	64
20																	70	66	73	68	75	69	68	64
21																	69	65	73	67	74	69	67	63
22																	69	64	74	67	62	68	64	61
23																	69	65	74	68	69	66	64	60
24																	69	64	73	68	69	64	63	59
25																	69	65	72	66	69	66	62	59
26																	69	65	71	65	69	66	62	58
27																	71	66	71	65	69	65	61	58
28																	71	66	71	65	67	64	59	58
29																	72	67	71	65	64	61	59	58
30																	72	67	72	65	64	60	58	58
31																	--	--	73	67	64	60	--	--
Average																	--	--	72	66	71	66	64	61

SACRAMENTO RIVER BASIN--Continued

PIT RIVER NEAR MONTGOMERY CREEK, CALIF.

LOCATION.--Temperature recorder at gaging station 1 mile upstream from Cow Canyon Creek and 3.5 miles west of town of Montgomery Creek, Shasta County.
DRAINAGE AREA.--5,170 square miles, approximately, excluding Goose Lake basin.
RECORDS AVAILABLE.--June 1951 to September 1951.
EXTREMES, 1951.--Water temperatures: Maximum, 80°F July 22.
REMARKS.--Records of discharge for water year 1950-51 given in Water-Supply Paper 1215.

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

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1																	--	--	73	69	70	68	67	63
2																	--	--	70	69	69	68	70	63
3																	--	--	70	68	69	68	67	62
4																	--	--	70	67	71	66	65	63
5																	--	--	69	67	70	66	64	63
6																	--	--	69	66	68	66	64	62
7																	--	--	71	67	68	66	64	62
8																	--	--	72	67	69	67	69	62
9																	--	--	70	67	69	67	70	60
10																	--	--	70	68	69	67	65	60
11																	--	--	70	68	72	67	64	62
12																	--	--	70	68	73	66	64	62
13																	--	--	70	68	69	65	64	63
14																	--	--	71	67	68	67	63	61
15																	--	--	71	65	68	66	68	61
16																	--	--	70	66	68	63	69	61
17																	--	--	69	67	68	67	64	61
18																	--	--	70	68	71	67	64	63
19																	--	--	70	68	71	66	64	63
20																	--	--	70	68	69	68	64	62
21																	69	67	72	68	68	67	64	61
22																	69	67	80	68	68	68	69	60
23																	70	67	71	68	68	67	73	60
24																	70	67	70	68	68	66	63	60
25																	69	67	69	66	75	65	63	61
26																	69	67	69	67	70	65	63	60
27																	69	67	69	68	67	67	62	60
28																	69	68	71	67	67	65	62	61
29																	69	68	71	66	66	64	65	60
30																	70	68	69	66	66	63	62	61
31																	--	--	70	68	66	64	--	--
Average																	--	--	71	67	69	66	65	61

SACRAMENTO RIVER BASIN--Continued

SQUAW CREEK ABOVE SHASTA LAKE, CALIF.

LOCATION.--Temperature recorder at gaging station, 0.5 mile upstream from Salt Creek, about 2 miles upstream from Shasta Lake, and 10 miles west of town of Montgomery Creek, Shasta County
DRAINAGE AREA.--65.3 square miles.
RECORDS AVAILABLE.--Water temperatures: June 1951 to September 1951.
EXTREMES, 1951.--Water temperatures: Maximum, 72°F July 18-20, 22-24.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1215.

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

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1																	--	--	71	68	71	68	63	61
2																	--	--	71	68	70	68	62	61
3																	--	--	70	67	70	67	63	62
4																	--	--	68	65	69	67	63	62
5																	--	--	66	64	68	65	63	62
6																	--	--	66	64	67	65	63	62
7																	--	--	67	64	67	65	63	61
8																	--	--	68	65	67	67	63	61
9																	--	--	70	66	68	66	63	61
10																	--	--	71	67	68	66	64	62
11																	--	--	71	67	68	66	64	62
12																	--	--	71	68	68	66	63	62
13																	--	--	71	67	67	65	63	61
14																	--	--	70	67	67	65	62	61
15																	--	--	70	67	68	66	64	62
16																	--	--	70	67	68	66	64	63
17																	--	--	71	67	68	66	65	63
18																	--	--	72	68	68	66	66	64
19																	--	--	72	69	68	65	67	66
20																	69	67	72	69	71	67	67	66
21																	69	67	71	68	70	68	67	65
22																	68	66	72	68	70	69	65	63
23																	69	67	72	69	69	67	64	62
24																	69	67	72	69	68	66	63	62
25																	69	67	71	67	67	66	63	62
26																	69	67	70	67	67	65	62	61
27																	70	67	70	67	66	66	62	60
28																	70	67	69	66	66	65	61	61
29																	71	68	69	65	65	64	61	61
30																	71	68	69	66	64	62	61	61
31																	--	--	71	67	63	62	--	--
Average																	--	--	70	67	68	66	63	62

McCLOUD RIVER ABOVE SHASTA LAKE, CALIF.

LOCATION.--Temperature recorder at gaging station just upstream from Shasta Lake, 0.3 mile downstream from Bollibokka Creek, and 11.5 miles east of La Moine, Shasta County.
DRAINAGE AREA.--606 square miles.
RECORDS AVAILABLE.--June 1951 to September 1951.
EXTREMES, June to September 1951.--Water temperatures: Maximum, 54°F July 11, 18, 19, 30, 31.
REMARKS.--Records of discharge for water year 1950-51 given in Water-Supply Paper 1215.

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

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1																	--	--	55	55	54	53	51	51
2																	--	--	55	55	54	53	51	51
3																	--	--	55	54	54	52	51	51
4																	--	--	55	53	54	52	52	51
5																	--	--	55	53	53	52	52	51
6																	--	--	55	53	53	52	52	51
7																	--	--	55	53	53	52	51	51
8																	--	--	55	54	53	52	51	51
9																	--	--	55	54	53	52	51	51
10																	--	--	55	54	54	52	52	51
11																	--	--	55	54	54	53	52	51
12																	--	--	55	54	54	52	52	51
13																	--	--	55	53	53	52	51	51
14																	--	--	55	53	53	52	51	51
15																	--	--	54	53	53	52	51	51
16																	--	--	54	53	53	52	51	51
17																	--	--	55	53	53	52	52	51
18																	--	--	55	53	53	52	52	52
19																	54	54	55	53	54	52	52	51
20																	55	54	55	53	54	53	52	52
21																	55	54	54	53	54	53	52	51
22																	55	54	54	53	54	53	51	51
23																	55	54	54	53	53	52	51	51
24																	54	54	54	53	53	52	51	51
25																	54	54	54	52	52	52	51	50
26																	54	53	53	52	52	52	50	50
27																	54	54	53	52	52	52	50	50
28																	54	54	53	52	52	52	50	50
29																	54	54	53	52	52	52	50	50
30																	55	54	54	52	52	51	50	50
31																	--	--	54	53	52	51	--	--
Average																	--	--	54	53	53	52	51	51

SACRAMENTO RIVER BASIN--Continued

SACRAMENTO RIVER AT KNIGHTS LANDING, CALIF.

LOCATION.--At gaging station, Yolo-Sutter County line, just upstream from Southern Pacific Railroad bridge at Knights Landing, and 13.1 miles upstream from Feather River.
RECORDS AVAILABLE.--Chemical analyses: March to September 1951.
Water temperatures: March to September 1951.
EXTREMES, March to September 1951.--Dissolved solids: Maximum, 177 ppm May 11-31; minimum, 108 ppm Mar. 2-10.
Hardness: Maximum, 90 ppm May 11-31; minimum, 61 ppm Mar. 2-10.
Specific conductance: Maximum daily, 383 micromhos May 27; minimum daily 125 micromhos Mar. 12.
Water temperatures: Maximum, 74°F May 27.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Sacramento, Calif. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1215.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 2-10, 1951	19,810	24	0.08	14	6.4	8.8	3.6	77	12	6.2	0.3	0.6		108	0.15	5,780	61	0	23	157	7.6	10
Mar. 11-20	14,660	25	.13	14	6.6	8.9	3.0	78	12	6.1	.3	.6		111	.15	4,390	62	0	23	158	7.6	10
Mar. 21-31	11,880	24	.16	14	7.1	8.3	3.2	80	12	5.0	.3	.7		112	.15	3,590	64	0	21	163	7.4	7
Apr. 1, 6-10	8,130	24	.16	15	7.8	9.7		86	9.7	6.5	.2	.5		118	.16	2,590	70	0	23	175	7.4	15
Apr. 2-5	9,090	24	.20	18	10	16		98	22	11	.3	.6		154	.20	3,780	86	6	28	238	7.4	20
Apr. 11-20	5,989	23	.12	16	8.8	10	5.6	93	15	8.5	.3	.4		134	.18	2,170	76	0	21	204	7.5	7
Apr. 21-30	5,007	26	.04	15	8.9	16	2.7	94	19	11	.1	.4		142	.19	1,920	74	0	31	219	7.7	6
May 1-10	9,337	25	.08	14	8.6	16	2.1	88	20	11	.1	.6		138	.19	3,480	70	0	32	212	7.9	10
May 11-31	6,748	25	.04	18	11	25	2.2	113	28	17	.1	.8		177	.24	3,220	90	0	37	283	7.6	10
June 1-10	5,317	26	.06	15	9.4	20	2.9	103	22	12	.2	.2		154	.21	2,210	76	0	35	241	7.2	10
June 11-20	5,771	26	.05	15	9.5	22	3.0	102	24	14	.2	.6		161	.22	2,510	76	0	37	253	7.3	7
June 21-30	5,459	25	.02	15	9.0	20	2.9	102	21	11	.2	.5		148	.20	2,180	74	0	36	231	7.4	6
July 1-10	5,800	26	.04	15	9.1	20	2.1	102	21	12	.2	.5		149	.20	2,330	75	0	36	231	7.6	6
July 11-20	7,397	24	.03	14	8.2	19	2.7	93	19	10	.2	.6		139	.19	2,780	69	0	36	214	7.6	7
July 21-31	8,819	16	.04	13	7.9	16	1.9	87	16	9.1	.2	.5		130	.18	3,100	65	0	34	198	7.2	8
Aug. 1-10	8,814	16	.03	13	7.8	16	2.7	89	19	8.7	.2	.4		128	.17	3,050	64	0	34	197	7.4	13
Aug. 11-20	8,551	16	.03	14	8.1	17	2.2	93	19	9.5	.2	.5		136	.18	3,140	68	0	34	206	7.3	10
Aug. 21-31	8,235	16	.03	14	9.0	19	2.2	102	19	11	.2	.5		146	.20	3,250	72	0	36	226	7.6	10
Sept. 1-10	8,550	17	.02	16	10	21	2.2	113	19	12	.2	.5		156	.21	3,600	81	0	35	246	7.6	10
Sept. 11-20	7,259	17	.03	16	10	20	2.7	115	20	12	.2	.5		157	.21	3,080	81	0	34	247	7.6	10
Sept. 21-30	6,192	15	.02	14	8.7	14	2.6	97	13	8.7	.2	.5		134	.18	2,240	71	0	29	203	7.6	15

SACRAMENTO RIVER BASIN--Continued

SACRAMENTO RIVER AT KNIGHTS LANDING, CALIF.--Continued

Temperature (°F) of water, March to September 1951
[Once-daily temperature measurement at approximately 10 a. m.]

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

SACRAMENTO RIVER BASIN--Continued

FEATHER RIVER AT NICOLAUS, CALIF.

LOCATION.--At gaging station at Nicolaus, Sutter County, 0.4 mile downstream from highway bridge, and 1.6 miles downstream from Bear River.
RECORDS AVAILABLE.--Chemical analyses: March to September 1951.
Water temperatures: March to September 1951.
EXTREMES, March to September 1951.--Dissolved solids: Maximum, 111 ppm Aug. 1-10; minimum, 50 ppm Apr. 11-20.
Hardness: Maximum, 74 ppm Aug. 11-20; minimum, 33 ppm Apr. 11-30.
Specific conductance: Maximum daily, 189 micromhos Aug. 17; minimum daily, 65.0 micromhos Apr. 17.
Water temperatures: Maximum, 79°F July 18-19.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Sacramento, Calif. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1215.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 1-10, 1951 ...	14,590	16	0.10	9.5	4.2	3.6	3.2	52	6.1	2.8	0.2	0.4		69	0.09	2,720	41	0	15	96.2	7.5	8
Mar. 11-20	14,000	17	.05	8.9	4.1	3.2	2.6	49	5.4	2.5	.2	.4		66	.09	2,490	39	0	14	91.1	7.5	8
Mar. 21-31	13,920	15	.08	8.7	3.6	3.3	4.8	47	4.1	1.3	.0	.9		62	.08	2,330	36	0	14	86.8	7.1	15
Apr. 1-10	12,890	15	.07	8.5	3.5	2.6	5.6	46	3.5	1.8	.0	.9		61	.08	2,120	36	0	12	82.4	7.1	15
Apr. 11-20	13,670	15	.05	7.8	3.2	2.6	2.7	43	4.0	.8	.2	.6		50	.07	1,850	33	0	14	69.8	7.0	10
Apr. 21-30	10,220	15	.08	7.8	3.2	2.8	1.3	41	4.4	1.5	.1	.3		53	.07	1,460	33	0	15	73.7	7.4	7
May 1-31.....	10,910	15	.06	8.1	3.4	3.0	1.5	42	3.7	1.6	.1	.5		56	.08	1,650	34	0	15	77.7	7.1	6
June 1-10	3,489	17	.10	10	4.1	3.8	1.1	56	3.9	2.5	.2	.3		72	.10	678	42	0	16	103	7.0	15
June 11-20	1,676	19	.11	11	4.7	4.0	1.6	62	4.7	3.0	.1	.4		78	.11	353	47	0	15	114	7.0	15
June 21-30	1,200	19	.06	12	5.4	2.3	2.1	66	5.0	2.8	.1	.4		86	.12	279	52	0	8	125	7.0	15
July 1-10.....	656	20	.04	14	6.9	4.7	2.1	76	6.8	3.2	.1	.4		95	.13	168	61	1	13	144	7.1	15
July 11-20	422	20	.03	15	7.3	6.7	1.8	85	7.5	5.4	.1	.5		107	.15	122	67	0	17	162	7.2	6
July 21-31	349	19	.03	15	7.0	5.9	1.8	81	7.4	4.0	.1	.4		102	.14	96	66	0	16	153	7.2	11
Aug. 1-10	249	20	.06	16	8.0	6.8	1.8	91	8.3	4.4	.1	.6		111	.15	75	73	0	16	170	7.2	8
Aug. 11-20	263	20	.01	16	8.3	6.7	1.6	91	8.9	4.2	.1	.6		110	.15	78	74	0	16	172	7.3	8
Aug. 21-31	439	19	.03	15	7.3	5.5	1.8	84	8.5	3.6	.1	.5		102	.14	121	67	0	15	156	7.3	8
Sept. 1-10	1,050	19	.02	13	6.7	5.4	2.4	78	6.7	2.8	.2	.3		93	.13	264	60	0	16	142	7.5	10
Sept. 11-20	1,524	16	.00	13	6.3	5.3	2.4	78	5.4	2.1	.1	.4		84	.11	346	58	0	16	133	7.3	3
Sept. 21-30	1,889	16	.00	13	6.2	5.3	2.4	78	5.1	2.4	.1	.8		84	.11	428	58	0	16	132	7.1	6

SACRAMENTO RIVER BASIN--Continued

FEATHER RIVER AT NICOLAUS, CALIF.--Continued

Temperature (°F) of water, March to September 1951
/Once-daily temperature measurement at approximately 8 a. m./

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

SACRAMENTO RIVER BASIN--Continued

AMERICAN RIVER AT FAIR OAKS, CALIF.

LOCATION.--From Mar. 2 to Apr. 27 samples were collected at gaging station at H Street Bridge, just east of Sacramento, Sacramento County, 6.5 miles upstream from mouth. From May 3 to Sept. 30 samples were collected at gaging station at Fair Oaks, Sacramento County, 10 miles downstream from South Fork.
DRAINAGE AREA.--1,921 square miles (above gaging station at Fair Oaks).
RECORDS AVAILABLE.--Chemical analyses: January to December 1906, March to September 1951.
Water temperatures: March to September 1951.
EXTREMES, March to September 1951.--Dissolved solids: Maximum, 69 ppm Aug. 21-31, Sept. 11-20; minimum, 31 ppm May 11-31.
Hardness: Maximum, 41 ppm Aug. 1 to Sept. 10; minimum, 19 ppm May 11-31.
Specific conductance: Maximum daily, 112 micromhos Aug. 28; minimum daily, 39.0 micromhos Apr. 11-12.
Water temperatures: Maximum, 76°F July 15, 18, 31, Aug. 1.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Sacramento, Calif. Discharge data for Mar. 2 to Apr. 27 are for Sacramento gaging station. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1215.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 2-10, 1951	7,940	16	0.02	7.4	3.5	3.1	2.0	41	5.3	3.0	0.3	0.3		58	0.08	1,240	33	0	16	79.6	7.4	10
Mar. 11-20	6,604	16	.01	6.8	3.1	2.9	2.0	40	4.6	2.6	.3	.2		54	.07	963	30	0	16	72.3	7.4	10
Mar. 21-31	6,410	13	.05	6.3	2.2	1.5	--	33	3.0	1.6	.0	.9		46	.06	796	25	0	10	59.5	7.1	15
Apr. 1-10	6,437	12	.04	5.8	1.9	2.0	--	29	2.6	1.8	.0	.8		44	.06	765	22	0	15	53.8	7.2	25
Apr. 11-20	8,181	12	.02	4.9	2.1	1.3	2.6	22	--	1.0	.2	.8		35	.05	773	21	3	11	43.9	6.9	10
Apr. 21-27	6,010	12	.05	5.3	2.1	2.3		27	2.3	1.4	.1	.3		39	.05	633	22	0	19	49.4	7.3	10
May 3-10	8,256	13	.08	5.5	2.5	2.1	3.5	29	2.9	1.4	.3	.4		45	.06	1,000	24	0	14	54.7	6.9	15
May 11-31	7,338	12	.02	4.5	1.8	1.8	1.5	23	1.8	1.4	.1	.5		31	.04	614	19	0	16	41.7	7.0	8
June 1-10	3,191	12	.03	5.6	1.6	2.4	2.2	26	2.3	1.6	.0	.2		40	.05	345	21	0	18	49.6	6.8	7
June 11-20	2,681	11	.04	5.6	1.5	2.5	1.9	27	3.0	2.3	.1	.3		41	.06	297	20	0	19	52.2	6.8	7
June 21-30	1,656	12	.06	7.6	1.8	2.5	2.9	31	2.7	3.0	.1	.2		46	.06	206	26	1	15	61.6	7.0	7
July 1-10	909	15	.03	9.7	2.2	3.4	2.2	39	3.8	2.6	.2	.3		56	.08	137	33	1	17	74.8	7.2	7
July 11-20	568	16	.03	10	2.6	4.1	2.7	43	4.4	3.7	.2	.5		63	.09	97	36	0	19	89.0	7.2	7
July 21-31	414	15	.01	9.4	3.3	3.2	2.4	46	4.0	4.2	.1	.5		65	.09	73	37	0	15	93.8	6.8	6
Aug. 1-10	317	15	.01	11	3.3	3.3	2.4	50	4.2	4.4	.1	.4		68	.09	58	41	0	14	101	6.9	3
Aug. 11-20	288	14	.01	11	3.4	3.3	2.4	50	4.1	4.8	.1	.6		68	.09	53	41	0	14	102	6.9	3
Aug. 21-31	279	14	.01	11	3.3	3.4	2.4	49	4.1	5.6	.1	.7		69	.09	52	41	1	14	103	6.9	4
Sept. 1-10	283	13	.02	11	3.4	3.2	2.4	49	4.9	4.9	.1	.5		67	.09	51	41	1	14	102	6.9	7
Sept. 11-20	251	12	.02	10	3.5	3.9	2.1	50	4.9	5.0	.2	.5		69	.09	47	39	0	17	104	7.1	10
Sept. 21-30	282	12	.02	10	3.4	3.9	2.4	50	4.9	4.9	.2	.5		68	.09	52	39	0	17	102	7.3	10

SACRAMENTO RIVER BASIN--Continued

AMERICAN RIVER AT FAIR OAKS, CALIF.--Continued

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

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

SACRAMENTO RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN SACRAMENTO RIVER BASIN IN CALIFORNIA

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

Date of collection	Instantaneous discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
SACRAMENTO RIVER AT DELTA																						
Apr. 11, 1951	1,730		--		--	--	2.8	--	47	--	2.2			--	--	--		38	0	--	82.8	7.4
May 8	--		17		4.8	7.3	3.0	0.5	53	2.4	2.0		0.0	0.23	63	0.09		42	0	13	86.2	7.8
Sept. 12	184		27		10	7.5	12	1.0	84	3.1	8.0	0.0	.0	.18	110	.15		56	0	31	160	
PIT RIVER NEAR CANBY																						
Apr. 11, 1951	226						15		90		5.0							60	0		178	7.5
May 9	718		28		15	4.9	13	3.7	92	7.9	2.2		2.2	0.24	122	0.17		58	0	31	168	7.4
BURNEY CREEK NEAR BURNEY																						
Apr. 11, 1951	--		--		--	--	1.8	--	30	--	1.8		--	--	--	--		20	0	--	48.0	7.4
May 9	73		23		5.8	2.9	2.5	0.4	37	1.4	.2		0.0	0.16	54	0.07		26	0	17	58.0	7.2
Sept. 13	11		30		10	5.6	5.1	.6	69	1.0	1.2	0.0	1.2	.07	89	.12		48	0	19	112	6.8
PIT RIVER NEAR MONTGOMERY CREEK																						
Apr. 10, 1951	5,200						7.7		71		7.0							47	0		126	7.0
May 15	4,620		38		12	5.8	9.2	1.8	81	3.4	2.8		0.0	0.19	113	0.15		54	0	26	139	7.9
McCLOUD RIVER ABOVE SHASTA LAKE																						
Apr. 10, 1951	1,910		--		--	--	3.4	--	52	--	3.2		--	--	--	--		36	0	--	87.2	7.4
May 16	1,660		30		9.7	3.9	3.5	1.0	54	2.2	1.2		0.0	0.14	78	0.11		40	0	15	90.6	7.7
Sept. 15	918		36		8.4	4.1	5.4	1.2	58	1.6	1.5	0.0	.0	.03	87	.12		38	0	23	95.7	8.2
SACRAMENTO RIVER AT KESWICK																						
Apr. 9, 1951	4,000		--		--	--	5.5	--	58	--	2.8		--	--	--	--		66	18	--	118	7.3
May 17	4,900		24		11	4.6	4.5	0.9	57	8.0	2.0		0.2	0.18	83	0.11		46	0	17	113	7.3
Sept. 13	6,160		22		10	5.3	5.4	1.0	61	4.7	1.5	0.0	.0	.10	80	.11		47	0	20	111	7.8

SACRAMENTO RIVER AT REDDING

Apr. 9, 1951	3,860		--		--	--	5.3	--	61	--	2.8		--	--	--	--		44	0	--	115	7.2
May 17	4,990		25		10	4.9	5.5	1.0	60	6.1	2.0		0.1	0.20	84	0.11		45	0	20	112	7.6
Sept. 12	6,720		22		9.6	5.8	5.4	1.0	63	4.9	1.8	0.0	.1	.13	82	.11		48	0	19	111	7.9

COTTONWOOD CREEK NEAR COTTONWOOD

Apr. 12, 1951	409		--		--	--	8.6	--	133	--	7.5		--	--	--	--		112	3	--	248	7.8
May 9	612		22		24	10	7.5	1.0	119	13	6.2		0.4	0.15	143	0.19		101	4	14	229	7.8
Sept. 13	57		25		13	9.0	9.0	1.2	96	6.2	3.2	0.0	1.0	.12	115	.16		69	0	22	173	7.0

SACRAMENTO RIVER AT HAMILTON CITY

Apr. 12, 1951	5,900		--		--	--	6.2	--	70	--	5.5		--	--	--	--		53	0	--	135	7.4
May 10	7,240		26		13	6.1	6.2	1.4	68	8.8	4.0		0.4	0.20	100	0.14		58	2	19	136	7.5
Sept. 13	--		24		11	5.1	7.0	.6	66	4.9	2.8	0.0	.6	.09	88	.12		48	0	24	126	6.9

STONY CREEK NEAR HAMILTON CITY

Apr. 12, 1951	a 30						15		152		20							133	8		316	7.9
May 10	a 10		12		34	11	12	0.9	147	15	16		0.2	0.19	174	0.24		130	10	17	304	7.9

INDIAN CREEK NEAR CRESCENT MILLS

Apr. 10, 1951	1,100						3.8		46		1.2							32	0		76.7	7.4
May 8	1,010		25		10	3.4	3.4	0.9	55	2.3	1.0		0.0	0.26	.73	0.10		39	0	16	91.2	7.6

FEATHER RIVER NEAR OROVILLE

Apr. 10, 1951	9,520						3.2		41		3.5							29	0		74.8	7.1
May 8	8,100		16		8.4	3.6	2.4	0.9	46	3.0	1.5		0.0	0.23	58	0.08		36	0	12	79.1	7.5

YUBA RIVER AT SMARTSVILLE

Apr. 10, 1951	5,500						1.8		38		2.8							28	0		68.2	7.1
May 8	5,080		13		7.3	2.2	1.5	0.5	33	3.1	1.0		0.0	0.20	45	0.06		27	0	10	60.2	7.5

a Mean daily discharge (cfs).

SACRAMENTO RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN SACRAMENTO RIVER BASIN IN CALIFORNIA--Continued

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

Date of collection	Instantaneous discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
YUBA RIVER AT MARYSVILLE																						
Apr. 9, 1951	4,580						2.1		40		1.8							32	0		72.6	7.2
May 7	5,270		15		7.7	2.2	2.1	0.6	34	3.7	1.0		0.0	0.28	49	0.07		28	0	14	63.1	7.5
FEATHER RIVER AT NICOLAUS																						
Apr. 9, 1951	12,400						3.1		46		2.5							35	0		82.9	7.2
May 7	13,300		15		8.2	3.4	2.5	1.2	41	5.2	1.8		0.2	0.18	58	0.08		34	1	13	78.6	7.3
SACRAMENTO RIVER AT VERONA																						
Apr. 9, 1951	20,300						5.0		48		6.0							40	0		102	7.2
May 7	26,200		15		8.8	3.4	2.5	1.0	43	4.0	3.0		0.2	0.18	59	0.08		36	1	13	85.1	7.4
AMERICAN RIVER AT SACRAMENTO																						
Apr. 13, 1951	7,960		--		--	--	1.4	--	23	--	1.5		--	--	--	--		17	0	--	42.3	7.1
May 16	6,070		13		4.7	1.9	2.0	0.9	26	2.6	1.2		0.0	0.16	39	0.05		20	0	17	46.9	7.3
Sept. 17	261		13		12	4.1	4.8	1.2	53	6.5	4.5	0.0	.9	.00	73	.10		47	3	18	114	7.0
SACRAMENTO RIVER AT SACRAMENTO																						
Apr. 13, 1951	a31,400		--		--	--	4.2	--	41	--	3.0		--	--	--	--		31	0	--	82.8	7.3
May 7	a35,800		17		10	5.6	8.0	1.4	56	9.2	6.8		0.3	0.27	86	0.12		48	2	26	138	7.4
Sept. 20	a9,620		23		18	11	23	.9	122	17	18	0.0	.1	.13	171	.23		90	0	35	279	7.2
CLEAR LAKE NEAR CLEAR LAKE OAKS																						
Apr. 16, 1951			--		--	--	13	--	174	--	8.8		--	--	--	--		138	0	--	308	8.0
May 11			14		27	17	11	2.9	176	13	7.5		1.0	1.2	181	0.25		137	0	14	315	7.8
Sept. 14			4.9		28	20	14	2.6	200	12	7.5	0.2	.0	1.2	189	.26		152	0	16	342	7.7
CLEAR LAKE AT LAKEPORT																						
Apr. 16, 1951			--		--	--	12	--	168	--	7.0		--	--	--	--		130	0	--	291	8.2
May 11			13		27	17	11	2.2	169	12	7.2		1.1	1.2	175	0.24		137	0	15	302	8.1
Sept. 14			16		28	20	14	2.6	197	12	7.5	0.0	.8	1.1	199	.27		152	0	16	343	7.6

a Mean daily discharge (cfs).

CACHE CREEK NEAR LOWER LAKE

Apr. 16, 1951			--		--	--	18	--	219	--	12		0.9	--	193	0.26		176	0		393	7.9
May 11			7.9		30	19	14	2.9	193	13	8.8			1.4				153	0	16	344	7.8
June 4			--		--	--	--	--	189	--	8.5			1.9				--	--		332	8.2

SACRAMENTO RIVER AT RIO VISTA

Apr. 20, 1951			--		--	--	6.2	--	50	--	5.8		--	--	--	--		41	0	--	113	7.4
May 15			16		11	5.6	8.0	1.0	58	8.6	8.0		0.8	0.19	88	0.12		50	3	25	134	7.5
Sept. 20			22		18	12	26	1.3	124	20	26	0.0	1.4	.17	188	.26		94	0	37	302	7.2

RUSSIAN RIVER BASIN

MISCELLANEOUS ANALYSES OF STREAMS IN RUSSIAN RIVER BASIN IN CALIFORNIA

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

Date of collection	Instantaneous discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
EAST FORK RUSSIAN RIVER NEAR CALPELLA																						
Oct. 26, 1950	a277		3.2		19	6.7	6.5	8.0	b90	7.7	3.2		0.0	1.1	100	0.14		75	0	14	163	8.7
Apr. 12, 1951	294		--		--	--	7.0	--	91	--	3.2		--	--	--	--		79	4	--	170	7.3
May 16	345		12		19	7.3	5.0	.7	91	9.5	3.5		.0	.47	102	.14		77	3	12	165	8.0
RUSSIAN RIVER NEAR HOPLAND																						
Apr. 12, 1951	398						8.0		105		3.5							88	2		194	7.5
May 8	538		13		21	9.2	5.6	0.9	107	11	3.8		1.2	0.44	118	0.16		90	3	12	198	7.7
RUSSIAN RIVER NEAR HEALDSBURG																						
Apr. 8, 1951	662		--		--	--	10	--	141	--	5.5		--	--	--	--		119	3	--	255	7.6
May 8	1,060		16		24	13	6.4	0.9	133	14	4.2		1.4	0.59	145	0.20		113	4	11	243	8.1
Sept. 9	131		14		28	15	11	1.0	162	12	5.5	0.0	.2	.67	166	.23		132	0	15	281	8.1
RUSSIAN RIVER AT GUERNEVILLE																						
Apr. 13, 1951	793						11		148		6.0							124	3		268	8.0
May 8	1,600		17		23	13	6.7	1.3	132	14	3.2		1.5	0.48	145	0.20		111	3	11	245	7.9

a Mean daily discharge (cfs).
b Includes equivalent of 6 parts per million of carbonate (CO_3).

MISCELLANEOUS ANALYSES OF STREAMS IN KLAMATH RIVER BASIN IN CALIFORNIA

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

Date of collection	Instantaneous discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
KLAMATH RIVER BELOW FALL CREEK NEAR COPCO																						
Apr. 9, 1951	3,250						16		72		4.2							76	17		218	7.2
May 7	4,440		5.3		12	6.6	15	2.5	72	28	4.2		1.5	0.30	111	0.15		57	0	35	188	7.3
KLAMATH RIVER AT SOMESBAR																						
Oct. 12, 1950	1,980		23	0.01	18	9.0	24	4.0	a 112	34	10		0.3	0.20	178	0.24		82	0	38	261	9.7
Apr. 10, 1951	15,500		--		--	--	5.5	--	61	--	2.5		--	--	--	--		51	1	--	121	7.0
May 10	11,200		12		12	6.8	7.5	1.3	73	14	3.2		.0	.16	93	.13		58	0	21	149	7.8
TRINITY RIVER AT LEWISTON																						
Apr. 11, 1951	4,910		--		--	--	1.5	--	47	--	1.0		--	--	--	--		39	0	--	76.3	7.1
May 17	4,080		13		4.0	6.6	1.5	0.1	46	2.0	1.2		0.0	0.15	51	0.07		37	0	8	74.3	7.7
Sept. 12	138		14		9.2	12	4.8	.4	87	4.0	5.2	0.0	.0	.05	93	.13		72	1	13	155	8.2
TRINITY RIVER NEAR HOOPA																						
Oct. 18, 1950	693		12	0.01	22	9.5	6.8	3.6	b 106	8.7	9.5		0.1	0.10	124	0.17		94	7	13	201	8.6
Apr. 10, 1951	10,600		--		--	--	2.5	--	61	--	1.2		--	--	--	--		52	2	--	106	7.2
May 11	8,980		13		11	6.6	2.0	.5	66	3.9	1.5		.0	.21	71	.10		55	0	7	109	8.0
KLAMATH RIVER NEAR KLAMATH																						
Apr. 11, 1951	29,100						2.0		60		1.8							53	4		111	7.4
May 13	22,900		12		12	6.3	5.2	0.9	68	9.1	2.5		0.0	0.16	82	0.11		56	0	17	128	7.9

a Includes equivalent of 35 parts per million of carbonate (CO_3).
b Includes equivalent of 6 parts per million of carbonate (CO_3).

PART 12. PACIFIC SLOPE BASINS IN WASHINGTON AND UPPER COLUMBIA RIVER BASIN

UPPER COLUMBIA RIVER BASIN

COLUMBIA RIVER MAIN STEM

COLUMBIA RIVER AT GRAND COULEE DAM, WASH.

LOCATION.--At Grand Coulee Dam, Grant-Okanogan County line, 2,500 feet upstream from gaging station, which is 14 miles upstream from Nespelem River.
DRAINAGE AREA.--74,100 square miles, approximately (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: November 1950 to September 1951.
Water temperatures: November 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 99 ppm May 1-10; minimum, 83 ppm Sept. 1-20.
Hardness: Maximum 78 ppm May 1-10; minimum, 67 ppm May 21-31.
Specific conductance: Maximum daily, 164 micromhos May 10; minimum daily, 136 micromhos May 29-30, June 6, 8.
Water temperatures: Maximum, 65°F Aug. 19; minimum, 37°F on many days during February to April.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1216.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Nov. 25-30, 1950	63,250	5.4	--	20	4.9	2.9		75	13	0.8	--	0.3		86	0.12	14,690	70	9	8	144	7.5	--
Dec. 1-10	60,060	7.2	0.04	22	4.9	1.6	1.5	76	13	--	0.2	.6		90	.12	14,590	75	13	4	150	7.5	15
Dec. 11-20	59,450	6.9	.03	21	4.7	1.7	2.0	78	13	--	.2	.7		91	.12	14,610	72	8	5	151	7.5	15
Dec. 21-31	88,090	7.2	.03	22	5.1	1.8	2.2	78	13	--	.3	.6		92	.13	21,890	76	12	5	153	7.5	15
Jan. 1-10, 1951	83,940	7.0	.01	21	5.5	2.0	2.4	77	14	1.0	.0	.6		90	.12	20,400	75	12	5	152	7.3	5
Jan. 11-20	76,060	6.9	.02	21	5.2	2.3	4.0	80	13	1.2	.0	1.1		91	.12	18,690	74	8	6	153	7.4	5
Jan. 21-31	70,520	7.1	.06	20	5.2	2.2	3.4	77	14	1.1	.0	.7		90	.12	17,140	71	8	6	149	7.4	10
Feb. 1-10	62,930	7.5	.02	21	5.2	2.3	3.8	78	14	1.2	.0	.7		91	.12	15,460	74	10	6	151	7.4	5
Feb. 11-20	102,700	7.5	.02	21	5.1	2.4	4.0	78	14	1.2	.0	.1		92	.13	25,510	73	9	6	154	7.4	5
Feb. 21-28	96,950	7.8	.03	20	5.2	3.3		76	14	.9	.0	.5		91	.12	23,820	71	9	9	150	7.4	10
Mar. 1-10	78,970	9.1	.04	20	5.3	2.2	5.8	76	16	.8	.0	1.2		93	.13	19,830	72	9	6	155	7.4	25
Mar. 11-20	77,900	8.9	.04	21	5.3	1.9	5.3	77	16	1.2	.0	1.3		95	.13	19,980	74	11	5	157	7.8	25
Mar. 21-31	66,940	11	.24	21	4.8	2.8	1.1	75	15	1.1	.2	1.0		96	.13	17,350	72	11	8	156	7.6	12
Apr. 1-10	71,660	10	.05	21	4.6	3.0	.8	77	15	1.0	.2	.5		94	.13	18,190	71	8	8	155	7.4	12
Apr. 11-20	119,400	10	.03	22	4.7	2.8	1.8	78	16	1.1	.2	.5		96	.13	30,950	74	10	7	159	7.4	12
Apr. 21-30	142,400	11	.01	22	4.8	3.2	2.1	79	15	1.4	.2	.6		98	.13	37,680	75	10	8	158	7.6	12
May 1-10	184,000	12	.03	23	5.0	2.9	2.2	81	15	1.1	.2	.5		99	.13	49,180	78	12	7	162	7.4	15
May 11-20	309,600	11	.06	22	4.7	3.0	1.9	78	14	1.0	.2	.4		96	.13	80,250	74	10	8	154	7.3	15
May 21-31	345,300	9.5	.04	20	4.2	2.0	1.6	73	11	.9	.2	.6		85	.12	79,250	67	7	6	141	7.3	15
June 1-10	314,900	9.4	.14	21	4.4	2.0	1.6	73	11	.9	.2	.4		84	.11	71,420	70	11	6	140	7.2	18
June 11-20	290,400	8.2	.12	21	4.6	2.3	1.8	77	11	.9	.2	.5		85	.12	66,650	71	8	6	147	7.4	18
June 21-30	313,900	8.2	.06	21	4.4	2.0	1.6	77	12	.9	.2	.6		85	.12	72,040	70	7	6	144	7.3	18
July 1-10	293,700	8.3	.02	20	5.3	1.8	3.8	76	11	1.0	.1	.5		86	.12	68,200	72	9	5	140	7.3	20
July 11-17	287,100	8.2	.06	20	4.8	1.9		78	12	1.2	.1	.8		87	.12	67,440	70	6	6	142	7.2	15

Aug. 7-10 a	190,300	6.1	--	--	--	--	--	76	11	0.6	--	--	--	--	--	b 68	6	9	139	7.2	--
Aug. 11-20	111,000	6.2	0.07	20	4.7	1.5	3.2	76	11	.6	0.0	0.6	85	0.12	25,470	69	7	4	140	7.5	20
Aug. 21-31	91,210	6.4	.02	20	4.9	1.5	2.7	78	11	.7	.0	.8	84	.11	20,690	70	6	4	140	7.3	10
Sept. 1-10	80,510	5.8	.01	20	4.9	1.3	2.7	78	12	.6	.0	.6	83	.11	18,040	70	6	4	140	7.6	7
Sept. 11-20	67,320	6.8	.01	20	4.7	1.3	2.9	76	12	.7	.0	.6	83	.11	15,090	69	7	4	140	7.5	7
Sept. 21-30	59,590	5.5	.03	20	4.7	1.3	2.7	75	12	.6	.1	.6	84	.11	13,520	69	8	4	140	7.6	15
Weighted average	c 140,000	8.6	0.06	21	4.8	2.2	2.4	77	13	1.0	0.1	0.6	89	0.12	33,640	72	9	6	147	--	--

a Not included for computation of weighted averages.
b Determined by Schwarzenbach method.
c Represents 82 percent of runoff for water year October 1950 to September 1951.

UPPER COLUMBIA RIVER BASIN--Continued

COLUMBIA RIVER MAIN STEM--Continued

COLUMBIA RIVER AT GRAND COULEE DAM, WASH.--Continued

Temperature (°F) of water, November 1950 to September 1951
/Once-daily temperature measurement at approximately 10 a. m./

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

SNAKE RIVER MAIN STEM

SNAKE RIVER AT NEELEY, IDAHO

LOCATION.--At gaging station at Neeley, Idaho, 400 feet upstream from Fish Hatchery buildings, and 0.9 mile downstream from American Falls Dam.

DRAINAGE AREA.--13,600 square miles, approximately, excluding non-tributary area on Snake River plains.

RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1951.

EXTREMES, 1950-51.--Water temperatures: Maximum, 70°F Aug. 2, 3, 8; minimum, freezing point on several days in January and February.

EXTREMES, 1949-51.--Water temperatures: Maximum, 70°F Aug. 2, 3, 8, 1951; minimum, freezing point on many days during Winter months.

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

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

SNAKE RIVER MAIN STEM--Continued

SNAKE RIVER AT KING HILL, IDAHO

LOCATION.--At county highway bridge about 400 yards downstream from gaging station, which is 300 feet east of railroad station at King Hill, Elmore County, and 20 miles downstream from Big Wood (Malad) River.
DRAINAGE AREA.--35,800 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: March to September 1951.
Water temperatures: March to September 1951.
EXTREMES, March to September 1951.--Dissolved solids: Maximum, 346 ppm Sept. 21-30; minimum, 283 ppm Apr. 11-20.
Hardness: Maximum, 210 ppm Sept. 11-20; minimum 181 ppm May 11-31.
Specific conductance: Maximum daily, 564 micromhos Aug. 21; minimum daily, 434 micromhos Apr. 14.
Water temperatures: Maximum, 69°F on several days in July and August.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1217.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 27-31, 1951	18,500	30	0.06	50	17	26	9.8	205	46	23	0.6	4.4		299	0.41	14,940	195	27	21	475	7.9	7
Apr. 1-10	17,900	29	.03	52	17	20	9.2	202	46	23	.6	4.3		299	.41	14,450	200	34	17	478	8.1	15
Apr. 11-20	15,070	30	.05	46	17	25	6.7	195	44	22	.7	2.4		283	.38	11,510	185	25	22	448	7.8	10
Apr. 21-30	10,040	34	.07	44	19	29	6.1	196	49	24	.6	3.2		296	.40	8,020	188	27	24	468	7.8	10
May 1-10	16,780	29	.06	45	18	26	6.1	194	47	22	.7	2.6		288	.39	13,050	186	27	23	461	7.9	5
May 11-20	18,580	23	.06	46	16	27	6.0	201	45	22	.7	2.6		293	.40	14,700	181	18	24	465	7.7	5
May 21-31	18,630	25	.03	46	16	25	6.0	200	45	20	.7	2.0		288	.39	14,490	181	20	22	460	8.0	5
June 1-10	14,810	27	.04	47	17	27	7.0	204	47	22	.7	2.8		296	.40	11,840	188	20	23	476	7.8	5
June 11-20	8,694	32	.06	45	19	32	8.6	210	54	25	.7	3.3		321	.44	7,540	190	18	26	504	8.0	5
June 21-30	10,810	31	.08	46	19	33	6.2	212	54	26	.7	3.3		322	.44	9,400	193	20	26	511	8.1	5
July 1-10	8,209	33	.03	45	20	31	5.4	210	52	24	.5	3.1		314	.43	6,960	194	22	25	499	7.6	8
July 11-20	8,039	36	.02	44	20	35	5.0	213	56	26	.5	3.4		328	.45	7,120	192	18	28	520	7.6	8
July 21-31	8,219	37	.02	43	20	36	5.2	216	57	27	.5	4.0		333	.45	7,390	190	12	29	525	7.8	9
Aug. 1-10	9,005	37	.02	46	21	35	5.6	217	58	28	.5	4.5		335	.46	8,150	202	24	27	527	7.9	9
Aug. 11-20	9,203	38	.02	46	21	35	4.8	217	57	26	.5	3.7		336	.46	8,350	202	24	27	521	7.7	5
Aug. 21-31	8,876	37	.01	47	21	35	4.8	217	59	26	.5	3.7		336	.46	8,050	204	26	27	527	7.8	5
Sept. 1-10	8,987	36	.01	47	21	36	5.0	222	60	27	.5	4.1		341	.46	8,270	204	22	27	534	7.9	5
Sept. 11-20	9,475	35	.01	48	22	36	5.6	226	61	28	.5	3.2		345	.47	8,830	210	26	27	539	8.0	5
Sept. 21-30	9,999	35	.02	48	21	36	5.6	226	62	26	.5	3.1		346	.47	9,340	206	22	27	540	8.0	8

SNAKE RIVER MAIN STEM--Continued

SNAKE RIVER AT KING HILL, IDAHO--Continued

Temperature (°F) of water, March to September 1951
[Once-daily temperature measurement at approximately 11:45 a. m.]

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

BOISE RIVER BASIN

BOISE RIVER AT NOTUS, IDAHO

LOCATION.--At steel county highway bridge, 360 yards downstream from gaging station which is a quarter of a mile southeast of Notus, Canyon County, and 7 miles northwest of Caldwell.
DRAINAGE AREA.--3,820 square miles.
RECORDS AVAILABLE.--Chemical analyses: January 1939 to January 1940, November 1950 to September 1951.
Water temperatures: November 1950 to September 1951.
Sediment records: January 1939 to June 1940.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 439 ppm Sept. 1-10; minimum, 89 ppm May 21-31.
Hardness: Maximum, 206 ppm Feb. 1-5; minimum, 39 ppm May 21-31.
Specific conductance: Maximum daily, 765 micromhos Feb. 1; minimum daily, 93.8 micromhos Apr. 20.
Water temperatures: Maximum, 85°F on several days in July and August; minimum, 36°F Jan. 31, Feb. 1-2.
EXTREMES, 1939-40, 1950-51.--Dissolved solids: Maximum, 914 ppm Aug. 21-31, 1939; minimum, 89 ppm May 21-31, 1951.
Hardness: Maximum, 284 ppm July 21-31, 1939; minimum, 39 ppm May 21-31, 1951.
Specific conductance: Maximum, 1,390 micromhos Aug. 21-31, 1939; minimum daily 93.8 micromhos Apr. 20, 1951.
Sediment loads (1939-40): Maximum, 8,000 tons Apr. 2, 1939; minimum, 0.3 ton Aug. 3, 1939.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1217.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Nov. 21-30, 1950	655	39	--	49	14	80		264	97	23	--	4.5		436	0.59	771	180	0	49	654	7.2	--
Dec. 1-10	829	31	0.06	45	12	66	6.4	234	82	20	0.5	4.9		378	.51	846	162	0	46	579	7.5	5
Dec. 11-20	786	31	.06	47	12	62	5.9	233	81	19	.5	4.2		374	.51	794	167	0	44	574	7.4	5
Dec. 21-31	697	32	.05	46	12	66	5.0	236	89	20	.4	4.2		386	.52	726	164	0	46	598	7.5	5
Jan. 1-10, 1951	660	32	.05	49	13	68	5.6	249	88	22	.4	3.0		406	.55	723	176	0	45	622	7.5	5
Jan. 11-20	662	35	.02	44	13	64	7.5	232	83	22	.5	5.6		385	.52	688	164	0	45	591	7.4	7
Jan. 21-31	690	36	.04	48	13	66	7.5	240	83	21	.5	5.4		395	.54	736	174	0	44	598	7.6	7
Feb. 1-5	832	37	.04	61	13	65	10	289	84	21	.4	4.3		434	.59	975	206	0	39	665	7.6	7
Feb. 6-10	1,860	28	.29	29	7.9	33	7.0	141	45	11	.4	5.0		255	.35	1,280	105	0	39	359	--	7
Feb. 11-19	1,412	28	.13	31	8.7	38	5.0	155	50	12	.3	5.6		251	.34	957	113	0	41	384	7.4	15
Feb. 20-28	1,286	27	.04	28	7.4	38	3.5	149	49	12	.5	5.0		239	.33	830	100	0	44	373	7.5	10
Mar. 1-10	1,386	26	.07	26	6.6	35	3.7	135	44	10	.5	4.8		215	.29	805	92	0	44	335	7.5	10
Mar. 11-20	2,621	23	.11	20	5.3	22	2.7	98	29	7.0	.5	3.8		156	.21	1,100	72	0	39	243	7.6	10
Mar. 21-31, Apr. 1-2	3,775	21	.16	17	3.9	16	6.7	82	22	5.2	.4	4.9		139	.19	1,420	58	0	34	198	7.3	25
Apr. 3-10	5,138	18	.23	15	3.1	11	6.6	66	15	3.5	.4	4.4		113	.15	1,570	50	0	29	151	7.3	45
Apr. 11-20	4,817	18	.19	12	3.5	7.6	3.4	58	11	2.2	.2	1.9		94	.13	1,220	44	0	25	119	7.2	20
Apr. 21-30	5,793	19	.15	13	2.9	9.8	2.4	60	9.5	2.2	.5	2.5		91	.12	1,420	44	0	31	124	7.2	7

BOISE RIVER AT NOTUS, IDAHO--Continued

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
May 1-10, 1951..	4,951	18	0.13	14	2.8	10	2.7	64	10	2.6	0.5	2.2		91	0.12	1,220	46	0	30	133	7.2	7
May 11-20.....	5,897	18	.10	13	2.8	11	2.6	62	11	2.9	.5	3.2		94	.13	1,500	44	0	34	137	7.2	9
May 21-31.....	5,734	15	.07	12	2.3	9.6	3.2	57	9.4	2.2	.4	2.0		89	.12	1,380	39	0	32	125	7.2	10
June 1-10.....	4,189	17	.11	14	3.2	14	3.7	73	15	3.8	.4	1.9		115	.16	1,300	48	0	37	162	7.2	10
June 11-20.....	2,650	18	.07	15	3.5	16	3.7	79	16	4.2	.5	2.1		121	.16	866	52	0	38	175	7.4	10
June 21-30.....	1,180	18	.08	19	4.5	22	4.0	99	23	6.0	.5	2.4		152	.21	484	66	0	40	229	7.4	10
July 1-10.....	796	22	.07	24	5.9	32	5.3	130	33	8.5	.5	4.3		198	.27	426	84	0	43	303	7.6	10
July 11-20.....	181	31	.03	38	11	69	3.7	214	79	22	.5	4.1		364	.50	178	140	0	51	556	7.4	12
July 21-31.....	186	34	.02	38	11	66	3.4	218	72	18	.5	3.2		350	.48	176	140	0	50	536	7.5	12
Aug. 1-10.....	242	32	.03	39	11	66	3.0	223	73	19	.5	3.2		358	.49	234	142	0	49	545	7.6	25
Aug. 11-20	126	34	.03	44	13	87	4.0	259	99	28	.4	3.1		438	.60	149	164	0	53	671	7.9	18
Aug. 21-31.....	266	36	.03	43	12	76	3.5	246	88	24	.4	4.2		410	.56	294	157	0	51	624	7.8	15
Sept. 1-10.....	252	39	.02	46	14	81	7.0	260	96	25	.5	3.3		439	.60	299	172	0	49	652	7.8	20
Sept. 11-20.....	290	39	.03	45	14	79	7.6	256	93	23	.6	3.5		423	.58	331	170	0	49	635	8.0	20
Sept. 21-30.....	328	37	.03	43	13	73	6.2	248	86	20	.6	4.9		402	.55	356	161	0	48	605	7.8	20
Weighted average	a 1,924	21	0.12	19	4.8	21	4.1	97	26	6.2	0.4	3.2		154	0.21	800	67	0	39	226	--	--

a Represents 93 percent of runoff for water year October 1950 to September 1951.

BOISE RIVER BASIN--Continued

BOISE RIVER AT NOTUS, IDAHO--Continued

Temperature (°F) of water, November 1950 to September 1951
[Once-daily temperature measurement at approximately 4 p. m.]

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

MISCELLANEOUS ANALYSES OF STREAMS IN SNAKE RIVER BASIN IN IDAHO

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

Date of collection	Mean discharge (cfs)	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate			
SNAKE RIVER NEAR BURLEY																						
Nov. 19, 1950			23		50	18	29		210	50	25		2.3		301	0.41		199	27	24	479	7.3
Jan. 19, 1951			23		55	18	28		220	53	25		1.6		312	.42		211	30	23	483	
Mar. 26			15		--	--	--		180	45	24		--		--	--		a 163	16	--	426	
SALMON FALLS CREEK NEAR BUHL																						
Nov. 19, 1950			55		89	30	77		246	193	73		9.6		648	0.88		346	144	33	957	7.3
Jan. 17, 1951			54		86	28	80		246	189	70		10		638	.87		330	128	35	923	
SNAKE RIVER BELOW THOUSAND SPRINGS NEAR HAGERMAN																						
Nov. 19, 1950			37		46	20	36		214	56	27		4.0		331	0.45		197	22	28	519	7.3
Jan. 17, 1951			32						215	54	28		2.9					a 201	25		504	
Mar. 26			23						218	52	25		--					--	--		507	
MALAD RIVER NEAR HAGERMAN																						
Nov. 19, 1950			33		38	17	23		196	30	14		3.5		255	0.35		165	4	23	394	
Jan. 19, 1951			34		40	17	21		196	31	13		4.2		257	.35		170	9	21	394	
WEISER RIVER AT WEISER																						
Dec. 10, 1948			29		17	6.3	13		94	12	4.8		0.2		129	0.18		68	0	29	176	
Aug. 22, 1949			32						140	18	4	0.7	1.6					a 84	0		255	
Nov. 20, 1950			29						86	8.1	3.1		.5					a 56	0		156	6.7

a Determined by Schwarzenbach method.

PART 14. PACIFIC SLOPE BASINS IN OREGON AND LOWER COLUMBIA RIVER BASIN

JOHN DAY RIVER BASIN

DESOLATION CREEK NEAR DALE, OREG.

LOCATION.--Temperature recorder at gaging station, 1 mile upstream from mouth, and 2 miles east of Dale, Pottawatomie County.
DRAINAGE AREA.--108 square miles.
RECORDS AVAILABLE.--Water temperatures: December 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 76°F July 24; minimum, freezing point on many days in January, February and March.
REMARKS.--Records of discharge for water year 1950-51 given in Water-Supply Paper 1218.

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

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

COLUMBIA RIVER AT MARYHILL FERRY NEAR RUFUS, OREG.

LOCATION.--At Maryhill Ferry about 2½ miles downstream from Rufus, Sherman County, and about 9 miles upstream from gaging station near The Dalles, which is just upstream from Celilo Falls, 3 miles downstream from Deschutes River, and 11 miles east of The Dalles, Wasco County.
DRAINAGE AREA.--237,000 square miles, approximately (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1951.
Water temperatures: December 1950 to September 1951.
EXTREMES, 1950-51.--Dissolved solids: Maximum, 140 ppm Feb. 1, 4-5, 7, 9-10; minimum, 87 ppm May 11-20.
Hardness: Maximum, 90 ppm Sept. 11-30; minimum, 56 ppm May 21-31.
Specific conductance: Maximum daily, 225 micromhos Sept. 21, 23; minimum daily, 124 micromhos May 26.
Water temperatures: Maximum, 71°F on several days in August; minimum, freezing point Jan. 25, 30.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Portland, Oreg. Discharge records for gaging station near The Dalles for water year October 1950 to September 1951 given in Water-Supply Paper 1218. These records include the inflow of Deschutes River, which on the average amounts to less than 5 percent of the annual runoff at the gaging station. No other appreciable inflow between Maryhill Ferry and gaging station except during periods of heavy local rains.

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Dec. 1-10, 1950	134,000	16	0.08	22	6.4	9.0	2.6	90	18	7.0	0.3	1.1		a127	0.17	45,950	81	7	19	198	7.5	15
Dec. 11-20	130,800	16	.08	21	6.5	8.9	2.6	92	18	5.1	.4	1.4		a125	.17	44,140	79	4	19	199	7.7	15
Dec. 21-31	160,400	15	.10	22	6.1	7.6	2.3	89	17	4.4	.4	.9		119	.16	51,540	80	7	17	185	7.6	15
Jan. 1-10, 1951	172,800	15	.05	20	6.3	7.2	3.9	87	16	3.6	.2	.9		115	.16	53,650	76	4	16	181	7.4	10
Jan. 11-20	142,200	16	.10	22	6.9	8.6	4.6	95	19	4.6	.2	1.2		126	.17	48,380	83	5	17	195	7.6	10
Jan. 21-31	149,600	17	.12	22	7.0	8.9	4.2	96	18	4.9	.3	1.1		130	.18	52,510	84	5	18	201	7.8	10
Feb. 1, 4-5, 7, 9-10	144,500	17	.22	22	7.2	9.8	2.5	99	19	5.4	.3	1.3		140	.19	54,620	84	3	20	213	7.7	10
Feb. 11-15, 18-19, 22	249,100	19	.18	20	6.9	7.0	3.8	87	18	3.8	.2	1.1		125	.17	84,070	78	7	15	181	7.4	25
Mar. 21-31	177,400	20	.18	21	7.7	6.0	4.0	88	20	4.6	.2	1.7		131	.18	62,750	84	12	13	195	7.4	25
Apr. 1-10	203,900	20	.16	19	6.6	6.3	3.7	82	17	4.0	.2	.7		126	.17	69,370	75	7	15	179	7.4	25
Apr. 11-20	266,800	20	.12	17	5.7	6.1	3.5	75	14	2.8	.2	1.3		103	.14	74,200	66	4	16	150	7.4	20
Apr. 21-30	288,600	15	.09	17	4.7	5.2	2.1	74	12	1.9	.4	1.4		94	.13	73,250	62	1	15	146	7.2	10
May 1-10	308,900	17	.07	17	4.9	5.6	2.2	72	12	2.1	.4	1.4		97	.13	80,900	63	4	16	148	7.3	6
May 11-20	507,100	14	.08	16	4.4	4.7	3.4	66	11	2.1	.4	1.4		87	.12	119,100	58	4	14	136	7.2	6
May 21-31	578,100	11	.09	15	4.4	5.4	3.8	65	11	3.6	.3	.8		89	.12	138,900	56	2	16	137	6.9	10
June 1-10	489,800	11	.03	17	4.6	4.6	3.2	70	11	2.8	.2	.7		90	.12	119,000	61	4	13	143	7.1	10
June 11-20	440,700	10	.02	17	4.5	4.4	2.6	70	10	2.2	.2	.8		88	.12	104,700	61	4	13	138	7.2	10
June 21-30	444,700	8.7	.01	18	4.5	4.3	2.8	73	11	2.1	.2	.8		89	.12	106,900	63	4	12	142	7.0	20
July 1-10	386,900	8.1	.03	20	5.2	5.4	1.6	82	12	2.2	.2	.6		97	.13	101,300	71	4	14	160	7.2	15
July 11-20	350,300	8.2	.03	21	5.8	6.1	2.8	88	15	4.1	.2	.7		106	.14	100,300	76	4	14	180	7.6	10
July 21-31	301,500	11	.01	22	5.9	5.7	4.6	92	16	2.8	.3	.7		109	.15	88,730	79	4	13	176	7.4	5

a Sum of determined constituents.

COLUMBIA RIVER MAIN STEM--Continued

COLUMBIA RIVER AT MARYHILL FERRY NEAR RUFUS, OREG.--Continued

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

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Aug. 1-10, 1951	236,200	11	0.01	22	5.6	5.6	3.6	88	14	5.1	0.2	0.8		107	0.15	68,240	78	6	13	174	7.6	5
Aug. 11-20	174,500	11	.01	22	6.1	6.7	3.4	90	16	3.6	.2	1.5		113	.15	53,240	80	6	15	185	7.6	5
Aug. 21-31	132,200	11	.02	23	6.7	8.2	4.8	98	19	4.0	.2	.8		122	.17	43,550	85	5	16	200	7.7	5
Sept. 1-10	125,100	11	.01	23	6.7	8.4	5.2	100	20	4.1	.3	.8		127	.17	42,900	85	3	17	208	7.7	5
Sept. 11-20	107,100	12	.01	24	7.2	10	4.6	104	22	4.9	.3	.8		137	.19	39,620	90	4	19	221	7.6	5
Sept. 21-30	96,800	14	.02	24	7.3	9.6	5.0	106	22	5.4	.4	.5		138	.19	36,070	90	3	18	218	8.0	5
Weighted average	b 257,100	13	0.06	19	5.5	6.0	3.3	80	14	3.3	0.3	1.0		105	0.14	72,890	70	4	15	164	--	--

b Represents 84 percent of runoff for water year October 1950 to September 1951.

COLUMBIA RIVER MAIN STEM--Continued

COLUMBIA RIVER AT MARYHILL FERRY NEAR RUFUS, OREG.--Continued

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

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

DESCHUTES RIVER BASIN

WARM SPRINGS RIVER AT HEHE MILL, NEAR WARM SPRINGS, OREG.

LOCATION.--Temperature recorder at gaging station, a quarter of a mile east of abondoned Hehe Mill, 10 miles south of Bear Springs ranger station, and 18 miles northwest of Warm Springs, Jefferson County.
DRAINAGE AREA.--108 square miles.
RECORDS AVAILABLE.--Water temperatures: May 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 59°F July 17; minimum, 33°F Jan. 17, 28-30, Feb. 1, Mar. 4, 5.
EXTREMES, May 1950 to September 1951.--Water temperatures: Maximum, 59°F July 5, 6, 25, 1950, July 17, 1951; minimum, 33°F Jan. 17, 28-30, Feb. 1, Mar. 4, 5, 1951.
REMARKS.--Records of discharge for water year 1950-51 given in Water-Supply Paper 1218.

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

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

KLICKITAT RIVER NEAR GLENWOOD, WASH.

LOCATION.--Temperature recorder at gaging station, half a mile downstream from Dairy Creek, 5 miles north of Glenwood, Klickitat County, and 7 miles upstream from Trout Creek.
DRAINAGE AREA.--360 square miles.
RECORDS AVAILABLE.--Water temperatures: July 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 57°F July 17, 1951; minimum, freezing point on Jan. 21, 1951.
EXTREMES, July 1950 to September 1951.--Water temperatures: Maximum, 57°F Aug. 18, 1950, July 17, 1951; minimum, freezing point on Jan. 21, 1951.
REMARKS.--Records of discharge for water years 1949-50 and 1950-51 given in Water-Supply Papers 1184 and 1218.

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

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

KLICKITAT RIVER BASIN--Continued

KLICKITAT RIVER NEAR GLENWOOD, WASH.--Continued

Temperature (°F) of water, July 1950 to September 1951--Continued

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1	43	41	41	40	37	37	36	36	32	32	--	--	41	39	43	40	45	43	53	49	55	51	50	47
2	42	41	42	41	37	37	36	35	32	32	--	--	42	39	43	41	46	44	54	49	55	50	51	49
3	43	42	43	42	38	37	35	35	34	32	--	--	42	40	44	42	47	45	54	50	56	52	52	49
4	45	43	43	42	38	38	35	35	35	34	--	--	42	40	44	40	47	46	52	49	56	51	51	48
5	46	45	42	42	38	37	35	35	35	35	--	--	42	40	43	40	47	45	50	47	56	51	51	49
6	45	44	42	41	38	37	35	33	35	33	--	--	42	40	43	42	47	45	50	47	55	50	51	49
7	47	45	42	42	38	38	33	33	35	34	--	--	42	40	43	42	46	45	52	47	55	51	52	50
8	47	46	42	40	39	38	34	33	36	35	--	--	42	40	45	41	48	44	53	49	56	51	52	49
9	46	43	40	38	39	39	34	34	--	--	--	--	42	40	45	41	49	45	54	49	56	52	51	49
10	49	45	38	37	39	39	35	34	--	--	--	--	41	39	45	42	49	46	53	49	56	52	51	49
11	48	46	37	37	39	39	35	35	--	--	--	--	42	39	44	41	49	48	53	48	55	51	50	47
12	47	47	38	37	39	39	35	35	--	--	--	--	43	40	42	41	50	47	54	49	54	49	49	47
13	48	47	38	37	39	38	36	35	--	--	--	--	43	40	43	40	50	48	56	51	54	49	50	47
14	48	47	38	37	38	37	36	33	--	--	--	--	42	40	44	41	52	47	55	51	55	50	50	48
15	47	45	37	35	39	37	34	33	--	--	--	--	42	39	45	41	52	48	55	51	55	51	50	48
16	44	43	36	35	39	39	34	32	37	36	--	--	43	39	47	43	51	47	56	51	55	51	50	49
17	45	43	36	36	39	39	34	32	36	36	--	--	43	40	46	43	51	47	57	51	55	51	53	50
18	45	45	36	36	40	39	34	33	37	36	--	--	43	40	45	42	51	47	55	51	54	50	52	49
19	46	45	36	35	40	40	34	33	37	37	--	--	42	39	45	42	51	48	54	50	54	51	51	49
20	46	46	37	35	40	40	34	32	37	37	--	--	41	39	46	43	51	48	53	49	55	51	51	48
21	46	43	38	37	40	40	33	31	37	37	--	--	41	38	47	43	52	48	55	50	55	51	48	46
22	45	44	39	38	41	40	33	33	37	37	--	--	42	39	47	43	51	48	55	50	54	51	48	46
23	45	44	39	39	--	--	35	33	37	35	--	--	43	41	47	45	52	48	56	51	52	48	48	47
24	44	43	39	39	--	--	36	35	36	35	--	--	43	39	45	43	51	48	56	51	51	48	48	47
25	45	44	40	39	--	--	36	36	36	35	--	--	43	40	45	42	51	47	56	51	52	49	50	48
26	44	43	40	40	--	--	36	35	35	34	--	--	43	41	46	43	53	49	55	50	53	50	48	45
27	43	41	40	39	--	--	35	33	35	33	--	--	43	41	47	45	52	48	55	51	53	50	46	44
28	41	41	39	39	37	37	33	32	35	33	--	--	42	41	45	42	53	48	56	51	52	48	47	46
29	41	41	39	39	38	37	32	32	--	--	--	--	42	40	44	41	53	49	55	51	48	46	47	47
30	42	41	39	37	38	37	32	32	--	--	40	39	42	40	44	42	54	49	55	50	49	47	49	47
31	42	41	--	--	37	36	32	32	--	--	40	38	--	--	45	43	--	--	55	51	49	47	--	--
Average	45	44	39	37	39	38	34	34	--	--	--	--	42	40	45	42	50	47	54	50	54	50	50	48

KLICKITAT RIVER NEAR PITT, WASH.

LOCATION.--Temperature recorder at gaging station, 3½ miles south of Pitt, Klickitat County, 5 miles upstream from Silvias Creek, and 7 miles upstream from mouth at Lyle. Altitude of gage is 285 feet.
DRAINAGE AREA.--1,290 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: August 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 66°F July 17, 23, 1951; minimum, 35°F Jan. 28-31, Feb. 1, 2, 1951.
EXTREMES, August 1950 to September 1951.--Water temperatures: Maximum, 66°F July 17, 23, 1951; minimum 35°F Jan. 28-31, Feb. 1, 2, 1951.
REMARKS.--Temperatures from Apr. 1 to July 25, 1951, are only fair; probably due to temperature bulb being covered with silt and gravel.
Records of discharge for water years 1949-50 and 1950-51 given in Water-Supply Papers 1184 and 1218.

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

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

KLICKITAT RIVER BASIN--Continued

KLICKITAT RIVER NEAR PITT, WASH.--Continued

Temperature (°F) of water, August 1950 to September 1951--Continued

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

GREEN POINT CREEK BELOW NORTH FORK NEAR DEE, OREG.

LOCATION.--Temperature recorder at gaging station, three-quarters of a mile upstream from mouth, 1¼ miles downstream from North Fork, and 1½ miles west of Dee, Hood River County.
DRAINAGE AREA.--20.0 square miles.
RECORDS AVAILABLE.--Water temperatures: May 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 58°F July 16-18, 22-24, Aug. 21; minimum, 35°F Jan. 28 to Feb. 3.
EXTREMES, May 1950 to September 1951.--Water temperatures: Maximum, 58°F July 25, 1950, July 16-18, 22-24, Aug. 21, 1951; minimum, 35°F Jan. 28 to Feb. 3, 1951.
REMARKS.--Records of discharge for water year 1950-51 given in Water-Supply Paper 1218.

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

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1	47	46	47	47	41	41	41	41	35	35	38	38	42	41	41	41	47	45	56	54	57	54	54	52
2	46	46	47	47	41	41	41	41	35	35	38	38	42	41	44	41	48	46	56	54	57	54	54	52
3	46	46	48	47	41	41	41	41	37	35	38	38	42	41	44	43	48	46	56	54	57	54	54	52
4	46	46	49	48	41	41	41	40	38	37	38	37	42	42	43	43	48	47	54	53	57	54	54	52
5	48	46	49	49	41	39	40	40	38	38	37	36	42	41	43	42	48	47	53	52	57	54	55	52
6	48	48	49	49	39	38	40	40	38	38	36	36	42	41	43	43	48	48	53	52	57	54	54	53
7	49	48	49	49	39	38	40	39	38	38	37	36	42	41	44	43	48	48	54	51	57	54	55	54
8	50	49	49	47	40	39	39	39	38	38	37	36	42	41	45	43	50	47	55	52	57	54	55	53
9	50	49	47	44	40	40	39	39	39	38	36	36	42	41	46	43	51	48	56	52	57	54	55	52
10	50	49	44	43	40	40	39	39	39	39	37	36	42	41	46	45	51	49	56	53	57	54	54	53
11	50	50	43	43	41	40	39	39	39	39	38	37	42	41	46	44	51	50	56	53	56	54	54	52
12	50	50	43	43	41	41	39	39	39	39	38	38	43	42	44	42	52	50	56	53	55	54	54	52
13	50	50	43	43	41	41	39	39	39	39	38	38	44	42	43	43	53	51	57	54	56	53	54	52
14	50	50	43	43	41	40	39	38	39	39	39	38	43	42	44	43	55	52	57	54	56	53	54	52
15	50	49	43	40	40	40	38	38	39	39	39	37	43	41	46	42	55	53	57	54	57	54	54	52
16	49	49	41	40	40	40	38	37	39	39	38	37	43	41	47	44	54	52	58	54	57	54	54	53
17	49	49	41	41	40	40	38	37	39	39	38	38	43	42	47	45	54	51	58	55	57	54	55	53
18	49	49	42	41	40	40	38	38	39	39	39	38	43	42	45	43	54	51	58	55	57	54	54	52
19	50	49	42	42	40	40	38	38	39	39	40	39	42	41	46	43	53	51	57	54	57	54	54	53
20	50	50	42	42	41	40	38	37	39	39	40	39	41	41	47	44	54	51	56	53	57	54	54	53
21	50	49	43	42	41	41	37	37	39	39	40	40	41	40	48	45	54	52	57	54	58	54	53	52
22	49	49	43	42	42	41	38	37	39	39	40	39	42	41	48	45	54	52	58	54	56	54	52	51
23	49	49	43	43	42	42	38	38	39	38	40	39	42	42	48	46	54	52	58	55	56	53	52	51
24	49	49	43	43	42	42	38	38	38	38	40	40	43	41	46	45	54	52	58	55	56	53	53	51
25	49	49	43	43	42	42	38	38	38	38	41	40	44	42	45	44	55	52	57	55	56	53	53	52
26	49	48	43	43	42	42	38	38	38	38	41	41	44	43	46	44	55	53	57	53	56	53	52	51
27	49	49	43	43	42	42	38	37	38	38	41	41	44	43	46	45	55	52	57	53	56	53	51	50
28	49	49	43	43	42	42	37	35	38	38	41	41	43	42	45	43	55	52	57	54	54	53	51	50
29	49	49	43	43	42	42	35	35	--	--	41	41	42	41	45	42	56	53	57	54	53	52	51	51
30	49	48	43	41	42	41	35	35	--	--	41	40	41	41	45	44	56	53	57	53	52	52	51	51
31	48	47	--	--	41	41	35	35	--	--	41	40	--	--	46	44	--	--	57	54	54	51	--	--
Average	49	48	44	44	41	41	38	38	38	38	39	38	42	41	45	43	52	50	56	54	56	54	53	52

SANDY RIVER BASIN

BULL RUN RIVER AT BULL RUN, OREG.

LOCATION.--Temperature recorder at gaging station at Bull Run, Clackamas County, 450 feet downstream from tailrace of Portland General Electric Co.'s power plant, and 1.5 miles downstream from Little Sandy River.
DRAINAGE AREA.--136 square miles.
RECORDS AVAILABLE.--Water temperatures: August 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 64°F Aug. 19; minimum, 35°F Jan. 30, 31, Feb. 1.
EXTREMES, August 1950 to September 1951.--Water temperatures: Maximum, 65°F Aug. 22, 1950; minimum, 35°F Jan. 30, 31, Feb. 1, 1951.
REMARKS.--Records of discharge for water year 1950-51 given in Water-Supply Paper 1218.

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

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

BULL RUN RIVER AT BULL RUN, OREG.--Continued

Temperature (°F) of water, August 1950 to September 1951--Continued

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

WILLAMETTE RIVER BASIN

MIDDLE FORK WILLAMETTE RIVER BELOW NORTH FORK NEAR OAKRIDGE, OREG.

LOCATION.--Temperature recorder at gaging station, half a mile below Whitehead Creek, 4 miles below North Fork of Middle Fork Willamette River, and 7 miles northwest of Oakridge, Lane County.
DRAINAGE AREA.--924 square miles.
RECORDS AVAILABLE.--Water temperatures: September 1950 to April 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 54°F Oct. 13; minimum, 35°F Jan. 29-31.
EXTREMES, September 1950 to April 1951.--Water temperatures: Minimum, 35°F Jan. 29-31, Feb. 1, Mar. 3-7, 1951.
REMARKS.--Records of discharge for water year 1950-51 given in Water-Supply Paper 1218.

Temperature (°F) of water September 1950 to April 1951

Day	September		October		November		December		January		February		March		April		May		June		July		August	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1	--	--	50	47	47	46	43	42	42	42	36	35	39	38	44	40								
2	--	--	49	47	47	46	42	42	42	42	36	36	38	38	46	41								
3	--	--	49	47	47	47	42	42	42	42	38	36	38	35	46	42								
4	--	--	51	49	47	47	43	42	42	42	40	38	36	35	46	42								
5	--	--	51	50	48	47	43	43	42	42	41	40	36	35	46	42								
6	--	--	50	49	48	47	44	43	42	41	41	41	35	35	46	42								
7	--	--	52	50	47	47	44	44	41	40	43	41	36	35	46	42								
8	--	--	52	51	49	47	44	44	41	40	42	42	37	36	46	42								
9	--	--	51	49	48	45	44	44	41	41	43	42	37	36	46	42								
10	--	--	53	50	45	43	44	44	42	41	42	42	38	37	46	42								
11	--	--	52	50	44	43	44	44	42	42	42	42	38	37	47	42								
12	--	--	52	51	45	44	44	44	42	41	43	42	39	38	47	43								
13	--	--	54	52	45	44	44	42	41	41	42	41	42	39	48	42								
14	--	--	53	52	44	44	44	42	42	41	42	41	42	39	48	42								
15	--	--	52	51	44	43	44	44	42	41	42	41	42	40	48	42								
16	--	--	51	50	44	43	44	44	41	40	41	40	40	39	47	42								
17	--	--	50	50	45	44	44	44	41	40	40	40	41	39	47	43								
18	--	--	51	49	44	44	44	44	40	40	40	39	42	39	48	44								
19	--	--	51	50	45	44	44	44	40	40	40	39	42	39	48	45								
20	--	--	51	51	45	45	44	44	40	40	40	40	43	40	46	45								
21	57	53	51	50	45	44	44	43	40	40	41	40	42	41	47	42								
22	57	53	51	51	45	44	44	43	41	40	40	40	41	40	47	43								
23	56	53	52	50	44	43	44	44	41	41	40	38	42	39	48	45								
24	57	54	51	50	44	43	44	44	42	41	39	38	43	39	48	43								
25	57	55	50	49	44	44	44	43	42	41	39	39	43	40	48	44								
26	55	53	49	48	44	44	43	42	42	41	39	38	44	41	46	43								
27	55	52	48	47	44	44	42	42	42	41	39	38	44	41	45	42								
28	54	51	47	47	44	43	42	42	41	37	40	38	43	40	42	42								
29	52	49	47	46	43	42	44	42	37	35	--	--	43	42	44	41								
30	50	47	46	46	43	42	44	42	35	35	--	--	42	40	43	41								
31	--	--	46	45	--	--	42	42	35	35	--	--	44	40	--	--								
Average	--	--	50	49	45	44	44	43	41	40	40	40	40	38	46	42								

MIDDLE FORK WILLAMETTE RIVER AT LOWELL, OREG.

LOCATION.--Temperature recorder at gaging station three-quarters of a mile south of Lowell, Lane County, and 4½ miles upstream from Lost Creek.
DRAINAGE AREA.--994 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1951.
EXTREMES.--Water temperatures: Maximum, 72°F July 16; minimum, 35°F Jan. 29-31, Mar. 6.
REMARKS.--Records of discharge for water year 1950-51 given in Water-Supply Paper 1218.

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

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

WILLAMETTE RIVER BASIN--Continued

FALL CREEK BELOW WINBERRY CREEK NEAR FALL CREEK, OREG.

LOCATION.--Temperature recorder at gaging station, 1½ miles downstream from Winberry Creek, and 2½ miles southeast of Fall Creek, Lane County.
DRAINAGE AREA.--190 square miles.
RECORDS AVAILABLE.--Water temperatures: August 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 74°F July 17; minimum, 34°F Jan. 30, 31.
EXTREMES, August 1950 to September 1951.--Water temperatures: Maximum, 74°F Aug. 17, 18, 20, 21, 1950, July 17, 1951; minimum, 34°F Jan. 30, 31, 1951.
REMARKS.--Records of discharge for water year 1950-51 given in Water-Supply Paper 1218.

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

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

FALL CREEK BELOW WINBERRY CREEK NEAR FALL CREEK, OREG.--Continued

Temperature (°F) of water, August 1950 to September 1951--Continued

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

WILLAMETTE RIVER BASIN--Continued

LOOKOUT CREEK NEAR BLUE RIVER, OREG.

LOCATION.--Temperature recorder at gaging station, 0.4 mile upstream from mouth, and 6 miles northeast of Blue River post office, Lane County.
DRAINAGE AREA.--24.1 square miles.
RECORDS AVAILABLE.--Water temperatures: August 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 64°F July 16-18, 23; minimum, 33°F Mar. 3-6..
EXTREMES, August 1950 to September 1951.--Water temperatures: Maximum, 64°F July 16-18, 23, 1951; minimum, 33°F Mar. 3-6, 1951.
REMARKS.--Records of discharge for water year 1950-51 given in Water-Supply Paper 1218.

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

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

WILLAMETTE RIVER BASIN--Continued

LOOKOUT CREEK NEAR BLUE RIVER, OREG.--Continued

Temperature (°F) of water August 1950 to September 1951--Continued

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

WILLAMETTE RIVER BASIN--Continued

NORTH SANTIAM RIVER BELOW BOULDER CREEK NEAR DETROIT, OREG.

LOCATION.--Temperature recorder at gaging station, half a mile downstream from Boulder Creek, and 3 miles southeast of Detroit, Marion County.
DRAINAGE AREA.--216 square miles.
RECORDS AVAILABLE.--Water temperatures: April to September 1951.
EXTREMES.--Water temperatures: Maximum, 59°F July 16-18, 22-24, 27, Aug. 1.
REMARKS.--Record of discharge for water year 1950-51 at site 2 miles downstream given in Water-Supply Paper 1218.

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

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

WILLAMETTE RIVER BASIN--Continued

BREITENBUSH RIVER ABOVE CANYON CREEK NEAR DETROIT, OREG.

LOCATION.--Temperature recorder at gaging station, 600 feet upstream from mouth of Canyon Creek, and 2 miles northeast of Detroit, Marion. County.
DRAINAGE AREA.--106 square miles.
RECORDS AVAILABLE.--Water temperatures: December 1950 to September 1951.
EXTREMES.--Water temperatures: Maximum, 58°F July 17; minimum, 33°F Mar. 3-7.
REMARKS.--Records of discharge for water year 1950-51 at site 500 feet downstream from Canyon Creek given in Water-Supply Paper 1218.

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

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1					--	--	42	42	37	35	37	36	40	38	40	39	46	43	54	49	56	51	51	48
2					--	--	42	41	37	37	37	36	41	39	43	40	47	43	55	49	56	51	51	48
3					--	--	42	42	38	37	36	33	41	39	42	41	49	44	54	50	56	51	52	49
4					--	--	42	42	39	38	35	33	41	39	42	41	47	45	52	49	56	51	52	50
5					--	--	42	42	39	38	34	33	41	39	43	40	45	44	50	48	56	51	52	50
6					--	--	42	41	39	39	34	33	41	39	42	41	46	45	52	48	55	50	52	50
7					--	--	41	40	39	39	34	33	42	40	43	41	46	45	53	47	55	51	52	51
8					--	--	42	40	39	39	34	34	42	39	45	41	50	44	54	48	--	--	52	50
9					--	--	42	42	40	39	35	34	42	39	45	41	50	45	54	48	56	51	52	49
10					--	--	42	42	40	40	36	35	42	40	44	42	50	46	55	49	56	51	50	50
11					--	--	41	40	40	40	36	36	42	40	43	42	50	46	55	49	54	52	51	48
12					--	--	41	40	40	40	37	36	43	40	42	41	48	47	55	49	55	51	51	48
13					--	--	41	40	40	39	38	37	43	40	43	41	50	46	56	50	55	50	52	48
14					--	--	40	40	39	39	38	38	43	40	45	41	53	47	54	50	55	50	52	50
15					--	--	41	40	39	39	38	36	43	40	46	42	52	47	56	50	56	51	52	50
16					--	--	40	39	39	39	37	36	43	40	47	43	52	46	57	51	56	51	52	51
17					--	--	39	39	39	38	38	37	43	40	47	43	52	47	58	52	55	51	54	51
18					--	--	39	39	38	38	38	38	43	41	46	42	52	47	57	53	55	50	53	50
19					--	--	39	39	38	38	37	36	42	41	47	42	52	47	56	52	56	52	52	49
20					--	--	39	39	39	38	40	38	41	40	47	43	53	47	56	50	56	52	52	50
21					43	43	39	39	39	38	39	39	42	38	48	43	53	48	56	50	56	52	51	48
22					44	43	40	39	39	38	39	38	42	39	49	43	53	48	57	51	54	52	50	48
23					44	44	40	39	38	38	39	38	43	41	46	44	54	48	57	52	52	50	49	48
24					44	44	39	39	38	38	39	38	43	40	44	43	52	48	57	52	51	50	49	48
25					44	44	40	39	38	38	40	38	44	40	47	44	54	48	56	52	50	50	49	49
26					44	43	41	40	38	38	40	39	43	40	47	43	54	48	56	51	50	50	50	48
27					43	43	41	39	38	36	40	39	42	40	46	44	54	48	56	51	50	50	49	46
28					43	42	39	35	36	36	40	38	40	40	46	43	54	48	56	51	50	50	48	47
29					43	42	35	35	--	--	40	38	40	40	46	42	54	48	56	51	49	48	48	48
30					43	42	35	35	--	--	39	38	40	39	45	42	54	48	56	51	51	48	49	48
31					42	42	35	35	--	--	40	39	--	--	46	43	--	--	56	51	50	48	--	--
Average					--	--	40	39	39	38	38	36	42	40	45	42	51	48	55	50	54	51	51	49

WILLAMETTE RIVER BASIN--Continued

WILLAMETTE RIVER AT SALEM, OREG.

LOCATION.--At bridge on Oregon Highway 22, Polk-Marion County line, 300 feet downstream from gaging station at Salem.
DRAINAGE AREA.--7,280 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: August to December 1910, August 1911 to August 1912, February to September 1951.
Water temperatures: February to September 1951.
EXTREMES, February to September 1951.--Dissolved solids: Maximum, 65 ppm July 11-31, Sept. 16-20, 24-29; minimum, 46 ppm Apr. 21-30.
Hardness: Maximum, 28 ppm Sept. 16-20, 24-29; minimum, 18 ppm Mar. 11-31, Apr. 21-30, May 11-20.
Specific conductance: Maximum daily, 77.4 micromhos Aug. 17; minimum daily, 40.9 micromhos Feb. 8.
Water temperatures: Maximum, 75°F June 28-30.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Portland, Oreg. Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1218.

Chemical analyses, February to September 1951

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C): Parts per million	Dissolved solids (residue at 180°C): Tons per acre-foot	Dissolved solids (residue at 180°C): Tons per day	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Percent sodium	Specific conductance (micromhos at 25°C)	pH	Color
Feb. 1-10, 1951..	72,500	15	0.16	4.6	1.9	3.5	2.2	27	2.7	3.3	0.0	0.5		50	0.07	9,790	19	0	26	54.7	7.2	20
Feb. 11-20.....	64,610	16	.09	4.7	1.9	3.3	2.4	27	2.3	2.3	.0	.5		48	.07	8,370	20	0	24	51.1	7.1	20
Feb. 21-28.....	29,390	18	.12	5.0	2.1	3.3	2.4	30	2.1	2.3	.2	.8		53	.07	4,210	21	0	23	57.3	7.0	25
Mar. 1-10	30,910	17	.16	4.8	2.1	3.0	1.8	28	2.6	2.7	.2	.6		56	.08	4,670	21	0	22	57.0	7.1	25
Mar. 11-20	50,970	16	.18	4.1	1.8	3.0	1.9	26	2.3	2.2	.2	.6		53	.07	7,290	18	0	24	51.3	6.9	25
Mar. 21-31	35,140	17	.10	4.2	1.8	3.0	2.2	27	1.8	2.3	.2	.6		49	.07	4,650	18	0	24	52.3	7.0	25
Apr. 1-10.....	29,020	16	.06	4.6	2.1	2.9	3.0	28	2.1	2.2	.5	.4		48	.07	3,760	20	0	21	50.2	6.7	20
Apr. 11-20.....	27,950	16	.05	5.2	2.1	3.0	3.4	29	1.8	1.7	.3	.3		49	.07	3,700	22	0	20	53.5	6.8	20
Apr. 21-30.....	19,070	16	.05	4.5	1.6	2.8	3.5	27	1.8	1.8	.1	.3		46	.06	2,370	18	0	21	49.2	6.8	20
May 1-10	22,980	17	.07	4.4	2.0	3.2	2.2	26	2.2	2.0	.5	.5		48	.07	2,980	19	0	24	49.2	6.7	8
May 11-20	25,670	17	.12	4.4	1.7	3.5	2.7	26	1.7	2.0	.5	.6		48	.07	3,330	18	0	26	49.5	6.6	50
May 21-31	17,560	18	.05	4.4	1.9	3.8	1.8	29	2.5	2.0	.5	.6		49	.07	2,320	19	0	28	52.9	6.7	25
June 1-10.....	11,270	19	.07	5.0	2.0	3.9	2.6	30	2.5	2.1	.5	.9		54	.07	1,640	21	0	26	58.7	6.7	12
June 11-20.....	9,378	20	.05	5.4	2.0	3.2	1.9	31	2.7	2.4	.2	.5		63	.09	1,600	22	0	22	64.7	6.8	20
June 21-30.....	7,366	20	.05	5.7	2.1	3.0	1.8	32	2.3	2.6	.2	.5		64	.09	1,270	23	0	21	66.4	6.7	25
July 1-10.....	6,455	20	.07	5.9	2.0	3.1	2.1	34	1.7	2.3	.2	.7		60	.08	1,050	23	0	21	64.9	6.9	25
July 11-20.....	5,437	22	.04	6.6	2.1	3.8	2.1	36	2.4	3.0	.2	.6		65	.09	954	25	0	23	70.3	6.8	20
July 21-31.....	4,674	20	.04	6.3	2.2	3.9	1.4	37	2.4	2.8	.2	.5		65	.09	820	25	0	24	72.1	6.9	25
Aug. 1-10.....	4,264	19	.09	6.1	2.4	4.5	2.1	38	2.6	3.2	.1	.5		62	.08	714	25	0	26	74.4	7.0	9
Aug. 11-17.....	4,386	18	.05	6.2	2.4	5.0	2.7	36	2.9	3.2	.1	.6		64	.09	758	25	0	27	74.2	7.1	9
Aug. 24-31.....	4,575	18	.10	6.1	2.4	4.9	3.0	37	2.5	3.6	.1	.7		64	.09	791	25	0	27	73.2	7.0	9
Sept. 1-3, 5, 11-15.....	4,567	18	.12	6.1	2.7	4.3	3.8	37	3.2	3.6	.3	.8		64	.09	789	26	0	23	71.9	6.9	25
Sept. 16-20, 24-29.....	4,236	18	.07	6.7	2.7	4.5	3.2	40	3.2	4.1	.1	.6		65	.09	743	28	0	24	73.4	7.0	25

WILLAMETTE RIVER BASIN--Continued

WILLAMETTE RIVER AT SALEM, OREG.--Continued

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

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

LEWIS RIVER BASIN

LEWIS RIVER AT ARIEL, WASH.

LOCATION.--Temperature recorder at gaging station at Ariel, Cowlitz County, half a mile downstream from Ariel Dam and power plant and 3 miles upstream from Cedar Creek.
DRAINAGE AREA.--731 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1950 to June, 1951
EXTREMES, 1950-51.--Water temperatures: Maximum, 55°F Oct. 6-9, 1950; minimum, 37°F Feb. 6-16, 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1218.

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

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1	--	--	49	49	43	43	42	42	39	39	39	39	--	--	44	44	46	46						
2	54	54	49	49	43	43	42	42	39	38	39	39	41	39	44	44	46	46						
3	54	54	49	49	43	43	42	42	38	38	39	39	40	39	44	44	--	--						
4	54	54	49	48	43	43	42	42	38	38	39	39	39	39	44	44	48	47						
5	54	54	48	47	43	43	42	42	38	38	39	39	39	39	44	44	47	47						
6	55	54	47	47	43	43	42	42	38	37	39	39	39	39	44	44	47	47						
7	55	54	47	47	43	43	42	42	37	37	39	39	40	39	44	44	47	47						
8	55	54	47	47	43	43	42	42	37	37	39	39	40	40	45	44	47	47						
9	55	54	47	47	43	43	42	42	37	37	39	39	40	40	45	45	48	47						
10	54	54	47	46	43	43	42	42	37	37	39	39	40	40	45	44	--	--						
11	54	54	47	46	43	43	42	42	37	37	39	39	41	40	45	44	49	48						
12	54	54	47	46	43	43	42	42	37	37	39	39	41	41	46	45	48	48						
13	54	54	46	46	43	43	42	41	37	37	39	39	41	41	45	45	48	48						
14	54	54	46	45	43	43	41	41	37	37	39	39	41	41	45	45	48	48						
15	54	53	45	44	43	43	41	41	37	37	39	39	41	41	45	45	--	--						
16	53	53	44	44	43	42	41	41	38	37	39	39	42	41	45	45	--	--						
17	53	53	44	44	42	42	41	41	38	38	39	39	42	41	45	45	--	--						
18	53	53	44	44	42	42	41	41	38	38	39	39	42	42	46	45	--	--						
19	53	53	44	43	42	42	41	41	39	38	39	39	43	42	46	46	--	--						
20	53	53	43	43	42	42	41	40	39	39	39	39	43	43	46	46	--	--						
21	53	52	43	43	42	42	40	40	39	39	39	39	43	42	46	46	--	--						
22	52	52	43	43	42	42	40	40	39	39	39	39	42	42	46	46	--	--						
23	52	52	43	43	42	42	40	40	39	39	39	39	42	42	46	46	--	--						
24	52	52	44	43	42	42	40	40	39	39	39	39	42	42	46	46	--	--						
25	52	52	44	43	42	42	40	40	39	39	40	39	42	42	46	46	--	--						
26	52	52	43	43	42	42	40	40	39	39	40	39	42	42	46	46	--	--						
27	52	52	43	43	42	42	40	39	39	39	39	39	44	42	46	46	--	--						
28	52	52	43	43	42	42	39	39	39	39	39	39	44	44	47	46	--	--						
29	52	52	43	43	42	42	39	39	--	--	40	39	44	44	47	46	--	--						
30	52	50	43	43	42	42	39	39	--	--	39	39	44	44	47	46	--	--						
31	50	49	--	--	42	42	39	39	--	--	--	--	--	--	46	46	--	--						
Average	53	53	45	45	43	42	41	41	38	38	39	39	42	41	45	45	--	--						

EAST FORK LEWIS RIVER NEAR HEISSON, WASH.

LOCATION.--Temperature recorder at gaging station just downstream from Basket Creek, 1½ miles northeast of Heisson, Clark County, and 20 miles upstream from mouth.
DRAINAGE AREA.--125 square miles.
RECORDS AVAILABLE.--Water temperatures: June 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 71°F July 13, 14, 16, 17, 23, Aug. 21, 1951; minimum, 33°F Jan. 31, Feb. 1, 1951.
EXTREMES, June 1950 to September 1951.--Water temperatures: Maximum, 71°F July 13, 14, 16, 17, 23, Aug. 21, 1951; minimum, 33°F Jan. 31, Feb. 1, 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1218.

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

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

COWLITZ RIVER BASIN

CISPUS RIVER NEAR RANDLE, WASH.

LOCATION.--Temperature recorder at gaging station, 500 feet upstream from bridge to Tower Rock ranger station, 4 miles downstream from North Fork and 8 miles southeast of Randle, Lewis County.
DRAINAGE AREA.--323 square miles.
RECORDS AVAILABLE.--Water temperatures: May 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 59°F Aug. 2-5, 9, 14-16, 20, 21, 1951.
EXTREMES, May 1950 to September 1951.--Water temperatures: Maximum, 59°F Aug. 2-5, 9, 14-16, 20, 21, 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1218. No temperature record for January to April 1951.

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

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

a Recorder stopped; range in temperature only from Oct. 1 to Oct. 24; maximum 48°, minimum 45° during this period. Recorder stopped; range in temperature only from Nov. 3 to Nov. 21; maximum 44°, minimum 40° during this period.

COWLITZ RIVER BASIN--Continued

RAINY CREEK NEAR KOSMOS, WASH.

LOCATION.--Temperature recorder at gaging station at county bridge, 2 miles northeast of Kosmos, Lewis County.
DRAINAGE AREA.--17.5 square miles.
RECORDS AVAILABLE.--Water temperatures: August 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 65°F July 13, 16, 17, 18, 1951; minimum, 36°F Jan. 28, 29, Mar. 3, 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 65°F July 13, 16, 17, 18, 1951; minimum, 36°F Jan. 28, 29, Mar. 3, 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1218.

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

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

COWLITZ RIVER BASIN--Continued

RAINY CREEK NEAR KOSMOS, WASH.--Continued

Temperature (°F) of water, August 1950 to September 1951--Continued

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

a Recorder stopped; range in temperature only from July 22 to Aug. 3; maximum 65°F, minimum 59°F, during this period.

WEST FORK TILTON RIVER NEAR MORTON, WASH.

LOCATION.--Temperature recorder, three quarters of a mile above mouth and 4 miles northeast of Morton, Lewis County.
DRAINAGE AREA.--16.4 square miles.
RECORDS AVAILABLE.--Water temperatures: August 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 63°F Aug. 21, 1951.
EXTREMES, August 1950 to September 1951.--Water temperatures: Maximum, 63°F Aug. 21, 1951.
REMARKS.--No temperature record from Dec. 21, 1950 to May 1, 1951. Records of discharge for water years 1949-50 and 1950-51 given in Water-Supply Papers 1184 and 1218.

Temperature (°F) of water August 1950 to September 1951

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

COWLITZ RIVER BASIN--Continued

WEST FORK TILTON RIVER NEAR MORTON, WASH.--Continued

Temperature (°F) of water August 1950 to September 1951--Continued

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

a Recorder stopped; range in temperature only from Nov. 5 to Dec. 21; maximum 45°, minimum 37° during this period.

COWLITZ RIVER NEAR MAYFIELD, WASH.

LOCATION.--Temperature recorder at gaging station 1 mile upstream from Mill Creek, 2 miles downstream from Winston Creek, and 2¼ miles west of Mayfield, Lewis County.
DRAINAGE AREA.--1,400 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 66°F July 28, 31, Aug. 1, 21, 1951; minimum, 35°F Jan. 29-31, Feb. 1, 2, 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1218.

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

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

COWLITZ RIVER BASIN--Continued

TOUTLE RIVER NEAR SILVER LAKE, WASH.

LOCATION.--Temperature recorder at gaging station at highway bridge half a mile downstream from confluence of North and South Forks and 5 miles northeast of Silver Lake, Cowlitz County.
DRAINAGE AREA.--474 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 71°F July 16, 23, 31, 1951; minimum, 34°F Jan. 29, 30, 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1218.

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

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

COWLITZ RIVER AT CASTLE ROCK, WASH.

LOCATION.--Temperature recorder at highway bridge in Castle Rock, Cowlitz County, 2½ miles downstream from Toutle River, and 14 miles upstream from mouth.
DRAINAGE AREA.--2,238 square miles.
RECORDS AVAILABLE.--Water temperatures: August 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 72°F Aug. 21, 1951; minimum, freezing point Jan. 29, 30, 1951.
EXTREMES, August 1950 to September 1951.--Water temperatures: Maximum, 72°F Aug. 21, 1951; minimum, freezing point Jan. 29, 30, 1951.
REMARKS.--Records of discharge for water years 1949-50 and 1950-51 given in Water-Supply Papers 1184 and 1218.

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

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

COWLITZ RIVER BASIN--Continued

COWLITZ RIVER AT CASTLE ROCK, WASH.--Continued

Temperature (°F) of water, August 1950 to September 1951--Continued

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

COWEMAN RIVER NEAR KELSO, WASH.

LOCATION.--Temperature recorder, 3 miles downstream from Goble Creek, 3.8 miles eoutheast of Kelso, Cowlitz County, and 5½ miles upstream from mouth.
DRAINAGE AREA.--119 square miles.
RECORDS AVAILABLE.--Water temperatures: July 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 80°F July 16, 1951; minimum, 34°F Jan. 31, 1951.
EXTREMES, July 1950 to September 1951.--Water temperatures: Maximum, 80°F July 16, 1951; minimum, 34°F Jan. 31, 1951.
REMARKS.--Records of diecharge for water years 1949-50 and 1950-51 given in Water-Supply Papers 1184 and 1218.

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

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

COWLITZ RIVER BASIN--Continued

COWEMAN RIVER NEAR KELSO, WASH.--Continued

Temperature (°F) of water, July 1950 to September 1951--Continued

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

ABERNETHY CREEK NEAR LONGVIEW, WASH.

LOCATION.--Temperature recorder, at gaging station 1 mile upstream from mouth and 11 miles northwest of Longview, Cowlitz County.
DRAINAGE AREA.--20.3 square miles.
RECORDS AVAILABLE.--Water temperatures: June 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum 67°F Aug. 19, 20, 1951; minimum, 34°F March 7, 1951.
EXTREMES, June 1950 to September 1951.--Water temperatures: Maximum, 68°F Aug. 19-21, 1950; minimum, 34°F March 7, 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1218.

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

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

CLATSKANIE RIVER BASIN

CLATSKANIE RIVER NEAR CLATSKANIE, OREG.

LOCATION.--Temperature recorder at gaging station, 2 miles downstream from Carcus Creek, and 5½ miles southeast of Clatskanie, Columbia County.
DRAINAGE AREA.--52.0 square miles.
RECORDS AVAILABLE.--Water temperatures: May 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 70°F June 29, July 16; minimum, 38°F Jan. 31, Feb. 1, 2, Mar. 6-11.
EXTREMES, May 1950 to September 1951.--Water temperatures: Maximum, 75°F July 24, 1950; minimum, 38°F Jan. 31, Feb. 1, 2, Mar. 6-11, 1951.
REMARKS.--Records of discharge for water year 1950-51 given in Water-Supply Paper 1218.

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

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

ELOKOMIN RIVER NEAR CATHLAMET, WASH.

LOCATION.--Temperature recorder at gaging station 2 miles northeast of Cathlamet, Wahkiakum County, and 4 miles upstream from mouth.
DRAINAGE AREA.--66 square miles.
RECORDS AVAILABLE.--Water temperatures: June 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 73°F June 29, 1951; minimum, 36°F Jan. 29, 30, 1951.
EXTREMES, June 1950 to September 1951.--Water temperatures: Maximum, 73°F June 29, 1951; minimum, 36°F Jan. 29, 30, 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1218.

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

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

a Recorder stopped; range in temperature only from Aug. 29 to Sept. 23; maximum 66°, minimum 54° during this period.

BIG CREEK BASIN

BIG CREEK NEAR KNAPPA, OREG.

LOCATION.--Temperature recorder at gaging station, 0.3 mile downstream from fish hatchery, and 2½ miles south of Knappa, Clatsop County.
DRAINAGE AREA.--31.9 square miles.
RECORDS AVAILABLE.--Water temperatures: May 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 62°F Aug. 20, 21; minimum, 37°F Mar. 5-7.
EXTREMES, May 1950 to September 1951.--Water temperatures: Maximum 62°F Aug. 20, 21, 1951; minimum, 37°F Mar. 5-7, 1951.
REMARKS.--Records of discharge for water year 1950-51 given in Water-Supply Paper 1218.

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

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1	48	47	47	47	--	--	45	45	39	38	40	40	44	41	45	44	54	49	57	56	59	57	57	54
2	47	46	48	47	--	--	45	45	40	39	40	39	45	42	46	45	54	49	58	55	61	57	58	55
3	48	46	49	48	--	--	45	45	41	40	40	39	46	43	48	46	52	51	56	54	60	57	59	55
4	48	48	49	49	--	--	45	45	42	41	40	38	45	44	48	48	51	50	55	53	60	58	59	56
5	48	48	49	49	--	--	45	44	42	42	38	37	45	42	49	45	50	50	54	53	61	57	57	56
6	49	48	49	49	45	45	44	44	42	41	39	37	46	43	49	48	50	50	55	53	60	56	56	56
7	50	48	49	48	45	45	44	43	43	42	38	37	46	44	48	47	50	50	58	52	61	56	57	56
8	50	50	49	48	45	44	43	43	44	43	38	38	45	42	49	45	54	50	55	55	58	57	58	56
9	50	49	48	46	45	44	43	43	45	44	38	38	46	43	50	46	56	51	55	54	57	56	57	55
10	50	49	46	45	45	45	44	43	45	45	39	38	46	43	51	49	55	52	60	54	56	56	58	57
11	50	50	45	45	45	45	44	44	45	45	39	39	47	44	51	49	54	53	61	55	56	56	58	57
12	50	50	45	45	45	45	45	44	45	44	39	39	47	44	49	47	53	53	61	56	57	56	58	55
13	50	50	45	44	45	43	45	45	44	43	41	39	47	44	48	46	54	53	59	56	59	56	59	56
14	50	50	44	43	43	43	45	45	44	43	41	41	47	44	48	48	59	53	60	56	60	55	59	57
15	50	49	43	43	44	43	45	44	44	43	41	40	47	43	50	46	58	54	59	57	59	57	58	56
16	49	48	44	43	44	44	44	43	43	42	41	40	47	44	53	49	57	52	61	57	60	55	59	57
17	48	48	--	--	44	44	44	43	43	42	41	41	46	44	52	50	57	53	59	57	59	56	59	58
18	49	48	--	--	44	44	44	44	43	42	42	41	46	45	51	49	56	53	59	57	60	55	58	57
19	50	49	--	--	44	44	44	43	42	42	43	41	45	44	52	48	57	52	59	57	61	56	58	57
20	50	50	--	--	45	44	43	43	42	42	43	42	46	42	53	49	58	52	60	56	62	57	57	56
21	50	49	--	--	45	45	43	43	43	42	42	40	46	41	54	50	58	53	60	56	62	58	56	54
22	49	47	--	--	45	45	43	43	42	42	41	40	45	43	55	51	58	54	61	56	60	58	56	53
23	48	47	--	--	46	45	43	43	42	41	42	40	47	43	53	51	55	53	59	57	60	57	55	54
24	48	47	--	--	46	46	44	43	42	41	43	41	47	43	52	50	58	53	58	57	59	56	55	54
25	48	47	--	--	46	46	44	44	42	40	43	42	48	45	50	48	59	53	57	56	60	56	55	55
26	48	47	--	--	46	45	44	43	41	40	43	43	48	45	51	48	56	54	60	56	59	56	55	52
27	48	47	--	--	45	45	43	41	41	40	43	42	47	45	50	49	58	52	60	57	57	56	53	53
28	48	48	--	--	45	45	41	38	41	40	44	42	45	45	50	48	60	54	58	57	56	55	54	53
29	48	48	--	--	45	45	38	38	--	--	44	42	45	43	51	46	61	55	60	56	55	53	54	54
30	48	47	--	--	46	45	38	38	--	--	42	42	45	44	50	47	61	56	61	56	55	52	55	54
31	47	47	--	--	45	45	38	38	--	--	43	41	--	--	54	49	--	--	60	57	56	53	--	--
Average	49	48	--	--	45	45	43	43	43	42	41	40	46	43	50	49	56	52	59	56	59	56	57	55

WEST BRANCH GRAYS RIVER NEAR GRAYS RIVER, WASH.

LOCATION.--Temperature recorder at gaging station 1 mile upstream from mouth and 3¼ miles northeast of Grays River, Wahkiakum County.
DRAINAGE AREA.--16.3 square miles.
RECORDS AVAILABLE.--Water temperatures: June 1950 to September 1951.
EXTREMES, 1950-51.--Water temperatures: Maximum, 65°F June 29, 1951; minimum, 38°F March 7, 8, 1951.
EXTREMES, 1950-51--Water temperatures: Maximum, 65°F July 24, 25, 1950, June 29, 1951; minimum, 38°F March 7, 8, 1951.
REMARKS.--Records of discharge for water year October 1950 to September 1951 given in Water-Supply Paper 1218.

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

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1	52	50	(a)	(a)	46	46	--	--	41	40	42	42	46	45	51	50	55	52	64	61				
2	51	49	48	48	46	46	--	--	42	41	42	41	46	46	52	51	56	53	63	60				
3	(a)	(a)	49	48	46	46	--	--	43	42	42	41	47	46	53	52	56	54	63	60				
4	(a)	(a)	49	49	46	46	--	--	44	43	41	40	47	47	53	53	54	53	60	59				
5	(a)	(a)	49	49	46	46	--	--	44	44	40	40	47	47	53	52	53	52	60	59				
6	(a)	(a)	49	49	46	46	--	--	44	44	40	39	48	47	53	53	53	52	60	58				
7	(a)	(a)	49	49	46	46	--	--	45	44	39	38	49	48	53	53	53	52	61	58				
8	(a)	(a)	48	47	46	46	--	--	46	45	38	38	49	47	54	52	55	52	61	59				
9	(a)	(a)	47	46	47	46	--	--	--	--	39	39	50	47	54	53	56	53	61	60				
10	(a)	(a)	46	45	47	47	--	--	--	--	40	40	51	49	55	54	56	55	64	60				
11	(a)	(a)	46	46	47	47	--	--	--	--	40	40	52	51	55	55	56	55	(b)	(b)				
12	(a)	(a)	46	45	47	47	--	--	45	45	40	40	53	52	55	54	55	55	(b)	(b)				
13	(a)	(a)	45	45	47	47	--	--	45	45	40	40	53	52	54	53	55	55	(b)	(b)				
14	(a)	(a)	45	44	47	47	--	--	45	45	42	40	53	52	53	53	58	55	(b)	(b)				
15	(a)	(a)	44	44	47	47	--	--	45	45	43	42	53	52	55	53	59	55	(b)	(b)				
16	(a)	(a)	44	44	47	47	--	--	45	45	43	43	53	52	57	55	59	56	(b)	(b)				
17	(a)	(a)	44	44	47	47	--	--	45	45	44	43	53	53	57	56	58	55	(b)	(b)				
18	(a)	(a)	44	44	47	47	--	--	45	44	44	44	53	52	56	54	58	55	(b)	(b)				
19	(a)	(a)	44	44	47	47	--	--	44	44	45	44	52	50	56	54	58	54	(b)	(b)				
20	(a)	(a)	46	44	47	47	--	--	44	44	45	45	51	50	57	55	59	55	(b)	(b)				
21	(a)	(a)	46	46	47	47	--	--	44	44	45	45	51	49	59	56	60	56	(b)	(b)				
22	(a)	(a)	47	46	--	--	--	--	44	44	45	45	51	50	59	57	61	58	(b)	(b)				
23	(a)	(a)	47	47	--	--	--	--	44	44	45	45	52	50	55	54	61	58	(b)	(b)				
24	(a)	(a)	47	47	--	--	--	--	44	44	45	45	53	51	54	52	60	57	(b)	(b)				
25	(a)	(a)	48	47	--	--	--	--	44	43	45	45	54	53	52	50	61	57	(b)	(b)				
26	(a)	(a)	48	48	--	--	45	45	43	43	45	45	55	53	52	51	61	59	(b)	(b)				
27	(a)	(a)	48	48	--	--	45	42	43	42	45	45	55	53	52	51	62	57	(b)	(b)				
28	(a)	(a)	48	48	--	--	42	41	42	42	45	45	52	51	52	51	63	59	(b)	(b)				
29	(a)	(a)	48	47	--	--	40	40	--	--	45	45	51	51	51	49	65	60	(b)	(b)				
30	(a)	(a)	47	46	--	--	40	40	--	--	45	45	51	50	51	50	64	61	(b)	(b)				
31	(a)	(a)	--	--	--	--	40	40	--	--	45	45	--	--	54	51	--	--	(b)	(b)				
Average	--	--	47	46	--	--	--	--	44	44	43	42	51	50	54	53	58	55	--	--				

a Recorder stopped; range in temperature only from Oct. 3 to Nov. 1; maximum 53°, minimum 48° during this period.
b After July 10 the temperature bulb was covered with gravel, and results are considered too inaccurate for publication.

YOUNGS RIVER BASIN

NORTH FORK KLASKANINE RIVER NEAR OLNEY, OREG.

LOCATION.--Temperature recorder at gaging station, half a mile downstream from Barth Falls, 2 miles upstream from North Fork of North Fork, and 4 miles southeast of Olney, Clatsop County.
DRAINAGE AREA.--14.0 square miles.
RECORDS AVAILABLE.--Water temperatures: May 1950 to September 1951.
EXTREMES, 1950-51--Water temperatures: Maximum, 64°F June 29; minimum, 35°F Jan. 29-31, Mar. 9.
EXTREMES, May 1950 to September 1951.--Water temperatures: Maximum, 64°F Aug. 18, 1950, June 29, 1951; minimum, 35°F Jan. 29-31, Mar. 9, 1951.
REMARKS.--Records of discharge for water year 1950-51 given in Water-Supply Paper 1218.

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

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

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