

Quality of Surface Waters of the United States 1961

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

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1885

*Prepared in cooperation with the States of
California, New Mexico, Oregon,
Utah, and Washington, U.S. Bureau
of Reclamation, and with other agencies*



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

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UNITED STATES DEPARTMENT OF THE INTERIOR

STEWART L. UDALL, *Secretary*

GEOLOGICAL SURVEY

William T. Pecora, *Director*

PREFACE

This report was prepared by the Geological Survey in co-operation with the States of California, New Mexico, Oregon, Utah, and Washington, U. S. Bureau of Reclamation and with other agencies by personnel of the Water Resources Division under the direction of L. B. Leopold, chief hydrologist, and S. K. Love, chief, Quality of Water Branch.

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[Symbols after station name designate type of data: c, chemical;
t, water temperature; s, sediment.]

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QUALITY OF SURFACE WATERS OF THE UNITED STATES, 1961

PARTS 9-14

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 State and 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 all uses. 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 content in streams may vary over wide ranges.

In 1941, the Geological Survey began publishing annual records of chemical quality, suspended sediment, and water temperature. The records prior to 1948 were published each year in a single volume for the entire country, and in two volumes in 1948 and 1949. Beginning in 1950, the records were published in four volumes and beginning in 1959 in five volumes. The drainage basins covered in the five volumes are shown in Figure 1. The data given in this volume were collected during the water year October 1, 1960, to September 30, 1961. The records are arranged by drainage basins in downstream order according to the Geological Survey method of reporting streamflow. Stations on tributary streams are listed between stations on the main stem in the order in which those tributaries enter the main stem.

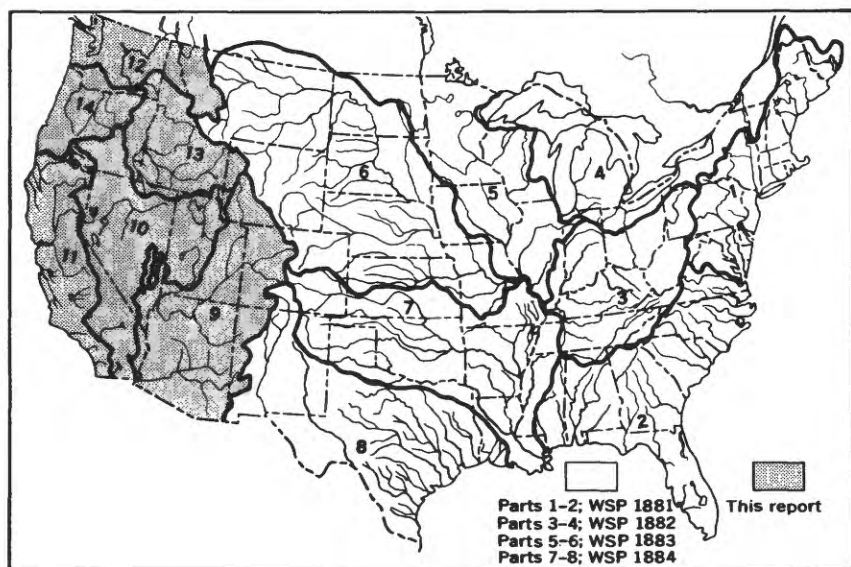


Figure 1. --Map of the conterminous United States showing basins covered by the five water-supply papers on quality of surface waters in 1961. The shaded portion represents the section of the country covered by this volume; the unshaded portion represents the section of the country covered by other water-supply papers.

A station number has been assigned as an added means of identification for each stream location where regular measurements of water quantity or quality have been made. The numbers have been assigned to conform with the standard downstream order of listing gaging stations. The numbering system consists of two digits followed by a hyphen and a six digit number. The notation to the left of the hyphen identifies the Part or hydrologic region used by the Geological Survey for reporting hydrologic data. The number to the right of the hyphen represents the position of the location in the standard downstream order listing measuring stations within each of the 14 parts. The assigned numbers are in numerical order but are not consecutive. They are so selected from the complete 6 digit number scale that intervening numbers will be available for future assignments to new locations. The identification number for each station in this report is printed to the left of the station name and contains only the essential digits. For example, the number is printed as 4-100 for a station whose complete identification number is 04-0100.00.

Descriptive statements are given for each sampling station where chemical analyses, temperature measurements, or sediment determinations have been made. These statements include the location of the station, drainage area, periods of records available, extremes of dissolved solids, hardness, specific conductance, temperature, sediment loads, and other pertinent data. Records of discharge of the streams at or near the sampling station are included in most tables of analyses.

During the water year ending September 30, 1961, the Geological Survey maintained 389 stations on 249 streams for the study of chemical and physical characteristics of surface water. Samples were collected daily and monthly at 280 of these locations for chemical-quality studies. Samples were also collected less frequently at many other points. Water temperatures were measured daily at 174 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, analyses made of the daily samples before compositing have not been reported. The specific conductance of almost all daily samples was determined, and as noted in the table headings this information is available for reference at the district offices listed under Division of Work, on page 30.

Quantities of suspended sediment are reported for 58 stations during the year ending September 30, 1961. 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. Particle-size distributions of sediments were determined at 47 of the stations.

COLLECTION AND EXAMINATION OF SAMPLES

Samples for analyses are usually collected at or near points on streams where gaging stations are maintained by Surface Water Branch of U. S. Geological Survey for measurement of water discharge. The concentration of solutes and sediments at different locations in the stream-cross section may vary widely with different rates of water discharge depending on the source of the material and the turbulence and mixing of the stream. In general, the distribution of sediment in a stream section is much more variable than the distribution of solutes. It is necessary to sample some streams at several verticals across the channel and especially for sediment, to uniformly traverse the depth of flow. These measurements require special sampling equipment to adequately integrate the vertical and lateral variability of the concentration in the section. These procedures yield a velocity-weighted mean con-

centration for the section in contrast to the average concentration that existed without regard to the variable velocities of the individual fluid elements.

The near uniformly dispersed ions of the solute load move with the velocity of the transporting water. Accordingly, the mean section concentration of solutes determined from samples is a precise measure of the total solute load. The mean section concentration obtained from suspended sediment samples is a less precise measure of the total sediment load, because the sediment samplers do not traverse the bottom 0.3 foot of the sampling vertical where the concentration of suspended sediment is greatest and because a significant part of the coarser particles in many streams move in essentially continuous contact with the bed and are not represented in the suspended sediment sample. Hence, the computed sediment loads presented in this report are usually less than the total sediment loads. For most streams the difference between the computed and total sediment loads will be small, in the order of a few percent.

CHEMICAL QUALITY

The methods of collecting and compositing water samples for chemical analysis are described in a manual by Rainwater and Thatcher (1960, 301 p.). No single method of compositing samples is applicable to all problems related to the study of water quality. Although generally holding to the principle of 10 day periods or equivalent to three composite samples per month modifications are usually made on the basis of dissolved-solids content as indicated by measurements of conductivity of daily samples, supplemented by other information such as chloride content, river stage, weather conditions and other background information of the stream.

TEMPERATURE

Daily water temperatures were measured at most of the stations at the time samples were collected for chemical quality or sediment content. So far as practicable, the water temperatures were taken at about the same time each day for an individual station in order that the data would be relatively unaffected by diurnal variations in temperature. Most large, swiftly flowing streams probably have a small diurnal variation in water temperature, whereas sluggish or shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. The thermometers used for determining water temperature were accurate to plus or minus 0.5° F.

At stations where thermographs are located, the records consist of maximum and minimum temperatures for each day, and the monthly averages of maximum daily and minimum daily temperatures.

SEDIMENT

In general, suspended-sediment samples were collected daily with U. S. depth-integrating cable-suspended samplers (U.S. Interagency, 1963, p. 56-77 and U. S. Interagency, 1952, p. 86-90) 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. Depth-integrated samples were collected periodically at three or more verticals in the cross section to determine the cross-sectional distribution of the concentration of suspended sediment with respect to that at the daily sampling vertical. In streams where transverse distribution of sediment concentration ranges widely, samples were taken at two or more verticals to define more accurately the average concentration of the cross section. During periods of high or rapidly changing flow, samples were taken two or more times throughout the day at most sampling stations.

Sediment concentrations were determined by filtration-evaporation method. At many stations the daily mean concentration for some days was obtained by plotting the velocity-weighted instantaneous concentrations on the gage-height chart. The plotted concentrations, adjusted, if necessary for cross-sectional distribution were connected or averaged by continuous curves to obtain a concentration graph. This graph represented the estimated velocity-weighted concentration at any time, and for most periods daily mean concentrations were determined from the graph. The days were divided into shorter intervals when the concentration and water discharge were changing rapidly. During some periods of minor variation in concentration, the average concentration of the samples was used as the daily mean concentration. During extended periods of relatively uniform concentration and flow, samples for a number of days were composited to obtain average concentrations and average daily loads for each period.

For some periods when no samples were collected, daily loads of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately preceding and following the periods, and suspended-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 suspended-sediment loads for individual days are

not estimated, because numerous factors influencing the quantities of transported sediment made it very difficult to make accurate estimates for individual days. However, estimated loads of suspended sediment for missing days in otherwise continuous period of sampling have been included in monthly and annual totals in order to provide a complete record. For some streams, samples were collected weekly, monthly, or less frequently, and only rates of sediment discharge at the time of sampling are shown.

In addition to the records of quantities of suspended sediment transported, records of the particle sizes of sediment are included. The particle sizes of the suspended sediment for many of the stations, and the particle sizes of the bed material for some of the stations were determined periodically.

The size of particles in stream sediments commonly range from colloidal clay (finer than 0.001 mm) to coarse sand or gravel (coarser than 1.0 mm). The common methods of particle-size analyses cannot accommodate such a wide range in particle size. Hence, it was necessary to separate most samples into two parts, one coarser than 0.062 mm and one finer than 0.062 mm. The separations were made by sieve or by a tube containing a settling medium of water. The coarse fractions were classified by sieve separation or by the visual accumulation tube (U. S. Interagency, 1957). The fine fractions were classified by the pipet method (Kilmer and Alexander, 1949) or the bottom withdrawal tube method (U. S. Interagency, 1943, p. 82-90).

EXPRESSION OF RESULTS

Quantities of water for analysis are most conveniently measured in the laboratory by use of volumetric glassware. The analytical results thus obtained in this report are expressed in weights of solute in a given volume of water. To express the results in parts of solute per million (ppm) of water the data must be converted. For most waters this conversion is made by assuming that the liter of water sample weighs 1 kilogram; and thus milligrams per liter are equal to parts per million.

Equivalents per million are not reported, although the expression of analyses in equivalents per million is sometimes preferred. An equivalent per million (epm) is a unit chemical combining weight of a constituent in a million unit weights of water. Chemical equivalence in equivalents per million can be obtained by (a) dividing the concentration in parts per million by the combining weight of that ion, or (b) multiplying the concentration (in ppm) by the reciprocal of the combining weights. The following table lists the reciprocals of the combining weights of cations and anions generally reported in water analyses.

The conversion factors are computed from atomic weights based on carbon-12 (International Union of Pure and Applied Chemistry, 1961).

Conversion factors: Parts per million to equivalents per million

Ion	Multiply by	Ion	Multiply by
Aluminum (Al^{+3}).....	0.11119	Hydroxide (OH^{-1})...	0.05880
Arsenic (As^{+3}).....	.04004	Iodide (I^{-1}).....	.00788
Barium (Ba^{+2}).....	.01456	Iron (Fe^{+3}).....	.05372
Beryllium (Be^{+2})....	.22192	Lead (Pb^{+2}).....	.00965
Bicarbonate (HCO_3^{-1})..	.01639	Lithium (Li^{+1}).....	.14411
Bromide (Br^{-1}).....	.01251	Magnesium (Mg^{+2})..	.08226
Cadmium (Cd^{+2}).....	.01779	Manganese (Mn^{+2}) ..	.03640
Calcium (Ca^{+2}).....	.04990	Nickel (Ni^{+2}).....	.03406
Carbonate (CO_3^{-2})....	.03333	Nitrate (NO_3^{-1}).....	.01613
Chloride (Cl^{-1}).....	.02821	Phosphate (PO_4^{-3})..	.03159
Chromium (Cr^{+6}).....	.11539	Potassium (K^{+1})....	.02557
Cobalt (Co^{+2}).....	.03394	Sodium (Na^{+1}).....	.04350
Copper (Cu^{+2}).....	.03148	Strontium (Sr^{+2})....	.02283
Fluoride (F^{-1}).....	.05264	Sulfate (SO_4^{-2}).....	.02083
Hydrogen (H^{+1}).....	.99209	Zinc (Zn^{+2}).....	.03060

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

The hardness of water is conventionally expressed in all water analyses in terms of an equivalent quantity of calcium carbonate. Such a procedure is required because hardness is caused by several different cations, present in variable proportions. It should be remembered that hardness is an expression in conventional terms of a property of water. The actual presence of calcium carbonate in the concentration given is not to be assumed. The hardness caused by calcium and magnesium (and other cations if significant) equivalent to the carbonate and bicarbonate is called carbonate hardness; the hardness in excess of this quantity is called noncarbonate hardness. Hardness or alkalinity values expressed in parts per million as calcium carbonate may be converted to equivalents per million by dividing by 50.

The value usually reported as dissolved solids is the residue on evaporation after drying at 180°C for 1 hour. For some waters, particularly those containing moderately large quantities of soluble salts, the value reported is calculated from the quantities of the various determined constituents using the carbonate equivalent of the reported bicarbonate. The calculated sum of the constituents may be given instead of or in addition to the residue. 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.

Specific conductance is given for most analyses and was determined by means of a conductance bridge and using a standard potassium chloride solution as reference. Specific conductance values are expressed in micromhos per centimeter at 25°C. Specific conductance in micromhos is 1 million times the reciprocal of specific resistance at 25°C. Specific resistance is the resistance in ohms of a column of water 1 centimeter long and 1 square centimeter in cross section.

The discharge of the streams is reported in cubic feet per second (see Streamflow, p. 24) and the temperature in degrees Fahrenheit. Color is expressed in units of the platinum-cobalt scale proposed by Hazen (1892, p. 427-428). A unit of color is produced by one milligram per liter of platinum in the form of the chloroplatinate ion. Hydrogen-ion concentration is expressed in terms of pH units. By definition the pH value of a solution is the negative logarithm of the concentration of gram ions of hydrogen. However, the pH meter that is generally used in Survey laboratories determines the activity of the hydrogen ions as distinguished from concentration.

An average of analyses for the water year is given for most daily sampling stations. Most of these averages are arithmetical, time-weighted, or discharge-weighted; when analyses during a year are all on 10-day composites of daily samples with no missing days, the arithmetical and time-weighted averages are equivalent. A time-weighted 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 discharge-weighted average approximates 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. A discharge-weighted average is computed by multiplying the discharge for the sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the sum of the discharges. Discharge-weighted averages are usually lower than arithmetical averages for most streams because at times of high discharge the rivers generally have lower concentrations of dissolved solids.

A program for computing these averages on an electronic digital computer was instituted in the 1962 water year. This program extended computations to include averages for pH values expressed in terms of hydrogen ion and averages for the concentration of individual constituents expressed in tons per day. Concentrations in tons per day are computed the same as daily sediment loads.

The concentration of sediment in parts per million 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 of material finer than indicated sizes in millimeters. The size classification used in this report was recommended by the American Geophysical Union Subcommittee on Terminology (Lane and others, 1947, p. 937). Other data included as pertinent to the size analyses for many streams are the date of collection, the stream discharge, sediment concentration when sample was collected, 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 mineral matter. The quantity of dissolved mineral matter in a natural water depends primarily on the type of rocks or soils with which the water has been in contact and the length of time of contact. Some streams are fed by both surface runoff and ground water from spring 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. Ground water is generally more highly mineralized than surface runoff because it remains in contact with the rocks and soils for much longer periods. The dissolved-solids content in a river is frequently increased by drainage from mines or oil fields, by the addition of industrial or municipal wastes, or--in irrigated regions--by drainage from irrigated lands.

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 calculated as sodium), alkalinity as carbonate and bicarbonate, sulfate, chloride, fluoride, nitrate, boron, pH, dissolved solids and specific conductance. Aluminum, manganese, color, acidity, oxygen consumed, and other dissolved constituents and physical properties are reported for certain streams. Phenolic material and minor elements including strontium, chromium, nickel, copper, lead, zinc, cobalt, arsenic, cadmium, and others are occasionally determined for a few streams in connection with specific

problems in local areas and the results are reported when appropriate. The source and significance of the different constituents and properties of natural waters are discussed in the following paragraphs. The constituents are arranged in the order that they appear on standard analytical statement cards which are used to process the chemical quality data in this report.

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.

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.

Manganese (Mn)

Manganese is dissolved in appreciable quantities from rocks in some sections of the country. It resembles iron in its chemical

behavior and in its occurrence in natural waters. However, manganese in rocks is less abundant than iron. As a result the concentration of manganese is much less than that of iron and is not regularly determined in many areas. 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. 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.

Calcium (Ca)

Calcium is dissolved from almost 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.

Strontium (Sr)

Strontium is a typical alkaline-earth element and is similar chemically to calcium. Strontium may be present in natural water in amounts up to a few parts per million much more frequently than the available data indicate. In most surface water the amount of strontium is small in proportion to calcium. However, in sea water the ratio of strontium to calcium is 1:30.

Sodium and potassium (Na and K)

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

Lithium (Li)

Data concerning the quantity of lithium in water are scarce. It is usually found in small amounts in thermal springs and saline waters. Lithium also occurs in streams where some industries dump their waste water. The scarcity of lithium in rocks is responsible more than other factors for relatively small amounts present in water.

Bicarbonate, carbonate and hydroxide (HCO_3 , CO_3 , OH)

Bicarbonate, carbonate, or hydroxide is sometimes reported as alkalinity. The alkalinity of a water is defined as its capacity to consume a strong acid to pH 4.5. Since the major causes of alkalinity in most natural waters are carbonate and bicarbonate ions dissolved from carbonate rocks, the results are usually reported in terms of these constituents. Although alkalinity may suggest the presence of definite amounts of carbonate, bicarbonate or hydroxide, it may not be true due to other ions that contribute to alkalinity such as silicates, phosphates, borates, possibly fluoride, and certain organic anions which may occur in colored waters. The significance of alkalinity to the domestic, agricultural, and industrial user is usually dependent upon the nature of the cations (Ca, Mg, Na, K) associated with it. However, moderate amounts of alkalinity does not adversely affect most users.

Hydroxide may occur in water that has been softened by the lime process. Its presence in streams usually can be taken as an indication of contamination and does not represent the natural chemical character of the 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 increasing the corrosiveness of waters that contain large quantities of calcium and magnesium.

Fluoride (F)

Fluoride has been reported as being present in some rocks to about the same extent as chloride. However, the quantity of fluoride in natural surface waters is ordinarily very small compared to that of chloride. Investigations have proved that fluoride concentrations of about 0.6 to 1.7 ppm reduced the incidence of dental caries and that concentrations greater than 1.7 ppm also protect the teeth from cavities but cause an undesirable black stain (Durfor and Becker, 1964, p. 20). Public Health Service, 1962 (p. 8), states, "When fluoride is naturally present in drinking water, the concentration should not average more than the appropriate upper control limit (0.6 to 1.7 ppm). Presence of fluoride in average concentration greater than two times the optimum values shall constitute grounds for rejection of the supply." Concentration higher than the stated limits may cause mottled enamel in teeth, endemic cumulative fluorosis, and skeletal effects.

Nitrate (NO_3)

Nitrate in water is considered a final oxidation product of nitrogenous material and may indicate contamination by sewage or

other organic matter. The quantities of nitrate present in surface waters are generally 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 ppm (as NO_3) may cause methemoglobinemia (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. U.S. Public Health Service (1962) sets 45 ppm as the upper limit.

Phosphate (PO_4)

Phosphorus is an essential element in the growth of plants and animals, and some sources that contribute nitrate, such as organic wastes and leaching of soils, may be important as sources for phosphate in water and its occurrence may add to the apparent alkalinity. The addition of phosphates in water treatment constitutes a possible source, although the dosage is usually small. In some areas, phosphate fertilizers may yield some phosphate to water. A more important source is the increasing use of phosphates in detergents. Domestic and industrial sewage effluents may therefore contain considerable amounts of phosphate.

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. Water 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, but generally water containing more than about 2,000 ppm is considered to be unsuitable for long-term irrigation under average conditions.

Chromium (Cr)

Few if any waters contain chromium from natural sources. Natural waters can probably contain only traces of chromium as a cation unless the pH is very low. When chromium is present in water, it is usually the result of pollution by industrial wastes. Fairly high concentrations of chromate anions are possible in waters having normal pH levels. Concentrations of more than 0.05 ppm of chromium in the hexavalent form constitute grounds for rejection of a water for domestic use on the basis of the standards of the U. S. Public Health Service (1962).

Nickel and cobalt (Ni, Co)

Nickel and cobalt are very similar in chemical behavior and also closely related to iron. Both are present in igneous rocks in small amounts and are more prevalent in silicic rocks. Any nickel in water is likely to be in small amounts and could be in a colloidal state. Cobalt may be taken into solution more readily than nickel. It may be taken into solution in small amounts through bacteriological activity similar to that causing solution of manganese. However, few data on the occurrence of either nickel or cobalt in natural water are available.

Copper (Cu)

Copper is a fairly common trace constituent of natural water. Small amounts may be introduced into water by solution of copper and brass water pipes and other copper-bearing equipment in contact with the water, or from copper salts added to control algae in open reservoirs. Copper salts such as the sulfate and chloride are highly soluble in waters with a low pH but in water of normal alkalinity these salts hydrolyze and the copper may be precipitated. In the normal pH range of natural water containing carbon dioxide, the copper might be precipitated as carbonate. The oxidized portions of sulfide-copper ore bodies contain other copper compounds. The presence of copper in mine water is common.

Copper imparts a disagreeable metallic taste to water. As little as 1.5 ppm can usually be detected, and 5 ppm can render the water unpalatable. Copper is not considered to be a cumulative systemic poison like lead and mercury; most copper ingested is excreted by the body and very little is retained. The pathological effects of copper are controversial, but it is generally believed very unlikely that humans could unknowingly ingest toxic quantities from palatable drinking water. The U. S. Public Health Service (1962) recommends that copper should not exceed 1.0 ppm in drinking and culinary water.

Lead (Pb)

Lead is only a minor element in most natural waters, but in industrial or mine and smelter effluents may contain relatively large amounts of lead. Many of the commonly used lead salts are water soluble.

Traces of lead in water usually are the result of solution of lead pipe through which the water has passed. Amounts of lead of the order of 0.05 ppm are significant, as this concentration is the upper limit for drinking water in the standards adopted by the U. S. Public Health Service (1962). Higher concentrations may be added to water through industrial and mine-waste disposal. Lead in the form of sulfate is reported to be soluble in water to the extent of 31 ppm (Seidell, 1940, p. 1409) at 25°C. In natural water this concentration would not be approached, however, since a pH of less than 4.5 would probably be required to prevent formation of lead hydroxide and carbonate. It is reported (Pleissner, 1907) that at 18°C water free of carbon dioxide will dissolve the equivalent of 1.4 ppm of lead and the solubility is increased nearly four fold by the presence of 2.8 ppm of carbon dioxide in the solution. Presence of other ions may increase the solubility of lead.

Zinc (Zn)

Zinc is abundant in rocks and ores but is only a minor constituent in natural water because the free metal and its oxides are only sparingly soluble. In most alkaline surface waters it is present only in trace quantities, but more may be present in acid water. Chlorides and sulfates of zinc are highly soluble. Zinc is used in many commercial products, and industrial wastes may contain large amounts.

Zinc in water does not cause serious effects on health, but produces undesirable esthetic effects. The U. S. Public Health Service (1962, p. 55) recommends that the zinc content not exceed 5 ppm in drinking and culinary water.

Barium (Ba)

Barium may replace potassium in some of the igneous rock minerals, especially feldspar and barium sulfate (barite) is a common barium mineral of secondary origin. Only traces of barium are present in surface water and sea water. Because natural water contains sulfate, barium will dissolve only in trace amounts. Barium sometimes occurs in brines from oil-well wastes.

The U. S. Public Health Service (1962) states that water containing concentrations of barium in excess of 1 ppm is not suitable for drinking and culinary use because of the serious toxic effects of barium on heart, blood vessels, and nerves.

Bromide (Br)

Bromine is a very minor element in the earth's crust and is normally present in surface waters in only minute quantities. Measurable amounts may be found in some streams that receive industrial wastes, and some natural brines may contain rather high concentrations. It resembles chloride in that it tends to be concentrated in sea water.

Iodide (I)

Iodide is considerably less abundant both in rocks and water than bromine. Measurable amounts may be found in some streams that receive industrial wastes, and some natural brines may contain rather high concentrations. It occurs in sea water to the extent of less than 1 ppm. Rankama and Sahama (1950, p. 767) report iodide present in rainwater to the extent of 0.001 to 0.003 ppm and in river water in about the same amount. Few waters will contain over 2.0 ppm.

PROPERTIES AND CHARACTERISTICS OF WATER

Hardness

Hardness is the characteristic of water that receives the most attention in industrial and domestic use. It is commonly 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.

Generally, bicarbonate and carbonate determine the proportions of "carbonate" hardness of water. Carbonate hardness is the amount of hardness chemically equivalent to the amount of bicarbonate and carbonate in solution. Carbonate hardness is approximately equal to the amount of hardness that is removed from water by boiling.

Noncarbonate hardness is the difference between the hardness calculated from the total amount of calcium and magnesium in solution and the carbonate hardness. If the carbonate hardness (expressed as calcium carbonate) equal the amount of calcium and magnesium hardness (also expressed as calcium carbonate) there is no noncarbonate hardness. Noncarbonate hardness is about equal to the amount of hardness remaining after water is boiled. The scale formed at high temperatures by the evaporation of water containing noncarbonate hardness commonly is tough, heat resistant, and difficult to remove.

Although many people talk about soft water and hard water, there has been no firm line of demarcation. Water that seems hard to an easterner may seem soft to a westerner. In this report hardness of water is classified as follows:

Hardness range (calcium carbonate in ppm)	Hardness description
0-60	Soft
61-120	Moderately hard
121-180	Hard
more than 180	Very hard

For public use, water with hardness above 200 parts per million generally requires softening treatment (Durfor and Becker, 1964, p. 23-27).

Acidity (H^{+1})

The use of the terms acidity and alkalinity is widespread in the literature of water analysis and is a cause of confusion to those who are more accustomed to seeing a pH of 7.0 used as a neutral point. Acidity of a natural water represents the content of free carbon dioxide and other uncombined gases, organic acids and salts of strong acids and weak bases that hydrolyze to give hydrogen ions. Sulfates of iron and aluminum in mine and industrial

wastes are common sources of acidity. The presence of acidity is reported in those waters which have a pH below 4.5.

Sodium-adsorption-ratio (SAR)

The term "sodium-adsorption-ratio (SAR)" was introduced by the U. S. Salinity Laboratory Staff (1954). It is a ratio expressing the relative activity of sodium ions in exchange reaction with soil and is an index of the sodium or alkali hazard to the soil. Sodium-adsorption-ratio is expressed by the equation:

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

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

Waters are divided into four classes with respect to sodium or alkali hazard: low, medium, high, and very high, depending upon the SAR and the specific conductance. At a conductance of 100 micromhos per centimeter the dividingpoints are at SAR values of 10, 18, and 26, but at 5,000 micromhos the corresponding dividingpoints are SAR values of approximately 2.5, 6.5, and 11. Waters range in respect to sodium hazard from those which can be used for irrigation on almost all soils to those which are generally unsatisfactory for irrigation.

Specific conductance (micromhos per centimeter at 25°C)

Specific conductance is a convenient, rapid determination used to estimate the amount of dissolved solids in water. It is a measure of the ability of water to transmit a small electrical current (see p. 8). The more dissolved solids in water that can transmit electricity the greater the specific conductance of the water. Commonly, the amount of dissolved solids (in parts per million) is about 65 percent of the specific conductance (in micromhos). This relation is not constant from stream to stream or from well to well and it may even vary in the same source with changes in the composition of the water (Durfor and Becker, 1964, p. 27-29).

Specific conductance of most waters in the eastern United States is less than 1,000 micromhos, but in the arid western parts of the country, a specific conductance of more than 1,000 micromhos is common.

Hydrogen-ion concentration (pH)

Hydrogen-ion concentration is expressed in terms of pH units (see p. 8). The values of pH often are used as a measure of the solvent power of water or as an indicator of the chemical behavior certain solutions may have toward rock minerals.

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 of 7.0 indicates that the water is neither acid nor alkaline. pH readings progressively lower than 7.0 denote increasing acidity and those progressively higher than 7.0 denote increasing alkalinity. 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 or organic matter usually have pH values less than 4.5.

The investigator who utilizes pH data in his interpretations of water analyses should be careful to place pH values in their proper perspective.

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 15 units generally passes unnoticed (U. S. Public Health Service, 1962). Some swamp waters have natural color in excess of 300 units.

The extent to which a water is colored by material in solution is commonly reported as a part of a water analysis because a significant color in water may indicate the presence of organic material that may have some bearing on the dissolved solids content. Color in water is expressed in terms of units between 0 and 500 or more based on the above standard (see p. 8).

Oxygen consumed

Oxygen consumed is a measure of the amount of oxygen required to oxidize unstable materials in water and may be correlated with natural-water color or with some carbonaceous organic pollution from sewage or industrial wastes.

Tolerances for oxygen consumed in feed water for low- and high-pressure boilers are 15 and 3 ppm, respectively (Northeast Water Works Association, 1940). Wash water containing more than 8 ppm has been reported to impart a bad odor to textiles; concentrations for water used in beverages and brewing range from 0.5 to 5.0 ppm (California State Water Pollution Control Board, 1952, 1954).

Organics

Phenols. --Phenolic material in water resources is invariably the result of pollution. Phenols are widely used as disinfectants and in the synthesis of many organic compounds. Waste products from oil refineries, coke areas, and chemical plants may contain high concentrations. Fortunately, phenols decompose in the presence of oxygen and organic material, and their persistence downstream from point of entry is relatively short lived. The rate of decomposition is dependent on the environment.

Very low concentrations impart such a disagreeable taste to water that it is highly improbable that harmful amounts could be consumed unknowingly. Reported thresholds of detection of taste and odor range from 0.001 to 0.01 ppm.

Detergents (ABS). --The chief surfactant in commercial detergents is anionic alkylbenzenesulfonate (ABS). ABS and other anionic surfactants resist chemical oxidation and biological breakdown. Their persistence in water over long periods of time contributes to pollution of both ground water and surface water. Some of the effects produced from detergent pollution are unpleasant taste, odor, and foaming (Wyman, Robertson, and Page, 1962). Although the physiological implications of ABS to human beings is unknown, prolonged ingestion of this material by rats is believed to be nontoxic (Paynter, 1960). The U.S. Public Health Service (1962) recommends that ABS should not exceed 0.5 ppm in drinking and culinary waters.

Temperature

Temperature is an important factor in property determining the quality of water. This is very evident for such a direct use

as an industrial coolant. Temperature is also important, but perhaps not so evident, for its indirect influence upon aquatic biota, concentrations of dissolved gases, and distribution of chemical solutes in lakes and reservoirs as a consequence of thermal stratification and variation.

Surface water temperatures tend to change seasonally and daily with air temperatures, except for the outflow of large springs. Superimposed upon the annual temperature cycle is a daily fluctuation of temperature which is greater in warm seasons than in cold and greater in sunny periods than with a cloud cover. Natural warming is due mainly to absorption of a solar radiation by the water and secondarily to transfer of heat from the air or from the bottom. Condensation of water vapor at the water surface is reported to furnish measurable quantities of heat. Heat loss takes place largely through radiation, with further losses through evaporation and conduction to the air and bottom. Thus the temperature of a small stream generally reaches a maximum in mid-to late afternoon due to solar heating and reaches a minimum from early to mid-morning after nocturnal radiation.

Temperature variations which commonly occur during summer in lakes and reservoirs of temperate regions results in a separation of the water volume into a circulating upper portion and a non-circulating lower portion. Separating the two is a stratum of water of variable vertical thickness in which the temperature decreases rapidly with increasing depth. This physical division of the water mass into a circulating and a stagnant portion is the result of density differences in the water column associated with the temperature distribution. Knowledge of the stratification in a body of water may result in increased utility by locating strata of more suitable characteristics. For example, the elevation of an intake pipe may be changed to obtain water of lower temperature, higher pH, less dissolved iron, or other desirable properties.

Temperature is a major factor in determining the effect of pollution on aquatic organisms. The resistance of fish to certain toxin substances has been shown to vary widely with temperature. The quantity of dissolved oxygen which the water can contain is also temperature dependent. Oxygen is more soluble in cold water than in warm water, hence the reduction of oxygen concentrations by pollution is especially serious during periods of high temperature when oxygen levels are already low. Increased temperatures also accelerate biological activity including that of the oxygen-utilizing bacteria which decompose organic wastes. These pollutional effects may be especially serious when low flow conditions coincide with high temperatures. Summary temperature data of water are essential for planning multiple uses of water resources.

Turbidity

Turbidity is the optical property of a suspension with reference to the extent to which the penetration of light is inhibited by the presence of insoluble material. Turbidity is a function on both the concentration and particle size of the suspended material. Although it is reported in terms of parts per million of silica, it is only partly synonymous with the weight of sediment per unit volume of water.

Turbid water is abrasive in pipes, pumps, and turbine blades. In process water, turbidities much more than 1 ppm are not tolerated by several industries, but others permit up to 50 ppm higher (Rainwater, Thatcher, 1960, p. 289). Although turbidity does not directly measure the safety of drinking water, it is related to the consumers acceptance of the water. A level of 5 units of turbidity becomes objectionable to a considerable number of people (U. S. Public Health, 1962).

SEDIMENT

Fluvial sediment is generally regarded as that sediment which is transported by, suspended in, or deposited by water. Suspended sediment is that part of it which remains in suspension in water owing to the upward components of turbulent currents or by colloidal suspension. Much fluvial sediment results from the natural process of erosion, which in turn is part of the geologic cycle of rock transformation. This natural process may be accelerated by agricultural practices. Sediment is also contributed by a number of industrial and construction 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, character of the solid mantle, plant cover, topography, and land use. The mode and rate of sediment erosion, transport, and deposition is determined largely by the size distribution of the particles or more precisely by the fall velocities of the particles in water. Sediment particles in the sandsize (larger than 0.062 mm) range do not appear to be affected by flocculation or dispersion resulting from the mineral constituents in solution. In contrast, 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.

STREAMFLOW

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

State reports containing more complete records of stream discharge may be obtained by writing to the responsible District Engineer, Surface Water Branch, U. S. Geological Survey. For the area covered in this volume, the States, drainage basins, and locations of the district engineers are listed below.

State	Drainage basin	Surface Water Branch district office
Arizona	Colorado River basin	P. O. Box 4070 Tucson, Ariz. 85717
California	The Great Basin Pacific slope basins in California	345 Middlefield Road Menlo Park, Calif. 94025
Colorado	Colorado River	Denver Federal Center Denver, Colo. 80225
Idaho	Snake River basin	Room 215 914 Jefferson Street Boise, Idaho 83702
Montana	Pacific slope basins in Washington and upper Columbia River.	P. O. Box 1696 409 Federal Bldg. Helena, Mont. 59601

State	Drainage basin	Surface Water Branch district office
New Mexico	Colorado River basin	P. O. Box 1750 Greer Bldg. 113 Washington Avenue Santa Fe, N. Mex. 87501
Nevada	Colorado River basin The Great Basin	222 E. Washington St. Carson City, Nev. 89701
Oregon	Snake River basin Pacific slope basins in Oregon and lower Columbia River	P. O. Box 3621 1002 NE Halladay St. Portland, Oreg. 97208
Utah	Columbia River basin The Great Basin	Room 8209 Federal Bldg. 125 S. State St. Salt Lake City, Utah 84111
Washington	Snake River basin Pacific slope basins in Washington and upper Columbia River	Room 300 1305 Tacoma Ave., S. Tacoma, Wash. 98402

PUBLICATIONS

Reports giving records of chemical quality and temperatures of surface waters and suspended-sediment loads of streams in the area covered by this volume for the water years 1941-61, are listed below:

Numbers of water-supply papers containing records for
Parts 9-14, 1941-61

Year	WSP	Year	WSP	Year	WSP	Year	WSP
1941	942	1947	1102	1953	1293	1959	1645
1942	950	1948	1133	1954	1353	1960	1745
1943	970	1949	1163	1955	1403	1961	1885
1944	1022	1950	1189	1956	1453		
1945	1030	1951	1200	1957	1523		
1946	1050	1952	1253	1958	1574		

Geological Survey reports containing chemical quality, temperature, and sediment data obtained before 1941 are listed below. Publications dealing largely with the quality of ground-water supplies and only incidentally covering the chemical composition of surface waters are not included. Publications that are out of print are preceded by an asterisk.

PROFESSIONAL PAPER

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

BULLETINS

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

WATER-SUPPLY PAPERS

- *108. Quality of water in the Susquehanna River drainage basin, with an introductory chapter on physiographic features, 1904.
*161. Quality of water in the upper Ohio River basin and at Erie, Pa., 1906.
*193. The quality of surface waters in Minnesota, 1907.
*236. The quality of surface waters in the United States, Part 1, Analyses of waters east of the one hundredth meridian, 1909.

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

Many of the reports listed are available for consultation in the larger public and institutional libraries. Copies of Geological Survey publications still in print may be purchased at a nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, who will, upon request, furnish lists giving prices.

COOPERATION

Many municipal, State, and Federal agencies gave assistance in collecting records for chemical-quality and sediment investigations. The table on page 28 lists the State and local agencies that cooperated in water-quality investigations in the drainage basins included in this volume and the locations of the quality-of-water district offices responsible for the data collected.

State	Cooperating agency	Drainage basin	District office
California	California Department of Water Resources, William Warne, director. California Water Pollution Control Board, Paul R. Bonderson, executive officer. Monterey County Flood Control and Water Conservation District, Loran Bunte, Jr., district engineer	The Great Basin Pacific slope basins in California	Room 8042 Federal Bldg. U. S. Court House 650 Capitol Avenue Sacramento, Calif. 95814
New Mexico	New Mexico Interstate Stream Commission, S. E. Reynolds, secretary	Colorado River	Geology Bldg. University of New Mexico P. O. Box 4217 Albuquerque, N. Mex. 87106
Oregon	Oregon State Board of Higher Education, Dr. J. C. Richards, chancellor.	Snake River Pacific slope basins in Oregon and lower Columbia River	P. O. Box 3202 830 N. E. Halladay Portland, Oreg. 97208
Utah	University of Utah, College of Mines and Mineral Industries, A. J. Eardley, dean. Utah State Engineer, Wayne D. Criddle.	Colorado River The Great Basin	8209 Federal Bldg. 125 S. State Street Salt Lake City, Utah 84111

State	Cooperating agency	Drainage basin	District office
Washington	Washington Department of Conservation and Development, E. T. Coe, director. Washington State Pollution Control Commission, W. W. Burgerson, director.	Pacific slope basins in Washington and upper Columbia River	P. O. Box 3202 830 N. E. Halladay Portland, Oreg. 97208

The Bureau of Reclamation, United States Department of the Interior, continued financial assistance for the operation of some chemical-quality and sediment investigations in the Colorado River basin in Arizona, Colorado, New Mexico, Utah, and Wyoming, for chemical-quality investigations at Lake Mead and below Hoover Dam on the Colorado River, and for water-quality investigations in the Pacific slope basins in Oregon and lower Columbia River basin.

Assistance was also provided by the Metropolitan Water District of southern California at La Verne, Calif., in the analyses of samples for the chemical-quality program at Lake Mead.

In addition to the cooperative programs, many stations were operated from funds appropriated directly to the Geological Survey. Chemical-quality and sediment load investigations in the Colorado River basin in Arizona, Colorado, New Mexico, and Utah have been 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, L. B. Leopold, chief Hydrologist, and S. K. Love, chief, Quality of Water Branch. The records were collected and prepared for publication under the supervision of district chemists as follows: In California and Nevada, Eugene Brown; Colorado, Wyoming, Utah, Hoover Dam, and the Virgin River basin in Arizona, J. G. Connor, succeeded by R. H. Langford; Idaho, Montana, Oregon, and Washington, L. B. Laird; and in Arizona and New Mexico, J. M. Stow. Any additional information on file may be obtained by writing or visiting the responsible quality-of-water district office.

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CHEMICAL ANALYSES, WATER TEMPERATURES, AND SEDIMENT

PART 9. COLORADO RIVER BASIN

COLORADO RIVER MAIN STEM

9-345. COLORADO RIVER AT HOT SULPHUR SPRINGS, COLO.

LOCATION.--At bridge at Hot Sulphur Springs, Grand County, 1 mile downstream from gaging station and 3.5 miles upstream from Beaver Creek. DRAINAGE AREA.--782 square miles upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: April 1947 to September 1961.

Water temperatures: April 1949 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 104 ppm July 1-31; minimum, 68 ppm June 1, 3-5.

Hardness: Maximum, 73 ppm July 1-31; minimum, 39 ppm May 1-31.

Specific conductance: Maximum daily, 175 microhmhos Aug. 9; minimum microhmhos Aug. 9; minimum daily, 76 microhmhos May 28.

Water temperature: Maximum, 74°F Aug. 28; minimum, freezing point on many days during November to April.

EXTREMES, 1947-61.--Dissolved solids (1947-50, 1952-61): Maximum, 123 ppm July 16-31, 1955; minimum, 38 ppm June 21-30, 1947.

Hardness (1947-50, 1952-61): Maximum, 80 ppm Aug. 1-10, 1955; minimum, 20 ppm June 21-30, 1947.

Specific conductance: Maximum daily, 210 microhmhos Apr. 13, 1958; minimum, freezing point on many days during winter months.

Water temperatures (1949-61): Maximum, 75°F Aug. 6, 1957; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium, Sodium	Non-carbonate			
Oct. 1-31, 1960.....	72.9	10	0.00	18	3.2	6.9	0.9	80	0	6.4	2.0	0.4	0.2	0.02	94	0.13	18.5	59	0	0.4	140	7.6
Nov. 1-21.....	102	11	.00	17	3.2	6.6	1.2	73	0	6.0	2.5	.3	.4	.01	88	.12	24.2	55	0	.4	133	7.5
Nov. 22-30.....	86.0	11	.00	18	3.6	10	1.2	84	0	8.8	4.0	.4	.1	.02	100	.14	23.8	59	0	.6	154	7.6
Dec. 1-31.....	49.7	10	.00	18	2.9	12	1.4	85	0	8.6	4.5	.4	.5	.02	102	.14	13.7	56	0	.7	156	7.7
Jan. 1-31, 1961.....	47.5	12	.01	16	2.9	12	1.4	81	0	8.6	5.0	.4	.5	.01	100	.14	12.8	52	0	.7	155	7.6
Feb. 1-28.....	54.1	10	.00	16	2.4	11	1.6	76	0	8.6	4.0	.3	.4	.02	98	.13	14.3	50	0	.7	150	7.4
Mar. 1-31.....	78.5	12	.00	18	1.9	10	1.9	79	0	7.0	4.5	.4	.5	.04	100	.14	21.2	54	0	.6	154	7.9
Apr. 1-30.....	150	9.6	.04	13	2.4	6.8	1.9	73	0	6.2	2.5	.4	.4	.03	91	.12	36.9	55	0	.4	139	7.7
May 1-31.....	326	9.8	.03	13	1.7	4.0	.9	50	0	5.1	1.0	.5	.5	.01	72	.10	63.4	39	0	.3	96	7.2
June 1, 3-5.....	372	11	.03	13	2.4	4.5	1.2	50	0	5.4	2.0	.6	.6	.04	68	.09	68.3	42	1	.3	97	7.1
June 2, 6-20.....	323	11	.02	18	1.9	5.7	1.2	70	0	4.9	.5	.3	.4	.02	82	.11	71.5	52	0	.3	127	7.3
June 21-23.....	392	9.3	.01	14	2.4	4.2	.8	55	0	3.3	1.0	.6	.5	.03	74	.10	78.3	44	0	.3	100	7.3
June 24-30.....	308	13	.02	22	2.4	7.1	1.3	92	0	3.9	.5	.3	.5	.03	103	.14	85.7	65	0	.4	158	7.6
July 1-31.....	192	12	.01	22	4.4	7.1	1.4	100	0	4.3	1.5	.4	1.2	.16	104	.14	53.9	73	0	.4	166	7.3

EAGLE RIVER BASIN--Continued
9-690. EAGLE RIVER AT GYPSUM, COLO.--Continued

Chemical analyses, in parts per million, water year October 1960 to September 1961--Continued

Date of collection	Mean silica discharge (cfs)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbocationate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhm-cm at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium	Magnesium			
Aug. 8, 1961.....	278	4.7	--	46	9.2	22	--	100	0	76	29	0.6	--	a 236	0.32	177	154	72	0.8	412	7.6
Sept. 1-6.....	392	6.7	--	108	16	41	2.3	178	0	202	56	0.07	--	527	72	558	344	198	1.0	821	7.9
Sept. 7-14.....	715	7.2	--	63	11	24	1.2	118	0	109	30	0.6	0.05	300	.41	579	203	106	1.0	493	7.7
Sept. 15-19.....	460	7.8	--	88	15	39	2.0	145	0	171	53	0.7	0.07	439	.60	545	280	161	1.0	699	7.8
Sept. 20-30.....	698	6.9	--	89	13	24	1.4	117	0	128	32	0.9	0.02	322	.44	607	224	128	.7	524	7.6
Weighted average	--	6.6	--	71	13	35	1.7	119	0	133	50	0.5	0.07	377	0.51	416	228	130	0.9	583	7.5
Time-weighted average.....	408	7.7	--	107	20	61	2.4	162	0	219	88	0.6	0.06	596	--	--	346	214	1.3	909	7.6
Tons per day.....	--	7.2	--	78.0	14.0	39.0	1.9	132	0	147	55.0	0.5	0.06	--	--	--	--	--	--	--	--

Analyses of additional samples

Oct. 14, 1960.....	b 172	9.6	172	27	91	248	0	355	117	0.8	--	904	1.23	420	540	337	1.7	1,310	7.5
Nov. 1.....	b 209	11.1	143	25	124	202	0	309	171	0.4	--	896	1.22	506	460	294	2.5	1,360	7.9
Jan. 12, 1961.....	b 172	13	143	24	96	206	0	306	124	2.1	--	606	1.10	374	456	285	2.0	1,220	7.8
Feb. 18.....	b 167	13	114	22	86	178	0	263	98	1.7	--	a 614	.84	277	376	230	1.3	923	8.1
May 21.....	b 1,030	6.8	32	4.9	13	79	0	43	12	1.7	--	147	.20	409	100	35	.6	248	7.4
June 3.....	b 1,510	6.3	25	5.8	9.0	65	0	35	10	2.0	--	a 125	.17	510	86	33	.4	230	7.7
June 16.....	b 1,450	5.6	30	4.4	11	68	0	43	10	1.9	--	a 139	.19	544	92	36	.5	222	7.4
June 27.....	b 804	6.5	46	7.3	24	98	0	75	28	1.1	--	a 236	.32	512	146	66	.9	389	7.0
July 11.....	b 381	6.0	83	9.7	35	143	0	131	50	0.4	--	a 393	.53	404	248	131	1.0	624	7.6
July 25.....	b 246	8.2	103	17	49	171	0	189	69	.4	--	546	.74	363	328	188	1.2	824	7.9
Aug. 8.....	b 271	7.9	103	16	52	165	0	191	72	.5	--	535	.73	396	332	187	1.3	831	7.6
Aug. 27.....	b 304	10	113	13	44	187	0	186	60	.5	--	524	.71	426	336	183	1.0	809	7.2

a Calculated from determined constituents.
b Discharge at time of sampling.

EAGLE RIVER BASIN--Continued
9-690. EAGLE RIVER AT GPSUM, COLO.--Continued

Temperature (°F) of water, water year October 1960 to September 1961																																Aver- age	
Month		Day																															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		31
October	54	52	50	52	54	55	53	57	51	51	50	54	45	40	45	39	42	42	47	45	52	55	45	51	52	50	41	46	43	43	44	48	
November	44	44	43	42	41	47	43	40	47	41	37	45	43	39	41	38	40	37	32	40	32	35	33	32	32	41	40	38	32	32	35	39	48
December	34	34	44	35	32	32	32	35	34	36	32	32	32	32	32	32	34	32	32	33	34	34	33	32	32	32	34	34	35	32	32	33	33
January	32	32	33	33	32	33	33	33	32	35	32	33	34	33	35	43	35	33	33	33	33	36	34	33	36	34	36	34	33	34	37	36	34
February	33	32	35	33	35	33	34	35	37	37	37	36	37	36	37	39	35	35	32	32	32	38	33	32	34	35	35	33	37	--	--	--	35
March	32	40	37	36	38	37	40	40	37	32	37	35	32	33	33	33	34	34	34	36	35	38	38	40	39	38	38	39	40	39	41	37	37
April	42	41	42	44	42	42	37	38	38	41	42	43	43	44	44	44	42	41	43	46	44	52	50	47	46	44	45	45	45	45	45	43	43
May	46	48	48	47	48	43	43	44	52	50	50	47	51	46	50	56	48	60	50	56	54	53	53	52	54	55	54	51	55	50	50	50	50
June	53	53	48	53	53	54	55	57	53	55	57	54	58	54	56	56	55	55	55	55	55	55	--	--	--	--	--	--	--	54	55	--	--
July	63	62	67	64	64	65	65	60	60	61	62	60	60	58	58	60	60	58	57	57	57	65	59	60	63	62	59	60	65	61	61	61	
August	61	70	59	60	59	61	63	63	63	58	67	63	61	62	60	60	61	60	63	65	60	56	62	59	62	60	63	61	62	57	52	61	61
September	58	53	44	44	45	48	53	50	53	55	56	54	48	49	48	49	52	52	55	54	51	48	43	43	43	50	48	45	45	47	43	--	49

EAGLE RIVER BASIN--Continued
9-699. GYPSUM CREEK AT GYPSUM, COLO.

LOCATION.--At mouth near bridge on U.S. Highways 6 and 24 at Gypsum, Eagle County.
RECORDS AVAILABLE.--Chemical analyses: January to August 1961 (discontinued).
REMARKS.--No discharge records available.

Chemical analyses, in parts per million, January to August 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (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) (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
													Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-bicarbonate		
Nov. 12, 1958.....		13	127	23	7.8		237	0	221	2.0		2.7	514	0.70		412	218	0.2	747
June 29, 1959.....		16	103	65	24		256	0	346	4.0		3	684	.93		523	313	.5	923
Sept. 3, 1960.....		51	139	37	22		66	0	461	7.0		3.5	753	1.02		500	448	.4	935
Jan. 14, 1961.....		13	121	18	9.0		216	0	202	3.0		2.3	474	.64		374	197	.2	674
Feb. 15.....		15	99	18	11		134	0	216	4.0		2.9	432	.59		320	210	.3	609
Mar. 23.....		13	109	21	2.5		166	0	213	3.0		2.2	446	.61		358	222	.1	646
May 21.....		19	319	41	28		307	0	730	6.5		6.9	1,300	1.77		965	713	.4	1,530
June 3.....		17	343	50	22		302	0	812	5.5		7.5	1,410	1.92		1,060	812	.3	1,880
June 16.....		23	279	47	18		94	0	806	5.5		6.4	1,230	1.67		890	813	.3	1,450
June 27.....		18	309	43	26		216	0	776	7.0		6.7	1,290	1.75		945	768	.4	1,530
July 11.....		15	313	41	22		336	0	683	6.0		4.0	1,250	1.70		950	674	.3	1,510
July 25.....		16	269	45	14		320	0	630	6.0		3.5	1,260	1.56		905	636	.2	1,430
Aug. 8.....		15	303	30	28		323	0	634	10		3.6	1,180	1.66		880	615	.2	1,450
Aug. 27.....		24	204	40	17		206	0	509	6.5		3.6	905	1.23		675	506	.3	1,150

COLORADO RIVER MAIN STEM

9-705, COLORADO RIVER NEAR DOTSERO, COLO.

LOCATION.--At gaging station about 500 feet south of U.S. Highways 6 and 24, 1.5 miles west of Dotsero, Eagle County, and 1.5 miles downstream from Eagle River. DRAINAGE AREA.--4,390 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: May 1959 to August 1961 (discontinued).

Chemical analyses, in parts per million, October 1960 to August 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbocation (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 14, 1960.....	976	6.3		62	12	44		132	0	122	46		0.3		340	0.46	896	204	96	1.3	557	7.4
Nov. 1.....	735	15		77	14	53		142	6	139	63		1.1		440	.60	873	250	120	1.4	683	8.3
Mar. 23, 1961.....	841	14		56	11	41		134	0	108	38		.7		a 335	.46	761	167	77	1.3	525	8.2
May 22.....	4400	11		36	6.3	13		107	0	41	10		1.4		170	.23	2020	116	28	.5	269	7.6
June 4.....	4320	11		30	6.3	12		88	0	41	9.0		.9		a 153	.21	1780	102	30	.5	241	8.2
June 16.....	3030	7.9		37	7.6	14		97	0	54	13		.7		a 182	.25	1490	124	44	.5	290	7.2
June 27.....	1640	9.3		49	10	26		122	0	81	27		.7		a 268	.36	1170	163	63	.8	422	7.0
July 11.....	1060	8.3		65	9.7	44		158	0	109	36		.5		a 335	.46	950	202	72	1.3	540	7.4
July 25.....	1390	9.0		91	12	37		142	0	115	32		.3		a 332	.45	1260	200	104	1.3	619	7.3
Aug. 8.....	854	9.3		76	14	46		150	0	116	37		.3		a 337	.42	893	225	94	1.3	569	7.4
Aug. 27.....	968	10		75	9.0	34		160	0	107	39		.8	0.05	357	.49	933	225	94	1.3	569	7.5

a Calculated from determined constituents.

COLORADO RIVER MAIN STEM--Continued

9-711. COLORADO RIVER NEAR GLENWOOD SPRINGS, COLO.

LOCATION.--At Shoshone powerplant, 6 miles upstream from gaging station at Glenwood Springs, Garfield County, and 6.5 miles upstream from Roaring Fork. DRAINAGE AREA.--4,560 square miles, approximately, upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: October 1941 to September 1961.

Water temperatures: May 1949 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 489 ppm Oct. 1-31; minimum, 169 ppm May 22-31.

Hardness: Maximum, 226 ppm Nov. 1-30; minimum, 107 ppm June 1-14.

Specific conductance: Maximum, 699 μ mhos/cm, 870 micromhos July 1; minimum daily, 252 micromhos June 2.

Freezing point: Records of freezing point on many days during November to March.

EXTREMES, 1941-61.--Dissolved solids: Maximum, 2,030 ppm Aug. 10, 1947; minimum, 106 ppm June 1-10, 1942.

Hardness: Maximum, 1,480 ppm Aug. 10, 1947; minimum, 72 ppm June 1-20, 1942.

Specific conductance: Maximum daily, 2,260 micromhos Aug. 10, 1947; minimum daily, 153 micromhos May 24, 1948.

Water temperatures (1949-61): Maximum, 71°F July 31, 1954, Aug. 19, 1955; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge are given for Colorado River at Glenwood Springs, Colo.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 1-31, 1960....	996	8.3	0.01	65	15	74	2.1	136	0	121	102		0.5	0.05	459	0.62	1,240	222	110	2.2	771	7.6
Nov. 1-30.....	956	9.0	--	58	15	73	2.5	142	0	122	98		0.8	0.03	458	.82	1,160	226	110	2.1	762	7.6
Dec. 1-31.....	984	11	--	66	12	64	2.3	133	0	96	93		1	0.04	408	.55	1,080	192	83	2.0	686	7.8
Jan. 1-31, 1961....	1,054	9.8	.00	55	9.7	63	2.2	124	0	79	94		1	0.03	382	.52	1,090	176	74	2.1	653	7.8
Feb. 1-28.....	1,014	9.3	--	54	10	68	2.0	120	0	82	99		0	0.03	393	.53	1,080	176	78	2.2	674	7.5
Mar. 1-31.....	886	11	--	60	12	68	2.6	131	0	106	99		2	0.03	434	.59	1,040	200	93	2.1	730	7.6
Apr. 1-30.....	1,113	11	.00	58	11	59	2.4	131	0	94	85		2	0.04	396	.54	1,190	188	81	1.9	667	8.1
May 1-11.....	1,735	10	--	49	9.2	41	1.7	116	0	66	62		3	0.03	310	.42	1,450	161	66	1.4	522	7.7
May 12-21.....	2,849	11	--	42	7.3	24	1.6	110	0	49	32		3	0.04	229	.31	1,760	135	45	.9	376	7.6
May 22-31.....	5,682	9.0	--	35	5.1	14	1.1	98	0	32	18		3	0.04	169	.23	2,590	109	29	.6	280	7.5
June 1-14.....	4,739	8.6	--	34	5.6	17	1.2	93	0	32	23		3	.17	178	.24	2,280	107	31	.7	299	7.6
June 15-23.....	2,769	7.7	--	39	8.3	29	1.2	98	0	57	38		3	.17	234	.32	1,690	132	52	1.1	402	7.6
June 24-30.....	1,729	8.8	--	51	11	48	2.0	124	0	80	66		3	.19	333	.45	1,550	173	71	1.6	561	7.7
July 1-31.....	1,341	9.4	.01	68	11	59	2.3	132	0	113	82		2	.03	432	.59	1,560	223	98	1.7	717	7.7
Aug. 1-31.....	1,297	10	--	67	11	69	2.3	144	0	112	93		2	.06	433	.59	1,520	214	96	2.0	734	7.7

COLORADO RIVER MAIN STEM--Continued
9-711. COLORADO RIVER NEAR GLENWOOD SPRINGS, COLO.--Continued

Chemical analyses, in parts per million, water year October 1960 to September 1961--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) (B)	Dissolved solids (residue at 180°C)				Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhm-cm at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day		Calcium, magnesium	Non-carbonate			
Sept. 1-26, 1961...	1,703	9.3	--	63	11	53	2.1	136	0	107	69		0.6	379	0.52	1,740		205	93	1.6	636	7.6
Sept. 27-30,	2,642	10	--	54	12	36	1.9	128	0	88	46		.6	312	.42	2,230		183	78	1.2	523	7.6
Weighted average	--	9.5	--	53	10	46	1.9	123	0	61	67		0.3	337	0.46	1,390		173	72	1.5	567	7.6
Time-weighted average.....	1,520	9.7	--	58	11	59	2.1	130	0	94	82		0.3	386	--	--		191	84	1.8	650	7.7
Tons per day....	--	39.0	--	217	41.0	196	7.9	504	0	332	276		1.4	--	--	--		--	--	--	--	--

Temperature (°F) of water, water year October 1960 to September 1961

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

COLORADO RIVER MAIN STEM--Continued
9-725. COLORADO RIVER AT GLENWOOD SPRINGS, COLO.

LOCATION.--at cableway, 0.2 mile downstream from gaging station at Glenwood Springs, Garfield County, 10 feet from U.S. Highways 6 and 24, and 0.2 mile upstream from Folsom, 1.56 square miles, approximately, upstream from gaging station.
DRAINAGE AREA.--1,560 square miles, approximately, upstream from gaging station.
RECORDS AVAILABLE.--Chemical analyses: May 1959 to August 1961 (discontinued).

Chemical analyses, in parts per million, October 1960 to August 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 14, 1960.....	1100	9.1		64	12	126		144	0	109	177		0.3	--	571	0.78	1700	206	90	3.8	964	7.5
Nov. 2, 1960.....	1708	13		82	15	185		176	0	150	260		.6	--	798	1.08	1520	264	120	5.0	1340	8.0
Nov. 13, 1961.....	1180	13		55	9.7	98		130	0	66	137		.9	--	477	.63	1460	176	99	3.2	809	9.1
Feb. 16, 1961.....	1180	12		28	12	106		131	0	87	154		1.0	--	a 525	.77	1580	168	78	3.4	851	7.0
Mar. 23, 1961.....	1130	12		63	14	104		142	0	117	141		.9	--	a 522	.71	1590	212	96	3.1	890	8.2
May 22, 1961.....	4310	12		38	4.9	33		115	0	47	31		1.2	--	219	.30	2550	116	22	1.3	356	7.7
June 4, 1961.....	4480	9.3		34	7.6	25		97	0	44	31		1.2	--	a 200	.27	2420	118	36	1.0	326	7.2
June 17, 1961.....	2900	8.6		40	6.6	44		106	0	60	52		.5	--	a 264	.36	2070	128	41	1.7	434	8.0
June 27, 1961.....	1700	7.9		53	8.8	70		122	0	79	98		.5	--	a 377	.51	1730	168	68	2.4	644	7.8
July 11, 1961.....	1150	9.5		79	9.2	109		162	0	113	155		1.6	0.05	571	.78	1770	234	101	3.1	972	7.1
July 25, 1961.....	1350	10		70	11	92		146	0	124	131		.7	.06	514	.70	1670	220	100	2.7	850	7.4
Aug. 8, 1961.....	1040	10		84	13	120		165	0	143	168		1.1	.05	639	.87	1790	262	127	3.2	1070	7.5
Aug. 27, 1961.....	1400	9.5		63	10	83		138	0	98	117		.6	.05	465	.63	1760	199	86	2.6	789	7.7

a Calculated from determined constituents.

ROARING FORK BASIN

9-850. ROARING FORK AT GLENWOOD SPRINGS, COLO.

LOCATION.--At gaging station at Glenwood Springs, Garfield County, 1,500 feet upstream from mouth.

DRAINAGE AREA.--1,460 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: November 1958 to August 1961.

Chemical analyses, in parts per million, October 1960 to August 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 14, 1960.....	498	12		97	17	32		208	0	151		0.6		457	0.62	614	313	142	0.8	714	7.7
Nov. 2.....	498	13		90	17	27		185	0	153		0.8		426	.58	573	295	143	.7	658	7.4
Jan. 14, 1961.....	425	15		80	18	30		148	0	165		1.6		417	.57	479	274	153	.8	625	7.3
Feb. 16.....	328	12		89	17	33		187	0	162		0.9		a 436	.59	386	292	139	.9	664	6.9
Mar. 23.....	336	11		89	15	33		182	0	162		1.6		a 427	.58	387	284	135	.8	650	8.1
May 17.....	1090	12		53	8.8	16		120	0	79		0.8		a 244	.33	718	168	70	.5	393	7.9
May 22.....	2650	11		34	6.3	8.5		91	0	43		1.0		a 156	.21	1120	112	37	.3	245	8.0
June 1.....	3010	8.6		34	6.8	7.8		86	0	46		1.1		a 154	.21	1250	114	42	.3	248	8.0
June 16.....	2990	8.6		34	7.1	7.6		91	0	44		1.0		a 155	.21	1250	116	41	.3	246	8.2
June 27.....	2150	8.6		48	7.3	13		116	0	65		1.4		a 210	.29	1220	150	55	.4	335	8.1
July 11.....	950	7.5		69	11	25		160	0	105		1		a 322	.44	826	218	87	.7	501	7.3
July 25.....	531	11		86	14	39		194	0	137		.2		a 425	.58	609	272	113	1.0	659	7.6
Aug. 8.....	538	11		86	16	36		192	0	137		.3		a 429	.58	623	280	123	.9	673	7.5
Aug. 27.....	510	13		103	12	32		208	0	140		1.4	0.04	454	.62	625	304	133	.8	715	7.5

a Calculated from determined constituents.

COLORADO RIVER MAIN STEM
9-955, COLORADO RIVER NEAR CAMERO, COLO.

LOCATION.--At Grand Valley project diversion dam, 3.7 miles upstream from Camero, Mesa County, 0.4 mile upstream from Plateau Creek, and 5.9 miles downstream from station.

Drainage area, 8,090 square miles, approximately upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses, October 1933 to September 1961.

Water temperatures: April 1949 to September 1961.

EXTREMES 1960-61.--Dissolved solids: Maximum, 813 ppm Apr. 1-4; minimum, 213 ppm June 1-16.

Hardness: Maximum, 316 ppm Apr. 1-4; minimum, 119 ppm June 1-16.

Specific conductance: Maximum daily, 1,440 microhos Apr. 2; minimum daily, 303 microhos June 2.

Water temperatures: Maximum, 71°F July 29 to Aug. 1; minimum, freezing point on many days during December to February.

EXTREMES 1933-61.--Dissolved solids (1933-43, 1950-61): Maximum, 1,050 ppm Dec. 21-31, 1939; minimum, 143 ppm June 11-20, 1935.

Hardness (1933-35, 1957-61): Maximum, 399 ppm July 21-31, 1934; minimum, 96 ppm June 21-30, 1935.

Specific conductance (1941-61): Maximum daily, 1,850 microhos June 8, 1944; minimum daily, 244 microhos July 2, 1947, July 3, 1957.

Water temperatures (1949-61): Maximum, 75°F July 27, 1953, July 12, 29, 31, 1954, July 28, 1956; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bi-car- bon- ate (HCO ₃)	Car- bon- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃) (B)	Bo-	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		So- dium ad- sorp- tion ratio (micro- mhos at 25°C)	Specific con- duct- ivity (micro- mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Cal- cium, Mag- ne- sium	Non-car- bon- ate			
Oct. 1-31, 1960...	1,732	8.6	--	81	21	143	--	168	0	183	190	4.3	--	--	734	1.00	3,430	289	151	3.6	1,200	7.5
Nov. 1-30.....	1,664	7.9	--	88	21	148	--	166	0	192	202	5.6	--	--	775	1.05	3,480	306	168	3.7	1,290	7.7
Dec. 1-31.....	1,627	9.0	--	82	20	142	--	161	0	176	195	6.4	--	--	742	1.01	3,260	286	154	3.7	1,230	7.7
Jan. 1-31, 1961...	1,606	8.2	0.01	77	16	1.3	4.2	150	0	162	202	6.3	0.03	--	710	.97	3,080	266	143	3.8	1,190	7.6
Feb. 1-28.....	1,532	8.0	.03	75	17	142	4.2	141	0	165	195	8.3	.05	--	694	.94	2,870	256	140	3.9	1,160	7.6
Mar. 1-31.....	1,393	8.5	.01	80	25	152	--	153	0	186	218	6.7	--	--	782	1.06	2,940	302	177	3.8	1,300	7.6
Apr. 1-4.....	1,428	8.7	.01	86	25	159	--	160	0	187	235	5.5	--	--	813	1.11	3,130	316	185	3.9	1,360	7.6
Apr. 5-30.....	1,777	6.9	.01	73	22	119	--	153	0	152	172	4.1	--	--	648	.68	3,100	271	146	3.1	1,090	7.7
May 1-3.....	2,477	7.6	.02	67	16	102	--	145	0	128	148	3.1	--	--	562	.76	3,760	282	123	2.9	946	7.7
May 4-12.....	2,991	8.3	.01	56	22	61	--	130	0	96	108	2.4	--	--	438	.60	3,540	229	122	1.7	747	7.6
May 13-22.....	5,106	8.2	.01	52	15	37	--	133	0	68	65	1.9	--	--	328	.45	4,520	193	84	1.2	551	7.7
May 23-31.....	10,370	6.3	.01	41	10	15	--	110	0	40	32	1.0	--	--	214	.29	5,900	145	55	.5	357	7.6
June 1-16.....	8,989	7.2	--	36	6.8	29	--	100	0	45	38	.3	.17	--	213	.29	5,170	119	37	1.2	367	7.5
June 17-21.....	6,300	6.6	--	41	8.0	40	--	106	0	59	52	.4	.3	--	266	.36	4,520	135	46	1.5	453	7.6
June 22-30.....	4,374	6.4	--	52	8.8	61	--	126	0	81	78	.2	.18	--	356	.48	4,200	166	63	2.0	610	7.6
July 1-31.....	2,252	9.6	--	75	16	105	--	170	0	130	144	1.1	--	--	593	.81	3,610	251	112	2.9	980	7.3
Aug. 1-31.....	1,875	9.9	--	79	18	121	--	175	0	150	166	3.2	--	--	656	.89	3,320	272	128	3.2	1,080	7.3

COLORADO RIVER MAIN STEM--Continued

9-955. COLORADO RIVER NEAR CAMBO, COLO.--Continued

Chemical analyses, in parts per million, water year October 1960 to September 1961--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		Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate					
Sept. 1-23, 1961...	2,642	9.9	--	73	16	100	--	157	0	144	130	--	4.0	--	--	572	0.78	4,080	248	119	2.7	941	7.2	
Sept. 24-30.....	3,913	11	--	62	14	69	--	143	0	122	83	--	3.1	--	--	450	.61	4,750	214	97	2.0	729	7.5	
Weighted average	--	8.1	--	63	15	89	--	140	0	117	124	--	3.1	--	--	506	0.69	3,560	221	106	2.5	844	7.5	
Time-weighted average.....	2,606	8.5	--	73	18	116	--	153	0	148	162	--	4.3	--	--	626	--	--	256	131	3.1	1,040	7.5	
Tons per day....	--	57.0	--	445	108	623	--	987	0	826	870	--	22.0	--	--	--	--	--	--	--	--	--	--	--

Temperature (°F) of water, water year October 1960 to September 1961

Day

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

GUNNISON RIVER BASIN

9-1375. GUNNISON RIVER NEAR CORY, COLO.

LOCATION.--At highway bridge, 0.5 mile upstream from Tongue Creek and 1.5 miles southwest of Cory, Delta County.

DRAINAGE AREA.--5,410 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: May 1959 to August 1961 (discontinued).

REMARKS.--Records of discharge are estimated.

Chemical analyses, in parts per million, October 1960 to August 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 13, 1960	250	13		171	85	198		258	0	910	30		7.2		1620	2.20	1090	776	564	3.1	1990	7.6
Nov. 1	450	18		91	45	82		183	0	405	13		3.5		770	1.05	936	414	264	1.8	1050	8.2
Jan. 13, 1961	450	21		90	32	66		193	0	299	19		3.1		625	.85	759	356	198	1.5	869	7.5
Feb. 15	500	17		80	33	75		174	0	322	13		2.9		a 629	.86	849	336	193	1.8	881	7.9
Mar. 23	850	22		55	19	40		145	0	163	9.0		2.4		a 381	.52	874	216	97	1.2	563	8.1
May 23	5300	16		30	6.0	13		90	0	51	5.5		2.0		a 170	.23	2430	109	35	.5	262	7.6
June 3	4900	15		28	8.8	13		82	0	51	3.5		2.4		a 169	.22	2120	98	31	.6	237	7.9
June 15	3300	14		34	8.0	14		96	0	63	3.0		.7		a 184	.25	1640	117	38	.6	277	7.5
June 26	1000	12		53	16	33		124	4	144	7.0		.9		a 331	.45	694	196	88	1.0	491	8.3
July 10	450	12		78	22	52		174	0	233	9.0		.4		a 496	.67	603	284	141	1.4	729	7.5
July 24	300	9.6		111	46	122		204	0	505	25		1.6		924	1.26	748	464	297	2.5	1260	7.4
Aug. 7	400	13		93	36	81		176	0	370	18		1.3		708	.96	765	380	236	1.8	983	7.8
Aug. 26	450	12		93	27	68		170	0	319	14		.9	0.15	641	.87	779	344	205	1.6	900	7.4

a Calculated from determined constituents.

GUNNISON RIVER BASIN--Continued
9-1495. UNCOMPAGRE RIVER AT DELTA, COLO.

LOCATION ---At gaging station at west edge of Delta, Delta County, 1.2 miles upstream from mouth.
DRAINAGE AREA ---1,110 square miles, approximately.
RECORDS AVAILABLE ---Chemical analyses: November 1958 to August 1961 (discontinued).

Chemical analyses, in parts per million, October 1960 to August 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bi- car- bon- ate (HCO ₃)	Car- bon- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ton (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		So- dium ad- sor- p- tion ratio	Specific con- duct- ance (micro- mhos at 25°C)	
															Parts per million	Tons per acre- foot	Tons per day	Cal- cium, Mag- ne- sium	Non- car- bon- ate			
Oct. 13, 1960.....	420	17		212	72	163		253	0	907	14		9.3		1520	2.07	1720	824	617	2.5	1890	7.6
Nov. 1.....	414	26		217	73	172		251	0	901	16		12		1426	1.93	1590	694	895	2.8	1840	6.1
Nov. 12, 1961.....	150	19		269	107	326		256	0	1430	32		23		2360	3.21	1020	1110	867	4.5	2740	7.6
Feb. 13.....	128	25		257	102	328		276	0	1430	30		17		2330	3.17	805	1050	832	4.4	2730	7.9
Mar. 23.....	148	16		236	66	246		268	0	1170	25		14		1930	2.62	771	950	730	3.5	2330	7.8
May 23.....	579	13		124	34	73		166	0	421	9.0		5.8		771	1.05	1210	450	297	1.5	1070	7.5
June 3.....	632	18		148	36	105		190	0	551	10		6.4		967	1.32	1650	520	364	2.0	1260	7.8
June 16.....	596	17		196	49	142		226	0	758	13		7.9		1290	1.75	2080	690	505	2.4	1620	8.0
June 26.....	275	18		236	61	175		270	0	927	17		11		1580	2.15	1170	840	619	2.6	1920	7.5
July 10.....	142	18		289	78	215		282	0	1190	20		12		1960	2.67	751	1040	809	2.9	2290	7.6
July 24.....	104	19		277	78	213		266	0	1170	20		11		1920	2.61	539	1010	792	2.9	2260	7.7
Aug. 7.....	210	20		261	66	210		266	0	1090	17		11		1810	2.46	1030	930	712	3.0	2160	7.6
Aug. 26.....	258	19		277	66	166		262	0	1020	17		10	0.29	1720	2.34	1200	960	729	2.4	2070	7.6

^a Daily mean discharge.

GUNNISON RIVER BASIN--Continued
 9-1495. UNCOMPAGRE RIVER AT DELTA, COLO.--Continued
 Periodic determinations of suspended-sediment discharge and particle size, water year October 1960 to September 1961
 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
 P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (°F)	Sam- pling point	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than sizes indicated, in millimeters											
							0.002	0.004	0.006	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Apr. 15, 1960.....	1200	55		535	2000	--		39	63			60	90	98	100			VPNC
Apr. 15.....	1200	55		535	2000	--		5	56			80	90	98	100			VPNC
Oct. 13.....	0615	55		420	371	421		39	64			92	96	100	--			VPNC
Nov. 1.....	0950	--		414	113	126		--	--			--	--	--	--			
Jan 13, 1961.....	1300	--		180	93	40		--	--			--	--	--	--			
Feb. 15.....	1030	--		128	246	65		--	--			--	--	--	--			
Mar. 23.....	1800	--		146	312	125		--	--			--	--	--	--			
May 23.....	1730	--		579	1450	2270		--	--			--	--	--	--			
June 3.....	1930	--		632	1050	1790		--	--			--	--	--	--			
June 16.....	0715	--		596	960	1460		--	--			--	--	--	--			
June 26.....	1230	--		275	316	235		--	--			--	--	--	--			
July 10.....	1745	--		142	120	46		--	--			--	--	--	--			
July 24.....	1545	--		104	76	22		--	--			--	--	--	--			
Aug. 7.....	1500	--		210	157	89		--	--			--	--	--	--			
Aug. 26.....	1650	--		258	182	127		--	--			--	--	--	--			

d Daily mean discharge.

GUNNISON RIVER BASIN--Continued

9-1525. GUNNISON RIVER NEAR GRAND JUNCTION, COLO.

LOCATION.--At bridge on State Highway 141, 180 feet downstream from gaging station, 0.4 mile downstream from Whitewater Creek, 0.5 mile south of Whitewater, and 8 miles southeast of Grand Junction, Mesa County.

DRAINAGE AREA.--7,870 square miles, approximately, upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: October 1931 to September 1961.

Water temperature: April to September 1961.

EXTREMES: 1960-61.--Dissolved solids: 1,720 ppm Oct. 1-31; minimum, 299 ppm May 24-31.

Hardness: Maximum, 905 ppm July 13-31; minimum, 186 ppm May 24-31.

Specific conductance: Maximum daily, 2,340 microhos Aug. 26; minimum daily, 426 microhos May 28.

Water temperatures: Maximum, 75°F on several days during June to August; minimum, freezing point on many days during November to February.

EXTREMES, 1931-61.--Dissolved solids: Maximum, 2,820 ppm Sept. 11-20, 1934; minimum, 203 ppm May 11-20, 1944.

Hardness (1931-35, 1943-61): Maximum, 1,370 ppm Sept. 1-20, 1934; minimum, 138 ppm May 11-31, 1958.

Specific conductance (1941-61): Maximum daily, 2,730 microhos Sept. 10, 1956; minimum daily, 260 microhos May 23, 1948.

Water temperatures (1949-61): Maximum, 86°F Aug. 13, 1958; minimum, freezing point on many days during winter months.

REMARKS.--Maximum observed during water year: Dissolved solids, 2,050 ppm Aug. 26; hardness, 1,050 ppm Aug. 26. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Flow affected by ice Dec. 7 to Feb. 6.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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		Specific conductance (microhos at 25°C)
														Parts per million	Tons per acre-foot	Calcium, Magnesium	Non-carbonate	
Oct. 1-31, 1960....	824	15	0.02	224	83	168	5.4	264	0	996	20	6.8	0.27	1720	2.34	3830	684	2.4
Nov. 1-30.....	980	16	--	160	60	118	4.6	240	0	672	16	6.5	.26	1240	1.69	3280	644	2.0
Dec. 1-31.....	631	16	--	146	58	114	4.6	232	0	630	16	7.2	.25	1170	1.59	2630	604	2.0
Jan. 1-31, 1961....	672	17	.00	156	60	119	4.1	244	0	656	18	6.8	.16	1210	1.65	2200	635	2.1
Feb. 1-28.....	711	15	--	139	56	121	3.8	217	0	620	22	5.6	.18	1140	1.55	2190	576	2.2
Mar. 1-17.....	747	12	--	127	58	121	4.1	204	0	603	19	5.0	.17	1110	1.51	2240	558	2.2
Mar. 18-29.....	1098	13	--	99	38	80	3.7	173	0	396	14	4.3	.14	768	1.04	2280	402	1.7
Mar. 30-31.....	862	14	--	144	61	125	4.3	210	0	650	16	6.5	.09	1190	1.62	2770	610	2.2
Apr. 1-5.....	1027	16	.01	127	42	90	3.8	192	0	488	16	1.9	.10	915	1.24	2370	490	1.8
Apr. 6-8.....	1393	16	.05	92	33	63	2.6	175	0	348	12	1.2	.06	648	.86	2440	366	1.4
Apr. 22-26.....	1688	15	.01	94	20	46	2.8	169	0	265	10	.8	.06	557	.76	2540	317	1.1
Apr. 27-30.....	924	14	.01	111	34	68	2.9	173	0	390	14	1.3	.12	748	1.02	1870	416	1.5
May 1.....	2330	12	--	108	26	54	2.8	194	0	308	11	.6	.19	612	1.63	3850	375	2.1
May 2-8.....	3234	13	--	76	16	30	3.1	154	0	161	6.0	.6	.08	410	.56	3580	254	1.2
May 9-11.....	2020	15	--	95	23	51	2.5	151	0	307	10	.3	.06	598	.81	3260	334	1.2
May 12-23.....	4076	12	--	71	15	28	1.6	131	0	178	5.5	.4	.07	384	.52	4230	236	.8
May 24-31.....	6796	13	--	56	11	20	1.5	117	0	127	3.5	.2	.06	299	.41	5490	186	.6
June 1-17.....	4741	12	--	68	15	30	2.1	132	0	182	5.0	.3	.06	391	.53	5010	231	.9
June 18-24.....	2560	14	--	92	23	46	2.5	157	0	274	7.0	.4	.07	557	.76	3880	323	1.1
June 25-30.....	1092	13	--	149	43	86	3.2	189	0	549	13	1.0	.14	980	1.33	2890	548	1.6

July 1-12, 1961...	672	9.3	.01	205	58	128	4.9	211	0	814	20	2.5	.20	1380	1.88	2500	750	577	2.0	1730	7.7
July 13-31.....	480	14	.01	240	74	151	6.0	229	0	989	24	4.7	.23	1670	2.27	2160	905	717	2.2	2030	7.8
Aug. 1-31.....	718	16	--	196	75	137	5.6	240	0	861	18	4.2	.20	1520	2.07	2950	800	603	2.1	1920	7.4
Sept. 1-22.....	1442	16	--	211	57	129	3.9	248	0	789	16	5.8	.19	1390	1.89	5410	760	357	2.0	1710	7.8
Sept. 23-30.....	2338	15	--	145	39	96	2.9	205	0	511	18	4.2	.13	935	1.27	5900	522	354	1.8	1240	7.8
Weighted average	--	14	--	121	38	77	3.2	183	0	449	12	2.9	0.13	839	1.14	3180	457	307	1.5	1090	7.7
Time-weighted average.....	1403	15	--	153	53	108	4.1	213	0	624	16	4.5	0.18	1130	--	--	601	426	1.9	1420	7.7
Tons per day....	--	53.0	--	468	144	293	12.0	693	0	1700	45.0	11.0	0.50	--	--	--	--	--	--	--	--

Analyses of additional samples

Oct. 13, 1960.....	a 770	17	231	85	183	252	0	1040	20	6.4	--	--	1780	2.42	3700	924	717	2.6	2090	7.5
Nov. 1.....	a 596	25	138	63	130	126	0	728	14	6.7	--	--	1210	1.65	3250	604	501	2.3	1500	8.2
Jan. 14, 1961.....	a 680	26	128	51	137	158	0	626	19	7.9	--	--	b 1080	1.47	1980	528	398	2.6	1400	8.2
Feb. 15.....	a 720	20	144	54	141	226	0	643	19	6.9	--	--	b 1140	1.55	2220	580	395	2.5	1490	7.4
Feb. 17.....	a 740	21	120	49	138	150	4	613	19	5.8	--	--	b 1040	1.41	2080	500	370	2.7	1380	8.3
Mar. 24.....	a 1020	19	98	36	87	152	14	391	15	5.3	--	--	b 740	1.01	2040	392	244	1.9	1000	8.6
May 22.....	a 5720	17	46	18	31	100	4	152	5.0	2.8	--	--	b 325	.44	5020	188	99	1.0	475	8.3
June 3.....	a 5860	15	61	9.7	25	118	0	136	4.0	2.4	--	--	b 311	.42	4920	192	95	.8	462	7.3
June 16.....	a 3590	16	71	19	40	138	0	210	6.0	2.7	--	--	b 433	.59	4200	256	143	1.1	624	7.9
June 26.....	a 1390	15	138	32	94	156	14	488	12	4.2	--	--	b 873	1.19	3280	476	325	1.9	1140	8.5
July 10.....	a 770	14	176	34	125	210	0	628	16	4.7	0.19	--	1140	1.56	2370	580	408	2.3	1410	7.6
July 24.....	a 478	15	283	44	159	238	0	967	20	1.8	.26	--	1650	2.24	2130	885	590	2.3	1960	7.1
Aug. 7.....	a 672	18	208	57	132	246	0	784	15	3.5	.24	--	1380	1.88	2500	755	553	2.1	1690	7.5
Aug. 26.....	a 609	15	184	36	132	271	0	623	17	4.3	.26	--	1180	1.60	1940	610	388	2.3	1510	7.4
Aug. 28.....	a 812	18	287	81	210	274	0	1190	26	7.3	.32	--	2050	2.79	4490	1050	825	2.8	2340	7.5

a Discharge at time of sampling.

b Calculated from determined constituents.

GUNNISON RIVER BASIN--Continued
9-1525. GUNNISON RIVER NEAR GRAND JUNCTION, COLO.--Continued

Temperature (°F) of water, water year October 1960 to September 1961																																	
Month		Day																													Aver- age		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		30	31
October		58	61	56	57	56	55	57	54	56	53	55	51	47	49	48	47	49	51	45	50	48	52	49	49	48	49	46	42	42	51		
November		44	40	40	48	49	44	44	40	40	41	41	37	39	39	39	39	39	39	36	36	32	32	32	32	32	32	35	35	35	35	51	
December		32	32	32	32	32	32	32	32	32	32	32	32	32	33	33	33	33	33	32	32	32	32	32	32	32	34	32	32	32	32	32	
January		34	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
February		32	33	32	32	32	32	32	32	32	32	39	39	39	40	40	40	40	40	33	38	34	34	34	34	34	39	39	39	39	39	39	39
March		35	40	40	40	40	38	40	40	40	45	48	48	48	48	48	48	48	48	45	45	45	45	45	45	45	45	45	45	45	45	45	45
April		48	50	51	53	50	48	46	43	44	45	47	46	43	44	45	45	50	52	50	52	50	48	45	48	50	52	55	53	53	53	53	48
May		54	55	54	53	50	50	49	50	52	53	56	54	48	53	55	55	52	60	52	56	55	58	55	52	58	59	59	58	57	58	54	54
June		58	58	56	55	58	58	60	62	62	63	68	64	62	63	62	64	65	65	65	68	72	68	68	66	64	64	75	70	71	73	64	64
July		70	70	71	70	69	73	72	70	72	70	69	70	70	72	72	71	69	68	74	75	70	70	70	75	70	71	72	75	75	71	71	71
August		72	70	71	74	72	74	73	73	72	71	72	70	71	69	69	70	70	71	71	73	71	73	71	72	75	70	72	69	67	71	71	71
September		64	61	55	53	54	55	62	60	62	62	62	60	61	62	63	63	62	61	59	56	53	50	53	53	54	59	55	56	52	58	58	58

GUNNISON RIVER BASIN--Continued

9-1525. GUNNISON RIVER NEAR GRAND JUNCTION, COLO.--Continued

Periodic determinations of suspended-sediment discharge and particle size, water year October 1960 to September 1961
 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
 P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (°F)	Sam- pling point	Discharge (cfs)	Sediment concentra- tion (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis
							Percent finer than size indicated, in millimeters										
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	
Apr. 14, 1960.....	1800	50		5500	832	--		34		51		71	86	98	100		VPWC VFN
Apr. 14.....	1800	50		5500	832	--		16		42		71	86	98	100		
Oct. 13.....	1600	--		770	104	216		--		--		--	--	--	--		VPWC VFN
Nov. 1.....	1130	--		996	47	126		--		--		--	--	--	--		
Jan. 1, 1961.....	1730	--		d 680	18	33		--		--		--	--	--	--		VPWC VFN
Feb. 15.....	0850	--		720	38	74		--		--		--	--	--	--		
Feb. 17.....	0915	--		740	24	48		--		--		--	--	--	--		VPWC VFN
Mar. 24.....	1740	--		1020	133	366		--		--		--	--	--	--		
May 22.....	1715	--		5720	543	8390		--		--		--	--	--	--		VPWC VFN
June 3.....	1035	--		5860	381	6030		--		--		--	--	--	--		
June 16.....	0935	--		3590	192	1860		--		--		--	--	--	--		VPWC VFN
June 26.....	1415	--		1390	53	199		--		--		--	--	--	--		
July 10.....	1415	--		770	19	40		--		--		--	--	--	--		VPWC VFN
July 24.....	1415	--		478	19	25		--		--		--	--	--	--		
Aug. 7.....	1340	--		672	259	470		--		--		--	--	--	--		VPWC VFN
Aug. 25.....	1815	72		609	14000	--		80		99		100	--	--	--		
Aug. 26.....	1800	--		812	1080	--		--		--		--	--	--	--		VPWC VFN
Oct. 11.....	1000	--		d 2210	407	2430		--		--		--	--	--	--		

d Daily mean discharge.

DOLORES RIVER BASIN

9-1800. DOLORES RIVER NEAR CISCO, UTAH

LOCATION.--At gaging station, 9 miles upstream from mouth, 13.5 miles downstream from Colorado-Utah State line, and 14 miles southeast of Cisco, Grand County.
DRAINAGE AREA.--4,580 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: March 1951 to September 1961.

Water temperatures: March 1951 to September 1959.

Sediment records: March 1951 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 4,070 ppm Oct. 14-16; minimum, 263 ppm June 1-16.

Hardness: Maximum, 880 ppm Aug. 3-6; minimum, 184 ppm June 1-16.

Specific conductance: Maximum, 1,353 microhm/cm Oct. 15; minimum daily, 354 microhm/cm May 31.

Sediment concentrations: Maximum daily, 6,393 ppm Sept. 20; minimum daily, 0 ppm on several days during July.

Sediment loads: Maximum daily, 21,000 tons Sept. 10; minimum daily, 0 tons on several days during July.

EXTREMES, 1951-61.--Dissolved solids (1953-61): Maximum, 7,920 ppm Oct. 1-10, 1956; minimum, 200 ppm June 1-10, 1957, May 1-31, 1956.

Hardness (1953-61): Maximum, 1,900 ppm Sept. 21-30, 1956; minimum, 132 ppm May 1-31, 1958.

Specific conductance: Maximum daily, 12,700 microhm/cm Oct. 7, 1956; minimum daily, 254 microhm/cm May 8, June 6, 1952.

Sediment concentrations: Maximum daily, 89,300 ppm Aug. 5, 1959; minimum daily, 0 ppm on several days in 1956-58, 1960-61.

Sediment loads: Maximum daily, 460,000 tons Apr. 21, 1956; minimum daily, 0 tons on several days in 1956-58, 1960-61.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Flow affected by ice Dec. 7-9, Dec. 15 to Jan. 3, Jan. 6, Jan. 8 to Feb. 8.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potas- sium (K)	Bi-car- bon- ate (HCO ₃)	Car- bon- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Specific con- duct- ance (micro- mhos at 25°C)		
															Parts per million	Tons per acre- foot	Tons per day	Cal- cium, Mag- ne- sium	Non- car- bon- ate			
Oct. 1-13, 17-18, 1960.....	64.7	5.0	0.01	162	100	667	27	37	0	1,020	915		20	0.13	2,950	4.01	515	815	785	10	4,730	6.8
Oct. 14-16.....	98.3	4.9	---	164	107	1,110	47	36	0	1,160	1,450		9.6	.24	4,070	5.54	1,080	850	820	17	6,380	6.8
Oct. 19-24, 26-31.....	97.6	6.7	.01	152	83	536	26	35	0	875	700		31	.13	2,430	3.30	6,400	720	691	6.7	3,830	6.8
Oct. 25.....	86	8.1	---	122	61	384	17	102	0	489	540		32	.09	1,700	2.31	554	470	7.1	2,740	7.7	
Nov. 1-30.....	117	7.6	---	156	80	443	22	3	0	602	585		60	.15	2,160	2.94	682	720	718	7.2	3,390	5.3
Dec. 1-31.....	111	5.6	---	140	78	553	27	6	0	765	795		30	.13	2,400	3.26	719	670	665	9.3	3,940	6.0
Jan. 1-31, 1961.....	97.2	5.8	.01	144	73	828	41	52	0	682	1,220		29	.11	3,040	4.13	796	660	617	14	5,080	6.2
Feb. 1-28.....	126	3.2	---	124	69	848	42	14	0	649	1,270		19	.11	3,040	4.13	1,030	584	563	15	5,120	6.1
Mar. 1-15.....	121	4.1	---	135	85	861	42	8	0	726	1,360		30	.13	3,270	4.45	1,070	684	677	15	5,410	6.1
Mar. 16-31.....	272	4.2	---	130	56	504	16	56	0	509	450		35	.07	1,530	2.08	1,120	585	507	5.6	2,530	7.9
Apr. 1-5.....	225	4.5	.01	144	64	583	27	36	0	598	900		35	.11	2,370	3.22	1,440	625	595	10	3,940	7.4
Apr. 6-19.....	564	4.9	.02	83	31	117	6.5	106	0	260	160		16	.08	730	.99	1,150	335	246	2.8	1,190	8.1
Apr. 20-30.....	1,793	6.6	.05	67	12	38	3.4	156	0	101	45		7.8	.09	358	.49	1,750	216	66	1.1	568	7.6
May 1-31.....	2,134	5.4	---	51	9.7	30	2.9	108	0	82	38		5.5	.13	278	.38	1,600	166	77	1.0	458	7.5
June 1-16.....	1,601	6.1	---	49	7.5	29	2.5	99	0	81	35		4.0	.04	263	.35	1,400	154	73	1.0	455	7.6

June 17-24, 1961..	862	4.3	--	53	12	73	4.6	60	0	134	109	7.2	.04	427	.58	994	182	133	2.4	756	7.6
June 25-30.....	482	4.5	--	61	17	126	8.1	53	0	186	185	7.3	.05	416	.54	902	284	181	3.5	1,080	6.9
July 1-20.....	237	3.8	.01	94	31	256	14	13	0	352	375	21.3	.05	1,150	1.56	736	362	351	5.9	1,990	6.0
July 21-31.....	76.4	6.1	.01	159	66	369	21	8	0	725	520	20	.12	1,890	2.57	390	686	659	6.2	3,060	5.9
Aug. 1-4, 14.....	149	5.9	--	188	77	453	23	33	0	869	585	28	.08	2,250	3.06	905	785	756	7.0	3,500	6.6
Aug. 5-6.....	346	4.9	--	218	81	1,030	48	6	0	859	1,590	40	--	3,870	5.26	3,620	880	875	15	6,310	5.2
Aug. 7-11, 13, 15-31.....	228	5.4	--	160	47	241	15	74	0	637	300	30	.04	1,490	2.03	917	640	579	4.1	2,270	7.5
Aug. 12.....	165	6.0	--	124	29	175	11	86	0	387	230	28	.14	1,030	1.40	459	430	359	3.7	1,680	8.2
Sept. 1-8.....	196	5.8	--	188	58	245	13	115	0	672	300	35	.11	1,570	2.14	831	496	402	4.0	2,340	7.6
Sept. 9-30.....	352	7.1	--	143	35	116	7.9	150	0	450	128	9.0	.12	972	1.32	924	502	379	2.3	1,450	7.6
Weighted average	--	5.6	--	78	24	141	8.1	96	0	235	197	12	0.09	747	1.02	964	250	211	2.9	1,220	6.6
Time-weighted average.....	478	5.5	--	125	54	411	21	55	0	551	583	24	0.12	1,800	--	--	530	465	7.1	2,930	6.1
Tons per day....	--	7.2	--	101	30.0	182	10.0	123	0	303	254	15.0	0.12	--	--	--	--	--	--	--	--

DOLORES RIVER BASIN--Continued

9-1800. DOLORES RIVER NEAR CISCO, UTAH--Continued

Suspended sediment, water year October 1960 to September 1961

/Where no concentrations are reported, loads are estimated/

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..	52	--	1	91	8	2	109	34	10
2..	56	7	1	86	--	2	104	--	10
3..	59	--	2	86	--	2	118	--	10
4..	59	13	2	95	--	2	118	--	10
5..	48	--	2	91	--	2	127	--	27
6..	48	15	2	95	--	2	132	--	35
7..	56	--	1	109	--	9	110	--	9
8..	56	7	1	127	--	27	90	--	2
9..	59	--	1	160	--	150	95	--	3
10..	63	6	1	143	--	48	114	--	16
11..	71	5	1	138	--	48	127	--	16
12..	71	--	1	132	--	48	127	--	16
13..	95	16	4	138	129	48	114	--	16
14..	109	--	4	123	--	12	114	--	16
15..	91	20	5	109	--	12	C 110	--	8
16..	95	--	4	104	--	12	C 110	27	8
17..	91	12	3	104	--	12	C 110	--	8
18..	86	--	2	118	--	12	C 110	--	8
19..	86	4	1	123	--	12	C 110	--	8
20..	123	--	1	127	--	22	C 110	--	8
21..	143	3	1	127	--	22	C 110	--	8
22..	118	--	1	127	--	22	C 110	--	8
23..	100	7	2	123	--	22	C 110	--	8
24..	100	--	2	123	--	22	C 110	--	8
25..	86	4	1	123	--	22	C 110	--	8
26..	82	--	2	118	--	22	C 110	--	8
27..	82	9	2	114	--	12	C 110	--	8
28..	82	--	2	114	--	12	C 110	27	8
29..	78	9	2	114	--	12	C 100	--	8
30..	82	--	3	114	--	12	C 100	--	8
31..	95	16	4	--	--	--	C 100	--	8
Total	2522	--	62	3496	--	664	3439	--	332
Day	JANUARY			FEBRUARY			MARCH		
	C	Mean discharge (cfs)	Mean concentration (ppm)	C	Mean discharge (cfs)	Mean concentration (ppm)	C	Mean discharge (cfs)	Mean concentration (ppm)
1..	C	100	4	C	110	67	20	104	32
2..	C	100	4	C	110	--	20	109	--
3..	C	100	4	C	110	--	20	114	--
4..	C	91	4	C	110	--	20	123	--
5..	C	78	1	C	110	--	20	132	--
6..	C	75	1	C	110	--	20	127	--
7..	C	78	1	C	110	--	20	138	--
8..	C	90	4	C	110	--	20	138	--
9..	C	100	4	C	118	--	20	132	--
10..	C	100	4	C	114	--	20	123	--
11..	C	100	4	C	123	--	20	114	--
12..	C	100	4	C	127	--	20	118	--
13..	C	100	4	C	132	--	24	118	--
14..	C	100	4	C	138	--	24	109	31
15..	C	100	4	C	148	--	28	118	--
16..	C	100	15	C	170	70	32	176	--
17..	C	100	12	C	148	--	24	220	--
18..	C	100	12	C	165	--	24	368	--
19..	C	100	12	C	154	--	24	376	--
20..	C	100	12	C	143	--	24	311	--
21..	C	100	12	C	132	--	15	296	--
22..	C	100	12	C	127	--	15	259	--
23..	C	100	12	C	127	--	15	220	--
24..	C	100	12	C	127	--	15	213	452
25..	C	100	12	C	123	--	15	267	--
26..	C	100	12	C	104	--	10	359	--
27..	C	100	12	C	104	--	10	320	--
28..	C	100	12	C	118	--	10	290	--
29..	C	100	12	C	--	--	--	250	--
30..	C	100	12	C	--	--	--	220	--
31..	C	100	12	C	--	--	--	200	--
Total		3012	--		3522	--		6162	--
C Composite period.									
			235			553			21075

DOLORES RIVER BASIN--Continued

9-1800. DOLORES RIVER NEAR CISCO, UTAH--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
 Where no concentrations are reported, loads are estimated/

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..	180	--	72	2490	1640	11000	2290	890	5500
2..	180	--	72	2810	2240	B 17000	2300	934	A 5800
3..	187	143	72	2910	2420	B 19000	2210	888	A 5300
4..	226	--	130	2890	2430	B 19000	1960	680	3600
5..	351	--	260	2850	2340	B 18000	1550	442	1850
6..	598	--	600	2290	1360	B 8400	1340	290	A 1050
7..	811	--	960	1910	892	B 4600	1320	269	960
8..	746	--	840	1500	469	B 1900	1270	207	A 710
9..	692	--	740	1360	381	B 1400	1360	221	A 810
10..	608	--	610	1260	323	B 1100	1490	236	A 950
11..	529	--	490	1370	378	B 1400	1500	237	A 960
12..	588	--	590	1580	539	2300	1490	236	A 950
13..	510	--	460	2010	682	A 3700	1930	242	A 1000
14..	510	--	460	2440	835	A 5500	1460	233	920
15..	529	--	460	2210	794	A 4500	1310	232	820
16..	491	--	460	1720	581	A 2700	1240	203	A 680
17..	418	296	334	1490	497	A 2000	1080	158	A 460
18..	418	--	340	1330	457	1640	982	130	345
19..	724	--	1200	1530	581	A 2400	970	126	A 330
20..	1290	--	4200	2090	957	5400	845	79	180
21..	1940	--	10500	2490	892	A 6000	856	80	A 185
22..	2090	--	12500	2420	903	5900	811	68	150
23..	2290	--	15500	2490	892	A 6000	724	56	A 110
24..	2290	--	15500	2530	893	A 6100	629	45	76
25..	1990	--	11000	2250	938	5700	578	33	A 51
26..	1570	1560	6600	2110	825	A 4700	549	28	41
27..	1200	--	4800	2040	773	4300	500	20	27
28..	1340	--	5500	2230	930	A 5600	464	20	A 25
29..	1680	--	7100	2510	1180	8000	418	19	A 21
30..	2040	--	8800	2590	1290	A 9000	384	19	A 20
31..	--	--	--	2420	979	6400	--	--	--
Total	29016	--	111150	66140	--	200640	35410	--	33881
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..	376	19	A 19	109	31	9	287	2450	1900
2..	368	19	19	104	7	A 2	170	675	A 310
3..	359	19	A 18	127	9	3	170	684	314
4..	343	0	0	220	88	A 52	160	787	A 340
5..	319	0	A 0	359	620	600	187	238	120
6..	311	0	0	334	610	A 550	194	382	A 200
7..	296	0	A 0	282	473	360	187	238	120
8..	282	0	0	226	524	A 320	215	4650	J 2700
9..	274	0	A 0	267	499	A 360	439	9280	J 11000
10..	252	0	0	239	511	330	600	13000	A 21000
11..	226	0	A 0	200	426	A 230	350	11600	A 11000
12..	206	0	0	165	357	A 150	280	6350	A 4800
13..	194	0	A 0	154	236	A 98	250	4000	A 2700
14..	176	4	2	187	614	310	239	3670	2370
15..	170	4	A 2	132	34	A 12	226	1970	A 1200
16..	160	5	A 2	302	6400	S 5220	226	1970	1200
17..	138	8	A 3	194	200	105	334	11100	A 10000
18..	123	9	3	359	5570	A 5400	407	12700	14000
19..	91	8	A 2	334	3880	A 3500	569	13000	A 20000
20..	82	5	1	282	1510	A 1150	418	13300	A 15000
21..	82	5	A 1	246	723	A 480	384	12500	A 13000
22..	78	5	A 1	213	330	190	351	11600	A 11000
23..	82	5	A 1	165	269	A 120	326	10700	A 9400
24..	86	2	T	138	236	88	359	12400	A 12000
25..	78	1	L	280	7510	J 5680	392	12300	A 13000
26..	67	1	T	218	2380	A 1400	376	11800	A 12000
27..	59	2	L	274	5950	A 4400	326	10700	A 9400
28..	59	2	L	200	1520	820	304	9020	A 7400
29..	63	1	L	187	1470	A 740	296	8010	A 6400
30..	91	94	A 23	176	1390	660	282	6570	A 5000
31..	95	113	29	176	1390	A 660	--	--	--
Total	5586	--	128	6849	--	A 33999	9304	--	218874
Total discharge for year (cfs-days).....								174458	
Total load for year (tons).....								821593	

S Computed by subdividing day.

T Less than 0.50 ton.

A Computed from partly estimated concentration graph.

B Computed from estimated-concentration graph.

J Computed from partly estimated concentration graph and subdividing day.

L Less than 0.50 ton, computed from partly estimated concentration graph.

DOLORES RIVER BASIN--Continued
9-1800. DOLORES RIVER NEAR CISCO, UTAH--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
F, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sam- pling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment concentra- tion (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
							17	22	28	33	40	51	65	83	90	100		VPWC
May 18, 1961.....	1200		61	1330	288			24		39		55	74	98	100			VPWC
May 25.....	1130		64	2080	886			13		31		55	70	98	100			SPN
May 25.....	1200		64	2080	886			13		31		55	70	98	100			SPWC
Aug. 5.....	1030		75	378	670			58		90		99	99	99	100			SPN
Aug. 5.....	1030		75	378	670			8		90		99	99	99	100			SPN
Aug. 17.....	1900		76	200	408			46		79		98	100	---	---			VPWC
Sept. 14.....	1200		68	239	3680			82		95		98	99	100	---	---		VPWC
Sept. 16.....	1115		66	208	9450			75		99		100	---	---	---			PWC
Sept. 18.....	1200		65	319	9980			79		95		98	100	---	---			VPWC

COLORADO RIVER MAIN STEM
9-1805. COLORADO RIVER NEAR CISCO, UTAH

LOCATION.--At gaging station, 1 mile downstream from Dolores River, 11 miles south of Cisco, Grand County, 36 miles downstream from Colorado-Utah State line, 97 miles upstream from Green River, and 235 miles upstream from San Juan River.

DRAINAGE AREA.--24,100 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: August 1928 to September 1961.

Water temperatures: May 1949 to September 1959.

Sediment records: May 1930 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 1,900 ppm Aug. 19; minimum, 316 ppm May 22-31.

Hardness: Maximum, 865 ppm Aug. 19; minimum, 194 ppm June 1-17.

Specific conductance: Maximum daily, 2,630 micromhos Aug. 19; minimum daily, 437 micromhos May 29.

Sediment loads: Maximum daily, 16,200 ppm Sept. 9; minimum daily, 9 ppm Jan. 3, 4, 8.

Sediment loads: Maximum daily, 524,000 tons Jan. 3, 4, 8.

EXTREMES, 1928-61.--Dissolved solids (1928-52, 1953-61): Maximum daily, 2,670 ppm Aug. 19, 1940; minimum, 202 ppm June 11-20, 1933, July 1-10, 1957.

Hardness (1928-35, 1943-52, 1953-61): Maximum, 1,090 ppm Sept. 1-10, 1934; minimum, 131 ppm June 11-20, 1952.

Specific conductance (1941-52, 1953-61): Maximum daily, 4,820 micromhos Dec. 13, 1957; minimum daily, 291 micromhos May 31, 1958.

Sediment concentrations (1930-61): Maximum daily, 66,000 ppm Oct. 27, 1951; minimum daily, 4 ppm Aug. 22, 1960.

Sediment loads (1930-61): Maximum daily, 2,790,000 tons Oct. 14, 1941; minimum daily, 14 tons Aug. 22, 1960.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-boronate			
Oct. 1-31, 1960....	2485	10	0.01	172	67	193	6.3	202	0	710	155		15	0.13	1430	1.94	9590	705	539	3.2	1970	8.0
Nov. 1-30.....	2972	12	--	146	57	170	5.3	186	0	584	152		11	.14	1230	1.67	9870	600	447	3.0	1770	8.2
Dec. 1-31.....	2677	9.7	--	126	46	169	5.7	184	0	465	170		13	.10	1090	1.48	7880	505	354	3.3	1650	8.1
Jan. 1-31, 1961..	2545	12	--	122	41	172	5.9	184	0	410	185		12	.00	1050	1.43	7220	475	324	3.4	1620	8.0
Feb. 1-28.....	2514	10	--	117	43	199	7.1	164	0	437	215		11	.08	1120	1.52	7600	468	334	4.0	1740	8.2
Mar. 1-31.....	2634	9.6	--	112	43	178	6.2	162	0	420	200		16	.07	1060	1.44	7540	458	325	3.6	1630	8.0
Apr. 1-20.....	2916	9.8	.01	115	43	165	5.8	164	0	430	160		13	.08	1020	1.39	8030	466	332	3.3	1570	8.1
Apr. 21-30.....	4375	9.0	.03	100	19	70	3.8	182	0	239	62		9.1	.03	601	.82	7420	330	181	1.7	923	7.3
May 1-12.....	6879	9.2	--	85	25	69	3.2	141	0	254	64		9.1	.05	588	.80	10920	314	198	1.7	895	8.1
May 13-21.....	9582	11	--	71	21	53	2.6	136	0	190	50		4.7	.05	470	.64	12160	264	152	1.4	726	7.8
May 22-31.....	17240	9.2	--	55	14	29	2.0	123	0	115	28		3.7	.04	316	.43	14710	197	96	.9	508	7.9
June 1-17.....	14560	9.6	--	68	12	35	2.1	120	0	128	26		3.4	.07	333	.45	13090	194	96	1.1	548	7.7
June 18-24.....	8443	9.1	--	68	18	53	2.7	122	0	185	50		3.8	.06	450	.61	10260	242	142	1.5	715	8.1
June 25-30.....	4733	6.8	--	89	26	81	3.3	136	0	277	79		4.9	.08	634	.86	8100	329	217	1.9	1000	8.1
July 1-14.....	2665	7.6	.01	139	46	137	5.0	171	0	466	130		6.6	.09	1040	1.41	7480	536	396	2.6	1550	7.7

COLORADO RIVER MAIN STEM--Continued

9-1805. COLORADO RIVER NEAR CISCO, UTAH--Continued

Suspended sediment, water year October 1960 to September 1961
/Where no concentrations are reported, loads are estimated/

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..	1930	89	464	3010	88	715	2460	44	290
2..	2020	80	436	2920	57	449	2430	44	290
3..	1920	78	404	2920	61	481	2690	40	290
4..	1890	99	505	3090	192	A 1600	2800	40	300
5..	1860	114	573	2950	201	A 1600	3060	36	300
6..	1840	100	497	3010	197	A 1600	3200	35	300
7..	1860	56	281	3110	191	A 1600	2880	39	300
8..	1920	90	470	3130	189	A 1600	2420	43	280
9..	1980	1300	6950	3260	182	A 1600	2320	45	280
10..	2240	2520	15200	3200	185	A 1600	2520	41	280
11..	2190	1290	7630	3090	192	A 1600	2900	38	300
12..	2260	700	4270	2980	199	A 1600	3080	36	300
13..	2380	205	1320	2950	207	1600	2960	38	300
14..	2540	300	2060	2950	151	A 1200	2800	40	300
15..	2640	215	1530	3030	147	A 1200	2740	41	300
16..	2790	206	1550	3010	148	A 1200	2600	43	300
17..	2920	162	1280	2950	151	A 1200	2310	16	A 100
18..	2950	156	1240	2900	153	A 1200	2090	18	A 100
19..	2790	151	1140	2840	156	A 1200	2300	16	A 100
20..	2850	126	970	2880	154	A 1200	2610	51	A 360
21..	2930	155	1230	3010	148	A 1200	2760	48	A 360
22..	2960	110	879	3140	142	A 1200	2790	48	A 360
23..	2880	--	1000	2900	153	A 1200	2880	46	A 360
24..	2870	155	1200	2840	156	A 1200	2960	45	A 360
25..	2850	96	739	2850	156	A 1200	2880	46	A 360
26..	2720	87	639	2850	156	A 1200	2800	48	A 360
27..	2820	97	739	2850	156	A 1200	2690	50	A 360
28..	2690	93	675	2820	158	A 1200	2710	49	A 360
29..	2770	--	410	2880	154	A 1200	2640	20	B 140
30..	2850	18	139	2840	156	A 1200	2420	21	B 140
31..	2920	84	662	--	--	--	2300	23	B 140
Total	77030	--	57082	89160	--	38045	83000	--	8670
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..	2160	10	B 58	2690	54	390	2200	71	420
2..	2160	10	B 58	2900	50	A 390	2260	69	A 420
3..	2250	9	B 55	2740	53	A 390	2360	66	A 420
4..	2280	9	B 55	2710	53	A 390	2430	64	A 420
5..	2060	10	B 56	2850	51	B 390	2440	64	A 420
6..	2070	10	B 56	2900	50	B 390	2440	64	A 420
7..	1950	11	B 58	2880	50	B 390	2480	63	A 420
8..	2260	9	B 55	2610	55	B 390	2360	66	A 420
9..	2490	36	A 240	2500	58	B 390	2260	69	A 420
10..	2540	35	A 240	2640	55	B 390	2190	71	A 420
11..	2680	33	A 240	2440	82	B 540	2100	74	A 420
12..	2710	33	A 240	2280	88	A 540	2180	71	A 420
13..	2740	32	A 240	2300	87	A 540	2310	67	A 420
14..	2610	34	A 240	2310	87	A 540	2370	66	A 420
15..	2610	34	A 240	2310	87	A 540	2220	70	A 420
16..	2720	54	A 400	2280	88	A 540	2370	66	A 420
17..	2880	51	A 400	2310	87	A 540	2710	137	B 1000
18..	2870	52	A 400	2540	79	A 540	3180	163	B 1400
19..	2870	52	A 400	2580	78	A 540	3380	153	B 1400
20..	2840	52	A 400	2440	82	A 540	3280	158	B 1400
21..	2800	53	A 400	2490	80	A 540	2980	137	B 1100
22..	2660	28	B 200	2420	83	A 540	2850	143	A 1100
23..	2520	29	B 200	2480	81	B 540	2840	143	A 1100
24..	2380	31	B 200	2430	82	B 540	2710	150	1100
25..	2430	30	B 200	2430	82	B 540	3030	134	A 1100
26..	2740	27	B 200	2300	87	B 540	3180	151	A 1300
27..	2630	28	B 200	2280	88	B 540	3200	150	A 1300
28..	2920	41	B 320	2360	85	B 540	3200	150	A 1300
29..	2790	42	B 320	--	--	--	2950	163	A 1300
30..	2660	45	B 320	--	--	--	2660	134	A 960
31..	2630	45	B 320	--	--	--	2540	127	A 870
Total	78910	--	7011	70400	--	13620	81660	--	24450

A Computed from partly estimated concentration graph.
B Computed from estimated-concentration graph.

COLORADO RIVER MAIN STEM--Continued

9-1805, COLORADO RIVER NEAR CISCO, UTAH--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
 /Where no concentrations are reported, loads are estimated/

Day	APRIL				MAY				JUNE			
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	2500	193	A 1300	4870	837	11000	20200	766	41800			
2..	2430	193	A 1300	6380	337	5800	20200	644	35100			
3..	2380	202	1300	7660	532	11000	19500	--	28000			
4..	2480	194	A 1300	18970	743	18000	16900	458	20900			
5..	2660	181	A 1300	9850	940	A 25000	13800	388	14500			
6..	3110	333	A 2800	8970	743	A 18000	11900	378	12100			
7..	3910	540	B 5700	7680	530	A 11000	11500	354	11000			
8..	3930	537	B 5700	6400	347	A 6000	11700	345	10900			
9..	3840	550	B 5700	5580	252	A 3800	12500	149	5030			
10..	3640	580	B 5700	4850	168	A 2200	14300	--	12000			
11..	3160	258	A 2200	4700	165	A 2100	15900	443	19000			
12..	3090	264	A 2200	6640	374	6700	15500	383	16000			
13..	2870	284	A 2200	10100	990	A 27000	15200	405	16600			
14..	2760	295	A 2200	11900	1460	A 47000	13800	229	8530			
15..	2740	297	A 2200	10470	1000	30000	12400	232	7770			
16..	2800	291	A 2200	8640	729	A 17000	11500	271	8410			
17..	2550	174	1200	7460	550	11000	10700	214	6180			
18..	2320	192	A 1200	7280	432	8490	10100	205	5590			
19..	2320	192	A 1200	7780	363	7630	9600	185	4800			
20..	2820	263	A 2000	9910	630	16900	8940	160	3860			
21..	4200	679	A 7700	12700	1260	43200	8430	160	3640			
22..	5540	1270	A 19000	12900	1170	40800	8020	169	3660			
23..	5780	1220	A 19000	14300	1110	42900	7460	154	3100			
24..	5490	1280	A 19000	16200	1600	70000	6550	137	2420			
25..	5400	1300	A 19000	16800	1440	65300	5800	118	1850			
26..	4850	916	12000	16600	900	40300	5400	103	1500			
27..	3880	449	A 4700	17200	722	33500	5000	69	932			
28..	3480	500	A 4700	18600	964	48400	4500	74	899			
29..	3450	505	A 4700	20000	889	48000	4000	63	680			
30..	3680	473	A 4700	19300	828	43100	3700	60	599			
31..	--	--	--	20500	682	37700	--	--	--			
Total	104060	--	165400	341190	--	798820	335000	--	307350			
Day	JULY				AUGUST				SEPTEMBER			
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	3400	--	470	2000	300	1620	2950	1200	9560			
2..	3330	--	350	2360	1150	7330	2520	7800	53100			
3..	3250	25	219	2490	1750	11800	2740	1650	12200			
4..	3080	27	225	3420	9320	S 90300	3300	890	7930			
5..	2920	192	1510	3160	3400	29000	4220	1430	16300			
6..	2770	447	3340	3000	2800	22700	4330	1360	15900			
7..	2540	104	713	2500	1230	8300	4310	970	11300			
8..	2490	83	558	2160	--	4700	4590	1000	12400			
9..	2460	84	558	1840	226	1120	11100	16200	S 524000			
10..	2580	80	557	1660	271	1210	6570	3000	A 53000			
11..	2460	--	430	1590	202	867	5300	3000	A 43000			
12..	2190	52	307	1660	424	1900	5200	2900	A 41000			
13..	2000	44	238	1630	146	643	4800	1900	A 25000			
14..	1840	38	189	1690	105	479	4400	1010	12000			
15..	1670	44	198	1710	110	508	4000	620	6700			
16..	1550	55	230	2100	5110	S 35400	3900	540	5690			
17..	1520	41	168	1850	1000	5000	3770	730	7430			
18..	1590	53	228	2100	3500	19800	5420	13100	S 217000			
19..	1630	66	290	2370	1200	7680	5270	11000	157000			
20..	1590	76	326	2200	1700	10100	4550	6000	73700			
21..	1620	62	271	2120	920	5270	4680	6300	79600			
22..	1660	66	296	2020	300	1640	5450	5150	75800			
23..	1710	63	291	1860	280	1410	6740	7850	S 156000			
24..	1760	49	233	1780	900	4330	8860	12200	292000			
25..	1950	--	250	2850	3700	S 32500	8040	10700	232000			
26..	1820	56	275	2660	1200	A 8600	7030	6000	114000			
27..	1660	50	224	2480	700	A 4700	6300	1600	27200			
28..	1520	50	200	2500	650	4390	6200	1300	21800			
29..	1470	50	200	2690	1830	S 14700	6240	1000	A 17000			
30..	1850	940	J 7600	2640	3000	21400	6360	1200	20600			
31..	1890	3510	S 19100	2380	1000	6430	--	--	--			
Total	65770	--	40044	69470	--	365827	159140	--	2340210			

Total discharge for year (cfs-days)..... 1554790
 Total load for year (tons)..... 4166529

S Computed by subdividing day.

A Computed from partly estimated concentration graph.

B Computed from estimated-concentration graph.

J Computed from partly estimated concentration graph and subdividing day.

COLORADO RIVER MAIN STEM--Continued

9-1805. COLORADO RIVER NEAR CISCO, UTAH--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;

P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sam- pling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Oct. 10, 1960.....	0745		58	2190	2460		68		95		100	---	---	---	---	---	---	PWC
Oct. 10.....	0745		58	2190	2460		4		68		100	---	---	---	---	---	---	PN
Oct. 11.....	0730		56	2020	1160		76		97		100	---	---	---	---	---	---	PWC
May 21, 1961.....	1235		63	12800	1210		25		46		76	87	97	100	---	---	---	VPWC
May 21.....	1235		63	12800	1210		---		---		76	85	95	100	---	---	---	S
May 31.....	1250		63	21100	786		24		40		67	82	97	100	---	---	---	VPWC
May 31.....	1250		63	21100	786		11		31		67	80	95	99	100	---	---	SDN
July 6.....	1000		73	2790	339		80		98		99	100	---	---	---	---	---	SPWC
July 31.....	1830		78	1760	520		62		87		100	---	---	---	---	---	---	PWC
Aug. 2.....	0830		76	2550	2590		64		93		100	---	---	---	---	---	---	PWC
Aug. 4.....	0930		75	3180	12100		64		94		100	---	---	---	---	---	---	PWC
Aug. 5.....	0800		73	3090	1670		64		93		100	---	---	---	---	---	---	PWC
Aug. 16.....	1415		73	5160	4360		49		75		99	100	---	---	---	---	---	SPWC
Aug. 16.....	1600		72	2140	16600		61		93		100	---	---	---	---	---	---	PWC
Aug. 16.....	1845		72	2140	16600		4		91		100	---	---	---	---	---	---	PN
Aug. 17.....	0930		73	1960	1100		60		87		100	---	---	---	---	---	---	PWC
Aug. 25.....	0745		70	3620	7880		55		82		100	---	---	---	---	---	---	PWC
Sept. 1.....	0620		69	4200	2270		42		67		97	99	100	---	---	---	---	VPWC
Sept. 1.....	0620		69	4200	2270		1		60		97	99	100	---	---	---	---	VPWC
Sept. 2.....	1030		63	2540	14400		70		100		---	---	---	---	---	---	---	PWC
Sept. 9.....	0730		64	18200	35000		39		63		94	99	100	---	---	---	---	VPWC
Sept. 14.....	0740	d	63	4400	1100		54		75		92	97	100	---	---	---	---	VPWC
Sept. 18.....	1320		65	7560	27000		46		66		98	100	---	---	---	---	---	VPWC
Sept. 19.....	0710		62	5120	9940		59		85		97	100	---	---	---	---	---	VPWC
Sept. 20.....	1800		63	4490	4980		64		87		96	100	---	---	---	---	---	VPWC
Sept. 24.....	0920		58	8410	11200		39		59		89	99	100	---	---	---	---	VPWC

d Daily mean discharge.

GREEN RIVER BASIN

9-2170. GREEN RIVER NEAR GREEN RIVER, WYO.

LOCATION.--At bridge on State Highway 530, about 1 mile upstream from gaging station, 0.8 mile upstream from Bitter Creek, at southeast edge of town of Green River, Sevier County, and 5 miles upstream from high waterline of proposed Orange Cove Reservoir.

DRAINAGE AREA.--10,000 acres.

RECORDS AVAILABLE.--Chemical analyses: May 1951 to September 1961.

Water temperatures: May 1951 to September 1961.

Sediment records: May 1951 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 488 ppm Dec. 1 to Jan. 15; minimum, 191 ppm June 1-24.

Hardness: Maximum, 270 ppm Dec. 1 to Jan. 15; minimum, 126 ppm June 1-24.

Specific conductance: Maximum daily, 781 micromhos May 14; minimum daily, 258 micromhos June 2.

Water temperatures: Maximum, 79°F July 8, 22; minimum, freezing point Dec. 3, Feb. 28.

Sediment concentrations: Maximum daily, 653 ppm Apr. 5; minimum daily, 8 ppm July 7, 29.

Sediment loads: Maximum daily, 4,440 tons June 1; minimum daily, 12 tons July 29.

EXTREMES, 1951-61.--Dissolved solids: Maximum, 855 ppm Nov. 15-20, 1955; minimum, 156 ppm May 23-31, 1958.

Hardness: Maximum, 420 ppm Nov. 15-20, 1955; minimum, 106 ppm May 23-31, 1958.

Specific conductance: Maximum daily, 1,240 micromhos Dec. 13, 1953; Nov. 19, 1955; minimum daily, 219 micromhos May 22, 1954.

Water temperatures: Maximum, 79°F July 8, 22, 1961; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 3,870 ppm Mar. 26, 1956; minimum daily, 1 ppm Aug. 18, 23, 1960.

Sediment loads: Maximum daily, 48,000 tons May 29, 1956; minimum daily, 2 tons on several days during December 1958, January 1959, August 1960.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Flow affected by ice Nov. 29 to Dec. 31, Jan. 12 to Mar. 29.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Calcium 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		Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Calcium Magnesium	Non-carbonate	
Oct. 1-31, 1960...	887	11	0.01	55	20	59	2.2	192	0	167	12		1.1	0.08	418	0.57	219	62	642
Nov. 1-30, 1960...	791	12	--	54	19	40	1.7	185	0	132	9.5		.3	.08	362	.49	212	60	553
Dec. 1-Jan. 15, 1961...	408	8.7	--	58	24	56	1.7	222	0	193	12		.5	.10	488	.66	270	88	714
Jan. 16-31, Feb. 1-28, 1961...	341	6.1	--	57	19	52	1.9	173	0	180	9.0		.5	.08	416	.57	222	80	634
Mar. 1-31, 1961...	482	9.9	--	56	18	51	2.0	167	0	174	9.5		1.0	.06	412	.56	215	78	625
Apr. 1-30, 1961...	842	8.3	.01	82	21	51	2.4	198	0	173	10		.1	.16	434	.59	242	80	854
May 1-23, 1961...	574	7.2	--	63	22	56	1.9	198	0	190	10		.1	.15	457	.62	248	86	681
May 24-31, 1961...	2140	7.0	--	36	10	20	1.9	124	0	67	4.0		.1	.13	223	.30	1290	31	340
June 1-24, 1961...	3011	9.0	--	36	8.5	17	1.7	131	0	50	3.0		1.0	.05	191	.26	1250	19	312
June 25-30, 1961...	1545	9.1	--	40	12	26	1.1	185	0	71	4.5		.8	.05	241	.33	1010	151	389
July 1-31, 1961...	757	5.9	.01	42	18	41	1.5	162	0	116	7.5	0.6	.6	.06	310	.42	170	37	505

Aug. 1-31, 1961.....	575	4.9	--	38	20	41	1.9	157	0	126	7.5	--	322	.44	500	178	49	1.3	512	7.8
Sept. 1-30.....	655	5.6	--	34	25	39	1.8	194	0	134	7.5	--	330	.45	584	190	64	1.2	518	8.0
Weighted average	--	8.3	--	47	17	38	1.8	165	0	122	7.4	--	327	0.44	706	186	52	1.2	506	7.9
Time-weighted average.....	799	6.0	--	52	19	46	1.9	177	0	150	8.9	--	379	--	--	209	64	1.4	579	7.9
Tons per day....	--	18.0	--	102	36.0	82.0	3.9	355	0	263	16.0	--	1.3	0.17	--	--	--	--	--	--

Temperature ($^{\circ}\text{F}$) of water, water year October 1960 to September 1961

		Temperature & 77° 72° 62° 52° 42° 32° 22° 12° 2° 1° 0° 1° 2° 3° 4° 5° 6° 7° 8° 9° 10° 11° 12° 13° 14° 15° 16° 17° 18° 19° 20° 21° 22° 23° 24° 25° 26° 27° 28° 29° 30° 31°																															Aver- age
		Day																															
Month		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	39	--	--
November.....	43	--	--	61	--	42	--	--	--	--	45	--	--	--	43	--	--	42	--	--	--	40	--	--	--	--	--	--	--	--	--	--	--
December.....	--	32	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
January.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
February.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
March.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	35	35	35	34	35	35	35	35	35	39	39	41	33	38	44	--	--	
April.....	42	48	--	48	45	43	--	42	42	43	48	48	47	42	44	46	50	49	50	52	55	49	48	47	50	48	50	55	58	52	--	48	
May.....	52	58	50	--	50	--	58	56	58	58	50	58	57	58	54	57	58	57	--	64	59	60	60	--	--	--	--	--	--	--	--	--	68
June.....	--	61	--	60	64	64	66	68	--	68	72	67	65	76	69	67	69	68	--	68	71	--	70	73	75	75	69	69	--	--	--	68	
July.....	71	75	73	75	76	--	70	79	77	75	72	--	68	70	71	75	73	78	70	72	79	73	72	74	75	73	72	70	72	72	73	73	
August.....	72	73	70	75	74	76	73	71	74	71	68	71	73	73	--	--	71	70	74	76	74	76	76	70	71	68	64	--	64	--	77	72	
September.....	65	66	64	63	61	61	60	62	62	61	61	61	61	61	61	60	59	61	63	64	60	65	65	60	58	60	51	54	50	45	--	59	

GREEN RIVER BASIN--Continued

9-2170. GREEN RIVER NEAR GREEN RIVER, WYO.--Continued

Suspended sediment, water year October 1960 to September 1961
 Where no concentrations are reported, loads are estimated/

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..	488	19 B	25	710	29	56	360	24 B	23
2..	488	19 B	25	703	29 B	55	440	27 B	32
3..	482	15 B	20	750	33 B	67	600	32	52
4..	488	15	20	814	38 B	84	680	35 B	64
5..	482	31 B	40	862	42	98	660	34 B	61
6..	482	46 B	60	879	42 B	100	640	33 B	57
7..	482	61 B	79	888	46 B	110	600	32 B	52
8..	488	72	95	854	52	120	560	31 B	47
9..	528	77 B	110	879	55 B	130	540	30 B	44
10..	726	77 B	150	879	55 B	130	500	29 B	39
11..	951	80	205	774	45 B	94	480	29 B	38
12..	1010	81 B	220	798	47	101	460	27 B	34
13..	969	80 B	210	888	88 B	210	450	27 B	33
14..	897	198 B	480	933	111 B	280	420	26 B	29
15..	838	614	1390	862	75	175	400	25 B	27
16..	774	167 B	350	830	49 B	110	390	25 B	26
17..	742	85 B	170	830	49 B	110	400	25 B	27
18..	718	40 B	78	862	77 B	180	410	25 B	28
19..	703	33 B	63	838	51	115	420	26 B	29
20..	703	33 B	63	766	49 B	100	400	25 B	27
21..	703	33 B	63	766	49 B	100	380	24 B	25
22..	703	33 B	63	689	46	86	390	25 B	26
23..	710	39 B	75	654	41 B	72	390	25 B	26
24..	734	66 B	130	766	63 B	130	400	25 B	27
25..	726	51 B	100	774	62 B	130	400	25 B	27
26..	718	40 B	78	822	77 B	170	390	25 B	26
27..	718	40 B	78	750	66 B	140	380	24 B	25
28..	710	39 B	75	806	69 B	150	350	23 B	22
29..	718	40	78	600	32 B	52	320	22 B	19
30..	710	39 B	75	450	27 B	33	320	22 B	19
31..	710	39 B	75	--	--	--	320	22 B	19
Total	21299	--	4743	23716	--	3488	13850	--	1030
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..	320	22 B	19	300	21 B	17	380	24 B	25
2..	330	22 B	20	310	22 B	18	390	25 B	26
3..	320	22 B	19	310	22 B	18	370	24 B	24
4..	310	22 B	18	300	21 B	17	370	24 B	24
5..	300	21 B	17	280	20 B	15	370	24 B	24
6..	310	22 B	18	280	20 B	15	370	24 B	24
7..	320	22 B	19	290	20 B	16	370	24 B	24
8..	330	22 B	20	310	22 B	18	370	24 B	24
9..	330	22 B	20	330	22 B	20	370	24 B	24
10..	330	22 B	20	340	23 B	21	380	25 B	25
11..	330	22 B	20	350	23 B	22	390	25 B	26
12..	330	22 B	20	380	24 B	25	410	172 B	190
13..	340	23 B	21	370	24 B	24	430	379 B	440
14..	350	23 B	22	370	24 B	24	430	379 B	440
15..	360	24 B	23	370	24 B	24	430	382	444
16..	360	24 B	23	370	24 B	24	440	116	138
17..	360	24 B	23	370	24 B	24	450	86	104
18..	350	23 B	22	370	24 B	24	450	44	53
19..	350	23 B	22	360	24 B	23	450	96	117
20..	340	23 B	21	370	24 B	24	450	89	108
21..	340	23 B	21	380	24 B	25	460	219	272
22..	350	23 B	22	380	24 B	25	490	117	234
23..	350	23 B	22	370	24 B	24	500	216	292
24..	360	24 B	23	370	24 B	24	520	503	706
25..	360	24 B	23	380	24 B	25	560	164	248
26..	360	24 B	23	360	24 B	23	560	152	230
27..	300	21 B	17	350	23 B	22	580	561	847
28..	280	20 B	15	360	24 B	23	640	319	551
29..	280	20 B	15	--	--	--	760	223	458
30..	290	20 B	16	--	--	--	930	110	276
31..	290	20 B	16	--	--	--	876	97	229
Total	10230	--	620	9680	--	604	14946	--	6647

B Computed from estimated-concentration graph.

GREEN RIVER BASIN--Continued

9-2170. GREEN RIVER NEAR GREEN RIVER, WYO.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
Where no concentrations are reported, loads are estimated/

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..	867	114	267	515	24	33	4060	405	4440
2..	921	95	236	530	27	39	4110	340	3770
3..	1100	--	910	545	38	56	3820	--	3400
4..	1360	430	1580	550	13	19	3820	--	2900
5..	1570	653	2770	555	31	46	3990	221	2380
6..	1630	644	2830	550	--	42	3790	110	1130
7..	1490	--	1600	550	--	38	3430	128	1190
8..	1200	139	450	550	23	34	3130	121	1020
9..	950	93	239	525	29	41	2860	111	857
10..	885	56	134	502	27	37	2760	--	760
11..	832	48	108	474	19	24	2960	84	671
12..	772	50	104	458	16	20	3170	44	377
13..	702	53	100	497	21	28	3320	116	1040
14..	667	61	110	540	79	115	3220	121	1050
15..	660	37	66	634	43	74	3110	23	193
16..	654	38	67	688	24	45	2920	14	110
17..	615	42	70	654	28	49	2760	25	186
18..	605	22	36	660	28	50	2480	58	388
19..	615	46	76	667	16	29	2340	35	221
20..	667	45	81	667	--	30	2270	16	98
21..	772	56	117	660	17	30	2170	--	88
22..	832	104	234	628	12	20	2030	14	77
23..	755	36	73	595	12	19	1900	32	164
24..	695	20	38	634	--	200	1850	--	110
25..	660	35	62	798	--	380	1780	13	62
26..	628	18	31	1220	--	560	1720	14	65
27..	585	15	24	1760	156	761	1600	11	48
28..	550	21	31	2450	321	2120	1470	10	40
29..	520	22	31	3110	--	2700	1390	10	38
30..	510	21	29	3540	--	3300	1310	18	64
31..	--	--	--	3610	--	3900	--	--	--
Total	25269	--	12504	30316	--	14819	81540	--	26937
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..	1220	33	109	555	10	15	545	505	743
2..	1130	38	116	575	150	233	520	150	211
3..	1080	11	32	565	24	37	520	139	195
4..	1030	10	28	530	24	34	530	126	180
5..	970	14	37	520	21	29	555	66	99
6..	912	--	28	510	15	21	595	76	122
7..	912	8	20	506	14	19	615	55	91
8..	940	29	74	502	10	14	595	75	120
9..	903	31	76	540	20	29	580	--	93
10..	930	107	269	648	19	33	565	43	66
11..	921	17	42	654	25	44	545	41	60
12..	912	--	32	660	23	41	570	43	66
13..	849	10	23	660	19	34	580	109	171
14..	798	14	30	628	108	183	585	105	166
15..	740	11	22	667	32	58	595	105	169
16..	702	236	447	654	--	52	610	101	166
17..	660	302	538	641	--	48	600	99	160
18..	610	330	544	600	--	44	634	71	122
19..	575	224	348	570	26	40	725	75	147
20..	555	210	315	555	21	31	695	75	141
21..	560	295	446	550	20	30	680	75	138
22..	555	226	339	545	18	26	789	71	151
23..	560	407	615	530	15	21	858	111	257
24..	560	13	20	520	20	28	894	--	220
25..	575	13	20	530	82	117	876	74	175
26..	565	13	20	560	155	234	832	76	171
27..	555	11	16	680	213	391	789	64	136
28..	555	12	18	580	180	280	740	74	148
29..	545	8	12	520	225	316	718	66	128
30..	545	11	16	492	160	213	702	66	125
31..	545	47	69	565	147	224	--	--	--
Total	23469	--	4721	17812	--	2919	19637	--	4937
Total discharge for year (cfs-days).....									291764
Total load for year (tons).....									83969

A Computed from partly estimated concentration graph.

GREEN RIVER BASIN--Continued

9-2170. GREEN RIVER NEAR GREEN RIVER, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (°F)	Sam- pling point	Discharge (cfs)	Sediment concentra- tion (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis	
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000		2.000
Mar. 29, 1961.....	1800	38		d	760	202		--	68	--	86	--	97	99	100	--	--	VPWC
May 14.....	1800	57			560	43		71	82	93	97	99	100	--	--	--	--	BWC
May 27.....	1200	64			1720	136		40	50	63	74	85	92	94	97	100	--	VPWC
June 2.....	2000	61			3980	295		--	34	--	53	--	69	81	94	100	100	VPWC
June 2.....	2000	61			3990	295		--	--	--	--	--	69	79	91	98	--	S
June 18.....	1130	69			2500	53		25	29	33	40	43	53	67	89	100	--	VPWC
Aug. 29.....	1730	64			515	258		--	95	--	100	--	--	--	--	--	--	PWC

d Daily mean discharge.

GREEN RIVER BASIN--Continued

9-2249. BLACKS FORK NEAR MARSTON, WYO.

LOCATION.--At Bonomo ranch near Marston, Sweetwater County, about 5 miles south of U.S. Highway 30, about 12 miles west of town of Green River, and 12 miles upstream from gaging station.

DRAINAGE AREA.--3,670 square miles, approximately, upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: March 1951 to September 1961.

Water temperatures: March 1951 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 3,180 ppm Dec. 4; minimum, 704 ppm Apr. 1-12.

Hardness: Maximum, 995 ppm July 1-11; minimum, 145 ppm Dec. 4.

Specific conductance: Maximum daily, 4,470 microhmhos Dec. 4; minimum daily, 870 microhmhos Apr. 9.

Water temperatures: Maximum, 75°F June 28, July 8; minimum, freezing point Dec. 3; minimum, 278 ppm Feb. 12-13, 1954.

Hardness, 1954-61.--Dissolved solids: Maximum, 4,481 ppm Oct. 1, 1953; minimum, 278 ppm Feb. 12-13, 1954.

Hardness, 1954-61.--Dissolved solids: Maximum, 4,481 ppm Oct. 1, 1953; minimum, 278 ppm Feb. 12-13, 1954.

Specific conductance: Maximum daily, 6,010 microhmhos Oct. 1, 1953; minimum daily, 413 microhmhos Apr. 11, 1960.

Water temperatures: Maximum, 84°F July 15, 16, 1955; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge are given for Blacks Fork near Green River.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (Fe)	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) (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)
														Parts per million	Tons per acre-foot	Calcium, magnesium, and sodium	Non-carbonate		
Nov. 1-4, 6-7, 10, 1960.....	0.1 4.6	--	177	88	369	5.3	180	4	1,260	117	1.2 0.44	2.110	2.87	2,110	2.87	802	648	5.7	2,740 8.3
Nov. 8-9, 11-30.....	1.2 5.5	--	135	64	245	4.5	236	0	817	74	2.5 .26	1,460	1.99	1,460	1.99	598	404	4.4	1,980 8.2
Dec. 1-3, 5-11, 13-14,.....	5.8 9.8	--	99	67	338	3.9	314	6	862	84	.6 .30	1,620	2.20	1,620	2.20	522	255	6.4	2,250 8.3
Dec. 4.....	6.5 12	--	8.0	30	1,180	8.2	654	685	840	90	3.3 1.0	3,180	4.32	3,180	4.32	145	0	4.3	4,470
Dec. 12, 15-19, 27, 29, 31.....	6.2 8.4	--	55	76	592	4.4	489	53	1,080	103	.3 .45	2,220	3.02	2,220	3.02	488	0	12	3,070 8.7
Dec. 20-26, 28, 30	6.5 7.6	--	109	64	247	3.5	347	0	879	63	.2 .23	1,340	1.82	1,340	1.82	534	249	4.6	1,860 8.2
Jan. 1-5, 1961.....	6.0 19	0.00	150	84	355	4.3	400	0	1,050	82	.5 .36	1,940	2.64	1,940	2.64	720	352	5.8	2,610 8.0
Jan. 6-31.....	7.3 9.2	0.00	182	73	214	3.2	305	0	868	67	.5 .29	1,570	2.14	1,570	2.14	755	505	3.4	2,060 8.0
Feb. 1-28.....	10.6 7.0	--	135	46	139	2.4	211	0	595	50	.7 .19	1,090	1.48	1,090	1.48	528	353	2.8	1,500 8.0
Mar. 1-31.....	123 7.4	--	96	30	127	2.9	196	0	392	57	1.4 .15	810	1.10	810	1.10	362	201	2.9	1,200 8.1
Apr. 1-12.....	223 16	0.00	76	30	113	5.3	230	0	283	65	2.7 .24	704	.96	704	.96	314	125	2.8	1,070 8.0
Apr. 13-30.....	58.2 10	0.00	109	47	279	6.9	247	0	513	87	1.1 .31	1,980	2.47	1,980	2.47	624	261	3.6	2,530 7.9
May 1-31.....	58.3 8.4	--	133	54	209	7.3	238	0	564	136	1.3 .28	1,350	1.75	1,350	1.75	528	323	4.0	1,760 7.9
June 1-11.....	70.3 12	--	123	50	204	6.2	267	0	572	114	1.6 .37	1,220	1.68	1,220	1.68	506	287	3.9	1,750 8.1

GREEN RIVER BASIN--Continued
9-2295. HENRYS FORK AT LINWOOD, UTAH

LOCATION.--About 1 mile downstream from gaging station, 0.4 mile north of Wyoming-Utah State line, in Sweetwater County, Wyo., 2 miles upstream from State Highway 530 at Linwood, 4 miles northeast of Manila, and 7 miles upstream from mouth.

DRAINAGE AREA.--520 square miles upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: March 1951 to September 1961.

Water temperatures: March 1951 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 2,460 ppm Aug. 1, 5; minimum, 391 ppm May 28-31.

Hardness: Maximum, 1,460 ppm Aug. 1, 5; minimum, 266 ppm May 28-31.

Specific conductance: Maximum daily, 3,060 microhmhos July 25, 26; minimum daily, 544 microhmhos May 30.

Water temperatures: Maximum, 78°F July 3; minimum, freezing point on many days during November to March.

EXTREMES, 1951-61.--Dissolved solids: Maximum, 2,960 ppm Sept. 23, 1959; minimum, 312 ppm June 1-6, 9-10, 1952.

Hardness: Maximum, 1,720 ppm Sept. 23, 1959; minimum, 208 ppm June 1-6, 9-10, 1952.

Specific conductance: Maximum daily, 3,280 microhmhos Sept. 23, 1959; minimum daily, 395 microhmhos May 15, June 2, 1952.

Water temperatures: Maximum, 81°F Aug. 6, 1960; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (Fe)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate		
Oct. 1-19, 22-26, 28-29, 1960.....	1.5 26	0.00 271	150	150	169	13	289	0	1300	66	--	0.5 0.54	2140	2.91	8.67	1290	1050	2.0	2520	8.1
Oct. 20-21, 27, 30-31, 1960.....	1.9 23	.00 170	101	101	90	11	251	0	767	41	--	.5 .37	1320	1.81	5.82	840	634	1.4	1690	8.2
Nov. 1-5, 7, 10-12, 1960.....	4. 28	-- 260	128	120	120	12	291	0	1160	54	--	.2 .16	1870	1.84	20.7	1160	940	1.7	2270	8.2
Nov. 6-8-30.....	26.6 23	-- 168	88	76	76	10	291	0	653	32	--	.2 .1	1190	1.63	85.5	780	541	1.2	1560	8.2
Dec. 1-31.....	31.0 20	-- 174	88	75	75	9.4	307	0	644	31	--	.3 .29	1190	1.62	99.6	785	543	1.2	1560	8.1
Jan. 1-31, 1961.....	25.5 19	.01 168	80	70	66	8.8	286	0	617	34	--	.4 .25	1140	1.55	78.5	750	515	1.1	1500	8.1
Feb. 1-28.....	30.6 17	-- 143	73	66	7.8	245	3	553	30	30	--	.5 .25	1010	1.37	83.4	658	452	1.1	1350	8.3
Mar. 1-31.....	58.7 17	-- 127	61	60	7.4	249	0	454	28	28	--	.8 .15	877	1.19	139	566	362	1.1	1200	8.2
Apr. 1-2, 9-25.....	64.7 21	.01 107	59	56	7.7	242	0	389	26	26	--	1.7 .27	787	1.07	137	508	310	1.1	1080	8.2
Apr. 3-8.....	206 26	.01 81	28	44	8.8	232	0	199	16	16	--	2.2 .20	519	.71	289	316	126	1.1	753	7.9
Apr. 26-30.....	15.6 19	.01 148	76	72	9.0	290	0	540	32	32	--	1.6 .29	1040	1.41	43.8	672	434	1.2	1380	7.9
May 1-8.....	16.0 16	-- 135	85	74	8.2	261	0	571	45	45	--	1.4 .31	1060	1.44	45.8	686	472	1.2	1390	8.1
May 9-13, 19-20.....	4.7 19	-- 196	103	106	10	300	0	824	34	34	--	1.5 .39	1440	1.96	18.3	915	669	1.5	1840	7.8
May 14-18, 21-27.....	43.4 22	-- 108	53	56	8.1	246	0	380	24	24	--	1.7 .26	775	1.05	90.8	488	286	1.1	1070	8.2
May 28-31.....	198 19	-- 68	23	22	5.7	197	0	144	10	10	--	1.9 .17	391	.53	209	266	104	.6	594	7.8
June 1-12.....	109 24	-- 109	35	37	7.0	248	2	248	16	16	--	.8 .16	591	.80	174	390	183	.8	848	8.2
June 13-15.....	44.3 24	-- 106	54	54	8.1	248	0	271	30	30	--	.7 .21	700	1.32	89.7	438	282	1.1	1630	8.2
June 16-21.....	13.2 26	-- 141	67	66	9.9	293	0	461	30	30	--	.7 .26	925	1.32	34.7	696	282	1.1	1340	8.1
June 22-30.....	1.0 25	-- 218	109	109	123	12	259	0	935	48	--	.6 .42	1600	2.18	4.32	985	783	1.7	2050	8.1

GREEN RIVER BASIN--Continued
9-2295. HENRYS FORK AT LINWOOD, UTAH--Continued

Temperature (°F) of water, water year October 1960 to September 1961

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

GREEN RIVER BASIN--Continued
9-2345. GREEN RIVER NEAR GREENDALE, UTAH

LOCATION.--At gaging station, 0.5 mile downstream from Flaming Gorge dam, 2 miles south of Dutch John, 4 miles northeast of Greendale, Daggett County, and 13 miles southeast of Linwood.

DRAINAGE AREA.--15,100 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: October 1956 to September 1961.

Segment records: October 1956 to September 1959.

EXTRACTS, 1959-61.--Dissolved solids: Maximum, 145 ppm June 1-30.

Hardness: Maximum, 424 ppm Dec. 1-9; minimum, 145 ppm Mar. 18-23; minimum, 236 ppm June 1-30.

SPECIFIC CONDUCTANCE, 1959-61.--Dissolved solids: Maximum, 145 ppm Mar. 18-23; minimum daily, 325 micromhos June 2.

Hardness: Maximum, 424 ppm Dec. 1-9, 1960; minimum, 130 ppm June 1-6, 1958.

Specific conductance: Maximum daily, 1,340 micromhos Aug. 30, 1961; minimum daily, 325 micromhos June 2, 1961.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (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) (B)	Dissolved solids (residue at 180° C)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)			
													Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-31, 1960.....	795	7.2	0.00	62	24	60	2.0	187	0	209	18	0.3	0.6	479	0.65	1030	254	101	1.6	720	8.2
Nov. 1-30.....	908	8.7	0.00	66	25	55	2.0	196	0	205	15	0.3	0.2	491	0.67	1200	266	105	1.5	718	8.0
Dec. 1-9.....	429	9.5	0.02	103	41	97	3.3	284	0	362	28	0.6	1.1	812	1.10	941	424	191	2.0	1100	7.7
Dec. 10-Jan. 31, 1961.....	439	9.2	0.01	80	26	56	2.1	216	0	229	15	0.2	0.19	535	0.73	634	304	127	1.4	784	8.2
Feb. 1-28.....	489	8.1	0.00	75	27	65	2.1	200	0	244	20	0.2	0.9	567	0.77	749	300	136	1.6	819	8.0
Mar. 1-17, 24-28..	908	6.5	0.00	68	27	70	2.4	182	0	248	24	0.3	1.2	558	0.76	1370	280	131	1.8	806	8.0
Mar. 18-23.....	1273	6.7	0.03	74	33	130	4.6	168	0	322	66	0.4	1.18	866	1.18	2980	320	182	3.2	1110	8.1
Mar. 29-31.....	1487	14	0.03	71	23	75	3.3	200	2	222	24	0.7	3.6	570	1.78	2290	270	103	2.0	828	8.3
Apr. 1-30.....	1274	14	0.03	66	25	60	2.8	209	0	203	19	0.3	1.9	508	0.69	1750	270	99	1.6	754	8.2
May 1-15, 17-20...	890	9.7	0.03	66	24	68	2.5	190	0	221	22	0.5	1.3	524	0.71	1260	262	106	1.8	767	7.9
May 16.....	1140	15	--	88	31	95	4.0	230	0	299	36	--	4.3	744	1.01	2290	346	157	2.2	1020	7.9
May 21-27.....	1246	8.6	0.01	56	18	53	2.4	163	0	173	17	--	1.2	425	0.58	1430	215	81	1.6	643	7.9
May 28-31.....	3210	15	0.01	49	12	27	2.1	155	0	88	9.5	0.6	3.0	289	0.39	2500	170	43	0.9	438	8.0
June 1-30.....	3227	9.8	0.02	40	11	22	1.6	136	0	72	7.5	0.3	1.4	305	0.32	2060	145	33	0.8	376	7.8
July 1-31.....	909	6.2	0.00	46	16	42	2.0	169	0	121	10	0.2	0.8	326	0.44	800	181	42	1.4	524	8.0
Aug. 1-29.....	697	5.9	--	52	19	55	2.9	172	0	161	16	0.3	1.3	399	0.54	751	208	67	1.6	624	7.9
Aug. 30-31.....	712	12	--	91	35	132	7.3	200	0	390	70	0.6	3.7	828	1.13	1590	368	204	3.0	1240	7.9

Sept. 1-5, 1961...	720	11	--	84	28	83	4.6	198	0	286	32	.5	3.6	0.15	628	.85	1220	324	162	2.0	994	7.9
Sept. 6-30.....	958	9.6	--	66	21	60	3.1	178	0	212	18	.5	1.7	.13	476	.65	1230	250	104	1.7	715	7.8
Weighted average	--	9.4	0.01	58	20	50	2.3	176	0	171	16	0.3	1.3	0.11	425	0.58	1190	228	84	1.4	636	7.9
Time-weighted average.....	1032	8.8	0.01	65	23	58	2.4	189	0	201	18	0.3	1.1	0.13	482	--	--	256	101	1.6	713	8.0
Tons per day....	--	26.0	0.04	163	56.0	140	6.4	489	0	476	45.0	0.9	3.7	0.29	--	--	--	--	--	--	--	--

GREEN RIVER BASIN--Continued
9-2510. YAMPA RIVER NEAR MAYBELL, COLO.

LOCATION.--At county bridge, 1 mile north of Maybell, Moffat County, and about 3.5 miles downstream from gaging station.

DRAINAGE AREA.--3,410 square miles, approximately, upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: November 1950 to September 1961.

Water temperatures: November 1950 to September 1961.

Sediment records: December 1950 to May 1958.

EXTREMES, 1950-61.--Dissolved solids: Maximum, 394 ppm Aug. 13-27; minimum, 82 ppm June 1-21.

Hardness: Maximum, 194 ppm Dec. 1-31; minimum, 52 ppm June 1-21.

Water temperature: Maximum, 69°F, 22 microamhos Aug. 24; minimum daily, 105 microamhos June 11.

EXTREMES, 1950-61.--Dissolved solids: Maximum, 545 ppm Sept. 21-30, 1956; minimum, 72 ppm June 21-30, 1951.

Hardness: Maximum, 238 ppm Dec. 1-10, 1957; minimum, 43 ppm June 1-21, 1959.

Specific conductance: Maximum daily, 947 microamhos Sept. 24, 1955; minimum daily, 94 microamhos June 14, 1959.

Water temperatures: Maximum, 82°F July 26, 1960; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Po- tas- sium (K)	Bi- car- bon- ate (HCO ₃)	Car- bon- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		So- dium ad- sorp- tion ratio	Specific con- duct- ance (micro- mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Cal- cium, Mag- ne- sium	Non-car- bon- ate			
Oct. 1-31, 1960...	197	5.3	0.00	41	16	51	2.8	204	0	78	25		1.1	0.10	316	0.43	168	174	7	1.7	532	8.0
Nov. 1-30.....	254	11	0.01	47	18	49	1.9	192	11	84	28		.8	.09	340	.46	233	190	15	1.5	551	8.7
Dec. 1-31.....	211	13	0.01	48	18	49	1.8	219	1	83	27		.6	.09	352	.46	201	194	13	1.5	564	8.3
Jan. 1-31, 1961....	199	11	0.00	45	16	50	2.3	216	0	74	28		1.1	.07	340	.46	183	179	2	1.6	552	7.9
Feb. 1-28.....	215	10	0.01	40	16	47	2.5	194	0	78	26		.9	.08	314	.43	182	168	9	1.6	521	7.7
Mar. 1-17, 25-31....	287	9.2	0.01	44	18	45	3.0	175	0	113	22		2.6	.05	348	.47	270	187	44	1.4	555	7.9
Mar. 18-24.....	364	9.1	0.01	38	13	32	3.4	141	0	81	16		2.7	.05	270	.37	280	146	30	1.2	473	7.8
Apr. 1-19.....	762	9.0	.04	49	17	36	2.9	163	0	117	16		1.8	.03	336	.46	691	193	59	1.2	525	8.0
Apr. 20-30.....	1,269	12	.17	39	9.5	18	2.2	131	0	58	6.0		2.0	.02	224	.30	767	137	30	0.7	344	7.9
May 1-13.....	2,535	14	0.28	28	7.5	11	1.5	104	0	34	5.0		1.7	.05	164	.22	1,120	102	17	.5	246	7.5
May 14-22.....	3,748	11	0.24	24	5.6	6.6	1.5	86	0	26	2.5		2.0	.05	133	.18	1,350	82	11	.4	199	7.2
May 23-31.....	5,644	9.3	0.16	16	3.9	4.9	1.1	61	0	13	2.0		1.7	.04	92	.13	1,400	56	6	.3	131	7.3
June 1-21.....	4,028	8.8	0.14	3.9	5.7	5.9	1.9	57	0	11	3.9		1.3	.04	82	.11	892	52	5	.3	125	7.1
June 22-23, 30.....	1,774	7.4	0.29	29	9.2	27	2.0	126	0	40	19		1.0	.07	200	.27	958	110	7	1.1	332	7.5
June 24-28.....	1,375	8.6	0.18	18	4.9	12	1.6	73	0	18	8.0		1.8	.04	112	.15	416	66	6	1.6	184	7.3
July 1-15.....	515	7.6	.02	28	9.5	25	1.7	122	0	37	17		1.1	.04	186	.25	259	110	10	1.0	321	7.1
July 16-31.....	208	2.9	.01	37	12	37	2.5	157	0	61	25		1.3	.06	256	.35	144	141	12	1.4	439	7.5
Aug. 1-12.....	200	4.1	0.02	42	15	45	3.7	186	0	74	27		2.3	.10	301	.41	163	167	14	1.5	513	7.7
Aug. 13-27.....	86.2	4.3	0.01	44	19	67	4.2	207	0	103	47		2.1	.14	394	.54	91.7	188	18	2.1	656	7.7
Aug. 28-29.....	99.5	6.3	0.01	34	11	25	2.4	146	0	46	14		1.6	.09	214	.29	87.5	130	10	1.0	362	8.1

Aug. 30-31, 1961..	92.0	5.0	--	43	19	50	3.1	192	8	84	28	2.8	.09	338	.46	84.0	186	15	1.6	556	8.5
Sept. 1-9.....	264	5.4	--	46	16	56	3.3	208	0	84	30	1.5	.13	337	.46	240	160	9	1.6	564	8.1
Sept. 10-21.....	352	5.1	--	36	13	30	2.5	160	0	55	18	1.6	.09	237	.32	225	144	13	1.1	400	7.9
Sept. 22-30.....	1,046	11	--	33	11	17	2.5	127	0	51	8.5	1.6	.04	199	.27	562	130	26	.6	315	7.8
Weighted average	--	9.8	--	26	8.0	17	1.6	103	0	37	8.6	1.6	0.05	166	0.23	390	96	13	0.7	261	7.3
Time-weighted average.....	869	8.9	--	38	14	38	2.4	166	1	70	21	1.4	0.07	279	--	--	154	16	1.3	454	7.6
Tons per day....	--	23.0	--	61.0	19.0	40.0	3.8	241	0	67.0	20.0	3.7	0.11	--	--	--	--	--	--	--	--

Temperature (°F) of water, water year October 1960 to September 1961

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

GREEN RIVER BASIN--Continued

9-2599.5. LITTLE SNAKE RIVER ABOVE LILLY, COLO.

LOCATION.--At bridge on State Highway 318, about 6 miles upstream from gaging station, about 10 miles northeast of Lily, Moffat County, and 16 miles upstream from mouth.

DRAINAGE AREA.--3,730 square miles, approximately, upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1961.

Water temperatures: December 1950 to September 1960.

Sediment records: May 1958 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 2,180 ppm Aug. 16; minimum, 139 ppm May 15 to June 19.

Hardness: Maximum, 475 ppm Aug. 16; minimum, 78 ppm Oct. 12-20.

Specific conductance: Maximum daily, 3,150 micromhos Aug. 16; minimum daily, 171 micromhos May 25.

Sediment concentrations: Maximum daily, 33,000 ppm Oct. 12; minimum daily, no flow on many days during October, July, and August.

Sediment loads: Maximum daily, 21,200 tons Oct. 11; minimum daily, 0 tons on many days during October, July, and August.

EXTREMES, 1960-61.--Dissolved solids (1950-61, 1952-61): Maximum, 2,330 ppm July 24, 1956; minimum, 109 ppm July 1-8, 10, 1957.

Hardness (1950-61, 1952-61): Maximum, 1,540 ppm July 24, 1955; minimum, 64 ppm July 1-8, 10, 1957, June 1-14, 1958, Mar. 11, 1960.

Specific conductance (1950-61, 1952-61): Maximum daily, 3,360 ppm Aug. 16, 1959; minimum daily, 166 ppm Aug. 17, 1959; no flow on many days.

Sediment concentrations (1958-61): Maximum daily, 142,000 ppm Sept. 25, 1959; minimum daily, 0 tons on many days.

Sediment loads (1958-61): Maximum daily, 142,000 tons Sept. 25, 1959; minimum daily, 0 tons on many days.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge are given for Little Snake River near Lily, Colo. Flow affected by ice Nov. 11 to Mar. 7.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Po- tas- sium (K)	Bi-car- bon- ate (HCO ₃)	Car- bon- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (residue at 180° C)			Hardness as CaCO ₃		So- ad- orp- tion ratio	Specific con- duct- ance (micro- mhos at 25° C)	
															Parts per million	Tons per acre- foot	Tons per day	Cal- cium, Mag- ne- sium	Non- car- bon- ate			
Oct. 11, 21-31, 1960.....	27.4 16		0.00	80	23	325	5.1	276	0	558	135		0.7	0.15	1,270	1.73	94.0	294	68	8.2	1,860	8.2
Oct. 12-20.....	78.8 24		0.00	25	3.6	206	2.6	258	2	214	65		2.8	1.10	665	.90	141	78	0	10	1,030	8.3
Nov. 1-8.....	29.6 18		--	57	19	172	2.5	249	11	292	58		1.2	1.11	752	1.02	60.1	222	0	5.0	1,140	8.5
Nov. 9-30.....	48.5 19		--	48	12	79	1.5	216	2	127	27		.7	.08	420	.57	55.0	172	0	2.6	652	8.1
Mar. 15-18, 20, 1961.....	370 15		--	37	6.8	68	2.2	172	0	89	28		1.3	.05	325	.44	325	120	0	2.7	526	8.1
Mar. 19.....	558 14		--	52	9.7	92	2.6	192	0	172	26		.6	.19	496	.67	747	170	13	3.1	715	7.8
Mar. 21-31.....	357 15		--	40	8.5	38	1.3	153	0	73	12		1.5	.04	264	.36	254	134	9	1.4	417	8.0
Apr. 1-5.....	303 18		--	34	7.1	81	2.6	194	3	91	28		1.2	.07	368	.50	301	114	0	3.3	581	8.4
Apr. 6-12.....	385 19		.02	40	8.0	27	1.2	150	0	58	9.5		1.1	.05	242	.33	252	134	11	1.0	377	8.2
Apr. 13-21.....	222 16		.00	47	10	39	1.7	169	5	77	13		.6	.05	252	.40	175	158	11	1.4	461	8.4
Apr. 22-30.....	378 14		.04	37	7.3	22	1.3	141	0	48	7.0		.8	.05	218	.30	222	123	7	.9	335	8.2
May 1-4.....	634 20		--	34	6.3	22	1.5	135	0	27	6.0		1.5	.05	196	.27	336	111	0	.9	301	8.2
May 5-14.....	791 15		--	32	5.6	15	1.2	120	0	37	3.5		1.9	.05	170	.23	363	102	4	.6	256	8.0
May 15-31.....	1,238 15		--	27	4.1	12	1.8	101	0	19	3.0		1.0	.05	139	.19	465	85	2	.6	207	8.0
June 1-19.....	1,114 15		--	28	3.6	13	1.3	109	0	18	3.5		1.0	.06	139	.19	418	84	0	.6	217	7.9

June 20-25, 1961...	336	13	--	30	7.3	26	1.9	133	0	41	7.0	1.0	.06	196	.27	178	105	0	1.1	311	7.7	
June 26-30.....	134	14	--	41	9.0	44	2.9	173	0	77	14	.8	.06	287	.39	104	140	0	1.6	454	8.1	
July 1-5.....	24.4	16	.01	58	13	68	3.9	219	0	138	22	.8	.05	433	.59	28.5	196	16	2.1	667	8.0	
Aug. 14-15, 17-23,	15.0	22	--	127	20	214	6.9	345	0	482	73	2.7	.15	1,100	1.50	44.6	400	117	4.7	1,540	7.8	
Aug. 25-31.....	28	21	--	160	18	595	7.2	576	0	733	375	3.2	.27	2,180	2.96	165	475	3	12	3,150	7.8	
Aug. 16.....	13	20	--	102	17	129	5.8	324	0	278	36	.9	.02	744	1.01	26.1	324	58	3.1	1,060	7.8	
Sept. 1-2.....	7.8	15	--	98	15	114	3.4	212	0	318	38	1.1	.16	704	.96	14.8	306	132	2.8	1,010	7.8	
Sept. 3-19.....	7.4	20	--	65	11	245	4.6	294	0	389	80	1.4	.17	964	1.31	19.3	209	0	7.4	1,430	7.9	
Sept. 20-24.....	135	18	--	55	8.5	152	4.3	262	0	225	47	1.2	.14	630	.86	230	172	0	5.0	964	8.1	
Sept. 25-30.....	150	13	--	42	7.1	71	2.5	207	0	93	18	3.2	.09	342	.47	139	134	0	2.7	540	8.1	
Weighted average	a	225	15	--	32	5.6	28	1.4	129	0	44	8.7	1.2	0.06	205	0.28	198	104	3	1.1	315	8.0
Tons per day....	--	15.0	--	31.0	5.4	27	1.3	124	0	43.0	8.4	1.1	0.06	--	--	--	--	--	--	--	--	

a Mean discharge based on 365 days; mean discharge for 212 days of chemical analyses, 357 cfs.

GREEN RIVER BASIN--Continued

9-2599.5, LITTLE SNAKE RIVER ABOVE LILY, COLO.--Continued

Suspended sediment, water year October 1960 to September 1981
/Where no concentrations are reported, loads are estimated/

Day	OCTOBER			NOVEMBER			DECEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	0	---	0	18	329	A	16	46	48
2..	0	---	0	19	370		19	48	50
3..	0	---	0	20	444	A	24	46	48
4..	0	---	0	23	483	A	30	46	48
5..	0	---	0	23	483		30	46	48
6..	0	---	0	29	575	A	45	40	40
7..	0	---	0	45	749	A	91	44	45
8..	0	---	0	60	926	A	150	46	48
9..	0	---	0	56	860		130	48	50
10..	0	---	0	55	808	A	120	50	53
11..	181	23900	S 21200	50	667	A	90	50	53
12..	182	33000	16800	50	622		84	48	50
13..	194	29000	15200	55	808	A	120	46	48
14..	197	11700	6220	55	808	A	120	46	48
15..	42	9500	1080	50	622	A	84	46	48
16..	26	8500	597	46	507	A	63	44	45
17..	18	6300	306	46	507		63	42	43
18..	17	4000	A 180	46	507	A	63	44	45
19..	16	2200	95	44	530	A	63	48	50
20..	17	1200	A 55	44	530	A	63	44	45
21..	15	650	A 26	44	530		63	40	40
22..	12	350	A 11	48	772	A	100	42	43
23..	10	210	A 6	50	889	A	120	44	45
24..	9.9	160	A 4	50	889	A	120	44	45
25..	10	150	4	50	904		122	44	45
26..	13	180	A 6	48	671	A	87	42	43
27..	17	260	12	46	507	A	63	38	38
28..	17	270	A 12	44	379		45	36	36
29..	16	270	A 12	44	379	A	45	34	34
30..	13	260	A 9	46	386	A	48	34	34
31..	15	280	A 11	---	---	---	---	36	36
Total	1037.9	---	61846	1304	---	2281	1352	---	1392
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..	34		34	30		29	120	432	B 140
2..	34		34	32		31	130	456	B 160
3..	34		34	34		34	120	432	B 140
4..	34		34	36		36	130	456	B 160
5..	32		31	38		38	140	450	B 170
6..	30		29	40		40	160	463	B 200
7..	32		31	40		40	170	479	B 220
8..	34		34	38		38	179	476	B 230
9..	36		36	40		40	185	480	B 240
10..	38		38	42		43	188	473	B 240
11..	40		40	44		45	194	477	B 250
12..	42		43	46		48	179	476	B 230
13..	42		43	48		50	203	474	B 260
14..	42		43	46		48	212	489	B 280
15..	42		43	48		50	236	390	249
16..	40		40	50		53	254	880	604
17..	38		38	55		59	330	2100	1870
18..	36		36	60		65	420	4970	S 6430
19..	36		36	55		59	558	4700	7080
20..	36		36	60		65	610	5600	9220
21..	36		36	65		71	480	4000	5180
22..	38		38	70		77	321	1360	1200
23..	38		38	75		84	317	1350	1160
24..	40		40	70		77	285	2020	1550
25..	42		43	80		90	274	906	670
26..	40		40	90		100	395	2850	3040
27..	38		38	80		90	610	1870	3080
28..	34		34	100		120	426	1070	1230
29..	30		29	---		---	317	759	650
30..	30		29	---		---	257	671	466
31..	30		29	---		---	240	631	409
Total	1128		1127	1512		1620	8640	---	47008

S Computed by subdividing day.

A Computed from partly estimated concentration graph.

B Computed from estimated-concentration graph.

GREEN RIVER BASIN--Continued

9-2599.5. LITTLE SNAKE RIVER ABOVE LILY, COLO.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
Where no concentrations are reported, loads are estimated⁷

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..	246	1180	784	317	330	282	1640	1320	5840
2..	334	10100	9110	365	1980	3020	1580	1220	5200
3..	325	7620	6690	681	1950	3590	1530	1140	4710
4..	285	2110	1620	975	3260	8580	1520	1030	4230
5..	325	4490	3940	984	2630	6990	1380	827	3080
6..	649	2570	4500	826	1650	3680	1260	728	2480
7..	515	1870	2600	756	1120	2290	1220	742	2440
8..	415	681	763	588	672	1070	1250	667	2250
9..	330	518	462	474	522	668	1150	738	2290
10..	285	428	329	395	416	444	1130	690	2110
11..	264	509	363	334	473	427	1110	872	2610
12..	240	456	295	665	1320	2370	1090	680	2000
13..	222	415	249	1470	4420	17500	1030	493	1370
14..	209	442	249	1420	2850	10900	928	525	1320
15..	206	429	239	1190	1620	5210	826	579	1290
16..	271	595	435	899	1040	2520	739	550	1100
17..	226	399	243	975	1050	2760	673	404	734
18..	185	320	160	1070	1220	3520	595	350	562
19..	194	332	174	937	940	2380	508	271	372
20..	197	403	214	918	898	2230	438	158	187
21..	285	1110	854	1120	1110	3360	395	156	166
22..	543	2060	3020	1270	1710	5860	356	135	130
23..	456	1250	1540	1240	1620	5420	334	124	112
24..	370	863	862	1370	2020	7470	278	116	87
25..	450	1060	1290	1340	--	6000	212	47	27
26..	420	801	908	1250	1330	4490	173	42	20
27..	348	510	479	1330	1990	7150	161	45	20
28..	297	394	316	1530	1930	7970	138	42	16
29..	268	425	308	1540	1540	6400	114	78	9
30..	250	958	647	1530	1400	5780	82	28	6
31..	--	--	--	1530	1460	6030	--	--	--
Total	9610	--	43643	31489	--	146361	23840	--	46768
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..	51	47	6	0	--	0	2.5	1700	A 11
2..	29	17	1	0	--	0	13	3900	A 137
3..	19	9	.5	16	15000	K 1700	16	3400	A 147
4..	13	17	.6	0	--	0	8.8	3800	A 90
5..	10	10	.3	0	--	0	12	17500	A 567
6..	6.0	--	.2	0	--	0	12	17000	A 551
7..	4.4	--	.2	0	--	0	7.7	12000	A 250
8..	2.9	--	.1	0	--	0	2.9	8100	A 63
9..	1.7	--	.1	0	--	0	6.6	5400	A 96
10..	1.4	--	.1	0	--	0	8.8	2630	A 62
11..	1.0	--	.1	0	--	0	7.7	880	A 18
12..	1.1	--	.1	0	--	0	6.0	425	A 7
13..	1.0	--	.1	0	--	0	5.5	575	A 9
14..	1.4	--	.1	44	24100	S 7100	6.0	13500	A 219
15..	1.4	--	.1	.4	500	1	4.8	21300	A 276
16..	.4	--	T	28	20200	S 2730	3.6	17700	A 172
17..	.3	--	T	19	7500	A 385	4.0	8200	A 89
18..	.2	--	T	5.5	2300	A 34	4.4	3300	A 39
19..	.1	--	T	1.2	1100	A 4	8.2	1400	A 31
20..	0	--	0	.2	500	A .3	10	1100	A 30
21..	0	--	0	62	26000	J 150000	46	1920	S 645
22..	0	--	0	35	11900	S 3830	173	7800	S 3640
23..	0	--	0	5.1	11300	S 410	173	16100	S 10700
24..	0	--	0	13	21000	737	271	22900	16800
25..	0	--	0	5.1	17000	234	197	10700	5690
26..	0	--	0	26	22900	S 1740	158	4700	2010
27..	0	--	0	8.8	1500	36	140	3000	1130
28..	0	--	0	2.5	230	A 2	128	2400	829
29..	0	--	0	1.4	80	A .3	132	2800	998
30..	0	--	0	21	17500	S 5780	142	2700	1040
31..	0	--	0	3.6	1800	A 17	--	--	--
Total	145.3	--	9.7	297.8	--	39740.6	1710.5	--	46346
Total discharge for year (cfs-days).....									62066.5
Total load for year (tons).....									438142.3

S Computed by subdividing day.

T Less than 0.05 ton.

A Computed from partly estimated concentration graph.

J Computed from partly estimated concentration graph and subdividing day.

K Computed from estimated-concentration graph and subdividing day.

GREEN RIVER BASIN--Continued

9-2599.5. LITTLE SNAKE RIVER ABOVE LILLY, COLO.--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961
 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
 P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (°F)	Sam- pling ature point	Discharge (cfs)	Sediment concentra- tion (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Oct. 11, 1960.....	1430	49		332	41700		80		97		98	98	99	100	--		VPNC	
Oct. 12.....	2130	47		203	31600		86		98		100	--	--	--	--		VPNC	
Oct. 14.....	0035	47		103	15800		95		100		--	--	--	--	--		PNC	
Oct. 15.....	2200	46		86	9270		97		99		100	--	--	--	--		VPNC	
Mar. 15, 1961.....	1740	37		282	685		49		77		92	94	97	100	--		VPNC	
Mar. 15.....	1740	37		282	685						92	94	96	99	100		SPN	
Mar. 26.....	2100	39		505	2840		47		67		88	90	97	100	--		VPNC	
Apr. 13.....	2000	49		218	407		64		79		94	92	100	--	--		VPNC	
Apr. 27.....	2145	57		313	564		51		65		76	78	89	95	100		VPNC	
May 12.....	1815	62		689	1420		30		47		70	79	92	100	--		VPNC	
May 12.....	1815	62		689	1420		--		--		70	78	90	99	100		S	
May 28.....	2230	62		1670	1780		20		29		61	79	92	99	100		VPNC	
May 28.....	2230	62		1670	1780		13		24		33	44	55	78	96	100	VPN	
June 21.....	1500	68		385	189		25	26	30		61	79	92	98	100		VPNC	
Aug. 16.....	1400	83		51	42300		20		99		100	--	--	--	--		VPNC	
Aug. 16.....	1400	83		51	42300				99		100	--	--	--	--		VPN	
Aug. 17.....	0100	67		28	17200		88		99		100	--	--	--	--		VPNC	
Aug. 17.....	1830	75		13	3000		91		100		--	--	--	--	--		PNC	
Aug. 22.....	0100	70		164	66000		64		95		100	--	--	--	--		PNC	
Aug. 22.....	2400	80		10	990		58		84		100	--	--	--	--		PNC	
Aug. 23.....	1600	59		9.9	25900		82		96		100	--	--	--	--		VPNC	
Aug. 25.....	0330	59		5.5	17000		92		100		--	--	--	--	--		PNC	
Aug. 26.....	1430	62		47	32000		79		98		100	--	--	--	--		VPNC	
Aug. 30.....	1600	68		21	4410		90		100		--	--	--	--	--		PNC	
Sept. 2.....	2330	49		37	5790		78		98		100	--	--	--	--		PNC	
Sept. 3.....	1900	59		10	1720		77		97		100	--	--	--	--		PNC	
Sept. 21.....	2200	45		236	7360		66		95		100	--	--	--	--		PNC	
Sept. 22.....	2230	42		92	5680		75		91		99	100	--	--	--		VPNC	
Sept. 23.....	1900	45		375	32400		73		90		96	98	99	100	--		VPNC	
Sept. 23.....	1900	45		375	32400		--		--		96	97	99	100	--		S	
Sept. 24.....	2100	54		236	17200		88		95		99	99	100	--	--		VPNC	
Sept. 26.....	2100	68		148	3370		77		92		97	99	100	--	--		VPNC	

GREEN RIVER BASIN--Continued

9-2810. GREEN RIVER NEAR JENSEN, UTAH

LOCATION.--At gaging station, 1 mile downstream from Cub Creek and Chew Ranch, 4 miles southeast of Dinosaur National Monument headquarters, 6.5 miles northeast of Jensen, Uintah County, and 12 miles upstream from Brush Creek.

DRAINAGE AREA.--25,400 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: June 1947 to September 1952.

Water temperatures: March 1949 to September 1959.

Sediment records: May 1949 to September 1961.

EXTREMES, 1960-61.--Sediment concentrations: Maximum daily, 25,300 ppm Aug. 31; minimum daily, 20 ppm Feb. 8.

Sediment loads: Maximum daily, 84,000 tons Aug. 31; minimum daily, 37 tons Feb. 8.

EXTREMES, 1948-61.--Sediment concentrations: Maximum daily, 39,800 ppm Aug. 23, 1960; minimum daily, 9 ppm Oct. 7-11, 1953.

Sediment loads: Maximum daily, 567,000 tons Apr. 9, 1952; minimum daily, 19 tons Oct. 7-11, 1953.

REMARKS.--Flow affected by ice Dec. 2-5, Dec. 8 to Feb. 7.

Suspended sediment, water year October 1960 to September 1961

Day	Mean discharge (cfs)	OCTOBER		NOVEMBER			DECEMBER		
		Suspended sediment		Suspended sediment			Suspended sediment		
		Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1..	693	69	A 130	1080	86	A 250	985	102	270
2..	681	82	A 150	1100	84	A 250	880	82	195
3..	669	89	A 160	1070	80	A 230	860	82	A 190
4..	669	55	99	1080	82	A 240	840	84	A 190
5..	669	55	A 99	1070	80	A 230	730	91	A 180
6..	669	55	A 99	1120	89	A 270	588	101	A 160
7..	675	54	A 98	1220	112	A 370	384	127	132
8..	681	52	96	1300	134	A 470	380	127	A 130
9..	748	94	A 190	1370	153	566	430	71	82
10..	814	155	A 340	1420	170	A 650	500	57	A 77
11..	1120	926	2800	1370	130	480	C 650	40	A 70
12..	961	424	A 1100	1320	126	A 450	C 650	40	A 70
13..	1080	857	A 2500	1400	148	A 560	C 650	40	A 70
14..	1290	1440	5000	1450	230	900	C 650	40	70
15..	1460	2080	A 8200	1360	68	A 250	C 650	80	A 140
16..	1400	1800	A 6800	1430	155	600	C 650	119	209
17..	1340	1600	A 5800	1510	147	A 600	C 650	120	A 210
18..	1290	1440	A 5000	1400	124	470	700	127	A 240
19..	1240	795	2660	1360	117	A 430	750	138	A 280
20..	1210	551	A 1800	1370	124	A 460	C 800	148	A 320
21..	1190	389	1250	1430	132	A 510	C 800	147	318
22..	1170	206	A 650	1310	107	A 380	C 800	100	216
23..	1180	314	A 1000	1280	104	360	850	44	101
24..	1170	206	A 650	1320	109	A 390	C 900	62	A 150
25..	1170	206	A 650	1320	109	A 390	C 900	62	A 150
26..	1160	145	454	1290	103	A 360	C 900	62	A 150
27..	1160	144	A 450	1370	124	A 460	C 900	62	A 150
28..	1130	85	259	1390	123	A 460	C 900	62	151
29..	1130	85	A 260	1380	123	A 460	C 900	74	A 180
30..	1120	86	A 260	1180	94	300	C 900	89	216
31..	1190	84	A 270	--	--	--	850	70	A 160
Total	32129	--	49274	39070	--	12796	22977	--	5227

A Computed from partly estimated concentration graph.

C Composite period.

GREEN RIVER BASIN--Continued

9-2610. GREEN RIVER NEAR JENSEN, UTAH--Continued

Suspended sediment, water year October 1960 to September 1961--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..	800	56	A 120	C 700	33	62	1120	66	A 200
2..	760	43	A 88	C 700	29	A 55	1110	67	A 200
3..	720	34	A 66	C 700	25	A 47	1130	66	A 200
4..	690	29	A 54	C 700	22	A 42	1050	46	A 130
5..	670	44	A 80	C 700	25	A 47	1040	43	A 120
6..	650	69	A 121	C 700	29	A 55	1080	58	A 170
7..	680	76	A 140	C 700	33	62	1020	41	A 113
8..	720	82	A 160	693	20	37	1000	36	A 97
9..	770	87	A 180	711	31	A 60	1060	49	A 140
10..	C 800	93	A 200	723	42	82	1110	57	A 170
11..	C 800	95	A 205	761	47	A 97	1110	57	A 170
12..	C 800	120	A 260	794	47	A 100	1150	61	A 190
13..	C 800	142	A 307	794	47	A 100	1170	63	A 200
14..	C 800	125	A 270	814	50	110	1240	84	A 280
15..	C 800	111	A 240	878	59	A 140	1360	150	A 550
16..	C 800	93	A 200	915	65	A 160	1480	350	A 1400
17..	C 800	79	A 171	993	75	200	1530	387	A 1600
18..	C 800	84	A 181	1010	62	A 170	1720	452	A 2100
19..	C 800	79	A 170	953	54	A 140	2130	1080	A 6200
20..	C 800	71	A 153	993	60	A 160	2900	3700	A 29000
21..	C 800	69	A 150	1040	64	A 180	2800	3170	A 24000
22..	C 700	63	A 120	1080	72	A 210	2640	2100	A 15000
23..	C 700	53	A 100	1030	65	A 180	2470	2400	A 16000
24..	C 700	42	A 79	930	60	A 150	2380	2650	A 17000
25..	C 700	32	A 60	1060	70	A 200	2540	2190	A 15000
26..	C 700	37	A 70	1140	65	A 200	2920	2030	A 16000
27..	C 700	43	A 81	977	76	A 200	3440	2150	A 20000
28..	C 700	41	A 77	930	76	A 190	3520	2530	A 24000
29..	C 700	39	A 74	--	--	--	3240	1830	A 16000
30..	C 700	37	A 70	--	--	--	2900	1530	A 12000
31..	C 700	35	A 66	--	--	--	2490	1250	A 8400
Total	23060	--	4313	24119	--	3436	57850	--	226630
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..	2420	1190	A 7800	2200	168	1000	12000	2190	A 71000
2..	2280	1120	A 6900	2510	236	A 1600	11700	2150	A 68000
3..	2320	990	A 6200	3290	473	A 4200	11600	2140	A 67000
4..	2630	1970	A 14000	4020	820	A 8900	11700	2150	A 68000
5..	2890	3200	A 25000	4850	1300	A 17000	11100	1700	A 51000
6..	3240	2860	A 25000	4810	1310	A 17000	10300	1980	A 55000
7..	4000	2310	A 25000	4670	1190	A 15000	10100	1620	A 44200
8..	3930	2170	A 23000	4190	972	A 11000	9870	1050	A 28000
9..	3550	1880	A 18000	3580	641	A 6200	9900	1100	A 29400
10..	3200	1720	A 14900	3170	467	A 4000	9870	1160	A 31000
11..	2750	1310	A 9700	2930	354	A 2800	9760	1400	A 37000
12..	2490	1100	A 7400	3130	461	A 3900	9680	1490	A 39000
13..	2360	628	A 4000	4920	1050	A 14000	9450	1060	A 27000
14..	2300	514	A 3190	7050	2210	A 42000	9370	909	A 23000
15..	2270	424	A 2600	7080	2250	A 43000	9120	690	A 17000
16..	2270	424	A 2600	5630	1450	A 22000	8650	599	A 14000
17..	2210	281	A 1680	5290	1240	A 17700	7890	516	A 11000
18..	2180	289	A 1700	5420	1370	A 20000	7520	542	A 11000
19..	2150	281	A 1630	5190	1180	A 16500	7000	466	A 8800
20..	2100	282	A 1600	4910	1130	A 15000	6450	293	A 5100
21..	2260	279	A 1700	5310	1260	A 18000	5860	475	A 7520
22..	3070	796	A 6600	4520	1530	A 27000	5600	490	A 6800
23..	3440	1180	A 11000	7160	1450	A 28000	5470	433	A 6400
24..	3080	806	A 6700	7630	1360	A 28000	5060	359	A 4900
25..	2970	723	A 5800	8050	1610	A 35000	4650	279	A 3500
26..	3010	406	A 3300	7860	1600	A 34000	4230	210	A 2400
27..	2790	372	A 2800	7780	1570	A 33000	3960	168	A 1800
28..	2510	310	A 2100	8700	1700	A 40000	3680	171	A 1700
29..	2340	222	A 1400	9450	1760	A 45000	3360	176	A 1600
30..	2280	211	A 1300	10300	1940	A 54000	3070	169	A 1400
31..	--	--	--	10900	2040	A 60000	--	--	--
Total	81290	--	244600	178500	--	684800	237970	--	743520

A Computed from partly estimated concentration graph.

C Composite period.

GREEN RIVER BASIN--Continued

9-2610, GREEN RIVER NEAR JENSEN, UTAH--Continued

Suspended sediment, water year October 1960 to September 1961--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..	2900	128	A 1000	1020	123	A 340	1100	14100	41900
2..	2680	105	A 760	1060	108	310	1070	3810	A 11000
3..	2560	93	640	1010	660	A 1800	1040	3350	A 9400
4..	2430	81	A 530	985	1390	3700	1060	2720	7780
5..	2320	73	457	1000	1520	A 4100	1050	1060	3000
6..	2200	69	A 410	985	1390	A 3700	1040	712	2000
7..	2050	64	354	930	1040	2600	1100	943	A 2800
8..	1930	61	A 320	900	576	A 1400	1160	1250	3900
9..	1820	59	A 290	892	498	1200	1400	2010	7600
10..	1720	57	265	892	498	A 1200	1430	2540	A 9800
11..	1640	54	A 240	849	279	640	1480	3500	14000
12..	1580	54	230	814	173	A 380	1430	2540	A 9800
13..	1520	49	A 200	870	230	A 540	1380	1340	5000
14..	1490	44	177	1160	734	2300	1310	1360	A 4800
15..	1450	46	A 180	1020	1710	A 4700	1220	1310	4300
16..	1380	48	A 180	1030	1780	4950	1200	1300	A 4200
17..	1300	51	179	1020	1710	A 4700	1160	1280	A 4000
18..	1240	134	A 450	985	1470	3900	1230	2020	6700
19..	1180	381	1210	1020	1710	A 4700	1220	2000	A 6600
20..	1130	386	1180	961	1040	A 2700	1350	357	1300
21..	1080	168	490	930	259	650	1650	831	A 3700
22..	1030	108	A 300	900	453	A 1100	2210	3020	18000
23..	990	71	A 190	870	979	2300	2310	3050	A 19000
24..	960	54	140	870	979	A 2300	2310	3050	A 19000
25..	940	43	A 110	835	843	1900	2660	2780	20000
26..	950	49	126	1250	7410	A 25000	2580	2830	19700
27..	1060	66	A 190	1280	8680	A 30000	2470	2850	19000
28..	1010	40	109	1190	5550	17800	2340	1420	A 9000
29..	1000	44	A 120	1160	3510	A 11000	2250	905	5500
30..	953	183	A 470	1130	2100	6400	2310	1060	A 6600
31..	969	214	560	1230	25300	A 84000	--	--	--
Total	47462	--	12057	31048	--	232310	47520	--	299380

Total discharge for year (cfs-days)..... 622995

Total load for year (tons)..... 2518343

A Computed from partly estimated concentration graph.

GREEN RIVER BASIN--Continued

9-2610. GREEN RIVER NEAR JENSEN, UTAH--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Samp- ling ature point (°F)	Water tem- per- ature (°F)	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Oct. 11, 1960.....	1115		55	1070	799		--	53	--	84	--	97	99	100	--	--	--	SPWC
Oct. 28.....	1430		50	1130	85		58	68	78	88	93	97	98	100	--	--	--	SBWC
Nov. 11.....	1045		38	1390	120		41	52	60	71	79	91	95	99	100	--	--	SBWC
Nov. 30.....	1415		36	1260	73		--	--	--	--	--	94	98	100	--	--	--	S
Mar. 23, 1961.....	1230		44	2380	2670		--	79	--	94	--	98	98	99	100	--	--	VPWC
Mar. 31.....	1400		45	2380	1200		--	73	--	90	--	96	97	98	100	--	--	VPWC
Mar. 31.....	1400		45	2380	1200		--	6	--	91	--	96	97	98	99	100	--	SPN
Apr. 5.....	1030		48	2900	3270		--	72	--	91	--	97	99	99	100	--	--	VPWC
Apr. 14.....	1100	d	48	2300	495		--	73	--	89	--	94	97	98	100	--	--	VPWC
Apr. 28.....	1500		57	2460	291		--	56	--	75	--	87	92	98	99	100	--	VPWC
May 15.....	1015		55	7210	2210		--	30	--	46	--	67	81	98	100	--	--	VPWC
May 15.....	1015		55	7210	2210		--	--	--	--	--	67	78	96	99	100	--	S
May 31.....	1000		61	10700	2100		--	16	--	26	--	43	54	81	100	--	--	VPN
May 31.....	1000		61	10700	2100		--	10	--	23	--	30	38	58	85	100	--	VPWC
June 14.....	1300		67	9200	822		--	11	--	17	--	30	38	58	85	100	--	VPWC
June 20.....	1700		75	6380	229		19	26	31	41	52	67	80	94	100	--	--	VWC
June 30.....	0730		69	3130	146		--	22	--	38	--	62	68	76	87	100	--	VPWC
June 30.....	0730		69	3130	146		--	--	--	--	--	62	68	75	87	100	--	S
July 14.....	0930	d	73	1490	42		41	52	60	71	81	86	88	92	99	100	--	VPWC
July 31.....	0900		74	938	159		--	87	--	95	--	98	98	99	100	--	--	SPWC
Aug. 14.....	1000		72	1210	869		--	67	--	92	--	99	100	--	--	--	--	VPWC
Aug. 14.....	1000		72	1210	869		--	6	--	89	--	99	100	--	--	--	--	VPN
Aug. 28.....	1720		72	1280	5670		--	79	--	98	--	100	--	--	--	--	--	SPWC
Aug. 30.....	1015		70	1190	1190		--	62	--	94	--	100	--	--	--	--	--	SPWC
Sept. 9.....	1130		66	1380	1770		--	63	--	80	--	96	100	--	--	--	--	VPWC
Sept. 11.....	0900		61	1490	3480		--	71	--	94	--	99	100	--	--	--	--	VPWC
Sept. 15.....	0930		60	1230	977		--	79	--	95	--	99	100	--	--	--	--	VPWC
Sept. 22.....	1000		53	2290	3290		--	50	--	81	--	94	98	100	--	--	--	VPWC
Sept. 26.....	1100		51	2580	5590		--	78	--	96	--	99	100	--	--	--	--	VPWC
Sept. 29.....	0830		50	2270	1030		--	70	--	92	--	97	99	100	--	--	--	VPWC

d Daily mean discharge.

GREEN RIVER BASIN--Continued
9-3020. DUCHESNE RIVER NEAR RANDLETT, UTAH

LOCATION.--At gaging station, 0.2 mile downstream from Uinta River, 1.2 miles southeast of Randlett, Uintah County, and 6.5 miles southeast of Fort Duchesne. DRAINAGE AREA.--3,920 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1951, November 1956 to September 1961.
Water temperatures: December 1950 to September 1961.
EXTREMES, 1960-61.--Dissolved solids: Maximum, 3,330 ppm Aug. 1-6, 9-26, 29-30; minimum, 592 ppm Sept. 19-25.
Hardness: Maximum, 1,090 ppm May 1-21; minimum, 298 ppm Sept. 19-25.
Water temperatures: Maximum, 73°F July 18, 26, 28; minimum, freezing point Dec. 8, 12.
EXTRIMES, 1950-51, 1956-61.--Dissolved solids (1956-61): Maximum, 5,350 ppm Aug. 1-6, 9-26, 29-30, 1961; minimum, 236 ppm June 5-10, 1957.
Hardness (1956-61): Maximum, 1,090 ppm May 1-21, 1961; minimum, 150 ppm June 5-10, 1957.
Water temperatures: Maximum daily, 4,450 micromhos Aug. 24, 1960; minimum daily, 291 micromhos May 29, 1951.
Sediment: Maximum daily, 4,450 micromhos Aug. 24, 1960; minimum daily, 291 micromhos May 29, 1951.
Water temperature: Maximum, 74°F July 29, 30, 1960; minimum, freezing point on many days.
REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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)	Dissolved solids (calculated)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 1-10, 1960.....	59.0 17		0.01 162		103	521	3.4	322	0	1230	310	1.6	0.98	2510	3.41	400	830	566	7.9	3380
Oct. 11-31.....	94.9 16		.00 133		72	289	3.4	319	0	778	128	2.1	1.0	1580	2.15	405	626	364	5.0	2240
Nov. 1-14.....	120 16		-- 136		79	286	2.7	335	0	806	129	1.8	1.0	1620	2.20	525	666	391	4.8	2240
Nov. 15-30.....	273 14		-- 101		54	153	1.8	317	0	428	68	1.9	.59	978	1.33	721	472	212	3.1	1430
Dec. 1-15.....	266 13		-- 103		55	157	1.8	322	0	439	70	2.2	.55	1000	1.36	718	482	218	3.1	1470
Mar. 1-15, 1961.....	248 8.4		-- 102		45	137	2.2	295	0	409	62	1.3	.63	913	1.24	611	440	198	2.8	1340
Mar. 16-22.....	137 9.1		-- 114		62	193	2.1	310	0	558	84	1.2	.90	1180	1.60	436	540	286	3.6	1680
Mar. 23-31.....	43.7 8.5		-- 180		190	412	3.0	356	0	1170	225	1.1	1.3	2280	3.10	269	900	608	6.0	3060
Apr. 1-30.....	28.5 9.5		.01 200		122	509	4.3	385	0	1400	270	.5	1.5	2710	3.69	209	1000	684	7.0	3570
May 1-21.....	14.7 11		-- 226		128	669	3.9	341	0	1670	395	.3	1.6	3270	4.45	130	1090	810	8.8	4310
May 22-24.....	44.3 13		-- 171		112	462	4.4	355	0	1260	235	.5	1.7	2440	3.32	292	885	594	6.8	3240
May 25-28.....	97.2 14		-- 118		69	260	3.2	290	0	737	105	.4	1.1	1450	1.97	381	576	338	4.7	2030
May 29-31.....	214 15		-- 94		44	169	2.4	239	0	489	69	0.4	.84	1000	1.36	578	416	220	3.6	1450
June 1-3.....	91.0 15		-- 139		68	282	3.6	311	0	784	132	.7	1.2	1580	2.15	388	624	369	4.9	2200
June 4-26.....	50.9 14		-- 166		96	409	4.9	344	0	1100	222	.8	1.5	2180	2.96	300	810	528	6.3	3010
June 27-30.....	14.0 10		-- 178		119	494	4.7	324	0	1230	345	.3	.93	2540	3.45	86.0	935	669	7.0	3530
July 1-31.....	10.1 6.7		.08 228		114	599	5.5	315	0	1470	430	.8	1.0	3010	4.09	82.1	1040	782	8.1	4140
Aug. 1-6, 9-26.....	6.3 5.4		-- 162		147	709	4.7	261	0	1600	545	2.9	1.2	3330	4.53	56.6	1060	846	9.5	4620
Aug. 29-30.....	4.2 8.3		-- 156		117	527	5.0	276	0	1260	370	2.9	1.2	2580	3.51	29.3	870	644	7.8	3640
Aug. 7-8.....																				
Aug. 27.....	115 25		-- 103		46	149	5.3	390	0	344	69	3.3	1.7	938	1.28	291	444	124	3.1	1480
Aug. 28, 31.....	9.7 7.6		-- 140		95	384	5.1	296	0	936	278	1.7	.92	1990	2.71	52.1	740	497	6.1	2860

GREEN RIVER BASIN--Continued
9-3020. DUCESNE RIVER NEAR RANDELT, UTAH--Continued

Chemical analyses, in parts per million, water year October 1960 to September 1961--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Po- tas- sium (K)	Bi- car- bon- ate (HCO ₃)	Car- bon- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃) (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		So- dium ad- orp- tion ratio (25°C)	Specific con- duct- micro- mhos at 25°C)			
														Parts per million	Tons per acre- foot	Tons per day	Cal- cium, Mag- ne- sium	Non- car- bon- ate					
Sept. 1-3, 1961.....	28.3	16	--	166	107	469	5.2	356	0	1160	295	--	1.2	1.2	2400	3.26	183	855	583	7.0	3320	8.2	
Sept. 4-8, 1961.....	43.5	7.8	--	180	122	569	4.6	333	0	1340	378	--	1.4	1.0	2770	3.77	325	950	677	8.0	3790	7.9	
Sept. 10-12, 1961.....	272	14	--	93	37	157	5.0	246	0	423	61	--	3.3	.54	915	1.24	672	384	182	3.5	1350	8.0	
Sept. 13-18, 1961.....	95.7	15	--	156	78	333	4.7	349	0	905	162	--	1.6	1.1	1830	2.49	473	710	424	5.4	2520	7.9	
Sept. 19-25, 1961.....	517	15	--	70	30	83	2.8	224	0	246	33	--	1.3	.41	592	.81	826	298	114	2.1	904	7.8	
Sept. 26-30, 1961.....	288	12	--	83	37	110	2.3	248	0	320	46	--	1.2	.54	734	1.00	571	360	157	2.5	1120	8.1	
Weighted average	147	13	--	115	114	218	2.8	302	0	604	107	--	1.6	0.77	3190	4.34	860	569	289	3.8	4140	7.9	
Tons per day.....	--	3.5	--	31.0	31.0	59.0	0.7	81	0	163	29.0	--	0.4	0.21	--	--	--	--	--	--	--	--	--

a Mean discharge based on 385 days; mean discharge for 290 days of chemical analyses, 99.8 cfs.

	Temperature (°F) of water, water year October 1960 to September 1961																															Average		
	Day																																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
October.....	--	--	52	--	--	--	53	--	--	51	50	45	47	51	42	42	40	--	--	45	--	--	--	47	--	--	45	--	--	--	--	35	--	
November.....	--	42	--	--	--	--	46	--	--	37	--	--	39	--	--	--	33	--	--	--	34	--	--	--	34	--	--	33	--	--	--	--	--	
December.....	33	--	--	33	--	--	--	32	--	--	--	32	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
January.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
February.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
March.....	--	--	--	--	--	33	--	--	33	--	--	--	38	47	45	44	43	44	--	41	40	41	41	47	45	45	43	40	41	41	41	43	--	
April.....	48	49	50	52	44	45	44	40	44	43	41	45	48	44	41	43	48	54	53	43	50	51	42	44	44	46	46	50	50	54	--	--	47	
May.....	54	57	54	54	50	50	51	54	56	58	57	56	53	48	58	54	53	59	57	57	55	58	61	62	62	64	58	61	61	58	61	58	61	56
June.....	63	59	61	69	62	61	63	67	65	69	66	63	65	64	65	64	65	69	68	69	68	70	72	70	68	66	69	70	70	64	--	--	66	
July.....	67	64	70	71	68	71	70	69	66	66	67	67	67	67	67	66	68	67	73	70	71	67	68	67	70	66	73	71	73	72	72	72	69	
August.....	68	70	68	71	71	72	68	69	68	68	66	70	70	67	66	67	68	68	69	67	70	69	70	69	70	69	67	69	68	63	64	--	58	
September.....	63	58	58	52	56	57	59	60	63	54	56	58	56	55	56	60	60	60	55	50	50	48	48	46	46	47	49	51	54	44	--	--	54	

GREEN RIVER BASIN--Continued
9-3065. WHITE RIVER NEAR WATSON, UTAH

LOCATION.--At bridge on State Highway 45, 350 feet upstream from gaging station, about 1 mile downstream from Evacuation Creek, and 7 miles north of Watson, Uintah County.

DRAINAGE AREA.--4,020 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1961.

Water temperatures: December 1950 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 1,480 ppm Aug. 13; minimum, 182 ppm June 11-19.

Hardness: Maximum, 700 ppm Aug. 13; minimum, 182 ppm June 11-19.

Specific conductance: Maximum, 700 ppm Aug. 13; minimum, 182 ppm June 11-19.

Water temperatures: Maximum, 78° F July 18, 28; minimum, freezing point on many days during November to March.

EXTREMES, 1950-61.--Dissolved solids: Maximum, 1,440 ppm Aug. 20; minimum, 182 ppm June 11-19.

Hardness: Maximum, 1,440 ppm Aug. 20; minimum, 182 ppm June 11-19.

Specific conductance: Maximum, 1,440 ppm Aug. 20; minimum, 182 ppm June 11-19.

Water temperatures: Maximum, 78° F July 18, 28; minimum, freezing point on many days during winter months.

EXTREMES, 1950-61.--Dissolved solids: Maximum, 1,440 ppm Aug. 20; minimum, 182 ppm June 11-19.

Hardness: Maximum, 1,440 ppm Aug. 20; minimum, 182 ppm June 11-19.

Specific conductance: Maximum, 1,440 ppm Aug. 20; minimum, 182 ppm June 11-19.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 1-31, 1960....	345	15	0.01	71	23	88	2.1	208	0	168	80	0.2	0.5	0.09	548	0.74	509	269	100	2.3	877
Nov. 1-30.....	358	17	--	68	22	98	2.6	200	6	176	83	--	0.6	0.11	585	0.80	565	282	88	2.6	898
Dec. 1-31.....	307	18	--	72	26	100	2.2	220	0	202	89	--	0.8	0.10	623	0.85	516	288	108	2.6	971
Jan. 1-31, 1961....	323	13	0.01	61	24	100	2.2	240	0	190	90	--	1.1	0.12	641	0.87	534	302	101	2.5	984
Feb. 1-16.....	323	19	--	73	22	103	2.3	232	0	169	89	--	1.1	0.13	594	0.81	518	272	82	2.7	942
Feb. 16-28.....	375	14	--	74	21	94	2.2	224	0	173	80	--	1.1	0.06	583	0.79	500	272	88	2.5	924
Mar. 1-31.....	371	18	--	72	22	96	2.2	222	0	185	85	--	1.4	0.06	603	0.82	604	276	94	2.5	945
Apr. 1-30.....	368	15	0.00	76	24	97	2.1	227	0	198	80	--	1.6	0.07	624	0.85	620	288	102	2.5	963
May 1-3.....	516	16	--	69	18	69	1.7	186	0	150	64	--	1.0	0.07	500	0.68	697	244	91	1.9	768
May 4-12.....	690	20	--	61	15	50	1.8	177	0	111	44	--	1.5	0.07	408	0.55	760	215	70	1.5	637
May 13-20.....	983	19	--	52	13	35	1.4	185	0	84	26	--	1.8	0.06	324	0.44	860	182	47	1.1	507
May 21-26, 27-31..	1546	16	--	49	10	21	1.1	153	0	51	20	--	1.7	0.06	255	0.35	1060	164	39	0.7	408
May 26.....	1530	15	--	64	14	32	1.8	194	0	74	38	--	1.8	0.13	380	0.52	1570	216	57	0.9	550
June 1-10.....	1528	15	--	48	11	21	1.4	157	0	54	20	--	1.5	0.04	250	0.34	1030	166	37	0.7	405
June 11-19.....	1302	15	--	47	11	23	1.5	147	0	58	21	--	1.1	0.03	252	0.34	886	162	41	0.8	404
June 20-30.....	510	16	--	82	15	40	2.1	182	0	103	38	--	0.9	0.04	374	0.51	515	215	66	1.2	593
July 1-10.....	200	17	0.05	74	25	68	2.0	216	0	169	64	--	0.7	0.06	530	0.72	429	285	108	1.8	832
July 11-20.....	201	14	0.01	76	24	79	2.8	207	0	191	73	--	0.6	0.06	559	0.76	384	288	118	2.0	885
July 21-31.....	240	16	0.16	82	25	83	3.1	217	0	194	76	--	0.7	0.06	592	0.81	384	307	129	2.1	931
Aug. 1-12, 14-19, 21-31.....	298	15	--	86	34	89	4.6	241	0	222	80	--	1.4	0.10	658	0.89	529	352	154	2.1	1030

GREEN RIVER BASIN--Continued

9-3065. WHITE RIVER NEAR WATSON, UTAH--Continued

Chemical analyses, in parts per million, water year October 1960 to September 1961--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)	Borate (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhm-cm at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate				
Aug. 13, 1961.....	415	16	--	192	54	188	9.3	270	0	607	195	--	1.8	0.30	1480	2.01	1660	700	479	3.1	1980	7.4	
Aug. 20.....	242	17	--	79	30	179	3.9	364	0	249	106	--	2.0	.02	864	1.18	565	320	22	4.4	1310	7.7	
Sept. 1-8, 10-28.....	629	16	--	90	19	79	3.0	238	0	196	58	--	2.0	.09	582	.79	988	302	107	2.0	895	7.9	
Sept. 9.....	791	16	--	94	25	141	4.4	288	0	255	105	--	1.1	.26	792	1.08	1690	336	211	3.3	1200	7.6	
Sept. 30.....	728	13	--	108	29	132	4.3	202	8	286	142	--	6.0	.27	840	1.14	1650	390	211	2.9	1250	8.4	
Weighted average	--	16	--	68	19	69	2.2	201	0	146	60	--	1.2	0.08	490	0.67	631	250	84	1.8	765	7.9	
Time-weighted average.....	478	16	--	73	22	83	2.5	215	1	173	73	--	1.1	0.09	559	--	--	275	98	2.2	871	7.9	
Tons per day....	--	21.0	--	88.0	25.0	89.0	2.8	259	0	189	77.0	--	1.6	0.10	--	--	--	--	--	--	--	--	--

Temperature (°F) of water, water year October 1960 to September 1961

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

GREEN RIVER BASIN--Continued
9-3070. GREEN RIVER NEAR OURAY, UTAH

LOCATION.--At gaging station, 2.8 miles upstream from Willow Creek and 3 miles southwest of Ouray, Uintah County.
DRAINAGE AREA.--35,500 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: December 1952, November 1956 to September 1961.

Water temperatures: December 1950 to September 1952, November 1956 to September 1961.

Sediment records: December 1950 to September 1955, October 1956 to September 1961 (discontinued).

EXTREMES, 1960-61.--Dissolved solids: Maximum, 854 ppm Aug. 30-31; minimum, 212 ppm June 1-30.

Hardness: Maximum, 434 ppm Aug. 30-31; minimum, 125 ppm June 1-30.

Specific conductance: Maximum daily, 1,370 microhos Aug. 30; minimum daily, 268 microhos June 6.

Water temperatures: Maximum, 80°F July 9, 22; minimum, freezing point Dec. 13, 28.

Sediment concentrations: Maximum daily, 16,200 ppm Sept. 21; minimum daily, 74 ppm July 21.

Sediment loads: Maximum daily, 140,000 tons Sept. 9, 23; minimum daily, 238 tons Jan. 25.

EXTREMES, 1958-61.--Dissolved solids (1958-61): Maximum, 854 ppm Aug. 30-31, 1961; minimum, 212 ppm June 1-30, 1961.

Hardness (1958-61): Maximum, 434 ppm Aug. 30-31, 1961; minimum, 125 ppm June 1-30, 1961.

Specific conductance (1958-61): Maximum daily, 1,370 microhos Aug. 30, 1961; minimum daily, 268 microhos June 6, 1961.

Water temperatures: Maximum, 87°F Aug. 14, 1961; minimum, freezing point on several days during September and December 1959, December 1960.

Sediment concentrations: Maximum, 67,000 ppm Aug. 23, 1959; minimum daily, 5 ppm Jan. 2, 1959.

Sediment loads: Maximum daily, 100,000 tons Aug. 31, 1957; minimum daily, 100 tons Oct. 31, 1959, to Jan. 7, 1959.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Flow affected by ice Dec. 8 to Feb. 20.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 1-9, 14	1513	13	0.00	62	24	94	2.2	178	7	221	49	0.4	0.9	0.13	561	0.76	2290	253	96	2.6	850	8.5
Oct. 16-31, 1960	1560	14	0.00	84	27	120	3.4	165	8	325	63	0.3	2.5	.24	733	1.00	3090	320	172	2.9	1060	8.6
Nov. 1-30	1899	13	0.00	62	27	80	2.3	192	5	215	42	0.3	3.0	.17	552	.75	2740	267	101	2.1	835	8.5
Dec. 1-31	1233	12	0.01	69	33	93	2.5	218	2	259	50	0.4	9.7	.30	649	.88	2160	308	126	2.3	956	8.3
Jan. 1-31, 1961	1235	12	0.00	64	30	80	2.4	199	6	219	46	0.3	1.0	.15	570	.78	1900	282	109	2.1	866	8.4
Feb. 1-28	1682	9.1	.01	68	26	75	2.4	215	0	205	44	0.4	9.9	.13	541	.74	2460	278	102	1.9	840	8.2
Mar. 1-31	2451	10	.02	65	28	81	2.5	194	5	224	44	0.3	1.1	.23	570	.78	3770	278	111	2.1	862	8.3
Apr. 1-30	3099	12	.02	61	22	66	3.5	189	0	186	52	0.3	1.1	.24	496	.67	4150	244	89	1.8	751	8.0
May 1-5	2886	14	.00	57	18	51	2.5	186	0	166	39	0.5	2.0	.08	410	.56	3190	217	64	1.5	630	8.1
May 6-31	6951	15	.08	42	11	29	2.0	143	0	74	16	0.5	2.4	.06	265	.36	4670	151	34	1.0	412	7.9
June 1-30	9663	13	.02	36	8.3	21	1.5	124	0	54	10	0.4	1.6	.06	212	.29	5530	125	23	.8	334	7.8
July 1-11	2657	10	.01	46	14	35	2.1	158	0	88	22	0.2	8.8	.08	294	.40	2110	172	42	1.2	471	7.7
July 12-31	1355	9.3	.01	57	17	55	2.4	181	0	131	35	0.2	.7	.10	390	.53	1430	209	61	1.6	618	7.8

GREEN RIVER BASIN--Continued
9-3070. GREEN RIVER NEAR OURAY, UTAH--Continued

Chemical analyses, in parts per million, water year October 1960 to September 1961--Continued

Chemical analyses, in parts per million, water year October 1960 to September 1961—continued																							
Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbocationate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio (micro-mhos at 25°C)	Specific conductance (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate				
Aug. 1-3, 1961.....	1190	15	--	76	28	92	4.3	240	0	240	48	0.5	4.3	0.19	620	0.84	1990	304	107	2.3	939	8.0	
Aug. 4-14.....	1153	13	--	71	22	72	4.3	217	0	189	42	.4	2.7	.15	524	.71	1630	269	91	1.9	812	7.9	
Aug. 15.....	1060	12	--	108	35	87	5.0	244	0	323	55	.6	2.5	.17	748	1.02	2140	414	214	1.9	1090	8.1	
Aug. 16-29.....	1154	12	--	67	21	73	4.0	174	9	200	42	.4	3.5	.14	520	.71	1620	255	98	2.0	802	8.4	
Aug. 30-31.....	1695	15	--	128	28	104	6.4	236	0	403	43	.8	2.6	.18	854	1.16	3910	434	240	2.2	1180	7.9	
Sept. 1-14.....	2121	14	--	99	24	90	5.0	220	0	298	45	.5	4.1	.15	706	.96	4040	345	165	2.1	1020	8.0	
Sept. 15-20.....	2367	14	--	67	20	71	3.8	190	0	189	39	.5	3.9	.16	508	.69	3250	249	93	2.0	775	8.0	
Sept. 21.....	2750	18	--	124	27	85	5.1	218	0	339	64	--	1.0	.12	788	1.07	5850	420	241	1.8	1130	7.9	
Sept. 22-30.....	3661	16	--	65	19	76	3.8	207	0	196	32	.6	2.8	.15	512	.70	5060	240	70	2.1	783	7.7	
Weighted average	--	13	0.03	54	18	53	2.4	167	1	142	28	0.4	1.6	0.13	401	0.55	3120	206	68	1.5	613	8.0	
Time-weighted average.....	2885	12	0.02	62	23	69	2.7	187	2	189	38	0.4	1.5	0.16	500	--	--	248	91	1.9	758	8.1	
Tons per day....	--	100	0.21	417	137	409	19.0	1300	8	1110	217	3.0	13.0	0.99	--	--	--	--	--	--	--	--	--

a Calculated from determined constituents.

GREEN RIVER BASIN--Continued

9-3070. GREEN RIVER NEAR OURAY, UTAH--Continued

Temperature (°F) of water, water year October 1960 to September 1961

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

GREEN RIVER BASIN--Continued

9-3070. GREEN RIVER NEAR OURAY, UTAH--Continued

Suspended sediment, water year October 1960 to September 1961

/Where no concentrations are reported, loads are estimated/

Day	OCTOBER				NOVEMBER				DECEMBER			
	Mean discharge (cfs)	Suspended sediment		Tons per day	Mean discharge (cfs)	Suspended sediment		Tons per day	Mean discharge (cfs)	Suspended sediment		Tons per day
		Mean concentration (ppm)				Mean concentration (ppm)				Mean concentration (ppm)		
1..	1070	249	A	720	1610	276	A	1100	1850	260	A	1300
2..	1070	249	A	720	1580	281	A	1100	1670	266		1200
3..	1050	212		600	1590	253		1090	1690	263	A	1200
4..	1030	201	A	560	1610	253	A	1100	1660	268	A	1200
5..	1030	200		556	1580	234	A	1000	1640	248	A	1100
6..	1030	201	A	560	1570	212	A	900	1540	265	A	1100
7..	1020	174		479	1590	196		841	861	250		581
8..	1030	201	A	560	1660	221	A	990	750	257	A	520
9..	1130	393	A	1200	1760	253	A	1200	650	264		463
10..	1440	2470		9600	1880	296		1500	500	304	A	410
11..	1470	1390		5500	1920	309	A	1600	700	254	A	480
12..	1500	1480		6000	1900	312	A	1600	780	237	A	500
13..	1710	1300		6000	1850	300	A	1500	900	218		530
14..	1610	644		2800	1840	302	A	1500	1100	182	A	540
15..	1680	3090		14000	2000	278	A	1500	1050	190	A	540
16..	1870	6930	A	35000	2000	278		1500	C 1000	196	A	530
17..	2060	14000	A	78000	1940	286	A	1500	C 1000	197		532
18..	2000	11500	A	62000	2030	292	A	1600	C 1000	196	A	530
19..	1910	3300		17000	2070	304		1700	C 1000	196	A	530
20..	1870	1700		8600	1980	299	A	1600	1080	202	A	590
21..	1800	864		4200	1960	302	A	1600	1150	206		640
22..	1770	649		3100	1970	301	A	1600	1270	198	A	680
23..	1730	432	A	2000	1970	301		1600	1390	192	A	720
24..	1720	409		1900	1910	291	A	1500	C 1500	185		749
25..	1720	409		1900	1890	274	A	1400	C 1500	170	A	690
26..	1680	309	A	1400	1880	276	A	1400	C 1500	156	A	630
27..	1660	290		1300	1890	274	A	1400	C 1500	141	A	570
28..	1640	248	A	1100	1890	274	A	1400	C 1500	138		559
29..	1630	227	A	1000	1930	249	A	1300	C 1500	128	A	520
30..	1600	199	A	860	1920	251		1300	C 1500	131	A	530
31..	1620	219		960	--	--		--	C 1500	133		530
Total	47150	--		270175	55170	--		40921	38231	--		21203
Day	JANUARY				FEBRUARY				MARCH			
	Mean discharge (cfs)	Suspended sediment		Tons per day	Mean discharge (cfs)	Suspended sediment		Tons per day	Mean discharge (cfs)	Suspended sediment		Tons per day
		Mean concentration (ppm)				Mean concentration (ppm)				Mean concentration (ppm)		
1..	1440	129	A	500	C 1350	89		324	1800	247		1203
2..	1370	124	A	460	C 1350	93	A	340	1870	353		1781
3..	1300	120	A	420	C 1350	96	A	350	2000	315		1703
4..	1240	116		388	C 1350	101		368	1990	290		1560
5..	1160	115	A	360	C 1350	99	A	360	1960	--		1660
6..	1100	114	A	340	C 1350	96	A	350	1890	342		1750
7..	1030	112		311	C 1350	96	A	350	1870	304		1537
8..	960	108	A	280	C 1350	95		346	1850	300		1507
9..	1000	111	A	300	C 1350	110	A	400	1770	265		1277
10..	1050	113	A	320	1400	122	A	460	1770	304		1450
11..	1140	113		348	1500	136		551	1810	301		1470
12..	1200	111	A	360	1580	178	A	760	1870	--		1900
13..	1270	96	A	380	1650	213	A	950	1900	452		2320
14..	C 1300	110		386	1720	258	A	1200	1900	348		1790
15..	C 1300	103	A	360	1800	320		1560	1890	362		1850
16..	C 1300	97	A	340	1900	351	A	1880	1960	407		2150
17..	C 1300	91	A	320	C 1950	380	A	2000	2120	598		3420
18..	C 1300	83		293	C 1950	384		2020	2230	871		5240
19..	C 1300	94	A	330	C 1950	380	A	2000	2210	--		5200
20..	C 1300	105	A	370	C 1950	380	A	2000	2290	--		5300
21..	C 1300	117		411	1960	397	A	2100	2790	1300		9750
22..	C 1300	117	A	410	1990	428		2300	3440	1410		13100
23..	C 1300	117	A	410	2020	361		1970	3390	1980		18100
24..	1160	105	A	330	1980	300		1600	3100	2440		20400
25..	1000	88		238	1930	269	A	1400	2900	--		19000
26..	1150	87	A	270	1940	267	A	1400	2880	--		17000
27..	1300	88	A	310	1910	271		1400	3120	1790		15100
28..	C 1350	87		317	1880	256		1300	3720	--		19000
29..	C 1350	88	A	320	--	--		--	4080	2000		22000
30..	C 1350	88	A	320	--	--		--	3950	1640		17500
31..	C 1350	88	A	320	--	--		--	3660	1520		15000
Total	38270	--		10822	47110	--		31959	75980	--		232030

A Computed from partly estimated concentration graph.

C Composite period.

GREEN RIVER BASIN--Continued

9-3070. GREEN RIVER NEAR OURAY, UTAH--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
/Where no concentrations are reported, loads are estimated/

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..	3250	1650	14500	2480	414	2770	13200	1580	56300
2..	2950	--	11000	2410	364	2370	14600	1870	73700
3..	2840	1160	8890	2520	--	3900	14400	1820	70800
4..	2720	1370	10100	3080	654	5440	14000	--	62000
5..	2800	1060	8010	3940	1320	14000	14000	1400	52900
6..	3070	1230	10200	4860	1630	21400	13100	1580	55900
7..	3370	2410	21900	5360	--	26000	12000	1360	44100
8..	3920	2670	28300	5130	1320	18300	11700	1190	37600
9..	4310	1960	22800	4840	887	11600	11400	1170	36000
10..	4190	1790	20300	4290	744	8620	11700	901	28500
11..	3970	1830	19600	3750	634	6420	11800	972	31000
12..	3530	1450	13800	3470	521	4880	12000	988	A 32000
13..	3180	5290	45400	3770	1030	10500	11800	973	A 31000
14..	2910	1250	9820	4760	1470	18900	11600	926	A 29000
15..	2790	975	7340	7250	2150	42100	11300	918	A 28000
16..	2610	746	5260	7950	2420	51900	10900	849	A 25000
17..	2590	666	4660	6870	1430	26500	10100	770	A 21000
18..	2680	555	4020	6260	1080	11700	9090	652	A 16000
19..	2500	541	3650	6310	1020	17400	8470	612	A 14000
20..	2300	465	2890	6170	880	14700	7860	518	A 11000
21..	2270	460	2820	6060	--	13000	7300	478	A 9500
22..	2480	--	5500	6460	1040	18100	6620	425	A 7600
23..	2970	--	8100	7620	1080	22200	6290	392	6660
24..	3660	1090	10800	8710	1340	31500	6120	319	5270
25..	3720	765	7680	9320	1440	36200	5690	--	5500
26..	3360	746	6770	9850	1430	38000	5320	404	5800
27..	3280	600	5310	9510	1570	40300	4920	249	3310
28..	3180	456	3920	9060	--	27000	4520	249	3040
29..	2930	410	3240	10100	1200	32700	4220	233	2650
30..	2650	400	2860	11100	1420	42600	3880	239	2500
31..	--	--	--	11900	1700	54600	--	--	--
Total	92980	--	329440	195160	--	681600	289900	--	807630
	JULY			AUGUST			SEPTEMBER		
1..	3570	174	1680	1130	3450	10500	1800	14300	69500
2..	3310	186	1660	1180	2100	6690	1650	4500	20000
3..	3100	172	1440	1260	5500	18700	1500	3510	14200
4..	2930	163	1290	1380	7000	26100	1400	5830	22000
5..	2770	206	1540	1300	6400	22500	1300	3810	13400
6..	2600	250	1760	1200	6350	20600	1250	3210	10800
7..	2430	181	1190	1190	2900	9320	1300	2460	8630
8..	2280	138	850	1150	1660	5150	2200	1600	9500
9..	2180	134	789	1100	1610	4780	3500	--	140000
10..	2080	123	691	1060	1070	3060	3300	--	130000
11..	1980	111	593	1050	586	1660	3100	13800	116000
12..	1870	98	495	1060	529	1510	2900	6640	52000
13..	1780	98	471	1060	402	1150	2400	3050	19800
14..	1690	93	424	1130	2800	8540	2100	2240	12700
15..	1670	90	406	1060	6400	18300	1900	1400	7180
16..	1600	--	360	1260	2600	8850	1900	1160	5950
17..	1540	78	324	1210	1920	6270	2000	1020	5510
18..	1540	78	324	1170	2500	7900	3000	8420	68200
19..	1450	80	313	1140	1510	4650	2800	9500	71800
20..	1340	79	286	1130	1340	4090	2600	6770	47500
21..	1260	74	252	1150	1140	3540	2750	16200	120000
22..	1200	85	275	1150	889	2760	3200	16100	139000
23..	1170	--	360	1120	820	2480	4300	12100	140000
24..	1160	139	435	1060	539	1540	4150	--	110000
25..	1120	108	327	930	753	1890	3800	7050	72300
26..	1080	145	423	986	1200	3190	3720	5380	54000
27..	1060	112	321	1100	4300	12800	3700	4250	42500
28..	1110	86	258	1280	2500	8640	3530	4030	38400
29..	1180	161	513	1470	1050	4170	3360	3800	34500
30..	1140	--	430	1430	8600	33200	3190	2880	24800
31..	1140	125	385	1960	8000	42300	--	--	--
Total	56330	--	20865	36856	--	306830	79600	--	1620170

Total discharge for year (cfs-days)..... 1052737

Total load for year (tons)..... 4373645

A Computed from partly estimated concentration graph.

GREEN RIVER BASIN--Continued

9-3070. GREEN RIVER NEAR OURAY, UTAH--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961
 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
 P, piped; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sam- pling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Oct. 10, 1960.....	1800		56	1540	3950		--	73	--	95	--	100	--	--	--	--	--	VPWC
Oct. 16.....	1725		38	1970	279		40	45	50	61	84	72	88	100	--	--	--	VPWC
Nov. 18.....	1725		38	1970	279		--	--	--	--	--	--	--	--	--	--	--	S
Dec. 7.....	1720		35	716	250		45	47	56	68	74	91	100	--	--	--	--	VPWC
Mar. 14, 1961.....	1800		49	1900	379		--	24	--	55	--	70	86	100	--	--	--	VPWC
Mar. 21.....	1800		47	3100	1430		--	38	--	--	--	--	70	84	97	100	--	VPWC
Mar. 21.....	1800		47	3100	1430		--	--	--	49	--	70	84	97	100	--	--	VPWC
Mar. 24.....	1810		49	3070	2430		--	--	--	85	--	90	95	100	--	--	--	VPWC
Mar. 29.....	1800		44	4130	1980		--	53	--	75	--	81	91	99	100	--	--	VPWC
Apr. 8.....	1500		42	4040	2630		--	57	--	74	--	82	90	100	--	--	--	VPWC
May 2.....	1815		62	2400	335		--	--	--	58	--	76	92	100	--	--	--	VPWC
May 6.....	1720		57	5130	1570		--	35	--	55	--	69	83	98	100	--	--	VPWC
May 6.....	1720		57	5130	1570		--	8	--	49	--	69	80	97	100	--	--	SPN
May 16.....	0540		56	8060	2440		--	39	--	55	--	76	88	99	100	--	--	VPWC
May 27.....	1430		88	9380	1430		--	34	--	53	--	78	90	99	100	--	--	VPWC
June 3.....	1500		64	14100	1640		--	27	--	46	--	--	75	89	99	100	--	VPWC
June 3.....	1500		64	14100	1640		--	--	--	--	--	--	75	87	98	100	--	S
June 10.....	1510		70	11600	875		--	26	--	43	--	70	86	99	100	--	--	VPWC
June 26.....	1830		78	5340	368		--	25	--	40	--	79	97	100	--	--	--	VPWC
July 1.....	1520		76	3500	158		29	37	45	60	70	85	99	100	--	--	--	VPWC
July 12.....	1820		79	1850	87		--	55	64	76	88	99	--	--	--	--	--	BWC
July 29.....	1535		78	1170	169		42	76	91	91	--	100	--	--	--	--	--	SPWC
Aug. 3.....	1840		78	1260	6530		--	82	--	99	--	100	--	--	--	--	--	SPWC
Aug. 3.....	1840		78	1260	6530		--	6	--	100	--	--	--	--	--	--	--	SDN
Aug. 7.....	1840		78	1190	2000		--	--	--	--	--	--	100	--	--	--	--	VPWC
Aug. 14.....	1820		78	1060	4170		--	--	--	--	--	--	--	--	--	--	--	SPWC
Aug. 16.....	1830		75	1280	2900		--	64	--	95	--	100	--	--	--	--	--	SPWC
Aug. 17.....	0645		70	1210	1350		--	77	--	96	--	100	--	--	--	--	--	SPWC
Aug. 27.....	0645		71	1100	5510		--	80	--	97	--	100	--	--	--	--	--	SPWC
Aug. 28.....	0705		73	1170	2770		--	76	--	98	--	100	--	--	--	--	--	SPWC

Aug. 30, 1961.....	1755	71	1610	13300	---	80	---	97	---	100	---	---	---	SPMC
Sept. 1.....	0645	65	d 1800	13000	---	80	---	97	---	100	---	---	---	SPMC
Sept. 2.....	1500	64	d 1650	3590	---	72	---	96	---	100	---	---	---	SPMC
Sept. 7.....	1800	78	d 1300	2430	---	82	---	96	---	100	---	---	---	SPMC
Sept. 11.....	1750	67	d 3100	13000	---	72	---	98	---	100	---	---	---	VPWC
Sept. 15.....	1835	69	d 1900	1370	---	64	---	87	---	98	100	---	---	VPWC
Sept. 18.....	0630	60	d 3000	7790	---	51	---	79	---	98	100	---	---	VPWC
Sept. 19.....	1730	60	d 2800	6810	---	67	---	79	---	98	100	---	---	VPWC
Sept. 21.....	0620	54	d 2750	16000	---	64	---	90	---	99	100	---	---	VPWC
Sept. 22.....	1735	50	d 3200	16100	---	63	---	64	---	97	99	100	---	VPWC
Sept. 23.....	1350	50	d 4300	11900	---	53	---	61	---	96	98	100	---	VPWC

d Daily mean discharge.

GREEN RIVER BASIN--Continued
9-3145. PRICE RIVER AT WOODSIDE, UTAH

LOCATION.--At gaging station at bridge on U.S. Highways 50 and 6 at Woodside, Emery County, 20 miles upstream from mouth.
DRAINAGE AREA.--1,500 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: December 1946 to September 1951 to September 1961.

Water temperatures: February 1951 to September 1959.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 7,060 ppm May 1-31; minimum, 1,040 ppm Aug. 16-17.

Hardness: Maximum, 2,730 ppm May 1-31; minimum, 530 ppm Aug. 16-17.

Specific conductance: Maximum daily, 7,640 micromhos May 28; minimum daily, 1,480 micromhos Aug. 17.

EXTREMES, 1951-61.--Dissolved solids: Maximum, 8,220 ppm Dec. 11, 1951; minimum, 592 ppm May 21-30, 1952.

Hardness: Maximum, 3,010 ppm Dec. 11, 1951; minimum, 353 ppm June 1-3, 6-10, 1952.

Specific conductance: Maximum daily, 8,540 micromhos Dec. 11, 1951; minimum daily, 814 micromhos June 1, 1952.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F) (NO ₃) (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)
												Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium, silum	Non-carbonate	
Oct. 1-31, 1960....	190	6.0	0.08	321	272	894	9.8	334	0	3370	105	5.4	7.00	2640	1920	1650	5720 7.8
Nov. 1-30.....	23.8	5.1	--	305	270	880	8.0	335	0	3290	96	7.0	58	323	1870	1600	5600 8.0
Dec. 1-31.....	19.6	7.2	--	297	255	798	8.5	356	0	3030	96	9.4	51	4680	1790	1500	5270 8.1
Jan. 1-31, 1961....	10.7	6.9	.02	337	304	928	8.2	431	0	3520	115	10	58	5440	2090	1740	6060 7.9
Feb. 1-28.....	22.6	9.9	--	263	233	733	7.7	322	0	2780	90	9.7	35	4280	1620	1350	4950 8.0
Mar. 1-31.....	25.6	5.9	--	309	328	893	8.4	313	0	3530	113	5.4	37	5350	2120	1860	5920 7.9
Apr. 1-15.....	24.5	5.8	.02	293	287	754	9.1	324	0	3050	104	4.0	28	4670	1910	1640	5270 7.8
Apr. 16-30.....	24.5	5.8	.07	325	321	1160	12	321	0	4540	154	1.6	46	6850	2710	2450	7220 8.9
May 1-31.....	5.3	2.1	--	467	358	1260	13	358	0	4700	165	2.1	43	7060	2730	2460	7340 8.1
June 1-4, 7-14.....	2.1	11	--	461	338	1220	15	338	0	4370	162	1.4	33	6950	2340	2230	7360 7.8
June 5-6.....	9.8	16	--	533	159	549	16	162	0	2880	80	3.2	38	4320	1980	1850	4820 8.1
July 5-14, 31.....	24.3	16	.25	405	134	332	17	375	0	1840	56	3.0	32	2990	1560	1250	3480 8.0
Aug. 1-3, 5-15, 18-21.....	31.9	14	--	373	89	275	12	244	0	1620	41	3.5	22	2550	1300	1090	3010 8.0
Aug. 4.....	363	17	--	210	62	226	7.8	472	0	835	34	1.2	03	1630	780	393	2140 7.7
Aug. 16-17.....	162	16	--	148	39	141	6.3	374	0	477	29	1.6	.47	1040	530	223	1480 8.2
Aug. 22-29, 31.....	189	14	--	234	52	182	8.3	291	0	910	24	2.8	.20	1570	800	561	1970 7.6
Aug. 30.....	130	12	--	325	103	349	12	220	0	1720	44	1.9	.42	2680	1240	1050	3100 7.9

Sept. 1-3, 1961...	91.3	14	--	244	50	157	8.5	214	0	974	27	1.1	.21	1590	2.16	392	855	680	2.3	1950	7.7
Sept. 4-6.....	18.1	24	--	233	133	530	12	210	0	970	50	7.3	.19	3720	4.16	177	1360	180	4.2	3800	8.0
Sept. 7-9.....	8.1	13	--	233	122	373	12	172	6	1730	50	5.3	.19	2720	3.70	159	1860	1010	4.8	3800	8.0
Sept. 10-12.....	609	13	--	305	15	139	9.6	194	0	924	18	1.3	.13	1320	2.07	2500	820	661	2.1	1850	7.6
Weighted average	--	11	--	303	117	416	9.5	260	0	1820	51	3.2	0.29	2860	3.89	627	1240	1020	4.6	3290	7.7
Time-weighted average.....	a 73.2	8.3	--	334	251	771	10	323	0	3060	98	5.4	0.42	4700	--	--	1860	1600	7.5	5230	7.9
Tons per day....	--	2.4	--	67.0	26.0	91.0	2.1	57	0	399	11.0	0.7	0.06	--	--	--	--	--	--	--	--

a Mean discharge based on 365 days; mean discharge for 329 days of actual flow, 81.2 cfs.

GREEN RIVER BASIN--Continued
9-3150. GREEN RIVER AT GREEN RIVER, UTAH

LOCATION.--At bridge on U.S. Highways 50 and 6 in town of Green River, Emery County, 1 mile upstream from gaging station.
DRAINAGE AREA.--40,800 square miles, approximately; upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: August 1928 to September 1961.

Water temperatures: May 1949 to September 1959.

Sediment records: May 1930 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 1,120 ppm Aug. 27, 30; minimum, 226 ppm June 1-30.
Hardness: Maximum, 590 ppm Sept. 18-20; minimum, 136 ppm June 1-30.

Specific conductance: Maximum daily, 1,530 microhos Aug. 30; minimum daily, 319 microhos June 19.

Sediment concentrations: Maximum daily, 34,000 ppm Sept. 10; minimum daily, 28 ppm July 27, 28.

Sediment loads: Maximum daily, 510,000 tons Sept. 10; minimum daily, 77 tons July 28.

EXTREMES, 1928-61.--Dissolved solids: Maximum, 2,010 ppm Sept. 29, 1943; minimum, 194 ppm June 21-30, 1933.

Hardness: Maximum, 898 ppm Aug. 7, 1957; minimum, 128 ppm June 21-30, 1933.

Specific conductance (1941-61): Maximum daily, 2,420 microhos Sept. 29, 1943; minimum daily, 272 microhos May 13, 1956.

Sediment concentrations (1930-61): Maximum daily, 83,100 ppm July 11, 1936; minimum daily, 30 ppm Sept. 27, 1956.

Sediment loads (1930-61): Maximum daily, 2,230,000 tons July 11, 1936; minimum daily, 54 tons Sept. 27, 1956.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Flow affected by ice Jan. 4 to Feb. 5.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbocationate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate		
Oct. 1-8, 13, 18-31, 1960.....	1453	10	0.00	71	27	101	3.0	198	4	281	54		1.6	0.18	638	0.87	2500	290	121	2.6	961 8.4
Oct. 9-12, 14-17.....	1888	9.0	0.00	118	35	139	4.5	201	0	476	50		1.7	0.23	939	1.30	4890	436	271	2.9	1320 7.9
Nov. 1-30.....	1766	11	--	73	32	103	2.3	212	5	283	47		1.9	0.17	963	0.90	3160	372	130	2.3	1150 8.3
Dec. 1-31.....	1397	13	--	58	36	116	2.3	234	0	333	35		1.3	0.19	850	1.96	2540	312	163	2.5	1070 8.2
Jan. 1-31, 1961.....	1292	12	0.00	87	38	100	2.6	266	0	293	49		1.4	0.17	720	0.98	2510	362	144	2.3	1070 8.2
Feb. 1-14, 17.....	1480	9.5	--	77	31	89	2.2	227	0	263	45		1.1	0.16	645	0.88	2580	320	134	2.2	961 8.0
Feb. 15-16, 18-28.....	1938	10	--	32	91	2.9	2.9	213	0	263	43		1.0	0.25	634	0.86	3320	304	129	2.3	947 7.8
Mar. 1-31.....	2221	9.8	--	79	29	100	3.5	213	0	273	46		1.5	0.25	655	0.89	3930	286	121	2.5	970 7.7
Apr. 1-30.....	3098	11	0.02	68	25	84	3.5	207	0	231	39		1.6	0.23	578	0.79	4830	272	102	2.2	865 7.8
May 1-17.....	4041	14	--	52	17	43	2.7	171	0	125	22		1.1	0.09	370	0.50	4040	200	60	1.3	574 7.9
May 18-31.....	7393	13	--	42	11	26	1.7	137	0	73	14		2.4	0.06	254	0.35	5070	149	37	0.9	402 8.0
June 1-30.....	9110	13	--	40	8.5	22	1.8	140	0	54	12		1.4	0.06	226	0.31	5560	136	21	0.8	363 7.9
July 1-2.....	3565	9.8	--	42	11	28	1.8	144	0	72	15		1.0	0.08	254	0.35	2440	152	34	1.0	408 7.8
July 3-30.....	1716	9.8	0.07	52	21	48	2.5	175	0	127	28		1.0	0.07	375	0.51	1740	214	70	1.4	596 8.0
July 31.....	1100	10	--	43	9.7	29	1.8	146	0	70	18		0.9	0.00	260	0.35	772	148	28	1.0	423 7.6

Aug. 1-3, 5-16, 18-26, 28-29, 31, 1961.....	1272	12	--	67	33	80	5.2	209	0	244	42	2.8	.12	610	.83	2090	302	131	2.0	905	7.9
Aug. 4.....	1720	13	--	85	48	125	6.2	226	0	435	41	1.6	.11	898	1.22	4170	408	223	2.7	1220	7.5
Aug. 10.....	1410	11	--	91	60	103	6.9	200	0	481	37	1.0	--	922	1.25	3510	476	312	2.1	1240	7.7
Aug. 17.....	1305	14	--	132	56	132	6.4	232	0	601	34	2.8	.15	1120	1.52	3950	580	370	2.4	1480	7.4
Aug. 27, 30.....	2879	11	--	82	28	92	5.0	200	0	299	42	2.7	.17	680	.92	5290	320	156	2.2	994	7.6
Sept. 1-17, 21-30. Sept. 18-20.....	3553	11	--	144	56	95	6.3	188	0	596	30	1.6	.12	1080	1.47	10360	590	436	1.7	1400	7.4
Weighted average	--	12	--	61	21	63	2.8	182	1	184	30	1.5	0.13	475	0.65	3590	240	90	1.7	714	7.9
Time-weighted average.....	2799	11	--	70	28	82	3.1	204	1	240	39	1.5	0.16	587	--	--	288	119	2.0	874	7.9
Tons per day....	--	89.0	--	461	182	476	21.0	1380	8	1390	230	12.0	0.99	--	--	--	--	--	--	--	--

GREEN RIVER BASIN--Continued

9-3150, GREEN RIVER AT GREEN RIVER, UTAH--Continued

Suspended sediment, water year October 1960 to September 1961
 /Where no concentrations are reported, loads are estimated/

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..	991	330	883	1490	229	A 920	1940	191	A 1000
2..	976	328	864	1490	229	A 920	1920	193	A 1000
3..	991	340	B 910	1470	252	1000	1920	193	A 1000
4..	1010	200	545	1450	255	A 1000	1710	182	A 840
5..	1010	204	556	1450	255	A 1000	1660	178	A 800
6..	991	218	583	1490	249	A 1000	1620	185	A 810
7..	976	220	A 580	1540	240	1000	1540	188	A 780
8..	976	220	A 580	1520	269	A 1100	1190	209	A 670
9..	1210	650	J 2710	1520	269	1100	798	246	530
10..	3600	26200	S 259000	1600	273	A 1180	544	286	A 420
11..	2220	11400	68300	1680	278	A 1260	524	290	A 410
12..	1830	5000	A 25000	1770	280	1340	745	266	A 535
13..	1640	2100	9300	1880	236	A 1200	798	260	A 560
14..	1520	890	A 3700	1880	220	A 1200	991	247	A 660
15..	1580	710	3030	1850	220	1100	1020	247	A 680
16..	1560	730	A 3100	1810	242	1180	1170	253	A 800
17..	1580	770	3280	1900	234	A 1200	1140	247	A 760
18..	1730	850	A 4000	1960	246	A 1300	1040	242	A 680
19..	1960	980	A 5200	1920	241	1250	1040	242	A 680
20..	1940	1000	A 5200	1980	262	A 1400	1080	247	720
21..	1830	970	4790	2040	278	A 1530	1040	242	A 680
22..	1810	920	A 4500	1960	255	A 1350	1170	253	A 800
23..	1750	850	4020	1940	247	1290	1270	257	A 880
24..	1730	730	A 3400	1940	246	A 1290	1640	259	A 980
25..	1680	600	A 2700	1980	251	1340	1520	258	A 1060
26..	1640	460	2040	1920	222	A 1150	1560	261	A 1100
27..	1620	441	A 1930	1900	215	A 1100	1600	231	1000
28..	1600	370	A 1600	1900	215	1100	1660	223	1000
29..	1540	289	A 1200	1900	215	A 1100	1640	226	1000
30..	1520	256	A 1050	1900	215	1100	1640	226	1000
31..	1500	235	950	--	--	--	1620	251	A 1100
Total	48511	--	425501	53030	--	35000	40510	--	24935
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..	1580	--	1050	1440	102	397	1790	118	570
2..	1470	239	950	1400	87	A 330	1750	116	A 550
3..	1410	--	880	1360	76	A 280	1730	113	A 530
4..	1350	--	800	1380	80	298	1750	116	A 550
5..	1280	--	700	1400	78	A 295	1900	131	A 670
6..	1220	--	600	1400	78	295	1900	131	A 670
7..	1170	--	540	1430	254	A 980	1880	130	660
8..	1100	--	450	1400	222	A 840	1790	103	A 500
9..	1000	129	348	1380	215	800	1750	95	A 450
10..	1000	143	386	1410	158	A 600	1730	101	A 470
11..	1030	126	350	1430	142	A 550	1690	94	A 430
12..	1080	--	450	1520	88	A 360	1680	95	A 430
13..	1150	174	540	1580	63	270	1690	94	A 430
14..	1200	--	510	1690	85	A 390	1730	101	A 470
15..	1270	--	470	1770	110	526	1790	103	500
16..	1350	--	430	1900	172	A 880	1830	107	A 530
17..	1380	--	470	1980	224	1200	1850	108	A 540
18..	1400	--	410	2040	200	A 1100	1920	114	A 590
19..	1410	--	410	2040	200	A 1100	2060	126	A 700
20..	1420	--	410	2090	177	1000	2150	134	780
21..	1430	--	400	2060	189	A 1050	2170	171	A 1000
22..	1450	--	390	2060	189	A 1050	2220	374	2240
23..	1430	--	400	1960	180	950	2630	718	A 5100
24..	1420	--	410	1880	118	A 600	3160	1410	12000
25..	1300	--	460	1900	131	672	3180	1400	12000
26..	1150	--	540	1880	130	A 660	3000	1120	A 9100
27..	1050	--	370	1850	123	A 610	2800	926	A 7000
28..	1250	--	480	1790	118	A 570	2820	959	A 7300
29..	1400	--	410	--	--	--	3130	1240	A 10500
30..	1450	--	390	--	--	--	3550	1560	15000
31..	1450	--	390	--	--	--	3820	1840	A 19000
Total	40050	--	15794	47400	--	18653	68840	--	111260

S Computed by subdividing day.
 A Computed from partly estimated concentration graph.

B Computed from estimated-concentration graph.
 J Computed from partly estimated concentration graph and subdividing day.

GREEN RIVER BASIN--Continued

9-3150, GREEN RIVER AT GREEN RIVER, UTAH--Continued

Suspended sediment, water year October 1960 to September 1961--Continued

Where no concentrations are reported, loads are estimated/

Day	APRIL				MAY				JUNE			
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Mean concentration (ppm)	Suspended sediment		Mean discharge (cfs)	Mean concentration (ppm)
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day			Mean concentration (ppm)	Tons per day		
1..	3710	1700	A 17000	2980	435	3500	10900		1750	51500		
2..	3420	1460	A 13500	2700	370	2700	11800		2550	81200		
3..	3050	1170	9600	2510	406	2750	12900		2800	A 98000		
4..	2900	1050	A 8200	2480	343	2300	13100		1900	A 67000		
5..	2820	959	A 7300	2630	387	A 2750	12800		1550	53600		
6..	2650	741	A 5300	3240	560	A 4900	12800		1680	58100		
7..	2780	906	A 6800	4110	847	A 9400	12300		1900	63100		
8..	3080	1180	A 9800	5050	1220	A 16700	11400		1600	A 49000		
9..	3390	1420	A 13000	5270	1290	A 18400	10900		1130	33300		
10..	3960	1920	20500	5050	1320	A 18000	10500		980	A 28000		
11..	4160	2140	A 24000	4640	1510	18900	10500		920	A 26000		
12..	4020	2120	A 23000	4080	980	10800	10500		850	24100		
13..	3770	1870	A 19000	3630	710	A 7000	10500		830	23500		
14..	3340	1550	A 14000	3550	500	4790	10800		820	A 23000		
15..	3030	1340	11000	3910	420	4430	10300		800	A 22000		
16..	2800	926	A 7000	5500	1400	A 21000	10100		800	A 22000		
17..	2700	796	A 5800	7370	2610	51900	9750		800	A 21000		
18..	2580	574	A 4000	7030	2430	46100	9280		800	A 20000		
19..	2560	564	A 3900	6120	1850	30600	8570		760	17600		
20..	2580	574	4000	5840	1350	21300	8000		520	11200		
21..	2480	612	B 4100	5880	1100	A 17000	7530		470	A 9600		
22..	2310	593	B 3700	5810	1100	A 17000	6950		510	A 9600		
23..	2260	590	B 3600	5880	1100	A 17000	6400		550	9500		
24..	2420	612	B 4000	6440	1070	18600	5910		510	A 8100		
25..	2950	628	A 5000	7450	1400	A 28000	5740		440	A 6800		
26..	3630	663	6500	8080	1790	39100	5440		325	4770		
27..	3630	643	A 6300	8570	1840	42400	5080		220	A 3000		
28..	3370	560	A 5100	8740	1800	A 42000	4670		300	3780		
29..	3340	543	A 4900	8570	1710	39600	4250		380	4360		
30..	3240	514	A 4500	8990	1440	35000	3940		325	3460		
31..	--	--	--	10100	1630	44500	--		--	--		
Total	92930	--	274400	172200	--	638620	273310		--	856170		
	JULY				AUGUST				SEPTEMBER			
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Mean concentration (ppm)	Suspended sediment		Mean discharge (cfs)	Mean concentration (ppm)
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day			Mean concentration (ppm)	Tons per day		
1..	3710	270	2700	1290	2200	7660	2020		23000	J 133000		
2..	3420	250	2310	1320	2640	S 11800	1920		6400	33200		
3..	3130	230	1940	1400	4010	S 19000	1660		7000	A 31000		
4..	2950	200	A 1600	1720	7750	S 39900	1500		8000	32400		
5..	2750	1100	A 8200	1600	8200	35400	1380		7500	A 28000		
6..	2680	4800	34700	1750	5300	25000	1290		6800	23700		
7..	2440	2240	14800	1660	2700	12100	1250		4000	13500		
8..	2310	800	4990	1430	3780	14600	2070		9380	S 66800		
9..	2150	237	1380	1360	3550	13000	4860		32600	S 481000		
10..	2020	348	1900	1200	1920	6220	4920		34000	J 510000		
11..	1940	277	1450	1100	1400	4160	3180		19000	A 160000		
12..	1850	168	839	1050	980	2780	3500		24000	A 230000		
13..	1790	126	609	1020	650	A 1800	2720		14500	106000		
14..	1710	132	609	1010	640	1750	2260		10400	63500		
15..	1660	107	480	1010	670	1830	2090		9200	51900		
16..	1580	89	380	1270	1120	3840	2000		5000	27000		
17..	1560	78	329	1410	10400	39600	2060		4800	A 27000		
18..	1520	68	279	1270	5900	20200	4170		26700	S 352000		
19..	1470	63	250	1290	2100	7310	2950		2500	30000		
20..	1410	64	244	1190	1820	5850	2720		21000	A 150000		
21..	1410	58	221	1170	1400	4420	3240		10200	89200		
22..	1270	42	144	1120	4900	14800	3470		14300	134000		
23..	1170	40	126	1100	1440	4280	3050		11000	A 91000		
24..	1120	38	115	1100	820	2440	4190		28000	A 320000		
25..	1070	37	107	1120	820	2480	4610		29000	A 360000		
26..	1050	35	99	1360	3200	11800	4050		20000	A 220000		
27..	1050	28	79	1320	15700	56000	3740		17000	A 170000		
28..	1020	28	77	1020	6700	18500	3660		8700	86000		
29..	991	29	78	1170	11300	S 45000	3600		6600	64200		
30..	976	55	145	1290	22900	79800	3440		5200	48300		
31..	1100	500	1480	1960	30100	S 163000	--		--	--		
Total	56277	--	82660	40080	--	676320	88390		--	4402700		

Total discharge for year (cfs-days)..... 1021528

Total load for year (tons)..... 7562013

S Computed by subdividing day.

B Computed from estimated concentration graph.

A Computed from partly estimated concentration graph.

J Computed from partly estimated concentration graph and subdividing day.

GREEN RIVER BASIN--Continued
 9-3150. GREEN RIVER AT GREEN RIVER, UTAH--Continued
 Particle-size analyses of suspended sediment, water year October 1960 to September 1961
 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
 P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sam- pling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment concentra- tion (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis	
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000		2.000
Oct. 10, 1960.....	1425		55	4110	30000		---	50	---	84	---	98	100	---	---	---	---	VPWC
Oct. 11.....	1720		56	2580	13600		---	53	---	85	---	100	---	---	---	---	---	VPWC
Mar. 25, 1961.....	1110		49	3210	1340		---	45	---	72	---	95	98	100	---	---	---	VPWC
Mar. 10.....	1110		48	3210	1340		---	6	---	64	---	95	98	100	---	---	---	SPWC
Apr. 10.....	1300		48	4020	1890		---	51	---	76	---	93	96	100	---	---	---	VPWC
Apr. 15.....	1345		54	3000	1280		---	78	---	94	---	100	---	---	---	---	---	PWC
Apr. 26.....	1805		57	3710	678		---	44	58	74	87	96	100	---	---	---	---	BWC
May 8.....	1625		63	5240	1300		---	43	70	76	---	100	---	---	---	---	---	PWC
May 15.....	1630		64	3990	412		---	51	64	78	88	97	100	---	---	---	---	BWC
May 27.....	1720		71	8740	1820		---	44	---	75	---	99	100	---	---	---	---	SPWC
June 6.....	1155		67	12800	2030		---	33	---	51	---	77	94	100	---	---	---	VPWC
June 6.....	1155		67	12800	2030		---	22	---	46	---	77	94	100	---	---	---	VPN
July 7.....	1830		79	2370	1420		---	70	---	94	---	99	100	---	---	---	---	SPWC
Aug. 4.....	1930		78	1640	7280		---	70	---	95	---	100	---	---	---	---	---	PWC
Aug. 5.....	1800		80	1450	9430		---	73	---	98	---	100	---	---	---	---	---	PWC
Aug. 5.....	1800		80	1450	9430		---	7	---	98	---	100	---	---	---	---	---	PN
Aug. 6.....	1530		82	1770	4480		---	62	---	90	---	100	---	---	---	---	---	PWC
Aug. 19.....	1330		83	1300	1850		---	68	---	95	---	100	---	---	---	---	---	PWC
Aug. 29.....	1400		80	991	2680		---	67	---	88	---	100	---	---	---	---	---	PWC
Sept. 8.....	1745		65	2460	12200		---	58	---	91	---	100	---	---	---	---	---	PWC
Sept. 13.....	1630		75	2510	12000		---	70	---	92	---	99	100	---	---	---	---	VPWC
Sept. 28.....	1620		60	3660	6550		---	52	---	70	---	90	98	100	---	---	---	VPWC

GREEN RIVER BASIN--Continued
9-3285. 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, 860 square miles. Approximate elevation, 6,000 feet.

RECORDS AVAILABLE.--Chemical analyses, November 1946 to September 1949, November 1950 to September 1961.

Water temperatures: July to September 1949, October 1950 to September 1961.

Sediment records: March 1948 to September 1949, October 1950 to September 1959.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 4,900 ppm Apr. 23; minimum, 1,100 ppm May 28-31.

Hardness: Maximum, 2,010 ppm July 1-31; minimum, 380 ppm Sept. 8.

Specific conductance: Maximum daily, 5,480 micromhos Apr. 23; minimum daily, 1,360 micromhos May 31.

Water temperatures: Maximum, 85°F June 25; minimum, freezing point on many days during December to March.

EXTREMES, 1948-49, 1950-61.--Dissolved solids: Maximum, 5,650 ppm July 11, 13-18, 1954; minimum, 487 ppm June 21-30, 1957.

Hardness: Maximum, 2,280 ppm July 11, 13-18, 1954; minimum, 298 ppm June 21-30, 1957.

Specific conductance: Maximum daily, 7,230 micromhos July 15, 1954; minimum daily, 689 micromhos June 28, 1957.

Water temperatures (1949, 1950-61): Maximum, 95°F July 11, 1954; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate	
Oct. 1-14, 19-21, 1960.....	190	10	0.01	238	52	237	8.1	184	0	1100	26		4.2	0.13	1770	2.41	908	810	659	3.6
Oct. 15-18, 22-31.....	43.6	9.5	0.01	269	156	469	10	228	0	2000	60		1.8	.22	3090	4.20	364	1310	1120	5.6
Nov. 1-30.....	34.8	9.1	--	246	175	504	7.9	277	0	2050	63		1.6	.23	3190	4.34	300	1340	1110	6.0
Dec. 1-31.....	29.7	10	--	261	175	446	7.5	337	0	1950	66		2.4	.22	3080	4.19	247	1370	1100	5.2
Jan. 1-6, 1961.....	28.1	13	.01	283	185	433	8.4	408	0	1950	70		2.7	.23	3150	4.28	239	1460	1130	4.9
Jan. 17-31.....	35.5	9.9	.01	222	141	316	6.0	378	0	1420	53		2.1	.17	2360	3.21	226	1140	825	4.1
Feb. 1-28.....	46.1	9.4	--	196	129	352	5.8	250	0	1480	48		1.9	.17	2350	3.20	293	1020	815	4.8
Mar. 1-24.....	39.5	7.6	--	248	163	459	7.8	244	0	2020	62		.9	.23	3090	4.20	330	1290	1090	5.6
Mar. 25-31.....	42.6	7.4	--	303	195	573	8.9	303	0	2470	72		1.6	.23	3760	5.14	436	1560	1310	6.3
Apr. 1-5.....	47.6	7.0	.01	295	212	592	9.2	289	0	2570	76		1.1	.36	3910	5.32	505	1600	1360	6.4
Apr. 6-9.....	63.0	8.5	.01	154	85	233	5.8	270	0	950	35		2.7	.21	1610	2.19	274	735	514	3.7
Apr. 10-12.....	41.7	6.4	.01	313	97	417	7.0	280	0	1750	54		1.3	.23	2790	3.79	314	1180	942	5.3
Apr. 13-22, 24-30.....	19.4	5.0	.01	305	216	575	9.8	311	0	2490	82		1.1	.32	3640	5.22	201	1650	1330	6.2
Apr. 23.....	15.6	6.9	--	353	265	784	10	318	0	3230	96		1.0	.36	4900	6.66	198	1970	1710	7.7
May 1-16, 21-22.....	19.8	8.0	--	335	232	607	11	304	0	2680	96		1.5	.37	4120	5.60	220	1790	1540	6.2
May 17-20.....	25.0	9.6	--	265	164	456	9.5	294	0	1980	71		1.4	.32	3120	4.24	211	1410	1170	5.3
May 23-24.....	67.5	8.3	--	208	161	369	8.2	276	0	1670	47		1.4	.26	2610	3.55	476	1180	954	4.7
May 26-28.....	119	9.3	--	145	88	202	5.8	258	0	900	27		2.7	.20	1510	2.05	485	722	510	3.3
May 29-31.....	147	8.6	--	115	70	138	4.6	252	0	618	20		2.9	.14	1100	1.50	572	365	2.5	1470
June 1-6.....	83.2	12	--	128	98	207	5.5	238	0	899	28		1.2	.19	1500	2.04	337	725	530	3.3

GREEN RIVER BASIN--Continued

9-3285. SAN RAFAEL RIVER NEAR GREEN RIVER, UTAH--Continued

		Temperature (°F) of water, water year October 1960 to September 1961																															Aver- age
		Day																															
Month		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October.....	43	47	--	--	--	--	--	--	--	52	48	42	49	49	44	54	51	52	52	52	52	50	--	--	54	--	53	58	51	41	43	--	
November.....	33	34	--	46	--	--	--	50	47	41	38	38	40	45	39	--	36	34	35	45	40	36	--	--	38	34	35	--	34	33	36	--	
December.....	--	--	--	--	--	--	--	32	32	32	32	--	32	32	32	--	--	--	--	--	--	33	--	--	--	--	--	--	--	--	--	--	
January.....	--	32	32	32	32	32	32	32	--	32	32	--	32	32	--	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
February.....	32	32	32	32	32	32	32	32	32	32	32	--	--	32	32	--	32	32	32	--	32	33	33	33	--	--	--	--	--	--	--	--	
March.....	32	32	--	--	--	--	33	33	33	33	33	--	--	33	--	33	--	33	--	--	--	34	34	34	34	34	34	34	34	34	34	34	--
April.....	--	--	34	34	--	--	--	--	34	--	34	48	55	48	45	60	54	54	57	55	51	55	55	42	46	54	54	55	58	68	--	49	
May.....	70	62	55	60	58	61	60	55	63	64	62	58	52	65	59	58	59	72	71	59	--	--	--	61	67	66	66	75	58	65	64	82	--
June.....	65	68	61	--	--	67	67	67	68	--	--	64	65	64	63	--	--	--	70	64	70	68	71	--	72	73	85	71	--	--	--	--	
July.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	84	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
August.....	--	80	74	69	72	75	(3	72	--	73	74	74	82	70	75	70	--	71	--	--	76	--	--	79	72	80	64	78	69	71	72	66	73
September.....	68	59	60	--	64	64	64	62	60	58	55	--	60	64	65	65	68	63	60	58	55	52	50	51	56	57	54	59	59	--	--	60	

SAN JUAN RIVER BASIN

9-3555. SAN JUAN RIVER NEAR ARCHULETA, N. MEX.

LOCATION.--At gaging station in right bank, 0.5 mile upstream from Gobernador Canyon, 1 mile north of Archuleta, San Juan County, and 6.8 miles downstream from Navajo Dam.

DRAINAGE AREA.--3,260 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: December 1954 to September 1961.

Water temperatures: December 1954 to September 1961.

Sediment records: December 1954 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 362 ppm Sept. 19; minimum, 95 ppm May 30 to June 3.

Hardness: Maximum, 250 ppm Sept. 19; minimum, 48 ppm May 30 to June 3.

Specific conductance: Maximum, 777 on several days during July and August; minimum, freezing point on several days during January.

Water temperatures: Maximum daily, 565 microhos Dec. 22, 23, Jan. 6; minimum daily, 124 microhos May 30.

Sediment concentrations: Maximum daily, 14,100 ppm Sept. 19; minimum daily, 21 ppm Jan. 24.

Sediment loads: Maximum daily, 34,900 tons Sept. 19; minimum daily, 1 tons Jan. 6, 8, 17.

EXTREMES, 1 (1956-61).--Dissolved solids: Maximum, 472 ppm Jan. 5, 1960; minimum, 85 ppm June 14 to July 11, 1957.

Hardness: Maximum, 240 ppm Jan. 5, 1960; minimum, 40 ppm May 30 to June 3, 1957.

Specific conductance: Maximum, 240 ppm Jan. 5, 1960; minimum daily, 101 microhos July 2, 1957.

Water temperatures: Maximum, 79° Aug. 19, 1955; minimum, freezing point on many days during winter months of each year.

Sediment concentrations: Maximum daily, 34,200 ppm Aug. 17, 1956; minimum daily, 9 ppm Dec. 22, 1956, Jan. 11, 31, 1959.

Sediment loads: Maximum daily, 522,000 tons July 27, 1957; 5 tons Dec. 22, 1956, Jan. 11, 31, 1959.

REMARKS.--Values reported for sodium (NA) are determined by analysis and do not include potassium (K). Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Flow affected by ice Dec. 20-27, 30, Jan. 21-23, Jan. 27 to Feb. 2.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carb. sulfate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		So-dium adsorp-tion ratio	Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 1-31, 1960..	420	14	0.06	46	7.3	35	3.8	152	0	83	8.8	0.3	1.7	0.07	274	0.37	311	145	20	1.3	428	7.4
Nov. 1-30.....	272	---	---	53	7.5	39	---	160	0	---	---	---	---	---	310	.42	228	163	32	1.3	480	7.4
Dec. 1-15.....	255	---	---	54	7.7	42	---	161	0	---	---	---	---	---	324	.44	223	166	32	1.4	499	7.4
Dec. 16-27.....	206	---	---	60	8.3	46	---	175	0	---	---	---	---	---	360	.49	200	186	42	1.5	550	7.6
Dec. 28-31.....	226	---	---	55	8.3	40	---	161	0	---	---	---	---	---	321	.44	196	171	39	1.3	498	7.5
Jan. 1-23, 1961...	181	---	---	58	8.6	41	---	168	0	---	---	---	---	---	338	.46	165	180	42	1.3	524	7.6
Jan. 24-Feb. 18..	256	---	---	51	6.8	38	---	146	0	---	---	---	---	---	300	.41	207	155	35	1.3	471	7.6
Feb. 19-28.....	296	13	.03	52	9.6	43	4.1	154	0	120	11.	.4	1.7	.05	330	.45	264	169	43	1.4	516	7.4
Mar. 1-17.....	472	---	---	52	9.8	44	---	159	0	---	---	---	---	---	342	.47	436	170	40	1.5	524	7.5
Mar. 18-20.....	614	---	---	48	9.7	30	---	141	0	---	---	---	---	---	293	.40	644	160	44	1.0	450	7.4
Mar. 21-23.....	910	---	---	56	10	39	---	152	0	---	---	---	---	---	339	.46	833	182	57	1.3	526	7.5
Mar. 24-31.....	1071	---	---	60	10	35	---	145	0	---	---	---	---	---	296	.41	862	166	47	1.0	455	7.5
Apr. 1-10.....	1100	---	---	60	11	35	---	155	0	---	---	---	---	---	350	.48	1040	196	69	1.1	530	7.5
Apr. 2-4.....	1247	---	---	52	11	25	---	139	0	---	---	---	---	---	293	.40	986	176	62	.8	450	7.8
Apr. 5-17.....	1718	---	---	52	8.0	18	---	125	0	---	---	---	---	---	236	.32	1090	138	35	.7	356	7.4
Apr. 18-19.....	2115	---	---	32	4.9	12	---	94	0	---	---	---	---	---	164	.22	937	100	23	.5	253	7.1

2317	14	.07	27	3.5	10	2.8	82	0	34	3.4	.3	1.1	.05	141	.19	882	82	15	.5	214	7.1
Apr. 20-28, 1961.																					
2370	---	---	22	2.7	8.1	---	69	0	---	---	---	---	---	120	.16	768	66	9	.4	173	7.5
Apr. 29-30.....																					
3335	---	---	22	3.6	10.	---	76	0	---	---	---	---	---	133	.18	1200	70	8	.5	183	7.7
May 1-2.....																					
3453	---	---	18	3.2	6.9	---	64	0	---	---	---	---	---	112	.15	1040	58	5	.4	148	7.1
May 3-5.....																					
2303	---	---	22	3.9	9.7	---	73	0	---	---	---	---	---	135	.18	839	71	11	.5	187	7.1
May 6-8.....																					
1867	---	---	24	4.6	11	---	82	0	---	---	---	---	---	149	.20	751	79	12	.5	210	7.5
May 9-11.....																					
2383	---	---	23	2.6	7.7	---	84	0	---	---	---	---	---	114	.16	918	60	7	.4	157	7.2
May 12-14.....																					
2360	---	---	22	2.4	9.7	---	67	0	---	---	---	---	---	124	.17	790	65	10	.5	177	6.9
May 15-18.....																					
3892	---	---	18	1.9	7.2	---	59	0	---	---	---	---	---	104	.14	1040	53	5	.4	141	7.2
May 19-29.....																					
4050	---	---	16	1.9	6.7	---	56	0	---	---	---	---	---	95	.13	1040	48	2	.4	152	7.3
May 30-June 3....																					
2371	---	---	19	2.8	9.3	---	68	0	---	---	---	---	---	117	.16	749	59	3	.5	163	7.5
June 4-18.....																					
1369	---	---	25	3.3	12	---	85	0	---	---	---	---	---	143	.19	529	76	6	.6	212	7.3
June 19-25.....																					
880	---	---	29	4.0	15	---	100	0	---	---	---	---	---	172	.23	409	89	7	.7	248	7.5
June 26-30.....																					
851	---	---	32	3.9	17	---	112	0	---	---	---	---	---	181	.25	416	96	4	.8	268	7.4
July 1-6.....																					
800	---	---	44	4.4	28	---	152	0	---	---	---	---	---	239	.33	516	128	3	1.1	372	7.7
July 7.....																					
772	---	---	33	5.0	17	---	118	0	---	---	---	---	---	192	.26	40000	103	6	.7	278	7.5
July 8-13.....																					
July 14-22.....	12	.13	36	5.4	21	4.3	126	0	46	6.8	.3	1.6	.05	206	.28	278	112	9	.9	317	7.4
July 23-31.....			40	6.6	24	---	140	0	---	---	---	---	---	246	.33	291	127	12	.9	354	7.5
Aug. 1.....			35	8.4	22	---	142	0	---	---	---	---	---	209	.48	432	126	10	.9	330	7.6
Aug. 1-12.....			44	8.5	26	---	136	8	---	---	---	---	---	268	.36	449	145	20	.9	390	8.4
Aug. 13.....																					
800	---	---	35	8.9	22	---	138	0	---	---	---	---	---	206	.28	445	124	11	.9	318	7.5
Aug. 14-16.....																					
1455	---	---	45	12.	27	---	168	0	---	---	---	---	---	268	.36	1050	160	22	.9	408	7.7
Aug. 17-18.....																					
1158	---	---	30	5.6	18	---	116	0	---	---	---	---	---	166	.23	519	98	3	.8	277	7.5
Aug. 19-22.....																					
831	---	---	36	8.3	20	---	136	0	---	---	---	---	---	210	.29	471	124	12	.8	329	7.4
Aug. 23-27.....																					
619	---	---	32	9.2	19	---	119	0	---	---	---	---	---	188	.26	314	118	20	.8	292	7.4
Aug. 28-Sept. 9..																					

SAN JUAN RIVER BASIN--Continued

9-3555. SAN JUAN RIVER NEAR ARCHULETA, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonylate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium, sodium		
Sept. 10-16, 1961	987	---	---	27	4.5	16	---	102	0	---	---	---	---	---	166	0.23	442	86	2	252
Sept. 17-18, 1961	626	---	---	38	6.1	16	---	134	0	---	---	---	---	---	201	.27	448	120	10	309
Sept. 19, 1961	2300	---	---	75	15	23	---	236	0	---	---	---	---	---	362	.49	250	250	56	385
Sept. 20-21, 1961	1835	---	---	30	6.3	14	---	116	0	---	---	---	---	---	172	.23	852	101	6	361
Sept. 22-30, 1961	1034	---	---	26	4.1	14	---	94	0	---	---	---	---	---	132	.21	424	82	5	230
Weighted average.....	---	---	---	32	5.1	17	---	111	0	---	---	---	---	---	187	---	---	101	10	274
Time weighted average.....	2226.3	---	---	41	6.8	27	---	131	0	---	---	---	---	---	244	---	---	131	24	374
Tons per day...	---	---	---	193	30	102	---	665	2	---	---	---	---	---	1120	---	---	---	---	---

Temperature (°F) of water, water year October 1960 to September 1961

[Once-daily measurement, generally 8:00 a.m. to 8:00 p.m.]

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

SAN JUAN RIVER BASIN--Continued

9-3555. SAN JUAN RIVER NEAR ARCHULETA, N. MEX.--Continued

Suspended sediment, water year October 1960 to September 1961

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..	252	79	54	300	69	56	191	33	17
2..	265	56	40	290	69	54	235	46	29
3..	278	76	57	285	53	41	248	49	33
4..	292	53	42	320	89	77	292	56	44
5..	283	45	34	350	73	69	250	36	24
6..	278	42	32	330	62	55	176	41	19
7..	274	43	32	355	58	56	128	95	33
8..	269	42	31	409	220	243	283	81	62
9..	278	43	32	392	670	709	320	49	42
10..	350	81	77	325	740	649	278	45	34
11..	360	58	56	292	150	118	278	59	44
12..	365	50	49	265	94	67	280	120	91
13..	376	43	44	265	56	40	292	52	41
14..	350	46	43	252	72	49	301	40	33
15..	360	41	40	252	57	39	269	69	50
16..	663	258	498	252	38	26	226	85	52
17..	814	420	923	243	28	18	199	40	21
18..	1600	2220	10300	206	27	18	170	33	15
19..	910	1270	3120	226	48	29	140	80	30
20..	545	685	1010	239	37	24	187	40	20
21..	409	400	442	243	38	25	226	39	24
22..	404	238	260	239	47	30	146	30	12
23..	360	107	104	235	50	32	222	35	21
24..	350	91	86	222	33	20	235	37	23
25..	365	65	64	218	48	28	226	33	20
26..	360	60	58	218	50	29	252	53	36
27..	335	52	47	239	62	40	248	24	16
28..	320	58	50	260	41	29	230	110	68
29..	330	56	50	235	32	20	248	45	30
30..	325	42	37	199	32	17	218	25	15
31..	310	51	43	--	--	--	210	31	18
Total	13030	--	17755	8156	--	2704	7204	--	1017
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..	190	69	35	214	38	22	243	90	59
2..	150	42	17	210	37	21	243	66	43
3..	140	44	17	218	42	25	274	75	55
4..	150	36	15	218	42	25	330	210	187
5..	140	54	20	218	33	19	330	237	211
6..	152	26	11	203	27	15	315	187	159
7..	162	30	13	199	40	21	274	210	155
8..	170	30	14	191	38	20	269	133	97
9..	180	28	14	210	70	40	248	82	55
10..	195	27	14	210	67	38	292	100	79
11..	206	32	18	260	55	39	414	400	447
12..	191	28	14	270	104	76	558	1040	1570
13..	203	34	19	269	89	65	680	1650	3030
14..	184	23	11	387	174	182	715	1920	3710
15..	180	24	12	409	294	325	782	2550	5380
16..	195	23	12	444	263	315	1050	2880	8160
17..	191	22	11	432	454	530	1000	2540	6860
18..	184	34	17	370	372	372	910	1950	4790
19..	191	36	19	297	270	217	790	1750	3730
20..	191	31	16	274	220	160	743	1120	2250
21..	199	31	17	287	145	112	846	1110	2540
22..	203	33	18	306	160	132	894	1300	3140
23..	214	25	14	360	378	367	951	1290	3450
24..	218	21	12	320	465	402	1230	1700	5650
25..	218	28	16	278	340	255	1310	2400	8490
26..	218	40	24	274	240	178	964	1400	3640
27..	230	64	40	297	140	112	701	400	757
28..	226	30	18	269	113	82	624	470	792
29..	195	55	29	--	--	--	902	1300	3200
30..	214	39	23	--	--	--	1490	3120	12600
31..	214	29	17	--	--	--	1350	2980	10900
Total	5894	--	547	7894	--	4167	21762	--	96186

S Computed by subdividing day.

B computed from estimated-concentration graph.

SAN JUAN RIVER BASIN--Continued

9-3555. SAN JUAN RIVER NEAR ARCHULETA, N. MEX.--Continued

Suspended sediment, water year October 1960 to September 1961--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..	1100	2480	7370	3150	445	3780	4270	68	784
2..	1040	1990	5590	3520	508	4830	4000	72	778
3..	1110	1560	4680	3660	312	3080	3490	55	518
4..	1590	2350	10100	3520	188	1790	2960	47	376
5..	2480	3870	25900	3180	215	1850	2620	82	580
6..	2140	2150	12400	2670	127	916	2480	94	629
7..	1620	830	3630	2260	138	842	2360	84	535
8..	2740	2700	21900	1980	153	818	2310	77	480
9..	2460	1820	12100	1730	145	677	2310	71	443
10..	1610	1070	4650	1720	162	752	2370	45	288
11..	1430	540	2080	2150	118	685	2440	44	290
12..	1220	320	1050	2740	140	1040	2420	34	222
13..	1430	310	1200	3180	124	1060	2380	64	411
14..	1540	435	1810	3030	80	654	2360	56	357
15..	1230	240	797	2540	91	624	2110	122	695
16..	1080	390	1140	2240	84	508	2300	156	969
17..	1360	335	1230	2160	57	352	2220	72	432
18..	1870	390	1970	2500	70	472	1950	95	495
19..	2360	510	3250	3030	89	728	1670	111	500
20..	2520	510	3470	3620	145	1420	1620	180	787
21..	2640	350	2490	3730	143	1440	1470	115	456
22..	2660	260	1870	3620	132	1290	1330	97	348
23..	2610	235	1660	3890	170	1790	1250	104	351
24..	2730	350	2580	3930	112	1190	1160	118	370
25..	2430	240	1570	3690	88	877	1080	104	303
26..	1890	150	765	3660	82	810	982	132	350
27..	1680	133	603	3710	71	711	937	136	344
28..	1690	210	958	3820	65	670	878	153	363
29..	2100	272	1540	3910	55	581	806	157	342
30..	2640	300	2140	4060	83	910	798	156	336
31..	--	--	--	4430	127	1520	--	--	--
Total	57000	--	142493	97030	--	38647	61311	--	14132
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..	806	96	209	460	239	297	578	230	359
2..	790	61	130	558	160	241	558	305	443
3..	830	84	188	1048	2880	8241	536	170	241
4..	982	51	135	1160	4830	15100	631	133	227
5..	878	80	190	1100	1380	4100	722	165	322
6..	820	69	153	1190	350	1120	708	112	214
7..	800	1400	3020	900	1900	4620	701	93	176
8..	720	600	1200	564	279	425	617	113	188
9..	820	86	190	506	162	221	617	122	203
10..	860	310	720	450	144	175	1240	682 S	2630
11..	820	298	660	624	169	285	1340	760	2750
12..	729	184	362	604	4650	7580	1040	340	955
13..	680	163	299	620	4800	8040	910	170	418
14..	620	175	293	700	1100	2080	782	150	317
15..	560	144	218	854	1500	3460	798	412 S	947
16..	460	116	144	846	2450	5600	798	505	1090
17..	390	147	155	1190	10600 S	35600	758	650	1330
18..	440	266	316	1720	9300	43200	894	2310 S	6200
19..	526	76	108	1670	3350	15100	2300	14100 S	94900
20..	493	121	161	1180	780	2490	2130	4680 S	29700
21..	490	118	156	937	480	1210	1540	1170	4860
22..	520	103	145	846	340	777	1290	630	2190
23..	540	264	385	937	5500	13900	1230	395	1310
24..	440	401	476	840	1050	2380	1170	560	1770
25..	387	252	263	780	4480	9430	1080	365	1060
26..	387	135	141	820	900	1990	1020	226	620
27..	365	143	141	780	2790	5880	973	160	420
28..	330	135	120	680	3410	6260	894	150	362
29..	395	80	107	590	1380	2200	830	185	415
30..	520	460	646	578	260	406	822	155	344
31..	480	492	638	564	265	404	--	--	--
Total	18978	--	12069	26308	--	202811	29477	--	156961
Total discharge for year (cfs-days).....									354044
Total load for year (tons).....									689489

S Computed by subdividing day.

B computed from estimated-concentration graph.

SAN JUAN RIVER BASIN--Continued
9-3555. SAN JUAN RIVER NEAR ARCHULETA, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1980 to September 1981
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (°F)	Sam- pling point	Discharge (cfs)	Sediment concentra- tion (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.018	0.031	0.082	0.125	0.250	0.500	1.000	2.000	
Oct. 16, 1960.....	1430	49		673	264		---	---	---	---	100	---	---	---	---	---	S	
Nov. 8.....	1400	47		409	383		---	---	---	---	99	100	---	---	---	---	S	
Jan. 27, 1961.....	1500	34	d	230	93		---	---	---	---	98	99	100	---	---	---	S	
Mar. 16.....	1700	45		1300	3160		58	78	91	---	94	95	95	99	100	---	VPWC	
Apr. 20.....	0700	48		2370	416		---	---	---	---	99	100	---	---	---	---	S	
May 1.....	1400	54		3160	382		---	---	---	---	84	86	88	95	100	---	S	
May 21.....	0800	52		3770	180		---	---	---	---	94	100	---	---	---	---	S	
May 31.....	1700	80		4580	180		---	---	---	---	78	85	90	97	100	---	S	
July 7.....	1800	71		800	2990		89	88	99	---	100	---	---	---	---	---	PWC	
Aug. 4.....	1730	75	d	1110	6580		73	83	99	---	100	---	---	---	---	---	PWC	
Aug. 18.....	1730	73		1860	9480		84	77	100	---	---	---	---	---	---	---	PWC	
Sept. 19.....	1800	60		2900	19200		84	74	98	---	100	---	---	---	---	---	PWC	

d Mean daily discharge.

SAN JUAN RIVER BASIN--Continued

9-3570. SAN JUAN RIVER AT BLOOMFIELD, N. MEX.

LOCATION.--At gaging station at bridge on State Highway 44, 0.8 mile south of Bloomfield, San Juan County, 3 miles upstream from Kutz Canyon, and 10 miles downstream from Canyon Largo.

DRAINAGE AREA.--5,410 square miles, approximately.

RECORDS AVAILABLE.--Water temperatures: November 1955 to September 1961.

Sediment records: November 1955 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 82°F July 16, 28, Aug. 7; minimum, freezing point on many days during December and January.

Sediment concentrations: Maximum daily, 73,700 ppm Sept. 19; minimum daily, 19 ppm Oct. 7.

Sediment loads.--Maximum daily, 881,000 tons Sept. 19; minimum daily, 9 tons Oct. 9.

EXTREMES, 1955-61.--Water temperatures: Maximum, 85°F July 23, 1959; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 101,000 ppm Aug. 1, 1956; minimum daily, 19 ppm Oct. 7, 1960.

Sediment loads: Maximum daily, 1,900,000 tons Mar. 9, 1960; minimum daily, 19 ppm Oct. 7, 1960.

REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex.

Temperature (°F) of water, water year October 1960 to September 1961
[Once-daily measurement, generally between 8:00 a.m. to 8:00 p.m.]

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

SAN JUAN RIVER BASIN--Continued

9-3570. SAN JUAN RIVER AT BLOOMFIELD, N. MEX.--Continued

Suspended sediment, water year October 1960 to September 1961

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..	200	52	28	285	59	45	183	22	11
2..	183	44	22	268	51	37	200	51	28
3..	204	25	14	268	48	35	227	28	17
4..	218	88	52	285	46	35	274	43	32
5..	209	22	12	338	56	51	302	79	64
6..	215	20	12	314	49	42	200	51	28
7..	196	19	10	314	50	42	160	62	27
8..	183	20	10	332	110	99	270	88	64
9..	179	19	9	399	420	452	285	98	75
10..	241	185	120	320	570	492	290	92	72
11..	302	195	159	290	830	650	280	48	36
12..	332	105	94	268	127	92	290	49	38
13..	371	70	70	252	53	36	310	50	42
14..	344	51	47	236	48	31	300	65	53
15..	449	9580 S	13900	232	53	33	280	72	54
16..	924	25200 S	73200	236	39	25	260	46	32
17..	1050	11000	31200	236	36	23	220	45	27
18..	1880	21500 S	117000	214	25	14	200	43	23
19..	1220	7200	23700	214	24	14	170	43	20
20..	580	1220	1910	236	22	14	160	62	27
21..	427	630	726	227	33	20	220	74	44
22..	357	410	395	214	37	21	130	75	26
23..	357	236	227	204	18	150	141	57	
24..	357	150	145	200	21	11	210	100 B	55
25..	392	101	107	196	30	16	240	51	33
26..	350	120	113	196	18	10	270	48	35
27..	320	90	78	214	82	47	265	69	49
28..	320	92	79	236	66	42	260	43	30
29..	314	112	95	258	44	31	250	44	30
30..	308	83	69	214	28	16	240	31	20
31..	296	62	50	--	--	--	230	27	17
Total	13278	--	263653	7696	--	2494	7326	--	1166
	JANUARY			FEBRUARY			MARCH		
1..	200	49	26	220	145	86	247	92	61
2..	150	82	33	220	79	47	227	80	49
3..	140	54	20	190	58	30	247	72	48
4..	140	49	19	200	56	30	332	108	97
5..	140	55	21	190	93	48	344	160	149
6..	150	70	28	180	64	31	320	170	147
7..	160	100	43	170	40	18	296	200	160
8..	170	156	72	225	61	37	268	165	119
9..	180	163	79	227	73	45	252	110	75
10..	200	145	78	236	84	54	258	67	47
11..	210	132	75	252	126	86	364	125 S	133
12..	210	123	70	263	108	77	538	1900	2760
13..	205	120	66	252	113	77	680	2800	5140
14..	205	110	61	296	335 S	306	730	4000	7880
15..	215	125	73	371	287	287	666	7160	16700
16..	220	124	74	498	474	637	942	5700	14500
17..	220	138	82	562	508	771	942	5200	13200
18..	210	127	72	506	483	660	794	2800	6000
19..	215	110	64	371	334	335	760	1750	3590
20..	220	100	59	285	262	202	740	1560	3120
21..	225	87	53	290	162	127	854	1780	4100
22..	230	193	120	302	112	91	878	1700	4030
23..	240	150	97	326	180	158	968	1800	4700
24..	250	94	63	357	280	270	1180	2840	9050
25..	250	120	81	279	420	316	1210	3850	12600
26..	250	150	101	258	310	216	1060	2350	6730
27..	260	142	100	274	240	178	854	1400	3230
28..	280	320	242	274	127	94	750	840	1700
29..	220	500	297	--	--	--	830	1500 S	3700
30..	230	396	246	--	--	--	1380	6200	23100
31..	240	215	139	--	--	--	1350	7700	28100
Total	6435	--	2654	8074	--	5314	21461	--	175015

S Computed by subdividing day.

B Computed from estimated-concentration graph.

SAN JUAN RIVER BASIN--Continued

9-3570. SAN JUAN RIVER AT BLOOMFIELD, N. MEX.--Continued

Suspended sediment, water year October 1960 to September 1961--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..	1010	5420	14800	3030	930	7610	4290	400	4630
2..	981	3850	10200	3460	1120	10500	4120	325	3620
3..	942	2720	6920	3560	890	8550	3610	430	4190
4..	1450	3150	12300	3510	710	6730	3050	300	2500
5..	2380	6820	43800	3270	520	4590	2600	140	983
6..	2600	5380	37800	2670	360	2600	2440	128	843
7..	1650	1800	8020	2130	250	1440	2280	115	708
8..	2620	3220 S	26200	1860	195	979	2220	106	635
9..	2750	4350	32300	1620	205	897	2210	103	615
10..	1740	1700	7990	1540	205	852	2260	107	653
11..	1500	850	3440	1820	230	1130	2340	140	885
12..	1360	770	2830	2460	385	2560	2280	103	634
13..	1410	520	1980	3210	570	4940	2280	203	1250
14..	1540	460	1910	3230	450	3920	2280	170	1050
15..	1380	440	1640	2600	660	4630	2080	900	5050
16..	1280	660	2280	2170	320	1870	2130	800	4600
17..	1350	410	1470	1950	135	711	2170	240	1410
18..	1620	710	3110	2210	170	1010	1790	148	715
19..	2220	1320	7910	2830	370	2830	1570	137	841
20..	2500	1400	9450	3460	570	5320	1420	234	897
21..	2710	1420	10400	3830	700	7240	1350	158	576
22..	2810	1280	9710	3560	440	4230	1290	139	484
23..	2690	1010	7340	3830	570	5890	1220	130	428
24..	2830	970	7410	3880	630	6600	1120	117	354
25..	2940	730	5010	3630	440	4310	1030	108	300
26..	1900	430	2210	3510	330	3320	929	98	246
27..	1650	270	1200	3510	305	2890	830	111	249
28..	1570	205	869	3610	310	3020	750	115	233
29..	1750	660	3120	3750	330	3340	818	121	267
30..	2340	680	4300	3910	330	3480	680	109	200
31..	--	--	--	4230	--	5140	--	--	--
Total	57053	--	287919	93840	--	123129	59437	--	39786
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..	670	111	201	385	955	993	413	890	992
2..	680	153	281	469	7800	9880	399	890	959
3..	680	307	564	770	22000	45700	364	820	806
4..	750	448	907	770	5100	10600	448	930	1120
5..	710	158	303	860	9050 S	26500	620	1340	2240
6..	700	10600 S	22100	806	4600	10000	530	950	1360
7..	680	2800	5140	680	772	1420	600	950	1540
8..	690	300	559	590	2100	3350	530	970	1390
9..	794	320	686	506	426	582	506	913	1250
10..	818	480	1060	469	290	367	830	11700 S	31700
11..	770	750	1560	469	188	238	1060	6700	19200
12..	650	209	367	610	14400 S	28200	1490	31300 S	158000
13..	610	180	296	610	5700	9390	1150	5200	16100
14..	522	136	192	710	2350	4500	1050	2070	5870
15..	462	95	119	782	2600	5490	1220	15800	52000
16..	392	95	101	1120	22700 S	134000	1100	6400	19000
17..	350	81	77	1080	32000	96800	1070	3000	8670
18..	308	60	50	1610	40100 S	201000	1910	32000 S	328000
19..	332	74	66	3170	62300 S	682000	4270	73700	881000
20..	364	65	64	1110	5900	17700	2580	16500	115000
21..	364	68	67	900	2220	5390	2000	8000	43200
22..	427	67	70	710	1560	2990	1500	5040	20400
23..	434	59	69	730	2200	5390	1390	3540	12400
24..	326	130	114	782	26500 S	64300	1250	3790	12400
25..	290	1020	799	690	5200	9690	1200	2910	9830
26..	279	201	151	690	6350	11800	1100	2430	7220
27..	247	112	75	660	2980	5310	1020	2750	7570
28..	238	375 S	319	570	3950	6080	968	2450	6400
29..	314	9560 S	10900	476	1420	1820	916	2310	5710
30..	427	25700	36900	441	1130	1350	866	1860	4390
31..	434	1670	1960	406	840	921	--	--	--
Total	15732	--	86117	24631	--	1402701	34260	--	1775677
Total discharge for year (cfs-days).....									349223
Total load for year (tons).....									4165625

S Computed by subdividing day.

B Computed from estimated-concentration graph.

SAN JUAN RIVER BASIN--Continued

9-3645. ANIMAS RIVER AT FARMINGTON, N. MEX.

LOCATION.--At gaging station at bridge on former State Highway 17, 0.6 mile southeast of Farmington, San Juan County, and 1.3 miles upstream from mouth. DRAINAGE AREA.--1,360 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: June 1940 to September 1961.

Water temperatures: December 1950 to September 1961.

Sediment records: December 1950 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 1,040 ppm July 30; minimum, 136 ppm May 23 to June 3.

Hardness: Maximum, 608 ppm July 30; minimum, 92 ppm May 23 to June 3.

Specific conductance: Maximum daily, 1,340 micromhos July 30; minimum daily, 201 micromhos May 29.

Water temperatures: Maximum, 84° F July 28; minimum, freezing point on Dec. 6.

Sediment loadings: Maximum, 41,374 tons July 28; minimum, 3 tons Feb. 3.

EXTREMES, 1940-61.--Dissolved solids (1940-49 1952-54, 1956-61): Maximum, 1,500 ppm Aug. 19, 1949; minimum, 111 ppm June 11-17, 19-20, 1944.

Hardness (1956-61): Maximum, 608 ppm July 30, 1961; minimum, 60 ppm July 1-7, 1957.

Specific conductance (1941-61): Maximum daily, 1,980 micromhos Aug. 19, 1944; minimum daily, 170 micromhos June 27, 1944.

Water temperatures (1950-61): Maximum, 88° F July 29, 1951; minimum, freezing point on many days during winter months.

Sediment concentrations (1950-61): Maximum daily, 36,100 ppm July 23, 1954; minimum daily, 1 ppm on several days during September 1956, September 1958.

Sediment loads (1950-61): Maximum daily, 337,000 tons July 23, 1954; minimum daily, less than 0.50 ton on many days during September 1955-57, 1959 and 1960.

REMARKS.--Values reported for sodium (Na) are determined by analysis and do not include potassium (K). Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 160°C)			Hardness as CaCO ₃		Sodium-sulfate ratio	Specific conductance (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate				
Oct. 1-10, 1960...	126	10	0.02	130	17	74	5.2	196		324	42	0.5	0.5	0.12	706	0.96	241	396	236	1.6	1030	7.7	
Oct. 11-14.....	294	---	---	111	15	60	---	188		---	---	---	---	---	589	1.04	468	340	186	1.4	886	7.8	
Oct. 15-16.....	468	---	---	122	16	98	---	200		---	---	---	---	---	762	1.04	1000	370	206	1.2	1080	7.8	
Oct. 17-31.....	423	---	---	102	14	54	---	177		---	---	---	---	---	542	0.74	619	314	169	1.3	819	7.9	
Nov. 1-30.....	279	---	---	105	15	56	---	169		---	---	---	---	---	567	0.77	427	323	184	1.4	850	7.7	
Dec. 1-31.....	272	---	---	109	14	59	---	174		---	---	---	---	---	573	0.78	421	329	186	1.4	870	7.7	
Jan. 1-8, 1961....	206	---	---	121	15	66	---	182		---	---	---	---	---	653	0.89	363	362	213	1.5	953	7.5	
Jan. 9-27.....	236	9.1	0.01	110	13	53	4.7	173		243	35	0.6	1.6	0.08	566	0.77	361	327	185	1.3	638	7.7	
Jan. 28-Feb. 28....	214	---	---	116	16	66	---	173		---	---	---	---	---	632	0.86	365	355	213	1.5	945	7.6	
Mar. 1-13.....	221	---	---	125	15	74	---	191		---	---	---	---	---	660	0.92	408	373	216	1.7	1010	7.5	
Mar. 14-15.....	328	---	---	105	16	60	---	190		---	---	---	---	---	499	0.66	442	328	172	1.4	867	7.6	
Mar. 16-31.....	420	---	---	96	14	48	---	176		---	---	---	---	---	508	0.69	576	297	153	1.2	769	7.7	
Apr. 1-4.....	468	---	---	95	14	39	---	174		---	---	---	---	---	460	0.65	607	296	154	1.0	716	7.6	
Apr. 5-8.....	892	---	---	79	10	25	---	158		---	---	---	---	---	364	0.50	877	240	110	0.7	566	7.7	
Apr. 9-18.....	912	---	---	65	8.3	20	---	143		---	---	---	---	---	288	0.39	709	196	79	0.6	467	7.6	
Apr. 19-26.....	656	---	---	74	9.6	25	---	155		---	---	---	---	---	335	0.46	593	224	97	0.7	536	7.6	
Apr. 27-29.....	914	---	---	67	8.5	19	---	146		---	---	---	---	---	300	0.41	740	202	82	0.6	468	7.6	
Apr. 30-May 1.....	1186	7.1	0.04	58	6.0	19	2.1	128		78	9.2	4	1.4	0.05	238	0.32	762	169	64	0.5	391	7.6	
Apr. 20-29.....	644	---	---	66	7.2	20	---	139		---	---	---	---	---	288	0.39	656	194	80	0.6	465	7.9	

SAN JUAN RIVER BASIN--Continued

9-3645. ANINAS RIVER AT FARMINGTON, N. MEX.--Continued

Suspended sediment, water year October 1960 to September 1961

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..	118	14	4	303	C 14	12	269	18	13
2..	124	20	7	310	C 14	12	269	17	12
3..	115	C 37	11	279	34	26	274	16	12
4..	115	C 37	11	279	19	14	328	25	22
5..	112	C 21	6	279	18	14	322	26	23
6..	115	C 21	7	279	19	14	263	41	29
7..	115	C 32	11	279	10	8	237	38	24
8..	136	C 32	12	316	154	131	279	35	26
9..	153	56	23	316	55	47	322	26	23
10..	153	45	19	291	106	83	310	53	44
11..	235	160	102	279	C 27	20	310	29	24
12..	302	120	98	274	C 27	20	291	24	19
13..	324	103	90	274	C 29	22	269	30	22
14..	314	45	38	279	C 29	22	303	37	30
15..	442	825	S 1080	279	C 29	22	279	45	34
16..	534	1350	1950	274	C 20	15	269	40	29
17..	559	1850	2790	274	C 20	15	243	32	21
18..	830	7750	S 18300	269	18	13	222	67	40
19..	595	2600	4180	269	C 19	14	227	36	22
20..	478	540	697	274	C 19	14	269	59	43
21..	421	240	273	279	16	12	269	45	33
22..	386	125	130	274	C 19	14	269	54	39
23..	368	91	90	269	C 19	14	269	58	42
24..	361	81	79	279	C 19	14	279	53	40
25..	347	73	68	269	C 19	14	279	45	34
26..	340	77	71	269	C 17	12	269	39	28
27..	347	105	98	269	C 17	12	263	26	18
28..	334	32	29	274	19	14	253	19	13
29..	328	27	24	253	12	8	258	16	11
30..	328	C 15	13	269	18	13	243	29	19
31..	316	C 15	13	--	--	--	237	29	19
Total	9745	--	30324	8380	--	665	8443	--	808
	JANUARY			FEBRUARY			MARCH		
1..	218	29	17	218	20	12	182	24	12
2..	191	39	20	209	14	8	178	44	21
3..	191	45	23	218	9	5	178	15	7
4..	174	82	39	204	16	9	204	28	15
5..	218	89	52	200	17	9	232	57	36
6..	200	56	30	196	23	12	227	54	33
7..	222	78	47	178	19	9	218	180	106
8..	237	101	65	196	15	8	218	180	106
9..	253	110	75	209	18	10	200	425	230
10..	253	107	73	214	49	28	204	390	215
11..	237	39	25	218	59	35	232	375	235
12..	237	79	51	227	121	74	279	580	437
13..	232	62	39	218	10	6	316	860	734
14..	237	56	36	218	90	53	310	1140	954
15..	237	59	38	237	240	154	347	1530	1430
16..	232	68	43	237	300	192	389	2170	2280
17..	222	53	32	248	310	208	396	1770	2000
18..	227	49	30	258	390	272	396	1030	1100
19..	222	44	26	227	410	251	403	980	1060
20..	222	35	21	214	425	246	389	680	714
21..	222	43	26	196	240	127	375	600	608
22..	227	38	23	209	210	119	375	790	800
23..	227	39	24	218	210	124	389	600	630
24..	227	39	24	209	250	141	426	850	978
25..	258	35	24	191	125	64	466	1350	1700
26..	237	22	14	191	43	22	450	750	911
27..	279	50	38	191	34	18	396	325	347
28..	269	31	22	191	27	14	389	210	221
29..	218	22	13	--	--	--	466	300	377
30..	218	25	15	--	--	--	522	1100	1550
31..	200	14	8	--	--	--	498	1320	1770
Total	7044	--	1013	5940	--	2230	10250	--	21617

S Computed by subdividing day.

C Composite period.

SAN JUAN RIVER BASIN--Continued

9-3645. ANIMAS RIVER AT FARMINGTON, N. MEX.--Continued

Suspended sediment, water year October 1960 to September 1961--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..	458	1310	1620	1830	2140	10600	3630	495	4850
2..	436	1040	1220	2200	2180	12900	3560	260	2500
3..	434	1080	1270	2540	1700	11700	3100	160	1340
4..	546	1650	2430	2520	1150	7820	2410	170	1110
5..	892	3090	7440	2090	710	4010	2030	170	932
6..	947	1700	4350	1540	520	2160	2160	165	962
7..	815	800	1760	1260	400	1360	2160	149	869
8..	1060	3730	10700	1040	300	844	2390	185	1190
9..	826	1140	2540	881	200	476	2580	163	1140
10..	710	450	863	859	180	417	2690	159	1150
11..	700	370	699	1240	473	1580	2650	156	1120
12..	642	250	433	1840	800	3970	2540	128	878
13..	651	280	492	2200	600	3560	2390	111	716
14..	700	350	662	1860	470	2360	2140	90	520
15..	642	220	381	1360	320	1180	2030	94	515
16..	579	190	297	1180	200	637	2000	201	1090
17..	570	200	308	1270	300	1030	1810	132	645
18..	710	380	728	1600	595	2570	1790	105	507
19..	914	900	2220	2290	710	4390	1730	102	476
20..	1060	1080	3090	2990	980	7910	1640	109	483
21..	1240	1550	5190	2870	580	4490	1600	82	354
22..	1220	1220	4020	2970	580	4650	1490	75	302
23..	1230	1000	3320	3330	540	4860	1320	72	257
24..	1330	1170	4200	3140	350	2970	1200	71	230
25..	1240	860	2880	3120	450	3790	1100	56	166
26..	980	500	1320	3390	790	7230	1030	33	92
27..	826	350	781	3740	800	8080	947	43	110
28..	771	300	625	4010	790	8590	870	31	73
29..	936	500	1260	3940	620	6600	740	26	51
30..	1360	1260	4630	3710	500	5010	660	15	27
31..	--	--	--	3600	480	4670	--	--	--
Total	25423	--	71729	72410	--	142374	58387	--	24655
	JULY			AUGUST			SEPTEMBER		
1..	660	31	55	131	130	46	243	24	16
2..	642	47	81	184	542	1340	232	24	15
3..	660	35	62	793	4050	9800	253	59	40
4..	642	113	196	804	2000	4340	328	65	58
5..	651	41	72	670	530	959	382	79	81
6..	624	43	72	597	374	603	368	44	44
7..	546	46	68	514	332	461	354	385	368
8..	530	53	76	382	231	238	340	475	436
9..	506	44	60	316	152	130	375	485	491
10..	498	99	133	258	112	78	774	8650	17200
11..	482	54	70	196	72	38	925	1400	3500
12..	403	40	44	196	48	25	826	600	1340
13..	382	45	46	258	93	90	624	390	657
14..	354	29	28	354	373	357	546	600	885
15..	310	27	23	310	218	182	482	430	560
16..	248	21	14	361	415	405	482	250	325
17..	186	38	19	613	19300	35100	522	140	197
18..	134	29	10	710	8500	16300	845	5090	20400
19..	102	47	13	690	1600	2980	1030	13200	37400
20..	94	22	6	579	540	844	936	6400	16200
21..	96	48	12	458	320	396	903	1400	3410
22..	134	38	14	434	265	310	870	1110	2610
23..	122	10	3	354	198	189	881	1150	2740
24..	96	14	4	303	130	106	947	1370	3500
25..	80	30	6	291	85	67	892	1020	2460
26..	63	16	3	303	190	155	804	830	1800
27..	58	35	5	291	150	118	710	710	1360
28..	60	25	4	243	70	46	642	600	1040
29..	63	90	15	186	28	14	579	540	844
30..	181	5620	3160	191	15	8	570	500	770
31..	86	400	93	191	14	7	--	--	--
Total	9693	--	4467	12161	--	75732	18665	--	120747
Total discharge for year (cfs-days).....									246541
Total load for year (tons).....									496361

S Computed by subdividing day.

SAN JUAN RIVER BASIN--Continued

9-3645. ANIMAS RIVER AT FARMINGTON, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (° F)	Sam- pling point	Discharge (cfs)	Sediment concentra- tion (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Oct. 18, 1960.....	1845	48		750	8690		55	67		96		99	99	100	--	--	SPWC	
Nov. 8.....	1755	50		291	154		--	--				99	99	100	--	--	S	
Jan. 20, 1961.....	1630	34		279	35		--	--				92	96	98	100	--	S	
Feb. 10.....	1500	45		222	49		--	--				92	94	95	98	100	S	
Mar. 10.....	1520	52		222	346		65	84		94		99	100	--	--	--	SPWC	
Apr. 20.....	0625	50		992	909		16	20		37		63	75	95	100	--	VPWC	
May 2.....	0900	52		1840	1290		15	18		33		55	69	84	98	100	VPWC	
May 26.....	1000	54		3060	579		--	--				26	35	51	73	100	V	
June 8.....	1230	57		2350	239		--	--								--	V	
July 30.....	0800	79		148	7660		70	81		100		36	53	78	100	--	PWC	
Aug. 18.....	1615	72		690	6920		56	70		94		100	--	--	--	--	PWC	
Sept. 10.....	1530	70		804	5000		45	58		86		98	99	100	--	--	SPWC	

SAN JUAN RIVER BASIN--Continued

9-3680. SAN JUAN RIVER AT SHIPROCK, N. MEX.

LOCATION --At gaging station on left bank 3 miles west of Shiprock, San Juan County, and 6 miles downstream from Chaco River.

DRAINAGE AREA 42,900 square miles, approximately.

RECORDS AVAILABLE --Chemical analyses, February 1941 to September 1945, July 1957 to September 1961.

Water temperatures: December 1950 to September 1961.

Sediment records: December 1950 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 1,330 ppm Sept. 18; minimum, 142 ppm May 23 to June 4.

Hardness: Maximum, 580 ppm Sept. 18; minimum, 87 ppm May 23 to June 4.

Specific conductance: Maximum, 1,750 micromhos July 28, Sept. 18; minimum, 219 micromhos May 29.

Water temperatures: Maximum, 88°F July 25; minimum, freezing point on several days in December and January.

Sediment concentrations: Maximum daily, 81,500 ppm Sept. 19; minimum daily, 14 ppm July 24.

Sediment loads: Maximum daily, 1,360,000 tons Sept. 19; minimum daily, 5 tons July 28.

EXTREMES, 1941-45, 1950-61.--Dissolved solids (1941-45, 1957-61): Maximum, 2,980 ppm July 30-31, 1959; minimum, 115 ppm June 21-28, 30, 1944.

Hardness (1941-45, 1957-61): Maximum, 1,100 ppm July 30-31, 1959; minimum, 70 ppm June 21-28, 30, 1944.

Specific conductance (1957-61): Maximum, 3,360 micromhos July 31, 1959; minimum, 188 micromhos June 6, 1958.

Water temperatures (1950-61): Maximum, 88°F July 9, 1958; Aug. 10, 1960, July 25, 1961; minimum, freezing point on many days during winter months each year.

Sediment concentrations (1950-61): Maximum daily, 86,000 ppm Aug. 14, 1955; minimum daily, 6 ppm July 17, 18, 1959.

Sediment loads (1950-61): Maximum daily, 1,700,000 tons July 27, 1957; minimum daily, 1 ton on several days in July and September 1959.

REMARKS.--Records of specific conductance or daily samples available in district office at Albuquerque, N. Mex. Flow affected by ice Jan. 3-15.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 1-12, 1960...	275	9.3		124	30	136		190	0	477	43		22	0.11	934	1.27	693	432	276	2.8	1320	7.8
Oct. 13-18.....	1322	15		99	17	122		217	0	342	32		10	09	744	1.01	2660	318	141	3.0	1060	8.0
Oct. 19-22.....	1495	15		92	14	89		176	0	277	28		11	09	613		2470	268	154	2.8	1020	7.8
Oct. 23-31.....	742	14		111	17	92		198	0	321	32		12	10	696		2470	318	154	2.8	1020	7.8
Nov. 1-30.....	632	11		115	21	100		186	0	356	36		11	11	746	1.01	1270	372	212	2.3	1080	7.8
Dec. 1-31.....	604	11		117	23	105		200	0	371	38		12	10	775	1.05	1280	386	222	2.3	1120	7.8
Jan. 1-2, 1961.....	426	13		110	26	114		144	6	422	44		15	09	821	1.12	644	382	254	2.5	1180	8.3
Jan. 3-7, 1961.....	412	17		124	30	133		176	0	480	50		15	11	946	1.28	1050	432	288	2.8	1330	8.0
Jan. 8-24.....	510	12		118	21	95		199	0	355	38		10	08	747	1.02	1030	380	217	2.1	1080	7.8
Jan. 25-26.....	646	11		105	21	79		181	0	321	30		7.6	08	664	.90	1180	350	202	1.8	973	7.3

Jan. 27-31, 1961...	642	14	102	15	149	209	0	382	58	4.1	1.3	897	1.12	1430	316	144	3.7	1230	7.6
Feb. 1-9, 11-12...	539	14	120	21	111	186	0	377	30	1.1	1.3	790	1.09	1140	384	224	2.5	1160	7.7
Feb. 10, 11-12...	566	14	104	18	102	186	6	343	30	8.1	1.3	790	1.09	1140	384	224	2.5	1160	7.7
Feb. 13-20...	712	13	102	16	100	186	0	325	33	8.7	1.0	689	.84	1230	332	196	2.4	1030	9.4
Feb. 21-28...	557	13	109	22	101	188	0	348	36	8.3	1.3	734	1.00	1100	362	200	2.3	1080	7.6
Mar. 1-12...	557	13	108	21	107	190	0	354	37	7.7	1.0	741	1.01	1110	354	198	2.5	1080	7.8
Mar. 13-17...	1273	15	94	16	78	202	0	256	26	8.1	.09	592	.81	2030	300	134	2.0	885	7.7
Mar. 18-25...	1356	14	84	15	60	176	0	219	20	6.2	.08	505	.69	1850	272	128	1.6	762	7.7
Mar. 26-30...	1570	14	70	13	43	154	0	167	15	5.5	.06	404	.55	1710	230	104	1.2	624	7.7
Mar. 31-Apr. 4...	1926	14	77	12	65	180	0	203	17	5.3	.11	482	.66	2510	242	94	1.8	734	7.6
Apr. 5...	2460	14	70	14	41	158	0	169	11	5.0	.10	403	.55	2680	234	106	1.2	615	8.0
Apr. 6-19...	2554	13	62	12	33	145	0	133	11	3.7	.06	339	.46	2340	202	83	1.0	529	7.7
Apr. 20-22...	3913	13	49	7.4	21	125	0	82	7.6	3.1	.05	244	.33	2580	153	50	.7	393	7.5
Apr. 23-26...	3628	12	41	6.7	18	102	0	174	6.4	2.4	.03	211	.29	2070	130	48	.7	339	7.9
Apr. 27-30...	2842	12	46	8.5	27	111	0	100	10.	3.1	.11	262	.36	1870	150	59	1.0	414	8.2
May 1...	2933	13	38	6.3	16	102	0	62	4.6	2.6	.02	193	.28	2640	121	38	.6	313	7.3
May 8-12...	4357	13	36	8.3	17	88	0	87	9.8	2.9	.07	252	.36	2010	150	56	1.0	415	7.2
May 13-15...			33	6.0	15	88	0	60	4.6	1.9	.04	177	.24	2080	107	35	.6	288	7.4
May 16-19...	3632	13	39	7.9	22	102	0	80	7.4	2.7	.07	222	.30	2180	130	46	.8	353	7.4
May 20-22...	5537	12	32	5.8	12	89	0	52	4.4	1.8	.05	166	.23	2480	104	31	.6	271	7.2
May 23-June 4...	7063	11	27	4.7	12	74	0	46	3.8	1.3	.04	142	.19	2710	87	26	.6	231	7.2
June 5-15...	4551	11	31	6.0	16	80	0	63	6.4	1.7	.08	174	.24	2140	102	36	.7	285	7.2
June 16-23...	3314	12	39	6.7	24	92	0	85	9.0	2.2	.07	223	.30	2000	125	50	.9	359	7.3
June 24-26...	2107	13	47	8.6	30	106	0	109	12	2.7	.07	274	.37	1560	153	66	1.1	429	8.1
June 27-30...	1448	12	57	10	41	124	0	147	16	4.2	.07	348	.47	1360	184	82	1.3	548	7.8
July 1-7...	1234	12	66	12	52	142	0	173	20	4.7	.09	410	.56	1370	212	96	1.6	627	7.9
July 8-11...	1040	16	91	8.5	83	188	0	261	23	1.9	.10	576	.78	1620	262	108	2.2	845	7.7
July 9-11...	1150	13	73	11	56	188	0	186	20	5.8	.09	443	.60	1380	226	96	1.6	668	7.6
July 12-17...	627	15	81	16	71	172	0	244	26	7.7	.07	546	.74	924	268	127	1.9	801	7.7
July 18-25...	244	12	101	28	127	170	0	409	43	18.	.18	822	1.12	542	368	228	2.9	1190	7.9

SAN JUAN RIVER BASIN--Continued
9-3680. SAN JUAN RIVER AT SHIPROCK, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1960 to September 1961--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		Sodium adsorption ratio (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium-Magnesium	Non-carbonate			
July 26-28, 1961..	114	9.2		127	44	183		172	0	647	61		27	0.14	1180	1.60	363	498	357	3.6	1620	8.2
July 29-31.....	298	18		121	26	142		218	0	443	54		20	.13	931	1.27	749	410	232	3.1	1300	7.7
Aug. 1-2.....	590	18		160	17	162		264	0	533	29		1.9	.09	1050	1.43	1670	470	254	3.3	1440	7.7
Aug. 3-4.....	1775	19		120	1.1	110		240	0	295	16		2.2	.11	689	.94	3300	304	108	2.7	994	7.8
Aug. 5-8.....	1528	18		86	9.1	61		176	0	200	12		7.1	.10	487	.66	2010	252	108	1.7	728	7.9
Aug. 9-15.....	592	15		95	13	77		180	0	264	26		1.0	.07	589	.80	941	292	144	2.0	876	7.8
Aug. 16-18.....	1937	18		92	7.4	124		222	0	290	35		3.1	.11	679	.92	3550	260	78	3.3	1010	8.0
Aug. 19.....	2620	17		100	5.0	122		240	0	191	18		1.1	.06	522	1.71	6510	270	74	4.9	1070	8.0
Aug. 20.....	4820	21		78	7.4	150		264	0	229	18		6.4	.01	444	.61	1460	230	30	3.0	1070	7.8
Aug. 21-24.....	1214	16		94	10	97		184	0	279	20		8.2	.08	604	.82	2070	276	110	2.4	859	7.9
Aug. 25-26.....	1270	16		79	13	80		202	0	263	24		8.2	.09	604	.82	2070	276	110	2.4	859	7.9
Aug. 27-31.....	819	16		74	9	68		164	0	222	25		8.0	.07	512	.70	1130	252	118	1.9	765	7.8
Sept. 1-11, 13.....	944	12		79	17	70		170	0	240	20		6.4	.08	528	.72	1350	268	128	1.9	800	8.1
Sept. 12, 14-15.....	1800	14		58	9.6	50		124	3	152	16		3.2	.10	368	.50	1790	184	78	1.6	580	8.3
Sept. 16-17.....	1285	16		83	14	64		202	0	200	18		3.2	.11	497	.68	1720	264	98	1.7	748	7.7
Sept. 18.....	1440	21		208	15	200		304	0	720	31		.6	.16	1330	1.81	5170	580	331	3.6	1750	7.2
Sept. 19-20.....	5375	16		104	10	150		298	0	347	15		2.2	.15	789	1.07	11450	302	58	3.8	1170	7.7
Sept. 21-30.....	2014	12		60	8.6	40		130	0	145	15		3.6	.08	348	.47	1890	185	78	1.3	545	7.7
Weighted average	---	13.0		61.0	10.0	48.0		135	0	160.0	15.0		4.4	0.07	378	0.51	---	196	85	1.3	573	7.4
Time weighted average	1634.2	13.0		88.0	16.0	78.0		168	0	266	26		8.0	.09	578	---	---	285	147	1.9	850	7.6
Tons per day	---	56.0		271	46.0	210		594	0	707	67		19.0	.32	1670	---	---	---	---	---	---	---

SAN JUAN RIVER BASIN--Continued
 9-3680. SAN JUAN RIVER AT SHIPROCK, N. MEX.--Continued
 Temperature (°F) of water, water year October 1960 to September 1961

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

SAN JUAN RIVER BASIN--Continued

9-3680. SAN JUAN RIVER AT SHIPROCK, N. Mex.--Continued

Suspended sediment, water year October 1960 to September 1961

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..	270	40	30	645	630	1100	560	340	514
2..	260	41	29	613	480	790	540	440	642
3..	245	47	31	629	350	594	588	650	1030
4..	225	188	114	589	250	398	691	610	1140
5..	209	56	32	573	100	155	733	880	1740
6..	217	136	80	581	51	80	677	930	1700
7..	205	29	16	597	110	177	588	495	786
8..	221	120	72	663	480	860	540	480	700
9..	250	100	68	735	315	625	658	1600	2800
10..	307	340	282	857	460	1100	719	1710	3320
11..	361	518	505	745	540	1090	712	760	1460
12..	525	460	652	690	440	820	684	710	1310
13..	565	190	290	654	165	291	664	570	1020
14..	549	158	234	645	70	122	726	2900	5680
15..	1150	--	E 60000	637	49	84	719	1300	2520
16..	1650	--	E 90000	621	80	130	684	210	388
17..	1880	--	E 120000	645	45	80	622	145	244
18..	2140	22000	127000	637	32	55	582	650	1020
19..	2120	22000	B 130000	604	29	47	555	320	480
20..	1660	9300	B 42000	604	80	130	505	190	259
21..	1180	4200	13400	599	195	315	515	130	181
22..	1020	2000	5510	622	395	663	520	90	126
23..	904	1000	2440	604	430	701	490	84	111
24..	820	850	1880	616	440	732	465	80	100
25..	778	650	B 1400	604	300	489	540	87	127
26..	735	550	1090	594	400	642	560	123	186
27..	717	320	619	588	400	635	560	106	160
28..	699	530	1000	582	400	629	588	97	154
29..	690	480	B 890	604	645	1050	604	118	192
30..	672	460	835	582	810	1270	599	144	233
31..	663	930	1660	--	--	--	540	186	271
Total	23887	--	602159	18959	--	15854	18728	--	30594
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..	475	89	114	582	3700	5810	525	139	197
2..	378	53	54	599	3000	4850	500	74	100
3..	342	64	59	550	2000	2970	495	64	59
4..	370	66	66	510	2320	3190	510	81	112
5..	400	595	643	495	1450	1940	610	220	362
6..	450	200	243	490	750	992	610	1300	2140
7..	500	77	104	460	500	621	588	1270	2020
8..	520	94	132	446	550	660	550	420	624
9..	520	76	107	490	880	1160	540	220	321
10..	520	90	126	566	2180	3330	515	1010	1400
11..	530	47	67	566	1490	2280	545	1250	1840
12..	510	53	73	628	1900	3220	691	950	1770
13..	480	40	52	646	1780	3100	946	1500	3830
14..	500	51	69	658	2700	4800	1080	2220	6470
15..	510	250	344	705	3320	3320	1240	2550	8540
16..	490	175	232	733	3000	5940	1500	4450	18000
17..	495	380	508	804	2200	4780	1600	5580	24100
18..	495	555	742	800	2000	4320	1360	4500	16500
19..	495	190	254	700	1300	2460	1360	2900	10600
20..	500	300	405	652	1250	2200	1280	2000	6910
21..	485	90	118	572	6280	9700	1160	1700	5320
22..	520	80	112	572	2750	4250	1300	1700	5970
23..	520	113	159	577	344	536	1250	1600	5400
24..	588	63	100	588	289	459	1440	1750	6800
25..	652	480	845	588	298	473	1700	2780	12800
26..	640	230	397	530	309	442	1840	3000	14900
27..	652	6700	11800	515	229	318	1590	2100	9020
28..	764	11000	22700	515	187	260	1290	1400	4900
29..	670	8600	15200	--	--	--	1290	1500	4500
30..	577	12000	18700	--	--	--	1840	2800	14000
31..	545	7500	11000	--	--	--	2440	7050	46400
Total	16093	--	85525	16537	--	81381	34185	--	235905

E Estimated.

B Computed from estimated-concentration graph.

SAN JUAN RIVER BASIN--Continued

9-3680. SAN JUAN RIVER AT SHIPROCK, N. MEX.--Continued

Suspended sediment, water year October 1960 to September 1961--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..	2120	7600	43500	4620	1450	18100	7490	450	9100
2..	1720	7350	34100	1920	3150	41800	7610	800	16400
3..	1610	5050	22000	5770	2600	40500	6810	500	9190
4..	1740	3050	14300	6250	1300	21900	5770	260	4050
5..	2460	4850	32200	5800	850	13300	4820	275	3580
6..	2870	7500	58100	4520	1050	12800	4590	260	3220
7..	2780	3750	28100	3430	450	4410	4520	410	5000
8..	3030	2300	18800	3250	850	7460	4460	850	10200
9..	3280	4100	36300	2720	3300	24200	4490	560	6790
10..	3000	2850	23100	2230	1300	7830	4620	960 B	12000
11..	2620	1600	11300	2400	598	3880	4690	360	4560
12..	2270	1050	6440	3580	662	6400	4820	350	4550
13..	2000	1050	5670	4420	1050	12500	4520	350 B	4300
14..	2300	1100	6830	4660	650	8180	4420	600 B	7200
15..	2440	900	5930	3990	750	8080	4110	170	1890
16..	1930	800	4170	3550	650	6230	3990	1020	11000
17..	1740	700	3290	3230	328	2860	3990	730	13300
18..	2180	700	4120	3580	450	4350	3680	490	4870
19..	3320	1100	9860	4170	1250	14100	3500	210	1980
20..	3990	1650	17800	4890	1100	14500	3050	200	1650
21..	3960	1750	18700	6030	850	13800	3050	395	3250
22..	3790	1700	17400	5690	1700	26100	2800	325	2460
23..	3930	1100	11700	6510	900	15800	2450	260	1720
24..	3700	1150	11500	6690	950	17200	2240	470	2840
25..	3740	850	8580	6690	500	9030	2120	270	1550
26..	3140	650	5510	6940	1100	20600	1960	195	1030
27..	2560	450	3110	7280	1200	23600	1730	170	794
28..	2120	900	5150	7470	1700	34300	1560	330	1390
29..	2340	1450	9160	7710	950	19800	1320	220	784
30..	3550	1100	10500	7530	760	15500	1180	120	382
31..	--	--	--	7320	650	12800	--	--	--
Total	82230	--	487220	158040	--	481910	116360	--	151030
	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..	1120	70 B	210	559	5930 S	14100	546	384	566
2..	1120	70	212	621	41200	71600	540	325	474
3..	1170	95	300	1500	32600 S	171000	534	295	425
4..	1320	415	1480	2050	27700	153000	570	257	396
5..	1420	350	1340	1870	7300	36900	712	450	865
6..	1270	155	531	1860	6860 S	38500	892	660	1590
7..	1220	1050	3460	1420	2800	10700	780	320	674
8..	1040	3020	8480	964	1000	2600	828	259	579
9..	1080	810	2360	719	1980	3840	788	460	979
10..	1210	420	1370	570	940	1450	1160	7850 S	28300
11..	1160	800	2510	470	570 B	720	2260	16900	103000
12..	972	1010	2650	409	500	552	2840	23900	183000
13..	733	600	1190	510	730	1010	1720	2130 S	106000
14..	621	150	252	663	1240	2220	1390	3750	14100
15..	564	420	640	804	2270	4930	1170	1800	5690
16..	475	140	180	1010	12300	33500	1350	12600	45900
17..	398	47	51	2200	38900 S	253000	1220	4700	15500
18..	290	36	28	2600	34400 S	301000	1440	49200 S	215000
19..	204	57	31	4620	47200	611000	5950	81500	1360000
20..	172	50 B	25	2840	38000	302000	4800	43000	578000
21..	223	32	19	1710	7300	33700	2920	12500	98600
22..	223	36	22	1250	2200	7430	2680	6000	43400
23..	294	49	39	980	881	2330	2300	3510	21800
24..	342	14	13	916	856	2120	2180	2720	16000
25..	204	18	10	1280	14500 S	55100	2030	2310	12700
26..	137	33	12	1260	7460 S	26300	1830	2070	10200
27..	112	30	9	1160	2020	6330	1720	1480	6870
28..	92	20	5	1030	2200	6120	1600	1530	6610
29..	77	600	146	748	1480	2990	1470	830	3290
30..	358	8050 S	12800	600	808	1310	1410	580	2210
31..	478	6600	8520	558	537	809	--	--	--
Total	20079	--	48895	39751	--	2158161	51630	--	2882718
Total discharge for year (cfs-days).....									596479
Total load for year (tons).....									7261352

S Computed by subdividing day.

B Computed from estimated-concentration graph.

SAN JUAN RIVER BASIN--Continued

9-3795. SAN JUAN RIVER NEAR BLUFF, UTAH

LOCATION.--At bridge on State Highway 47, 1,800 feet downstream from gaging station, 20 miles southwest of Bluff, San Juan County, and 114 miles upstream from mouth. --23,000 square miles, approximately, upstream from gaging station.

DRAINAGE AVAILABLE.--Chuska Plateau to June 1927, October 1929 to September 1961.

RECORDS AVAILABLE.--Chemical analyses from September 1961 (discontinued).

Water temperatures: May 1944 to September 1958; July 1929 to September 1961.

Sediment records: August to September 1928; July 1929 to September 1961.

EXTREMES 1960-61.--Dissolved solids: Maximum, 1,400 ppm Oct. 4; minimum, 188 ppm May 22-31.

Hardness: Maximum, 655 ppm Oct. 4; minimum, 119 ppm May 22-31.

Specific conductance: Maximum daily, 1,830 microhos Jan. 9; minimum daily, 258 microhos June 4.

Water temperatures: Maximum, 82°F July 12, 13; minimum, freezing point on many days during December to February.

Sediment concentrations: Maximum daily, 58,000 ppm Aug. 21; minimum daily, 20 ppm July 28.

Sediment loads: Maximum daily, 755,000 tons Sept. 20; minimum daily, 11 tons July 28.

EXTREMES 1929-61.--Dissolved solids: Maximum, 1,860 ppm July 21-31, 1934; minimum, 152 ppm June 11-20, 1952.

Hardness: Maximum, 874 ppm July 21-31, 1934; minimum, 102 ppm July 1-6, 8-10, 1957.

Specific conductance (1941-61): Maximum daily, 2,780 microhos Sept. 19, 1959; minimum daily, 208 microhos June 17, 1952.

Water temperatures (1944-61): Maximum, 92°F July 31, 1959; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 309,000 ppm Sept. 21, 1929; minimum daily, no flow on several days during July 1934 and August 1939.

Sediment loads: Maximum daily, 12,000,000 tons Oct. 14, 1941; minimum daily, 0 tons on several days during July 1934 and August 1939.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Flow affected by ice Jan. 1-28.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbocation (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio (micro-mhos at 25°C)	Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium-Magnesium	Non-bicarbonate			
Oct. 1-3, 5-14, 1960.....	309	7.8	0.01	119	33	158	4.9	172	0	515	48		27	0.09	995	1.35	830	432	291	3.3	1370	7.9
Oct. 4.....	270	8.8	--	176	52	182	5.7	128	0	826	39		31	.09	1400	1.90	1020	655	550	3.1	1750	8.2
Oct. 15-31.....	1467	13	.02	103	20	126	4.6	205	0	382	32		8.1	.10	804	1.09	3180	342	174	3.0	1320	7.9
Nov. 1-30.....	665	12	--	115	35	114	3.8	187	0	457	40		13	.16	899	1.22	1610	432	279	2.4	1250	8.2
Dec. 1-31.....	644	11	--	118	36	120	3.8	194	0	472	42		13	.15	934	1.27	1620	444	285	2.5	1290	8.1
Jan. 1-5, 1961.....	456	10	.00	136	37	125	3.7	225	0	500	48		12	.08	1000	1.36	1230	494	310	2.4	1370	7.7
Jan. 6-12.....	510	12	.00	159	46	158	5.1	238	0	636	60		16	.12	1240	1.69	1710	584	389	2.8	1650	8.0
Jan. 13-31.....	609	10	.00	121	31	111	3.8	200	0	444	40		10	.08	889	1.21	1460	430	266	2.3	1230	8.2
Feb. 1-28.....	735	11	--	134	34	114	4.3	191	0	499	38		11	.07	961	1.31	1910	475	318	2.3	1310	8.3
Mar. 1-18.....	761	8.2	--	122	35	115	4.0	195	0	456	40		8.7	.07	942	1.28	1940	450	290	2.4	1290	8.0
Mar. 19-31.....	1508	10	--	87	22	72	3.7	167	0	289	23		6.1	.06	618	.84	2520	310	173	1.8	888	7.8
Apr. 1-6.....	2073	13	.00	87	21	78	3.6	174	0	304	21		6.0	.07	636	.86	3560	304	161	1.9	906	8.1
Apr. 7-20.....	2519	13	.01	71	17	37	2.8	152	0	175	15		4.1	.06	436	.59	2970	245	120	1.0	638	7.9
Apr. 21-30.....	3139	11	.01	51	10	26	2.0	119	0	111	10		3.1	.05	296	.40	2510	169	71	.9	451	8.1
May 1-9, 14-21.....	4145	12	--	50	8.0	22	1.6	116	0	94	9.0		2.1	.04	262	.36	2930	157	62	.8	408	7.7

May 10-13, 1961...	2522	13	8	61	13	32	2.1	134	0	143	12	2.6	.06	352	.48	2400	207	97	1.0	536	7.5
May 22-31.....	6352	9.8	39	39	2.1	17	1.2	89	0	70	8.5	1.8	.04	188	.26	3210	119	42	.6	300	7.8
June 1-17.....	2435	9.2	49	49	2.6	30	1.8	102	0	123	8.0	2.5	.04	202	.27	2660	124	51	.7	323	7.7
June 18-30.....	1110	9.4	01	68	14	50	2.9	131	0	190	21	4.7	.11	428	.58	1280	227	120	1.5	648	7.6
July 1-4.....																					
July 5-22.....	843	11	.05	89	20	76	3.9	169	0	278	26	8.7	.05	626	.85	1420	306	167	1.9	900	7.8
July 23-31.....	240	8.8	.14	108	31	126	4.5	146	0	475	42	20	.11	907	1.23	588	398	278	2.7	1280	7.7
Aug. 1, 7-12,																					
16-18, 22.....	1291	15	--	98	12	99	5.0	215	0	279	26	5.8	.11	642	.87	2240	294	118	2.5	919	7.8
Aug. 2-6.....	1406	16	--	168	24	163	6.2	275	0	600	25	1.4	.17	1160	1.58	4400	518	292	3.1	1550	7.8
Aug. 13-15, 19-21,																					
28-29.....	1766	16	--	115	20	130	5.4	233	0	418	30	6.0	.12	858	1.17	4090	370	179	2.9	1210	7.7
Aug. 23-27, 30-31.	1250	15	--	82	12	73	4.5	190	0	225	21	5.0	.09	532	.72	1800	253	96	2.0	793	7.8
Sept. 1-9, 11-22.	1786	13	--	113	17	95	5.1	193	0	365	24	6.0	.09	738	1.00	3360	350	192	2.2	1050	7.7
Sept. 10.....	2310	1.5	--	76	9.5	69	4.7	250	0	144	16	1.6	.11	a	.63	2890	228	13	2.0	882	7.8
Sept. 23-30.....	1916	12	--	81	7.8	51	3.7	140	0	208	16	6.3	.03	453	.82	2340	233	118	1.5	682	7.8
Weighted average	--	11	--	75	16	59	2.9	146	0	227	19	5.2	0.07	498	0.68	2210	252	132	1.5	719	7.8
Time-weighted average.....	1641	11	--	98	23	90	3.7	173	0	343	29	8.7	0.09	708	--	--	342	200	2.0	995	7.9
Tons per day....	--	50.0	--	334	69.0	261	13.0	649	0	1000	85.0	23.0	0.30	--	--	--	--	--	--	--	--

a Calculated from determined constituents.

SAN JUAN RIVER BASIN--Continued
9-3795. SAN JUAN RIVER NEAR BLUFF, UTAH--Continued

Temperature (°F) of water, water year October 1960 to September 1961

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

SAN JUAN RIVER BASIN--Continued

9-3795. SAN JUAN RIVER NEAR BLUFF, UTAH--Continued

Suspended sediment, water year October 1960 to September 1961
Where no concentrations are reported, loads are estimated⁷

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..	306	73	60	753	864	1760	613	552	914
2..	281	64	49	731	821	1620	583	485	763
3..	356	5100	4900	718	366	710	566	337	515
4..	270	4200	3060	711	521	1000	816	19000	60700
5..	257	1600	1110	697	768	1450	731	22300	44000
6..	229	418	258	684	796	1470	724	2000	3910
7..	232	242	152	819	4500	9950	731	324	639
8..	235	193	122	731	5400	10700	684	742	1370
9..	254	158	108	745	1400	2820	620	426	713
10..	439	7350	9390	738	3950	7870	690	1100	2050
11..	302	5000	4080	804	2870	6230	827	1990	4440
12..	302	1100	897	834	1330	2990	774	1260	2630
13..	352	900	855	745	2150	4320	745	1040	2090
14..	478	2100	2710	711	846	1620	724	562	1100
15..	878	7000	16600	670	1400	2530	738	740	1470
16..	2310	15700	101000	651	676	1190	760	1160	2380
17..	2340	24800	158000	620	484	810	738	710	1410
18..	3180	34600	308000	613	976	1620	670	--	1550
19..	3140	31400	266000	620	305	511	601	1040	1690
20..	2630	27800	197000	595	330	530	548	228	337
21..	1690	19000	86700	583	440	693	548	154	228
22..	1260	11000	37000	607	354	580	510	83	114
23..	998	6100	16400	566	396	605	542	194	284
24..	922	3800	9460	572	271	419	560	203	307
25..	881	2780	6610	572	1110	1710	510	100	138
26..	819	2130	4710	560	505	764	488	--	100
27..	811	1750	3830	560	232	351	548	--	250
28..	774	1290	2700	578	286	446	560	--	290
29..	782	--	2500	572	172	266	595	--	470
30..	767	1090	2260	589	143	227	620	387	668
31..	753	926	1880	--	--	--	613	--	620
Total	29228	--	1248401	19949	--	67762	19977	--	138120
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..	570	--	450	657	8870	15700	572	877	1350
2..	510	195	269	670	4140	7490	578	870	1360
3..	440	198	235	998	--	13000	560	823	1240
4..	380	106	109	881	4650	11100	583	619	974
5..	380	--	80	753	3480	7080	632	612	1040
6..	410	48	53	804	4790	10400	651	1340	2360
7..	460	293	364	745	3990	8030	767	568	1180
8..	520	--	230	657	2810	4980	697	2610	4910
9.. C	540	68	99	638	2720	4690	632	1130	1930
10.. C	540	--	95	684	--	6000	554	1460	2180
11.. C	540	62	90	782	3500	7390	554	483	722
12..	560	219	331	711	4280	8220	560	436	659
13..	540	306	446	718	2900	5620	613	994	1650
14..	510	204	281	745	2080	4180	774	2230	4660
15..	520	295	414	760	2270	4660	998	2630	7090
16..	540	306	446	738	2260	4500	1120	3390	10300
17..	540	285	416	819	3250	7190	1280	4390	15200
18.. C	520	261	366	834	4290	9660	1570	6660	28200
19.. C	520	183	257	906	3560	8710	1430	6800	26300
20.. C	520	--	400	858	2940	6810	1330	5890	21200
21.. C	520	385	541	774	2310	4830	1300	4200	14700
22.. C	520	157	220	684	1720	3180	1230	2030	6740
23.. C	520	142	199	626	942	1590	1240	1640	5490
24..	560	1350	2040	620	787	1320	1270	2510	8610
25..	2610	132	221	620	670	1120	1400	3100	11700
26.. C	700	1280	2420	651	429	754	1750	4500	21300
27.. C	700	410	775	645	976	1700	1830	450	22000
28.. C	700	5440	10300	601	760	1230	1640	3700	16400
29..	731	1670	3300	--	--	--	1550	3800	15900
30..	972	4300	11300	--	--	--	1610	5750	25000
31..	811	2510	5500	--	--	--	2030	13200	72300
Total	17414	--	42247	20579	--	171134	33305	--	354645

⁸ Computed by subdividing day.

A Computed from partly estimated concentration graph.

C Composite period.

SAN JUAN RIVER BASIN--Continued

9-3795. SAN JUAN RIVER NEAR BLUFF, UTAH--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
/Where no concentrations are reported, loads are estimated/

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..	2370	10300	65900	2980	2300	18500	6790	1950	35700
2..	2220	7450	44700	4200	3120	35400	6920	4310	80500
3..	1820	8500	41800	4850	4230	55400	6870	2080	38600
4..	1620	7700	33700	5390	3970	57800	6200	1650	27600
5..	1740	6050	28400	5510	3190	47500	5160	1430	19900
6..	2670	6300	45400	5120	1940	26800	4310	2760	32100
7..	3570	9300	89600	4170	2270	25600	4250	2130	24300
8..	2890	6250	48800	3420	1820	16800	4100	1300	14400
9..	3050	4900	40400	2910	625	4910	4200	1380	15600
10..	3750	5500	55700	2430	10100	66300	4370	1170	13800
11..	2980	3350	27000	2090	6600	37200	4580	1520	18800
12..	2520	3250	22100	2250	1650	10000	4720	1210	15400
13..	2120	3450	19700	3320	1940	17400	4520	1280	15600
14..	1890	2080	10600	4620	2940	36700	4320	855	9970
15..	2190	2300	13600	4550	2310	28400	4170	968	10900
16..	2180	2200	12900	3600	608	5910	3850	1300	13500
17..	1810	1650	8060	3110	1330	11200	3740	1000	10100
18..	1650	800	3560	2830	1230	9400	3690	1710	17000
19..	1980	1900	10200	3230	1340	11700	3460	1220	11400
20..	2680	3600	26000	4340	2010	23600	3240	825	7220
21..	3260	3650	32100	5640	2790	42500	2910	896	7040
22..	3550	3800	36400	6120	3720	61500	2910	1060	8330
23..	3690	2900	28900	5750	2130	33100	2680	1030	7450
24..	3580	2150	20800	6300	2350	40000	2370	907	5800
25..	3830	2200	22800	6280	2720	46100	2100	776	4400
26..	3750	1100	11100	6010	1910	31000	1880	2020	10300
27..	2980	1800	14000	6120	1890	31200	1760	878	4170
28..	2440	1900	12500	6490	2030	35600	1600	1630	7040
29..	2130	1450	8340	6700	2210	40000	1470	475	1890
30..	2180	2200	12900	6840	2340	43200	1320	766	2730
31..	--	--	--	6710	2690	48700	--	--	--
Total	79090	--	847960	143880	--	999420	114440	--	491540
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..	1090	121	356	309	24700	20600	842	13800	31400
2..	1010	70	191	702	31200	62000	724	9500	18600
3..	1050	750	2130	920	39500	104000	711	7300	14000
4..	1290	3750	16200	1460	44000	197000	677	4400	8040
5..	1310	6100	22300	2180	43500	258000	677	2300	4200
6..	1320	3160	11300	1770	45000	223000	697	2000	3760
7..	1190	2400	7710	1700	17000	78000	850	4200	9640
8..	1330	9920	50500	1310	11400	40300	858	3300	7640
9..	1390	12800	53300	1060	8100	23200	3690	24000	301000
10..	1040	11600	32600	811	4800	10500	2310	27700	173000
11..	1010	6500	17700	711	3400	6530	1280	27600	95400
12..	1090	2400	7060	601	2800	4540	2000	27200	161000
13..	1020	770	2120	520	4300	6000	2190	23000	136000
14..	842	814	1850	510	9500	13100	1740	20000	94000
15..	704	860	1630	578	6600	10300	1310	16600	58700
16..	638	754	1300	1580	16800	166000	1150	9500	29500
17..	548	375	555	1640	21200	117000	1570	22000	93300
18..	483	242	316	3030	26100	216000	1260	10000	34000
19..	418	196	221	2890	40200	325000	3120	29000	271000
20..	332	104	93	4680	53200	697000	5580	48300	755000
21..	284	88	67	2380	58000	387000	3920	49000	538000
22..	232	75	47	1450	30800	121000	2650	24800	177000
23..	223	118	71	1180	10100	32200	2300	10800	67100
24..	241	94	61	1080	7700	22500	2070	7520	42000
25..	267	117	84	939	3900	9890	2070	4900	27400
26..	332	63	56	1480	12800	59500	2040	3540	19500
27..	267	62	45	1550	19500	81600	1840	3570	17700
28..	198	20	11	990	21000	56100	1780	2860	13700
29..	182	2190	1680	1580	23400	116000	1670	2700	12200
30..	164	1700	753	1330	12800	46000	1560	2520	10600
31..	288	20600	16800	1190	13100	42100	--	--	--
Total	21783	--	249107	44111	--	3551960	55136	--	3224380

Total discharge for year (cfs-days)..... 598892
 Total load for year (tons)..... 11386676

S Computed by subdividing day.

A Computed from partly estimated concentration graph.

SAN JUAN RIVER BASIN--Continued

9-3795, SAN JUAN RIVER NEAR BLUFF, UTAH--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sam- pling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment con- cen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Oct. 26, 1960.....	1415		59	834	2010			53		66		77	87	99	100			VPWC
Feb. 7, 1961.....	0905		32	819	3520			66		78		82	88	99	100			VPWC
Feb. 7.....	0905		32	819	3520			--		--		82	87	98	100			S
Feb. 11.....	0900		40	834	3070			63		79		84	90	100				VPWC
Feb. 20.....	0900		41	873	2640			62		73		79	86	100				VPWC
Mar. 17.....	0900		51	1280	4200			50		68		78	87	99	100			VPWC
Mar. 27.....	0845		48	1790	4070			47		65		79	87	99	100			VPWC
Apr. 3.....	0830		57	1680	8230			67		81		88	93	99	100			VPWC
Apr. 22.....	0855		57	3640	3830			21		31		53	70	95	100			VPWC
Apr. 22.....	0855		57	3640	3830			13		32		53	70	95	100			VPN
June 8.....	0820		69	4160	1200	4	6		7		9	11	19	45	89	100		VPWC
June 8.....	0820		69	4160	1200		--	--		--		19	40	85	98	100		S
July 9.....	1910		81	1080	8210		67	92		92		97	98	100				VPWC
July 10.....	0725		75	1180	15100		68	96		96		98	99	100				VPWC
Aug. 4.....	0810		75	906	42000		53	69		69		96	99	100				VPWC
Aug. 4.....	0810		75	906	42000		4			70		96	99	100				VPN
Aug. 5.....	0720		74	2360	32100		61	32100		76		87	98	100				VPWC
Aug. 7.....	0745		74	1600	14400		63	14400		78		86	98	100				VPWC
Aug. 7.....	0745		74	1600	14400		--	--		--		86	97	100				S
Aug. 22.....	0735		72	1520	33900		--	--		92		96	98	100				VPWC
Aug. 24.....	0900		75	1080	5520		60			74		87	95	100				VPWC
Sept. 3.....	0915		61	704	7460		59			74		87	93	100				VPWC
Sept. 11.....	0815		67	1360	29700		66			81		95	98	100				VPWC
Sept. 18.....	0750		67	1290	9160		57			73		87	97	100				VPWC

COLORADO RIVER MAIN STEM

9-3800. COLORADO RIVER AT LEES FERRY, ARIZ.

LOCATION:--At gaging station on left bank at head of Marble Gorge at Lees Ferry, Coconino County, just upstream from Paria River, 16 miles downstream from site of Glen Canyon Dam, 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, November 1942 to October 1945, October 1947 to September 1961.

Water temperatures: July 1949 to September 1961.

Water temperature records: October 1928 to December 1933, November 1942 to September 1944, October 1947 to September 1961.

EXTREMES: 1942-45, dissolved solids: Maximum, 1,920 ppm Oct. 15; Minimum, 326 ppm June 1-24.

Hardness: Maximum, 960 ppm Oct. 15; Minimum, 144 ppm July 31.

Specific conductance: Maximum, 2,430 microhos Oct. 15; Minimum, 453 microhos June 8.

Water temperatures: Maximum, 62°F July 10, 11, Aug. 3, 5; minimum, 33°F on several days during January.

Sediment concentrations: Maximum daily, 32,500 ppm Aug. 7; minimum daily, 1,360 tons July 27.

EXTREMES: 1928-33, 1942-45, 1947-61.--Dissolved solids (1928-30, 1942-45, 1947-61): Maximum, 1,920 ppm Oct. 15, 1960; minimum, 208 ppm June 11-20, 1928.

Hardness (1928-33, 1942-45, 1947-61): Maximum, 960 ppm Oct. 15, 1960; minimum, 132 ppm June 11-20, 1944.

Specific conductance (1942-45, 1947-61): Maximum daily, 2,430 microhos Oct. 15, 1960; minimum daily, 318 microhos June 8, 1948.

Water temperatures (1942-45, 1947-61): Maximum, 62°F July 26, 1959; minimum, freezing point on many days during winter months of most years.

Sediment concentrations (1928-33, 1942-44, 1947-61): Maximum daily, 83,300 ppm Aug. 11, 1930; minimum daily, 134 ppm Aug. 12, 1958.

Sediment loads (1928-33, 1942-44, 1947-61): Maximum daily, 9,450,000 tons Aug. 7, 1928; minimum daily, 1,220 tons Jan. 8, 1949.

REMARKS:--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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)	Bo-ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		So-dium ad-sorp-tion ratio	Specific con-ductance (micro-mhos at 25°C)	
														Parts per million	Tons per acre-foot	Tons per day	Cal-cium	Non-car-bonate			
Oct. 1-6, 1960.....	3513	11	0.00	151	49	174	6.8	191	573	136	0.6	12	0.18	1310	1.78	12400	580	424	3.1	1740	8.0
Oct. 7-11.....	3796	---	---	156	46	170	---	205	---	---	---	---	---	1270	1.73	13000	580	412	3.1	1730	7.6
Oct. 12.....	4720	---	---	134	37	126	---	218	---	---	---	---	---	972	1.32	12400	485	306	2.5	1400	7.8
Oct. 13-14.....	5235	---	---	160	48	164	---	224	---	---	---	---	---	1240	1.69	17500	595	412	2.9	1690	7.8
Oct. 15.....	7010	---	---	296	54	236	---	236	---	---	---	---	---	1240	2.61	36300	960	766	3.3	2430	7.6
Oct. 16-17.....	7330	---	---	128	31	140	---	204	---	---	---	---	---	948	1.29	18000	448	281	2.9	1400	7.9
Oct. 18-31.....	6774	---	---	160	40	163	---	220	---	---	---	---	---	1200	1.63	22000	565	384	3.0	1650	7.6
Nov. 1-30.....	5905	---	---	136	41	148	---	211	---	---	---	---	---	1080	1.47	16900	510	337	2.9	1530	7.7
Dec. 1-31.....	4467	---	---	124	39	144	---	207	---	---	---	---	---	1020	1.39	12300	470	300	2.9	1460	7.6
Jan. 1-28, 1961.....	4240	20	0.01	136	41	172	6.3	222	451	190	4	14	0.13	1100	1.50	12600	495	313	3.4	1610	7.6
Jan. 29-Feb. 28.....	5869	---	---	115	35	145	---	204	---	---	---	---	---	988	1.34	15700	430	263	3.0	1420	7.7
Mar. 1-27.....	5582	---	---	113	36	156	---	202	---	---	---	---	---	1010	1.37	15200	428	262	3.3	1450	7.7
Mar. 28-Apr. 7.....	8139	---	---	104	30	126	---	206	---	---	---	---	---	899	1.17	18900	382	213	2.8	1250	7.6
Apr. 8-11.....	10330	---	---	90	25	102	---	182	---	---	---	---	---	723	1.98	20200	328	179	2.4	1050	8.0
Apr. 12-15.....	10630	---	---	102	29	111	---	200	---	---	---	---	---	803	1.09	23000	372	208	2.5	1160	7.8

Apr. 16-30, 1961...	9619	13	.01	88	25	94	5.1	186	269	70	.4	6.9	.09	698	.95	18100	324	172	2.3	1010	7.6
May 1-4.....	10160	--	--	76	22	71	--	171	--	--	--	--	--	571	.78	15700	280	140	1.8	850	7.7
May 5-19.....	15480	--	--	70	18	57	--	156	--	--	--	--	--	492	.67	20600	248	120	1.6	621	7.8
May 20-26.....	21430	--	--	61	16	46	--	145	--	--	--	--	--	415	.56	24000	216	97	1.4	621	7.8
May 27-31.....	31700	--	--	52	13	34	--	134	--	--	--	--	--	346	.47	29600	184	74	1.1	517	7.7
June 1-24.....	29510	16	.00	61	12	29	3.1	160	100	18	.3	3.1	.06	326	.44	26000	200	69	.9	516	7.8
June 25-July 2....	14400	--	--	60	16	42	--	142	--	--	--	--	--	384	.54	15300	214	98	1.2	606	7.6
July 3-6.....	9822	--	--	53	18	77	--	161	--	--	--	--	--	464	.66	12800	214	132	1.8	743	7.6
July 7-15.....	3898	--	--	107	39	106	--	179	--	--	--	--	--	833	1.53	8770	426	186	1.9	979	7.9
July 16-29.....	4112	--	--	146	45	142	--	194	--	--	--	--	--	1110	1.41	12300	548	389	2.3	1230	7.5
July 30-Aug. 6....	5862	--	--	198	48	157	--	212	--	--	--	--	--	1350	1.84	21700	690	516	2.6	1850	7.4
Aug. 7-16.....	5255	--	--	152	33	144	--	210	--	--	--	--	--	1090	1.48	15500	515	343	2.8	1520	7.5
Aug. 17-27.....	6450	--	--	186	42	144	--	199	--	--	--	--	--	1270	1.73	22100	635	472	2.5	1710	7.4
Aug. 28-31.....	6162	--	--	180	35	113	--	254	--	--	--	--	--	1140	1.55	19000	592	384	2.0	1500	7.5
Sept. 1-4.....	5120	--	--	208	43	148	--	192	--	--	--	--	--	1400	1.90	19400	695	538	2.4	1790	8.0
Sept. 5-8.....	20900	--	--	169	31	94	--	314	--	--	--	--	--	978	1.33	55200	550	292	1.7	1330	7.7
Sept. 9-11.....	24300	--	--	298	42	150	--	274	--	--	--	--	--	1720	2.34	113000	915	690	2.2	2110	7.9
Sept. 12.....	18700	--	--	184	31	96	--	262	--	--	--	--	--	1080	1.47	54500	985	346	1.7	1430	7.9
Sept. 13.....	10960	--	--	260	42	124	--	212	--	--	--	--	--	1510	2.05	44700	820	646	1.9	1830	7.8
Sept. 14-18.....	13400	--	--	189	29	104	--	244	--	--	--	--	--	1030	1.40	37300	540	340	1.9	1390	7.5
Sept. 19-23.....	10300	--	--	209	34	122	--	234	--	--	--	--	--	1280	1.71	35000	660	476	2.1	1620	7.6
Sept. 24-26.....	13700	--	--	150	31	112	--	184	--	--	--	--	--	1000	1.96	37000	500	341	2.2	1330	7.6
Sept. 27-30.....		--	--	106	27	93	--	186	--	--	--	--	--	752	1.02	--	372	219	2.0	1070	7.6
Weighted average.....		--	--	122	33	123	--	198	--	--	--	--	--	925	--	--	440	278	2.5	1310	7.6
Time-weighted average.....	9177	--	--	2620	658	2310	--	4620	--	--	--	--	--	18600	--	--	--	--	--	--	--
Tons per day....		--	--				--		--	--	--	--	--		--	--	--	--	--	--	--

COLORADO RIVER MAIN STEM--Continued

9-3800. COLORADO RIVER AT LEES FERRY, ARIZ.--Continued

Temperature (°F) of water, water year October 1960 to September 1961
[Once-daily measurement, generally between 8:00 a.m. to 5:00 p.m.]

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

COLORADO RIVER MAIN STEM--Continued

9-3800. COLORADO RIVER AT LEES FERRY, ARIZ.--Continued

Suspended sediment, water year October 1960 to September 1961

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..	3760	920	9340	5500	2550	37900	1560	490	2060
2..	3650	1000	9860	5360	2600	37600	1420	505	1940
3..	3550	950	9110	5390	2500	36400	1800	340	1650
4..	3440	840	7810	5470	2400 B	35000	3030	710	5810
5..	3360	780 B	7100	5550	2400 B	36000	3970	920	9860
6..	3320	760	6810	5530	2350	35100	4550	1020	12500
7..	3340	820	7400	5550	2350	35200	4930	1100 B	15000
8..	3280	1180	10500	6030	3250	52900	5220	1220	17200
9..	3630	4150	40700	6570	4750	84300	5440	1260	18500
10..	3880	9700	102000	6030	3850	62700	5640	1290	19600
11..	4850	5300	69400	6000	3120	50500	5820	1200 B	19000
12..	4720	5150	65600	5940	2550	40900	5730	1180	18300
13..	5250	5550	78700	5910	2400 B	38000	5470	1100 B	16000
14..	5220	5750	81000	6030	2550	41500	5220	960	13500
15..	7010	6150	116000	6000	2720	44100	5030	870 B	12000
16..	7720	8300 B	170000	5850	2400	37900	4900	710	9390
17..	6940	7850	147000	5820	2450	38500	620	8000	
18..	7410	10100	202000	5820	2300	36100	4780	610	7870
19..	8390	13900	315000	5910	1900	30300	4720	600 B	7700
20..	8140	14900	327000	5940	1900 B	30000	4680	580	7330
21..	8250	17100	381000	5850	1900	30000	4600	560 B	7000
22..	7940	15700	337000	5850	2020	31900	4500	550 B	6700
23..	6870	12000	223000	5880	1920	30500	4350	540	6340
24..	6480	8800	154000	5820	1900 B	30000	4230	450	5140
25..	6350	6150	105000	5880	1900 B	30000	4280	440 B	5100
26..	6130	4500	74500	6100	2000	32900	4380	470	5560
27..	6030	3980	64800	6100	2250	37100	4500	470 B	5700
28..	5850	3550	56100	5970	2000	32200	4600	480	5960
29..	5790	3250	50800	5880	1800	28600	4680	490 B	6200
30..	5670	3000 B	46000	4620	1600	20000	4800	550	7130
31..	5530	2650	39600	--	--	--	4850	610 B	8000
Total	171750	--	3314130	174150	--	1144100	138480	--	292040
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..	4850	660	8640	5170	1000 B	14000	5410	1440	21000
2..	4830	600 B	7800	5170	1000 B	14000	5330	1250	18000
3..	4700	520 B	6600	5090	1030	14200	5140	1110	15400
4..	4500	480	5830	5030	1000 B	14000	5200	1140	16000
5..	4250	440 B	5100	5060	990	13500	5530	1200 B	18000
6..	3970	400 B	4300	5220	1000 B	14000	5440	1200 B	18000
7..	3740	360	3640	5300	920	13200	5300	1060	15200
8..	3610	350	3400	5300	900 B	13000	5280	1080	15400
9..	3550	340	3260	5250	880	12500	5280	1160	16500
10..	3420	320 B	3000	5140	980 B	14000	5360	1120	16200
11..	3380	290	2650	5110	1070	14800	5440	1080	15900
12..	3420	320 B	3000	5140	810	11200	5390	1000 B	15000
13..	3460	350	3270	5110	700 B	9700	5200	1000	14000
14..	3630	390 B	3800	5170	700 B	9800	4960	1000 B	13000
15..	3810	470	4830	5170	720	10100	4800	1080	14000
16..	3990	490 B	5300	5170	720 B	10000	4720	1000 B	13000
17..	4200	520	5900	5140	720	10000	4800	960	12400
18..	4350	540 B	6300	5090	700 B	9600	5280	1100 B	16000
19..	4500	610	7410	5060	620	8470	5610	1410	21400
20..	4580	620 B	7700	5110	600 B	8300	5790	1700 B	27000
21..	4680	640	8090	5390	650	9460	6100	2000	32900
22..	4750	720 B	9200	7110	1880 S	38700	6100	2080	34300
23..	4830	820	10700	9230	3150	78500	6540	2340	41300
24..	4800	710	9200	10700	4450	129000	6740	2360	43000
25..	4750	640 B	8200	10300	3900	108000	6670	2000 B	36000
26..	4680	620 B	7800	7800	6300	133000	6670	1760	31700
27..	4700	640 B	8100	7240	3900	76200	6640	1700	30500
28..	4780	740 B	9600	5940	2300	36900	7010	1680	31800
29..	4930	910	12100	--	--	--	7940	2550	54700
30..	5110	970 B	13000	--	--	--	8430	2720	61900
31..	5200	980	13800	--	--	--	8360	2500	56400
Total	133950	--	211520	166710	--	848130	182460	--	785900

S Computed by subdividing day.

B Computed from estimated-concentration graph.

COLORADO RIVER MAIN STEM--Continued

9-3800. COLORADO RIVER AT LEES FERRY, ARIZ.--Continued

Suspended sediment, water year October 1960 to September 1961--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..	8000	2400	51800	10300	1630	45300	35600	1780	171000
2..	8210	2740	60700	9640	1510	39300	34800	1800	169000
3..	8570	3500	81000	10000	1530	41300	35600	1690	162000
4..	8500	3500	80000	10700	1770	51100	38400	1800	187000
5..	8390	3020	68400	12200	2300	76000	39700	1600	170000
6..	8180	3110	68700	14400	2890	112000	37400	1500	152000
7..	7940	3500	75000	16600	3450	155000	33500	1450	131000
8..	9230	4250	106000	18100	3230	158000	31500	1470	125000
9..	11100	5180	155000	17500	2900	137000	29900	1340	108000
10..	10300	4870	135000	15800	2450	105000	28000	1200	91000
11..	10700	4780	138000	14400	2380	92500	28000	1180	89200
12..	11600	4040	127000	13400	1970	71300	28400	1080	82800
13..	10700	3590	104000	12900	1780	62000	29600	1220	97500
14..	10300	3000	83000	12700	1700	58000	30300	1100	90000
15..	9910	2500	66900	13200	1820	64900	29900	1300	105000
16..	9570	2180	56300	16100	2200	95600	28800	1020	79300
17..	9450	2100	53600	19300	2580	134000	28000	870	65800
18..	9120	1960	48300	18700	2280	115000	26500	840	60100
19..	8250	1740	38800	16900	1790	81700	25400	920	63100
20..	7800	1670	35200	16600	1610	72200	24300	720	47300
21..	7690	1610	33400	17800	1730	83100	22900	770	47600
22..	8220	1620	36000	18700	2000	100000	21800	720	42600
23..	8540	1830	42200	20400	2400	134000	20800	610	34000
24..	8830	1910	45500	23600	2530	161000	19300	570	29700
25..	9720	2400	63000	25400	2530	174000	18400	530	26300
26..	10900	2570	75600	27300	2320	171000	17200	530	24600
27..	12000	2540	82300	29200	2220	175000	15800	600	25600
28..	12000	2390	77400	30700	2220	184000	14700	660	26200
29..	11300	2100	64100	31100	2100	178000	13700	660	23700
30..	10900	2820	83000	32700	2180	193000	12700	530	18200
31..	--	--	--	34800	2050	193000	--	--	--
Total	285920	--	2235200	581340	--	3513300	800800	--	2544600
	JULY			AUGUST			SEPTEMBER		
1..	11800	500	15900	3030	530	4340	8250	12700	283000
2..	10900	480	14100	3420	4500	43400	6000	13700	222000
3..	9990	620	16700	3070	10000	82900	5470	10100	149000
4..	10100	580	16000	4520	13500	165000	4930	7900	105000
5..	10300	1200	33000	4500	20400	248000	4550	7200	88000
6..	8900	2320	55800	7940	27800	596000	5170	8100	110000
7..	8570	4100	94900	8830	32500	804000	4880	9000	119000
8..	7970	2200	47000	9080	26000	640000	5880	5800	92100
9..	7550	1200	24000	7940	20700	444000	16100	11000	480000
10..	7380	1050	21000	6800	18400	338000	21900	19600	1160000
11..	7350	1400	27800	6030	12200	199000	24700	28200	1880000
12..	6380	1640	28300	5220	10800	152000	24300	29800	1960000
13..	6030	780	12700	4830	9000	117000	18700	20300	1020000
14..	5910	980	15600	3900	8650	91100	13200	17000	610000
15..	5820	1200	19000	3550	6500	62300	11300	28500	870000
16..	5500	1100	16000	3440	5050	46900	10500	29000	820000
17..	5030	1010	13700	4440	4450	41300	9870	21800	581000
18..	4680	770	9730	4250	3250	37300	9910	15000	400000
19..	4380	650	7690	5610	14400	218000	11300	12900	394000
20..	4080	580	6390	6220	9800	165000	12500	16300	550000
21..	3830	450	4650	6480	16000	280000	14200	17300	663000
22..	3760	500	5100	7550	14000	290000	16300	19700	867000
23..	3630	2000	20000	6030	18800	306000	12700	21700	744000
24..	3500	3730	35200	5200	19200	270000	10100	21100	575000
25..	3340	1450	13100	4550	13200	162000	9910	18600	498000
26..	3260	410	3610	4250	8100	93000	10900	15200	447000
27..	3240	155	1360	4230	6000	69000	13400	11800	427000
28..	3180	190	1630	4550	5550	68200	15000	9200	373000
29..	3160	220	1900	5970	7600	123000	13900	11100	417000
30..	3200	240	2100	7240	14200	278000	12500	11000	370000
31..	3220	297	2590	8040	14100	306000	--	--	--
Total	185940	--	586550	169710	--	6740740	358320	--	17274100
Total discharge for year (cfs-days).....									3349530
Total load for year (tons).....									39490310

S Computed by subdividing day.

B Computed from estimated-concentration graph.

COLORADO RIVER MAIN STEM--Continued

9-3800. COLORADO RIVER AT LEE'S FERRY, ARIZ.--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;

P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (°F)	Sam- pling point	Discharge (cfs)	Sediment concentra- tion (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Oct. 12, 1960.....	1040			4580	4590	3230	44	55	--	80	--	99	100	--	--	--	--	SPWC
Jan. 15, 1961.....	1210			3850	443	3280	7	8	--	12	--	54	98	100	--	--	--	VPWC
Feb. 23.....	1050			8610	3250	4060	3	4	--	7	--	59	99	100	--	--	--	VPWC
Apr. 12.....	1400			11800	3690	4120	24	30	--	46	--	75	98	100	--	--	--	VPWC
May 10.....	1130			16100	2310	3370	23	28	--	46	--	76	94	97	100	--	--	VPWC
May 18.....	1040			18000	2380	3860	20	24	--	41	--	71	90	96	100	--	--	VPWC
May 27.....	1010			28800	3640	2990	13	16	--	24	--	44	57	63	96	100	--	VPWC
June 2.....	1140			34400	1830	2990	20	27	31	40	48	56	63	82	100	--	--	VPWC
June 7.....	1140			34600	1830	3040	4	10	29	39	50	56	63	82	100	--	--	VPWC
June 7.....	1130			33500	1330	3330	23	31	--	51	--	70	76	93	100	--	--	VPWC
June 16.....	1010			29200	1820	3110	21	21	--	38	--	58	80	85	100	--	--	VPWC
Aug. 6.....	0730			7310	25500	3970	51	63	--	87	--	100	--	--	--	--	--	SPWC
Sept. 10.....	1000			22200	19900	2640	35	48	--	71	--	94	100	--	--	--	--	VPWC

PARIA RIVER BASIN

9-3820. PARIA RIVER AT LEES FERRY, ARIZ.

LOCATION.--At gaging station, 0.5 mile upstream from mouth and 1 mile northwest of Lees Ferry, Coconino County.
DRAINAGE AREA.--1,570 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: October 1947 to February 1950.

Water temperatures: October 1956 to September 1961.

Sediment records: October 1947 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Not determined.

Sediment concentrations: Maximum daily, 433,000 ppm Aug. 4; minimum daily, 4 ppm June 1-30.

Sediment loads: Maximum daily, 2,470,000 tons Sept. 18; minimum daily, 18 tons June 1-30.

EXTREMES, 1947-61.--Water temperatures (1956-60): Maximum, 96°F Aug. 11, 1958, July 29, 1960; minimum, freezing point

Jan. 18, 1960 and several days during 1961.

Sediment concentrations: Maximum daily, 433,000 ppm Aug. 4, 1961; minimum daily, 1 ppm June 1-10, 1950.

Sediment loads: Maximum daily, 5,130,000 tons Sept. 12, 1958; minimum daily, less than 0.05 ton on many days most years.

REMARKS.--Flow affected by ice Jan. 5-16.

Temperature (°F) of water, water year October 1960 to September 1961

Month	Day																															Aver- age		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
October	71	57	57	78	--	--	--	--	60	56	56	63	67	56	48	--	53	--	61	67	59	58	63	56	67	66	--	--	--	--	--	45	--	
November	43	--	--	--	--	--	48	55	50	54	55	--	48	53	51	--	52	--	53	--	45	--	--	--	--	--	--	--	--	--	45	--	--	
December	--	--	--	--	41	--	--	--	--	36	--	42	35	38	33	--	--	--	33	35	--	--	33	--	--	35	--	--	33	--	34	--	--	
January	--	33	--	32	--	--	32	--	32	--	34	--	32	--	32	--	32	--	32	--	32	--	32	33	--	--	--	--	47	--	37	--	--	
February	37	--	38	--	38	--	48	--	42	37	--	--	54	44	45	--	46	--	43	--	44	--	34	--	--	48	40	--	--	--	--	--	--	
March	41	--	45	42	43	--	55	44	45	46	44	--	49	48	50	57	50	49	51	68	--	59	68	51	--	55	58	47	46	50	53	51	--	
April	53	66	61	--	60	67	55	60	54	55	65	58	53	--	55	73	77	61	60	--	75	--	52	--	50	--	54	--	79	--	--	--	--	
May	78	--	67	--	--	58	--	--	82	--	--	--	57	--	82	--	--	73	--	--	--	--	--	--	--	--	--	77	--	--	84	--	--	
June	--	--	--	--	--	84	--	--	--	--	--	92	--	--	80	--	--	87	--	--	--	--	--	79	--	--	88	--	--	82	--	--	--	
July	83	--	84	--	--	81	82	--	--	78	79	86	80	87	--	--	88	89	87	77	77	--	--	81	84	88	85	93	--	--	70	--	--	
August	80	78	79	78	71	--	69	--	85	72	78	85	69	72	72	77	77	81	--	--	--	--	--	77	72	70	69	85	74	69	69	76	--	--
September	67	64	65	58	--	--	66	69	--	66	76	75	68	--	75	--	67	66	60	56	68	70	--	70	--	72	73	74	78	75	73	69	--	--

PARIA RIVER BASIN--Continued

9-3820. PARIA RIVER AT LEES FERRY, ARIZ.--Continued

Suspended sediment, water year October 1960 to September 1961
[Where no daily concentrations are reported, loads are estimated]

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	C 23	0.3	10	--	2	18	128	6.2
2..	5.2	C 23	.3	11	--	3	16	--	10
3..	5.2	C 23	.3	11	--	3	16	--	20
4..	5.2	C 23	.3	11	--	3	20	--	25
5..	5.2	C 23	.3	12	--	4	16	560	24
6..	5.0	C 23	.3	13	--	30	9.7	--	10
7..	5.0	C 23	.3	156	36500 S	27800	11	--	10
8..	7.0	12500 S	671	71	52000	10300	8.2	--	9
9..	696	198000 S	771000	28	57000	4470	9.6	--	8
10..	887	155000 S	651000	20	29200	1580	17	354 S	22
11..	212	68000 S	49800	18	15200	739	22	560 B	40
12..	63	40000	7060	18	2100	102	22	659 S	44
13..	35	29000	2740	17	66.0 B	30	20	547 S	35
14..	21	9500	539	17	300	14	17	779 S	38
15..	18	3120	152	17	285	13	17	795	36
16..	14	3100 B	120	17	228	10	14	630	24
17..	16	3450	149	16	200 B	9	14	--	20
18..	18	3100 B	150	16	205	9	14	--	25
19..	25	2280	154	16	290 B	13	12	--	20
20..	21	3200	181	16	340	15	12	460	15
21..	17	7200	330	16	250	11	12	--	14
22..	16	14600	631	15	210	8.5	11	--	12
23..	15	4200	170	15	--	8	12	460	15
24..	14	781	30	15	--	8	14	--	16
25..	14	333	13	15	--	8	13	--	14
26..	13	156	5.5	15	--	7	13	375	13
27..	12	--	3	16	--	7	16	--	20
28..	12	--	3	16	--	7	19	--	25
29..	12	--	3	16	--	7	20	550	30
30..	11	--	3	14	145	5.5	8.9	--	10
31..	10	77	2.1	--	--	--	6.2	410	6.9
Total	2214.5	--	1484911.7	664	--	45226	450.6	--	613.1
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..	6.2	C 163	2.7	23	C 355	22	11	380	11
2..	5.4	C 163	2.4	23	C 355	22	14	440 B	16
3..	5.2	C 163	2.3	20	C 355	19	17	470	22
4..	4.7	C 163	2.1	20	C 355	19	20	630	34
5..	4.7	C 163	2.1	15	C 485	20	22	820	49
6..	3.8	C 163	1.7	12	C 485	16	18	10000 B	790
7..	3.8	C 163	1.7	16	C 485	21	25	23800	1610
8..	3.8	C 163	1.7	19	C 579	30	18	2400	117
9..	4.7	C 163	2.1	18	C 579	28	16	3100	134
10..	5.2	C 163	2.3	18	C 579	28	20	3800	205
11..	5.4	C 163	2.4	17	C 579	27	26	1300	91
12..	5.9	C 163	2.6	18	C 579	28	26	1800 B	130
13..	7.1	230	4.4	18	C 579	28	21	4800	272
14..	8.6	190 B	4	16	C 579	25	19	7000	359
15..	8.9	150	3.6	13	C 579	20	20	4280	231
16..	9.6	150 B	4	13	C 579	20	19	4000	205
17..	12	C 157	5.1	16	C 579	25	21	4600	249
18..	16	C 157	6.8	16	C 579	25	20	5950	321
19..	16	C 157	6.8	14	C 579	22	19	2600	133
20..	13	C 157	5.5	12	C 579	19	17	850	39
21..	13	C 157	5.5	15	C 579	23	15	750 B	30
22..	12	C 157	5.1	14	C 579	22	15	780	32
23..	13	C 157	5.5	13	C 579	20	14	700	26
24..	13	C 157	5.5	11	C 443	13	13	1400	49
25..	16	--	16	9.6	C 443	11	20	2800 B	180
26..	16	--	16	13	C 443	16	35	3700	350
27..	16	--	16	12	C 443	14	24	2500	162
28..	16	--	16	10	C 443	12	22	1950	116
29..	16	--	16	--	--	--	22	1050	62
30..	16	--	16	--	--	--	20	9900	535
31..	17	340	16	--	--	--	20	2200	119
Total	314.0	--	201.6	434.6	--	595	609	--	6679

S Computed by subdividing day.

B Computed from estimated-concentration graph.

C Composite period.

PARIA RIVER BASIN--Continued

9-3820. PARIA RIVER AT LEES FERRY, ARIZ.--Continued

Suspended sediment, water year October 1960 to September 1961--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..	23	1200	75	3.6	C 22	0.2	3.4	C 4	T
2..	21	1700	96	4.0	C 22	.2	3.6	C 4	T
3..	18	15800	768	3.6	C 22	.2	5.2	C 4	T
4..	18	16000 B	780	4.7	C 22	.3	4.6	C 4	T
5..	15	11000	446	6.2	C 41	.7	4.7	C 4	T
6..	14	5000	189	5.0	C 41	.6	5.0	C 4	T
7..	13	11500	404	5.9	C 41	.7	4.5	C 4	T
8..	46	22800	2830	5.9	C 41	.7	4.0	C 4	T
9..	33	20200	1800	8.2	C 41	.9	3.2	C 4	T
10..	16	18600	804	4.7	C 41	.5	2.8	C 4	T
11..	14	18800	711	3.6	C 26	.3	4.2	C 4	T
12..	12	6600	214	3.0	C 26	.2	3.6	C 4	T
13..	10	5800	157	3.0	C 26	.2	3.2	C 4	T
14..	8	2300	50	4.0	C 26	.3	3.4	C 4	T
15..	7.5	455	9.2	4.7	C 26	.3	3.6	C 4	T
16..	8.2	217	4.8	4.5	C 26	.3	3.8	C 4	T
17..	8.9	155	3.7	4.0	C 26	.3	2.6	C 4	T
18..	8.2	214	4.7	4.5	C 26	.3	4.2	C 4	T
19..	7.8	230	4.8	3.8	C 8	.1	4.2	C 4	T
20..	7.1	200 B	4	3.8	C 8	.1	3.8	C 4	T
21..	5.2	175	2.5	3.8	C 8	.1	3.6	C 4	T
22..	4.7	128	1.6	4.0	C 8	.1	3.0	C 4	T
23..	5.2	84	1.2	3.8	C 8	.1	3.0	C 4	T
24..	4.7	50 B	.6	3.8	C 8	.1	1.6	C 4	T
25..	5.0	51	.7	3.8	C 8	.1	3.2	C 4	T
26..	5.0	100 B	1	3.8	C 8	.1	3.0	C 4	T
27..	4.7	134	1.7	2.8	C 8	.1	3.8	C 4	T
28..	4.7	100 B	1	3.2	C 8	.1	3.0	C 4	T
29..	4.7	58	.7	4.1	C 8	.1	3.2	C 4	T
30..	4.0	40 B	.4	4.2	C 8	.1	2.4	C 4	T
31..	--	--	--	3.6	C 8	.1	--	--	--
Total	356.6	--	9365.6	131.6	--	8.5	107.4	--	1.2
Day	JULY			AUGUST			SEPTEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	1.8	53	0.3	37	175000	19400	177	156000	S 113000
2..	4.2	40 B	.5	15	64000	2690	28	49000	3840
3..	5.9	20	.3	62	183000	61500	13	25200	885
4..	107	84000 B	75000	2110	433000	S 4100000	10	14200	383
5..	72	160000 B	35000	1100	124000	S 946000	9.3	6300	B 160
6..	24	90500	6300	899	348000	S 1520000	8.2	1800	B 40
7..	12	48500	1630	68	109000	21500	8.2	550	12
8..	8.6	26000 B	600	24	52000	B 3500	13	10400	S 392
9..	6.2	7500 B	130	17	47000	2240	1000	247000	S 1140000
10..	13	20500	805	17	27500	1260	95	132000	36400
11..	7.1	25000	479	33	27500	S 2870	26	92000	6940
12..	5.7	12500	192	41	156000	S 25200	14	59500	2330
13..	4.7	20500	260	18	60000	3020	12	31000	1000
14..	4.2	9500	108	13	22500	790	12	17000	551
15..	3.2	1400 B	12	9.6	15500	402	14	17400	S 1110
16..	3.4	620 B	6	13	45000	S 1940	18	47000	2370
17..	3.8	480	4.9	74	125000	S 30900	12	32000	1080
18..	3.6	370	3.6	30	90000	7830	2460	283000	247000
19..	3.6	265	2.6	17	50000	2380	208	125000	S 87800
20..	4.5	300	3.6	16	29000	1250	36	84000	8470
21..	14	14700	1210	11	13000	B 390	28	60500	4740
22..	13	21000 B	740	39	95000	B 15000	19	29000	1400
23..	6.2	9800 B	160	62	178000	S 40400	16	11000	475
24..	4.5	4600	56	40	151000	18100	14	4000	B 150
25..	4.0	1900	21	403	182000	S 340000	13	630	22
26..	3.8	860	8.8	184	158000	S 104000	11	318	9.4
27..	3.6	400	3.9	34	84000	8000	10	289	7.8
28..	3.6	203	2.0	14	45500	1780	10	217	5.9
29..	3.4	200 B	2	12	36000	1210	8.9	214	5.1
30..	13	47000 B	6000	65	114000	S 47900	8.2	101	2.2
31..	86	196000	52300	114	155000	S 56900	--	--	--
Total	453.6	--	181041.5	5591.6	--	7388352	4311.8	--	3883670.4

Total discharge for year (cfs-days)..... 15639.3
 Total load for year (tons)..... 13000665.8

S Computed by subdividing day.

T Less than 0.05 ton.

B Computed from estimated-concentration graph.

C Composite period.

PARIA RIVER BASIN--Continued

9-3820. PARIA RIVER AT LEES FERRY, ARIZ.--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (°F)	Sam- pling point	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Oct. 9, 1960.....	0930	60		129	142000		44	48		75		90	98	100				VPNC
Oct. 10.....	1220	55		551	127000		39	47		67		91	99	100				VPNC
July 31, 1961.....	1800	78		86	200000		42	49		72		93	98	100				VPNC
Aug. 4.....	0620	72		2540			10	12		15		25	48	80	98	100		VPNC
Aug. 4.....					596000													
Aug. 4.....	1810	77		235	258000		34	41		60		89	98	100				VPNC
Aug. 4.....	1940	77		6270	451000		14	18		26		42	67	91	99	100		VPNC
Sept. 18.....	1730	66		2470	270000		18	23		33		52	83	99	100			VPNC

LITTLE COLORADO RIVER BASIN--Continued

9-4012. LITTLE COLORADO RIVER AT CAMERON, ARIZ.--Continued

Suspended sediment, water year October 1960 to September 1961

[Where no daily concentrations are reported, loads are estimated]

Day	OCTOBER			NOVEMBER			DECEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	0	--	0	1.2			0.8		
2..	0	--	0	.6			.8		
3..	0	--	0	.1			.2		
4..	0	--	0	0			1.8		
5..	0	--	0	0			3.4		
6..	0	--	0	4.6			1.1		
7..	0	--	0	7.2			1.1		
8..	00	--	0	6.1			.8		
9..	66	52000 B	11000	3.4			.6		
10..	32	41500	3720	1.8			.5		
11..	16	25000	1080	2.2			22		
12..	5.8	20000 B	310	2.2			8.2		
13..	1.6	18000 B	80	1.6			7.0		
14..	.6	17000 B	30	1.1			5.7		
15..	862	51300 S	144000	1.1			4.4		
16..	214	28400 S	19200	1.1			1.8		
17..	351	34600 S	47800	1.1			.8		
18..	422	35600 S	48700	1.0			1.2		
19..	531	40800 S	82000	.8			0		
20..	1110	56000	174000	1.0			.4		
21..	524	56000	82200	.5			.1		
22..	198	55000	30500	0			0		
23..	108	55000	16600	0			0		
24..	70	55000	10800	0			0		
25..	40	54000	6050	0			0		
26..	20	53000	2970	0			0		
27..	10	52000	1460	.4			0		
28..	10	51000	1430	.5			0		
29..	10	49000	1370	.4			0		
30..	6	45000 B	760	.4			0		
31..	3	40000 B	340	--			0		
Total	4611.0	--	686400	40.4	--	600	62.7	--	350
Day	JANUARY			FEBRUARY			MARCH		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1..	0			1.8			0	--	0
2..	0			1.8			0	--	0
3..	0			1.2			0	--	0
4..	0			.8			0	--	0
5..	0			.3			0	--	0
6..	0			.3			0	--	0
7..	0			.2			0	--	0
8..	0			.1			0	--	0
9..	0			0			0	--	0
10..	0			0			0	--	0
11..	0			0			0	--	0
12..	0			0			0	--	0
13..	0			0			0	--	0
14..	0			0			0	--	0
15..	0			0			0	--	0
16..	0			0			0	--	0
17..	0			0			0	--	0
18..	0			0			0	--	0
19..	0			0			0	--	0
20..	0			0			0	--	0
21..	0			0			0	--	0
22..	0			0			0	--	0
23..	0			0			0	--	0
24..	0			0			0	--	0
25..	0			0			0	--	0
26..	0			0			0	--	0
27..	10			0			0	--	0
28..	12			0			280	6930 S	8740
29..	7.1	--		--			572	14200 S	22000
30..	4.6	--		--			187	11000	5550
31..	3.3	--		--			108	9510	2770
Total	37.0	--	200	6.5	--	40	1147	--	39060

S Computed by subdividing day.

B Computed from estimated-concentration graph.

LITTLE COLORADO RIVER BASIN--Continued

9-4012. LITTLE COLORADO RIVER AT CAMERON, ARIZ.--Continued

Suspended sediment, water year October 1960 to September 1961--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..	101	9050	2470						
2..	119	9220	2960						
3..	138	9190	3420						
4..	114	10700 S	6180						
5..	183	17500	8650						
6..	510	18700	25700						
7..	854	16200	37400						
8..	836	12800	28900						
9..	686	11100	20600						
10..	520	9300	13100						
11..	385	7780	8090						
12..	310	6420	5370						
13..	266	6000	4310						
14..	195	6040	3180						
15..	160	4600	1990						
16..	133	3150	1130						
17..	104	2400	674						
18..	88	2320	551						
19..	70	1860	352						
20..	40	1240	134						
21..	25	1500	101						
22..	15	1470	60						
23..	5	1400 B	18						
24..	.2	1000 B	1						
25..	0	--	0						
26..	0	--	0						
27..	0	--	0						
28..	0	--	0						
29..	0	--	0						
30..	0	--	0						
31..	--	--	--						
Total	5857.2	--	175341	0	--	0	0	--	0
	JULY			AUGUST			SEPTEMBER		
1..	0			158	--	45000	93	72200	18800
2..	0			171	--	60000	75	70400	14800
3..	29			233	--	111000	60	69200	11600
4..	13			80	--	20000	50	65400	9160
5..	0			129	--	40000	45	60000 B	7600
6..	0			211	99400 S	63000	40	55000 B	6200
7..	0			155	92000	41400	35	50000 B	4900
8..	0			40	94500	11000	30	50000 B	4200
9..	0			13	81500	2970	664	123000 S	392000
10..	0			10	64500	1810	982	160000 S	494000
11..	0			10	52000	1460	180	108000	56400
12..	0			10	--	1000	30	96600	14000
13..	0			5	--	450	25	89200	6470
14..	0			5	--	400	17	76500	3640
15..	0			5	--	350	16	75600	3390
16..	0			15	--	3000	15	72500	3040
17..	0			59	92700 S	21000	13	72100	2620
18..	0			43	98000	12200	11	71400	2200
19..	0			269	126000 S	101000	10	69200	1940
20..	0			881	111000	284000	10	67600	1890
21..	0			1020	92000	272000	60	67900	11400
22..	0			409	79000	90500	60	118000	20500
23..	0			227	73500	46700	40	110000	12800
24..	0			131	75800	27800	25	91900	6660
25..	0			84	75800	17800	18	83500	4210
26..	0			45	79400	10000	12	83100	2790
27..	0			30	98000	8530	8	83400	1870
28..	0			20	90000	5220	5	68400	958
29..	0			67	84300 S	18200	4	69800	782
30..	0			114	91500	30200	3	68000 B	570
31..	314			120	80000	26900	--	--	--
Total	356	--	100000	4768	--	1374890	2656	--	1121390

Total discharge for year (cfs-days)..... 19541.8
 Total load for year (tons)..... 3498271

S Computed by subdividing day.

B Computed from estimated-concentration graph.

COLORADO RIVER BASIN--Continued

9-4012. LITTLE COLORADO RIVER AT CAMERON, ARIZ.--Continued

Particle-size analysis of suspended sediment, water year October 1960 to September 1961
 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
 P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time per- sue (° F)	Water tem- per- ature (° F)	Sam- pling point	Discharge (cfs)	Sediment concentra- tion (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis
							Percent finer than size indicated, in millimeters										
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	
April 19, 1960....	1800	65		13400	4880		--	42	51	86	98	100		VPWC			
Sept. 12, 1961....	1800	73		50	102000		58	72	79	80	84	95	100	VPWC			

COLORADO RIVER MAIN STEM

9-4095. COLORADO RIVER NEAR GRAND CANYON, ARIZ.

LOCATION--At gaging station on left bank at Kaibab Bridge, 0.2 mile upstream from Bright Angel Creek, 11 miles by trail northeast of Grand Canyon, 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 1961.

Water temperatures: October 1936 to October 1942, September 1943 to September 1961.

Sediment records: October 1925 to November 1942, September 1943 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 1,790 ppm Sept. 13; minimum, 337 ppm May 30 to June 26.

Hardness: Maximum, 965 ppm Sept. 13; minimum, 194 ppm May 30 to June 26.

Specific conductance: Maximum daily, 2,390 micromhos Oct. 17; minimum daily, 492 micromhos June 20.

Water temperatures: Maximum daily, 41,600 ppm Sept. 10; minimum daily, 16 ppm Dec. 25-31.

Sediment concentrations: Maximum daily, 41,600 ppm Sept. 10; minimum daily, 203 tons Dec. 25.

EXTREMES, 1925-42, 1943-61.--Dissolved solids: Maximum, 1,890 ppm Sept. 21-30, 1934; minimum, 225 ppm June 11-20, 1942.

Hardness: Maximum, 965 ppm Sept. 13, 1961; minimum, 137 ppm June 11-17, 1926.

Specific conductance: Maximum, 2,900 micromhos Sept. 6, 1940; minimum, 341 micromhos June 15, 1942.

Water temperatures: Maximum, 88°F July 17, 1944; minimum, freezing point on several days during January and February 1948, December 1955.

Sediment concentrations: Maximum daily, 138,000 ppm Sept. 13, 1927; minimum daily, 16 ppm Dec. 25-31, 1960.

Sediment loads: Maximum daily, 27,600,000 tons Sept. 13, 1927; minimum daily, 196 tons Oct. 11, 1956.

REMARKS--Values reported for sodium (Na) are determined by analysis and do not include potassium (K). Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 1-13, 1960....	4411	18	0.01	148	49	210	7.9	197	558	194	0.6	12	0.19	4370	1.86	16300	570	408	3.8	1900	8.1
Oct. 14-15.....	5855	---	---	152	42	193	---	206	---	---	---	---	---	1270	1.73	20100	550	381	3.6	1790	7.7
Oct. 16-18.....	8163	---	---	226	45	236	---	184	---	---	---	---	---	1700	2.31	37500	750	599	3.7	2200	8.0
Oct. 19-31.....	7625	---	---	149	37	191	---	228	---	---	---	---	---	1230	1.67	25300	525	338	3.6	1700	7.7
Nov. 1-11.....	6269	---	---	143	43	186	---	220	---	---	---	---	---	1230	1.67	20800	535	354	3.5	1710	7.8
Nov. 12-30.....	6448	---	---	134	41	177	---	224	---	---	---	---	---	1130	1.54	19700	505	322	3.4	1630	7.7
Dec. 1.....	5300	---	---	120	40	175	---	214	---	---	---	---	---	1080	1.47	15400	466	290	3.5	1570	8.0
Dec. 2-3.....	1855	---	---	126	40	187	---	228	---	---	---	---	---	1130	1.54	5660	478	291	3.7	1640	7.8
Dec. 4-5.....	2355	---	---	116	41	217	---	248	---	---	---	---	---	1220	1.66	7760	490	282	3.6	1570	7.9
Dec. 6-31.....	5372	---	---	113	41	176	---	223	---	---	---	---	---	1070	1.46	15300	484	282	3.6	1570	7.7
Dec. 26-31.....	5020	---	---	128	43	198	---	231	---	---	---	---	---	1170	1.59	15800	495	306	3.9	1710	7.8
Jan. 1-25, 1961.....	4616	17	0.1	132	43	202	7.0	246	454	199	5	12	.20	1200	1.63	15000	508	306	3.9	1780	7.6
Jan. 26-Feb. 28.....	6157	---	---	111	38	174	---	210	---	---	---	---	---	1020	1.39	17000	456	267	3.7	1550	7.5
Mar. 1-30.....	6075	---	---	109	45	192	---	220	---	---	---	---	---	1040	1.41	17100	456	276	3.9	1600	7.8

COLORADO RIVER BASIN--Continued
 9-4025. COLORADO RIVER NEAR GRAND CANYON, ARIZ.--Continued
 Temperature (°F) of water, water year October 1960 to September 1961

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

COLORADO RIVER MAIN STEM--Continued

9-4025. COLORADO RIVER NEAR GRAND CANYON, ARIZ.--Continued

Suspended sediment, water year October 1960 to September 1961
(where no concentrations are reported, loads are estimated)

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..	4400	595	7070	6080	1400	23000	5300	450	6440
2..	4300	--	6400	6070	1210	19800	2100	455	2580
3..	4220	--	5700	5940	925	14800	1610	455	1980
4..	4100	--	5100	5950	790	12700	1750	320	1490
5..	4020	--	4600	6060	700	11500	2980	310	2490
6..	3920	390	4130	6140	650	10800	4260	360	4140
7..	3890	360	3780	6150	640	10600	4970	--	4600
8..	3940	335	3560	6290	655	11100	5470	--	4400
9..	3980	330	3550	6700	950	17200	5700	--	3800
10..	4500	330	4010	7020	1870	35400	5870	--	3300
11..	5120	520	7190	6560	1480	26200	6000	--	3100
12..	5570	4400	66200	6500	2060	36200	6170	--	2700
13..	5380	15200	221000	6460	1770	30900	6100	143	2360
14..	5830	8400	132000	6430	1090	18900	5900	150	2390
15..	5880	15000 B	240000	6550	890	15700	5680	111	1700
16..	8280	24000 B	540000	6500	940	16500	5480	85	1260
17..	8340	22500	507000	6420	820	14200	56380	82	1190
18..	7870	10000	212000	6360	895	15400	5280	72	1030
19..	8550	9500	219000	6380	760	13100	5260	C 59	838
20..	9470	10600	271000	6430	720	12500	5220	C 59	832
21..	9660	16400	428000	6450	560	9750	5130	C 59	817
22..	9180	22000 B	550000	6390	395	6810	5080	C 59	809
23..	8470	14000 B	320000	6410	380	6580	4970	C 59	792
24..	7460	12600	254000	6420	380	6590	4820	C 59	768
25..	7060	10200	194000	6380	400	6890	4710	C 16	203
26..	6920	8100	151000	6490	420 B	7400	4750	C 16	205
27..	6740	5900 B	110000	6660	410	7370	4870	C 16	210
28..	6650	5550	63500	6570	400	7100	4990	C 16	216
29..	6460	2500	43600	6410	440	7620	5060	C 16	219
30..	6320	1900	32400	6310	455	7750	5180	C 16	224
31..	6200	1600	26800	--	--	--	5270	C 16	228
Total	192660	--	4636590	191480	--	440360	151290	--	57311
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..	5380	C 34	494	5650	C 55	839	6170	4200	70000
2..	5350	C 34	491	5650	C 55	839	5820	2720	42700
3..	5310	C 34	487	5680	C 55	843	5740	1280	19800
4..	5180	C 34	476	5600	C 55	832	5650	720	11000
5..	4970	C 34	456	5490	C 55	815	5700	568	8740
6..	4700	C 34	431	5540	C 55	823	5950	--	9200
7..	4450	C 20	240	5660	C 55	841	5830	--	8200
8..	4240	C 20	229	5690	C 55	845	5740	--	7700
9..	4100	C 20	221	5700	C 55	846	5690	470	7220
10..	4040	C 20	218	5680	C 55	843	5680	500	7670
11..	3920	C 20	212	5580	C 55	829	5780	480	7490
12..	3860	C 20	208	5570	C 55	827	5820	440	6910
13..	3880	C 20	210	5570	C 55	827	5710	400	6170
14..	3950	C 20	213	5580	C 55	828	5540	420	6280
15..	4070	C 20	220	5640	C 55	838	5280	430	6130
16..	4220	C 20	228	5680	C 55	843	5170	390	5440
17..	4380	C 20	237	5680	C 55	843	5050	350	4770
18..	4530	C 20	245	5620	C 55	835	5140	355	4930
19..	4730	C 29	370	5520	C 55	820	5620	385	5840
20..	4830	C 29	378	5510	C 55	818	5880	400	6350
21..	4910	C 29	384	5540	C 55	823	6130	550	9100
22..	5000	C 29	392	5940	53	850	6290	630	10700
23..	5120	C 29	401	7570	250	5110	6360	790	13600
24..	5140	C 29	402	9580	780	20200	6830	1090	20100
25..	5130	C 29	402	11400	1400	43100	6950	1240	23300
26..	5120	C 29	401	10100	1400	38200	6880	1320	24500
27..	5120	C 29	401	7900	450	9600	6870	1110	20400
28..	5120	C 29	401	7570	1510	30900	6970	1010	19000
29..	5170	C 29	405	--	--	--	7440	950	19100
30..	5350	42	607	--	--	--	8580	1830	42400
31..	5560	52	781	--	--	--	8660	1830	42800
Total	146830	--	11241	177890	--	165457	190920	--	497740

B Computed from estimated-concentration graph.
C Composite period.

COLORADO RIVER MAIN STEM--Continued

9-4025, COLORADO RIVER NEAR GRAND CANYON, ARIZ.--Continued

Suspended sediment, water year October 1960 to September 1961--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..	8520	1460	33600	10900	1570	46200	36500	4610	454000
2..	8180	1300	28700	10300	1460	40600	36500	4410	435000
3..	8480	1290	29500	9880	1310	34900	37800	3780	386000
4..	8640	1390	32400	10400	1300 B	37000	38700	3350	350000
5..	8630	1600	37300	11500	1300 B	40000	39200	3500	370000
6..	8660	1500 B	35000	13200	1900 B	68000	39200	3400	360000
7..	8820	1500 B	36000	15300	3300	136000	37400	3000 B	300000
8..	8820	1500 B	36000	17300	4380	205000	34400	2600 B	240000
9..	10600	3410 S	101000	18300	4400	217000	31700	2390	205000
10..	12000	4260	138000	17300	3500	163000	30200	2040	166000
11..	10900	3750	110000	15800	3100	132000	29300	1850	146000
12..	11800	4160	133000	14600	2850	112000	28900	1860	145000
13..	11800	3570	114000	13900	2490	93400	29800	2000	161000
14..	11100	2710	81200	13400	1860	67300	31300	2000	169000
15..	10700	2510	72500	13200	1690	60200	32100	1800	156000
16..	10400	2220	62300	14300	2420	93400	31300	1510	128000
17..	9970	1920	51700	17800	4820	232000	30600	1380	114000
18..	9900	1620	43300	19900	4400	236000	28800	1280	99500
19..	9350	1460	36900	18700	2990	151000	27400	1200	88800
20..	8520	1460	33600	16900	2460	112000	26400	1160	82700
21..	8080	1360	29700	17100	2920	135000	25200	1300	88500
22..	8070	1200	26100	18500	3570	178000	24000	1280	82900
23..	8470	1160	28500	19500	3290	173000	22400	1090	65900
24..	8690	1100	25800	22000	3390	201000	21100	930 B	53000
25..	9080	1170	28700	24800	4290	287000	20100	830	45000
26..	10300	1480	41200	26200	4490	318000	19100	740	38200
27..	11700	2100	66300	28400	4880	374000	17800	690	33200
28..	12400	2380	79700	30200	4570	373000	16400	660	29200
29..	12000	1990	64500	31300	4790	405000	15200	700	28700
30..	11500	1890	58700	32800	4370	387000	14300	610	23600
31..	--	--	--	34800	4780	449000	--	--	--
Total	296080	--	1693200	578480	--	5557000	853100	--	5044200
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..	13500	510	18600	3920	140	1480	8880	13600	326000
2..	12600	510	17400	3720	850	8540	8400	13900	315000
3..	11700	570	18000	4010	6990	75700	6310	12500	213000
4..	10600	770	22000	3880	3000	31400	5990	15000 B	240000
5..	11200	550	16600	6060	9250	151000	5510	9800	146000
6..	10400	1100 B	30900	6030	14600	238000	5210	8700	122000
7..	9420	2000 B	51000	9340	18900	477000	5860	6600	104000
8..	9000	3200 B	78000	9170	28000	693000	5640	7600 B	120000
9..	8370	4100	92700	9470	17700	453000	8580	14300 S	448000
10..	7930	1650	35300	8130	25500	560000	19700	41600	2290000
11..	7760	840	17600	7120	27000 B	520000	22800	27000	1660000
12..	7660	840	17400	6420	21000 B	360000	25400	34400	2450000
13..	6810	660	12100	5820	15500	244000	22400	29100	1760000
14..	6490	660 B	12000	5470	10500	155000	17300	20100	939000
15..	6290	850	14400	4580	10400	129000	13100	21800	771000
16..	6210	600	10100	4190	7300	82600	12000	22800	739000
17..	5900	1000	15900	4130	7500	83600	11000	20300	603000
18..	5480	1350	20000	4180	7250	81800	11200	16500	499000
19..	5140	1160	16100	5090	5750	79000	12000	27000	875000
20..	4790	830	10700	6550	6600	117000	12800	22400	774000
21..	4490	700	8490	7480	19000	384000	13400	9950	360000
22..	4280	550 B	6400	8050	21300	463000	16400	11800	523000
23..	4180	380 B	4300	8020	21800	472000	16000	17000 B	730000
24..	4160	270	3030	6690	15200	275000	12600	16000	544000
25..	3950	280	2990	5870	20500	325000	10900	16600	489000
26..	3790	360	3680	5540	17300	259000	10900	17600	518000
27..	3670	240	2380	5060	18500	253000	12400	16000	536000
28..	3650	600	5910	4840	15400	201000	14800	13300	531000
29..	3590	650	6300	5140	10500	146000	15500	10500	439000
30..	3560	300	2880	6900	6900	129000	14100	10000	381000
31..	3600	160	1560	7840	12300	260000	--	--	--
Total	210170	--	574720	188710	--	7708120	377080	--	20445000
Total discharge for year (cfs-days).....									3554690
Total load for year (tons).....									46830939

S Computed by subdividing day.

B Computed from estimated-concentration graph.

COLORADO RIVER BASIN--Continued

9-4025. COLORADO RIVER NEAR GRAND CANYON, ARIZ.--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;

P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (° F)	Sam- pling point	Discharge (cfs)	Sediment concentra- tion (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis		
							Percent finer than size indicated, in millimeters												
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000		2.000	
Nov. 6, 1960.....	1630	58		6170	686		54	68		92	100		99		100				PWC
Feb. 25, 1961.....	1600	46		12800	b 2100		43	26		50	97		99		100				SPWC
Apr. 23.....	1100	55		11800	b 4200		48	58		84	98		100		100				SPWC
May 28.....	1415	73		30400	4140		12	16		28	65		89		99		100		VPWC
June 2.....	1230	67		36500	3520		13	16		27	54		79		95		100		VPWC
June 18.....	0800	76		29100	1130		18	26		38	58		78		96		100		VPWC
Aug. 5.....	0930	80		3640	9180		59	71		93	100		100		100		100		PWC

b Computed from estimated-concentration graph.

VIRGIN RIVER BASIN

9-4150. VIRGIN RIVER AT LITTLEFIELD, ARIZ.

LOCATION.--At gaging station 0.4 mile downstream from Beaver Dam Wash, 0.4 mile upstream from Littlefield, Mohave County, and 36 miles upstream from waterline of Lake Mead at elevation 1,221 feet above mean sea level.

DRAINAGE AREA.--5,090 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: July 1949 to September 1961.

Water temperatures: October 1947 to September 1961.

Sediment records: October 1947 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 2,630 ppm Aug. 1-31; minimum, 1,960 ppm Oct. 11-13.

Hardness: Maximum, 1,570 ppm Aug. 1-31; minimum, 1,020 ppm Dec. 1-31.

Specific conductance: Maximum daily, 3,800 microhmhos Aug. 11; minimum daily, 2,360 microhmhos Oct. 12.

Water temperatures: Maximum, 88°F July 16; minimum, 44°F Jan. 28.

Sediment concentrations: Maximum daily, 128,000 ppm Sept. 9; minimum daily, 194 ppm July 3.

EXTREMES, 1949-50.--Dissolved solids (1949-50): Maximum, 3,620 ppm Sept. 2, 1960; minimum, 524 ppm Mar. 16, 1958.

Hardness (1949-50): Maximum, 2,060 ppm Sept. 2, 1960; minimum, 334 ppm Mar. 16, 1958.

Specific conductance (1949-50): Maximum, 3,800 microhmhos Oct. 12, 1960; minimum, 1,960 microhmhos Apr. 28, 1952.

Water temperatures (1949-50): Maximum, 88°F July 16, 1958; minimum, 44°F Jan. 28, 1949.

Sediment concentrations (1949-50): Maximum, 128,000 ppm Sept. 9, 1959; minimum, 104 ppm July 9, 1959.

Sediment loads: Maximum daily, 1,740,000 tons Aug. 25, 1955; minimum daily, 16 tons July 9, 1959.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carb. sulfate (SO ₄)	Chloride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		So- ad- sorp- tion ratio	Specific conductance (microhmhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 1-10, 14-31, 1960.	86.7	20	0.01	319	101	278	25	306	0	1030			1.6	2320	3.16	543	1210	959	3.5	3140
Oct. 11-13.....	237	11	0.04	329	71	189	16	280	0	940			1.9	1860	2.67	1250	1110	880	2.5	2610
Nov. 1-30.....	211	18	0.01	297	80	256	21	324	0	890			1.7	2060	2.80	1170	1070	804	3.4	2860
Dec. 1-31.....	130	16	0.01	269	85	256	19	344	0	808			2.7	1990	2.71	698	1020	738	3.5	2800
Jan. 1-31, 1961....	125	17	0.00	309	68	253	23	347	0	838			1.6	2030	2.76	685	1050	765	3.4	2850
Feb. 1-28.....	130	16	0.01	295	86	262	23	343	0	849			1.3	2060	2.80	723	1090	809	3.5	2880
Mar. 1-31.....	128	19	0.01	297	84	254	24	317	0	899			1.3	2090	2.84	722	1080	825	3.4	2890
Apr. 1-30.....	74.5	22	0.01	333	100	254	26	332	0	1040			1.3	2290	3.11	461	1240	968	3.1	3080
May 1-31.....	62.2	21	0.01	339	107	234	27	273	0	1100			1.3	2310	3.14	388	1280	1060	2.8	3080
June 1-30.....	64.7	21	0.01	327	112	239	27	270	0	1100			1.5	2310	3.14	404	1280	1050	2.9	3080
July 1-31.....	135	19	0.01	393	108	208	25	280	0	1160			2.3	2370	3.22	864	1420	1200	2.4	3120

Aug. 1-31, 1961.....	272	19	--	497	80	211	22	313	0	1360	288	1.0	.77	2630	3.58	1930	1310	2.3	3260	7.8	
Sept. 1-30.....	366	19	--	421	89	233	23	306	0	1220	316	2.1	.77	2470	3.36	2440	1420	1160	2.7	3190	7.8
Weighted average	--	19	--	364	88	239	23	314	0	1070	330	1.4	0.79	2290	3.11	925	1270	1010	3.0	3040	7.9
Time-weighted average.....	150	19	--	342	91	244	24	313	0	1020	341	1.2	0.81	2240	--	--	1230	971	3.1	3020	7.9
Tons per day....	--	7.5	--	147	36.0	97.0	9.3	127	0	431	134	0.6	0.32	--	--	--	--	--	--	--	--

Temperature (°F) of water, water year October 1960 to September 1961

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

VIRGIN RIVER BASIN--Continued

9-4150. VIRGIN RIVER AT LITTLEFIELD, ARIZ.--Continued

Suspended sediment, water year October 1960 to September 1961

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..	58	556	87	98	1200	318	152	3210	1320
2..	58	4680	733	93	1350	339	156	1970	830
3..	58	4380	686	93	1270	319	149	1820	732
4..	62	800	134	93	1170	294	147	1870	742
5..	62	360	60	98	1640	434	141	1920	731
6..	62	304	51	168	8420 S	5090	141	1620	617
7..	60	252	41	1610	70600 S	341000	155	3250	1360
8..	60	260	42	378	18000	18400	160	2920	1260
9..	69	3000	559	209	7800	4400	165	4190	1870
10..	87	4000 A	940	185	4200	2100	160	3500	1510
11..	417	28400 S	35600	181	3400	1660	128	2850	985
12..	169	7500	3420	183	3370	1670	128	2630	909
13..	124	4200	1410	181	3560	1740	130	2430	853
14..	110	3100	921	183	2700	1330	125	1840	621
15..	114	2200	677	174	2970	1400	125	2320	783
16..	112	2070	626	190	4380	2250	120	1750	567
17..	110	2370	704	158	2470	1140	115	1810	562
18..	110	2530	781	158	2300	981	120	1820	590
19..	108	2270	662	163	1840	810	125	2030	685
20..	100	1800	486	156	1940	817	120	2070	671
21..	94	2300	584	160	1980	855	120	1970	638
22..	98	2600	688	156	2190	922	115	2100	652
23..	89	1440	346	156	1940	817	115	2070	643
24..	94	1600	406	152	1760	722	115	1950	605
25..	98	2040	540	156	2050	863	120	1620	525
26..	94	1300	330	156	1820	767	120	1940	629
27..	93	1170	294	160	2400	1040	115	2120	658
28..	87	1300	305	174	4200	1970	115	1720	534
29..	91	1150	283	160	2600	1120	110	1880	558
30..	94	1100	279	152	1680	689	105	1390	394
31..	96	850	220	--	--	--	110	1600	475
Total	3138	--	52895	6334	--	396257	4022	--	24509
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..	110	1340	398	145	2420	947	152	2220	911
2..	112	1760	532	137	2250	832	160	2600	1210
3..	112	1090	330	141	1320	503	176	3870	1840
4..	116	1310	410	137	2320	858	176	2580	1230
5..	118	1110	354	137	1990	736	174	2460	1160
6..	120	1590	515	134	1890	684	174	2620	1230
7..	112	1260	381	137	2020	747	178	3250	1560
8..	116	644	202	139	2000	751	169	2760	1260
9..	122	768	253	137	2150	795	163	2360	1040
10..	124	1880	629	134	3960	1430	154	2040	848
11..	122	1890	623	156	2100	885	141	1970	750
12..	122	1560	514	141	2120	807	114	1460	449
13..	122	1820	600	141	2000	761	100	966	261
14..	116	2710	849	130	1780	625	96	939	243
15..	118	1390	443	126	1340	456	94	1230	312
16..	128	1980	684	128	2110	729	93	1370	344
17..	128	1770	612	130	1480	519	96	1400	363
18..	122	2260	744	120	1420	460	93	1230	309
19..	118	1860	593	112	1010	305	141	2520	959
20..	120	1730	561	122	1960	646	122	1690	557
21..	122	1840	606	110	979	291	108	1760	513
22..	116	1500	470	104	2670	750	80	853	184
23..	122	1460	481	96	1640	425	78	858	181
24..	124	7490	2510	100	962	260	81	1080	236
25..	114	6220	1910	98	1210	320	91	1260	310
26..	116	1780	557	133	3420	1230	134	5140	1860
27..	163	1720	757	158	1790	764	145	3280	1280
28..	202	1980	1080	158	2170	925	154	3070	1480
29..	147	3510	1390	--	--	--	149	3130	1260
30..	141	2830	1080	--	--	--	114	1950	600
31..	130	2940	1030	--	--	--	80	858	185
Total	3875	--	22098	3641	--	19442	3980	--	24725

S Computed by subdividing day.

A Computed from partly estimated concentration graph.

VIRGIN RIVER BASIN--Continued

9-4150, VIRGIN RIVER AT LITTLEFIELD, ARIZ.--Continued

Suspended sediment, water year October 1960 to September 1961--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..	64	773	134	62	698	117	64	442	76
2..	67	8940	1620	62	416	70	64	422	73
3..	72	758	147	62	486	81	64	400	69
4..	85	7050	470	62	1420	238	64	499	86
5..	102	3330	917	62	415	69	65	365	64
6..	106	4370	1250	62	340	57	65	305	54
7..	76	5550	1140	64	567	98	65	448	79
8..	145	3170	1240	65	370	65	67	372	67
9..	108	2620	764	64	374	65	67	252	46
10..	72	1370	266	62	353	59	65	1460	256
11..	76	907	186	60	327	53	65	298	52
12..	93	1510	379	64	474	82	65	237	42
13..	83	1130	253	64	391	68	65	253	44
14..	94	1170	297	62	334	56	65	280	49
15..	72	664	129	60	324	52	65	249	44
16..	60	554	90	60	422	68	65	242	42
17..	58	563	88	60	1230	199	65	322	57
18..	58	611	96	60	433	70	65	463	81
19..	62	512	86	60	316	51	65	445	78
20..	67	613	111	60	354	57	65	301	53
21..	65	2210	388	62	307	51	65	447	78
22..	62	518	87	62	312	52	64	326	56
23..	60	396	64	62	372	62	64	411	71
24..	60	425	69	62	322	54	64	339	59
25..	60	443	72	62	315	53	64	369	64
26..	60	500	81	62	410	69	64	379	65
27..	62	586	98	64	434	75	64	283	49
28..	62	522	87	64	593	102	64	270	47
29..	62	364	61	64	480	83	64	343	59
30..	62	405	68	64	602	104	64	358	62
31..	--	--	--	64	437	76	--	--	--
Total	2235	--	10738	1929	--	2456	1941	--	2022
	JULY			AUGUST			SEPTEMBER		
1..	62	502	84	163	21700	9550	194	36000	19600
2..	62	394	66	65	5800	1020	91	3600	885
3..	65	194	34	59	1500	239	84	1300	295
4..	780	48400 S	201000	565	77000 S	158000	89	900	216
5..	572	49000 S	87900	140	61500	24100	93	1020	256
6..	168	15000	6800	89	23500	5650	96	440	114
7..	89	1460	351	70	3600	680	96	510	132
8..	75	937	190	63	1570	267	100	280	76
9..	72	827	161	65	795	140	1400	128000 S	600000
10..	72	718	140	163	8360	28900	345	73500 S	80100
11..	72	605	118	509	50200 S	88000	145	28000	11000
12..	73	567	112	1070	68200 S	293000	111	5230	1570
13..	76	488	100	192	30000	15600	111	1950	584
14..	78	487	103	98	13500	3570	111	800	240
15..	79	1760	375	84	3020	685	109	520	153
16..	81	1590	348	89	2390	574	107	470	136
17..	81	474	104	93	1930	485	478	3930 S	24100
18..	83	1170	262	86	1200	279	5330	105000 S	1350000
19..	83	722	162	83	600	134	542	62000	94100
20..	81	607	133	89	555	133	274	45000	34500
21..	84	2820	640	143	25100 S	10400	218	14000	8240
22..	83	409	92	400	69800 S	119000	156	1600	674
23..	84	744	169	289	105000	88000	127	1810	621
24..	86	700 A	160	1590	93800 S	502000	91	1130	278
25..	116	30100 S	11900	830	46700 S	127000	81	723	158
26..	79	4200	896	159	10400	4460	81	592	129
27..	81	5000	1090	117	2500	790	78	432	91
28..	83	800	179	107	900	260	78	539	114
29..	83	700	157	100	400 A	110	84	1150	261
30..	207	39900 S	39300	407	44800 S	112000	83	519	116
31..	408	86400 S	147000	460	63300 S	114000	--	--	--
Total	4198	--	500126	8437	--	1709026	10983	--	2228739
Total discharge for year (cfs-days).....								54713	
Total load for year (tons).....								4993033	

S Computed by subdividing day.

A Computed from partly estimated concentration graph.

VIRGIN RIVER BASIN--Continued
9-4150. VIRGIN RIVER AT LITTLEFIELD, ARIZ.--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (° F)	Sam- pling point	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis
							Percent finer than size indicated, in millimeters										
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	
Nov. 7, 1960.....	0630	55		1920	63000		28		47		71	88	99	100			VPNC
Nov. 7.....	0630	55		1920	63000						71	86	98	100			S
Nov. 15.....	0730	54		1920	2820		24		41		64	76	98	100			VPNC
Nov. 30.....	1200	56		156	1910		16		30		64	82	98	100			VPNC
Dec. 15.....	1200	53		d	2340		10		20		52	81	98	100			VPNC
Dec. 31.....	1700	58		d	1500		11		19		47	83	98	100			VPNC
Jan. 15, 1961.....	0815	50		116	1600		11		19		49	84	98	100			VPNC
Jan. 15.....	0815	50		116	1600		--		--		49	81	97	100			S
Jan. 31.....	1700	58		145	3080		12		22		51	84	98	100			VPNC
Jan. 31.....	1700	58		145	3080		1		18		51	84	98	100			VPN
Feb. 14.....	1400	63		130	1930		11		18		39	79	98	100			VPNC
Feb. 28.....	1200	57		163	2510		12		20		41	76	98	100			VPNC
Feb. 28.....	1200	57		163	2510		2		17		41	76	98	100			VPN
Mar. 15.....	1700	66		91	1180		16				44	80	98	100			VPNC
Mar. 31.....	1700	73		78	795		15	21	25		30	51	85	100	--		VPNC
Apr. 6.....	1740	72		91	2320		33		43		64	90	99	100			VPNC
Apr. 6.....	1740	72		91	2320		1		32		64	87	98	100			SPN
July 4.....	1330	79		1880	101000		30		56		79	93	99	100			VPNC
July 4.....	1330	79		1880	101000		10		49		79	90	99	100			SPN
July 5.....	0600	74		610	50700		41		68		89	97	100	--			VPNC
July 6.....	1730	82		142	12300		66		90		97	99	100	--			VPNC
July 31.....	1200	78		1520	141000		34		64		91	97	100	--			SPNC
Aug. 1.....	1630	87		136	20200		58		87		96	98	100	--			VPNC
Aug. 2.....	1700	81		59	2400		47		67		78	86	99	100			VPNC
Aug. 4.....	0630	77		1610	126000		33		54		80	91	99	100			SPNC
Aug. 5.....	0800	76		168	65000		63		91		97	99	100	--			VPNC
Aug. 6.....	1830	82		73	16300		71		93		97	99	100	--			VPNC
Aug. 11.....	1200	73		497	65900		37		67		85	98	100	--			VPNC
Aug. 12.....	0630	68		3380	148000		25		46		86	96	100	--			SPNC
Aug. 13.....	0700	73		254	32900		64		89		97	99	100	--			VPNC

Aug. 14, 1961	1600	85	93	11000		75	91	96	98	100	--		VPWC
Aug. 22	1600	82	710	91900		24	65	96	98	100	--		VPWC
Aug. 22	1600	82	710	91900		--	80	94	98	100	--		S
Aug. 23	1800	77	277	106000		53	80	97	98	100	--		VPWC
Aug. 24	0600	75	2400	145000		23	47	74	87	98	100		SPWC
Aug. 25	0600	75	1570	63900		38	60	91	96	99	100		SPWC
Aug. 26	0600	72	191	12500		60	87	96	98	100	--		VPWC
Sept. 9	0600	62	1980	143000		30	51	80	93	99	100		SPWC
Sept. 10	0700	62	418	84900		52	75	93	97	99	100		VPWC
Sept. 11	0600	62	159	30300		65	90	97	99	100	--		VPWC
Sept. 18	0600	58	10600	73700		36	59	75	83	93	99	100	SPWC
Sept. 18	0630	52	660	62200		49	75	93	97	100	--		VPWC

d Daily mean discharge.

COLORADO RIVER MAIN STEM

9-4210. LAKE MEAD AT HOOVER DAM, ARIZ.-NEV.

LOCATION.--Midway between the intake towers, 225 feet upstream from the gaging station on State line between Mohave County, Ariz., and Clark County, Nev.
 DRAINAGE AREA.--167,800 square miles, approximately, upstream from gaging station.
 RECORDS AVAILABLE.--Chemical analyses: October 1940 to September 1961.
 REMARKS.--Samples are collected by the U.S. Bureau of Reclamation and analyzed by the Metropolitan Water District of Southern California, La Verne, Calif.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Depth (feet)	Elevation (feet)	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Dissolved solids (calculated)	Hardness as CaCO ₃	Noncarbonate hardness as CaCO ₃	Specific conductance (micro-mhos at 25°C)	pH
Oct. 3, 1960...	5	1,165	78.6	9.0	71	24	77	4	122	1	240	67	1.9	555	274	172	884	8.5
Oct. 3,	25	1,145	78.1	--	--	--	--	--	122	0	--	66	--	--	--	--	886	7.7
Oct. 3,	75	1,120	77.0	--	--	--	--	--	122	--	--	66	--	--	275	--	891	7.7
Oct. 3,	75	1,070	70.7	--	--	--	--	--	122	1	--	66	--	--	--	--	889	8.3
Oct. 3,	105	1,070	67.7	--	--	--	--	--	122	--	--	73	--	--	315	--	886	7.8
Oct. 3,	125	1,045	62.6	9.8	84	25	82	4	144	0	265	73	2.3	617	313	195	980	8.0
Oct. 3,	150	1,020	58.9	--	--	--	--	--	--	--	--	74	--	--	319	--	995	7.8
Oct. 3,	175	995	56.4	10	87	25	84	4	150	0	269	74	2.3	631	320	197	990	8.2
Oct. 3,	200	970	55.5	--	--	--	--	--	--	--	--	76	--	--	323	--	1,020	7.7
Oct. 3,	225	945	54.5	--	--	--	--	--	153	0	--	75	--	--	--	--	1,020	8.1
Oct. 3,	250	920	54.1	--	--	--	--	--	--	--	--	77	--	--	326	--	1,020	7.7
Oct. 3,	275	895	53.6	10	90	26	88	4	153	1	278	79	2.6	656	332	205	1,020	8.5
Oct. 3,	300	870	53.5	--	--	--	--	--	--	--	--	80	--	--	331	--	1,040	7.9
Oct. 3,	325	845	53.5	9.8	90	26	89	4	157	0	273	81	2.8	654	332	203	1,040	8.1
Oct. 3,	350	820	53.4	--	--	--	--	--	--	--	--	83	--	--	334	--	1,060	8.8
Oct. 3,	375	795	53.2	--	--	--	--	--	157	1	--	82	--	--	--	--	1,060	7.5
Oct. 3,	400	770	53.3	--	--	--	--	--	--	--	--	84	--	--	335	--	1,060	7.8
Oct. 3,	425	745	53.1	10	91	27	92	4	139	2	282	85	2.7	676	336	204	1,060	8.6
Oct. 3,	445	725	53.6	--	--	--	--	--	166	0	--	86	--	--	--	--	1,060	8.3
Nov. 29,	5	1,163	62.6	8.4	79	26	83	4	135	0	265	70	1.4	604	302	191	945	7.4
Nov. 29,	25	1,143	63.0	--	--	--	--	--	135	--	--	71	--	--	--	--	940	8.0
Nov. 29,	50	1,118	63.3	--	--	--	--	--	--	--	--	71	--	--	302	--	945	7.9
Nov. 29,	75	1,093	63.0	--	--	--	--	--	135	0	--	69	--	--	--	--	940	8.2
Nov. 29,	100	1,068	63.5	--	--	--	--	--	--	--	--	69	--	--	300	--	945	8.0
Nov. 29,	125	1,043	62.8	--	--	--	--	--	134	0	--	69	--	--	--	--	940	8.2
Nov. 29,	150	1,018	62.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 29,	175	993	58.0	8.8	86	27	87	4	146	0	279	73	2.0	640	326	206	970	7.7
Nov. 29,	200	968	56.5	--	--	--	--	--	--	--	--	74	--	--	326	--	995	7.6
Nov. 29,	225	943	55.0	8.4	79	26	84	4	135	0	--	74	--	--	304	--	1,000	7.8
Nov. 29,	250	918	54.2	--	--	--	--	--	--	--	--	76	--	--	334	--	1,040	8.1
Nov. 29,	275	893	54.7	9.2	89	27	91	4	155	0	282	78	2.3	660	333	206	1,020	8.3

[illegible]

COLORADO RIVER MAIN STEM--Continued

9-4210. LAKE MEAD AT HOOVER DAM, ARIZ.-NEV.--Continued

Chemical analyses, in parts per million, water year October 1960 to September 1961--Continued

Date of collection	Depth (feet)	Elevation (feet)	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Dissolved solids (calculated)	Hardness as CaCO ₃	Noncarbonate hardness as CaCO ₃	Specific conductance (micro-mhos at 25 °C)	pH
Jan. 31, 1961	325	838	53.9	10	90	28	91	4	165	0	279	82	2.5	669	340	205	1,060	8.0
Jan. 31	350	813	53.9	--	--	--	--	--	--	--	--	83	--	--	340	--	1,080	7.9
Jan. 31	375	786	53.9	--	--	--	--	--	167	0	--	82	--	--	--	--	1,060	7.7
Jan. 31	400	763	53.9	--	--	--	--	--	--	--	--	83	--	--	342	--	1,060	7.9
Jan. 31	425	738	54.1	11	90	28	92	4	159	4	263	82	2.3	676	342	206	1,060	7.9
Jan. 31	438	723	54.1	--	--	--	--	--	170	0	--	83	--	--	--	--	1,060	7.9
Feb. 28	5	1,158	--	9.3	82	26	80	4	142	0	261	72	1.8	607	311	194	966	8.2
Feb. 28	25	1,136	--	--	--	--	--	--	142	0	--	72	--	--	311	--	965	8.2
Feb. 28	50	1,111	--	--	--	--	--	--	--	--	--	72	--	--	311	--	972	8.1
Feb. 28	75	1,086	--	--	--	--	--	--	142	0	--	72	--	--	311	--	972	8.1
Feb. 28	100	1,061	--	--	--	--	--	--	--	--	--	72	--	--	311	--	975	7.9
Feb. 28	125	1,036	--	--	--	--	--	--	142	0	--	72	--	--	311	--	974	8.1
Feb. 28	150	1,011	--	--	--	--	--	--	--	--	--	--	--	--	310	--	975	7.9
Feb. 28	175	986	--	9.5	82	26	80	4	142	0	267	72	1.8	613	311	196	974	7.9
Feb. 28	200	961	--	--	--	--	--	--	--	--	--	76	--	--	320	--	999	7.8
Feb. 28	225	936	--	9.8	88	28	87	4	156	0	280	80	2.4	657	331	205	1,040	7.9
Feb. 28	250	911	--	--	--	--	--	--	--	--	--	82	--	--	333	--	1,050	8.0
Feb. 28	275	886	--	9.4	90	30	99	4	163	0	293	82	3.3	702	344	212	1,110	8.0
Feb. 28	300	861	--	--	--	--	--	--	--	--	--	97	--	--	352	--	1,140	7.8
Feb. 28	325	836	--	--	--	--	--	--	166	0	--	99	--	--	351	--	1,150	7.6
Feb. 28	350	811	--	--	--	--	--	--	--	--	--	98	--	--	356	--	1,120	8.4
Feb. 28	375	786	--	9.3	90	31	106	5	162	2	300	99	3.5	727	352	215	1,140	7.8
Feb. 28	400	761	--	--	--	--	--	--	--	--	--	99	--	--	352	--	1,140	8.2
Feb. 28	438	723	--	--	--	--	--	--	167	0	--	99	--	--	352	--	1,140	8.2
Apr. 13	5	1,150	57.2	9.3	84	26	84	4	143	0	269	75	1.6	624	317	200	985	8.4
Apr. 13	25	1,130	56.0	--	--	--	--	--	144	0	--	--	--	--	--	--	985	8.2
Apr. 13	50	1,105	55.6	--	--	--	--	--	--	--	--	76	--	--	316	--	985	8.1
Apr. 13	75	1,080	56.2	--	--	--	--	--	139	2	--	--	--	--	--	--	980	8.5
Apr. 13	100	1,055	54.2	--	--	--	--	--	--	--	--	74	--	--	314	--	990	8.1
Apr. 13	125	1,030	54.4	9.8	84	26	86	4	142	2	269	77	1.8	631	317	197	990	8.4
Apr. 13	150	1,005	53.7	--	--	--	--	--	--	--	--	--	--	--	316	--	995	8.0
Apr. 13	175	980	53.7	9.8	86	27	91	4	150	0	281	82	1.6	657	326	203	1,030	8.4
Apr. 13	200	955	53.8	--	--	--	--	--	--	--	--	82	--	--	326	--	1,040	7.9
Apr. 13	225	930	53.2	9.8	90	28	97	4	149	1	291	90	2.6	687	338	214	1,080	8.5
Apr. 13	250	905	52.1	--	--	--	--	--	--	--	--	94	--	--	344	--	1,120	8.0
Apr. 13	275	880	52.6	9.8	91	29	105	4	137	4	296	96	3.0	718	346	211	1,110	8.6

COLORADO RIVER MAIN STEM--Continued
9-4210, LAKE MEAD AT HOOVER DAM, ARIZ.-NEV.--Continued

Chemical analyses, in parts per million, water year October 1960 to September 1961--Continued																		
Date of collection	Depth (feet)	Elevation (feet)	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Dissolved solids (calculated)	Hardness as CaCO ₃	Noncarbonate hardness as CaCO ₃	Specific conductance (micro-mhos at 25°C)	pH
June 8, 1961...	300	857	53.8	--	--	--	--	--	--	--	--	90	--	--	341	--	1,100	7.9
June 8.....	325	832	53.4	--	--	--	--	--	151	4	--	91	--	--	340	--	1,100	8.4
June 8.....	350	797	53.4	--	--	--	--	--	--	--	--	90	--	--	340	--	1,100	7.9
June 8.....	375	782	53.6	11	87	30	100	4	149	6	289	93	3.4	697	341	210	1,110	8.6
June 8.....	400	757	53.6	--	--	--	--	--	--	--	--	89	--	--	339	--	1,100	7.9
June 8.....	425	732	53.6	--	--	--	--	--	135	4	--	94	--	--	--	--	1,090	8.4
June 8.....	435	722	53.5	--	--	--	--	--	166	0	--	94	--	--	--	--	1,130	7.7
June 30.....	5	1,156	78.0	10	77	27	85	4	123	0	273	76	1.4	615	303	202	990	8.1
June 30.....	25	1,136	77.7	--	--	--	--	--	123	0	--	76	--	--	308	--	986	7.9
June 30.....	50	1,111	68.2	--	--	--	--	--	--	--	--	76	--	--	--	--	991	7.9
June 30.....	75	1,086	65.2	--	--	--	--	--	137	0	--	75	--	--	314	--	993	7.6
June 30.....	100	1,061	62.2	1	--	--	--	--	--	--	--	75	--	--	--	--	988	8.0
June 30.....	125	1,036	58.6	--	--	--	--	--	143	0	--	75	--	--	--	--	993	7.7
June 30.....	150	1,011	58.0	--	--	--	--	--	--	--	--	75	--	--	316	--	995	7.8
June 30.....	175	986	55.9	10	84	26	84	4	145	0	270	76	2.4	630	319	200	1,000	8.0
June 30.....	200	961	54.7	--	--	--	--	--	--	--	--	75	--	--	312	--	988	7.9
June 30.....	225	936	54.0	10	87	28	94	4	155	0	282	86	3.0	672	334	207	998	7.8
June 30.....	250	911	53.5	--	--	--	--	--	--	--	--	92	--	--	343	--	1,100	7.7
June 30.....	275	886	53.2	10	90	30	98	4	165	0	286	94	3.4	698	348	213	1,120	8.2
June 30.....	300	861	53.4	--	--	--	--	--	--	--	--	95	--	--	347	--	1,120	7.8
June 30.....	325	836	53.2	--	--	--	--	--	165	0	--	96	--	--	--	--	1,120	8.2
June 30.....	350	811	53.6	--	--	--	--	--	--	--	--	96	--	--	349	--	1,130	7.8
June 30.....	375	786	53.5	10	90	30	102	4	165	0	295	96	3.6	714	350	215	1,130	8.0
June 30.....	400	761	54.0	--	--	--	--	--	--	--	--	97	--	--	349	--	1,140	7.6
June 30.....	438	723	53.6	--	--	--	--	--	167	0	--	97	--	--	--	--	1,140	7.9
Aug. 1.....	5	1,153	81.5	10	77	27	86	4	122	0	277	77	1.3	620	303	203	984	8.0
Aug. 1.....	25	1,133	81.3	--	--	--	--	--	117	2	--	77	--	--	--	--	979	8.5
Aug. 1.....	50	1,108	79.7	--	--	--	--	--	--	--	--	76	--	--	301	--	983	7.8
Aug. 1.....	75	1,083	65.7	--	--	--	--	--	137	0	--	75	--	--	--	--	989	8.0
Aug. 1.....	100	1,058	61.5	--	--	--	--	--	--	--	--	74	--	--	317	--	993	8.3
Aug. 1.....	125	1,033	57.8	--	--	--	--	--	142	0	--	74	--	--	--	--	991	7.9
Aug. 1.....	150	1,008	55.5	--	--	--	--	--	--	--	--	--	--	--	319	--	998	7.9
Aug. 1.....	175	983	55.7	10	84	27	86	4	144	0	274	76	2.5	636	321	203	1,000	7.9
Aug. 1.....	200	958	55.1	--	--	--	--	--	--	--	--	78	--	--	324	--	1,020	7.9
Aug. 1.....	225	933	54.7	11	87	28	91	4	153	0	280	83	2.8	663	332	207	1,050	7.9
Aug. 1.....	250	908	54.3	--	--	--	--	--	--	--	--	87	--	--	335	--	1,080	7.8
Aug. 1.....	275	883	53.9	10	88	29	94	4	156	0	289	88	3.2	683	339	211	1,080	8.0

Aug. 1, 1961...	300	858	53.7	--	--	--	--	--	--	--	--	--	--	342	--	1,100	7.9
Aug. 1.....	325	833	53.7	--	--	--	--	0	--	--	90	--	--	--	--	1,100	7.8
Aug. 1.....	350	808	53.7	--	--	--	--	--	--	--	91	--	--	348	--	1,120	7.8
Aug. 1.....	375	783	53.6	12	90	30	99	4	163	0	293	3.3	707	348	214	1,120	7.8
Aug. 1.....	400	758	53.5	--	--	--	--	--	--	--	95	--	--	350	--	1,130	7.8
Aug. 1.....	435	723	53.8	--	--	--	--	--	160	4	--	--	--	--	--	1,120	8.5
Aug. 31.....	5	1,149	82.0	8.8	72	28	85	4	109	1	272	1.3	604	293	202	965	8.4
Aug. 31.....	25	1,129	82.5	--	--	--	--	--	109	1	--	--	--	--	--	965	8.4
Aug. 31.....	50	1,104	79.0	--	--	--	--	--	--	--	--	--	--	291	--	975	8.2
Aug. 31.....	75	1,079	84.3	9.8	80	28	85	4	137	0	273	1.9	628	313	203	1,000	7.9
Aug. 31.....	100	1,054	83.0	--	--	--	--	--	--	--	--	--	--	316	--	1,000	7.9
Aug. 31.....	125	1,029	82.2	--	--	--	--	--	142	0	--	--	--	--	--	1,000	7.7
Aug. 31.....	150	1,004	87.0	--	--	--	--	--	--	--	--	--	--	318	--	1,000	7.9
Aug. 31.....	175	979	86.5	9.8	83	28	85	4	144	0	274	2.0	633	320	202	1,020	8.0
Aug. 31.....	200	954	85.2	--	--	--	--	--	--	--	77	--	--	321	--	1,020	8.0
Aug. 31.....	225	929	84.9	10	83	28	87	4	149	0	276	2.3	645	324	202	1,060	7.9
Aug. 31.....	250	904	84.4	--	--	--	--	--	--	--	86	--	--	331	--	1,060	7.9
Aug. 31.....	275	879	83.6	11	85	30	98	4	157	0	286	2.7	683	336	207	1,060	8.0
Aug. 31.....	300	854	83.6	--	--	--	--	--	--	--	--	--	--	339	--	1,060	7.9
Aug. 31.....	325	829	83.6	--	--	--	--	--	160	0	--	--	--	--	--	1,110	7.9
Aug. 31.....	350	804	83.4	--	--	--	--	--	--	--	92	--	--	342	--	1,100	7.9
Aug. 31.....	375	779	83.4	10	88	30	100	4	163	0	291	2.9	702	345	211	1,120	7.9
Aug. 31.....	400	754	83.4	--	--	--	--	--	--	--	96	--	--	348	--	1,140	7.9
Aug. 31.....	431	723	83.4	--	--	--	--	--	172	0	--	--	--	--	--	1,140	8.2

COLORADO RIVER MAIN STEM--Continued

9-4240. COLORADO RIVER NEAR TOPOCK, ARIZ.

LOCATION.--Temperature recorder at gaging station, Gila and Salt River meridian, on left bank in Mohave Canyon, 2.7 miles downstream from Topock, Mohave County, 39.5 miles upstream from Parker Dam, and 49 miles downstream from Davis Dam.

DRAINAGE AREA.--172,300 square miles, approximately.

RECORDS AVAILABLE.--Water temperatures: July 1952 to September 1961.

EXTREMES, 1960.---Water temperatures: Maximum, 76°F Aug. 13-14; minimum, 49°F on several days in January.

EXTREMES, 1952-61.--Water temperatures: Maximum, 78°F July 25, 1956; minimum, 46°F Feb. 3, 4, 1956, Jan. 5, 1960.

Temperature (°F) of water, water year October 1960 to September 1961

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

COLORADO RIVER MAIN STEM--Continued

LOCATION---Temperature recorder at gaging station, Gila and Salt River Meridian, on right bank 1.4 miles downstream from Palo Verde Canal intake structure, 9.5 miles northeast of Blythe, Calif., and 11.0 miles upstream from Ehrenberg, Yuma County, Ariz. DRAINAGE AREA.--182,200 square miles, approximately.

DRAINAGE AREA: 102,200 square miles, approximately.
RECORDS AVAILABLE: ---Water temperatures: April 1956 to September 1961.

RECORDS AVAILABLE: April 1900 to September 1901.
EXTREMES, 1960-61.---Water temperatures: Maximum, 81°F on several days during August and September; minimum, 48°F Jan. 27.

EXTREMES, 1956-61.--Water temperatures: Maximum, 88°F Aug. 7, 11, 1958; minimum, 47°F Jan. 31, Feb. 1, 4, 1960. Ice on several days during August and September; maximum, 2.5 ft.

[illegible]

COLORADO RIVER MAIN STEM--Continued
9-4293. COLORADO RIVER BELOW CIBOLA VALLEY, ARIZ.

LOCATION.--Temperature recorder at gaging station, Gila and Salt River meridian, on left bank, 6.7 miles south of Cibola, Yuma County, Ariz., 38 miles upstream from Imperial Dam, 39.7 miles downstream from Ehrenberg, Ariz. 52.1 miles downstream from Palo Verde diversion dam near Blythe, Calif., and at mile 620 on Colorado River Profile Survey map.

DRAINAGE AREA.--183,500 square miles, approximately.

RECORDS AVAILABLE.--Water temperatures: March 1956 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 87°F Aug. 21.

EXTREMES, 1956-61.--Water temperatures: Maximum, 88°F Aug. 1, 10, 11, 1959; minimum, 49°F on several days in January 1960.

REMARKS.--Temperature recorder inoperative Nov. 8-14, 16-24, Dec. 8 to Jan. 25.

	Temperature (°F) of water, water year October 1960 to September 1961																															Average	
	Day																																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
October	76	76	75	77	79	78	78	77	77	73	71	70	71	70	67	65	66	68	69	70	71	71	73	74	74	75	74	75	74	73	74	73	
Maximum	75	75	75	77	79	78	78	77	73	71	70	70	70	69	67	65	66	68	69	70	71	71	73	74	74	75	74	75	74	73	74	73	
Minimum	72	72	72	72	72	72	69	--	--	--	--	--	--	--	62	--	--	--	--	--	--	--	--	60	61	60	59	58	57	--	--		
November	73	72	72	72	73	73	73	--	--	--	--	--	--	--	61	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Maximum	72	72	72	72	72	72	69	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Minimum	57	57	57	57	56	54	51	50	--	--	52	53	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
December	57	57	57	56	54	51	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Maximum	57	57	57	56	54	51	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Minimum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
January	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Maximum	56	56	--	--	--	--	--	--	--	59	59	59	59	59	59	59	58	58	57	55	57	57	57	56	56	57	56	55	55	53	55		
Minimum	55	--	--	--	--	--	--	55	--	--	58	57	58	58	58	57	57	55	54	55	55	56	54	54	55	55	55	54	--	--	--		
February	56	56	56	56	56	57	58	58	59	60	60	61	61	61	61	61	61	61	61	61	62	63	63	63	61	60	60	60	62	60	60		
Maximum	55	56	56	56	56	56	57	57	58	59	60	60	60	60	60	60	61	61	61	61	61	62	61	60	59	60	59	60	59	60	59		
Minimum	64	65	66	67	67	67	65	64	64	66	66	66	66	66	66	67	68	69	69	68	67	66	65	64	66	67	69	70	71	--	66		
April	62	64	65	66	67	67	65	64	63	64	66	65	65	65	65	66	68	69	68	66	65	64	63	64	64	66	67	69	69	--	66		
Maximum	71	71	69	67	68	66	68	70	72	71	70	67	68	70	71	72	72	72	72	72	72	72	72	73	73	73	72	71	70	70	71		
Minimum	70	70	69	67	66	66	65	66	68	70	67	66	66	68	70	71	71	71	71	71	72	72	72	72	72	72	72	71	70	69	70		
June	70	71	73	74	75	77	77	78	78	78	79	80	81	82	81	83	84	84	83	82	83	83	84	84	83	84	84	83	84	83	--	80	
Maximum	69	69	71	73	74	75	76	77	77	77	77	78	78	80	80	81	83	82	81	81	82	82	82	82	82	82	82	82	82	82	--	79	
Minimum	83	83	82	82	82	82	83	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	83	83	84	84	84	83	84	83	83		
July	82	80	81	80	81	81	81	81	81	83	83	83	83	83	83	83	83	83	83	83	82	82	82	82	82	82	82	83	83	83	82		
Maximum	85	84	84	84	85	86	86	84	84	85	85	85	85	85	85	85	85	85	85	86	87	86	84	85	86	86	85	85	84	84	85		
Minimum	83	84	84	82	83	85	86	84	83	84	83	83	83	83	83	83	83	83	84	86	84	83	82	84	84	84	83	83	82	82	84		
August	84	83	79	78	79	80	80	79	78	80	82	81	82	82	82	82	81	80	79	78	77	77	77	77	78	78	79	79	79	79	--	80	
September	83	79	77	76	76	78	79	77	77	77	80	80	80	80	80	81	80	79	77	77	77	76	76	76	77	77	77	78	77	78	77	--	80
Maximum	84	83	79	78	79	80	80	79	78	79	80	81	82	82	82	82	81	80	79	78	77	77	77	77	78	78	79	79	79	79	--	80	
Minimum	83	79	77	76	76	78	79	77	77	77	80	80	80	80	80	81	80	79	77	77	77	76	76	76	77	77	77	78	77	78	77	--	

GILA RIVER BASIN

9-4305. GILA RIVER NEAR GILA, N. MEX.

LOCATION ---At gaging station on left bank at Hooker damsite, 1 mile upstream from Mogollon Creek, and 7 miles northeast of Gila, Grant County.

DRAINAGE AREA ---1,864 square miles.

RECORDS AVAILABLE ---Water temperatures: July 1959 to September 1961.

Sediment records: July 1959 to September 1961.

EXTREMES, 1960-61 ---Water temperatures: Maximum, 87°F July 24; minimum, 40°F Nov. 29, Dec. 4, 9, 20.

Sediment concentrations: Maximum daily, 17,500 ppm June 16; minimum daily, 2 ppm Dec. 11-14.

Sediment loads: Maximum daily, 7,170 tons June 17; minimum daily, less than 0.50 ton on many days during December and January.

EXTREMES, 1959-61 ---Water temperatures: Maximum, 87°F July 24, 1961; minimum, 34°F Jan. 16, 1960.

Sediment concentrations: Maximum daily, 17,500 ppm June 16, 1961; minimum daily, 1 ppm Sept. 3, 1959.

Sediment loads: Maximum daily, 14,800 tons Mar. 9, 1960; minimum daily, less than 0.50 ton on many days in September 1959, December 1960 and January 1961.

REMARKS ---Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex.

Temperature (°F) of water, water year October 1960 to September 1961

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

GILA RIVER BASIN--Continued

9-4305. GILA RIVER NEAR GILA, N. MEX.--Continued

Suspended sediment, water year October 1960 to September 1961

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..	31	12	1	65	9	2	54	C	7
2..	32	10	1	63	12	2	54	C	7
3..	32	10	1	61	11	2	57	C	7
4..	32	13	1	59	C	11	71	C	7
5..	31	12	1	59	C	11	69	C	7
6..	31	12	1	59	C	11	63	C	7
7..	31	14	1	61	C	11	61	C	7
8..	29	12	1	59	C	11	61	C	5
9..	40	30	3	57	C	11	69	C	5
10..	42	21	2	57	C	11	67	C	5
11..	40	17	2	57	C	9	63	C	2
12..	39	10	1	57	C	9	59	C	2
13..	39	24	3	57	C	9	61	C	2
14..	40	12	1	55	C	9	61	C	2
15..	49	20	B	55	C	9	61	C	4
16..	62	110	B	55	C	9	59	C	4
17..	120	287	S	55	C	9	59	C	3
18..	254	800	549	55	C	6	57	C	3
19..	220	437	260	55	C	6	57	C	3
20..	154	206	86	55	C	6	57	C	3
21..	120	120	B	55	C	6	59	C	3
22..	102	75	B	55	C	6	57	C	3
23..	91	50	B	55	C	6	59	C	3
24..	86	36	8	55	C	6	59	C	3
25..	80	24	5	55	C	6	59	C	3
26..	76	19	4	55	C	6	59	C	4
27..	71	21	4	54	C	6	59	C	4
28..	69	20	B	54	C	6	59	C	6
29..	67	14	3	55	C	6	61	C	6
30..	65	12	2	54	C	6	67	C	6
31..	65	7	1	--	--	--	67	C	6
Total	2240	--	1168	1703	--	40	1885	--	23
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..	65	C	3	71	C	6	65	C	6
2..	61	C	3	71	C	6	63	C	6
3..	59	C	3	67	C	6	63	C	6
4..	59	C	3	61	C	6	63	C	6
5..	59	C	3	61	C	6	69	C	6
6..	59	C	3	63	C	6	74	C	6
7..	59	C	3	63	C	6	74	C	6
8..	57	C	3	63	C	6	71	--	E
9..	55	C	3	63	C	6	74	--	E
10..	55	C	3	63	C	6	74	--	E
11..	55	C	3	63	C	6	78	--	E
12..	57	C	3	63	C	6	80	--	E
13..	55	C	3	63	C	6	82	20	4
14..	55	C	3	63	C	6	86	28	7
15..	55	C	3	63	C	6	93	49	12
16..	55	C	3	63	C	6	107	80	B
17..	57	C	3	65	C	6	114	95	29
18..	57	C	3	65	C	6	117	66	21
19..	57	C	3	67	C	6	114	60	B
20..	57	C	3	67	C	6	114	50	B
21..	57	C	3	67	C	6	110	40	12
22..	57	C	3	67	C	6	105	39	11
23..	57	C	3	67	C	6	110	42	12
24..	59	C	3	67	C	6	114	63	19
25..	65	C	3	65	C	6	124	106	35
26..	65	C	3	65	C	6	130	112	39
27..	71	C	8	65	C	6	132	110	B
28..	82	C	8	65	C	6	127	66	23
29..	80	C	8	--	--	--	124	51	17
30..	78	C	8	--	--	--	124	50	B
31..	76	C	8	--	--	--	127	58	20
Total	1895	--	24	1816	--	28	3002	--	391

E Estimated.

S Computed by subdividing day.

T Less than 0.50 ton.

B Computed from estimated-concentration graph.

C Composite period.

GILA RIVER BASIN--Continued

9-4305. GILA RIVER NEAR GILA, N. MEX.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued

Day	APRIL			MAY			JUNE		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	122	45	15	76	21	4	34	30	3
2..	117	43	14	74	27	5	32	20	2
3..	114	50	15	71	27	5	30	16	1
4..	110	69	20	71	25	5	30	14	1
5..	117	108	34	76	20	4	29	22	2
6..	127	126	43	78	23	5	29	13	1
7..	143	220	85	76	27	6	29	25	2
8..	152	240	98	69	20	4	27	19	1
9..	152	170	70	69	18	3	27	20	1
10..	146	100	39	65	21	4	27	22	2
11..	135	76	28	61	18	3	27	26	2
12..	127	54	19	59	20	3	27	22	2
13..	120	55	18	57	15	2	27	25	2
14..	112	48	15	59	18	3	27	22	2
15..	107	39	11	59	15	2	29	20	2
16..	102	40	11	55	15	2	84	17500	S 4500
17..	100	38	10	54	16	2	122	16100	S 7170
18..	98	40	11	54	17	2	70	9200	B 1700
19..	96	40	10	52	13	2	57	1450	223
20..	98	40	10	50	17	2	52	554	78
21..	105	60	18	48	17	2	48	348	45
22..	112	60	18	44	21	2	44	270	32
23..	110	44	13	42	16	2	41	294	33
24..	102	32	9	42	21	2	39	229	24
25..	100	30	8	41	19	2	41	240	B 25
26..	98	33	9	41	20	2	41	250	28
27..	93	27	7	41	20	B 2	85	2840	S 903
28..	86	30	7	39	20	B 2	57	1600	B 250
29..	82	23	5	37	30	B 3	46	800	B 100
30..	80	20	4	37	30	3	42	425	48
31..	--	--	--	36	72	7	--	--	--
Total	3363	--	674	1733	--	97	1300	--	15185
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..	42	300	34	32	130	11	30	500	40
2..	42	335	38	39	1000	B 110	27	190	14
3..	44	460	55	37	2800	280	26	250	B 18
4..	52	1190	167	32	500	B 45	25	220	15
5..	48	1420	184	29	179	14	30	130	11
6..	41	600	66	27	120	9	32	98	8
7..	48	380	49	27	115	8	37	100	B 10
8..	46	370	46	27	94	7	39	126	13
9..	42	290	33	26	101	7	44	290	34
10..	42	250	28	24	108	7	48	210	27
11..	51	628	S 204	32	180	B 16	54	600	84
12..	44	6000	713	63	11600	S 2120	55	600	89
13..	41	1470	163	37	2300	230	61	580	96
14..	41	268	30	32	740	64	61	1050	173
15..	39	360	38	63	7800	1330	55	440	65
16..	36	300	B 30	64	4930	S 985	55	160	24
17..	32	190	B 16	50	1200	B 160	52	103	14
18..	29	140	11	67	3150	570	48	84	11
19..	29	120	9	63	800	136	44	70	B 8
20..	29	125	10	54	324	47	42	60	B 7
21..	27	97	7	46	278	35	41	52	6
22..	30	97	8	52	1160	S 246	39	36	4
23..	30	70	6	74	4500	899	37	36	4
24..	27	67	5	63	880	150	36	29	3
25..	26	57	4	57	512	79	34	33	3
26..	26	53	4	48	423	55	34	28	3
27..	24	52	3	42	238	27	32	37	3
28..	24	40	3	55	2200	B 760	32	42	4
29..	27	34	2	48	7700	998	32	49	4
30..	34	120	11	41	850	94	32	30	3
31..	36	300	29	34	220	20	--	--	--
Total	1129	--	2006	1385	--	9519	1214	--	798
Total discharge for year (cfs-days).....								22,665	
Total load for year (tons).....								29,953	

S Computed by subdividing day.

B Computed from estimated-concentration graph.

GILA RIVER BASIN

9-4305. GILA RIVER NEAR GILA, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;

P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (°F)	Sam- pling point	Discharge (cfs)	Sediment concentra- tion (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Oct. 19, 1960.....	1600	58		202	382		---	---	---	---	87	89	92	97	99	100	---	S
Mar. 15, 1961.....	1600	60		91	26		---	---	---	---	95	98	100	---	---	---	---	S
July 8.....	1130	78		48	392		---	---	---	---	100	---	---	---	---	---	---	S
July 12.....	1730	74		42	4760		69	85	98	100	100	---	---	---	---	---	---	PWC
Aug. 3.....	1230	78		37	2580		74	96	98	98	100	---	---	---	---	---	---	PWC
Aug. 12.....	1900	73		44	2860		72	86	94	94	100	---	---	---	---	---	---	PWC
Aug. 13.....	1500	78		34	2290		75	76	86	86	100	---	---	---	---	---	---	PWC
Sept. 11.....	1600	80		63	1250		78	85	97	97	100	---	---	---	---	---	---	PWC

GILA RIVER BASIN--Continued
9-4740. GILA RIVER AT KELVIN, ARIZ.

LOCATION ---Just above mouth of Mineral Creek, 1,200 feet upstream from gaging station at Kelvin, Pinal County, 17 miles downstream from San Pedro River, and 19.5 miles upstream from Ashurst-Hayden Dam.

DRAINAGE AREA ---18,011 square miles at gaging station, of which 5,125 square miles is below Coolidge Dam.

RECORDS AVAILABLE ---Chemical analyses: December 1950 to September 1961.

Water temperatures: December 1950 to September 1961.

Sediment records: January 1958 to September 1961.

EXTREMES, 1960-61 ---Dissolved solids: Maximum, 3,780 ppm May 13-25; minimum, 407 microhms July 30.

Hardness: Maximum, 1,970 ppm May 13-25; minimum, 232 ppm Sept. 21-22.

Specific conductance: Maximum daily, 5,120 microhms May 22; minimum daily, 631 microhms July 30.

Water temperatures: Maximum, 94°F Aug. 20, 21; minimum, 48°F Dec. 7-10.

Sediment concentrations: Maximum daily, 139,000 ppm July 30; minimum daily, 1 ppm May 8.

Sediment loads: Maximum daily, 345,000 tons Aug. 23; minimum daily, less than 0.50 ton on many days during May to July.

EXTREMES, 1950-61 ---Dissolved solids: Maximum, 3,780 ppm May 13-25, 1961; minimum, 294 ppm Sept. 24, 1954.

Hardness: Maximum, 1,970 ppm May 13-25, 1961; minimum, 132 ppm Sept. 21-22, 1954.

Specific conductance: Maximum daily, 5,120 microhms May 22, 1961; minimum, 407 microhms Jan. 20, 1932.

Water temperatures: Maximum, 94°F Aug. 20, 21, 1961; minimum, 48°F Dec. 7-10, 1954.

Sediment concentrations (1958-61): Maximum daily, 139,000 ppm July 30, 1961; minimum daily, 1 ppm May 8, 1961.

Sediment loads (1958-61): Maximum daily, 559,000 tons Aug. 6, 1958; minimum daily, less than 0.50 ton on many days during May to July 1961.

REMARKS ---Values reported for sodium (Na) are determined by analysis and do not include potassium (K). Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. No appreciable inflow from Mineral Creek between sampling point and gaging station, except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Total acidity as H ⁺	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhms at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-7, 1960.	25.1	--	--	358	65	0.0	232	--	113	--	--	--	--	2160	2.94	146	1160	1070	3.0	2730	7.3	--
Oct. 8-14.....	61.0	--	--	205	19	.0	77	--	156	--	--	--	--	924	1.26	152	588	460	1.4	1350	7.5	--
Oct. 9-15.....	26.6	--	--	442	77	.0	228	--	62	--	--	--	--	2640	3.59	190	1420	1370	2.6	3070	6.6	--
Oct. 16-20.....	25.6	--	--	405	66	.0	216	--	126	--	--	--	--	2350	3.20	162	1280	1180	2.6	2870	6.8	--
Oct. 21-31.....	17.9	29	0.03	525	85	.0	242	31	38	1750	240	1.1	1.0	3020	4.11	146	1660	1630	2.6	3390	6.4	--
Nov. 1-17.....	15.4	--	--	525	80	.0	249	--	57	--	--	--	--	3020	4.11	126	1640	1590	2.7	3420	6.7	--
Nov. 18-24.....	17.0	--	--	580	100	.6	242	--	0	--	--	--	--	3260	4.43	130	1860	1860	2.4	3890	7.3	--
Nov. 25-29.....	14.4	--	--	408	93	.0	235	--	196	--	--	--	--	2810	3.58	136	1340	1190	3.1	3020	7.3	--
Nov. 30-.....	189	--	--	109	24	.0	186	--	208	--	--	--	--	974	1.32	497	370	203	4.2	1520	7.9	--
Dec. 1-10.....	60.0	--	--	226	36	.0	193	--	199	--	--	--	--	1500	2.04	243	710	547	3.2	2050	7.6	--
Dec. 11-31.....	24.6	--	--	325	56	.0	210	--	159	--	--	--	--	2050	2.79	136	1040	910	2.8	2530	7.7	--

GILA RIVER BASIN--Continued

9-4740. GILA RIVER AT KELVIN, ARIZ.--Continued

Chemical analyses, in parts per million, water year October 1960 to September 1961--Continued

Date of collection	Mean discharge	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Total acidity as H ⁺	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH or Col.
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium, sodium	Non-carbonate			
Jan. 1-7, 1961.	20.9	--	--	335	59	0.0	215	--	149	--	--	--	--	2180	2.96	123	1080	958	2.8	2600	7.8
Jan. 8-16,	20.3	--	--	418	65	0.0	216	--	107	--	--	--	--	2540	3.45	139	1310	1220	2.6	2890	7.4
Jan. 17,	21.0	--	--	532	81	1.1	210	--	0	--	--	--	--	3070	4.18	174	1660	1660	2.2	3410	3.9
Jan. 18-25,	19.4	--	--	350	60	0.0	218	--	110	--	--	--	--	2250	3.06	118	1120	1030	2.8	2650	7.4
Jan. 26-27,	27.0	--	--	465	71	4.4	198	--	0	--	--	--	--	2760	3.75	201	1450	1450	2.3	3140	3.4
Jan. 28-Feb. 18	23.4	--	--	470	70	0.0	215	--	36	--	--	--	--	2640	3.59	187	1480	1430	2.5	3040	6.5
Feb. 19-28,	252	23	0.01	134	38	0.0	298	12	204	325	448	1.4	2.4	1440	1.96	960	490	323	5.9	2290	7.5
Mar. 1-8,	182	--	--	155	40	0.0	324	--	196	--	--	--	--	1610	2.19	791	550	390	6.0	2500	7.7
Mar. 9-31,	37.7	--	--	272	83	0.0	310	--	113	--	--	--	--	2120	2.88	273	895	784	4.5	2900	7.6
Apr. 1-10,	26.4	26	0.0	358	70	0.0	385	22	162	1160	555	1.3	1.8	2340	3.18	231	1000	909	4.9	3220	7.5
Apr. 11-30,	26.4	26	0.0	400	73	0.0	314	--	142	--	--	--	--	2690	3.66	206	1180	1130	4.9	3580	6.9
May 1-12,	8.2	--	--	630	97	7.7	296	--	0	--	--	--	--	2700	3.67	59.8	1300	1180	3.8	3340	7.4
May 13-25,	4.8	--	--	495	91	0.0	259	--	178	--	--	--	--	3780	5.14	49.0	1970	1970	2.9	4270	3.2
May 26-31,	2.0	--	--	528	110	0.0	112	--	296	--	--	--	--	2990	4.07	16.1	1610	1460	2.8	3440	7.5
June 1-30,	5.5	--	--	528	110	0.0	112	--	296	--	--	--	--	2780	3.78	3.8	1770	1530	1.2	2920	7.5
July 1-20,	4.4	--	--	515	116	0.0	106	--	290	--	--	--	--	2700	3.67	2.9	1760	1520	1.1	2880	7.8
July 21, 25,	46.0	--	--	298	45	0.0	89	--	398	--	--	--	--	1500	2.04	186	930	604	1.3	1870	7.7
July 26-28,	254	--	--	173	30	0.0	42	--	660	--	38	--	--	696	.95	477	556	0	.8	1180	7.8
July 29,	25.0	--	--	143	21	0.0	41	--	262	--	--	--	--	694	.94	46.8	444	230	.8	989	7.7
July 27-29,	31.7	--	--	196	34	0.0	74	--	476	--	--	--	--	980	1.33	63.9	530	240	1.3	1380	7.8
July 30-31,	414	--	--	96	16	0.0	49	--	472	--	--	--	--	458	.62	512	304	0	1.2	739	8.2
Aug. 1,	260	--	--	210	48	0.0	520	--	262	--	--	--	--	2340	3.18	1640	720	506	8.4	3730	7.9
Aug. 2,	972	--	--	130	29	0.0	126	--	342	--	--	--	--	1270	1.66	2210	445	89	5.3	2080	7.8
Aug. 3-5,	278.0	--	--	130	29	0.0	126	--	342	--	--	--	--	807	1.10	617	340	62	3.2	1290	7.5
Aug. 6-10,	174	26	1.0	192	26	0.0	151	11	348	268	170	1.1	6.1	1050	1.43	215	465	200	3.0	1540	7.7
Aug. 11-13,	174	--	--	110	16	0.0	39	--	402	--	--	--	--	514	.70	241	342	12	.9	791	7.7
Aug. 14-16,	309	--	--	144	22	0.0	36	--	478	--	--	--	--	627	.85	523	450	58	.8	961	7.7
16-19, 22,		--	--					--		--	--	--	--								

Aug. 17, 1961.	75.7	---	188	27	.0	88	---	304	---	1010	1.37	208	580	331	1.6	1370	7.9
Aug. 20-21, 1961.	156.5	---	112	20	.0	37	---	460	---	500	.88	2110	360	0	1.8	808	8.0
Aug. 23-24	85.4	---	400	39	.0	129	---	144	---	2080	2.84	482	1180	1040	1.8	2400	7.8
Aug. 25-29.....	501	---	104	19	.0	53	---	458	---	543	.74	735	338	0	1.3	861	7.9
Aug. 30-31.....		---															
Sept. 1-5, 7,		---															
Sept. 1-5, 7,	184	---	116	15	.0	115	---	215	---	788	1.07	391	352	176	2.7	1170	7.7
9-11.....		---															
Sept. 6.....	134	---	146	20	.0	142	---	98	---	1040	1.41	376	448	368	2.9	1460	7.1
Sept. 8, 12, 13	679	---	118	14	.0	51	---	219	---	585	.81	1090	352	172	1.2	867	7.7
Sept. 14.....	551	---	86	11	.0	45	---	312	---	407	.55	605	260	4	1.2	675	7.8
Sept. 15-20.....	108	---	132	18	.0	123	---	186	---	905	1.23	264	404	252	2.7	1300	7.8
Sept. 21-22.....	110	---	73	12	.0	125	---	192	---	663	.90	137	232	74	3.6	1030	8.1
Sept. 21-22.....	142	---	106	15	.0	122	---	162	---	799	1.09	306	328	195	2.9	1180	7.6
Sept. 23-30.....		---															
Weighted average....	---	---	173	31	.0	156	---	279	---	1160	1.58	---	585	334	2.8	1650	5.5
Time-weighted average	78.0	---	352	63	.0	212	---	173	---	2170	---	---	1160	997	2.9	2650	4.5
Tons per day	---	---	36	6.5		33	---	59	---	243	---	---	---	---	---	---	---

Temperature ($^{\circ}\text{F}$) of water, water year October 1960 to September 1961

	Day																															Aver- age
Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October.....	50	81	85	80	81	80	79	75	75	70	72	72	74	67	65	70	65	65	70	74	74	74	70	75	75	75	75	72	70	68	70	
November.....	70	70	70	67	71	70	69	59	69	68	--	64	62	65	60	60	60	60	60	60	60	60	60	60	60	60	60	60	55	55	64	
December.....	56	53	50	55	50	48	46	46	45	52	52	52	50	54	52	54	54	55	55	57	53	53	55	55	55	55	54	53	56	55	53	
January.....	55	55	55	54	57	55	55	54	57	55	56	--	54	54	55	55	55	55	53	53	51	60	56	56	65	61	62	55	60	58	56	
February.....	65	63	60	63	63	60	60	--	65	63	64	62	62	60	64	60	58	58	60	60	60	58	58	58	58	57	58	--	--	60	60	
March.....	60	56	57	64	62	57	62	67	68	62	62	72	72	72	65	65	65	65	70	70	70	70	70	70	70	70	72	58	62	68	65	
April.....	71	70	75	75	77	70	82	65	67	62	68	72	72	70	70	82	82	--	--	80	65	--	65	--	68	68	70	72	--	--	71	
May.....	72	70	66	63	--	65	--	75	75	78	62	60	66	68	70	74	68	66	66	66	66	66	66	66	70	72	68	62	68	66	70	
June.....	86	86	82	86	84	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	
July.....	80	80	75	--	82	82	84	84	84	82	82	82	82	80	80	80	78	78	78	75	78	75	78	78	80	82	88	85	88	86	82	
August.....	85	87	84	84	85	90	90	90	92	87	82	84	80	78	81	84	88	90	94	94	--	79	78	78	88	88	86	86	80	82	86	
September.....	75	75	75	78	80	80	80	73	80	85	85	85	78	78	80	82	81	81	75	72	72	70	73	73	78	80	80	78	76	82	78	

GILA RIVER BASIN--Continued

9-4740. GILA RIVER AT KELVIN, ARIZ.--Continued

Suspended sediment, water year October 1960 to September 1961

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..	33	142	13	16	87	4	203	2020	1110
2..	28	51	4	16	85	4	197	1160	617
3..	27	39	3	17	75	3	217	1330	779
4..	26	19	1	17	74	3	225	1210	735
5..	20	16	1	17	86	4	219	1070	633
6..	23	9	1	16	45	2	217	1570	920
7..	19	22	1	16	79	3	197	1850	984
8..	61	4410	S 2800	14	31	1	138	770	287
9..	26	3600	253	14	68	3	86	515	120
10..	17	260	12	14	110	4	65	700	120
11..	37	53700	S 5890	14	166	6	55	931	138
12..	24	27600	1790	15	240	B 10	37	520	52
13..	21	5700	323	14	232	9	29	267	21
14..	24	2160	140	16	143	6	27	287	21
15..	37	12600	S 1740	15	167	7	26	224	16
16..	30	5250	S 474	14	187	7	24	286	19
17..	22	335	20	16	116	5	33	187	17
18..	28	340	26	17	184	8	32	218	19
19..	28	332	25	17	128	6	27	182	13
20..	20	222	12	16	161	7	25	196	13
21..	19	166	9	12	158	5	24	285	18
22..	20	168	9	11	117	3	22	257	15
23..	19	108	6	11	136	4	24	199	13
24..	19	115	6	11	121	4	24	308	20
25..	19	167	9	11	99	3	19	255	13
26..	19	158	8	10	99	3	18	215	10
27..	19	150	B 8	11	100	3	17	191	9
28..	16	185	8	12	115	4	18	210	B 10
29..	17	149	7	36	1140	S 320	22	268	16
30..	14	99	4	177	3520	1680	21	317	18
31..	16	155	7	--	--	--	24	589	38
Total	748	--	13610	613	--	2131	2312	--	6814
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..	24	198	13	23	368	23	307	560	464
2..	20	263	14	22	330	20	298	515	414
3..	22	237	14	22	562	33	246	430	286
4..	19	227	12	22	355	21	179	688	333
5..	20	227	12	22	312	19	140	240	91
6..	20	250	14	19	234	12	109	109	32
7..	21	308	17	20	304	16	95	156	40
8..	24	205	13	21	299	17	83	137	31
9..	20	510	28	21	266	15	75	241	49
10..	20	576	31	22	330	B 20	68	336	62
11..	19	518	27	22	400	24	62	139	23
12..	19	767	39	21	461	26	61	225	37
13..	20	377	20	22	316	19	59	147	23
14..	20	365	20	20	220	12	57	202	31
15..	18	328	16	20	540	29	55	128	19
16..	23	1400	87	20	711	38	54	129	19
17..	21	20200	S 1300	20	972	52	54	171	25
18..	16	6300	272	54	2400	B 690	53	568	81
19..	16	10600	458	194	4640	2430	45	272	33
20..	18	2100	102	211	2470	1410	42	95	11
21..	20	2000	108	225	2060	1250	44	164	19
22..	19	2240	115	231	1680	1050	42	198	22
23..	21	2070	117	231	960	599	36	416	40
24..	20	1330	72	231	638	398	35	303	29
25..	25	746	50	240	626	406	35	318	30
26..	24	480	31	300	1800	S 1510	34	382	35
27..	30	1090	88	327	1340	1180	34	268	25
28..	28	1170	88	327	920	812	33	327	29
29..	26	510	36	--	--	--	33	262	23
30..	24	412	27	--	--	--	41	455	50
31..	24	390	B 25	--	--	--	44	690	82
Total	661	--	3266	2930	--	12131	2553	--	2488

S Computed by subdividing day.

B Computed from estimated-concentration graph.

GILA RIVER BASIN--Continued

9-4740. GILA RIVER AT KELVIN, ARIZ.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued

Day	APRIL			MAY			JUNE		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	41	700	77	16	58	3	0.6	131	T
2..	36	418	41	13	188	7	.6	92	T
3..	33	188	17	11	172	5	.7	164	T
4..	36	242	24	9.2	82	2	.6	130	T
5..	38	318	33	9.2	40 B	1	.6	167	T
6..	38	212	22	7.3	31	1	.6	148	T
7..	38	177	18	6.4	20	T	.6	113	T
8..	35	135	13	6.0	1	T	.7	225	T
9..	35	157	15	5.2	15	T	.7	176	T
10..	36	157	15	4.2	6	T	.7	131	T
11..	34	410	38	4.8	22	T	.7	146	T
12..	32	350	30	6.4	39	1	.8	190	T
13..	31	346	29	6.0	102	2	.8	239	T
14..	31	412	34	4.8	102	1	.7	144	T
15..	31	538	45	4.2	82	1	.7	173	T
16..	26	378	27	4.8	168	2	.4	151	T
17..	28	280	21	6.4	196	3	.4	123	T
18..	33	358	32	6.0	146	2	.3	122	T
19..	35	349	33	5.2	199	3	.3	169	T
20..	33	320 B	30	4.5	197	2	.4	139	T
21..	33	321	29	3.2	71	1	.3	157	T
22..	32	227	20	5.5	166	2	.3	136	T
23..	30	207	17	3.5	103	1	.3	190	T
24..	28	229	17	3.5	79	1	.3	134	T
25..	25	227	15	4.2	106	1	.1	153	T
26..	24	300 B	19	3.8	25	T	.2	123	T
27..	23	518	32	2.9	55	T	.3	160	T
28..	21	515	29	1.9	41	T	.3	126	T
29..	19	354	18	1.3	53	T	.2	11	T
30..	18	130 B	6	1.1	99	T	.2	10	T
31..	--	--	--	.8	110	T	--	--	--
Total	933	--	796	172.3	--	45	14.4	--	6
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	T	260	50100	36500	200	20500	11100
2..	.2	12	T	672	55800 S	218000	205	9200	5090
3..	.2	12	T	445	48200 S	66100	149	3800	1530
4..	.3	49	T	240	10600 S	7290	164	1350	598
5..	.4	10	T	165	3500	1560	192	850	441
6..	.2	177	T	120	3870	1250	134	640	232
7..	.2	66	T	100	2800	756	132	686	244
8..	.2	111	T	70	2290	433	1320	28300 S	173000
9..	.2	22	T	50	1420	192	300	34600 S	38700
10..	.2	16	T	40	30000 A	3200	170	1180	542
11..	.2	16	T	192	36800 S	38000	145	15000 A	5900
12..	.2	17	T	146	12600 S	7120	492	21000	27900
13..	.2	18	T	185	47600 S	30800	226	45000 S	29500
14..	.2	22	T	573	64300 S	182000	551	61000 S	148000
15..	.2	20	T	354	90000	92400	125	17000	5740
16..	.2	17	T	188	61800 S	44100	120	4500	1460
17..	.2	14	T	127	42900 S	33900	110	1120	333
18..	.2	26	T	205	73600 S	44800	100	793	214
19..	.2	28	T	329	55600 S	73800	100	576	156
20..	4.5	6390 S	1530	75	3320 S	874	95	350	90
21..	57	17900 S	104000	25	713	48	90	2300	559
22..	306	130000 S	177000	206	6440 S	52800	129	7420	2580
23..	391	120000 S	162000	2920	55100 S	345000	138	1720	641
24..	65	93500	17600	210	59500 S	39300	136	551	202
25..	35	26500	2500	114	22200 S	7370	136	567	208
26..	25	23700	1600	95	11900	3050	132	652	232
27..	75	24700	1670	69	2280	425	134	850	308
28..	30	25500	2070	52	680	95	154	3400	1410
29..	40	63500	7110	97	4270 S	5280	154	1420	590
30..	318	139000 S	142000	406	53000	60200	154	540	225
31..	509	111000 S	174000	596	62400 S	120000	--	--	--
Total	1809.7	--	793080	9326	--	1516643	6387	--	457725
Total discharge for year (cfs-days).....									28459.4
Total load for year (tons).....									2808735

S Computed by subdividing day.

T Less than 0.50 ton.

A Computed from partly estimated-concentration graph.

B Computed from estimated-concentration graph.

GILA RIVER BASIN--Continued

9-4740. GILA RIVER AT KELVIN, ARIZ.--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961
 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
 F, pipe; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (° F)	Sam- pling point	Discharge (cfs)	Sediment con- cen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Oct. 11, 1960.....	1700	72		34	64100		67	85		100		--	--	--			PWC	
Dec. 15.....	1430	54		29	224		--	--	--	--		98	100	--			S	
Jan. 13, 1961.....	1700	54		19	278		--	--	--	--		100	--	--			S	
July 21.....	1200	85		36	200000		56	76		98		100	--	--			PWC	
July 22.....																		
July 22.....	1700	75		20	60700		38	57		89		99	99	100			VPWC	
July 30.....	1700	88		138	105000		58	76		87		100	--	--			PWC	
Aug. 18.....	1700	88		125	47200		63	81		95		100	--	--			PWC	

GILA RIVER BASIN--Continued

9-5020. SALT RIVER BELOW STEWART MOUNTAIN DAM, ARIZ.

LOCATION.--Just downstream from dam, 3.5 miles upstream from gaging station below Stewart Mountain Dam, which is 6 miles upstream from Verde River, Maricopa County.

DRAINAGE AREA.--6,211 square miles.

RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1961.

Water temperatures: December 1950 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 597 ppm Aug. 1 to Sept. 30; minimum, 154 ppm Oct. 1 to Nov. 30.

Hardness: Maximum, 176 ppm Aug. 29 to Sept. 30; minimum, 1120 micromhos Sept. 29; minimum daily, 884 micromhos Oct. 17.

Specific conductance: Maximum daily, 1,120 micromhos during September. 1951; minimum, 361 ppm Mar. 21-31, 1953.

Water temperatures: Maximum, 70°F on several days during September. 1951; minimum, 49°F Feb. 14, 1951.

EXTREMES, 1950-61.--Dissolved solids: Maximum, 1,300 ppm Aug. 21-26, 1951; minimum, 138 ppm Mar. 21-31, 1953.

Hardness: Maximum, 270 ppm Nov. 30, 1950; minimum, 138 ppm Mar. 21-31, 1953.

Specific conductance: Maximum, 1,120 micromhos during September. 1951; minimum, 361 ppm Mar. 21-31, 1953.

Water temperatures: Maximum, 70°F on several days during September. 1951; minimum, 49°F Feb. 14, 1951.

REMARKS.--Values reported for sodium (Na) are determined by analysis and do not include potassium (K). Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. No inflow between sampling point and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carb- onate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		So- dium ad- sorp- tion ratio (micro- mhos at 25°C)	pH	
															Parts per million	Tons per acre- foot	Tons per day	Cal- cium Mag- nesium	Non- carbon- ate			
Oct. 1-Nov. 30, 1960.....	119	20	0.02	46	9.5	121	4.7	146		40	186	0.3	1.5	0.12	511	0.69	164	154	34	4.2	902	7.8
Dec. 1-31.....	65	--	--	47	11	126	--	151		--	--	--	--	--	516	.70	90.7	161	38	4.3	947	7.7
Jan. 1-Feb. 28, 1961.....	152	19	.03	47	10	123	4.7	151		42	190	.5	.9	.15	514	.70	211	160	36	4.2	932	7.7
Mar. 1-31.....	1340	--	--	48	9.7	123	--	150		--	--	--	--	--	517	.70	1870	160	37	4.2	924	7.8
April 1-30.....	867	20	.00	48	11	135	5.7	155		43	202	.4	1.3	.13	531	.72	1240	164	37	4.6	969	7.5
May 1-31.....	1231	--	--	50	9.5	132	--	154		--	--	--	--	--	552	.75	1830	164	38	4.5	986	7.7
June 1-30.....	1480	--	--	50	11	142	--	160		--	--	--	--	--	574	.78	2280	170	39	4.7	1030	7.8
July 1-31.....	1650	23	.01	51	11	148	4.8	160		47	230	.4	.8	.12	594	.81	2650	172	41	4.9	1070	7.8
Aug. 1-28.....	1186	--	--	51	11	147	--	158		--	--	--	--	--	597	.81	1910	173	44	4.9	1070	7.7
Aug. 29-Sept. 30, 1961.....	987	--	--	53	11	153	--	164		--	--	--	--	--	564	.77	1590	176	42	5.0	1080	7.8
Weighted average	--	--	--	50	11	139	--	157		--	--	--	--	--	564	0.77	--	168	39	4.6	1010	7.7
Time-weighted average.....	781.6	--	--	49	10	133	--	154		--	--	--	--	--	544	--	--	164	38	4.4	978	7.7
Tons per day....	--	--	--	105	22	293	--	331		--	--	--	--	--	1190	--	--	--	--	--	--	--

GILA RIVER BASIN--Continued

9-5020. SALT RIVER BELOW STEWART MOUNTAIN DAM, ARIZ.--Continued

Temperature (°F) of water, water year October 1960 to September 1961
 [Once-daily measurement at 7:00 a.m.]

Month	Day																															Aver- age
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October	67	67	75	67	66	66	--	67	67	67	67	66	65	64	64	64	64	64	64	64	64	65	65	65	65	65	65	--	--	--	--	66
November	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
December	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	55	55	55	--	--
January	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
February	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
March	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	55	55	55	56	56	55	55	55	55	55
April	55	55	55	55	55	55	55	55	56	56	56	57	57	57	57	57	57	57	58	58	56	57	57	57	57	57	57	57	57	55	55	56
May	56	56	56	56	56	56	56	58	58	58	59	59	59	59	59	59	59	61	60	60	60	60	60	60	61	61	61	61	61	61	61	59
June	61	61	61	61	61	61	62	62	62	62	62	63	63	63	63	63	64	64	64	65	65	65	65	65	65	65	65	65	65	65	65	63
July	66	66	67	66	67	67	67	67	67	67	67	67	67	67	68	68	68	68	68	68	68	66	67	67	67	67	67	67	67	68	69	67
August	68	68	69	68	68	68	68	68	68	68	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
September	69	69	69	69	69	69	69	69	69	70	70	70	70	69	70	70	70	70	70	70	70	70	--	69	69	68	68	68	69	68	--	69

GILA RIVER BASIN--Continued
9-5045. OAK CREEK NEAR CORNVILLE, ARIZ.

LOCATION:--Temperature recorder at gaging station near left bank on downstream side of pier of county highway, 0.2 miles upstream from Page Springs, 4 miles northeast of Cornville, Navajo County, and 15 miles upstream from mouth.
DRAINAGE AREA--357 square miles.
RECORDS AVAILABLE--Water temperatures: June 1954 to September 1961.
EXTREMES, 1960-61.--Water temperatures: Maximum, 86°F July 25, Aug. 7; minimum, 39°F Jan. 3-5, 7.
EXTREMES, 1954-61.--Water temperatures: Maximum, 90°F July 28, 1954; July 11, 1955; minimum, 37°F Feb. 21, 1955, Jan. 4-6, 1960.

Month	Temperature (°F) of water, water year October 1960 to September 1961																															Average		
	Day																															Average		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
October	70.69	71.70	71.70	70.69	70.69	69.69	67.61	60.61	62.62	60.61	62.62	60.61	62.62	60.61	62.62	60.61	62.62	60.61	62.62	60.61	62.62	60.61	62.62	60.61	62.62	60.61	62.62	60.61	62.62	60.61	62.62	60.61	62.62	
Maximum	67.66	68.67	68.67	67.66	67.66	66.66	64.59	59.58	60.59	61.60	62.61	60.59	62.60	60.58	62.59	60.57	62.58	60.56	62.57	60.55	62.56	60.54	62.55	60.53	62.54	60.52	62.53	60.51	62.52	60.50	62.51	60.49	62.50	
Minimum	55.55	55.55	55.55	57.57	57.57	57.57	53.52	53.52	52.51	50.49	48.48	48.49	49.49	48.48	48.49	49.49	48.48	48.49	49.49	48.48	48.49	49.49	48.48	48.49	49.49	48.48	48.49	49.49	48.48	48.49	49.49	48.48	48.49	
November	53.54	54.55	54.55	55.57	57.59	57.59	53.52	53.52	52.51	51.50	49.48	48.47	48.48	48.49	49.49	48.48	48.49	49.49	48.48	48.49	49.49	48.48	48.49	49.49	48.48	48.49	49.49	48.48	48.49	49.49	48.48	48.49	49.49	
Maximum	47.47	49.48	47.45	42.41	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	
Minimum	47.49	49.48	47.45	42.41	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	42.42	
December	43.41	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	
Maximum	41.40	39.39	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	
Minimum	48.48	49.49	48.47	48.47	46.45	47.48	47.48	48.49	49.51	52.53	53.55	53.55	53.55	53.55	53.55	53.54	53.53	53.54	53.53	53.54	53.53	53.54	53.54	53.54	53.54	53.54	53.54	53.54	53.54	53.54	53.54	53.54	53.54	53.54
January	55.56	56.54	53.53	54.54	56.57	58.58	60.61	61.60	58.56	57.59	60.62	62.62	61.57	58.58	56.53	55.52	56.53	55.52	56.53	55.52	56.53	55.52	56.53	55.52	56.53	55.52	56.53	55.52	56.53	55.52	56.53	55.52	56.53	55.52
Maximum	52.54	54.50	49.52	51.54	54.55	56.57	57.58	59.57	56.55	53.55	56.58	60.59	55.52	56.53	55.52	56.53	55.52	56.53	55.52	56.53	55.52	56.53	55.52	56.53	55.52	56.53	55.52	56.53	55.52	56.53	55.52	56.53	55.52	56.53
Minimum	57.55	58.62	64.63	62.62	64.63	62.62	63.64	66.65	65.68	70.72	67.67	67.66	66.65	63.66	67.70	72.73	66.65	63.66	67.70	72.73	66.65	63.66	67.70	72.73	66.65	63.66	67.70	72.73	66.65	63.66	67.70	72.73	66.65	63.66
February	54.49	52.55	58.60	57.53	54.55	53.55	56.56	59.58	60.62	62.62	62.62	62.62	62.62	62.62	62.62	62.62	62.62	62.62	62.62	62.62	62.62	62.62	62.62	62.62	62.62	62.62	62.62	62.62	62.62	62.62	62.62	62.62	62.62	62.62
Maximum	73.73	71.69	66.66	66.70	74.71	71.70	67.71	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73
Minimum	62.62	62.60	59.58	58.57	61.63	62.61	59.58	61.61	62.63	63.62	62.64	64.65	65.66	64.65	65.66	64.65	65.66	64.65	65.66	64.65	65.66	64.65	65.66	64.65	65.66	64.65	65.66	64.65	65.66	64.65	65.66	64.65	65.66	64.65
March	74.74	75.77	78.77	80.80	80.79	83.80	80.79	80.80	79.80	79.83	82.80	82.80	81.84	84.85	83.84	85.84	84.83	85.84	83.81	84.83	85.84	83.81	84.83	85.84	83.81	84.83	85.84	83.81	84.83	85.84	83.81	84.83	85.84	83.81
Maximum	63.62	63.65	66.66	66.67	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66	67.66
Minimum	84.79	78.83	82.79	84.84	84.85	83.84	83.82	69.79	83.83	85.84	83.81	84.83	85.84	83.81	84.83	85.84	83.81	84.83	85.84	83.81	84.83	85.84	83.81	84.83	85.84	83.81	84.83	85.84	83.81	84.83	85.84	83.81	84.83	85.84
April	73.73	72.70	71.71	72.73	73.74	72.74	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75	74.75
Maximum	84.79	78.83	82.79	84.84	84.85	83.84	83.82	69.79	83.83	85.84	83.81	84.83	85.84	83.81	84.83	85.84	83.81	84.83	85.84	83.81	84.83	85.84	83.81	84.83	85.84	83.81	84.83	85.84	83.81	84.83	85.84	83.81	84.83	85.84
Minimum	79.83	78.84	85.84	86.85	84.76	80.82	84.83	76.80	83.81	76.81	83.83	74.77	81.79	79.78	79.81	79.78	79.81	79.78	79.81	79.78	79.81	79.78	79.81	79.78	79.81	79.78	79.81	79.78	79.81	79.78	79.81	79.78	79.81	79.78
May	71.74	76.75	74.77	75.76	56.64	73.72	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73
Maximum	77.76	73.74	75.76	76.75	72.74	76.77	73.73	74.75	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73	73.73
Minimum	71.70	53.64	66.67	59.70	68.68	59.69	67.66	68.67	67.66	68.67	67.66	68.67	67.66	68.67	67.66	68.67	67.66	68.67	67.66	68.67	67.66	68.67	67.66	68.67	67.66	68.67	67.66	68.67	67.66	68.67	67.66	68.67	67.66	68.67

GILA RIVER BASIN--Continued
9-5100. VERDE RIVER BELOW BARTLETT DAM, ARIZ.

LOCATION ---At gaging station on right bank 2.2 miles downstream from Bartlett Dam, Maricopa County, and 3.5 miles upstream from Camp Creek.
DRAINAGE AREA ---6 186 square miles.

RECORDS AVAILABLE ---Chemical analyses: December 1950 to September 1961.

Water temperatures: December 1950 to September 1961.

EXTREMES, 1960-61 ---Dissolved solids: Maximum, 412 ppm Aug. 1-31; minimum, 334 ppm Sept. 14-20.

Hardness: Maximum, 276 ppm Mar. 1-31; minimum, 202 ppm Sept. 14-20.

Specific conductance: Maximum daily, 885 microhos Dec. 12; minimum daily, 527 microhos Sept. 14.

Water temperatures: Maximum, 85°F on several days in August; minimum, 49°F on several days in January.

EXTREMES, 1950-61 ---Dissolved solids: Maximum, 550 ppm Dec. 18-21, 1956; minimum, 156 ppm Jan. 11-20, 1952.

Hardness: Maximum, 413 ppm Dec. 18-21, 1956; minimum, 108 ppm Jan. 11-20, 1952.

Specific conductance: Maximum daily, 958 microhos Nov. 10, 1956; minimum daily, 234 microhos Jan. 13, 15, 1952.

Water temperatures: Maximum, 90°F July 16, Aug. 14, 1951; minimum, 41°F Jan. 30, 1952.

REMARKS ---Values reported for sodium (Na) are determined by analysis and do not include potassium (K). Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1950 to September 1961

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		Sodium adsorption ratio	Specific conductance (microhmios at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 1-31, 1960....	72.2	28	0.02	48	33	45	4.1	282	0	82	28	0.5	1.1	0.17	397	0.54	77.4	257	26	1.2	643	8.2
Nov. 1-30.....	238	---	---	50	34	44	---	294	0	---	---	---	---	---	398	.54	256	264	23	1.2	647	8.2
Dec. 1-31.....	205	---	---	51	34	44	---	290	3	---	28	---	---	---	400	.54	221	268	28	1.2	848	8.3
Jan. 1-31, 1961....	107	26	.00	51	34	43	3.4	295	4	73	26	.4	.5	.18	397	.54	115	268	20	1.1	645	8.3
Feb. 1-28.....	77.0	---	---	51	35	40	---	303	0	---	---	---	---	---	394	.54	81.9	272	24	1.1	637	8.1
Mar. 1-31.....	194	---	---	52	36	39	---	303	0	---	---	---	---	---	386	.52	202	276	28	1.0	641	8.2
Apr. 1-30.....	53.1	25	.01	50	34	41	3.4	304	0	68	26	.4	.7	.18	386	.52	55.3	266	17	1.1	640	8.0
May 1-31.....	79.4	---	---	54	31	41	---	296	0	---	---	---	---	---	385	.52	82.5	260	18	1.1	631	8.2
June 1-30.....	588	---	---	58	25	38	---	280	0	---	---	---	---	---	373	.51	592	246	18	1.0	605	8.0
July 1-31.....	243	---	---	49	32	46	---	276	0	---	---	---	---	---	408	.55	268	256	28	1.3	850	8.1
Aug. 1-31.....	129	24	.00	47	33	48	4.3	276	0	86	31	.4	1.7	.23	412	.58	193	254	30	1.3	858	8.0
Sept. 1-13.....	205	---	---	47	32	40	---	290	0	---	---	---	---	---	391	.53	216	238	23	1.4	839	8.2
Sept. 14-20.....	244	---	---	43	32	40	---	286	0	---	---	---	---	---	334	.45	187	202	22	1.2	844	7.9
Sept. 21-30.....	264	---	---	44	31	48	---	268	0	---	---	---	---	---	386	.52	285	238	28	1.3	838	8.2
Weighted average	---	---	---	51	31	42	---	---	---	---	---	---	---	---	389	0.53	---	256	23	1.1	632	8.1
Time-weighted average.....	183.8	---	---	50	33	43	---	---	---	---	---	---	---	---	393	---	---	280	24	1.1	638	8.1
Tons per day....	---	---	---	28	15	21	---	---	---	---	---	---	---	---	193	---	---	---	---	---	---	---

GILA RIVER BASIN--Continued
9-5195. GILA RIVER BELOW GILLESPIE DAM, ARIZ.

LOCATION.--About 1 mile downstream from gaging station on Gila Bend Canal which is 200 feet downstream from 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 (revised).--49,650 square miles.

RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1961.

Water temperatures: December 1950 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 6,960 ppm Dec. 1-22; minimum, 358 ppm July 23.

Hardness: Maximum, 1,920 ppm Dec. 1-22; minimum, 124 ppm July 23.

Specific conductance: Maximum, 124 ppm Dec. 1-22; minimum, 124 ppm July 23.

Water temperature: Maximum, 87.7°; minimum, 42.7° Dec. 1-22; minimum, 42.7° Dec. 1-22.

Water specific gravity: Maximum, 1.019; minimum, 1.015 Aug. 2, 1955.

EXTREMES 1950-61.--Dissolved solids: Maximum, 7,050 ppm Dec. 1-22; minimum, 227 ppm Aug. 2, 1955.

Hardness: Maximum, 1,940 ppm Oct. 11-20, 1951; minimum, 95 ppm Aug. 2, 1955.

Specific conductance: Maximum daily, 10,400 micromhos on several days during December 1959, November and December 1960; minimum daily, 370 micromhos Aug. 2, 1955.

Water temperatures: Maximum, 98°F July 8, 1958, July 22, 1959; minimum, 35°F Jan. 1, 1951.

REMARKS.--Values reported for sodium (Na) are determined by analysis and do not include potassium (K). Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Samples from canal are believed to be representative of total flow passing Gillespie Dam, including spill and amounts diverted into Gila Bend and Enterprise Canals.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Chemical analyses, in parts per million, water year October, 1960 to September, 1961																				
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		Specific conductance (micro-mhos at 25°C)	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 1-31, 1960...	9.4	28	0.01	385	156	1510	11	288	1520	2160	3.4	47	3.6	6190	8.42	157	1600	1360	8960	7.7
Nov. 1-30.....	11.4	---	---	408	168	1350	---	322	---	---	---	---	---	6440	8.76	198	1710	1450	9210	7.7
Dec. 1-22.....	11.7	---	---	464	185	1730	---	348	---	---	---	---	---	6960	9.47	220	1920	1650	10200	7.5
Dec. 23-24.....	11.0	---	---	388	144	1330	---	348	---	---	---	---	---	5490	7.47	163	1860	1280	8110	7.6
Dec. 25-31.....	13.3	---	---	448	178	1810	---	389	---	---	---	---	---	6730	9.15	242	1850	1560	9730	7.7
Jan. 1-Feb. 9, 1961.....	15.2	30	.00	440	178	1650	12	340	1710	2380	2.8	55	3.3	6550	8.91	269	1830	1550	9700	7.8
Feb. 10-11.....	12.3	---	---	390	162	1460	---	282	---	---	---	---	---	5910	8.04	239	1640	1410	8710	7.7
Feb. 12-28.....	12.3	---	---	435	174	1650	---	318	---	---	---	---	---	6680	9.08	222	1800	1540	9620	7.8
Mar. 1-12.....	15.1	---	---	432	180	1540	---	338	---	---	---	---	---	6530	8.88	266	1620	1400	9380	7.7
Mar. 13-14.....	14.0	---	---	318	123	1070	---	250	---	---	---	---	---	4500	6.12	170	1300	1100	6730	7.4
Mar. 15-31.....	13.2	---	---	420	173	1530	---	319	---	---	---	---	---	6450	8.77	230	1760	1500	9340	7.5
Apr. 1-30.....	11.8	32	.01	385	165	1520	12	293	1560	2170	3.5	45	3.3	6220	8.46	198	1640	1400	8960	7.5
May 1-20.....	8.0	---	---	392	166	1600	---	289	---	---	---	---	---	5810	7.83	141	1460	1280	8440	7.6
May 21-June 6.....	8.5	---	---	342	155	1440	---	245	---	---	---	---	---	5850	7.96	134	1490	1290	8440	7.6
June 7-10.....	6.4	---	---	592	176	1720	---	256	---	---	---	---	---	6920	9.41	120	1700	1490	9720	7.5

GILA RIVER BASIN--Continued

9-5195. GILA RIVER BELOW GILLESPIE DAM, ARIZ.--Continued

Temperature (°F) of water, water year October 1960 to September 1961
[Once-daily measurement at 10:00 a.m.]

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

DIVERSIONS AND RETURN FLOWS AT AND BELOW IMPERIAL DAM

9-5255. YUMA MAIN CANAL BELOW COLORADO RIVER SIPHON, AT YUMA, ARIZ.

LOCATION.--At gaging station on Yuma Main Canal below Colorado River siphon on Arizona side of river, 3.5 miles downstream from siphon-drop powerplant, and 0.2 mile downstream from upper highway bridge over Colorado River at Yuma, Yuma County.

RECORDS AVAILABLE.--Chemical analyses: September 1928 to September 1961.

Water temperatures: May 1960 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 870 ppm Jan. 1-29; minimum, 794 ppm June 1-30.

Hardness: Maximum, 385 ppm Dec. 1-31; minimum, 348 ppm Aug. 1-31.

Specific conductance: Maximum daily, 1,380 microhos Dec. 27; minimum daily, 1,150 microhos July 5.

EXTREMES, 1943-51.--Dissolved solids: Maximum, 1,000 ppm Jan. 1-31, 1957; minimum, 532 ppm Jan. 1-10, 1953.

Hardness: Maximum, 478 ppm July 1-31, 1957; minimum, 260 ppm Jan. 1-10, 1953.

Specific conductance: Maximum daily, 1,520 microhos Jan. 18, 1957; minimum daily, 795 microhos Jan. 5, 1953.

REMARKS.--Values reported for sodium (Na) are determined by analysis and do not include potassium (K). Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carb. sulfate (CO ₃)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Bor. (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 1-31, 1960...	478	--	--	99	28	122	7	167	--	--	--	--	--	812	1.10	1050	352	215	2.8	1230	7.9
Nov. 1-30.....	372	15	0.01	101	27	136	5.0	171	326	130	0.4	1.4	0.17	837	1.14	841	362	222	3.1	1270	8.0
Dec. 1-31.....	269	--	--	105	25	135	--	176	--	--	--	--	--	847	1.15	615	385	221	3.1	1270	8.1
Jan. 1-29, 1961...	330	17	0.01	100	27	136	4.9	171	328	130	5	1.9	.18	870	1.18	775	382	222	3.1	1280	8.0
Jan. 30-Feb. 28...	478	--	--	100	26	123	--	170	--	--	--	--	--	843	1.15	1090	358	218	2.8	1210	7.9
Mar. 1-31.....	483	--	--	100	26	118	--	171	--	--	--	--	--	808	1.10	1070	356	216	2.7	1180	7.9
Apr. 1-30.....	560	15	0.01	100	28	129	4.8	172	307	111	4	2.2	.18	787	1.08	1210	358	217	2.8	1190	7.9
May 1-31.....	621	--	--	98	28	120	--	168	--	--	--	--	--	839	1.14	1410	358	220	3.0	1230	8.0
June 1-30.....	602	--	--	96	29	127	--	165	--	--	--	--	--	794	1.08	1290	358	223	2.9	1200	8.0
July 1-31.....	601	18	0.00	94	29	125	4.9	181	319	118	4	1.7	.17	795	1.09	1300	352	220	2.9	1200	7.9
Aug. 1-31.....	509	--	--	97	26	126	--	180	--	--	--	--	--	827	1.12	1140	346	217	2.9	1210	8.2
Sept. 1-30.....	631	--	--	96	27	127	--	182	--	--	--	--	--	838	1.14	1430	350	217	3.0	1230	8.1
Weighted average	--	--	--	98	27	126	--	187	--	--	--	--	--	823	1.12	--	358	219	2.9	1220	7.9
Time-weighted average.....	495.8	--	--	99	27	127	--	168	--	--	--	--	--	826	--	--	357	219	2.9	1230	7.9
Tons per day....	--	--	--	132	38	169	--	224	--	--	--	--	--	1100	--	--	--	--	--	--	--

DIVERSIONS AND RETURN FLOWS AT AND BELOW IMPERIAL DAM--Continued
9-5255. YUMA MAIN CANAL BELOW COLORADO RIVER SIPHON AT YUMA, ARIZ.--Continued

Temperature (°F) of water, water year October 1960 to September 1961																																	
Month	Day																															Aver- age	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
May.....	73	75	73	72	70	--	--	69	73	73	73	72	--	--	71	72	74	74	74	--	--	76	75	75	77	75	--	--	--	75	--	75	--
June.....	73	74	--	--	--	76	78	78	81	--	--	78	80	81	83	82	--	--	84	85	84	84	84	--	--	83	84	83	83	83	--	--	--
July.....	--	--	83	--	--	83	81	81	--	83	85	85	86	86	--	--	84	85	85	85	84	--	84	85	85	85	83	85	--	--	85	--	--
August.....	85	86	85	85	--	--	86	86	86	85	87	--	88	88	85	84	85	86	86	87	87	86	86	86	86	86	86	86	86	85	84	--	--
September.....	84	--	--	--	--	78	78	83	81	--	--	81	82	83	82	84	--	--	83	78	79	78	76	--	--	77	79	78	78	--	--	--	--

MISCELLANEOUS ANALYSES OF STREAMS IN COLORADO RIVER BASIN

Periodic determinations of suspended-sediment discharge and particle size, water year October 1960 to September 1961

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (°F)	Sam- pling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis
							Percent finer than size indicated, in millimeters										
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000

EAGLE RIVER BASIN

9-700. EAGLE RIVER BELOW GYPSUM, COLO.

Oct. 14, 1960.....	1000			172	15	7											
Nov. 14.....	1730			202	14	10											
Jan. 14, 1961.....	1000			172	14	2											
Feb. 15.....	1700			167	125	56											
Mar. 23.....	0830			161	46	20											
May 21.....	0830			1030	78	217											
June 3.....	1840			1510	37	151											
June 16.....	1430			1450	22	86											
June 27.....	0630			804	13	28											
July 11.....	1100			381	12	12											
July 25.....	1200			246	20	13											
Aug. 8.....	1115			274	28	21											
Aug. 27.....	1015			301	83	67											

LITTLE COLORADO RIVER BASIN

9-4015. MOENKOPI WASH NEAR CAMERON, ARIZ.

Mar. 30, 1961.....				21.7	10600	621											
Aug. 4.....				47.0	90100	12300											
Aug. 5.....				192	192000	114000											
Aug. 7.....				9.3	68100	1770											
Aug. 17.....				34.3	101000	10000											

d Daily mean discharge.

PART 10. THE GREAT BASIN
GREAT SALT LAKE BASIN
10-100. GREAT SALT LAKE, UTAH

LOCATION.--At gaging station at Salt Lake County Boat Harbor on southeast shore of lake, 17 miles west of Salt Lake City, Salt Lake County.
RECORDS AVAILABLE.--Chemical analyses: February 1960 to September 1961 (discontinued).

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Lake elevation (feet)	Silica (SiO ₂)	Alu- mi- num (Al)	Iron (Fe)	Man- ga- nese (Mn)	Cal- cium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Po- tas- sium (K)	Bi- car- bon- ate (HCO ₃) (CO ₃)	Car- bon- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl) (mbs at 180°C)	Fluo- ride (F)	Ni- trate (NO ₃)	Boron (B)	Disolved solids (residue at 180°C)	Hardness as CaCO ₃		Sodium ad- sor- p- tion ratio	Specific conduct- ance (micro- mhos at 25°C)	Col- or pH
																		Cal- cium, mag- nesium	Non- car- bon- ate			
Oct. 11, 1960.	4,193.30	5.5	--	0.05	324	8,400	89,400	5,040	332	0	20,200	151,000	133,000	69	82	278,000	278,000	173,000	173,000	7.6		
Nov. 30.....	4,193.20	5.0	2.6	.02	303	7,380	77,800	4,230	331	0	12,700	133,000	148,000	86	80	244,000	244,000	175,000	175,000	7.7		
Dec. 15.....	4,193.30	5.5	2.6	.02	288	8,410	86,900	4,670	340	0	16,000	148,000	146,000	103	103	269,000	269,000	177,000	177,000	7.6		
Feb. 1, 1961..	4,193.40	5.7	2.6	.05	315	8,220	83,500	4,540	338	0	15,300	146,000	146,000	--	--	269,000	269,000	181,000	181,000			
Feb. 15.....	4,193.50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	273,000	273,000	179,000	179,000			
Mar. 1.....	4,193.60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	256,000	256,000	179,000	179,000			
Mar. 15.....	4,193.70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	268,000	268,000	180,000	180,000			
Apr. 4.....	4,193.80	--	--	--	--	--	--	--	--	--	--	--	--	--	--	266,000	266,000	179,000	179,000			
Apr. 17.....	4,193.70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	272,000	272,000	180,000	180,000			
May 1.....	4,193.65	--	--	--	--	--	--	--	--	--	--	--	--	--	--	273,000	273,000	179,000	179,000			
May 16.....	4,193.50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	277,000	277,000	179,000	179,000			
May 31.....	4,193.40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	281,000	281,000	180,000	180,000			
June 30.....	4,193.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	284,000	284,000	179,000	179,000			
July 25.....	4,192.55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	285,000	285,000	178,000	178,000			
Aug. 1.....	4,192.45	--	--	--	--	--	--	--	--	--	--	--	--	--	--	282,000	282,000	180,000	180,000			
Aug. 15.....	4,192.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	281,000	281,000	180,000	180,000			
Sept. 5.....	4,191.75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	284,000	284,000	178,000	178,000			
Sept. 18.....	4,191.70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	275,000	275,000	178,000	178,000			

Date of collection	Iodide (I) (mg/l)	Density (grams per ml at 20°C)	Date of collection	Iodide (I) (mg/l)	Density (grams per ml at 20°C)	Date of collection	Iodide (I) (mg/l)	Density (grams per ml at 20°C)
Oct. 11, 1960.	0.43	1.217	Mar. 15, 1961.	--	1.202	June 30, 1961.	--	1.216
Nov. 30, 1960.	.42	1.189	Apr. 4, 1961.	--	1.200	July 25, 1961.	--	1.215
Dec. 15, 1960.	.45	1.212	Apr. 17, 1961.	--	1.206	Aug. 1, 1961.	--	1.215
Feb. 1, 1961.	.45	1.203	May 1, 1961.	--	1.208	Aug. 15, 1961.	--	1.218
Feb. 15, 1961.	--	1.205	May 16, 1961.	--	1.211	Sept. 5, 1961.	--	1.217
Mar. 1, 1961.	--	1.192	May 31, 1961.	--	1.214	Sept. 18, 1961.	--	1.210

BEAR RIVER BASIN

10-1261. BEAR RIVER AT BEAR RIVER BIRD REFUGE, NEAR BRIGHAM CITY, UTAH

LOCATION.--At headquarters building, about 35 miles downstream from gaging station and 12 miles west of Brigham City, Box Elder County. DRAINAGE AREA.--6,000 square miles, approximately, upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: October 1959 to September 1961 (discontinued).

EXTREMES, 1960-61.--Dissolved solids: Maximum, 3,780 ppm Oct. 1-9; minimum, 571 ppm Apr. 30 to May 3.

Hardness: Maximum, 598 ppm Oct. 1-9; minimum, 276 ppm Apr. 12-21.

Specific conductance: Maximum daily, 6,320 microhos Oct. 5; minimum daily, 1,010 microhos Apr. 19.

REMARKS.--Water discharge estimated on the basis of discharge of gaging station near Collinston, Utah.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 1-9, 1960....	100	13	--	53	113	1170	71	577	17	258	1760	3.1	--	--	3780	5.14	1020	598	97	21	6300	8.4
Oct. 10-13.....	100	24	--	50	105	1090	62	552	0	241	1630	2.9	--	--	3490	4.75	942	556	103	20	5900	8.2
Oct. 16-22.....	700	15	--	63	58	308	24	389	16	95	450	3.7	--	--	1230	1.67	2320	396	51	6.7	2140	8.4
Oct. 23-27.....	700	15	--	61	59	313	22	399	5	92	480	3.9	--	--	1260	1.71	2380	396	61	6.9	2190	8.3
Oct. 30-Nov. 4....	700	17	--	64	39	177	15	350	14	68	250	1.8	--	--	796	1.08	1500	322	12	4.3	1400	8.4
Nov. 5-10.....	900	14	--	64	43	138	13	368	0	60	205	1.5	--	--	719	.98	1750	336	34	3.3	1250	7.9
Nov. 11-21.....	1000	12	--	67	43	140	13	378	0	66	200	3.4	--	--	734	1.00	1980	344	34	3.3	1280	7.9
Nov. 22-27.....	1200	16	--	77	46	297	22	388	0	80	455	6.1	--	--	1200	1.63	3890	380	82	6.6	2100	7.7
Nov. 28-Dec. 3....	1000	16	--	72	40	153	14	378	0	64	230	3.3	--	--	775	1.05	2090	344	51	4.1	1370	8.0
Dec. 4-8.....	800	16	--	75	43	182	16	362	10	75	280	3.0	--	--	875	1.19	1890	364	51	4.1	1520	8.3
Dec. 9-17.....	900	11	--	71	47	170	14	371	14	71	250	3.0	--	--	832	1.13	2020	368	41	3.8	1450	8.4
Dec. 18-25.....	1000	15	--	69	45	144	13	366	0	69	215	3.8	--	--	756	1.03	2040	356	39	3.3	1310	8.0
Dec. 26-31.....	900	18	--	75	47	222	16	410	0	72	345	4.7	--	--	1000	1.36	2430	380	52	5.0	1750	8.0
Jan. 1-9, 1961....	500	13	--	83	40	190	19	411	0	62	295	1.2	--	--	910	1.24	1230	372	35	4.3	1590	7.8
Jan. 10-12.....	1100	13	--	77	44	179	17	400	0	86	276	1.2	--	--	861	1.17	2560	374	48	4.0	1580	7.7
Jan. 13-16.....	800	15	--	77	39	166	18	384	0	80	255	1.9	--	--	813	1.11	1760	352	37	3.9	1440	7.7
Jan. 17-21.....	1100	14	--	67	40	159	13	358	0	61	245	1.9	--	--	765	1.04	2270	334	40	3.8	1350	8.2
Jan. 22-23.....	400	9.5	--	72	36	137	12	330	12	55	210	1.8	--	--	700	.95	756	328	38	3.3	1240	8.4
Jan. 24-Feb. 5....	900	15	--	79	38	177	15	375	0	59	280	1.7	--	--	844	1.15	2050	354	47	4.1	1490	8.1
Feb. 6-11.....	900	9.3	--	72	35	172	14	323	11	56	265	1.1	--	--	794	1.08	1930	322	39	4.2	1400	8.4
Feb. 12-15.....	1500	14	--	63	36	105	11	326	12	55	145	1.9	--	--	805	.82	2450	306	19	2.6	1040	8.3
Feb. 16-21.....	1500	17	--	73	34	103	12	359	0	53	145	4.9	0.14	--	817	.84	2500	323	29	2.5	1080	7.7
Feb. 22-Mar. 3....	1200	20	--	79	38	139	14	386	0	58	205	4.2	.15	--	743	1.01	2410	285	28	3.3	1320	7.7
Mar. 4-8.....	1200	17	--	57	38	156	15	296	14	63	232	3.8	.15	--	740	1.01	2400	288	32	3.9	1320	8.6
Mar. 9-20.....	1100	17	--	70	39	127	14	371	0	61	188	3.7	.15	--	694	.94	2060	335	31	3.0	1240	8.2

Mar. 21-25, 1961...	1500	18	--	65	37	126	13	318	12	60	185	4.7	.15	678	.92	2750	314	34	3.1	1200	8.5
Mar. 26-Apr. 2....	1500	15	--	59	38	112	12	296	15	56	160	4.1	.13	604	.82	2450	302	35	2.8	1080	8.6
Apr. 3-7.....	1200	19	0.01	80	37	139	15	386	0	63	200	2.8	.15	732	1.00	2370	354	37	3.2	1300	8.0
Apr. 8-11.....	800	16	.00	66	38	151	13	338	3	59	225	3.4	.15	739	1.01	1600	320	38	3.7	1320	8.3
Apr. 12-21.....	1300	14	.02	59	32	112	11	298	0	44	165	1.8	.13	581	.79	2040	276	32	2.9	1050	8.2
Apr. 22-29.....	100	13	.01	66	31	104	11	327	0	46	150	2.6	.13	577	.78	156	282	24	2.7	1040	7.9
Apr. 30-May 5....	400	13	--	66	29	105	11	321	0	41	155	2.8	.16	571	.78	156	285	22	2.7	1030	8.2
May 6-15.....	100	12	--	68	41	242	17	346	0	70	370	2.3	.20	984	1.34	286	340	56	5.7	1780	7.7
May 16-21.....	100	10	--	79	55	627	29	338	0	83	1040	2.4	.31	2140	2.91	578	422	145	13	3850	8.1
May 22-29.....	100	9.7	--	66	50	690	30	308	0	83	1090	3.1	.32	2230	3.03	602	370	117	16	4020	8.2
May 30-June 16...	100	8.6	--	58	83	719	35	294	24	99	1140	4.1	.36	2360	3.21	637	404	124	16	4320	8.7
June 17-July 2....	100	9.3	--	67	63	695	36	408	0	111	1090	2.3	.37	2300	3.13	621	454	89	15	4120	8.0
July 3-10.....	100	9.4	.01	64	71	1010	52	379	0	128	1620	2.9	.49	3230	4.39	872	452	141	21	5720	8.2
July 11-16.....	100	8.6	.02	60	72	927	50	377	0	129	1490	4.7	.49	3020	4.11	815	444	135	19	5380	8.1
July 17-23.....	100	7.4	.02	57	60	627	37	377	0	120	988	3.3	.39	2150	2.92	580	390	81	14	3900	8.0
July 24-Aug. 3....	100	6.9	.02	58	77	856	46	412	0	124	1380	3.2	.43	2850	3.88	770	462	124	17	5050	8.0
Aug. 4-31.....	100	--	--	--	--	--	--	--	--	--	1440	--	--	--	--	--	--	--	--	5110	--
Sept. 1-26.....	100	--	--	--	--	--	--	--	--	--	1100	--	--	--	--	--	--	--	--	4140	--
Weighted aver- age 8.....	619	15	--	68	42	217	17	366	--	67	327	3.1	--	933	1.27	1560	342	42	5.1	1660	--

a Includes estimated data for missing periods. Represents 100 percent of runoff for water year.

WEBER RIVER BASIN

10-1285. WEBER RIVER NEAR OAKLEY, UTAH

LOCATION.--At gaging station, 1.4 miles downstream from South Fork, 2.6 miles upstream from Weber-Provo diversion canal, and 3.2 miles northeast of Oakley, Summit County.
DRAINAGE AREA.--163 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1959 to September 1961 (discontinued).

Chemical analyses, in parts per million, water year October 1960 to September 1961

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)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium sum	Non-carbonate		
Oct. 16-Nov. 14, 1960.....	49.1	4.5	0.01	51	12	2.7	1.2	188	4	17	4.0		0.2	163	0.22	21.6	176	15	0.1	325
Nov. 15-Dec. 15, 1960.....	48.4	5.0	.00	46	12	2.4	1.2	181	0	18	3.0		.1	153	.21	20.0	162	14	.1	302
Dec. 16-Jan. 13, 1961.....	36.1	6.0	.01	50	13	2.7	1.1	196	0	19	3.0		.5	197	.27	20.3	177	16	.1	327
Jan. 14-Feb. 21, 1961.....	40.6	5.1	.01	52	12	2.4	.8	201	0	19	3.0		.0	186	.25	20.4	178	13	.1	328
Feb. 22-Mar. 10, 1961.....	41.7		--	--	--	--	--	--	--	--	--	--	--	220	.30	24.8	--	--	--	360
Mar. 11-Apr. 11, 1961.....	54.6	--	--	--	--	--	--	--	--	--	--	--	--	183	.25	27.0	--	--	--	330
Apr. 12-30, 1961.....	86.2	--	--	--	--	--	--	--	--	--	--	--	--	140	.19	32.6	--	--	--	236
June 10-14, 1961.....	229	--	--	--	--	--	--	--	--	--	--	--	--	102	.14	63.1	--	--	--	161
July 15-Aug. 16, 1961.....	53.1	--	--	--	--	--	--	--	--	--	--	--	--	163	.22	23.4	--	--	--	276
Aug. 17-Sept. 16, 1961.....	49.5	--	--	--	--	--	--	--	--	--	--	--	--	134	.21	20.6	--	--	--	279
Sept. 24-30, 1961.....	102	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	199
Weighted average.....	92.5	4.3	--	37	7.9	2.4	--	140	--	11	2.2		0.2	134	0.18	33.5	125	10	0.1	240

a Includes estimated data for missing periods. Represents 100 percent of runoff for water year.

WEBER RIVER BASIN--Continued

10-1305. WEBER RIVER NEAR COALVILLE, UTAH

LOCATION.--At gaging station, 1.5 miles upstream from high waterline of Echo Reservoir, 1.5 miles south of Coalville, Summit County, 3 miles upstream from Chalk Creek, and 6 miles downstream from Silver Creek.

DRAINAGE AREA.--436 square miles.

RECORDS AVAILABLE.--Chemical analyses: September 1959 to September 1961 (discontinued).

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carb- onate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃	So- dium ad- sorp- tion ratio	Specific con- duct- ance pH (micro- mhos at 25°C)		
															Parts per million	Tons per acre- foot	Tons per day					
Oct. 17-Nov. 16, 1960.....	48.3	8.5	0.01	68	16	11	2.1	264	0	27	11	0.1	0.1		260	0.35	33.9	236	20	0.3	453	7.7
Nov. 17-Dec. 17, 1960.....	53.4	13	.01	83	17	12	2.3	250	4	77	12	.6	.6		325	.44	46.9	276	64	.3	538	8.3
Dec. 18-Jan. 13, 1961.....	57.6	11	.01	75	15	10	2.6	260	0	45	11	1.0	1.0		303	.41	47.1	251	38	.3	486	7.9
Jan. 14-Feb. 17, 1961.....	47.6	12	.14	73	17	10	2.4	264	0	43	11	1.0	1.0		311	.42	40.1	250	34	.3	482	8.2
Feb. 18-Mar. 13, 1961.....	61.0	--	--	--	--	--	--	--	--	--	--	--	--	--	258	.35	42.5	--	--	--	459	--
Apr. 28-May 12, 1961.....	17.5	--	--	--	--	--	--	--	--	--	--	--	--	--	254	.35	12.0	--	--	--	451	--
May 30-July 27, 1961.....	185	--	--	--	--	--	--	--	--	--	--	--	--	--	249	.34	10.4	--	--	--	422	--
Aug. 1-20, 1961.....	39.4	--	--	--	--	--	--	--	--	--	--	--	--	--	260	.35	27.7	--	--	--	443	--
Aug. 21-Sept. 30, 1961.....	58.5	--	--	--	--	--	--	--	--	--	--	--	--	--	259	.35	40.9	--	--	--	452	--
Weighted average a.....	71.1	9.8	--	66	15	10	2.3	245	--	34	9.4	--	--	--	270	0.37	51.8	226	25	0.3	445	--

a Includes estimated data for missing periods. Represents 100 percent of runoff for water year.

WEBER RIVER BASIN--Continued

10-1310. CHALK CREEK AT COALVILLE, UTAH

LOCATION.---At gaging station, 100 feet downstream from bridge on U.S. Highway 189 in Coalville, Summit County, and 0.3 mile upstream from mouth. DRAINAGE AREA.--253 square miles. RECORDS AVAILABLE.--Chemical analyses: September 1959 to September 1961 (discontinued).

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate			
Oct. 1-9, 1960.....	7.2	8.5	---	100	32	61	3.0	430	0	35	91	4.7	0.11	---	550	0.75	10.7	383	30	1.4	949	8.0
Oct. 10-Nov. 10.....	13.6	8.4	0.00	89	24	34	1.5	369	0	23	51	1.4	---	---	401	.55	14.9	320	18	.6	723	7.8
Nov. 11-Dec. 8.....	15.9	8.7	0.01	89	24	38	2.6	349	8	26	59	2.0	---	---	416	.57	17.9	322	23	.9	737	8.3
Dec. 9-31.....	12.1	8.6	.02	84	25	38	2.7	357	0	22	58	2.5	---	---	423	.58	13.8	311	18	.9	725	8.1
Jan. 1-31, 1961.....	8.9	7.4	.01	88	26	49	2.6	372	0	27	75	6.6	---	---	477	.65	11.5	328	23	1.2	809	8.0
Feb. 1-28.....	11.8	---	---	---	---	---	---	---	---	---	---	---	---	---	459	.62	14.6	---	---	---	802	---
Mar. 1-23, 25-31.....	30.1	---	---	---	---	---	---	---	---	---	---	---	---	---	347	.47	28.2	---	---	---	618	---
Apr. 1-30.....	28.1	---	---	---	---	---	---	---	---	---	---	---	---	---	293	.40	22.2	---	---	---	536	---
June 1-17.....	26.5	---	---	---	---	---	---	---	---	---	---	---	---	---	306	.42	21.9	---	---	---	558	---
Aug. 1-31.....	4.7	---	---	---	---	---	---	---	---	---	---	---	---	---	517	.70	6.56	---	---	---	915	---
Sept. 1-30.....	4.4	---	---	---	---	---	---	---	---	---	---	---	---	---	542	.74	6.40	---	---	---	960	---
Weighted average.....	18.7	7.8	---	87	25	37	2.4	372	---	23	55	---	1.9	---	420	0.57	18.9	320	15	0.9	738	---

a. Includes estimated data for missing periods. Represents 100 percent of runoff for water year.

WEBER RIVER BASIN--Continued

10-1320. WEBER RIVER AT ECHO, UTAH

LOCATION.--At Echo Dam outlet, 0.8 mile upstream from Echo Creek and 1 mile southeast of Echo, Summit County.

DRAINAGE AREA.--732 square miles.

RECORDS AVAILABLE.--Chemical analyses: September 1959 to September 1961 (discontinued).

REMARKS.--Records of discharge supplied by Echo Reservoir watermaster.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Nov. 2, 1960.....	0.5	9.9	0.00	73	17	18	2.1	257	9	34	24		1.0		299	0.41	0.40	250	24	0.5	521	8.4
Dec. 1.....	.511		.00	76	18	18	2.1	282	0	35	25		1.1		306	.42	.41	262	31	.5	546	7.8
Dec. 28.....	.512		.01	75	18	19	2.3	279	0	38	26		1.5		334	.45	.45	260	31	.5	548	7.8
Jan. 31, 1961.....	.511		.01	80	16	18	1.8	287	0	37	25		1.0		334	.45	.45	264	29	.5	548	8.0
Feb. 28.....	.5		--	--	--	--	--	--	--	--	--		--		335	.46	.45	--	--	--	557	--
Mar. 30.....	.5		--	--	--	--	--	--	--	--	--		--		311	.42	.42	--	--	--	529	--
Apr. 30.....	114		--	--	--	--	--	--	--	--	--		--		321	.44	98.8	--	--	--	544	--
June 3.....	285		--	--	--	--	--	--	--	--	--		--		284	.36	274	--	--	--	453	--
Sept. 3.....	158		--	--	--	--	--	--	--	--	--		--		284	.36	124	--	--	--	453	--
Sept. 5.....	167		--	--	--	--	--	--	--	--	--		--		328	.45	148	--	--	--	552	--

WEBER RIVER BASIN--Continued

10-1365. WEBER RIVER AT GATEWAY, UTAH

LOCATION.--At gaging station, 800 feet downstream from Union Pacific Railroad bridge, 2,500 feet downstream from Strawberry Creek, and 2,500 feet east of section house at Gateway, Morgan County, Utah.

DRAINAGE AREA.--1,610 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: May 1958 to September 1961.

Water temperatures: August 1958 to September 1959.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 352 ppm Sept. 1-30; minimum, 233 ppm Apr. 1-6.

Hardness: Maximum, 270 ppm Jan. 1-31; minimum, 182 ppm Apr. 1-6.

Specific conductance: Maximum daily, 621 microhos Sept. 21, 28; minimum daily, 376 microhos May 26.

EXTREMES, 1958-61.--Dissolved solids: Maximum, 352 ppm Sept. 1-30, 1961; minimum, 154 ppm Apr. 26 to May 4, 1959.

Hardness: Maximum, 270 ppm Nov. 1-30, 1959, Jan. 1-31, 1961; minimum, 110 ppm Apr. 26 to May 4, 1959.

Specific conductance: Maximum daily, 621 microhos Sept. 21, 28, 1961; minimum daily, 242 microhos May 13, 1960.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carb. sulfate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 1-31, 1960.....	111	11	0.00	67	18	23	2.7	255	2	43	26		2.3	0.07	317	0.43	95.0	244	32	0.6	535	8.3
Nov. 1-30.....	61.6	15	.00	71	19	23	2.6	272	0	42	28		2.9	.07	326	.44	54.2	254	31	.6	554	8.2
Dec. 1-31.....	57.2	14	--	62	18	22	2.6	241	0	42	29		3.0	.06	312	.42	48.2	230	32	.6	524	8.1
Jan. 1-31, 1961.....	49.5	14	.00	75	20	22	2.3	302	0	44	27		3.1	.05	349	.47	46.6	270	22	.6	577	8.0
Feb. 1-28.....	71.2	14	--	77	18	21	2.7	277	0	42	29		3.2	.04	344	.47	66.1	266	39	.6	574	8.0
Mar. 1-31.....	89.9	15	--	68	16	21	2.5	236	9	38	27		2.3	.05	318	.43	77.2	236	28	.6	525	8.4
Apr. 1-6.....	136	8.4	.09	53	12	16	2.1	176	6	34	22		1.5	--	233	.32	85.6	182	28	.5	400	8.5
Apr. 7-30.....	116	9.4	.01	59	16	19	2.2	218	0	36	24		1.2	.14	280	.38	67.7	212	33	.6	471	7.9
May 1-31.....	281	13	--	60	16	18	2.2	228	0	36	24		1.5	.06	278	.38	211	214	27	.5	468	7.9
June 1-30.....	325	14	--	64	19	19	2.5	259	0	37	24		1.6	.19	305	.41	268	237	25	.5	522	8.0
July 1-31.....	275	13	.01	70	19	19	2.2	264	0	37	25		1.3	.06	307	.42	228	251	35	.5	523	7.9
Aug. 1-31.....	164	14	--	63	22	18	2.8	284	0	41	24		1.4	.06	316	.43	140	248	32	.5	535	7.8
Sept. 1-30.....	109	15	--	75	17	28	2.7	281	0	42	30		2.6	.07	352	.48	104	256	28	.8	564	7.9
Weighted average.....	143	13	--	66	18	20	2.4	255	--	39	25		1.8	0.09	308	0.42	119	238	30	0.6	518	--

WEBER RIVER BASIN--Continued

10-1410. WEBER RIVER NEAR PLAIN CITY, UTAH

LOCATION.--At gaging station at bridge on State Highway 40, 1 mile downstream from Fourmile Creek, 1.5 miles south of Plain City, Weber County, and 6 miles upstream from mouth.

DRAINAGE AREA.--2,060 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: October 1959 to September 1961 (discontinued).

EXTREMES, 1960-61.--Dissolved solids: Maximum, 682 ppm Sept. 7-18; minimum, 316 ppm Oct. 24 to Nov. 9.

EXTREMES, 1959-61.--Dissolved solids: Maximum daily, 1,200 micromhos Sept. 7; minimum daily, 368 micromhos Nov. 4, 1960.

EXTREMES, 1959-61.--Total dissolved solids: Maximum daily, 1,200 micromhos Sept. 7; minimum daily, 368 micromhos Nov. 4, 1960.

EXTREMES, 1959-61.--Total dissolved solids: Maximum daily, 1,200 micromhos Sept. 7; minimum daily, 368 micromhos Nov. 4, 1960.

Hardness (1959-60): Maximum, 294 ppm July 15-21, 1960; minimum, 148 ppm Apr. 5-13, 1960.

Specific conductance: Maximum daily, 1,200 micromhos Sept. 7, 1961; minimum daily, 357 micromhos Apr. 13, 1960.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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		Sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium-Magnesium	Non-carbonate			
Oct. 1-9, 1960.....	55.4	14	--	75	23	50	6.3	312	0	32	66	18	--	--	446	0.61	66.7	280	24	1.3	757	7.4
Oct. 24-Nov. 9.....	267	11	0.02	67	16	30	4.3	257	0	28	43	2.6	--	--	316	.43	228	232	21	.9	562	7.5
Nov. 10-30.....	140	12	.02	78	23	60	8.1	299	6	45	85	8.8	--	--	466	.63	176	290	35	1.5	811	8.3
Dec. 1-Jan. 15.....	115	11	.00	80	21	62	7.6	318	0	47	85	8.8	--	--	493	.67	153	288	27	1.6	823	7.9
Jan. 16-Feb. 28.....	123	12	.00	77	21	64	7.4	300	0	45	90	9.4	--	--	486	.66	161	279	33	1.7	821	7.6
Mar. 1-15.....	116	--	--	--	--	--	--	--	--	--	--	--	--	--	487	.66	153	--	--	--	839	--
Mar. 16-31.....	189	--	--	--	--	--	--	--	--	--	--	--	--	--	433	.59	221	--	--	--	743	--
Apr. 1-9.....	186	--	--	--	--	--	--	--	--	--	--	--	--	--	339	.46	170	--	--	--	582	--
Apr. 20-May 31.....	14.0	--	--	--	--	--	--	--	--	--	--	--	--	--	633	.86	23.9	--	--	--	1100	--
June 1-30.....	10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	619	.84	17.2	--	--	--	1050	--
July 1-31.....	6.3	--	--	--	--	--	--	--	--	--	--	--	--	--	483	.66	8.22	--	--	--	837	--
Aug. 1-31.....	3.0	--	--	--	--	--	--	--	--	--	--	--	--	--	628	.85	5.09	--	--	--	1090	--
Sept. 1-18.....	4.0	--	--	--	--	--	--	--	--	--	--	--	--	--	662	.93	7.37	--	--	--	1200	--
Weighted average a.....	83.7	11	--	73	21	52	6.9	300	--	38	73	--	--	--	447	0.61	101	268	22	1.4	766	--

a Includes estimated data for missing periods. Represents 100 percent of runoff for water year.

JORDAN RIVER BASIN

10-1710. JORDAN RIVER AT SALT LAKE CITY, UTAH

LOCATION.--At highway bridge on 21st South St., Salt Lake City, Salt Lake County, 0.2 mile upstream from gaging station, about 200 feet upstream from diversion structure at head of Surplus Canal, and about 2 miles downstream from Mill Creek.

RECORDS AVAILABLE.--Chemical analyses: October 1959 to September 1961 (discontinued).

EXTREMES, 1960-61.--Dissolved solids: Maximum, 1,520 ppm Oct. 9-13; minimum, 1,030 ppm May 26-31.

Hardness: Maximum, 760 ppm Oct. 9-13; minimum, 522 ppm May 26-31.

Specific conductance: Maximum daily, 2,380 microhos Oct. 11; minimum daily, 1,620 microhos May 29.

EXTREMES, 1959-61.--Dissolved solids: Maximum daily, 1,520 ppm Oct. 9-13, 1960; minimum, 1,030 ppm May 26-31, 1960.

Hardness: Maximum daily, 760 ppm Oct. 9-13, 1960; minimum, 522 ppm May 26-31, 1960.

Specific conductance: Maximum daily, 2,380 microhos Oct. 11, 1960; minimum, 1,620 microhos May 29, 1960.

REMARKS.--Water discharge computed by adding the discharge of Jordan River at Salt Lake City and the discharge of Surplus Canal at Salt Lake City.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhos at 25°C)
															Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate		
Oct. 1-9, 1960....	224	18	--	156	74	203	--	160	0	559	285	--	6.1	--	1390	1.89	692	561	3.4	2070
Oct. 9-13.....	278	18	0.28	168	83	245	--	384	0	451	390	--	1.5	--	1520	2.07	760	448	3.9	2380
Oct. 14-20.....	249	22	0.03	172	71	214	--	336	0	518	315	--	8.3	--	1440	1.96	720	525	3.5	2170
Oct. 21-27.....	249	22	0.02	162	66	199	--	316	0	454	285	--	2.8	--	1320	1.80	676	476	3.5	2080
Oct. 28-Nov. 3....	230	23	1.7	165	71	197	--	134	0	378	285	--	3.3	--	1400	1.90	704	574	3.2	2090
Nov. 4-10.....	237	17	--	156	68	185	14	311	0	398	290	--	5.5	--	1290	1.75	670	415	3.1	1980
Nov. 11-16.....	235	20	--	168	73	202	18	302	0	465	310	--	1.8	--	1410	1.92	720	472	3.3	2140
Nov. 17-26.....	221	23	--	164	66	185	15	322	0	416	295	--	4.9	--	1330	1.81	680	416	3.1	2050
Nov. 27-29.....	235	17	--	160	71	205	16	257	0	470	310	--	5.7	--	1380	1.88	690	479	3.4	2100
Nov. 30-Dec. 8....	224	23	--	152	68	181	15	317	0	403	285	--	2.8	--	1290	1.75	660	400	3.1	2010
Dec. 9-15.....	220	22	--	164	72	178	15	195	0	523	280	--	9.1	--	1360	1.85	705	545	2.9	2060
Dec. 16-23.....	217	21	--	164	74	184	15	214	0	514	295	--	5.1	--	1380	1.88	715	540	3.0	2090
Dec. 24-31.....	213	22	--	168	63	175	14	319	0	396	280	--	6.6	--	1300	1.77	680	418	2.9	2010
Jan. 1-6, 1961....	200	19	--	160	68	182	16	287	0	423	285	--	3.9	--	1310	1.78	660	445	3.0	2030
Jan. 9-12.....	214	20	--	152	72	186	14	282	0	433	300	--	3.6	--	1320	1.80	675	444	3.1	2070
Jan. 13-19.....	196	17	--	168	71	180	13	148	0	565	290	--	11	--	1390	1.89	712	591	2.9	2090
Jan. 20-27.....	189	23	--	160	65	177	13	294	0	396	280	--	11	--	1280	1.75	684	463	3.0	1990
Jan. 28-Feb. 2....	189	23	--	160	65	177	13	294	0	396	280	--	11	--	1280	1.75	684	463	3.0	1990
Feb. 3-11.....	189	21	0.1	164	60	167	12	286	0	457	280	--	5.4	--	1400	1.91	716	565	2.9	2060
Feb. 12-14.....	217	19	0.02	174	69	181	14	184	0	533	305	--	12	--	1410	1.92	716	565	2.9	2060
Feb. 15-23.....	207	20	0.1	158	72	175	13	292	0	402	285	--	10	--	1290	1.75	688	449	2.9	1960
Feb. 24-Mar. 3....	210	22	0.01	166	68	186	14	198	0	510	295	--	12	--	1380	1.88	692	530	3.1	2080
Mar. 4-10.....	205	23	0.02	160	65	174	14	266	0	422	285	--	12	--	1300	1.77	668	450	2.9	1990

Mar. 11-16, 1961..	201	22	.03	167	69	179	14	142	0	549	285	12	---	1380	1.88	749	700	584	2.9	5940	6.6
Mar. 17-23.....	197	19	.07	156	68	178	13	280	0	396	285	4.4	---	1280	1.74	681	668	430	3.0	1970	7.3
Mar. 24-31.....	202	23	.14	147	67	174	13	288	0	398	275	4.0	---	1250	1.70	662	644	408	3.0	1940	7.6
Apr. 1-6.....	187	18	---	164	61	192	15	233	0	452	300	3.4	---	1330	1.81	672	658	467	3.2	2030	7.0
Apr. 7-12.....	181	19	---	159	70	184	14	140	0	540	298	1.4	---	1360	1.86	674	662	367	3.1	2060	6.9
Apr. 13-21.....	174	17	---	172	44	166	13	202	0	441	262	4.3	---	1230	1.87	578	610	444	2.9	1860	6.9
Apr. 22-27.....	160	19	---	154	65	152	12	125	0	525	252	15	---	1260	1.71	544	652	550	2.6	1900	6.7
Apr. 28-May 2.....	145	18	---	153	51	152	11	273	0	358	245	13	---	1140	1.55	446	580	368	2.7	1770	7.4
May 3-12.....	170	14	---	149	64	169	15	91	0	565	268	5.0	---	1300	1.77	597	636	561	2.9	1960	6.4
May 13-19.....	206	15	---	138	70	179	16	160	0	498	282	9.2	---	1290	1.75	717	832	501	3.1	1980	6.7
May 20-25.....	167	16	---	142	65	165	15	143	0	509	255	6.3	---	1250	1.70	564	620	503	2.9	1930	6.7
May 26-31.....	159	12	---	128	49	149	12	263	0	320	220	4.6	---	1030	1.40	442	522	306	2.8	1620	7.4
June 1-5.....	140	15	---	142	63	173	16	105	0	525	250	7.7	.37	1240	1.69	469	612	526	3.0	1910	7.0
June 10-16.....	163	15	---	133	65	194	16	286	0	389	285	8.1	.31	1230	1.67	541	600	365	3.4	1950	7.4
June 17-22.....	132	17	---	147	71	197	17	105	0	575	290	5.1	.28	1370	1.66	488	660	574	3.3	2090	6.8
June 23-29.....	115	16	---	135	67	197	17	279	0	391	268	17	.33	1270	1.73	394	612	383	3.5	2010	7.3
June 30-July 7.....	151	18	---	148	75	209	18	69	0	643	308	3.7	.35	1460	1.99	595	678	621	3.5	2200	6.5
July 8-15.....	156	19	---	146	71	223	19	289	0	436	332	7.7	.36	1400	1.90	590	662	425	3.6	2190	7.3
July 16-20.....	126	16	---	139	69	202	16	120	0	532	376	1.4	.31	1350	1.84	439	630	532	3.5	2050	7.6
July 21-27.....	121	17	---	141	75	229	20	282	0	447	332	2.4	.39	1400	1.90	457	660	429	3.9	2190	7.2
July 28-Aug. 1.....	118	18	---	143	67	204	16	302	0	392	295	5.6	.34	1290	1.75	411	630	382	3.5	2030	7.5
Aug. 2-11.....	140	19	---	136	64	186	16	286	0	391	280	3.7	.33	1240	1.69	469	602	367	3.3	1960	7.5
Aug. 12-31.....	124	---	---	---	---	---	---	---	---	---	302	---	---	---	---	---	---	---	---	---	---
Sept. 1-30.....	147	---	---	---	---	---	---	---	---	---	290	---	---	---	---	---	---	---	---	---	---
Weighted average a.....	113	19	---	157	66	185	15	245	0	459	290	6.6	---	1320	1.80	403	671	470	3.1	2030	---

a Includes estimated data for missing periods. Represents 100 percent of runoff for water year.

JORDAN RIVER BASIN--Continued
10-1726.05. JORDAN RIVER AT MOUTH, AT WOODS CROSS, UTAH

LOCATION.--At diversion canal from Burnham dam on road to New State Gun Club, 2.5 miles west of Woods Cross, Davis County.
RECORDS AVAILABLE.--Chemical analyses, July 1959 to July 1961 (discontinued).
REMARKS.--No discharge records available.

Chemical analyses, in parts per million, July 1959 to July 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Mg.	Non-carbonate			
July 1, 1959.....		19	--	117	59	200	--	252	0	371	265		6.0		1,160	1.58		536	329	3.8	1,780	7.7
Sept. 29.....		20	0.05	131	65	181	15	248	0	404	280		8.8	0.25	1,230	1.67		594	391	3.2	1,930	7.5
Oct. 1.....		18	--	146	63	179	--	217	0	458	250				1,230	1.67		622	444	3.1	1,970	7.6
Oct. 12.....		12	--	164	63	221	--	243	0	482	315		1.5		1,380	1.86		666	467	3.7	2,060	7.3
Oct. 19.....		18	--	167	66	208	--	234	0	507	295		4.1		1,380	1.88		688	496	3.4	2,120	7.4
Oct. 27.....																						
Nov. 2.....		17	--	164	68	231	--	234	0	509	330		2.7		1,440	1.96		688	498	3.8	2,210	7.7
Nov. 9.....		26	--	167	66	223	--	234	0	505	325		2.7		1,320	1.93		684	492	3.8	2,150	7.6
Nov. 16.....		20	--	167	66	203	--	226	0	472	282		2.9		1,370	1.73		694	467	3.4	2,050	7.2
Nov. 24.....		17	0.05	143	66	196	--	226	0	472	282		7.1		1,250	1.73		688	467	3.4	1,980	7.5
Nov. 30.....		20	0.05	140	72	184	--	238	0	456	265		4.7		1,260	1.71		646	451	3.2	1,960	7.5
Dec. 8.....		16	--	146	70	198	--	224	0	491	272		2.1		1,310	1.78		650	466	3.4	2,010	7.9
Dec. 14.....		17	0.06	142	66	187	--	232	0	443	270		3.3		1,240	1.69		628	436	3.2	1,980	7.5
Dec. 21.....		18	--	140	67	202	--	244	--	464	270		1.3		1,280	1.74		624	424	3.5	1,980	--
Dec. 28.....		16	0.04	143	72	188	--	210	0	468	280		8.4		1,280	1.74		652	480	3.2	2,030	7.4
Jan. 4, 1960.....		15	0.01	152	75	189	--	294	0	453	272		3.1		1,300	1.77		688	447	3.1	2,020	7.9
Jan. 6.....		19	0.01	160	71	193	--	302	0	447	278		7.1		1,320	1.80		690	442	3.2	2,050	7.4
Jan. 14.....		17	0.00	136	62	211	--	221	5	410	305		11		1,270	1.73		596	407	3.8	2,020	8.3
Jan. 18.....		17	0.01	156	73	210	--	203	7	509	305		9.2		1,390	1.89		690	512	3.5	2,130	8.4
Jan. 25.....		19	0.00	150	69	204	--	211	0	482	295		13		1,340	1.82		658	485	3.5	2,080	7.5
Feb. 1.....		14	0.01	120	74	206	--	240	0	423	290		8.4		1,250	1.70		604	407	3.6	1,960	8.0
Feb. 8.....		10	0.00	130	77	193	--	218	0	459	285		2.4		1,260	1.71		642	463	3.3	1,980	8.1
Feb. 22.....		18	0.05	139	62	211	--	873	0	18	330		2.9		1,270	1.73		604	0	4.9	2,170	7.5
Feb. 26.....		17	0.01	127	85	213	--	422	0	9.5	355		2.3		1,340	1.82		584	0	5.7	2,330	7.8
Mar. 7.....		12	0.01	119	57	217	--	202	0	385	305		7.7		1,200	1.63		524	196	4.5	1,900	7.8
Mar. 14.....		12	0.01	119	57	217	--	202	0	385	305		7.7		1,200	1.63		530	364	4.1	1,900	7.8
Mar. 21.....		13	0.04	120	62	207	--	208	0	395	300		1.7		1,200	1.63		554	385	3.8	1,990	7.8
Mar. 28.....		8.7	0.02	111	68	268	--	198	0	426	375		5.7		1,380	1.85		554	393	5.0	2,180	8.1
Apr. 11.....		15	0.01	123	44	122	--	277	0	267	175		4.4		884	1.20		488	261	2.4	1,990	7.2
Apr. 13.....		14	0.03	115	45	122	--	188	0	314	180		2.4		884	1.20		472	318	2.4	1,970	7.1
Apr. 18.....		14	0.01	139	47	143	--	248	0	338	210		9.9		1,020	1.39		540	337	2.7	1,580	7.3

Apr. 25, 1960.....	16	.00	139	48	147	--	257	0	342	210	.6	1,030	1.40	544	353	2.7	1,560	7.2
May 2.....	14	.00	143	52	172	--	238	0	386	245	.9	1,130	1.54	566	373	3.1	1,750	7.4
May 9.....	15	.00	109	46	122	--	202	0	305	170	3.0	670	1.18	460	284	2.5	1,360	7.2
May 23.....	9.8	.00	114	53	161	--	136	0	423	210	3.6	1,040	1.41	500	386	3.1	1,610	7.0
May 30.....	22	.06	131	55	167	--	258	0	375	225	1.5	1,110	1.51	556	344	3.1	1,690	6.9
June 6.....	14	.01	95	46	149	--	202	0	289	200	3	897	1.22	424	258	3.1	1,420	7.0
June 13.....	14	.00	139	65	186	--	208	0	488	270	4.9	1,270	1.72	616	450	3.1	1,820	7.9
June 20.....	16	.00	149	66	192	--	236	0	474	265	3.3	1,260	1.74	646	450	3.3	1,850	7.1
July 4.....	9.2	--	186	69	253	--	216	0	567	340	4.5	1,520	2.07	700	523	4.2	2,280	8.1
July 11.....	16	--	123	59	251	--	402	0	257	345	12	1,260	1.71	548	218	4.6	2,240	7.4
July 18.....	18	--	112	64	402	--	1,040	0	59	355	4.1	1,530	2.08	544	0	7.5	2,770	7.2
Aug. 8.....	17	--	140	69	217	--	214	0	488	285	5.7	1,340	1.82	632	457	3.8	2,030	7.2
Aug. 16.....	14	--	325	131	544	--	338	0	1,170	735	3.4	3,090	4.20	1,350	1,070	6.4	4,340	7.3
Aug. 23.....	17	--	156	63	228	--	270	0	461	310	3.2	1,370	1.66	646	425	3.9	2,080	7.1
Aug. 30.....	16	--	143	66	219	--	266	0	431	305	9.4	1,330	1.81	628	410	3.6	2,070	7.4
Sept. 6.....	17	--	136	68	210	--	220	0	455	285	8.4	1,300	1.77	620	440	3.7	2,010	7.5
Sept. 12.....	17	.02	117	61	202	--	256	0	391	255	7.6	1,160	1.60	544	334	3.8	1,660	7.6
Sept. 19.....	17	.01	135	64	222	--	266	0	428	285	2.1	1,300	1.77	600	365	3.9	2,010	7.2
Sept. 26.....	18	.01	156	74	226	--	227	0	528	315	4.4	1,440	1.96	692	506	3.7	2,180	7.1
Oct. 3.....	19	.03	159	68	207	--	190	0	526	295	7.5	1,360	1.88	676	520	3.5	2,080	7.3
Oct. 10.....	17	.09	236	83	233	--	254	0	703	345	10	1,760	2.39	928	720	3.3	2,500	7.3
Oct. 17.....	15	.33	248	91	228	--	268	0	749	345	8	1,820	2.79	896	776	3.1	2,560	7.1
Nov. 3.....	20	.00	156	61	189	--	306	0	381	300	6.7	1,370	1.73	840	394	3.2	2,060	7.4
Jan. 10, 1961.....	21	--	156	61	189	--	306	0	381	300	6.7	1,370	1.73	840	394	3.2	2,060	7.4
Apr. 5.....	21	--	131	65	183	--	284	0	383	280	7.8	1,240	1.69	644	411	3.1	1,800	7.4
July 25.....	--	--	--	--	--	--	--	--	--	--	--	1,240	1.69	--	--	--	1,830	--

a. Residue at 180°C.

SEVIER LAKE BASIN

10-1915. SEVIER RIVER BELOW PIUTE DAM, NEAR MARYSVILLE, UTAH

LOCATION.---At outlet below Piute Dam, 0.8 mile upstream from gaging station and about 9 miles south of Marysville, Piute County. DRAINAGE AREA.--2,440 square miles, approximately, upstream from gaging station. RECORDS AVAILABLE.--Chemical analyses: March 1958 to September 1961.

Chemical analyses, in parts per million, February to September 1961

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		Sodium adsorption ratio	Specific conductance (microhm-cm at 25°C)	pH
															Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate			
Feb. 28, 1961.....	130	28	--	46	19	25	2.7	248	0	27	12		1.9	0.02	280	0.38	194	0	0.8	453	7.9
Mar. 13.....	141	29	--	44	19	26	2.8	244	0	28	12		1.4	0.03	279	0.38	188	0	0.8	446	8.0
Mar. 21.....	137	26	--	43	19	26	2.8	242	0	28	12		1.2	0.05	282	0.38	186	0	0.8	445	7.9
Mar. 27.....	144	25	--	43	18	26	2.9	241	0	30	13		1.3	0.04	280	0.38	184	0	0.8	445	7.9
Mar. 3.....	115	24	0.01	43	20	26	3.2	248	0	28	11		1.1	0.17	270	0.37	190	0	0.8	455	7.4
Apr. 10.....	105	29	0.07	44	20	26	3.2	248	0	28	11		0.8	0.17	273	0.37	192	0	0.8	457	8.2
Apr. 17.....	97	29	0.01	46	20	27	3.2	256	0	30	11		0.6	0.18	279	0.38	198	0	0.8	472	7.7
Apr. 25.....	80	28	0.01	47	20	28	3.2	229	15	33	12		1.6	0.16	293	0.40	202	0	0.9	477	8.5
May 9.....	321	28	--	42	21	28	3.3	245	0	34	12		1.8	0.16	284	0.39	192	0	0.9	472	7.8
May 16.....	470	27	--	42	21	29	3.3	243	0	36	12		1.9	0.17	285	0.39	192	0	0.9	477	7.9
May 25.....	186	27	--	43	21	32	3.6	247	0	37	14		1.6	0.19	283	0.40	193	0	1.0	489	7.8
May 29.....	180	29	--	43	21	31	3.6	241	0	40	16		1.4	0.18	293	0.40	189	0	1.0	484	7.7
June 4.....	217	24	--	43	20	31	3.6	241	0	40	16		1.4	0.18	293	0.40	189	0	1.0	484	7.7
June 13.....	212	25	--	47	17	23	3.3	231	0	31	15		0.5	0.15	273	0.37	188	0	0.7	455	7.6
June 19.....	201	26	--	47	18	23	3.4	237	0	29	14		0.5	0.17	282	0.38	194	0	0.7	455	7.8
June 26.....	210	31	--	49	16	23	3.9	239	0	27	16		2.0	0.11	284	0.39	190	0	0.7	455	8.0
July 6.....	295	25	0.01	51	16	22	3.8	238	0	30	16		1.6	0.07	277	0.38	192	0	0.7	448	7.8
July 12.....	292	29	0.02	51	17	22	3.8	239	0	29	16		1.2	0.07	280	0.38	196	0	0.7	449	7.6
July 17.....	203	29	0.02	52	17	22	4.6	244	0	30	16		2.1	0.07	288	0.39	198	0	0.7	459	7.8
July 25.....	30	35	0.02	53	17	24	4.0	253	0	33	16		1.4	0.07	300	0.41	204	0	0.7	480	7.6
Aug. 2.....	34	34	--	55	18	25	4.0	257	0	34	17		0.9	0.07	306	0.42	208	0	0.8	487	7.8
Aug. 8.....	130	30	--	55	20	25	4.0	262	0	35	18		1.1	0.08	312	0.42	220	5	0.7	492	7.8
Aug. 14.....	144	32	--	61	17	27	3.9	268	0	38	18		1.2	0.09	322	0.44	222	2	0.8	506	8.0
Aug. 21.....	35	29	--	59	18	28	4.0	273	0	42	18		1.1	0.09	334	0.45	222	0	0.8	516	8.2
Aug. 29.....	66	27	--	58	20	30	4.0	257	8	44	18		0.2	0.10	330	0.45	225	1	0.9	514	8.5
Sept. 11.....	22	--	--	--	--	--	--	--	--	--	20		--	--	--	--	--	--	--	535	--
Sept. 18.....	42	--	--	--	--	--	--	--	--	--	16		--	--	--	--	--	--	--	504	--
Sept. 26.....	31	--	--	--	--	--	--	--	--	--	14		--	--	--	--	--	--	--	480	--
Weighted average.....	104	28	0.02	49	19	26	3.8	260	--	26	14		1.3	0.12	295	0.40	200	0	0.8	470	--

a Includes estimated data for missing periods. Represents 100 percent of runoff for water year.

SEVIER LAKE BASIN--Continued

10-2240. SEVIER RIVER NEAR LYNNDYL, UTAH

LOCATION--At bridge on county road, 1.5 miles upstream from gaging station and about 2 miles south of Lynndyl, Millard County.

DRAINAGE AREA--6,270 acres, approximately, upstream from gaging station.

RECORDS AVAILABLE--Chemical analyses, March 1951, to September 1961.

Water temperatures: March 1951, to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 1,750 ppm July 1-20, 26-31; minimum, 812 ppm Sept. 1-7.

Hardness: Maximum, 625 ppm July 1-20, 26-31; minimum, 343 ppm Aug. 1-6.

Specific conductance: Maximum daily, 3,180 microhos July 10; minimum daily, 1,310 microhos Aug. 3.

Water temperatures: Maximum, 64°F Aug. 28; minimum, 34°F on many days during December and January.

EXTREMES, 1951-61.--Dissolved solids: Maximum, 4,650 ppm Jan. 16-22, 1955; minimum, 512 ppm Mar. 9-12, 1955.

Hardness: Maximum, 1,710 ppm Jan. 16-22, 1955; minimum, 248 ppm Mar. 9-12, 1955.

Specific conductance: Maximum daily, 7,040 microhos Jan. 21, 1955; minimum daily, 855 microhos Mar. 11, 1955.

Water temperatures: Maximum, 85°F July 21-23, 1956; minimum, 33°F on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Discharges are adjusted to compensate for inflow from a deep well discharging to the river between the sampling point and the gaging station.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio (microhmhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 1-31, 1960.....	34.1	11	0.01	67	77	186	4.4	270	0	256	290		2.1	0.26	1030	1.40	94.8	484	263	3.7	1720	7.9
Nov. 1-30.....	36.4	11	—	75	75	181	4.1	286	0	244	280		1.6	.23	1010	1.37	99.3	498	263	3.5	1700	8.1
Dec. 1-31.....	36.6	13	—	80	70	176	3.8	297	0	239	280		1.2	.16	1010	1.37	99.8	486	242	3.5	1700	8.0
Jan. 1-31, 1961.....	34.8	14	.00	83	68	174	4.1	302	0	237	272		1.5	.18	1000	1.36	94.0	488	240	3.4	1690	8.0
Feb. 1-28.....	33.3	11	—	85	72	203	4.0	288	0	274	310		.0	.19	1100	1.50	98.9	510	274	3.9	1850	8.0
Mar. 1-31.....	27.2	9.7	—	96	89	254	4.8	299	0	348	400		.3	.24	1350	1.84	99.1	604	359	4.5	2230	8.0
Apr. 1-15.....	23.8	13	.01	92	92	274	5.6	303	0	373	415		.5	.29	1410	1.92	100.6	608	360	4.8	2340	8.0
Apr. 16-30.....	33.5	16	.01	83	77	210	5.2	297	0	286	325		2.1	.24	1150	1.84	104	528	282	4.0	1930	8.1
May 1-31.....	464	24	—	91	71	278	5.9	325	0	333	380		5.6	.38	1350	1.84	1690	518	282	5.3	2240	8.0
June 1-30.....	205	19	—	89	82	323	6.9	305	0	402	440		2.4	.41	1510	2.05	836	558	308	5.9	2480	7.8
July 1-20, 26-31.....	202	21	.01	104	89	387	7.5	306	0	469	520		2.1	.47	1750	2.38	954	625	374	6.7	2830	7.7
July 21-25.....	30.3	13	.01	93	81	219	5.2	280	0	261	320		1.2	.28	1100	1.50	90.0	490	260	4.3	1900	8.0
Aug. 1-6.....	238	22	—	90	76	248	7.4	283	0	178	194		1.5	.32	828	1.13	332	343	100	3.7	1350	7.5
Aug. 7-17.....	61	23	—	101	76	354	7.4	243	0	436	492		2.3	.27	1610	2.19	355	563	364	6.5	2620	7.5
Aug. 16-31.....	26.0	15	—	83	49	200	5.6	257	0	233	268		.7	.28	981	1.33	68.9	408	197	4.3	1640	7.7
Sept. 1-7.....	16.1	13	—	67	52	145	4.0	260	0	183	219		.4	.42	812	1.10	35.3	382	169	3.2	1370	7.8

WALKER LAKE BASIN

10-2930. EAST WALKER RIVER NEAR BRIDGEPORT, CALIF.

LOCATION.---At gaging station 1,500 feet downstream from Bridgeport Reservoir, 5 miles north of Bridgeport, Mono County, and 10 miles upstream from Sweetwater Creek.

DRAINAGE AREA.---342 square miles

RECORDS AVAILABLE.---Chemical analyses: October 1958 to September 1961.

REMARKS.---Flow regulated by Bridgeport Reservoir.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)	pH
													Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 6, 1960.....	37	--	--	--	--	14	--	94	--	4.0	--	--	--	--	--	63	0	0.8	193	7.8
Nov. 2.....	26	--	--	--	--	13	--	90	--	6.2	--	0.1	--	--	--	61	0	0.7	177	8.0
Dec. 7.....	5.0	--	--	--	--	38	--	154	--	10	--	.4	--	--	--	99	0	1.7	354	7.9
Jan. 3, 1961.....	5.4	--	--	--	--	28	--	136	--	7.0	--	.2	--	--	--	95	0	1.3	321	8.1
Feb. 7.....	6.2	--	--	--	--	17	--	100	--	3.0	--	.2	--	--	--	76	0	.8	225	8.2
Mar. 2.....	5.4	--	--	--	--	21	--	112	--	3.5	--	.1	--	--	--	75	0	1.1	240	8.2
Apr. 4.....	29	--	--	--	--	22	--	153	--	3.4	--	.1	--	--	--	82	0	1.1	256	8.2
May 2.....	38	25	0.00	25	5.2	25	4.0	138	25	4.8	0.4	.2	179	0.24	--	84	0	1.2	279	8.0
June 1.....	60	--	--	--	--	23	--	138	--	1.3	--	.2	--	--	--	84	0	1.0	279	8.2
July 6.....	66	--	--	--	--	18	--	122	--	1.0	--	.0	--	--	--	87	0	.8	243	7.8
Aug. 9.....	64	--	--	--	--	17	--	126	--	2.5	--	.1	--	--	--	87	0	.8	243	7.8
Sept. 7.....	64	24	--	28	3.4	17	4.9	128	14	2.5	.3	1.5	159	.22	--	84	0	.8	238	7.8

WALKER LAKE BASIN--Continued

10-2960. WEST WALKER RIVER BELOW LITTLE WALKER RIVER, NEAR COLEVILLE, CALIF.

LOCATION.--At bridge on U.S. Highway 395, 200 feet downstream from gaging station, 275 feet downstream from East Fork, and 13 miles southeast of Coleville,

Mono County.

DRAINAGE AREA.--182 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 6, 1960.....	25	--	--	--	--	21	--	92	--	--	5.0	--	--	0.2	--	--	--	50	0	1.3	195	7.7
Nov. 2.....	23	--	--	--	--	23	--	94	--	--	--	--	--	.2	--	--	--	50	0	1.4	194	8.0
Dec. 7.....	25	--	--	--	--	21	--	122	--	--	5.8	--	--	.2	--	--	--	64	0	1.1	187	8.1
Jan. 3, 1961.....	31	--	--	--	--	9.4	--	70	--	--	3.8	--	--	.0	--	--	--	47	0	.6	136	8.0
Feb. 7.....	35	--	--	--	--	7.4	--	58	--	--	.5	--	--	.1	--	--	--	43	0	.5	111	8.0
Mar. 2.....	44	--	--	--	--	9.8	--	43	--	--	2.0	--	--	.0	--	--	--	39	4	.7	120	8.0
Apr. 4.....	269	--	--	--	--	2.3	--	29	--	--	.0	--	--	.0	--	--	--	19	0	.2	47	7.6
May 2.....	257	10	0.00	3.2	2.4	2.0	0.7	24	--	0.0	.0	0.1	0.1	.1	31	0.04	--	18	0	.2	44	7.6
June 1.....	366	--	--	--	--	2.4	--	27	--	--	.6	--	--	.0	--	--	--	18	0	.2	46	7.5
July 6.....	137	--	--	--	--	2.4	--	30	--	--	1.0	--	--	.0	--	--	--	21	0	.2	55	7.7
Aug. 9.....	26	--	--	--	--	5.4	--	50	--	--	2.2	--	--	.0	--	--	--	39	0	.4	101	7.9
Sept. 7.....	26	12	--	15	3.5	5.5	1.3	72	--	4.0	2.5	.1	.1	.1	79	.11	--	52	0	.3	129	8.1

CARSON RIVER BASIN

10-3055. EAST FORK CARSON RIVER NEAR MARLBOROUGH, CALIF.

LOCATION.--Approximately 100 yards upstream from Hangmans Bridge, 1.2 miles southeast of Marikieville, Alpine County, and 7 miles southeast of Woodfords.
 RECORDS AVAILABLE.--Chemical analyses: September 1958 to September 1961.
 REMARKS.--No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 6, 1960.....						10		79			2.3			0.2				55	0	0.6	156	8.0
Nov. 2.....						13		75						.2				52	0	.8	152	8.0
Dec. 7.....						13		116			7.5			.2				94	0	.6	213	8.0
Jan. 3, 1961.....						8.9		80			4.0			.2				66	0	.5	176	8.1
Feb. 7.....						11		69			3.2			.2				52	0	.7	148	8.1
Mar. 2.....						11		72			4.0			.1				51	0	.7	150	8.0
Apr. 4.....						5.5		39			2.0			.1				25	0	.5	71	7.6
May 2.....		18	0.01	6.0	3.2	4.0	0.9	39		3.0	1.8	0.1	0.2	.1		56	0.08	28	0	.4	70	7.2
June 2.....						5.0		43						.1				27	0	.4	101	8.0
July 6.....						6.3		54			2.0			.2				37	0	.5	103	7.8
Aug. 9.....						6.4		56		4.0	4.0	.1	.3	.2				38	0	.5	103	7.8
Sept. 7.....	17			11	3.3	6.5	1.4	56							76	.10		41	0	.4	110	7.8

CARSON RIVER BASIN--Continued

10-3090. EAST FORK CARSON RIVER NEAR GARDNERVILLE, NEV.

LOCATION.--Temperature recorder at gaging station, 2 miles east of Mud Lake Reservoir, 4.5 miles downstream from Bryant Creek, and 7 miles southeast of Gardnerville, Douglas County.

DRAINAGE AREA.--344 square miles.

WATER TEMPERATURES.--Water temperatures: July 1955 to September 1961.

EXTREMES, 1955-61.--Water temperatures: Maximum, 82° Aug. 21, minimum, 34° Dec. 11, 31.

EXTREMES, 1958-61.--Water temperatures: Maximum, 85° Aug. 7, 1960; minimum, freezing point Dec. 30, 1955, Dec. 24, 28, 31, 1957, several days during January 1958, Dec. 16, 18, 1959.

Temperature (°F) of water, water year October 1960 to September 1961

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

CARSON RIVER BASIN--Continued

10-3100. WEST FORK CARSON RIVER AT WOODFORDS, CALIF.

LOCATION.--At bridge on State Highway 89, 0.3 mile upstream from gaging station, 0.8 mile southwest of Woodfords, Alpine County, and 3.5 miles downstream from Willow Creek.
 DRAINAGE AREA.--66 square miles, approximately.
 RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl Sulfate (CO ₃)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-bicarbonate		
Oct. 6, 1960.....	9.5	--	--	--	--	4.4	--	47	--	1.0	--	--	0.0	--	--	--	32	0	0.3	85
Nov. 2.....	12	--	--	--	--	5.0	--	46	--	--	--	--	0	--	--	--	28	0	0.4	79
Dec. 7.....	13	--	--	--	--	4.1	--	48	--	1.5	--	--	0	--	--	--	30	0	0.3	82
Jan. 3, 1961.....	12	--	--	--	--	4.2	--	48	--	--	--	--	0	--	--	--	31	0	0.3	82
Feb. 7.....	16	--	--	--	--	5.1	--	41	--	1.2	--	--	0	--	--	--	31	0	0.4	78
Mar. 2.....	131	--	--	--	--	3.6	--	43	--	1.2	--	--	.1	--	--	--	29	0	0.3	75
Apr. 4.....	142	--	--	--	--	4.1	--	29	--	0	--	--	0	--	--	--	16	0	0.5	48
May 2.....	131	17	0.00	4.0	2.7	1.9	0.9	29	0.0	0.5	0.1	0.1	0.1	41	0.06	21	21	0	0.2	51
June 2.....	101	--	--	--	--	2.5	--	28	--	3	--	--	0	--	--	21	0	0.2	53	
July 6.....	54	--	--	--	--	2.0	--	30	--	0.8	--	--	0	--	--	23	0	0.2	58	
Aug. 9.....	13	--	--	--	--	3.6	--	50	--	--	--	--	0	--	--	33	0	0.3	82	
Sept. 7.....	8.5	21	--	11	2.3	3.4	1.8	48	3.0	1.5	.1	.1	0	68	.09	37	0	0.2	87	

HUMBOLDT RIVER BASIN

10-3350. HUMBOLDT RIVER NEAR RYE PATCH, NEV.

LOCATION --At gaging station 1,000 feet downstream from Rye Patch Dam and 1.5 miles northwest of Rye Patch, Pershing County.

DRAINAGE AREA --16,100 square miles, approximately.

RECORDS AVAILABLE --Chemical analyses: December 1951 to September 1958, October 1959 to September 1961.

Water temperatures: December 1951 to September 1958, October 1959 to September 1961.

EXTREMES, 1960-61. --Dissolved solids: Maximum, 1,510 ppm Apr. 22-30; minimum, 606 ppm July 1-19.

Hardness: Maximum, 414 ppm May 1-June 3; minimum, 205 ppm July 1-19.

Specific conductance: Maximum daily, 2,790 microhos June 3; minimum daily, 965 microhos July 4.

Water temperatures: Maximum, 70°F July 15-26; minimum, 50°F Apr. 22-30.

EXTREMES, 1951-58, 1959-61. --Dissolved solids: Maximum, 2,190 ppm Sept. 1-5, 1954; minimum daily, 384 microhos June 24, 1956.

Hardness: Maximum, 482 ppm Sept. 1-5, 1954; minimum, 86 ppm Jan. 25, 1958.

Specific conductance: Maximum daily, 4,010 microhos Sept. 2, 1954; minimum daily, 33°F on many days during winter months.

Water temperatures (1951-54, 1958-58, 1959-61): Maximum, 78°F Sept. 21, 1958; minimum, 33°F on many days during winter months.

REMARKS --Records of specific conductance of daily samples available in district office at Sacramento, Calif. Flow completely regulated by Rye Patch Reservoir.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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		Sodium adsorption ratio	Specific conductance (microhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Apr. 22-30, 1961...	289	30	0.01	83	32	383	30	316		160	575		1.4	1.5	1,510	2.05	1,180	338	79	9.3	2,550
May 1-June 3,.....	163	43	--	110	34	333	28	382		158	510		1.6	1.5	1,440	1.96	6,340	414	101	7.1	2,420
June 4-9,.....	46.2	38	--	83	27	250	23	354		131	335		2.7	1.2	1,049	1.48	136	318	28	6.1	1,830
June 10-13,.....	67.0	37	--	87	19	157	17	296		79	208		1.8	.8	799	1.02	135	246	3	4.4	1,240
July 1-19,.....	78.8	36	.01	56	15	126	16	280		67	145		.4	.6	606	.82	139	205	0	3.8	1,010
July 20-31,.....	48.8	37	.02	63	21	173	21	306		88	210		.4	.9	782	1.06	103	244	0	4.8	1,320
Weighted average a.....	128	38	--	92	30	303	26	345		139	447		1.4	1.3	1,280	1.74	442	353	71	7.0	2,150

a Represents 99 percent of runoff for water year.

Temperature (°F) of water, water year October 1960 to September 1961

Month	Day																															Aver- age	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
April.....	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	50	50	50	50	50	50	50	---	---	
May.....	52	52	53	54	55	56	58	59	60	60	60	60	60	60	60	55	55	55	55	56	56	56	56	60	60	60	55	53	53	53	---	---	
June.....	57	57	55	55	55	55	55	56	56	56	56	55	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
July.....	68	66	66	68	68	68	67	68	68	68	68	68	68	68	70	70	70	70	70	70	70	70	70	70	70	70	70	---	---	---	---	69	

PYRAMID AND WINNEMUCCA LAKES BASIN
10-3368. LAKE TAHOE AT BIJOU, CALIF.

LOCATION.--At boat landing at Connoley's Resort, Bijou, El Dorado County.
RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.
REMARKS.--No discharge records available.

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 5, 1960.....		--			--	5.2	--	50	--	--	1.5	--	--	0.0	--	--		35	0	0.4	957.6
Nov. 1.....		--			--	6.9	--	50	--	--	1.8	--	--	.1	--	--		34	0	.5	957.7
Dec. 6.....		--			--	6.2	--	54	--	--	1.5	--	--	.0	--	--		35	0	.5	957.7
Jan. 2, 1961.....		--			--	6.1	--	55	--	--	.5	--	--	.0	--	--		33	0	.5	947.9
Feb. 6.....		--			--	5.7	--	52	--	--	2.0	--	--	.0	--	--		36	0	.4	938.0
Mar. 1.....		--			--	6.9	--	50	--	--	1.6	--	--	.0	--	--		32	0	.5	927.0
Apr. 3.....		--			--	6.3	--	56	--	--	2.0	--	--	.1	--	--		34	0	.5	1007.7
May 1.....		11	0.02	10	1.7	5.7	1.3	50	1.0	1.5	0.0	0.0	0.0	.1	57	0.08		32	0	.4	897.7
June 2.....		--			2.1	5.5	--	44	--	--	1.8	--	--	.1	--	--		30	0	.4	847.0
July 5.....		--			--	5.9	--	50	--	--	2.0	--	--	.1	--	--		37	0	.4	947.9
Aug. 8.....		--			--	5.9	--	54	--	--	1.8	--	--	.0	--	--		33	0	.4	938.0
Sept. 6.....	14			9.2	2.6	5.0	2.0	51	.0	.0	4.2	.0	.0	.0	62	.08		33	0	.4	968.0

Chemical analyses, in parts per million, water year October 1960 to September 1961

PYRAMID AND WINNEMUCCA LAKES BASIN--Continued
10-3369. LAKE TAHOE NEAR TAHOE VISTA, CALIF.

LOCATION.--At boat landing at Edgewater Cottage (private residence), and 8 miles northeast of Tahoe Vista, Placer County.
RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.
REMARKS.--No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 5, 1960.....						5.0		49		1.8			0.1	--	--		38	0	0.4	95	7.7
Nov. 2.....						6.4		49		2.2			.1	--	--		34	0	.5	93	7.5
Dec. 6.....						5.6		54		1.8			.1	--	--		36	0	.4	96	7.8
Jan. 6, 1961.....						5.6		54		2.0			0	--	--		35	0	.4	95	7.9
Feb. 6.....						6.2		52		1.1			0	--	--		34	1	.5	95	8.0
Mar. 1.....						6.4		40					.0	--	--		34	1	.5	95	7.1
Apr. 3.....						5.8		54		2.5			.1	--	--		32	0	.4	92	8.0
May 1.....		12	0.01	11	1.6	5.8	1.4	52	1.0	1.6	0.0	0.0	.1	61	0.08		34	0	.4	94	7.9
June 1.....				8.9	3.0	6.1		51		1.6			.1	--	--		34	0	.5	96	7.8
July 5.....						6.0		50		2.0			.1	--	--		40	0	.4	93	7.9
Aug. 5.....						5.9		53		1.7			.0	--	--		33	0	.5	91	8.0
Sept. 6.....		13		9.0	2.6	5.3	1.6	50	.0	4.1	.2	.0	.0	61	.08		33	0	.4	93	8.0

PYRAMID AND WINNEMICCA LAKES BASIN--Continued

10-3370. LAKE TAHOE AT TAHOE, CALIF.

LOCATION.--At State Highway 89 bridge and upstream from headgate for Truckee River at Tahoe, Placer County.

DRAINAGE AREA.--506 square miles, at lake outlet.

RECORDS AVAILABLE.--Chemical analyses: October 1960 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate			
Oct. 5, 1960.....						5.1		50	0		1.5			0.1				35	0	0.4	93	7.7
Nov. 1.....						6.9		50	0		1.8			.1				36	0	.5	95	7.7
Dec. 6.....						6.2		54	0									34	0	.5	95	7.7
Jan. 2, 1961.....						5.7		54	0		.5			.0				33	0	.4	93	7.8
Feb. 6.....						5.7		53	0		.8			.0				33	0	.4	93	8.0
Mar. 1.....						6.4		50	0		.9			.0				33	0	.5	93	7.3
Apr. 3.....						7.5		54	0		2.0			.1				34	0	.6	92	8.0
May 1.....		12	0.01			7.7	1.3	53	0	1.0	1.4	0.0	0.0	.1	60	0.08		34	0	.4	93	7.7
June 1.....						5.9		51	0		1.4							34	0	.4	93	7.7
July 5.....						5.9		50	0		1.2			.1				32	0	.4	93	7.9
Aug. 8.....						5.9		47	3		1.5			.0				32	0	.5	91	8.6
Sept. 6.....		14				5.4	1.7	52	0	1.0	4.1	.0	.0	.0	64	.09		34	0	.4	95	8.0

PYRAMID AND WINNEMUCCA LAKES BASIN--Continued
10-3380. TRUCKEE RIVER NEAR TRUCKEE, CALIF.

LOCATION.--At gaging station 1.4 miles upstream from Donner Creek, and 2.5 miles southwest of Truckee, Nevada County.
DRAINAGE AREA.--552 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.
REMARKS.--No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonylate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25 C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-bicarbonate		
Oct. 5, 1960.....	355	--	--	--	--	5.3	--	50	--	--	1.8	--	--	0.1	--	--	--	36	0	0.4	97
Nov. 1,.....	184	--	--	--	--	6.6	--	51	--	--	1.8	--	--	.1	--	--	--	34	0	.5	99
Dec. 6,.....	181	--	--	--	--	6.0	--	52	--	--	1.5	--	--	.2	--	--	--	37	0	.4	101
Jan. 1,.....	195	--	--	--	--	6.0	--	52	--	--	3.5	--	--	.0	--	--	--	37	0	.4	101
Feb. 6,.....	114	--	--	--	--	6.0	--	44	--	--	1.0	--	--	.1	--	--	--	40	0	.4	108
Mar. 1,.....	--	--	--	--	--	6.4	--	--	--	--	--	--	--	--	--	--	--	41	5	.4	109
Apr. 3,.....	224	--	--	--	--	5.2	--	43	--	--	2.2	--	--	.3	--	--	--	31	0	.4	87
May 1,.....	268	17	0.01	8.4	--	4.8	1.0	42	4.0	2.6	0.1	0.8	.1	--	62	0.08	--	31	0	.4	85
June 1,.....	125	--	--	7.2	1.9	2.9	--	33	--	--	1.3	--	--	--	--	--	--	26	0	.3	65
July 5,.....	241	--	--	--	--	5.7	--	49	--	--	1.4	--	--	.1	--	--	--	43	3	.4	96
Aug. 8,.....	138	--	--	--	--	5.9	--	56	--	--	2.0	--	--	.0	--	--	--	37	0	.4	99
Sept. 6,.....	44	17	--	10	3.5	6.3	2.0	57	4.0	4.4	4.4	.0	.0	.0	75	.10	--	40	0	.4	110

PYRAMID AND WINNEMUCCA LAKES BASIN--Continued

10-3460. TRUCKEE RIVER AT FARAD, CALIF.

LOCATION.--At gaging station 0.7 mile downstream from Farad powerplant, 2.5 miles north of Floriston, Nevada County, 3.4 miles downstream from Bronco Creek, and 3.5 miles upstream from California-Nevada State line.

DRAINAGE AREA.--932 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961 (discontinued).

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbocationate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium, silum	Non-carbonate			
Oct. 5, 1960.....	414	--	--	--	--	5.3	--	54	--	--	2.4	--	--	0.0	--	--	--	38	0	0.4	102	7.5
Nov. 1.....	225	--	--	--	--	7.3	--	61	--	--	1.8	--	--	.1	--	--	--	42	0	.5	110	7.6
Dec. 6.....	272	--	--	--	--	6.0	--	53	--	--	2.2	--	--	.0	--	--	--	39	0	.4	103	7.8
Jan. 2, 1961.....	418	--	--	--	--	8.0	--	58	--	--	3.0	--	--	.0	--	--	--	37	0	.4	102	7.9
Feb. 1.....	270	--	--	--	--	5.5	--	68	--	--	1.4	--	--	.1	--	--	--	43	0	.4	103	7.8
Mar. 1.....	517	--	--	--	--	4.1	--	44	--	--	2.0	--	--	.2	--	--	--	31	0	.3	84	7.6
Apr. 3.....	578	18	0.02	--	2.4	4.4	1.0	41	--	3.0	0.1	0.9	--	--	60	0.08	--	30	0	.3	80	7.7
May 1.....	488	--	--	6.6	2.4	3.3	--	34	--	--	1.5	--	--	.0	--	--	--	26	0	.3	67	6.6
June 1.....	451	--	--	--	--	5.0	--	52	--	--	3.4	--	--	--	--	--	--	40	0	.3	90	7.7
July 5.....	432	--	--	--	--	4.6	--	49	--	--	--	--	--	.0	--	--	--	32	0	.4	84	7.8
Aug. 8.....	237	16	--	8.2	2.6	4.1	1.5	43	--	1.6	4.8	0.0	0.1	--	60	.08	--	31	0	.3	86	7.7
Sept. 6.....																						

^a Daily mean discharge.

HONEY LAKE BASIN

10-3565. SUSAN RIVER AT SUSANVILLE, CALIF.

LOCATION --At gaging station 0.5 mile west of Susanville, Lassen County, and 1.1 miles upstream from Piute Creek.
DRAINAGE AREA --192 square miles.
RECORDS AVAILABLE --Chemical analyses: October 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-bicarbonate		
Oct. 13, 1960.....	4.8	--	--	--	--	6.5	--	120	--	0.5	--	--	0.0	--	--	--	89	0	0.3	188
Nov. 10.....	6.6	--	--	--	--	4.4	--	111	--	0.8	--	--	0.0	--	--	--	83	0	0.2	180
Dec. 15.....	13	--	--	--	--	5.6	--	98	--	2.0	--	--	0.0	--	--	--	72	0	0.3	158
Jan. 13, 1961.....	13	--	--	--	--	5.9	--	107	--	2.2	--	--	0.0	--	--	--	77	0	0.3	157
Feb. 16.....	41	--	--	--	--	5.0	--	68	--	2.2	--	--	0.0	--	--	--	47	0	0.3	114
Mar. 9.....	37	--	--	--	--	4.8	--	73	--	1.7	--	--	0.0	--	--	--	55	0	0.3	126
Apr. 13.....	89	--	--	--	--	3.6	--	53	--	0.8	--	--	0.0	--	--	--	42	0	0.2	90
May 11.....	78	28	0.03	9.6	4.4	1.8	0.7	57	0	0.5	0.1	0.3	0.0	74	0.10	0.10	42	0	0.1	93
June 15.....	159	--	--	--	--	1.8	--	36	0	0.0	--	--	0.0	--	--	--	26	0	0.2	60
July 13.....	1.7	--	--	--	--	5.9	--	107	0	0.8	--	--	0.0	--	--	--	82	0	0.3	171
Aug. 3.....	1.7	--	--	--	--	7.7	--	141	0	1.0	--	--	0.0	--	--	--	101	0	0.3	214
Sept. 13.....	1.5	41	--	20	11	6.9	2.5	129	3	1.0	0.1	0.3	0.0	151	0.21	0.21	96	0	0.3	205

PART 11. PACIFIC SLOPE BASINS IN CALIFORNIA

CAMEL RIVER BASIN

11-1432.5. CAMEL RIVER NEAR CAMEL, CALIF.

LOCATION.--Approximately 30 feet downstream from Rancho San Carlos bridge, 2 miles east of Carmel, Monterey County, and 4.5 miles from mouth.
 DRAINAGE AREA.--195 square miles.
 RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.
 REMARKS.--No discharge records available. Stream dry during summer months.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Dec. 13, 1960.....						31		163			28			0.1				184	50	1.0	480 8.2
Jan. 11, 1961.....						43		198			46			0				254	92	1.2	686 8.0
Feb. 15.....						31		166			36			0.1				183	47	1.0	542 8.1
Mar. 8.....						62		225			66			0.1				279	95	1.6	828 8.0
Apr. 12.....						58		228			67			0.1				308	121	1.4	844 8.0
May 3.....	21		0.00	78	23	60	5.0	215		139	63	0.4	0.0	0		495	0.67	290	114	1.5	789 7.9

SALINAS RIVER BASIN--Continued

11-1488. NACIMIENTO RIVER NEAR BRYSON, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961
(Where no concentrations are reported loads are estimated)

(where no concentrations are reported loads are estimated)									
Day	OCTOBER			NOVEMBER			DECEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..				0	--	0	2810	692	S 8440
2..				0	--	0	722	30	S 66
3..				0	--	0	237	12	S 8.4
4..				0	--	0	138	2	.7
5..				0	--	0	92	--	.2
6..				0	--	0	67	1	.2
7..				0	--	0	51	--	.1
8..				0	--	0	42	--	.1
9..				0	--	0	33	--	.1
10..				0	--	0	32	1	.1
11..				0	--	0	49	2	.3
12..				0	--	0	38	--	.2
13..				15	6860	S 230	32	--	.2
14..				12	144	S 5.7	29	1	.1
15..				5.5	69	K 1.2	49	4	K .7
16..				1.0	40	.1	65	--	.4
17..				.7	--	.1	51	1	.1
18..				.4	--	T	45	--	.1
19..				.2	--	T	38	--	.2
20..				.2	--	T	34	--	.2
21..				.2	--	T	32	2	.2
22..				.1	--	T	29	--	.2
23..				.1	--	T	27	--	.1
24..				.1	--	T	24	--	.1
25..				.1	--	T	22	--	.1
26..				358	66	S 113	21	1	.1
27..				95	29	K 8.7	20	--	.1
28..				28	--	.6	19	--	.1
29..				17	2	.1	18	--	.1
30..				12	--	.1	18	--	.1
31..				--	--	--	17	2	.1
Total	0		0	545.6	--	359.6	4901	--	8519.7
JANUARY				FEBRUARY			MARCH		
1..	16	--	0.1	286	27	S 22	18	--	T
2..	16	--	.1	216	--	4.1	18	--	T
3..	15	--	.1	182	2	1.0	17	--	T
4..	15	--	.1	141	--	.4	17	--	T
5..	14	1	T	115	--	.3	18	1	T
6..	13	--	T	98	1	.3	18	--	T
7..	13	--	T	81	--	.2	18	--	T
8..	12	--	T	69	1	.2	17	--	T
9..	12	--	T	60	--	.2	16	--	T
10..	12	1	T	53	--	.1	15	--	T
11..	12	--	T	67	4	K 1.0	14	--	T
12..	12	--	T	84	2	S .6	13	1	T
13..	11	--	T	60	--	.2	12	--	T
14..	11	--	T	53	--	.1	13	--	.1
15..	10	1	T	51	1	.1	202	33	S 21
16..	10	--	T	47	1	.1	135	--	4.4
17..	9.5	--	T	44	--	.1	136	15	S 6.1
18..	9.5	--	T	40	--	.1	118	--	2.2
19..	9.5	--	T	36	--	.1	87	2	.5
20..	9.5	--	T	33	1	.1	71	--	.4
21..	9.5	--	T	30	--	.1	62	1	.2
22..	9.5	1	T	28	--	.1	53	2	.3
23..	8.8	--	T	26	--	.1	47	--	.3
24..	8.8	2	T	23	--	.1	44	--	.2
25..	12	4	K .2	22	--	.1	45	--	.1
26..	1150	122	S 427	21	1	.1	40	1	.1
27..	369	24	K 28	20	--	.1	36	--	.1
28..	199	3	1.6	19	1	.1	34	--	.2
29..	141	--	.8	--	--	--	33	--	.3
30..	106	--	.3	--	--	--	30	3	.2
31..	265	34	S 38	--	--	--	29	--	.2
Total	2520.6	--	497.0	2005	--	32.1	1426	--	37.5

S Computed by subdividing day.
T Less than 0.05 ton.K Computed from estimated-concentration
graph and subdividing day.

QUALITY OF SURFACE WATERS, 1961

SALINAS RIVER BASIN--Continued

11-14S8. NACIMIENTO RIVER NEAR BRYSON, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
(Where no concentrations are reported loads are estimated)

[illegible]

T Less than 0.05 ton.

SALINAS RIVER BASIN--Continued

11-1486. NACIMIENTO RIVER NEAR BRYSON, CALIF.--Continued

Particle size analyses of suspended sediment, water year October 1960 to September 1961
 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
 P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sampling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment concentra- tion (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis	
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.063	0.125	0.250	0.500	1.000		2.000
Nov. 13, 1960.....	0830		47	e 0.2	29,200		21	25	37	54	74	88	94	98	99	100		VPWC
Nov. 14.....	0900		46	14	156							97	97	98	100	--		V
Nov. 26.....	1000		48	1,220	139							79	82	82	95	100		V
Dec. 1.....	0945		52	1,110	957							65	77	88	99	100		V
Dec. 1.....	1600		54	8,070	949							38	46	61	80	95	100	V

e Estimated.

SALINAS RIVER BASIN--Continued

11-1497. SAN ANTONIO RIVER AT SAM JONES BRIDGE, NEAR LOCKWOOD, CALIF.

LOCATION.--At gaging station 300 feet downstream from China Gulch, and 3.5 miles southwest of Lockwood, Monterey, County.

DRAINAGE AREA.--211 square miles.

RECORDS AVAILABLE.--Water temperatures: January to July 1959, May to September 1961.

Sediment records: January to July 1959, May to September 1961.

Suspended sediment, January to July 1959

(Where no concentrations are reported loads are estimated)

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	3.2	--	(t)	16	--	0.2	133	--	22
2	3.2	--	(t)	16	7	.3	111	54	16
3	3.2	--	(t)	15	--	.2	100	--	11
4	3.2	--	(t)	14	4	.2	98	25	5.9
5	6.0	--	(t)	13	--	.2	81	--	5.7
6	80	31	k11	13	7	.2	79	28	6.0
7	79	25	s6.1	12	--	.2	77	--	5.6
8	30	9	.7	12	--	.2	72	--	4.9
9	456	1,100	s2,310	12	6	.2	70	--	4.5
10	619	764	s1,510	75	82	k61	67	--	4.3
11	342	--	74	563	508	s805	65	--	4.4
12	207	28	16	355	310	297	63	--	4.6
13	155	--	10	246	--	150	60	29	4.7
14	123	--	6.6	143	--	42	60	--	4.4
15	95	--	4.4	107	--	12	58	--	3.6
16	81	--	3.1	844	1,400	s4,340	58	19	3.0
17	67	--	2.0	607	490	903	56	--	2.3
18	56	--	1.4	986	664	1,770	56	--	2.1
19	48	5	.6	615	210	349	53	--	1.9
20	42	2	.2	513	165	229	53	12	1.7
21	38	--	.2	830	541	s1,860	52	--	1.5
22	35	--	.4	604	190	310	50	--	1.2
23	32	7	.6	504	--	160	48	9	1.2
24	28	--	.5	351	110	113	50	--	1.2
25	27	--	.5	307	--	83	50	--	1.2
26	27	6	.4	259	--	63	48	9	1.2
27	25	--	.3	210	--	45	49	--	1.3
28	22	--	.2	162	--	31	47	--	1.4
29	20	--	.2	--	--	--	45	--	1.7
30	18	3	.1	--	--	--	45	17	2.1
31	17	--	.2	--	--	--	45	--	1.9
Total	2,787.8	--	3,959.8	8,434	--	11,524.9	1,988	--	134.5

s Computed by subdividing day.

t Less than 0.05 ton.

k Computed from estimated-concentration graph and subdividing day.

SALINAS RIVER BASIN--Continued

11-1497. SAN ANTONIO RIVER AT SAM JONES BRIDGE, NEAR LOCKWOOD, CALIF.--Continued

Suspended sediment, January to July 1959--Continued

Suspended sediment, January to July 1959--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	45	--	1.7	19			8.1		
2	45	--	1.5	19			7.4		
3	45	--	1.2	19			6.7		
4	43	--	.9	19			6.0		
5	43	--	.9	19			8.0		
6	43	8	.9	18			5.3		
7	43	--	.9	17			5.3		
8	43	--	.8	16	12		4.6		
9	42	--	.8	16			3.9		
10	42	--	.7	15			3.2		
11	42	--	.7	15			2.5		
12	38	--	.8	14			2.5		
13	37	6	.6	13			2.5		
14	37	--	.6	14			2.5		
15	33	--	.5	14			2.5		
16	32	--	.5	13			2.1		
17	30	--	.5	12			2.1		
18	28	--	.5	11			2.1		
19	28	--	.5	9.5			2.1		
20	27	--	.4	9.5			2.1		
21	27	--	.4	9.5			2.1		
22	23	--	.3	9.5			2.1		
23	20	--	.3	9.5			2.1		
24	19	--	.3	9.5			2.5		
25	20	--	.3	9.5			2.5		
26	23	--	.3	9.5			3.2		
27	37	--	1.0	11			2.5		
28	30	--	.8	9.5			3.2		
29	29	--	.6	9.5			3.2		
30	20	11	.6	8.8			3.2		
31	--	--	--	8.8			--		
Total	1,008	--	20.6	406.6	--	11	106.1	--	2
July									
1	2.5								
2	2.5								
3	2.5								
4	2.1								
5	1.7								
6	1.7								
7	1.3								
8	1.3								
9	1.0								
10	1.0								
11	1.0								
12	1.0								
13	1.3								
14	1.3								
15	1.3								
16	1.3								
17	1.3								
18	1.3								
19	1.3								
20	1.3								
21	1.3								
22	1.7								
23	1.7								
24	1.7								
25	1.7								
26	1.3								
27	1.3								
28	1.7								
29	1.7								
30	1.7	3							
31	1.3								
Total	45.9	--	0.4						
Total discharge for period January to July (cfs-days)..... 14,776.4									
Total load for period January to July (tons)..... 15,653.2									

SALINAS RIVER BASIN--Continued

11-1497. SAN ANTONIO RIVER AT SAM JONES BRIDGE, NEAR LOCKWOOD, CALIF.--Continued

Suspended sediment and temperature (°F) of water, May to September 1961

Date	Time (24 hr)	Water tem- per- ature (°F)	Discharge (cfs)	Suspended sediment	
				Mean concen- tration (ppm)	Discharge (tons per day)
May 4, 1961.....		63	5.0	3	(t)
May 11.....		68	4.1	3	(t)
May 19.....		68	3.1	2	(t)
May 25.....		68	2.1	3	(t)
May total.....		--	a105.3	--	b0.7
June 1.....		65	2.4	2	(t)
June 7.....		79	1.8	3	(t)
June 9.....		73	1.8	3	(t)
June 16.....		75	1.6	2	(t)
June 23.....		83	.7	3	(t)
June 30.....		80	.6	4	(t)
June total.....		--	a40.6	--	b0.3
July total.....		--	4.1	--	(t)
August total.....		--	0	--	0
September total.....		--	0	--	0

Total discharge for period May to September (cfs-days)..... 150.0

Total load for period May to September (tons)..... 1.0

t Less than 0.05 ton.

a Monthly totals include days not shown.

b Days not shown are estimated and included in total.

SALINAS RIVER BASIN--Continued

11-1497. SAN ANTONIO RIVER AT SAN JONES BRIDGE, NEAR LOCKWOOD, CALIF.--Continued

Particle-size analyses of suspended sediment, January to July 1959

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Samp- ling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis	
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000		2.000
Jan. 9, 1959.....	1320		54	808	2,000		16	22	30	36	52	63	75	90	97	100		VFMC
Jan. 16.....	0940		53	850	1,150			36	50	50		62	74	87	99	100		VFMC
Feb. 16.....	1130		56	1,240	3,580			33	48	48		64	75	89	99	100		VFMC
Feb. 16.....	1430		57	1,370	3,690			17				39	52	71	96	100		VFMC
Feb. 18.....	0855		51	1,120	803			--	--	--		27	40	68	99	100		V

SALINAS RIVER BASIN--Continued

11-1500. SAN ANTONIO RIVER AT PLEYTO, CALIF.

LOCATION.--At gaging station at old townsite of Pleyto, Monterey County, 1.1 miles downstream from Cooperhead Creek, and 15 miles west of Bradley.

DRAINAGE AREA.--284 square miles.

RECORDS AVAILABLE.--Water temperatures: February to September 1961.

Sediment records: February to September 1961.

Suspended sediment and temperature (°F) of water, February to September 1961					
Date	Time (24 hr)	Water tem- per- ature (°F)	Discharge (cfs)	Suspended sediment	
				Mean concen- tration (ppm)	Discharge (tons per day)
Feb. 2, 1961.....		60	61	13	2.1
Feb. 14.....		62	29	4	.3
Feb. 15.....		55	29	3	.2
February total.....		--	a826	--	b13.6
Mar. 20.....		65	33	6	0.5
Mar. 21.....		60	27	5	.4
Mar. 22.....		58	25	4	.3
Mar. 26.....		55	20	4	.2
Mar. 29.....		58	18	4	.2
Mar. 31.....		77	16	2	.1
March total.....		--	a565	--	b5.9
Apr. 4.....		72	14	3	0.1
Apr. 7.....		74	12	2	.1
Apr. 10.....		78	10	2	.1
Apr. 26.....		75	4.7	1	(t)
April total.....		--	a242.8	--	b1.5
May total.....		--	28.8	--	0.1
June total.....		--	0	--	0
July total.....		--	0	--	0
August total.....		--	0	--	0
September total.....		--	0	--	0
Total discharge for period February to September (cfs-days).....					1,662.6
Total load for period February to September (tons).....					21.1

t Less than 0.05 ton.

a Monthly totals include days not shown.

b Days not shown are estimated and included in total.

SALINAS RIVER BASIN--Continued

11-1525. SALINAS RIVER NEAR SPECKLES, CALIF.

LOCATION.--At gaging station in El Toro Grant 80 feet upstream from bridge on Salinas-Monterey highway, 0.5 mile upstream from Toro Creek, 2 miles west of Speckles, Monterey County, and 4 miles south of Salinas.
DRAINAGE AREA.--4,156 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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) (B)	Dissolved solids (calculated)			Hardness as CaCO ₃	Specific conductance (micro-mhos at 25°C)	pH		
														Parts per million	Tons per acre-foot	Tons per day					
Oct. 5, 1960.....	31.1					109		272	0		140		0.4				205	0	3.3	1,090	7.5
Nov. 8.....	3.0					138		726	22		160		.3				596	0	2.5	1,610	8.3
Dec. 13.....	3.0					126		830	0		132		.2				600	0	2.2	1,660	7.9
Jan. 11, 1961....	1.3					114		496	0		123		.3				375	0	2.6	1,280	7.8
Feb. 16.....	1.1					120		342	0		130		.3				251	0	3.3	1,090	7.5
Mar. 8.....	1.0					118		305	0		130		.5				206	0	3.6	1,030	6.9
Apr. 12.....	1.8					126		242	0		138						244	46	3.5	1,120	7.4
May 3.....	1.3	50	0.04	51	29	127	14	266	0	105	128		29		665	0.90	246	30	3.5	1,110	7.2
June.....	1.2					149		245	0		143		.5				280	79	3.9	1,190	7.4
July 12.....	1.0					138		313	0		152		.5				325	68	3.3	1,300	7.4
Aug. 1.....	.8					135		336	0		152		.6				292	16	3.4	1,280	7.5

a. Estimated.

PAJARO RIVER BASIN

11-1540. UVAS CREEK NEAR MORGAN HILL, CALIF.

LOCATION:---At site of former gaging station, 500 feet upstream from Uvas Dam, 0.6 mile downstream from Eastman Canyon, and 4.8 miles southwest of Morgan Hill, Santa Clara County.

DRAINAGE AREA:---30.4 square miles.

RECORDS AVAILABLE:---Chemical analyses: October 1953 to September 1961.

REMARKS:---No discharge records available. Stream dry during August and September.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate	
Oct. 8, 1960.....						10		180	0		5.5			0.1				155	7	337
Nov. 9.....						11		170	10		5.2			.1				167	11	343
Dec. 14.....						11		178	0		8.5			.0				168	20	354
Jan. 11, 1961.....						12		183	0		7.0			.1				174	24	372
Feb. 15.....						12		188	0		10			.1				182	29	380
Mar. 8.....						12		194	0		8.5			.2				184	25	387
Apr. 12.....						13		202	0		9.7			.1				194	28	402
May 3.....						14	1.2	184	8	40	10	0.3	0.1	.1				198	34	400
June 7.....	14		0.00	45	21	14		207	10		8.6			.1	245	0.33		215	29	433
July 12.....						16		239	6		10			.1				227	21	466

PAJARO RIVER BASIN--Continued

11-1565. SAN BENITO RIVER NEAR WILLOW CREEK SCHOOL, CALIF.

LOCATION.--At gaging station, 1.7 miles downstream from Willow Creek, San Benito County, 1.8 miles northwest of Willow Creek School, and 10.4 miles northwest of San Benito.

DRAINAGE AREA.--251 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

REMARKS.--Stream dry during July to September.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate		
Oct. 5, 1960.....	0.1					218		516	13		170			2.1				610	166	3.8	2,010
Nov. 9.....	.2					213		468	16		215			1.9				614	200	3.8	2,100
Dec. 14.....	.5					176		431	16		136			1.7				550	172	3.9	1,860
Jan. 11, 1961.....	1.5					200		522	25		135			1.6				597	117	3.6	1,860
Feb. 15.....	1.8					200		469	26		135			1.6				580	153	3.6	1,850
Mar. 8.....	1.8					200		476	35		142			1.8				619	171	3.5	1,900
Apr. 12.....	1.4					254		502	22		186			2.1				600	151	4.5	2,080
May 3.....	.2	15	0.00	50	130	248	3.6	486	25	475	176	0.5	0.4	2.0	1,370	1.86		658	218	4.2	2,080
June 7.....	.2					256		426	25		185			2.0				600	209	4.5	2,070

PAJARO RIVER BASIN--Continued

11-1590. PAJARO RIVER AT CHITTENDEN, CALIF.

LOCATION.--At gaging station, on State highway bridge in Salsipuedes Grant, 0.6 mile downstream from Descadero Creek, 0.6 mile southeast of Chittenden, Santa Cruz County, and 2.3 miles downstream from San Benito River.
DRAINAGE AREA (revised).--1,186 square miles.
RECORDS AVAILABLE.--Chemical analyses; October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 5, 1960.....	1.5	--	--	--	--	169	--	499	13	156	--	--	0.8	--	--	--	444	14	3.5	1,630	8.4
Nov. 9.....	1.9	--	--	--	--	198	--	536	16	185	--	--	.6	--	--	--	495	29	3.9	1,690	8.3
Dec. 14.....	3.9	--	--	--	--	161	--	448	10	145	--	--	.7	--	--	--	458	74	3.3	1,430	8.4
Jan. 11, 1961.....	7.3	--	--	--	--	100	--	470	0	120	--	--	.6	--	--	--	468	171	2.0	1,350	8.0
Feb. 15.....	8.2	--	--	--	--	100	--	396	0	118	--	--	.7	--	--	--	495	170	2.0	1,340	8.0
Mar. 8.....	6.8	--	--	--	--	100	--	398	0	110	--	--	.7	--	--	--	508	182	1.9	1,330	8.2
Apr. 12.....	10	--	--	--	--	108	--	510	6	108	--	--	.7	--	--	--	518	90	2.1	1,400	8.3
May 3.....	5.1	16	0.01	93	69	146	3.6	440	11	237	0.3	3.7	1.0	--	--	--	516	137	2.8	1,500	8.4
June 7.....	3.1	--	--	--	--	159	--	466	11	143	--	--	.8	--	--	--	448	48	3.3	1,460	8.4
July 12.....	.2	--	--	--	--	200	--	531	10	211	--	--	1.1	--	--	--	455	3	4.1	1,670	8.4
Aug. 7.....	.4	--	--	--	--	184	--	494	31	159	--	--	1.0	--	--	--	452	0	3.8	1,560	8.5
Sept. 7.....	.5	19	--	67	70	196	4.4	514	22	169	.3	1.3	1.1	973	1.32	--	456	0	4.0	1,600	8.5

SOQUEL CREEK BASIN

11-1600. SOQUEL CREEK AT SOQUEL, CALIF.

LOCATION.--At gaging station 0.2 mile upstream from highway bridge in town of Soquel, Santa Cruz County, and 0.4 mile downstream from Bates Creek.
 DRAINAGE AREA.--40.2 square miles.
 RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 4, 1960.....	2.0	--	--	--	--	36	--	216	12	--	58	--	--	0.3	--	--	--	275	78	0.9	719	8.4
Nov. 8.....	3.1	--	--	--	--	51	--	248	0	--	74	--	--	.2	--	--	--	291	88	1.3	744	8.2
Dec. 13.....	4.6	--	--	--	--	65	--	239	6	--	86	--	--	.2	--	--	--	324	118	1.6	864	8.4
Jan. 10, 1961.....	4.6	--	--	--	--	58	--	246	9	--	82	--	--	.1	--	--	--	318	102	1.4	894	8.4
Feb. 14.....	10	--	--	--	--	58	--	222	8	--	62	--	--	.1	--	--	--	290	95	1.5	797	8.4
Mar. 7.....	7.3	--	--	--	--	57	--	223	9	--	70	--	--	.2	--	--	--	297	99	1.4	820	8.4
Apr. 11.....	5.1	--	--	--	--	55	--	226	9	--	83	--	--	.5	--	--	--	291	91	1.4	785	8.5
May 2.....	4.6	29	0.01	79	24	54	3.9	223	13	111	78	0.3	0.6	.2	496	0.68	--	294	89	1.5	783	8.7
May 6.....	3.6	--	--	--	--	54	--	223	13	--	78	--	--	.3	--	--	--	294	89	1.4	783	8.7
July 11.....	3.6	--	--	--	--	42	--	222	11	--	53	--	--	.1	--	--	--	289	86	1.1	718	8.5
Aug. 4.....	1.5	--	--	--	--	42	--	238	0	--	53	--	--	.1	--	--	--	280	85	1.1	706	7.9
Sept. 8.....	1.4	--	--	--	--	42	--	238	0	--	53	--	--	.1	--	--	--	280	85	1.1	706	7.9
Sept. 8.....	1.0	36	--	71	24	43	4.7	244	0	85	51	0.3	.2	.0	435	.59	--	276	78	1.1	707	8.0

a Estimated.

SAN LORENZO RIVER BASIN

11-1605. SAN LORENZO RIVER AT BIG TREES, CALIF.

LOCATION: --In Canada del Rincon Grant at Sequoia Picnic and Camp Grounds at Big Trees, Santa Cruz County, approximately 0.5 mile upstream from gaging station, and 4 miles north of Santa Cruz.

DRAINAGE AREA: --11 square miles.

RECORDS AVAILABLE: --Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 4, 1960.....	15	--	--	--	--	23	--	128	0	--	26	--	--	0.1	--	--	--	118	13	346	7.8
Nov. 8.....	14	--	--	--	--	25	--	148	0	--	34	--	--	0.1	--	--	--	144	23	393	8.2
Dec. 13.....	27	--	--	--	--	27	--	110	0	--	27	--	--	--	--	--	--	145	55	395	8.2
Jan. 10, 1961.....	20	--	--	--	--	33	--	143	0	--	26	--	--	0.1	--	--	--	141	24	385	8.1
Feb. 14.....	47	--	--	--	--	28	--	128	0	--	23	--	--	0.1	--	--	--	134	29	380	8.1
Mar. 7.....	31	--	--	--	--	25	--	132	0	--	24	--	--	0.1	--	--	--	135	27	374	8.2
Apr. 11.....	27	--	--	--	--	24	--	143	0	--	25	--	--	0.3	--	--	--	148	31	399	8.1
May 2.....	23	21	0.01	44	7.8	26	1.5	136	3	41	26	0.2	1.0	1	239	0.33	142	26	393	8.3	
June 6.....	20	--	--	--	--	25	--	137	4	--	27	--	--	0.1	--	--	139	20	385	8.3	
July 11.....	9.3	--	--	--	--	25	--	140	0	--	25	--	--	--	--	--	138	23	368	7.9	
Aug. 4.....	9.1	--	--	--	--	23	--	135	0	--	27	--	--	0	--	--	128	17	350	8.1	
Sept. 12.....	8.5	32	38	38	6.8	21	1.5	132	0	30	24	0.2	0.5	0	219	0.30	123	15	343	7.9	

GUADALUPE RIVER BASIN

11-1680. LOS GATOS CREEK AT LOS GATOS, CALIF.

LOCATION.--At gaging station, 0.3 mile downstream from Trout Creek, 0.5 mile downstream from Lexington Reservoir, and 1 mile south of Los Gatos, Santa Clara County.

DRAINAGE AREA (revised).--38.6 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 4, 1960.....	0.3	--	--	--	--	28	--	328	0	--	21	--	--	0.2	--	--	--	344	75	0.7	785	8.0
Nov. 8.....	26	--	--	--	--	14	--	191	0	--	9.0	--	--	.2	--	--	--	173	16	.5	370	8.2
Dec. 13.....	4.6	--	--	--	--	28	--	279	6	--	20	--	--	.1	--	--	--	286	47	.7	720	8.3
Jan. 10, 1961.....	2.3	--	--	--	--	26	--	311	0	--	12	--	--	.1	--	--	--	342	87	.6	726	8.2
Feb. 14.....	6.5	--	--	--	--	33	--	244	0	--	16	--	--	.1	--	--	--	315	115	.8	685	8.2
Mar. 7.....	3.3	--	--	--	--	27	--	275	0	--	19	--	--	.2	--	--	--	350	125	.6	746	8.2
Apr. 11.....	1.4	--	--	--	--	33	--	268	6	--	20	--	--	.3	--	--	--	370	40	.7	777	8.4
May 2.....	2.9	14	0.00	100	33	30	2.7	282	2	167	19	0.3	0.8	.1	508	0.69	--	384	149	.7	780	8.4
June 6.....	.4	--	--	--	--	32	--	324	0	--	22	--	--	.2	--	--	--	409	157	.7	839	8.1
July 1.....	.4	--	--	--	--	32	--	322	0	--	22	--	--	.2	--	--	--	404	157	.7	838	8.1
Aug. 4.....	.3	--	--	--	--	11	--	353	0	--	23	--	--	.3	--	--	--	404	115	.2	835	8.2
Sept. 12.....	.1	17	--	85	40	28	2.5	365	0	112	16	.1	.3	.3	481	.65	.65	377	78	.6	775	8.0

COYOTE CREEK BASIN

11-1700. COYOTE CREEK NEAR MADRONE, CALIF.

LOCATION.--At gaging station, near southeast corner of La Laguna Seca Grant, 1.2 miles downstream from Anderson Dam, and 1.8 miles northeast of Madrone, Santa Clara County.

DRAINAGE AREA (revised).--195 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

REMARKS.--Stream dry during summer months.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-bicarbonate		
Oct. 5, 1960.....	98					19		201		16			0.1				200	24	0.6	442
Nov. 9.....	69					25		287		25			.1				260	25	.7	591
Dec. 14.....	7.4					20		202		14			.2				197	25	.6	449
Jan. 11, 1961.....	7.4					17		197		12			.2				162	20	.5	419
Feb. 15.....	2.4					16		174		12			.1				168	20	.5	390
Mar. 8.....	2.8					17		181		10			.2				192	44	.5	393
Apr. 12.....	57					17		195		10			.1				182	22	.5	412
May 3.....	115	13	0.00	57	22	20	7.3	236	49	13	0.3	1.1	.1	305	0.41		232	29	.6	494

ALAMEDA CREEK BASIN

11-1785. ARROYO VALLE NEAR LIVERMORE, CALIF.

LOCATION.--At gaging station in Valle de San Jose Grant, 900 feet downstream from highway bridge, 1.1 miles upstream from Dry Creek, 4.1 miles south of Livermore, Alameda County, and 6.9 miles southeast of Pleasanton.

DRAINAGE AREA, 4.9 square miles.

RECORDS AVAILABLE: Chemical analyses: December 1958 to September 1961.

Water temperatures: October 1959 to September 1961 (discontinued).

EXTREMES, 1960-61.--Dissolved solids: Maximum, 1,090 ppm Jan. 13-24; minimum, 446 ppm Mar. 23-31.

Hardness: Maximum, 570 ppm Jan. 13-24; minimum, 303 ppm Mar. 23-31.

Specific conductance: Maximum daily, 1,740 micromhos Jan. 18; minimum daily, 681 micromhos Mar. 29.

Water temperatures: Maximum, 80°F Aug. 7; minimum, 49°F Dec. 15, Jan. 15-17, 19.

EXTREMES, 1959-60.--Dissolved solids: Maximum, 1,090 Jan. 13-24, 1961; minimum, 159 ppm Feb. 9, 10, 1960.

Hardness: Maximum, 562 ppm Jan. 9-26, 1960; minimum, 116 ppm Feb. 9-10.

Specific conductance: Maximum daily, 1,740 micromhos Jan. 24, 1960; minimum, 242 micromhos Feb. 10, 1960.

Water temperatures: Maximum, 80°F July 21, 1960; minimum, 44°F Jan. 14, 15, 1960.

REMARKS.--Records of specific conductance of daily samples available in district office at Sacramento, Calif. No flow during summer months.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate sum		
Nov. 12- Dec. 15, 1960...	0.1 36		0.00 100		66	167	4.2	460	0	202	192	0.2	1.6	2.4	1.030	1.40	0.28	520	143	3.2	1,590 8.1
Jan. 9-12, 1961...	.1 32		.00 115		65	169	3.8	459	0	217	225	.2	.6	2.9	1.070	1.46	.29	555	179	3.1	1,720 8.0
Jan. 13-24, 1961...	.1 32		.00 125		63	165	3.6	478	0	218	225	.2	.5	2.9	1.090	1.48	.29	570	178	3.0	1,720 8.2
Jan. 25-31, 1961...	.8 30		.00 101		58	150	4.0	416	0	196	205	.2	.2	2.9	936	1.30	2.06	492	151	2.9	1,570 8.2
Feb. 1-6, 1961...	8.8 21		.00 67		40	43	2.0	315	0	110	40	.3	.8	.7	504	.69	12.0	352	74	1.0	764 8.1
Feb. 7-17, 1961...	4.9 22		.00 68		44	52	2.3	328	0	118	44	.2	.3	.9	541	.74	7.16	352	83	1.2	841 8.0
Feb. 18-28, 1961...	2.7 24		.02 71		44	52	2.1	320	9	118	46	.2	.2	.9	550	.75	4.01	356	79	1.2	841 8.4
Mar. 1-12, 1961...	2.2 19		.00 74		42	56	2.4	333	0	119	54	.2	1.5	.9	541	.74	3.21	358	85	1.3	856 8.2
Mar. 13-22, 1961...	7.2 18		.00 68		37	48	2.4	306	0	100	36	.2	1.5	.8	472	.64	9.18	323	72	1.1	744 7.9
Mar. 23-31, 1961...	7.1 15		.00 64		35	43	2.2	280	7	92	42	.1	1.4	.8	446	.61	8.35	303	62	1.1	698 8.4
Apr. 1-30, 1961...	2.0 20		.00 64		39	46	2.2	322	0	95	38	.2	1.2	.8	480	.65	2.99	320	56	1.1	770 8.2
May 1-12, 1961...	1.3 21		.00 67		38	52	2.2	333	0	99	34	.3	.6	.8	495	.67	1.74	324	51	1.3	795 7.8
May 13-21, 1961...	.7 22		.00 68		39	55	2.2	340	0	89	43	.3	3.1	0	506	.69	.96	328	49	1.3	822 7.8
May 22-31, 1961...	.4 24		.00 68		40	63	2.5	335	9	97	52	.1	4.1	1	535	.73	.58	336	47	1.5	865 8.3
June 1-11, 1961...	.2 26		.00 72		42	65	2.4	366	0	108	57	.1	2.1	1.3	555	.75	.30	352	52	1.5	894 8.1
June 12-20, 1961...	.2 29		.00 67		44	69	2.5	334	18	99	64	.1	2.5	1.3	567	.77	.31	346	42	1.6	902 8.5

ALAMEDA CREEK BASIN--Continued
11-1769. ARROYO DE LA LAGUNA AT VERONA, CALIF.

LOCATION.--At bridge on State Highway 21, 2.1 miles south of Pleasanton, Alameda County, and 8 miles northeast of Niles.

RECORDS AVAILABLE.--Chemical analyses: October 1959 to September 1961.

Water temperatures: October 1959 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 1,100 ppm June 1-6; minimum, 446 ppm Mar. 15-18.

Hardness: Maximum, 670 ppm June 1-6; minimum, 59 ppm Aug. 14-31.

Specific conductance: Maximum daily, 1,970 micromhos May 12; minimum daily, 701 micromhos Mar. 17.

Water temperatures: Maximum, 74°F Aug. 9, 29, 30; minimum, 38°F Jan. 6.

EXTREMES, 1959-61.--Dissolved solids: Maximum, 1,130 ppm Apr. 8-23, 1960; minimum, 193 ppm Feb. 8-11, 1960.

Hardness: Maximum, 700 ppm Apr. 8-23, 1960; minimum, 59 ppm Aug. 14-31, 1961.

Specific conductance: Maximum daily, 2,060 micromhos May 25, 1960; minimum daily, 246 micromhos Feb. 8, 1960.

Water temperatures: Maximum, 80°F Aug. 6, 1960; minimum, 38°F Jan. 6, 1961.

REMARKS.--Records of specific conductance of daily samples available in district office at Sacramento, Calif. Records of discharge furnished by Alameda County Flood Control and Water Conservation District. Unmeasured intermittent flow May to September.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day				
Nov. 15, 26-30, 1960.....	2.5 29		0.09 98		58	60	34	420 0	100	162		-- 47	0.7		796 1.08	5.4	485	141	1.2	1,220 7.8	
Dec. 1-7.....	2.1 19		.00 80		50	71	19	320 0	145	111		0.3 20	1.0		675 .92	3.8	404	142	1.5	1,100 7.3	
Dec. 8-19.....	.3 25		.00 106		61	86	18	378 12	169	149		.3 12	1.6		826 1.12	.67	516	186	1.6	1,320 8.4	
Dec. 20-31.....	.4 23		.00 107		60	100	29	424 30	126	150		.3 26	1.4		847 1.15	.91	512	139	1.9	1,350 8.6	
Jan. 1-12, 1961....	.3 24		.00 106		57	102	18	478 5	99	165		.1 24	1.3		836 1.14	.68	497	97	2.0	1,360 8.3	
Jan. 13-25.....	.3 24		.00 106		56	105	18	497 0	99	162		.2 27	1.3		844 1.15	.68	494	86	2.1	1,380 7.4	
Jan. 26-31.....	3.9 17		.00 64		31	68	17	259 0	79	109		.2 19	.7		533 .72	5.6	288	76	1.7	892 7.2	
Feb. 1-4.....	1.0 28		.01 72		41	71	25	295 0	92	123		.3 24	.8		622 .85	1.7	348	106	1.7	1,050 7.1	
Feb. 5-17.....	.5 27		.01 96		57	93	19	405 0	118	164		.3 25	1.3		801 1.09	1.1	472	140	1.9	1,360 7.9	
Feb. 18-28.....	.4 22		.01 117		69	117	18	474 0	154	208		.3 17	2.0		957 1.30	1.0	576	187	2.1	1,630 8.1	
Mar. 1-14.....	.2 22		.00 129		67	123	20	448 30	132	200		.2 27	1.5		973 1.32	.53	596	179	2.2	1,580 8.6	
Mar. 15-18.....	6.7 15		.00 50		30	51	24	208 0	59	85		-- 29	.6		446 .61	8.1	248	77	1.4	764 7.0	
Mar. 19-31.....	.1 22		.00 95		54	100	16	342 26	109	170		.3 20	1.5		763 1.06	.21	460	136	2.0	1,270 8.6	
Apr. 1-10.....	.2 26		.01 113		70	102	16	484 0	146	198		.3 11	2.5		923 1.26	.50	570	173	1.9	1,550 8.0	
Apr. 11-20.....	.1 25		.01 95		72	124	14	410 0	166	218		.2 7.1	2.6		933 1.26	.25	535	199	2.3	1,550 8.1	

ALAMEDA CREEK BASIN--Continued

11-1790. ALAMEDA CREEK NEAR NILES, CALIF.

LOCATION.--At gaging station, 0.3 mile downstream from railroad bridge, and 1.2 miles northeast of Niles, Alameda County.

DRAINAGE AREA.--633 square miles.

RECORDS AVAILABLE.--Chemical analyses: February 1952 to September 1961.

Water temperatures: January 1957 to September 1961.

Sediment records: January 1957 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 346 ppm Oct. 1-9; minimum, 381 ppm Oct. 1-9.

Hardness: Maximum, 246 ppm Oct. 1-9; minimum, 136 ppm Feb. 8-10, 1960.

Specific conductance: Maximum daily, 1,160 micromhos M; minimum daily, 614 micromhos Oct. 1.

Water temperatures: Maximum, 75°F June 12; minimum, 37°F Jan. 5.

Sediment concentrations: Maximum daily, (estimated) 38 ppm Jan. 27; minimum daily, no flow on many days.

EXTREMES, 1958-61.--Dissolved solids (1958-57, 1959-61): Maximum, 739 ppm Aug. 11, 18-20, 1960; minimum, 215 ppm Feb. 8-10, 1960.

Hardness (1958-57, 1959-61): Maximum, 430 ppm Jan. 16, 1957; minimum, 136 ppm Feb. 8-10, 1960.

Specific conductance (1958-57, 1959-61): Maximum daily, 1,270 micromhos Jan. 15, 1957; minimum daily, 312 micromhos Feb. 9, 1960.

Water temperatures: Maximum, 68°F June 1, 1960; minimum, 37°F Jan. 5, 1961.

Sediment concentrations (1957-61): Maximum daily, 5,340 ppm Apr. 3, 1958; minimum daily, no flow on many days.

Sediment loads (1957-61): Maximum daily, 285,000 tons Apr. 3, 1958; minimum daily, 0 ton on many days.

REMARKS.--Records of specific conductance of daily samples available in district office at Sacramento, Calif.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate	
Oct. 1-9, 1960....	1.5 16	0.01	52	28	39	1.7	221	11	76	36	0.1	2.3	0.5	381	0.52	1.54	246	47	616 8.5
Oct. 15, 16, 27-31	1.1 13	0.01	48	36	68	2.6	239	15	122	47	.3	2.1	.8	484	.66	1.14	268	47	777 8.6
Nov. 1-10.....	1.1 10	0.03	58	40	54	2.5	283	0	115	44	--	.9	.7	494	.67	1.51	308	76	809 8.2
Nov. 11-20.....	1.7	7.9	0.01	61	35	54	2.3	278	0	110	44	.2	.7	475	.65	.85	294	66	771 8.0
Nov. 21-30.....	1.0	8.5	.02	61	38	56	2.3	273	0	120	49	.4	.6	513	.70	1.45	310	86	815 8.0
Dec. 1-8.....	2.2 13	.00	68	35	60	2.7	312	0	112	42	.2	1.0	.9	527	.72	3.16	314	58	828 8.1
Dec. 9-17.....	1.9 18	.00	56	45	63	2.6	284	0	134	72	.2	.7	.9	523	.72	1.58	304	130	833 8.2
Dec. 18-31.....	1.6 15	.00	61	40	67	2.4	306	0	144	85	.2	.7	.8	613	.82	3.33	379	115	871 8.1
Jan. 1-5, 1961....	2.0 15	.00	83	42	67	2.4	336	0	144	85	.2	.7	.8	571	.78	3.33	379	115	871 8.1
Jan. 6-14.....	.8 11	.00	77	38	62	2.4	311	0	136	68	.2	.1	.9	571	.78	1.26	349	94	914 8.0

ALAMEDA CREEK BASIN--Continued

11-1790. ALAMEDA CREEK NEAR NILES, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961
(Where no concentrations are reported loads are estimated)

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..	2.6		T	6.0	9	S 0.2	0.9	--	T
2..	2.2		T	2.2	--	T	1.9	--	0.1
3..	3.0	10	0.1	.6	--	T	6.6	--	.4
4..	2.7		.1	.3	--	T	3.1	--	.1
5..	1.5		T	.3	--	T	1.9	12	.1
6..	.7		T	.4	--	T	1.3	--	T
7..	.6		T	.4	--	T	1.1	--	T
8..	.1		T	.4	3	T	1.0	--	T
9..	.1		T	.4	4	T	1.0	--	T
10..	0		0	.3	--	T	.9	--	T
11..	0		0	.4	--	T	.9	--	T
12..	0		0	.7	--	T	.9	12	T
13..	0		0	1.0	--	T	.7	--	T
14..	0		0	.9	12	T	.7	--	T
15..	.2		T	.7	--	T	.8	9	T
16..	.1		T	.5	--	T	.7	--	T
17..	0		0	.5	--	T	.9	--	T
18..	0		0	.7	--	T	.8	--	T
19..	0		0	.6	--	T	.7	5	T
20..	0		0	.6	--	T	.6	--	T
21..	0		0	.5	5	T	.7	--	T
22..	0		0	.4	--	T	.9	--	T
23..	0		0	.4	--	T	.8	--	T
24..	0		0	.4	--	T	.8	--	T
25..	0		0	.5	--	T	.8	--	T
26..	0		0	4.4	--	.2	1.0	--	T
27..	.1		T	1.5	--	.1	.9	5	T
28..	.1		T	1.0	--	T	.8	--	T
29..	.1		T	.7	13	T	.8	--	T
30..	.1		T	.7	--	T	.7	--	T
31..	.1		T	--	--	--	2.6	8	K .2
Total	14.3	--	0.3	28.4	--	0.8	38.2	--	1.4
Day	JANUARY			FEBRUARY			MARCH		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	5.4	--	0.4	4.8	--	0.3	0.7	--	T
2..	1.9	22	.1	4.2	--	.3	.7	--	T
3..	.9	--	T	3.1	--	.2	.6	--	T
4..	1.0	--	T	3.2	--	.2	.7	--	T
5..	.9	--	T	2.7	--	.1	.6	--	T
6..	.7	--	T	2.0	--	.1	1.0	--	T
7..	.8	--	T	1.9	17	.1	1.0	10	T
8..	.8	--	T	1.7	--	.1	1.2	--	T
9..	.8	11	T	1.7	--	.1	1.4	--	T
10..	.9	--	T	1.4	--	.1	1.2	--	T
11..	.9	12	T	1.5	--	.1	1.0	--	T
12..	.9	--	T	1.8	--	.1	1.1	--	T
13..	.8	--	T	1.8	--	.1	1.3	10	T
14..	.8	--	T	2.1	10	.1	1.3	--	T
15..	.7	--	T	2.1	6	T	3.1	--	0.1
16..	.7	--	T	1.8	--	T	8.7	28	.7
17..	.7	--	T	1.5	--	T	8.4	--	.5
18..	.7	--	T	1.3	--	T	8.0	--	.4
19..	.8	5	T	1.3	--	T	5.4	--	.2
20..	.7	--	T	1.2	--	T	3.5	--	.1
21..	.7	--	T	1.2	--	T	2.7	11	.1
22..	.7	--	T	1.1	11	T	2.1	15	.1
23..	.8	--	T	1.1	--	T	1.9	--	.1
24..	.8	--	T	1.0	--	T	2.0	--	.1
25..	.9	6	T	1.0	--	T	3.0	--	.1
26..	2.3	22	.1	.9	--	T	2.4	--	.1
27..	8.5	--	.9	.9	--	T	2.7	12	.1
28..	4.8	28	.4	.9	--	T	2.7	--	.1
29..	3.5	--	.2	--	--	--	2.1	--	.1
30..	3.3	--	.2	--	--	--	1.9	--	.1
31..	6.3	30	.5	--	--	--	1.9	--	.1
Total	54.4	--	3.3	51.2	--	2.4	76.5	--	3.5

S Computed by subdividing day.
T Less than 0.05 ton.K Computed from estimated-concentration
graph and subdividing day.

QUALITY OF SURFACE WATERS, 1961

ALAMEDA CREEK BASIN--Continued

11-1790. ALAMEDA CREEK NEAR NILES, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
(Where no concentrations are reported loads are estimated)

(where no concentrations are reported loads are estimates)									
Day	APRIL			MAY			JUNE		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	1.7	--	0.1	1.1	7		0.3	--	
2..	1.7	--	.1	1.0	--		.3	--	
3..	1.7	--	.1	1.0	--		.3	--	
4..	1.3	--	T	1.0	--		.3	--	
5..	1.2	--	T	.9	--		.2	18	
6..	1.1	--	T	1.2	--		.2	--	
7..	1.1	--	T	1.2	--		.1	--	
8..	1.2	--	T	1.0	16		.1	21	
9..	1.0	--	T	1.0	--		.1	--	
10..	1.0	8	T	1.0	--		.2	--	
11..	.7	--	T	1.0	--		.1	--	
12..	.8	--	T	1.0	--		.1	--	
13..	1.0	--	T	.9	--		.1	--	
14..	1.0	--	T	.8	--		0	--	
15..	1.5	--	.1	.7	27		0	--	
16..	2.2	--	.1	.5	--		0	--	
17..	1.0	8	T	.6	--		0	--	
18..	1.0	--	T	.6	--		0	--	
19..	1.0	--	T	.9	--		0	--	
20..	1.0	--	T	.8	--		0	--	
21..	1.1	--	T	.7	--		0	--	
22..	1.9	--	T	.7	13		0	--	
23..	2.1	--	T	.7	--		0	--	
24..	1.8	8	T	.6	--		0	--	
25..	1.4	--	T	.5	--		0	--	
26..	1.3	--	T	.5	--		0	--	
27..	1.2	8	T	.5	--		0	--	
28..	1.2	--	T	.3	10		0	--	
29..	1.1	--	T	.3	--		0	--	
30..	1.1	--	T	.3	--		0	--	
31..	--	--	--	.2	--		--	--	
Total	38.4	--	1.2	23.5	--	0.9	2.4	--	0.1
	JULY			AUGUST			SEPTEMBER		
1..									
2..									
3..									
4..									
5..									
6..									
7..									
8..									
9..									
10..									
11..									
12..									
13..									
14..									
15..									
16..									
17..									
18..									
19..									
20..									
21..									
22..									
23..									
24..									
25..									
26..									
27..									
28..									
29..									
30..									
31..									
Total	0		0	0		0	0		0
Total discharge for year (cfs-days).....									327.3
Total load for year (tons).....									13.9
T Less than 0.05 ton.									

BUENA VISTA LAKE BASIN--Continued

11-1910. KERN RIVER BELOW ISABELLA DAM, CALIF.

LOCATION.--At Isabella Dam, Kern County, approximately 0.6 mile upstream from gaging station, and 1 mile southwest of Isabella.
DRAINAGE AREA.--2,094 square miles upstream from gaging station.
RECORDS AVAILABLE.--October 1955 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃		So-dium adsorp-tion ratio	Specific con-ductance (microhmhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Cal-cium, Mag-nesium	Non-car-bonate			
Oct. 14, 1960.....	15	--	--	--	--	24	--	116	--	--	7.5	--	--	0.2	--	--	--	79	0	1.2	254	7.4
Nov. 3.....	20	--	--	--	--	24	--	121	--	--	12	--	--	.3	--	--	--	77	0	1.2	261	7.1
Dec. 5.....	21	--	--	--	--	28	--	145	--	--	10	--	--	.3	--	--	--	91	0	1.3	293	7.4
Jan. 3, 1961.....	16	--	--	--	--	26	--	145	--	--	9.5	--	--	.2	--	--	--	92	0	1.2	308	7.0
Feb. 6.....	20	--	--	--	--	34	--	150	--	--	13	--	--	.3	--	--	--	96	0	1.5	321	7.8
Mar. 1.....	15	--	--	--	--	30	--	184	--	--	11	--	--	.3	--	--	--	102	0	1.3	335	7.1
Apr. 5.....	7.3	--	--	--	--	32	--	155	--	--	15	--	--	.5	--	--	--	101	0	1.4	335	7.4
May 1.....	6.3	2.9	0.00	--	4.9	28	2.7	143	--	22	14	0.0	0.9	0.2	174	0.24	--	90	0	1.3	314	7.6
June 6.....	7.3	--	--	24	5.5	26	--	125	--	--	10	--	--	.4	--	--	--	83	0	1.2	278	7.5
July 3.....	236	--	--	--	--	23	--	119	--	--	10	--	--	.3	--	--	--	73	0	1.3	234	7.5
Aug. 1.....	284	--	--	--	--	25	--	126	--	15	10	--	--	.1	--	--	--	81	0	1.2	273	7.4
Sept. 1.....	115	16	--	26	5.0	28	3.1	141	--	--	12	.5	.3	.2	175	.24	--	85	0	1.3	261	7.5

BUENA VISTA LAKE BASIN--Continued

11-1940. KERN RIVER NEAR BAKERSFIELD, CALIF.

LOCATION.--At gaging station, at Kern County Land Co. diversion weir, approximately 2 miles east of Oil City, and 5 miles northeast of Bakersfield, Kern County.
 DRAINAGE AREA, 2,450 square miles.
 RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.
 REMARKS.--Records of discharge given in State of California Bulletin No. 23-61.

Chemical analyses, in parts per million, water year October 1960 to September 1961																						
Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhms at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 5, 1960.....	a175	--	--	--	--	24	--	98	--	--	12	--	--	0.2	--	--	--	66	0	1.3	237	8.0
Nov. 3.....	a157	--	--	--	--	23	--	89	--	--	10	--	--	.4	--	--	--	61	0	1.3	231	7.9
Dec. 15.....	a209	--	--	--	--	20	--	94	--	--	9.8	--	--	.2	--	--	--	61	0	1.1	216	7.7
Jan. 5, 1961.....	a178	--	--	--	--	24	--	96	--	--	9.8	--	--	.2	--	--	--	63	0	1.3	233	8.1
Feb. 7.....	a206	--	--	--	--	25	--	94	--	--	10	--	--	.3	--	--	--	62	0	1.4	234	7.9
Mar. 2.....	167	--	--	--	--	25	--	125	--	--	9.8	--	--	.2	--	--	--	62	0	1.4	232	7.5
Apr. 4.....	246	--	--	--	--	19	--	82	--	--	8.5	--	--	.3	--	--	--	53	0	1.1	194	8.1
May 10.....	a273	13	0.01	12	1.9	13	1.3	54	--	12	6.5	0.0	0.2	.1	87	0.12	--	38	0	.9	138	7.9
June 6.....	260	--	--	12	2.4	13	--	60	--	--	5.2	--	--	.1	--	--	--	40	0	.9	137	7.8
July 11.....	387	--	--	--	--	24	--	100	--	--	9.5	--	--	.2	--	--	--	60	0	1.3	220	8.0
Aug. 2.....	366	--	--	--	--	26	--	112	--	--	12	--	--	.2	--	--	--	70	0	1.4	252	7.9
Sept. 5.....	288	14	--	19	3.2	22	2.4	98	--	14	10	.4	.0	.1	133	.18	--	61	0	1.2	221	8.0

a Daily mean discharge.

TULARE LAKE BASIN

11-2035. TULE RIVER NEAR PORTERVILLE, CALIF.

LOCATION.--At gaging station, at highway bridge, 1 mile upstream from South Fork, and 6 miles east of Porterville, Tulare County.
 DRAINAGE AREA.--261 square miles.
 RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961 (discontinued).

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate			
Dec. 15, 1960.....	24					25		232	0		16			0.0				164	0	0.9	402	8.2
Jan. 4, 1961.....	22					25		229	5		14			.2				180	0	.8	430	8.4
Feb. 7, 1961.....	30					25		218	6		14			.2				159	0	.9	403	8.4
Mar. 2, 1961.....	14					25		213	7		12			.2				163	0	.9	387	8.4
Apr. 4, 1961.....	121					15		149	4	7.0	9.0			.1				113	0	.6	289	8.4
May 9, 1961.....	32	26	0.00	38	8.0	18	2.5	170	4		9.5	0.2	0.3	.2	198	0.27		128	0	.7	310	8.4
June 6, 1961.....	6.5					19		184	6		12			.1				140	0	.7	336	8.5

TULARE LAKE BASIN--Continued

11-2105. KANEAH RIVER NEAR THREE RIVERS, CALIF.

LOCATION.--At gaging station 2.5 miles downstream from South Fork and 3 miles southwest of Three Rivers Post Office, Tulare County.
 DRAINAGE AREA.--220 square miles.
 RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961 (discontinued).

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium-silicium	Non-carbonate			
Oct. 5, 1960.....	17	--	--	--	--	8.6	--	72	0	--	11	--	--	0.1	--	--	--	57	0	0.5	163	7.9
Nov. 3.....	28	--	--	--	--	8.9	--	72	0	--	9.0	--	--	0.1	--	--	--	56	0	0.5	156	7.9
Nov. 14.....	80	--	--	--	--	6.6	--	64	0	--	5.0	--	--	0.0	--	--	--	56	0	0.4	125	7.9
Dec. 1.....	65	--	--	--	--	8.0	--	71	0	--	5.0	--	--	0.0	--	--	--	53	0	0.5	136	8.0
Jan. 4, 1961.....	92	--	--	--	--	6.6	--	86	0	--	4.2	--	--	0.1	--	--	--	69	0	0.3	166	7.8
Feb. 7.....	85	--	--	--	--	6.2	--	64	0	--	5.0	--	--	0.0	--	--	--	47	0	0.4	123	7.9
Mar. 2.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 4.....	602	--	--	--	--	3.1	--	31	0	--	1.5	--	--	0.1	--	--	--	21	0	0.3	57	7.6
May 9.....	518	7.9	0.01	6.2	0.7	2.9	0.6	23	0	1.0	1.9	0.0	0.2	0.0	32	0.04	18	0	0.3	48	7.5	
June 6.....	512	--	--	5.8	1.0	2.1	--	25	0	--	1.3	--	--	0.1	--	--	18	0	0.2	46	7.4	
July 11.....	--	--	--	--	--	5.0	--	50	0	--	4.6	--	--	--	--	--	--	40	0	0.3	102	7.9
Aug. 2.....	28	--	--	--	--	7.2	--	61	0	--	8.0	--	--	0.0	--	--	--	50	0	0.4	130	8.1
Sept. 5.....	34	8.0	--	16	1.5	5.8	1.6	55	2	2.8	6.0	0.2	2.5	0.0	73	0.10	46	0	0.4	119	8.4	

TULARE LAKE BASIN--Continued
11-2185. KINGS RIVER BELOW NORTH FORK, CALIF.

LOCATION ---At gaging station, 0.6 mile downstream from North Fork, Fresno County, 2.4 miles southwest of Balch Camp, and 8.5 miles southeast of Trimmer. DRAINAGE AREA ---1,350 square miles, approximately.
RECORDS AVAILABLE ---Chemical analyses: October 1955 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 3, 1960.....	133	--	--	--	--	3.4	--	25	--	--	2.6	--	--	0.0	--	--	--	24	4	0.3	62	7.1
Nov. 1.....	129	--	--	--	--	4.2	--	25	--	--	3.8	--	--	.1	--	--	--	22	2	.4	66	6.9
Dec. 5.....	393	--	--	--	--	3.5	--	22	--	--	2.0	--	--	.0	--	--	--	19	1	.3	53	6.9
Jan. 3, 1961.....	200	--	--	--	--	4.1	--	31	--	--	.8	--	--	.0	--	--	--	19	0	.4	60	7.0
Feb. 1.....	259	--	--	--	--	4.7	--	24	--	--	2.0	--	--	.1	--	--	--	20	0	.4	59	7.1
Feb. 28.....	259	--	--	--	--	3.7	--	26	--	--	1.4	--	--	.0	--	--	--	20	0	.4	56	7.4
Apr. 3.....	1,190	--	--	--	--	2.8	--	23	--	--	2.5	--	--	.0	--	--	--	20	1	.3	50	7.2
May 1.....	1,850	6.8	0.01	2.9	0.4	1.9	0.6	10	--	2.0	1.5	0.0	0.2	.0	21	0.03	--	8	0	.3	30	6.8
June 5.....	2,160	--	--	2.1	.7	1.5	--	12	--	--	.6	--	--	.0	--	--	--	8	0	.2	23	6.6
July 10.....	1,150	--	--	--	--	2.2	--	18	--	--	2.0	--	--	.0	--	--	--	13	0	.3	38	7.1
Aug. 7.....	1,110	7.6	--	--	--	2.2	--	19	--	--	.2	--	--	.0	--	--	--	11	0	.3	33	6.8
Sept. 5.....	226	--	--	5.3	.5	2.9	.9	22	--	1.0	1.7	.2	.1	.0	31	.04	--	15	0	.3	48	7.6

TULARE LAKE BASIN--Continued
11-2200. BIG CREEK ABOVE PINE FLAT RESERVOIR, CALIF.

LOCATION.--At gaging station, 2.4 miles upstream from mouth and 2.7 miles northeast of Trimmer.
DRAINAGE AREA.--59.2 square miles.
RECORDS AVAILABLE.--October 1960 to September 1961.
REMARKS.--No flow during summer months.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonylate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Nov. 1, 1960.....	0.8					16		42			22			0.2				55	21	0.9	198	7.3
Dec. 5, 1960.....	15					7.7		32			8.4			.1				35	9	.6	100	6.8
Jan. 3, 1961.....	4.9					9.8		49			10			.0				36	0	.7	120	7.1
Feb. 1, 1961.....	9.4					8.2		38			7.8			.1				31	0	.6	105	7.6
Feb. 28, 1961.....	7.6					8.5		43			8.4			.1				35	0	.6	107	7.7
Apr. 3, 1961.....	19					6.6		37			4.5			.1				23	0	.6	77	7.4
May 1, 1961.....	7.9	24	0.01	8.3	1.2	8.8	1.4	38		3.0	7.6	0.0	0.1	.0	73	0.10		26	0	.8	91	7.5
June 5, 1961.....	4.0				8.6	9.3		44			8.3			.1				31	0	.7	103	7.3

TULARE LAKE BASIN--Continued
11-2215. KINGS RIVER BELOW PINE FLAT DAM, CALIF.

LOCATION.--At gaging station, 3,200 feet downstream from Pine Flat Dam, Fresno County, and 2.9 miles northeast of Piedra.
DRAINAGE AREA.--1,542 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1955 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 5, 1960.....	139	--	--	--	--	1.3	--	15	--	1.0	--	--	0.0	--	--	--	14	2	0.2	34	7.0
Nov. 1.....	52	--	--	--	--	1.5	--	13	--	1.8	--	--	--	--	--	--	13	1	.2	35	6.8
Dec. 5.....	84	--	--	--	--	1.8	--	19	--	1.0	--	--	.1	--	--	--	14	0	.2	48	6.9
Jan. 3, 1961.....	102	--	--	--	--	2.6	--	27	--	1.5	--	--	--	--	--	--	17	0	.2	51	6.9
Feb. 1.....	102	--	--	--	--	3.5	--	27	--	1.5	--	--	--	--	--	--	18	2	.4	47	7.3
Feb. 28.....	472	--	--	--	--	2.2	--	24	--	1.2	--	--	.0	--	--	--	19	0	.2	47	7.3
Apr. 3.....	131	--	--	--	--	2.7	--	17	--	1.5	--	--	--	--	--	--	11	0	.4	39	6.9
May 1.....	1,120	8.2	0.00	5.8	0.6	3.0	0.9	20	3.0	0.0	0.3	--	--	35	0.05	--	17	1	.3	50	7.3
June 5.....	1,700	--	--	4.0	1.5	2.2	--	22	--	1.0	--	--	.1	--	--	--	16	0	.2	42	6.8
July 10.....	2,700	--	--	--	--	1.6	.7	15	--	1.1	--	--	--	--	--	--	10	0	.2	28	7.0
Aug. 7.....	2,300	--	--	--	--	2.7	--	26	--	1.0	--	--	--	--	--	--	20	0	.3	51	7.0
Sept. 5.....	806	7.2	--	3.8	.6	1.7	.6	18	.6	.1	.4	--	.6	25	.03	--	12	0	.2	34	7.2

TULARE LAKE BASIN--Continued

11-2227. KINGS RIVER AT PEOPLES WEIR, NEAR KINGSBURG, CALIF.

LOCATION.--Approximately 0.2 mile downstream from gaging station located on diversion weir, 2 miles south of Kingsburg, and approximately 12 miles northeast of Hanford, Kings County.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

REMARKS.--Records of discharge furnished by Kings River Water Association.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day					
Oct. 5, 1960.....	6	--	--	--	--	3.7	--	42	--	--	2.2	--	--	0.0	--	--	--	33	0	0.3	89	7.6
Nov. 3.....	60	--	--	--	--	12	--	92	--	--	4.0	--	--	.1	--	--	--	64	0	.6	179	8.0
Dec. 14.....	21	--	--	--	--	11	--	92	--	--	4.4	--	--	.1	--	--	--	66	0	.6	173	8.0
Jan. 4, 1961.....	15	--	--	--	--	13	--	114	--	--	4.5	--	--	.0	--	--	--	79	0	.6	214	8.1
Feb. 8.....	21	--	--	--	--	13	--	103	--	--	5.8	--	--	.0	--	--	--	74	0	.7	207	8.1
Mar. 2.....	237	--	--	--	--	3.8	--	36	--	--	1.4	--	--	.0	--	--	--	29	0	.3	75	7.5
Apr. 4.....	102	--	--	--	--	4.6	--	57	--	--	5.2	--	--	.0	--	--	--	46	0	.3	119	7.8
May 9.....	36	13	0.02	13	--	9.3	1.3	67	--	7.0	5.8	0.0	0.9	.0	87	0.12	--	49	0	.6	139	8.0
May 16.....	26	--	--	13	--	9.9	--	72	--	--	4.5	--	--	.1	--	--	--	51	0	.6	144	7.8
July 10.....	1,386	--	--	--	--	2.0	--	18	--	--	.6	--	--	.0	--	--	--	13	0	.2	36	7.1
Aug. 2.....	500	--	--	--	--	2.6	--	21	--	--	2.8	--	--	.0	--	--	--	18	1	.3	49	7.5
Sept. 5.....	9	9.7	--	6.2	2.1	3.2	--	36	--	.6	1.6	.2	.3	.0	43	.06	--	24	0	.3	64	7.4

SAN JOAQUIN RIVER BASIN

11-2300. SOUTH FORK SAN JOAQUIN RIVER NEAR FLORENCE LAKE, CALIF.

LOCATION.--Temperature recorder at gaging station, just downstream from spillway of Florence Lake Dam, Fresno County, and 6 miles upstream from Bear Creek.

DRAINAGE AREA.--171 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1960 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 64°F Aug. 21; minimum, 33°F Jan. 5, on several days during February.

	Temperature (°F) of water, water year October 1960 to September 1961																																Average
	Day																																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
October	54	54	54	54	54	54	54	53	53	51	49	48	48	48	47	47	47	47	47	47	46	46	46	46	46	46	46	46	46	46	46	49	
Maximum	54	54	54	54	54	54	54	53	53	51	49	48	48	48	47	47	47	47	47	47	46	46	46	46	46	46	46	46	46	46	46	49	
Minimum	49	49	49	49	49	49	49	48	48	46	45	44	44	44	43	43	43	43	43	43	42	42	42	42	42	42	42	42	42	42	42	46	
November	46	46	46	46	45	45	44	42	42	42	41	41	41	41	40	40	40	40	41	39	39	39	38	39	39	39	41	40	38	38	37	41	
Maximum	46	46	46	46	45	45	44	42	42	42	41	41	41	41	40	40	40	40	41	39	39	39	38	39	39	39	41	40	38	38	37	41	
Minimum	45	45	46	45	44	42	42	40	40	40	40	40	40	39	39	39	39	39	39	39	39	39	38	38	38	38	37	38	37	37	36	40	
December	39	37	37	37	37	36	35	35	35	35	35	35	35	35	35	35	35	35	35	36	37	36	36	35	35	35	34	34	34	34	34	35	
Maximum	39	37	37	37	37	36	35	35	35	35	35	35	35	35	35	35	35	35	35	36	37	36	36	35	35	35	34	34	34	34	34	35	
Minimum	37	37	36	36	36	35	34	34	34	34	34	34	34	34	34	34	34	34	34	34	35	35	35	35	35	35	34	34	34	34	34	35	
January	34	34	34	34	34	34	34	34	34	34	34	34	34	34	35	35	35	35	35	35	35	35	36	36	36	36	38	37	37	36	36	35	
Maximum	34	34	34	34	34	34	34	34	34	34	34	34	34	34	35	35	35	35	35	35	35	35	36	36	36	36	38	37	37	36	36	35	
Minimum	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	35	35	35	35	35	35	35	36	36	36	36	37	37	36	36	35	35	
February	36	35	35	35	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	37	37	36	36	36	35	
Maximum	36	35	35	35	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	37	37	36	36	36	35	
Minimum	35	33	33	34	34	34	34	34	34	34	35	33	34	34	34	34	34	34	34	34	34	35	35	35	35	35	36	37	36	35	35	35	36
March	37	39	40	40	39	39	38	38	39	40	39	40	40	41	40	39	40	41	41	42	41	42	41	41	40	40	39	41	42	42	43	40	40
Maximum	37	39	40	40	39	39	38	38	39	40	39	40	40	41	40	39	40	41	41	42	41	42	41	41	40	40	39	41	42	42	43	40	40
Minimum	36	38	38	38	38	37	37	36	38	38	38	38	38	38	38	38	38	38	38	38	39	39	39	40	39	40	38	38	38	38	39	38	38
April	43	44	44	44	45	45	46	45	45	47	47	46	47	48	49	48	49	50	48	48	47	46	43	46	45	47	47	49	50	50	--	47	
Maximum	43	44	44	44	45	45	46	45	45	47	47	46	47	48	49	48	49	50	48	48	47	46	43	46	45	47	47	49	50	50	--	47	
Minimum	40	40	41	41	42	42	42	41	42	42	42	44	42	43	44	45	46	46	45	44	44	44	42	42	42	44	44	44	45	45	--	43	
May	49	49	49	49	47	46	48	48	47	48	48	48	48	47	48	48	47	47	47	49	49	49	49	49	49	49	49	49	47	48	48	48	
Maximum	49	49	49	49	47	46	48	48	47	48	48	48	48	47	48	48	47	47	47	49	49	49	49	49	49	49	49	49	47	48	48	48	
Minimum	47	45	46	45	45	45	44	44	44	44	44	44	44	44	44	44	44	45	45	45	45	45	46	46	46	47	48	48	48	47	47	45	
June	48	48	48	48	48	49	48	48	48	49	49	49	49	50	50	50	50	50	50	50	51	51	51	51	51	52	52	51	51	51	51	50	
Maximum	48	48	48	48	48	49	48	48	48	49	49	49	49	50	50	50	50	50	50	50	51	51	51	51	51	52	52	51	51	51	51	50	
Minimum	48	47	46	46	46	47	47	47	47	47	47	47	48	48	49	49	49	49	49	49	50	50	50	50	50	51	51	51	51	51	51	49	
July	52	51	52	52	54	54	54	54	54	54	55	55	54	55	55	55	55	56	57	57	57	57	57	57	57	57	57	57	57	57	57	55	
Maximum	51	51	51	51	51	51	52	52	52	53	53	53	53	53	53	53	55	55	55	55	55	56	56	56	57	57	57	57	57	57	57	54	
Minimum	51	51	51	51	51	51	52	52	53	53	53	53	53	53	53	53	55	55	55	55	55	56	56	57	57	57	57	57	57	57	57	54	
August	59	59	59	59	61	61	61	61	61	61	61	61	59	59	60	61	61	61	61	61	61	64	63	62	61	61	60	62	61	60	61	61	
Maximum	59	59	59	59	61	61	61	61	61	61	61	61	59	59	60	61	61	61	61	61	61	64	63	62	61	61	60	62	61	60	61	61	
Minimum	58	59	59	59	59	60	60	60	60	61	61	59	58	58	59	60	60	61	61	61	61	61	61	61	61	61	60	60	59	59	59	60	
September	62	62	62	62	62	61	61	61	61	60	60	60	60	60	60	60	60	60	60	60	60	59	58	57	56	55	56	57	57	56	--	59	
Maximum	62	62	62	62	62	61	61	61	61	60	60	60	60	60	60	60	60	60	60	60	60	59	58	57	56	55	56	57	57	56	--	59	
Minimum	59	59	59	59	59	59	59	60	59	57	57	57	57	57	57	58	58	57	56	56	54	54	54	54	54	54	55	55	55	55	55	57	

SAN JOAQUIN RIVER BASIN--Continued

11-2370. BIG CREEK BELOW HUNTINGTON LAKE, CALIF.

LOCATION.--Temperature recorder at gaging station, 1,200 feet upstream from Grouse Creek, and 1 mile downstream from Huntington Lake, Fresno County.
 DRAINAGE AREA.--80.0 square miles.
 RECORDS AVAILABLE.--Water temperatures: July to September 1961.

		Temperature (°F) of water, July to September 1961																															Average
		Day																															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Month		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
July																																	
Maximum	...	58	57	56	57	56	56	57	58	58	59	59	57	59	58	58	59	59	58	58	58	59	59	59	59	59	59	59	58	58	58	59	
Minimum	...	52	52	54	53	52	51	52	52	53	54	54	54	54	53	53	54	54	53	54	53	54	53	54	55	55	55	54	54	54	55	54	
August																																	
Maximum	...	59	57	59	59	59	61	61	61	60	58	58	60	60	59	59	59	58	59	60	62	62	62	62	62	62	61	58	59	60	60	61	
Minimum	...	54	55	56	57	57	56	57	56	56	57	56	56	56	55	55	55	54	55	57	58	58	58	58	58	57	56	55	56	56	57	56	
September																																	
Maximum	...	61	61	60	60	61	60	59	59	59	60	60	59	59	59	59	58	57	57	58	57	56	56	57	57	57	57	56	56	56	56	58	
Minimum	...	57	57	56	57	57	57	56	56	56	56	56	56	56	55	55	55	57	55	53	54	54	55	53	54	54	54	54	55	54	55	53	

SAN JOAQUIN RIVER BASIN--Continued

11-2465. WILLOW CREEK AT MOUTH, NEAR AUBREY, CALIF.

LOCATION.--Temperature recorder at gaging station, 40 feet upstream from bridge, 0.4 mile upstream from mouth, 1.3 mile upstream from Windy Creek, and 4.3 miles northeast of Aubrey, Fresno County.

DRAINAGE AREA.--30 square miles.

RECORDS AVAILABLE.--October 1960 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 88°F June 23, 24, 26, 27; minimum, 36°F Jan. 3, 4.

REMARKS.--Stream dry during summer months.

Temperature (°F) of water, water year October 1960 to September 1961

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

SAN JOAQUIN RIVER BASIN--Continued

11-2510. SAN JOAQUIN RIVER BELOW FRIANT, CALIF.

LOCATION.--At gaging station, 0.5 mile west of Friant, Fresno County, 1.5 miles downstream from Cottonwood Creek, and 2 miles downstream from Friant Dam.
 DRAINAGE AREA.--1,675 square miles.
 RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Po- tas- sium (K)	Bi- car- bon- ate (HCO ₃)	Car- bon- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		So- dium ad- orp- tion ratio	Specific con- duct- ance (micro- mhos at 25°C)	pH
															Parts per million	Tons per acre- foot	Tons per day	Cal- cium, Mag- ne- sium	Non- car- bon- ate			
Oct. 4, 1960.....	144	---	---	---	---	4.6	---	20	---	---	5.0	---	---	0.1	---	---	---	17	1	0.5	56	7.0
Nov. 2.....	125	---	---	---	---	4.2	---	18	---	---	4.8	---	---	.1	---	---	---	15	0	.5	53	7.3
Dec. 14.....	94	---	---	---	---	5.0	---	24	---	---	4.0	---	---	.0	---	---	---	19	0	.5	56	7.4
Jan. 7, 1961.....	52	---	---	---	---	3.0	---	19	---	---	3.2	---	---	.0	---	---	---	19	0	.3	50	7.4
Feb. 7.....	50	---	---	---	---	4.0	---	16	---	---	3.0	---	---	.1	---	---	---	19	0	.5	56	7.4
Mar. 3.....	104	---	---	---	---	4.6	---	20	---	---	6.0	---	---	.0	---	---	---	15	0	.5	56	7.5
Apr. 4.....	132	---	---	---	---	3.0	---	21	---	---	6.4	---	---	.0	---	---	---	17	0	.3	57	7.3
May 9.....	174	14	0.00	3.6	1.7	5.0	0.8	22	---	1.0	5.2	0.1	0.3	.0	43	0.06	---	16	0	.6	56	7.2
June 5.....	178	---	---	---	---	5.3	---	19	---	---	6.0	---	---	.1	---	---	---	14	0	.6	59	7.5
July 11.....	178	---	---	---	---	5.5	---	29	---	---	3.7	---	---	.0	---	---	---	17	0	.6	60	7.5
Aug. 4.....	171	---	---	---	---	5.4	---	24	---	---	6.0	---	---	.0	---	---	---	19	0	.5	64	7.2
Sept. 6.....	146	10	.00	3.6	1.6	5.4	.7	24	---	.0	6.0	.1	.4	.1	40	.05	---	16	0	.6	59	7.3

SAN JOAQUIN RIVER BASIN--Continued
11-2535. SAN JOAQUIN RIVER NEAR BIOLA, CALIF.

LOCATION.--At Skaggs Bridge, 1.9 miles upstream from gaging station, and approximately 2.5 miles northwest of Biola, Fresno County. DRAINAGE AREA.--1,805 square miles upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: November 1952 to September 1958, November 1959 to September 1961 (discontinued).

Water temperatures: November 1952 to September 1958, November 1959 to September 1961 (discontinued).

EXTREMES, 1959-61.--Dissolved solids: Maximum, 80 ppm Dec. 1-3; minimum, 49 ppm Dec. 4-18.

Hardness: Maximum, 34 ppm Nov. 24-30; minimum, 18 ppm Dec. 4-18.

Specific conductance: Maximum daily, 138 microhos Jan. 8; minimum daily, 59 microhos Dec. 13.

Water temperatures: Maximum, 94° F June 15; minimum, 39° F Jan. 3.

EXTREMES, 1952-58, 1959-61.--Dissolved solids: Maximum, 131 ppm Nov. 29, 1957; minimum, 26 ppm May 30, 1956.

Hardness: Maximum, 54 ppm Nov. 29, 1957; minimum, 9 ppm Oct. 1-15, 1956.

Specific conductance: Maximum daily, 178 microhos Mar. 18, 1958; minimum daily, 33 microhos June 18, 1956.

Water temperatures: Maximum, 94° F June 8, 1955, June 15, 1961; minimum, 36° F Feb. 23, 24, 28, Mar. 1, 2, 1953.

REMARKS.--Records of specific conductance of daily samples available in district office at Sacramento, Calif. No appreciable inflow between sampling point and gaging station except during periods of heavy runoff.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 1-10, 1960...	89.7			4.8	1.9	7.3		25							59	0.08	14.3	20	0	0.7	75
Oct. 11-20.....	87.6			6.4	1.0	7.3		28							60	.08	14.2	20	0	0.7	80
Oct. 21-31.....	89.3			5.8	1.5	7.3		29							62	.08	14.9	20	0	0.7	78
Nov. 1-10.....	86.1			8.6	2.4	7.6		36							55	.07	14.3	24	3	0.7	78
Nov. 11-20.....	79.1			6.0	3.4	7.3		32							63	.09	11.9	25	3	0.7	82
Nov. 16-23.....	42.2			6.0	3.4	7.3		32							63	.09	7.41	29	3	0.6	85
Nov. 24-30.....	27.9			8.0	3.4	9.3		46							76	.10	5.73	34	0	0.7	105
Dec. 1-3.....	73.0			8.0	2.4	8.6		42							80	.11	15.8	30	0	0.7	102
Dec. 4-18.....	287			6.4	5.5	5.6		24							49	.07	38.0	18	0	0.6	87
Dec. 19-31.....	70.3			8.0	5.0	7.7		34							54	.07	10.2	22	0	0.7	85
Jan. 1-10, 1961...	116			7.2	1.0	7.3		30							58	.08	18.2	22	0	0.7	84
Jan. 11-20.....	172			8.0	5.0	7.3		28							51	.07	23.7	22	0	0.7	73
Jan. 21-31.....	110			6.4	1.0	6.6		28							50	.07	14.8	20	0	0.6	73
Feb. 1-10.....	50.4			7.5	2.7	8.8		48							57	.09	9.12	29	0	0.7	97
Feb. 11-20.....	48.8			6.7	3.3	8.8		43							66	.08	8.70	30	0	0.7	99
Feb. 21-28.....	68.5			6.5	2.7	8.5		40							60	.08	10.8	27	0	0.7	92
Mar. 1-10.....	85.2			6.4	1.5	8.0		32							55	.09	12.7	22	0	0.7	79
Mar. 11-20.....	83.7			4.8	2.2	8.2		30							58	.08	13.1	21	0	0.8	76

Mar. 21-31, 1961..	74.5	6.0	1.9	7.8	30	56	.08	11.3	23	0	.7	75	7.2
Apr. 1-10,	73.1	6.0	1.2	7.6	29	56	.08	11.1	20	0	.7	76	7.2
Apr. 11-20,	63.9	5.8	2.1	7.1	26	56	.08	12.1	21	0	.7	73	7.2
Apr. 21-30,	55.9	4.8	2.2	7.1	25	56	.08	13.5	21	0	.7	69	7.1
May 1-10,	58.3	5.3	1.5	6.7	22	52	.07	13.8	20	2	.7	71	6.5
May 11-19,	106	5.6	1.9	6.7	24	50	.07	14.3	22	2	.6	69	6.6
May 20-31,	88.8	4.8	1.9	6.7	24	50	.07	12.0	20	0	.6	70	6.6
June 1-30,	70.2	5.2	1.7	7.1	26	55	.07	10.4	20	0	.7	73	7.2
July 1-31,	64.3	5.2	1.7	7.1	25	58	.08	10.1	20	0	.7	74	6.7
Aug. 1-31,	58.3	4.8	2.4	6.6	27	56	.08	8.81	22	0	.6	74	7.0
Sept. 1-15,	58.2	5.6	1.9	7.0	28	53	.07	8.33	22	0	.6	74	7.1
Sept. 16-30,	46.2	5.6	2.4	6.9	31	55	.08	6.99	24	0	.6	78	7.4
Weighted average	85.2	6.0	1.6	7.1	28	55	0.07	12.7	22	0	0.7	73	--

a Calculated from determined constituents.

Temperature (°F) of water, water year October 1960 to September 1961

Month	Day																															Aver- age
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October	79	77	77	77	78	79	72	69	61	66	68	65	66	66	70	68	67	72	68	72	77	70	62	68	--	63	65	--	61	63	--	70
November	66	62	62	56	--	66	62	59	56	56	59	60	60	59	58	60	--	64	--	60	55	60	57	--	52	52	53	52	52	55	--	58
December	55	56	53	52	48	--	45	46	50	49	50	50	50	50	51	54	45	50	51	50	51	49	--	49	44	45	44	--	48	42	43	49
January	44	45	39	43	44	43	--	47	45	--	--	--	--	46	45	47	47	43	49	48	44	49	45	42	45	53	47	52	47	--	51	46
February	57	55	57	56	60	62	57	62	63	64	--	52	54	60	57	53	60	57	59	--	64	--	60	52	52	58	60	59	--	--	--	58
March	65	61	60	57	59	57	56	64	57	59	57	65	67	64	61	63	--	67	65	68	70	67	65	67	65	63	62	64	69	--	69	63
April	70	78	80	80	78	75	--	78	75	72	75	--	73	75	--	77	75	--	70	69	70	70	--	63	70	72	75	79	80	--	74	--
May	--	72	74	70	70	--	78	77	78	78	75	--	69	71	--	80	80	80	--	80	--	80	78	79	78	--	72	76	74	74	--	83
June	76	79	84	76	82	82	83	81	--	84	78	76	89	89	94	90	91	81	83	79	87	85	85	--	88	82	79	82	85	82	--	83
July	75	--	76	78	78	78	84	87	84	--	91	85	89	89	--	87	80	91	--	--	89	93	81	80	74	74	87	74	73	--	73	82
August	75	78	87	85	86	84	--	85	83	85	90	91	--	--	--	85	75	76	--	--	87	--	89	--	89	84	78	76	81	--	86	--
September	--	72	75	85	85	75	82	80	74	84	82	74	80	70	74	--	72	76	75	78	75	72	70	79	80	75	80	80	80	67	--	77

SAN JOAQUIN RIVER BASIN--Continued

11-2580. FRESNO RIVER NEAR DAULTON, CALIF.

LOCATION --At gaging station, 0.5 mile downstream from Willow Creek, and 5.3 miles southeast of Daulton, Madera County.
 DRAINAGE AREA --259 square miles.
 RECORDS AVAILABLE.--Chemical analyses: January 1958 to September 1961.

Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Nov. 2, 1960.....	2.7					45		62			89			0.2				76	25	2.3	373
Dec. 14, 1960.....	20					19		73			30			.0				57	6	1.1	348
Jan. 4, 1961.....	14					20		52			32			.0				49	6	1.2	205
Feb. 8, 1961.....	30					15		53			23			.1				42	0	1.0	168
Mar. 3, 1961.....	31					17		53			21			.0				39	0	1.2	162
Apr. 5, 1961.....	54					10		48			8.7			.0				28	0	.8	100
May 10, 1961.....	48	20	0.00	6.8	2.2	9.1	0.9	38		0.0	11	0.1	0.1	.1	88	0.09		28	0	.8	92
June 5, 1961.....	30					11		37			12			.0				33	3	.8	106

Chemical analyses, in parts per million, water year October 1960 to September 1961

SAN JOAQUIN RIVER BASIN--Continued

11-2590. CHOWCHILLA RIVER AT BUCHANAN DAMSITE, CALIF.

LOCATION.--At gaging station, 1.9 miles upstream from Raynor Creek, and 4.3 miles west of Raymond, Madera County.

DATE AND TIME.--11:38 a.m., Dec. 14, 1960.

RECORDS AVAILABLE.--Chemical analyses: January 1958 to September 1961.

REMARKS.--No flow during summer months.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro- mhos at 25°C)	pH
															Parts per million	Tons per acre- foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Dec. 14, 1960.....	8.1					39		132			84			0.0				130	22	1.5	420	7.8
Jan. 4, 1961.....	5.4					40		102			91			.0				128	44	1.5	483	7.9
Feb. 8.....	12					31		98			55			.1				98	18	1.4	345	8.2
Mar. 3.....	11					27		101			54			.1				93	10	1.2	345	8.2
Apr. 3.....	16					23		90			36			.0				73	0	1.2	254	8.2
May 10.....	18.1	24	0.00	25	4.5	31	2.4	94		3.0	48	0.1	0.0	.1	184	0.25		81	4	1.5	315	8.1
June 8.....	2.2					40		97			83			.0				110	30	1.7	433	8.2

SAN JOAQUIN RIVER BASIN--Continued
11-2603. BEAR CREEK AT MERCED, CALIF.

LOCATION.--At U. S. Highway 99 bridge in Merced, Merced County.
RECORDS AVAILABLE.--Chemical analyses, January 1959 to September 1961 (discontinued).
REMARKS.--No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium, silium	Non-carbonate			
Oct. 6, 1960.....		--				16	--	169	3	--	3.7	--	--	0.0	--	--		128	0	0.6	300	8.4
Nov. 2.....		--				24	--	180	4	--	5.2	--	--	.0	--	--		129	0	.9	320	8.4
Dec. 14.....		--				15	--	170	4	--	8.8	--	--	.0	--	--		139	0	.6	282	8.4
Jan. 3, 1961.....		--				14	--	166	6	--	6.0	--	--	.0	--	--		147	1	.5	306	8.3
Feb. 6.....		--				15	--	209	0	--	6.5	--	--	.0	--	--		180	9	.5	384	8.2
Mar. 3.....		--				25	--	170	2	--	8.5	--	--	.1	--	--		147	4	.9	336	8.3
Apr. 3.....		--				14	--	147	0	--	7.5	--	--	.0	--	--		123	2	.6	289	8.2
May 10.....		13	0.00	6.4	4.9	3.3	0.9	41	0	4.0	2.2	0.1	0.2	.0	56	0.08		36	2	.2	85	7.4
June 5.....		--				4.0	--	48	0	--	1.2	--	--	.0	--	--		37	0	.3	85	7.3
Aug. 4.....		--				13	--	124	0	--	4.4	--	--	.0	--	--		92	0	.6	233	7.3
Sept. 8.....		31		18	7.5	14	1.4	109	0	8.0	8.5	.1	1.3	.0	144	.20		76	0	.7	208	8.0

SAN JOAQUIN RIVER BASIN--Continued

11-2610. SALT SLOUGH NEAR LOS BANOS, CALIF.

LOCATION--At gaging station in Sanjon de Santa Rita Grant, at San Luis Ranch, 600 yards downstream from confluence with Mud Slough, and 7.0 miles north of Los Banos, Merced County.
 RECORDS AVAILABLE--November 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium-Magnesium sum	Non-carbonate	
Oct. 5, 1960.....	86	--	--	--	--	99	--	157	--	174	--	--	0.3	--	--	--	210	81	968
Nov. 9.....	36	--	--	--	--	258	--	227	--	334	--	--	.9	--	--	--	361	175	1,990
Dec. 15.....	56	--	--	--	--	282	--	237	286	385	--	--	.7	--	--	--	385	191	2,020
Jan. 12, 1961....	a 78	--	--	--	--	285	--	251	344	358	--	--	1.7	--	--	--	435	229	2,130
Feb. 16.....	67	--	--	--	--	356	--	258	448	440	--	--	2.2	--	--	--	500	288	2,550
Mar. 9.....	a 58	--	--	--	--	334	--	228	445	385	--	--	2.0	--	--	--	478	291	2,440
Apr. 13.....	47	--	--	--	--	224	--	207	222	318	--	--	.8	--	--	--	370	200	1,750
May 4.....	65	25	0.00	56	29	146	4.8	160	135	220	0.5	2.8	.4	698	0.95	--	260	129	1,210
June 8.....	93	--	--	--	--	115	--	172	132	148	--	--	.7	--	--	--	238	97	1,020
July 13.....	61	--	--	--	--	147	--	168	160	172	--	--	1.0	--	--	--	248	110	1,140
Aug. 3.....	46	--	--	--	--	154	--	176	124	222	--	--	.6	--	--	--	250	106	1,240
Sept. 7.....	73	25	--	52	32	157	5.0	174	129	232	.3	2.4	.7	721	.98	--	260	117	1,300

a Daily mean discharge.

SAN JOAQUIN RIVER BASIN--Continued

11-2615. SAN JOAQUIN RIVER AT FREMONT FORD BRIDGE, CALIF.

LOCATION --At gaging station in Orestimba Grant, 150 feet downstream from Fremont Ford Bridge, Merced County, 2.1 miles downstream from Salt Slough, 4.5 miles west of Stevinson, and 6.7 miles upstream from Merced River.

DRAINAGE AREA --8,090 square miles, approximately.

RECORDS AVAILABLE --Chemical analyses: July 1955 to September 1961.

Water temperatures: July 1955 to September 1959.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 6, 1960.....	55	--	--	--	--	171	--	179	0	--	270	--	--	0.4	--	--	--	268	121	4.5	1,440	7.8
Nov. 10.....	28	--	--	--	--	310	--	228	0	--	520	--	--	0.8	--	--	--	461	274	6.3	2,440	7.5
Dec. 15.....	450	--	--	--	--	326	--	227	6	--	440	--	--	1.1	--	--	--	470	274	6.5	2,310	8.4
Jan. 12, 1961.....	148	--	--	--	--	225	--	291	0	220	265	--	--	1.1	--	--	--	360	121	5.2	1,660	8.2
Feb. 16.....	127	--	--	--	--	338	--	234	0	364	395	--	--	1.6	--	--	--	455	263	6.9	2,250	7.7
Mar. 9.....	99	--	--	--	--	368	--	231	0	412	474	--	--	1.8	--	--	--	480	291	7.3	2,590	7.6
Apr. 13.....	92	--	--	--	--	298	--	250	0	256	444	--	--	0.7	--	--	--	475	270	5.9	2,318	8.1
Apr. 21.....	90	24	88	46	33	218	3.2	193	0	202	388	0.3	5.2	6	1,070	1.58	408	250	4.7	1,900	8.2	
May 4.....	128	19	0.02	66	33	164	4.4	195	0	155	260	0	4.1	6	802	1.09	302	142	4.1	1,390	7.5	
June 8.....	123	--	--	--	--	174	--	184	0	164	250	--	--	6	--	--	290	139	4.4	1,340	8.2	
July 13.....	76	--	--	--	--	166	--	189	0	167	261	--	--	8	--	--	314	159	4.1	1,430	8.0	
Aug. 3.....	62	--	--	--	--	198	--	196	0	169	316	--	--	7	--	--	320	159	4.8	1,610	8.2	
Aug. 17.....	77	27	--	64	32	190	5.2	165	0	131	300	5	4.5	4	836	1.14	292	157	4.9	1,510	7.0	
Aug. 28.....	93	22	66	34	34	198	4.8	190	0	155	312	1	2.4	7	889	1.21	306	150	4.9	1,580	7.5	
Sept. 7.....	93	23	--	60	35	182	2.8	182	0	410	284	3	1.6	5	819	1.11	294	145	4.6	1,440	7.6	

a Daily mean discharge.

SAN JOAQUIN RIVER BASIN--Continued

11-2700. MERCED RIVER AT EXCHEQUER, CALIF.

LOCATION --At gaging station at Exchequer, Mariposa County, 0.65 mile downstream from Lake McClure, and 5 miles northeast of Merced Falls.
 DRAINAGE AREA --1,059 square miles.
 RECORDS AVAILABLE --Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 4, 1960.....	35	--	--	--	--	4.1	--	92	--	5.6	--	--	0.1	--	--	--	80	5	0.2	185	6.1
Nov. 2.....	37	--	--	--	--	4.0	--	100	--	3.8	--	--	0	--	--	--	89	7	0.3	198	6.7
Dec. 1.....	42	--	--	--	--	4.2	--	64	--	3.2	--	--	0	--	--	--	48	0	0.3	113	7.7
Jan. 3, 1961.....	41	--	--	--	--	4.2	--	52	--	3.5	--	--	0	--	--	--	49	6	0.2	113	7.7
Feb. 6.....	37	--	--	--	--	3.4	--	52	--	3.5	--	--	0	--	--	--	49	7	0.3	119	6.0
Mar. 1.....	35	--	--	--	--	4.4	--	52	--	3.3	--	--	0	--	--	--	50	7	0.3	118	8.0
Apr. 3.....	39	--	--	--	--	2.4	--	51	--	5.6	--	--	0	--	--	--	49	7	0.1	118	7.9
May 8.....	1,430	7.1	0.01	4.4	1.0	2.0	0.7	16	2.0	2.8	0.0	0.1	0	28	0.04	15	2	0.2	39	7.3	
June 7.....	1,520	--	--	3.0	0.5	1.7	--	13	--	1.0	--	--	1	--	--	10	0	0.2	26	7.2	
July 12.....	147	--	--	--	--	2.0	--	28	--	--	--	--	0	--	--	24	1	0.2	57	7.7	
Aug. 4.....	176	--	--	--	--	2.5	--	33	--	3.8	--	--	1	--	--	31	4	0.2	74	7.3	
Sept. 8.....	143	9.3	--	12	2.4	3.2	0.7	48	3.0	3.2	1.1	0.8	0	59	0.08	40	1	0.2	95	7.6	

SAN JOAQUIN RIVER BASIN--Continued

11-2725. MERCED RIVER NEAR STEVINSON, CALIF.

LOCATION.--At gaging station, 5 miles upstream from mouth, and 6 miles northwest of Stevinson, Merced County.

DRAINAGE AREA.--1,274 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 6, 1960.....	57	--	--	--	--	36	--	155	0	--	27	--	--	0.0	--	--	--	95	0	1.6	367	8.1
Nov. 10.....	99	--	--	--	--	37	--	145	0	--	22	--	--	.1	--	--	--	91	0	1.7	325	8.0
Dec. 15.....	120	--	--	--	--	30	--	146	0	--	16	--	--	.0	--	--	--	95	0	1.3	309	8.0
Jan. 12, 1961.....	115	--	--	--	--	28	--	157	0	--	15	--	--	.0	--	--	--	92	0	1.3	304	8.0
Feb. 16.....	131	--	--	--	--	30	--	132	0	--	16	--	--	.0	--	--	--	86	0	1.4	295	8.0
Mar. 9.....	103	--	--	--	--	30	--	130	0	--	18	--	--	.0	--	--	--	94	0	1.3	314	8.0
Apr. 13.....	17	--	--	--	--	45	--	166	4	--	34	--	--	.0	--	--	--	121	0	1.8	394	8.4
May 4.....	71	26	0.02	22	7.1	30	2.0	132	0	15	20	0.1	3.4	.1	191	0.26	--	84	0	1.4	294	7.8
June 8.....	88	--	--	21	6.9	28	--	129	0	--	16	--	--	.1	--	--	--	81	0	1.4	286	7.9
July 13.....	27	--	--	--	--	44	--	160	0	--	35	--	--	.0	--	--	--	97	0	1.9	394	7.9
Sept. 7.....	36	30	--	23	8.9	32	1.7	149	0	12	24	.1	2.3	.0	207	.28	--	94	0	1.4	353	7.7

SAN JOAQUIN RIVER BASIN--Continued

11-2740. SAN JOAQUIN RIVER NEAR NEWMAN, CALIF.

LOCATION.--At gaging station, at bridge on Hills Ferry Road, 300 feet downstream from Merced River, and 3.5 miles northeast of Newman, Stanislaus County.
 DRAINAGE AREA.--9,990 square miles.
 RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio at 25°C)	Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 6, 1960.....	115	--	--	--	--	183	--	168	--	--	262	--	--	0.5	--	--	--	303	165	4.6	1,530	8.0
Nov. 10.....	a150	--	--	--	--	228	--	238	--	--	325	--	--	1.8	--	--	--	364	169	5.2	1,860	7.6
Dec. 15.....	227	--	--	--	--	338	--	251	--	--	420	--	--	1.1	--	--	--	460	254	6.9	2,310	7.7
Jan. 12, 1961.....	515	--	--	--	--	228	--	279	--	231	238	--	--	1.2	--	--	--	323	94	5.5	1,610	7.7
Feb. 16.....	358	--	--	--	--	338	--	296	--	438	390	--	--	1.6	--	--	--	498	285	6.6	2,360	8.0
Mar. 9.....	235	--	--	--	--	368	--	236	--	470	449	--	--	1.9	--	--	--	516	322	7.1	2,680	7.6
Apr. 13.....	157	--	--	--	--	318	--	276	--	340	436	--	--	9	--	--	--	493	267	6.2	2,450	6.2
May 4.....	200	18	0.04	61	33	158	4.4	193	164	164	234	0.3	3.2	4	771	1.05	228	70	4.0	1,350	7.5	
June 8.....	217	--	--	--	--	192	--	191	211	211	235	--	--	9	--	--	318	161	4.7	1,480	8.2	
July 13.....	a100	--	--	--	--	214	--	202	225	302	302	--	--	9	--	--	400	230	4.7	1,710	7.6	
Aug. 3.....	a85	--	--	--	--	236	--	226	221	334	334	--	--	7	864	1.18	366	179	5.4	1,780	7.7	
Aug. 17.....	100	25	--	64	35	200	5.2	184	135	302	302	0.3	6.4	5	--	--	304	153	5.0	1,550	7.7	
Sept. 7.....	133	24	--	52	29	138	3.4	179	85	212	212	0.3	1.8	4	634	0.86	250	103	3.6	1,200	7.7	

a Daily mean discharge.

SAN JOAQUIN RIVER BASIN--Continued

11-2747. SAN JOAQUIN RIVER NEAR GRAYSON, CALIF.

LOCATION--At gaging station, at Laird Slough Bridge, 1.8 miles east of Grayson, Stanislaus County, 5 miles upstream from confluence with Tuolumne River, 14 miles south of Modesto.

RECORDS AVAILABLE--Chemical analyses: October 1953 to September 1961.

REMARKS--Records of discharge given in State of California Bulletin No. 23-61 as San Joaquin River at Grayson. Flow is San Joaquin River diversion into Laird Slough which returns to San Joaquin River main channel 2.1 miles downstream.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 10, 1960.....	250	--	--	--	--	185	--	235	0	--	270	--	--	0.6	--	--	--	328	135	4.4	1,640	8.0
Nov. 11.....	315	--	--	--	--	182	--	222	0	--	239	--	--	.5	--	--	--	272	90	4.8	1,340	8.0
Dec. 14.....	325	--	--	--	--	185	--	266	0	--	225	--	--	.6	--	--	--	302	84	4.6	1,410	8.0
Jan. 7, 1961.....	320	--	--	--	--	190	--	240	0	--	235	--	--	.7	--	--	--	335	138	4.5	1,500	7.8
Feb. 10.....	540	--	--	--	--	188	--	218	0	--	232	--	--	1.0	--	--	--	296	117	4.8	1,490	7.7
Mar. 9.....	300	--	--	--	--	233	--	228	0	--	318	--	--	1.1	--	--	--	392	205	5.1	1,910	8.0
Apr. 10.....	230	--	--	--	--	220	--	236	0	--	288	--	--	.8	--	--	--	362	168	5.0	1,690	8.0
May 9.....	315	26	0.00	50	30	128	3.4	181	3	100	180	0.1	3.0	.4	613	0.83	249	96	3.5	1,080	8.3	
June 6.....	245	--	--	--	--	138	--	204	0	--	175	--	--	.5	--	--	274	107	3.6	1,100	8.2	
Aug. 9.....	80	--	--	--	--	168	--	266	0	--	256	--	--	.3	--	--	402	184	4.4	1,570	7.9	
Aug. 17.....	100	28	--	70	49	179	5.0	216	24	198	261	.0	4.8	.5	926	1.26	378	161	4.0	1,550	8.5	
Sept. 12.....	175	20	--	67	41	177	4.0	238	0	180	257	.3	4.2	.6	868	1.18	336	141	4.2	1,500	7.8	

SAN JOAQUIN RIVER BASIN--Continued

11-2880. TUOLUMNE RIVER ABOVE LA GRANGE DAM, NEAR LA GRANGE, CALIF.

LOCATION.--Approximately 0.5 mile upstream from gaging station at Don Pedro Dam, 4 miles upstream from La Grange Dam, and 5.5 miles upstream from La Grange, Stanislaus County.

DRAINAGE AREA.--1,534 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954, October 1956 to September 1961.

REMARKS.--No appreciable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate			
Oct. 10, 1960.....	610	--	--	--	--	1.7	--	11	--	--	1.5	--	--	0.1	--	--	--	9	0	0.2	25	7.0
Nov. 11.....	680	--	--	--	--	1.5	--	11	--	--	1.8	--	--	.1	--	--	10	1	.2	25	6.8	
Dec. 14.....	1,260	--	--	--	--	1.6	--	14	--	--	1.5	--	--	.0	--	--	13	2	.2	31	7.2	
Jan. 7, 1961.....	493	--	--	--	--	2.3	--	18	--	--	.2	--	--	--	--	--	10	0	.3	28	6.9	
Feb. 11.....	126	--	--	--	--	2.3	--	12	--	--	1.0	--	--	--	--	--	11	1	.3	30	7.4	
Mar. 9.....	409	--	--	--	--	1.3	--	13	--	--	1.0	--	--	.1	--	--	12	1	.2	31	6.9	
Apr. 10.....	1,340	--	--	--	--	1.8	--	20	--	--	.8	--	--	.0	--	--	14	0	.2	36	7.4	
May 9.....	904	7.2	0.01	3.8	1.5	2.0	0.7	19	--	1.0	2.0	0.0	0.5	.0	28	0.04	16	0	.2	41	7.5	
June 6.....	1,430	--	--	--	--	1.5	--	13	--	--	1.0	--	--	--	--	--	10	0	.2	27	7.1	
Aug. 9.....	1,530	--	--	--	--	1.3	--	12	--	--	--	--	--	.0	--	--	7	0	.2	20	6.9	
Sept. 12.....	2,120	4.8	--	2.5	.5	1.2	.4	12	--	.2	--	.1	.4	.0	16	.02	8	0	.2	22	6.7	

SAN JOAQUIN RIVER BASIN--Continued

11-2898. TUOLUMNE RIVER AT HICKMAN, CALIF.

LOCATION.--At gaging station, approximately 0.6 mile south of Waterford, and 1 mile north of Hickman, Stanislaus County.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

REMARKS.--Records of discharge given in State of California Bulletin No. 23-61 as Tuolumne River at Hickman Bridge.

Chemical analyses, in parts per million, water year October 1960 to September 1961

CHEMICAL ANALYSES, IN PPM, PER MILLION, WATER FROM OCTOBER 1960 TO SEPTEMBER 1961																				
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 (calculated)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium, silum	Non-carbonate	
Oct., 10, 1960.....	123	--	--	--	--	56	--	110	--	--	108	--	--	0.1	--	--	--	120	30	543 7.9
Nov. 11.....	497	--	--	--	--	15	--	27	--	--	29	--	--	0	--	--	--	31	9	143 7.4
Dec. 14.....	695	--	--	--	--	8.0	--	30	--	--	14	--	--	0	--	--	--	30	5	102 7.2
Jan. 7, 1961.....	624	--	--	--	--	7.7	--	29	--	--	13	--	--	0	--	--	--	27	3	99 7.4
Feb., 10.....	285	--	--	--	--	19	--	46	--	--	35	--	--	.1	--	--	--	51	13	205 7.9
Mar. 9.....	104	--	--	--	--	54	--	97	--	--	103	--	--	.1	--	--	--	111	31	507 8.2
Apr. 10.....	84	--	--	--	--	57	--	131	--	--	113	--	--	.1	--	--	--	138	31	553 8.2
May 9.....	87	50	0.00	29	13	54	6.1	105	4.0	120	0.1	0.6	0	.0	329	0.45	126	40	566 7.8	
June 6.....	83	--	--	--	--	58	--	110	--	--	112	--	--	.1	--	--	124	34	543 8.0	
Aug. 9.....	69	--	--	--	--	64	--	124	--	1.6	124	--	--	.0	--	--	146	44	593 8.2	
Sept., 12.....	--	49	--	33	12	60	5.6	114	--	--	121	.2	.3	.1	339	.46	133	40	582 8.2	

SAN JOAQUIN RIVER BASIN--Continued

11-2902. TUOLUMNE RIVER AT TUOLUMNE CITY, CALIF.

LOCATION.--At gaging station, at bridge in Tuolumne City, Stanislaus County, and 3.4 miles from mouth.
 RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

REMARKS.--Records of discharge given in State of California Bulletin No. 23-61.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 10, 1960.....	260	--	--	--	--	114	--	167	0	--	232	--	--	0.2	--	--	--	216	79	3.4	1,040	8.0
Nov. 11.....	270	--	--	--	--	47	--	66	0	--	94	--	--	.1	--	--	--	92	38	2.1	420	6.9
Dec. 14.....	765	--	--	--	--	37	--	54	0	--	70	--	--	.0	--	--	--	77	33	1.8	356	7.2
Jan. 7, 1961.....	800	--	--	--	--	32	--	49	0	--	65	--	--	.1	--	--	--	68	28	1.7	328	7.1
Feb. 10.....	415	--	--	--	--	61	--	96	0	--	136	--	--	.1	--	--	--	137	58	2.3	640	7.6
Mar. 9.....	230	--	--	--	--	108	--	156	0	--	218	--	--	.2	--	--	--	206	78	3.3	988	7.4
May 9.....	235	41	0.04	53	16	102	8.0	147	0	10	207	0.0	3.1	.0	512	0.70	--	198	77	3.2	933	7.8
June 6.....	145	--	--	--	--	116	--	139	0	--	285	--	--	.1	--	--	--	232	102	3.3	1,060	8.2
Aug. 17.....	185	46	--	56	19	128	9.4	170	0	11	283	.3	3.8	.2	625	.85	--	246	98	3.6	1,200	7.7
Sept. 12.....	225	43	--	59	13	96	6.2	186	0	7.2	179	.2	4.2	.1	500	.68	--	242	94	3.7	1,130	7.3
																		199	46	3.0	863	7.8

SAN JOAQUIN RIVER BASIN--Continued

11-2905. SAN JOAQUIN RIVER AT MAZE ROAD BRIDGE, NEAR MODESTO, CALIF.

LOCATION.--At Maze Road Bridge, 0.2 mile downstream from gaging station at Hetch Hetchy Crossing, 2.7 miles upstream from Stanislaus River, and 12 miles west of Modesto, Stanislaus County.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

REMARKS.--Records of discharge given in State of California Bulletin No. 23-61 as San Joaquin River at Hetch Hetchy Aqueduct Crossing.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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)	Boiron (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Calcium-Magnesium	Non-carbonate			
Oct. 10, 1960.....	510	--	--	--	--	155	--	211	0	--	260	--	--	--	--	288	115	4.0	1,360	8.1
Nov. 11.....	940	--	--	--	--	90	--	128	0	--	144	--	0.5	--	--	179	74	2.9	808	7.9
Dec. 14.....	685	--	--	--	--	93	--	189	0	--	132	--	0.3	--	--	174	19	3.1	770	7.6
Jan. 7, 1961.....	1,190	--	--	--	--	88	--	108	0	--	122	--	0.3	--	--	152	63	3.1	729	7.6
Feb. 10.....	1,050	--	--	--	--	143	--	167	0	--	198	--	0.6	--	--	237	100	4.1	1,180	7.5
Mar. 9.....	400	--	--	--	--	165	--	177	0	--	287	--	0.6	--	--	304	159	4.1	1,460	7.8
Apr. 10.....	250	--	--	--	--	176	--	192	0	--	325	--	0.4	--	--	316	158	4.5	1,500	8.0
May 9.....	505	30	0.01	53	28	129	8.2	171	0	88	286	0.1	3.1	629	0.86	297	157	3.8	1,400	8.1
June 6.....	310	--	--	--	--	159	--	192	0	--	258	--	0.5	--	--	284	137	3.9	1,200	7.5
Aug. 9.....	115	--	--	--	--	206	--	202	0	--	404	--	0.5	--	--	392	226	4.5	1,800	8.1
Aug. 17.....	180	37	--	71	32	168	8.0	180	9	63	309	0	4.8	791	1.08	310	148	4.2	1,440	8.5
Sept. 12.....	--	27	--	63	34	156	5.2	222	0	112	254	0.2	4.3	765	1.04	298	116	3.9	1,310	7.8

SAN JOAQUIN RIVER BASIN--Continued

11-2999.98 STANISLAUS RIVER AT TULLOCH DAMSITE, NEAR KNIGHTS FERRY, CALIF.

LOCATION.--Approximately 1 mile downstream from Tulloch Dam, 2.4 miles downstream from Goodwin Dam, and 4.6 miles upstream from Knights Ferry, Stanislaus County.

RECORDS AVAILABLE.--Chemical analyses: October 1956 to September 1961.

REMARKS.--No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium-Magnesium	Non-carbonate			
Oct. 4, 1960.....						1.9		42		1.4			0.0				35	1	0.1	80	7.5
Nov. 2.....						2.8		33		1.5			0.0				28	1	0.2	66	7.3
Dec. 13.....						2.4		36		1.5			0.0				31	1	0.2	68	7.4
Jan. 3, 1961.....						2.4		36		1.0			0.0				28	0	0.2	98	7.6
Feb. 6.....						3.4		37		1.0			0.0				35	5	0.3	79	7.7
Mar. 1.....						2.7		45		1.2			0.0				31	0	0.2	73	7.4
Apr. 3.....						1.3		37		2.5			1				33	3	0.1	75	7.6
May 8.....		17	0.00		5.2	2.7	0.7	30	2.0	1.0	0.1	0.1	1	46	0.06		24	0	0.2	56	7.4
June 5.....				4.9	2.1	2.0		28		2							20	0	0.2	50	7.4
July 12.....						2.0		28		2							20	0	0.2	52	7.5
Aug. 4.....						2.5		33		2.2			0				27	0	0.2	65	7.7
Sept. 8.....	8.9			5.6	2.8	2.6	0.3	35	0	1.2	1	0.3	0	39	0.05		26	0	0.2	63	7.3

SAN JOAQUIN RIVER BASIN--Continued

11-3034. STANISLAUS RIVER NEAR MOUTH, NEAR VERNALIS, CALIF.

LOCATION.---At gaging station, 2.9 miles upstream from mouth, and approximately 6 miles northeast of Vernalis, San Joaquin County.
 RECORDS AVAILABLE.---Chemical analyses: October 1953 to September 1961.
 REMARKS.---Records of discharge given in State of California Bulletin No. 23-61 as Stanislaus River near Mouth.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate			
Oct. 6, 1960.....	104			--	--	20		172			8.8			0.1				117	0	0.8	316	8.2
Nov. 10.....	171			--	--	14		131			6.5							97	0	.6	251	8.1
Dec. 15.....	193			--	--	12		124			5.2			.0				94	0	.5	228	8.0
Jan. 12, 1961.....	214			--	--	7.1		82			2.8			.0				65	0	.4	155	7.8
Feb. 17.....	147			--	--	14		129			7.2			.0				99	0	.6	255	8.0
Mar. 9.....	48			--	--	18		164			7.4			.0				117	0	.7	308	7.7
Apr. 13.....	11.1			--	--	17		204			11			.0				148	0	.6	335	7.7
May 4.....	12.34		0.01	30	12	2.1		172		10	9.0	0.1	0.6	.1	207	0.28		126	0	.7	315	7.7
June 8.....	4.7			--	--	20		147			24			.1				134	0	.8	321	8.0
July 13.....	.5			--	--	12		152			9.3			.0				112	0	.5	279	7.8

SAN JOAQUIN RIVER BASIN--Continued
11-3035. SAN JOAQUIN RIVER NEAR VERNALIS, CALIF.

LOCATION.--At gaging station 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 1951 to September 1961.

Water temperatures: March 1951 to September 1961.

Sediment records: November 1956 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 1,220 ppm Aug. 10, 11; minimum, 370 ppm Dec. 21-31.

Hardness: Maximum, 410 ppm Apr. 9-21; minimum, 146 ppm Dec. 21-31.

Specific conductance: Maximum daily, 2,350 micromhos Aug. 11; minimum daily, 629 micromhos Dec. 16.

Water temperatures: Maximum, 78°F June 23, 27; minimum, 41°F Dec. 10, 11, Jan. 7, 26.

Sediment concentrations: Maximum daily, 113 ppm July 2; minimum daily, 15 ppm Jan. 4.

Sediment loads: Maximum daily, 404 tons Feb. 1; minimum daily, 2 tons Aug. 10.

EXTREMES, 1951-61.--Dissolved solids: Maximum, 1,220 ppm Aug. 10, 11, 1961; minimum, 54 ppm June 1-10, 1952.

Hardness: Maximum, 410 ppm Apr. 9-21, 1951; minimum, 146 ppm Dec. 21-31, 1952.

Specific conductance: Maximum daily, 2,350 micromhos Aug. 11, 1961; minimum daily, 60 micromhos June 21, 1953.

Water temperatures: Maximum, 79°F June 1, 1960; minimum, 39°F Jan. 10, 1952.

Sediment concentrations (1956-61): Maximum daily, 680 ppm Feb. 20, 1958; minimum daily, 9 ppm Jan. 4, 1960.

Sediment loads (1956-61): Maximum daily, 28,500 tons Apr. 5, 1958; minimum daily, 2 tons Aug. 10, 1961.

REMARKS.--Records of specific conductance of daily samples available in district office at Sacramento, Calif.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)		Hardness as CaCO ₃		Sodium carbonate ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Calcium Magnesium	Non-carbonate		
Oct. 1-12, 1960....	542	37	0.00	62	27	141	5.2	201	0	90	225	0.1	3.7	0.4	690	0.94	266	101	3.8	1,200
Oct. 13-20, 1960....	810	32	.00	44	20	96	4.3	147	0	67	150	.0	3.2	.2	489	.67	193	72	3.0	858
Oct. 21-31, 1960....	829	28	.00	42	20	96	3.7	140	0	73	150	.0	2.8	.2	485	.66	189	74	3.0	855
Nov. 1-10, 1960....	996	26	.00	39	18	85	3.2	121	3	63	136	.1	2.7	.2	436	.59	170	66	2.8	762
Nov. 11-20, 1960....	1,078	26	.01	38	16	82	2.8	128	3	57	130	.1	3.1	.3	423	.58	170	60	2.7	741
Nov. 21-30, 1960....	963	30	.00	44	19	93	2.8	137	3	67	154	.1	3.3	.3	484	.66	187	70	3.0	837
Dec. 1-10, 1960....	1,300	27	.00	36	17	69	3.4	124	0	59	110	.2	3.2	.3	386	.52	158	56	2.4	711
Dec. 11-20, 1960....	1,299	25	.00	34	15	69	2.7	113	0	58	110	.2	3.2	.2	373	.51	148	55	2.5	669
Dec. 21-31, 1960....	1,825	25	.00	33	15	69	2.7	111	0	56	110	.2	3.4	.3	370	.50	146	55	2.6	667
Jan. 1-10, 1961....	1,223	24	.00	36	14	73	2.7	111	0	68	112	.1	2.1	.2	387	.53	148	57	2.6	712
Jan. 11-20, 1961....	1,342	24	.00	38	18	101	2.8	142	0	90	135	.2	3.2	.4	484	.66	170	54	3.4	831
Jan. 21-31, 1961....	1,440	21	.00	38	17	102	3.4	128	0	94	142	.3	3.6	.4	485	.66	166	61	3.4	838

Feb. 1-6, 1961.....	1,462	18	.01	38	19	88	5.0	133	0	85	128	.2	4.9	.4	452	.61	1,810	172	63	2.9	811	7.7
Feb. 7-17.....	1,079	26	.01	48	25	123	5.0	164	0	111	180	.2	6.5	.5	606	.82	1,770	221	87	3.6	1,070	7.5
Feb. 18-28.....	980	26	.00	44	32	132	3.8	162	0	120	198	.3	5.2	.6	642	.87	1,680	240	107	3.7	1,140	8.1
Mar. 1-9.....	612	26	.00	58	28	139	4.0	166	0	109	224	.2	5.2	.5	676	.92	1,120	261	125	3.8	1,220	7.9
Mar. 10-19.....	340	33	.01	68	30	143	6.2	163	12	74	260	.2	5.1	.4	732	1.00	672	294	141	3.6	1,310	8.3
Mar. 20-31.....	405	27	.00	--	--	143	4.6	210	0	97	252	.2	4.3	.5	a737	.99	795	297	125	3.6	1,290	8.1
Apr. 1-12.....	232	29	.00	79	32	163	2.8	180	0	82	328	.2	3.6	.4	809	1.10	507	330	182	3.9	1,480	7.4
Apr. 13-18.....	142	31	.01	87	34	173	3.2	176	0	81	370	.2	5.4	.5	872	1.19	334	356	214	4.0	1,600	7.4
Apr. 19-21.....	78.3	25	.07	94	43	200	2.6	178	0	100	415	.2	5.5	.6	974	1.32	206	410	264	4.3	1,780	7.3
Apr. 22-30.....	235	26	.01	71	39	144	3.1	176	0	78	282	.2	6.1	.4	739	1.01	489	337	193	3.4	1,340	7.3
May 1-7.....	253	27	.00	72	32	165	5.5	193	0	84	288	.1	.5	.4	770	1.05	526	311	153	4.1	1,390	7.6
May 8-16.....	435	24	.00	62	29	138	5.2	190	0	92	222	.2	.3	.4	667	.91	783	272	116	3.7	1,210	7.6
May 17-31.....	406	30	.00	64	31	151	5.0	193	0	92	250	.2	1.9	.5	721	.98	790	286	128	3.9	1,250	8.2
June 1-9.....	271	32	.00	70	32	149	5.8	195	0	85	272	.1	3.6	.4	746	1.01	546	306	146	3.7	1,360	7.6
June 10-30.....	193	33	.00	76	35	170	5.6	195	0	86	328	.1	3.5	.6	834	1.13	435	332	172	4.1	1,500	7.6
June 21-30.....	168	35	.02	78	38	172	6.0	194	0	86	345	.1	3.7	.4	880	1.17	383	344	185	4.0	1,550	7.6
July 1-10.....	168	36	.02	77	35	160	5.6	202	0	57	316	.2	2.2	.5	792	1.08	385	336	170	3.6	1,500	7.7
July 11-19.....	77.2	32	.00	91	42	192	5.6	188	0	60	410	.1	3.1	.6	929	1.26	194	400	246	4.2	1,790	7.6
July 20, 21.....	47.5	29	.00	102	46	230	5.6	188	0	68	495	.1	2.3	.5	1,070	1.46	137	445	291	4.7	2,060	7.8
July 22-31.....	76.8	31	.00	87	43	196	6.0	190	0	96	405	.1	3.1	.6	962	1.31	199	395	239	4.3	1,770	7.6
Aug. 1-9.....	74.0	34	.00	91	42	204	5.6	197	0	90	407	.1	3.7	.5	975	1.33	195	400	236	4.4	1,800	7.5
Aug. 10, 11.....	40.0	30	.00	111	55	256	6.0	190	0	124	543	--	2.7	.6	1,220	1.66	132	503	347	5.0	2,270	7.6
Aug. 12-20.....	148	35	.01	81	35	177	6.0	204	0	69	342	.2	3.0	.5	849	1.15	339	348	179	4.1	1,560	7.8
Aug. 21-31.....	235	31	.01	76	38	175	6.0	217	0	107	312	.2	2.5	.7	852	1.16	541	334	156	4.2	1,520	7.7
Sept. 1-8.....	365	31	.13	66	35	174	5.6	228	0	109	295	.2	2.6	.6	831	1.13	819	308	121	4.3	1,440	7.9
Sept. 9-17.....	297	33	.04	60	43	161	5.2	222	0	88	276	.2	4.7	.5	783	1.06	628	326	144	3.9	1,370	6.2
Sept. 18-30.....	327	31	.00	67	37	165	5.0	208	8	112	285	.1	2.9	.5	816	1.11	720	320	136	4.0	1,430	6.4
Weighted average	604	27	0.04	b46	b23	109	6.0	151	--	81	176	b0.2	3.6	0.4	b545	0.74	889	210	88	3.2	966	--

a. Estimated.

b. Includes estimates for missing data.

SAN JOAQUIN RIVER BASIN--Continued
 11-3035. SAN JOAQUIN RIVER NEAR VERNALIS, CALIF.--Continued
 Temperature (°F) of water, water year October 1960 to September 1961

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

SAN JOAQUIN RIVER BASIN--Continued

11-3035. SAN JOAQUIN RIVER NEAR VERNALIS, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961
(Where no concentrations are reported loads are estimated)

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..	478	--	50	830	20	45	1080	34	99
2..	546	38	56	810	--	46	1130	--	100
3..	542	--	56	905	23	56	1200	33	107
4..	486	38	50	950	--	56	1360	--	120
5..	494	--	52	1010	21	57	1360	30	110
6..	506	39	53	1080	--	64	1310	--	81
7..	546	--	56	1080	26	76	1260	19	65
8..	584	33	52	1080	--	73	1420	--	84
9..	584	--	44	1120	25	76	1450	26	102
10..	592	25	40	1100	--	74	1430	--	110
11..	562	--	35	1100	26	77	1410	30	114
12..	579	24	38	1110	--	81	1370	--	110
13..	682	--	52	1130	28	85	1310	31	110
14..	750	32	65	1130	--	79	1220	--	99
15..	840	--	64	1050	25	71	1310	28	99
16..	895	24	58	1060	--	72	1350	26	95
17..	890	--	58	1040	26	73	1330	26	93
18..	795	24	52	1040	--	73	1290	28	98
19..	765	--	50	1070	24	69	1190	27	87
20..	860	26	60	1050	--	62	1210	32	105
21..	865	--	56	975	21	55	1260	31	105
22..	880	21	50	925	--	50	1270	30	103
23..	895	--	51	955	22	57	1280	23	79
24..	805	22	48	1040	--	70	1270	21	72
25..	660	--	39	1050	25	71	1250	22	74
26..	710	21	40	985	--	53	1250	21	71
27..	790	--	45	885	20	48	1240	21	70
28..	835	21	47	900	--	49	1220	17	56
29..	880	--	45	925	21	52	1260	17	58
30..	905	18	44	990	--	67	1300	17	60
31..	890	--	43	--	--	--	1310	20	71
Total	22091	--	1549	30375	--	1937	39900	--	2807
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..	1300	19	67	1590	94	404	860	29	67
2..	1260	23	78	1570	83	352	795	23	49
3..	1150	19	59	1470	75	298	660	25	45
4..	1080	15	44	1440	74	288	534	27	39
5..	1230	20	66	1490	74	298	522	23	32
6..	1270	17	58	1330	70	251	579	22	34
7..	1280	17	59	1230	63	209	562	19	29
8..	1260	16	54	1200	62	201	546	27	40
9..	1250	20	68	1200	62	201	446	22	26
10..	1150	27	84	1150	56	174	350	18	17
11..	1230	36	120	1120	56	169	350	20	19
12..	1290	40	139	1070	50	144	340	19	17
13..	1340	38	137	1010	42	115	375	24	24
14..	1450	33	129	960	40	104	316	22	19
15..	1460	29	114	945	42	107	281	18	14
16..	1340	25	90	980	41	108	299	17	14
17..	1280	24	83	1000	35	94	319	16	14
18..	1300	22	77	1000	30	81	358	16	15
19..	1360	20	73	1000	27	73	410	21	23
20..	1370	24	89	985	29	77	446	24	29
21..	1370	24	89	955	31	80	406	20	22
22..	1460	30	118	955	32	83	375	23	23
23..	1450	38	149	970	27	71	354	26	25
24..	1310	42	149	950	24	62	358	25	24
25..	1230	46	153	970	29	76	392	22	23
26..	1370	49	181	990	30	80	400	30	32
27..	1420	63	242	935	26	66	478	31	40
28..	1550	67	277	845	25	57	486	31	41
29..	1580	68	290	--	--	--	462	29	36
30..	1560	73	307	--	--	--	372	31	31
31..	1560	87	366	--	--	--	330	33	29
Total	41490	--	4009	31310	--	4323	13761	--	892

QUALITY OF SURFACE WATERS, 1961

SAN JOAQUIN RIVER BASIN--Continued

11-3035. SAN JOAQUIN RIVER NEAR VERNALIS, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
(Where no concentrations are reported loads are estimated)

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..	299	33	27	254	87	60	335	63	57
2..	333	37	33	263	83	59	294	57	45
3..	336	46	42	225	82	50	239	56	36
4..	257	48	33	209	75	42	239	62	40
5..	195	40	21	225	71	43	291	73	57
6..	176	36	17	251	87	59	300	66	53
7..	197	44	23	347	102	96	256	57	39
8..	203	49	27	466	105	132	248	57	38
9..	186	54	27	490	99	131	237	58	37
10..	206	53	29	458	96	119	211	58	33
11..	225	59	36	406	86	94	214	69	40
12..	173	51	24	434	83	97	248	73	49
13..	147	49	19	403	70	76	239	65	42
14..	163	50	22	426	80	92	190	49	25
15..	147	45	18	438	98	116	178	56	27
16..	142	43	16	392	92	97	154	76	32
17..	145	50	20	375	86	87	163	67	29
18..	106	55	16	372	84	84	175	60	28
19..	80	53	11	375	82	83	175	55	26
20..	68	48	9	386	79	82	180	71	35
21..	87	46	11	414	85	95	173	83	39
22..	132	40	14	462	92	115	146	78	31
23..	179	43	21	450	80	97	137	67	25
24..	266	59	42	438	87	103	163	57	25
25..	296	76	61	450	87	106	173	65	30
26..	260	75	53	450	81	98	214	81	47
27..	242	67	44	406	75	82	180	74	36
28..	245	70	46	375	68	69	146	73	29
29..	254	70	48	392	62	66	146	76	26
30..	245	84	56	378	63	64	170	78	36
31..	--	--	--	361	63	61	--	--	--
Total	5990	--	866	11771	--	2655	6212	--	1092
	JULY			AUGUST			SEPTEMBER		
1..	185	94	47	115	64	20	335	85	77
2..	199	113	61	89	59	14	360	72	70
3..	194	111	58	63	58	10	363	63	62
4..	209	103	58	54	62	9	394	76	81
5..	197	83	44	54	63	9	374	76	77
6..	151	77	31	65	62	11	360	73	71
7..	125	70	24	101	60	16	310	80	67
8..	110	64	19	89	60	14	304	72	59
9..	137	68	25	36	34	3	314	81	69
10..	151	96	39	30	29	2	324	81	71
11..	115	102	32	50	34	5	346	85	79
12..	72	77	15	63	40	7	328	77	68
13..	59	65	10	132	59	21	276	71	53
14..	57	62	10	173	71	33	237	63	40
15..	70	70	13	190	85	44	239	59	38
16..	101	58	16	178	84	40	262	57	40
17..	101	63	17	149	78	31	262	48	34
18..	84	58	13	149	79	32	291	58	46
19..	36	50	5	137	75	28	324	64	56
20..	36	43	4	163	90	40	335	59	53
21..	59	57	9	224	103	62	335	58	52
22..	63	52	9	224	110	67	328	75	66
23..	57	57	9	214	95	55	321	78	68
24..	96	51	13	204	93	51	346	66	62
25..	65	50	9	209	86	49	363	55	54
26..	68	54	10	194	80	42	332	47	42
27..	63	48	8	194	88	46	310	52	44
28..	72	53	10	248	85	57	321	51	44
29..	61	58	10	279	82	62	318	47	40
30..	91	58	14	296	83	66	321	49	42
31..	132	69	25	304	78	64	--	--	--
Total	3216	--	667	4670	--	1010	9633	--	1725
Total discharge for year (cfs-days).....									220,419
Total load for year (tons).....									23,532

SAN JOAQUIN RIVER BASIN--Continued

11-3035. SAN JOAQUIN RIVER NEAR VERNALIS, CALIF.--Continued

Particle size analyses of suspended sediment, water year October 1960 to September 1961
 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
 P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Samp- ling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment con- cen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis	
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000		2.000
Apr. 27, 1961.....	1300		68	242	66								99	100				V
May 23.....	0800		63	450	93								99	100				V
June 9.....	1010		70	248	59								100	---				V

SAN JOAQUIN RIVER BASIN--Continued

11-3042. SAN JOAQUIN RIVER AT MOSSDALE, CALIF.

LOCATION.--Boat landing at Mossdale Bridge at Mossdale, San Joaquin County, opposite tidal gaging station, and 7.6 miles northeast of Tracy.
 RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bi- car- bon- ate (HCO ₃)	Car- bon- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		So- dium ad- sorp- tion ratio (micro- mhos at 25°C)	Specific con- duct- ance pH	
															Parts per million	Tons per acre- foot	Tons per day	Cal- cium, Mag- ne- sium	Non- car- bon- ate			
Oct. 7, 1960.....		--	--	--	--	127	--	196	--	--	221	--	--	--	0.0	--	--	261	100	3.4	1,190	8.1
Nov. 10.....		--	--	--	--	86	--	127	--	--	137	--	--	--	.2	--	--	173	69	2.8	739	8.1
Dec. 15.....		--	--	--	--	86	--	124	--	--	132	--	--	--	.3	--	--	164	62	2.9	736	7.7
Jan. 12, 1961.....		--	--	--	--	74	--	124	--	--	134	--	--	--	.5	--	--	168	66	2.5	788	7.7
Feb. 17.....		--	--	--	--	129	--	168	--	--	208	--	--	--	.5	--	--	240	102	3.6	1,130	7.7
Mar. 9.....		--	--	--	--	151	--	188	--	--	244	--	--	--	.5	--	--	290	136	3.9	1,320	8.0
Apr. 14.....		--	--	--	--	162	--	170	--	--	262	--	--	--	.4	--	--	309	170	4.0	1,430	7.6
May 4.....	14	0.02	59	29	139	139	6.0	173	--	70	242	0.1	0.5	.3	.3	645	0.88	265	118	3.7	1,200	7.9
June 8.....		--	--	--	--	148	--	191	--	--	248	--	--	--	.4	--	--	294	137	3.7	1,260	7.9
July 14.....		--	--	--	--	85	--	150	--	--	153	--	--	--	.3	--	--	183	60	2.7	815	7.7
Aug. 9.....		--	--	--	--	61	--	140	--	--	97	--	--	--	.2	--	--	141	26	2.2	580	7.8
Aug. 17.....	7.5		42	21	83	139	5.2	155	--	35	142	.1	3.0	.3	.3	415	.56	190	63	2.6	801	8.0
Sept. 7.....	23		67	33	161	161	5.6	216	--	91	280	.2	.8	.3	.3	768	1.04	304	127	4.0	1,410	8.2

SAN JOAQUIN RIVER BASIN--Continued

11-3048. SAN JOAQUIN RIVER AT GARWOOD BRIDGE, NEAR STOCKTON, CALIF.

LOCATION.--Boat landing at Garwood Bridge on State Highway 4, opposite tidal gaging station, and 1.8 miles west of Stockton, San Joaquin County. RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonylate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 3, 1960.....		--		--	--	78	--	186	--	--	105	--	--	0.3	--	--	--	153	0	2.7	703
Nov. 1.....		--		--	--	118	--	189	--	--	180	--	--	.3	--	--	--	220	81	3.5	961
Dec. 16.....		--		--	--	77	--	118	--	--	112	--	--	.0	--	--	--	150	53	2.7	670
Jan. 13, 1961.....		--		--	--	86	--	115	--	--	123	--	--	.3	--	--	--	157	63	3.0	719
Feb. 17.....		--		--	--	114	--	187	--	--	188	--	--	.4	--	--	--	219	82	3.3	1,030
Mar. 10.....		--		--	--	133	--	188	--	--	202	--	--	.5	--	--	--	238	84	3.7	1,130
Apr. 14.....		--		--	--	132	--	182	--	--	186	--	--	.4	--	--	--	223	90	3.8	1,060
May 5.....	1.4	0.01	41	23	102	6.2	133	61	61	61	169	0.2	1.4	.3	472	0.64	199	90	3.1	873	
June 9.....	--		--	--	--	90	--	132	--	--	144	--	--	.3	--	--	--	173	65	3.0	804
July 14.....	--		--	--	--	56	--	107	--	--	102	--	--	.2	--	--	--	126	38	2.0	573
Aug. 9.....	--		--	--	--	84	--	99	--	--	102	--	--	.1	--	--	--	125	52	2.5	582
Sept. 6.....	.5		32	18	90	6.0	159	29	29	29	134	.2	1.2	.0	389	.53	154	24	3.2	734	

SAN JOAQUIN RIVER BASIN--Continued

11-3112. STOCKTON SHIP CHANNEL NEAR RINDGE PUMP, ON RINDGE TRACT, CALIF.

LOCATION. --Boat landing at ship channel, downstream from confluence with Fourteen Mile Slough, downstream from tidal gaging station, and approximately 9.6 miles northwest of Stockton, San Joaquin County.

RECORDS AVAILABLE. --Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium-Magnesium	Non-carbonate		
Oct. 3, 1960.....						46		109			78			0.1				111	22	1.9	477
Nov. 1,.....						76		144			59			.2				144	26	2.8	644
Dec. 16,.....						89		132			134			.0				168	60	3.0	749
Jan. 6, 1961.....						78		119			130			.3				182	87	2.8	788
Feb. 9,.....						79		117			133			.3				184	102	2.4	836
Mar. 10,.....						69		117			112			.3				164	68	2.3	681
Apr. 5,.....						52		107			80			.2				138	50	1.9	529
May 11,.....		15	0.01			28	1.8	83		21	42	0.2		.9				92	24	1.3	317
June 1,.....						24		85			33			.0				85	15	1.1	279
July 12,.....						25		90			33			.1				86	12	1.2	297
Aug. 9,.....						52		90			82			.1				92	18	2.4	450
Sept. 7,.....	19			17	13	46	2.4	89		19	69	.1	2.7	.0	232	.32		96	23	2.0	415

SAN JOAQUIN RIVER BASIN--Continued

11-3127. OLD RIVER AT SOUTH TIP OF FABIAN TRACT, NEAR TRACY, CALIF.

LOCATION.--At southern tip of Fabian Tract, at trash rack of pump intake at end of Lammers Road, approximately 3 miles east of Bethany, and 6.1 miles north of Tracy, San Joaquin County, Calif.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

REMARKS.--No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance micro-mhos at 25°C
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 6, 1960.....						141		192		252							274	117	3.7	1,290
Nov. 11.....						102		147		152			0.4				207	86	3.1	870
Dec. 16.....						102		153		135			0.3				210	85	3.1	893
Jan. 13, 1961.....						69		129		137			0.3				188	82	2.2	833
Feb. 17.....						129		187		212			0.7				258	105	3.5	1,180
Mar. 7.....						146		182		218			0.6				274	125	3.8	1,230
Apr. 11.....						170		195		278			0.6				339	179	4.0	1,470
May 1.....	2.4		0.01		31	145	6.2	187	107	230	0.2	0.6	0.4	676	0.92		280	127	3.8	1,230
June 6.....						152		194		249			0.5				313	154	3.7	1,330
July 11.....						94		146		161			0.4				219	99	2.8	925
Aug. 9.....						74		137		124			0.3				160	48	2.5	714
Sept. 7.....	2.1			53	28	121	5.0	160	66	215	0.1	0.2	0.2	570	0.78		248	117	3.3	1,070

SAN JOAQUIN RIVER BASIN--Continued

11-3129.9. DELTA-MENDOTA CANAL ABOVE TRACY PUMPING PLANT, NEAR TRACY, CALIF.

LOCATION.--At Byron Road bridge, 1.1 miles upstream from Tracy Pumping plant, Alameda-Contra Costa County line, and 9.2 miles northwest of Tracy, San Joaquin County.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

REMARKS.--Records of discharge given for Delta-Mendota Canal at Tracy pumping plant, near Tracy. No appreciable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day				
Oct. 4, 1960.....	2,319	---	---	---	---	51	---	102	---	---	90	---	---	0.1	---	---	---	114	30	2.1	509
Nov. 7,.....	2,284	---	---	---	---	109	---	147	---	---	155	---	---	.6	---	---	---	195	74	3.4	905
Feb. 14, 1961.....	454	---	---	---	---	124	---	162	---	---	177	---	---	.5	---	---	---	194	61	3.9	1,050
Mar. 6,.....	2,277	---	---	---	---	91	---	108	---	---	156	---	---	.1	---	---	---	234	145	2.6	955
Apr. 10,.....	2,807	---	---	---	---	28	---	81	---	---	36	---	---	---	---	---	---	95	29	1.3	316
May 1,.....	3,071	18	0.00	18	8.3	21	1.4	75	24	24	31	0.1	0.8	.1	160	0.22	79	17	1.0	263	
June 5,.....	3,367	---	---	---	---	19	---	60	---	---	23	---	---	.1	---	---	76	10	1.0	242	
July 10,.....	4,143	---	---	---	---	29	---	69	---	---	44	---	---	.1	---	---	91	16	1.3	334	
Aug. 3,.....	4,337	---	---	---	---	96	---	83	---	---	168	---	---	.1	---	---	129	61	3.7	745	
Sept. 11,.....	1,769	16	---	16	16	74	3.4	89	23	23	124	.1	3.0	.3	322	.44	111	36	3.1	610	

SAN JOAQUIN RIVER BASIN--Continued

11-3130.1. DELTA-MENDOTA CANAL BELOW TRACY PUMPING PLANT, NEAR TRACY, CALIF.

LOCATION --At canal bridge 4.98, 0.5 mile downstream from Mountain House Road siphon, 2.9 miles downstream from Tracy Pumping Plant, and 8.5 miles northwest of Tracy, California.

RECORDS AVAILABLE Chemical analyses: July 1959 to September 1961.

Water temperatures: July 1959 to September 1961.

Sediment records: July 1959 to June 1960.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 717 ppm Feb. 11-20; minimum, 146 ppm May 11-20.

Hardness: Maximum, 255 ppm Feb. 21-28; minimum, 74 ppm May 1-10.

Specific conductance: Maximum, 797 μ mhos/cm, 1,270 microhmhos/cm, 20; minimum, 146 ppm May 11-20.

Water temperatures: Maximum, 79°F July 11, 22, Aug. 7; minimum, 41°F Jan. 21.

EXTREMES, 1958-61.--Dissolved solids (1960-61): Maximum, 717 ppm Feb. 11-20, 1961; minimum, 146 ppm May 11-20, 1961.

Hardness (1960-61): Maximum, 255 ppm Feb. 21-28, 1961; minimum, 74 ppm May 1-10, 1961.

Specific conductance (1960-61): Maximum, 797 μ mhos/cm, 1,270 microhmhos/cm, 20; minimum, 146 ppm May 11-20, 1961.

Water temperatures: Maximum, 81°F July 25, 1960; minimum (1960-61), 41°F Jan. 21, 1961.

REMARKS.--Records of specific conductance of daily samples available in district office at Sacramento, Calif. Records of discharge given for Delta-Mendota Canal at Tracy pumping plant near Tracy. No flow in canal during December and part of January.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate		
Oct. 1-12, 1960...	2,069	21	0.02	28	18	74	2.8	117	3	37	119	0.1	1.2	381	0.52	2,130	142	41	2.7	668	8.4
Oct. 13-21, 1960...	1,252	24	.02	47	24	115	4.2	165	0	72	183	.1	1.5	563	.79	1,940	216	81	3.4	994	7.5
Oct. 22-31, 1960...	902	21	.02	36	19	86	2.8	135	2	98	130	.1	1.6	440	.60	1,070	170	56	2.9	761	8.3
Nov. 1-10, 1960...	482	---	---	45	22	94	---	146	4	---	---	---	---	539	.73	701	203	77	2.8	859	7.6
Nov. 11-20, 1960...	428	---	---	42	21	94	---	144	0	---	---	---	---	491	.67	567	192	74	3.0	872	8.1
Nov. 21-30, 1960...	598	---	---	43	21	94	---	150	0	---	---	---	---	503	.68	812	195	72	2.9	872	8.1
Jan. 21-31, 1961...	691	22	.00	42	21	99	2.6	144	0	96	144	.3	3.4	543	.74	1,010	192	74	3.1	905	7.7
Feb. 1-10, 1961...	172	20	.01	46	24	120	4.2	149	0	116	168	.2	6.2	601	.82	2,719	214	92	3.6	1,010	7.6
Feb. 11-20, 1961...	854	25	.01	55	28	136	4.6	172	0	136	200	.2	6.0	8	.97	1,650	253	112	3.7	1,170	7.5
Feb. 21-28, 1961...	1,376	27	.01	56	28	132	4.0	158	0	139	199	.3	5.8	6	.97	2,660	255	125	3.6	1,160	7.5
Mar. 1-9, 1961...	2,163	24	.00	55	28	107	4.6	114	0	410	162	.3	9.4	4	.86	3,730	254	161	2.9	982	8.0
Mar. 10-19, 1961...	2,352	24	.00	40	19	64	3.1	96	0	85	104	.3	6.8	3	.57	2,680	180	101	2.1	657	8.0
Mar. 20-31, 1961...	1,581	22	.00	35	18	60	2.9	96	0	65	106	.3	4.5	3	.49	1,550	162	83	2.1	596	7.9
Apr. 1-10, 1961...	2,177	26	.03	28	13	38	2.6	94	0	42	64	.3	2.8	2	.38	1,630	124	47	1.5	456	7.7
Apr. 11-20, 1961...	3,078	20	.02	19	8.4	22	1.6	77	0	25	31	.2	1.3	1	.24	1,470	82	19	1.1	279	8.1
Apr. 21-30, 1961...	3,200	21	.03	16	8.8	19	1.2	75	0	20	26	.2	1.0	1	.21	1,320	76	14	1.0	249	7.7
May 1-10, 1961...	2,680	18	.00	17	7.7	19	1.3	76	0	17	24	.2	.8	1	.20	1,060	74	12	1.0	245	7.5

May 11-20, 1961...	2,587	19	.00	16	8.5	16	1.4	76	0	18	22	.2	.7	.1	146	.20	1,020	75	13	.8	221	8.0
May 21-31.....	2,855	19	.00	17	9.8	20	1.3	81	0	22	26	.2	.7	.1	157	.21	1,210	83	17	1.0	254	8.0
June 1-10.....	3,415	18	.01	17	8.4	19	1.5	84	0	21	22	.1	.0	.1	152	.21	1,400	77	8	.9	248	7.4
June 11-20.....	3,830	19	.03	16	8.8	20	1.4	88	0	16	22	.1	.0	.1	149	.20	1,540	76	4	1.0	249	7.9
June 21-30.....	4,256	18	.04	16	9.6	21	1.4	89	0	19	25	.1	.0	.1	161	.22	1,850	80	7	1.0	263	8.1
July 1-10.....	3,983	25	.04	17	11	30	1.7	92	0	28	38	.1	.9	.1	199	.27	2,140	86	11	1.4	317	7.9
July 11-20.....	4,716	23	.04	18	12	46	2.4	90	0	23	70	.1	1.1	.1	248	.34	3,160	95	21	2.1	424	8.0
July 21-31.....	4,678	21	.05	18	16	72	3.2	86	0	29	126	.1	1.2	.1	355	.48	4,450	112	41	3.0	618	7.7
Aug. 1-10.....	3,274	19	.03	11	18	103	4.0	84	0	30	175	.0	1.4	.1	446	.61	5,070	126	57	4.0	986	7.4
Aug. 11-20.....	3,676	17	.03	21	17	99	4.0	82	0	37	169	.0	1.3	.1	429	.55	4,490	123	56	3.9	768	7.5
Aug. 21-31.....	3,246	21	.04	20	17	90	3.4	86	0	35	146	.0	.8	.1	393	.53	3,440	129	49	3.6	700	7.8
Sept. 1-10.....	2,154	23	.07	17	18	82	2.8	90	0	30	131	.2	.9	.2	369	.50	2,180	115	41	3.3	628	7.5
Sept. 11-20.....	1,881	24	.07	20	17	74	3.0	98	0	32	120	.2	.8	.2	388	.47	1,970	120	40	2.9	615	8.0
Sept. 21-30.....	2,039	19	.07	22	16	65	2.9	108	0	35	105	.2	.7	.3	349	.43	1,920	121	32	2.6	571	8.0
Weighted average	2,056	a21	0.03	23	14	57	a2.5	94	--	a39	a89	a0.1	a1.6	a0.2	310	0.42	1,720	115	38	2.2	520	--

a Includes estimates for missing data.

Temperature (°F) of water, water year October 1960 to September 1961

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

SAN JOAQUIN RIVER BASIN--Continued
11-3130.5. DELTA-MENDOTA CANAL NEAR MENDOTA, CALIF.

LOCATION ---Approximately 1 mile upstream from control gates into Mendota Pool, and 2 miles north of Mendota, Fresno County.
RECORDS AVAILABLE---Chemical analyses: October 1953 to September 1961.
REMARKS---No discharge records available.

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 6, 1960.....						55		101	0		94							118	35	2.2	539
Nov. 10.....						99		132	0		135			0.1				174	66	3.3	816
Dec. 14.....						101		137	0		140			.4				189	77	3.2	842
Jan. 12, 1961.....						115		224	0		146			.6				214	30	3.4	954
Feb. 16.....						112		132	4		146			.6				204	89	3.4	982
Mar. 9.....						109		120	0		178			.4				252	154	3.0	1,060
Apr. 13.....						32		84	0		42			.2				102	33	1.4	346
May 4.....		19	0.00		8.4	22	1.1	74	0	27	0.3	0.8		.1		162	0.22	82	21	1.1	268
June 7.....						21		82	0		23			.1				78	11	1.0	255
July 13.....						33		90	0		49			.1				90	16	1.5	364
Aug. 3.....						87		86	0		148			.1				121	50	3.4	702
Aug. 17.....		19			17	100	4.4	82	0	42	172			1.1	418	.57		126	59	3.9	782
Sept. 6.....	14			21	16	87	4.2	93	0	39	137			.8	365	.50		120	44	3.5	695

SAN JOAQUIN RIVER BASIN--Continued
11-3132. GRANT LINE CANAL AT TRACY ROAD BRIDGE, CALIF.

LOCATION --At bridge on Tracy Road, approximately 5 miles north of Tracy, San Joaquin County.
RECORDS AVAILABLE --Chemical analyses: October 1958 to September 1961.
REMARKS --No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium sorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 6, 1960.....						120		150			224			0.3				250	102	3.3	1,160	7.8
Nov. 15.....						78		118			138			.2				178	89	2.8	1,790	8.1
Dec. 15.....						78		118			138			.3				163	86	2.7	675	7.7
Jan. 13, 1961.....						78		130			145			.5				187	80	2.5	836	7.8
Feb. 17.....						129		159			208			.4				236	97	3.7	1,110	7.9
Mar. 7.....						111		138			196							233	103	3.2	1,060	8.1
Apr. 11.....						143		172			252			.4				278	137	3.7	1,250	7.9
May 1.....		1.2	0.04	50	23	119	5.4	163		69	185	0.2	0.7	.3		0.73		220	86	3.5	1,000	8.0
June 6.....						128		208			218			.4				272	101	3.4	1,160	7.8
July 11.....						35		98			52			.1				100	20	1.5	380	7.7
Aug. 9.....						74		101			127			.1				130	47	2.8	645	7.7
Sept. 7.....	1.0			54	28	132	5.0	163		62	232	.1	.1	.2	594	.81		248	114	3.6	1,140	7.8

SAN JOAQUIN RIVER BASIN--Continued

11-3132.5. OLD RIVER AT CLIFTON COURT FERRY, CALIF.

LOCATION.--At Clifton Court Ferry Crossing, 0.3 mile downstream from tidal gaging station, 2.1 miles east of Herdlyn, and 3.6 miles north of Bethany, San Joaquin County.
 RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Chemical analyses, in parts per million, water year 1960 to September 1961																				
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) (lb)	Dissolved solids (calculated)			Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)		
													Parts per million	Tons per acre-foot	Tons per day					
Oct. 3, 1960.....		--		--	--	53	--	98	--	84	--	--	0.1	--	--	100	20	2.3	488	8.0
Nov. 7.....		--		--	--	101	--	138	--	153	--	--	.2	--	--	198	85	3.1	855	7.7
Dec. 12.....		--		--	--	97	--	141	--	140	--	--	.0	--	--	183	67	3.1	811	8.0
Jan. 9, 1961.....		--		--	--	75	--	126	--	142	--	--	.3	--	--	183	80	2.4	821	7.8
Feb. 13.....		--		--	--	106	--	140	--	178	--	--	.5	--	--	230	115	3.0	1,020	7.5
Mar. 7.....		--		--	--	91	--	109	--	136	--	--	.1	--	--	228	139	2.6	886	7.9
Apr. 11.....		--		--	--	27	--	81	--	39	--	--	.1	--	--	96	30	1.2	315	7.8
May 2.....		17	0.04	15	8.4	16	1.6	70	17	21	0.2	0.1	.1	130	0.18	72	15	1.8	214	7.9
June 5.....		--		--	--	19	--	81	--	21	--	--	.1	--	--	76	10	1.0	241	7.8
July 10.....		--		--	--	31	--	87	--	44	--	--	--	--	--	88	17	1.4	327	7.9
Aug. 3.....		--		--	--	97	--	82	--	169	--	--	.0	--	--	122	55	3.8	760	7.8
Sept. 11.....		16		18	16	69	3.3	89	25	120	.2	.9	.1	312	.42	110	37	2.9	585	7.8

SAN JOAQUIN RIVER BASIN--Continued
11-3133. ITALIAN SLOUGH AT MOUTH, NEAR BYRON, CALIF.

LOCATION.--At confluence of Italian Slough and Old River, 3.6 miles east of Byron, Contra Costa County, and 12 miles northwest of Tracy.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.
REMARKS.--No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 3, 1960.....		--		--	--	60	--	96	--	--	98	--	--	0.1	--	--	--	105	26	2.5	535	7.9
Nov. 7.....		--		--	--	58	--	101	--	--	82	--	--	.2	--	--	--	120	37	2.3	529	7.9
Dec. 12.....		--		--	--	101	--	147	--	--	155	--	--	.3	--	--	--	188	67	3.2	818	7.9
Jan. 9, 1961.....		--		--	--	77	--	116	--	--	156	--	--	.5	--	--	--	200	105	2.4	863	7.5
Feb. 13.....		--		--	--	118	--	130	--	--	198	--	--	1.0	--	--	--	206	99	3.6	1,040	7.4
Mar. 7.....		--		--	--	141	--	147	--	--	204	--	--	1.1	--	--	--	233	112	4.0	1,130	8.0
Apr. 11.....		--		--	--	42	--	87	--	--	65	--	--	.3	--	--	--	124	53	1.6	463	8.0
May 2.....		16	0.05	17	7.4	20	1.5	77	19	19	22	0.1	0.0	.0	141	0.19	--	73	10	1.0	226	7.8
June 5.....		--		--	--	19	--	80	--	--	20	--	--	.1	--	--	--	76	19	1.0	230	7.8
July 10.....		--		--	--	132	--	95	--	--	186	--	--	.1	--	--	--	85	12	1.5	330	7.7
Aug. 3.....		--		--	--	178	--	87	--	--	132	--	--	.0	--	--	--	130	52	4.0	805	7.7
Sept. 11.....		16		18	17	78	3.4	87	24	24	132	.2	.6	.1	332	.45	--	113	42	3.2	638	7.8

SAN JOAQUIN RIVER BASIN--Continued
11-3133.5. INDIAN SLOUGH NEAR BRENTWOOD, CALIF.

LOCATION.--At East Contra Costa Irrigation District Pumping station on Bixler Road, 3.6 miles north of Byron, and 4.1 miles southeast of Brentwood, Contra Costa County.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.
REMARKS.--No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate		
Oct. 4, 1960.....		--			--	81	--	126	0	--	134	--	--	0.5	--	--	--	143	40	2.9	726
Nov. 8.....		--			--	150	--	304	8	--	156	--	--	2.2	--	--	--	331	64	3.6	1,310
Dec. 12.....		--			--	153	--	341	8	--	200	--	--	2.6	--	--	--	358	63	3.5	1,300
Jan. 10, 1961.....		--			--	174	--	358	0	--	195	--	--	2.5	--	--	--	350	57	4.0	1,360
Feb. 14.....		--			--	155	--	321	0	--	225	--	--	2.2	--	--	--	367	104	3.5	1,420
Mar. 6.....		--			--	185	--	295	5	--	230	--	--	2.5	--	--	--	359	109	4.2	1,570
Apr. 10.....		--			--	34	--	92	0	--	40	--	--	.3	--	--	--	103	28	1.5	346
May 1.....		18	0.12	17	9.8	28	1.4	95	0	22	38	0.3	0.6	.2	161	0.22	--	83	11	1.1	269
June 5.....		--			--	28	--	92	0	--	26	--	--	.4	--	--	--	83	12	1.2	215
July 10.....		--			--	53	--	121	0	--	76	--	--	.5	--	--	--	126	27	2.1	513
Aug. 3.....		--			--	127	--	105	0	--	218	--	--	.5	--	--	--	164	78	4.3	968
Sept. 11.....		17		22	24	104	4.2	115	0	48	173	.2	1.9	.4	452	.61	--	152	58	3.7	852

SAN JOAQUIN RIVER BASIN--Continued

11-3134. OLD RIVER AT ORWOOD BRIDGE, NEAR MIDDLE RIVER, CALIF.

LOCATION.--At Atchison, Topeka and Santa Fe Railroad bridge, 1.6 miles west of Middle River, San Joaquin County, and 7.9 miles east of Brentwood.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

REMARKS.--No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
													Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium, sum	Non-carbonate			
Oct. 4, 1960.....		--		--	--	51	--	102	--	80	--	--	--	--	--	100	16	2.2	476	7.9
Nov. 8.....		--		--	--	48	--	103	--	63	--	0.2	--	--	--	109	25	2.0	433	8.0
Dec. 12.....		--		--	--	101	--	149	--	155	--	0.3	--	--	--	196	74	3.1	840	7.9
Jan. 10, 1961.....		--		--	--	74	--	108	--	148	--	0.4	--	--	--	200	111	2.3	876	7.3
Feb. 14.....		--		--	--	106	--	118	--	180	--	0.5	--	--	--	260	163	2.9	1,070	7.3
Mar. 6.....		--		--	--	82	--	107	--	122	--	0.6	--	--	--	208	120	2.5	828	7.8
Apr. 10.....		--		--	--	17	--	75	--	20	--	--	--	--	--	77	15	0.8	228	8.0
May 1.....		16	0.07	14	6.4	19	1.2	71	15	17	0.1	0.0	1	123	0.17	61	3	1.0	196	7.8
June 1.....		--		--	--	17	--	80	--	18	--	--	--	--	--	120	16	1.8	217	7.8
July 10.....		--		--	--	38	--	87	--	58	--	--	--	--	--	132	16	1.8	217	7.8
Aug. 3.....		--		--	--	126	--	81	--	220	--	--	--	--	--	140	74	4.6	938	7.5
Sept. 11.....		18		18	18	74	4.0	89	31	132	0.2	1.3	0	340	0.46	117	44	3.0	630	8.0

SAN JOAQUIN RIVER BASIN--Continued

11-3134.2. ROCK SLOUGH NEAR KNIGHTSEN, CALIF.

LOCATION.--At Contra Costa Canal intake at the end of Tule Lane, 2 miles northeast of Knightsen, Contra Costa County, and 4.2 miles southeast of Oakley.
 RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.
 REMARKS.--No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)		
															Parts per million	Tons per acre-foot	Tons per day					
Oct. 3, 1960.....		--		--	--	57	--	99	--	--	89	--	--	0.1	--	--	--	112	31	2.3	506	7.9
Nov. 7.....		--		--	--	43	--	101	--	--	54	--	--	0	--	--	--	104	21	1.8	400	8.1
Dec. 12.....		--		--	--	73	--	137	--	--	116	--	--	0	--	--	--	168	56	2.5	689	7.7
Jan. 9, 1961.....		--		--	--	66	--	123	--	--	136	--	--	0	--	--	--	206	105	2.0	864	7.6
Feb. 13.....		--		--	--	106	--	132	--	--	188	--	--	0	--	--	--	269	161	2.8	1,100	7.4
Mar. 6.....		--		--	--	74	--	103	--	--	110	--	--	0	--	--	--	188	104	2.3	754	7.9
Apr. 10.....		--		--	--	19	--	77	--	--	26	--	--	0	--	--	--	81	18	0	251	7.8
May 1.....	0.09	17		13	8.0	14	1.2	73		14	15	0.2	0.0	0	118	0.16		65	5	0	190	7.8
June 5.....		--		--	--	18	--	82	--	--	17	--	--	0	--	--	--	73	6	0	227	7.8
July 10.....		--		--	--	42	--	89	--	--	68	--	--	0	--	--	--	94	21	1.9	413	7.7
Aug. 3.....		--		--	--	151	--	84	--	--	269	--	--	0	--	--	--	155	86	5.3	1,100	7.2
Sept. 11.....		18		18	19	89	3.8	90		33	146	.1	.2	.0	371	.50		134	50	3.5	693	7.9

SAN JOAQUIN RIVER BASIN--Continued

11-3134.5. OLD RIVER AT MANDEVILLE ISLAND, CALIF.

LOCATION.--On northwest side of Mandeville Island, San Joaquin County, approximately 0.5 mile upstream from confluence with San Joaquin River, and approximately 5.5 miles southwest of Terminus.

RECORDS AVAILABLE.--Chemical analyses: December 1954 to September 1961.

REMARKS.--No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-Calcium Magnesium			
Oct. 3, 1960.....		---		---	---	43	---	101		---	66	---	---	0.1	---	---	---	97	14	1.9	427	7.8
Nov. 1.....		---		---	---	33	---	96		---	39	---	---	0	---	---	---	82	3	1.6	302	8.0
Dec. 16.....		---		---	---	38	---	141		---	61	---	---	0	---	---	---	138	22	1.4	405	8.0
Jan. 6, 1961.....		---		---	---	26	---	87		---	54	---	---	0	---	---	---	107	36	1.1	403	7.8
Feb. 9.....		---		---	---	57	---	90		---	100	---	---	0	---	---	---	184	110	1.8	678	7.6
Mar. 10.....		---		---	---	25	---	82		---	40	---	---	0	---	---	---	96	29	1.1	329	7.9
Apr. 5.....		---		---	---	14	---	74		---	16	---	---	0	---	---	---	70	9	0.7	201	8.0
May 11.....		19	0.00	13	7.2	12	1.4	72		11	12	0.1	0.4	0	111	0.15	---	62	3	1.7	177	7.5
June 1.....		---		---	---	16	---	80		---	12	---	---	0	---	---	---	69	3	1.7	201	7.9
July 12.....		---		---	---	44	---	85		---	70	---	---	0	---	---	---	91	21	2.0	412	8.0
Aug. 9.....		---		---	---	135	---	81		---	237	---	---	0	---	---	---	137	71	5.0	997	7.8
Sept. 6.....		16		19	13	80	4.3	88		29	121	0.1	1.2	0	327	0.44	---	103	31	3.4	559	8.0

SAN JOAQUIN RIVER BASIN--Continued

11-3210. MOKELUMNE RIVER AT LANCHA PLANA, CALIF.

LOCATION --Approximately 500 feet downstream from gaging station, 1 mile east of Lancha Plana, Amador County, 3 miles downstream from Pardee Dam, and 5 miles upstream from Camanche Creek.

DRAINAGE AREA --584 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonylate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium-Magnesium slum	Non-carbonate			
Oct. 3, 1960.....	252	---	---	---	---	1.7	---	17	---	---	2.5	---	---	0.0	---	---	---	17	3	0.2	41	6.9
Nov. 1.....	208	---	---	---	---	2.0	---	15	---	---	2.5	---	---	0	---	---	13	1	.2	37	7.2	
Dec. 13.....	199	---	---	---	---	2.0	---	14	---	---	1.8	---	---	0	---	---	15	4	.2	39	7.3	
Jan. 3, 1961.....	212	---	---	---	---	2.0	---	21	---	---	2.8	---	---	0	---	---	15	0	.2	37	7.1	
Feb. 6.....	132	---	---	---	---	3.9	---	16	---	---	2.2	---	---	.1	---	---	19	6	.4	50	7.4	
Mar. 1.....	138	---	---	---	---	2.3	---	16	---	---	4.5	---	---	0	---	---	16	3	.2	48	7.4	
Apr. 3.....	138	---	---	---	---	1.3	---	17	---	---	4.6	---	---	1	---	---	20	6	1	49	7.3	
May 8.....	185	13	0.00	3.2	1.9	2.7	0.9	19	---	1.0	3.8	0.0	0.1	0	36	0.05	16	0	.3	48	7.2	
June 1.....	273	---	---	---	---	2.6	---	17	---	---	4.0	---	---	0	---	---	17	3	.3	48	7.6	
July 10.....	320	---	---	---	---	2.9	---	22	---	---	3.6	---	---	0	---	---	17	0	.3	50	7.5	
Aug. 10.....	295	---	---	---	---	2.9	---	21	---	---	6.2	---	---	.1	---	---	18	1	.3	56	7.4	
Sept. 6.....	288	10	---	4.6	1.6	2.5	.7	18	---	5.0	4.6	.2	.0	.0	38	.05	18	3	.3	54	7.4	

SAN JOAQUIN RIVER BASIN--Continued
11-3255. MOKELUNE RIVER AT WOODBRIDGE, CALIF.

LOCATION: ---At dam of Woodbridge Irrigation District, 0.4 mile upstream from gaging station at Woodbridge, San Joaquin County.

DRAINAGE AREA: ---644 square miles upstream from gaging station. 1961.

RECORDS AVAILABLE: ---Chemical analyses: March 1961 to September 1960 to September 1961.

Water temperatures: March 1961 to September 1960, 79°F to 83°F; July 30 - 31, 83°F.

EXTREMES, 1951-58, 1960-61: ---Water temperatures: Maximum (1951-54, 1956-58, 1960-61), 83°F July 9, 1961; minimum (1951-55, 1956-58), 35°F Jan. 20, 30, 1954.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 6, 1960.....	30	---	---	---	---	2.0	---	23	---	2.8	---	---	0.1	---	---	---	21	2	0.2	52
Nov. 4.....	60	---	---	---	---	2.2	---	19	---	2.8	---	---	0	---	---	---	17	1	.2	46
Dec. 15.....	163	---	---	---	---	2.7	---	16	---	1.8	---	---	0	---	---	---	17	4	.3	43
Jan. 13, 1961.....	183	---	---	---	---	2.0	---	24	---	2.2	---	---	0	---	---	---	16	0	.2	41
Feb. 17.....	113	---	---	---	---	3.6	---	20	---	2.8	---	---	0	---	---	---	21	5	.3	55
Mar. 10.....	35	---	---	---	---	3.0	---	19	---	4.6	---	---	0	---	---	---	19	3	.3	53
Apr. 14.....	13	---	---	---	---	3.5	---	26	---	4.8	---	---	0	---	---	---	24	3	.3	66
May 5.....	14	10	0.12	6.4	0.7	3.9	1.5	23	1.0	3.6	0.0	0.9	.1	39	0.05	---	19	0	.4	58
June 1.....	13	---	---	---	---	3.0	---	23	---	3.2	---	---	0	---	---	---	19	0	.4	58
July 14.....	18	---	---	---	---	2.6	---	23	---	7.0	---	---	.1	---	---	---	20	0	.3	52
Aug. 10.....	17	---	---	---	---	4.3	---	25	---	7.0	---	---	.1	---	---	---	20	0	.4	65
Sept. 7.....	31	12	---	5.4	1.6	2.3	.7	24	2.0	5.1	.2	.1	.0	41	.06	---	20	0	.2	56

SAN JOAQUIN RIVER BASIN--Continued

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

SAN JOAQUIN RIVER BASIN--Continued

11-3368. LITTLE POTATO SLOUGH NEAR TERMINOUS, CALIF.

LOCATION.--At tidal gaging station at bridge on State Highway 12, approximately 0.2 mile from confluence with South Fork Mokelumne River, and approximately 0.5 mile north of Terminous, San Joaquin County.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbocationate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Soil adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium-silum	Non-carbonate			
Oct. 2, 1960.....						16		92			19			0.0				77	1	0.8		229 8.0
Nov. 7.....						19		88			31			.0				72	12	1.0		218 8.1
Nov. 12.....						14		86			26			.0				62	13			210 7.2
Dec. 1.....						12		79			10			.1				68	3	.6		190 7.5
Jan. 9, 1961.....						16		74			32			.1				89	28	.7		257 7.4
Feb. 13.....						16		84			18			.2				75	6	.7		210 7.8
Mar. 6.....						13																
Apr. 10.....						8.4		66			9.0			.1				59	5	.5		150 7.9
May 1.....						12	1.3	74		13	12	0.1	0.0	.0		0.16		64	3	.6		181 7.8
June 5.....		19	0.05	13		18		94			12			.1				71	0	.9		218 8.0
July 10.....						16		82			20			.0				73	6	.8		219 7.7
Aug. 8.....						14		76			14			.0				65	3	.8		198 8.0
Sept. 7.....		19		16	10	19	1.6	102		11	20	.2	.0	.0	147	.20		82	0	.9		251 8.0

SAN JOAQUIN RIVER BASIN--Continued

11-3372. SAN JOAQUIN RIVER AT ANTIOCH, CALIF.

LOCATION.--At tidal gaging station at Antioch, Contra Costa County, and 4.5 miles from mouth.

RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate	
Oct. 3, 1960.....						313		102			575			0.2				252	168	2,190
Nov. 7.....						216		95			425							204	126	1,620
Dec. 12.....						25		114			29							79	0	259
Jan. 9, 1961.....						48		76			74							94	32	440
Feb. 13.....						28		76			31							84	22	291
Mar. 6.....						25		79			33							99	34	307
Apr. 10.....						14		75			16							70	8	198
May 1.....		16	0.04	17	8.6	40	2.0	78	22	22	60	0.1	0.2		204	0.28	78	14	2.0	359
June 5.....						174		82			278						154	87	6.1	1,150
July 10.....						530		92			977						416	341	11	3,400
Aug. 3.....						1,030		90			1,860						694	620	17	6,280
Sept. 11.....		9.9		43	88	715	25	94	143	143	1,260	0	2.5	4	2,330	3.17	469	392	14	4,330

SACRAMENTO RIVER BASIN

11-3420. SACRAMENTO RIVER AT DELTA, CALIF.

LOCATION:--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:--Chemical analyses: December 1953 to September 1961.
 Water temperatures: June to September 1951, October 1953 to September 1957.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 11, 1960.....	232	--	--	8.0	8.5	11	--	79	0	--	7.5	--	--	0.1	--	--	--	55	0	0.6	153
Nov. 8.....	218	--	--	--	--	12	--	79	0	--	6.7	--	--	.2	--	--	--	52	0	.7	135
Dec. 13.....	602	--	--	--	--	5.9	--	62	0	--	4.0	--	--	.0	--	--	--	45	0	.4	116
Jan. 11, 1961.....	565	--	--	--	--	6.9	--	86	0	--	4.0	--	--	.0	--	--	--	61	0	.4	111
Feb. 14.....	3,620	--	--	--	--	2.6	--	40	0	--	2.2	--	--	.0	--	--	--	32	0	.2	75
Mar. 7.....	942	--	--	--	--	4.5	--	50	0	--	1.8	--	--	.0	--	--	--	42	1	.3	97
Apr. 11.....	1,660	--	--	--	--	2.5	--	51	0	--	1.8	--	--	.0	--	--	--	40	0	.2	86
May 9.....	1,310	17	0.00	5.8	5.8	2.7	0.3	49	0	0.0	2.8	0.0	0.0	.0	58	0.08	--	38	0	.2	81
June 12.....	382	--	--	--	--	8.4	--	50	0	--	4.9	--	--	.0	--	--	--	46	0	.2	93
July 12.....	306	--	--	--	--	9.6	--	77	0	--	7.0	--	--	.1	--	--	--	48	0	.3	134
Aug. 2.....	226	--	--	--	--	11	1.0	76	1	3.0	10	.1	.2	.2	112	.15	--	54	0	.7	152
Sept. 11.....	200	31	--	11	6.4	11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.3

SACRAMENTO RIVER BASIN--Continued

11-3455. SOUTH FORK PIT RIVER NEAR LIKELY, CALIF.

LOCATION --At gaging station 1.3 miles downstream from West Valley Creek and 3.5 miles east of Likely, Modoc County.

DRAINAGE AREA --248 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25 C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 13, 1960.....	58	--	--	--	--	10.4	--	79	0	--	--	--	--	0.1	--	--	--	53	0	0.6	145	8.0
Nov. 10.....	25	--	--	--	--	5.4	--	43	0	--	8	--	--	--	--	--	--	44	0	.4	104	7.9
Dec. 15.....	220	--	--	--	--	6.2	--	64	0	--	2.7	--	--	--	--	--	--	44	0	.4	102	7.7
Jan. 12, 1961.....	85	--	--	--	--	5.7	--	70	0	--	--	--	--	0	--	--	--	43	0	.4	103	7.8
Feb. 16.....	8.0	--	--	--	--	8.1	--	74	0	--	--	--	--	.1	--	--	--	50	0	.5	134	8.0
Mar. 9.....	5.6	--	--	--	--	11	--	73	0	--	1.0	--	--	.1	--	--	--	46	0	.7	121	8.0
Apr. 13.....	47	--	--	--	--	4.7	--	49	0	--	--	--	--	0	--	--	--	36	0	.3	87	7.9
May 11.....	122	33	0.06	9.2	4.4	5.1	2.4	63	0	1.6	1.5	0.1	0.8	.0	89	0.12	--	41	0	.3	110	7.5
June 15.....	50	--	--	--	--	3.6	--	54	0	--	--	--	--	.0	--	--	--	37	0	.3	89	7.9
July 13.....	65	--	--	--	--	10	--	83	0	--	1.5	--	--	.1	--	--	--	56	0	.6	151	8.1
Aug. 2.....	152	--	--	--	--	12	--	95	0	--	3.5	--	--	.2	--	--	--	63	0	.7	174	8.1
Sept. 13.....	22	38	--	16	6.3	13	4.4	89	4	9.0	4.5	.1	.6	.0	140	.19	--	66	0	.7	183	8.5

a Daily mean discharge.

b Estimated daily mean discharge.

SACRAMENTO RIVER BASIN--Continued

11-3485. PIT RIVER NEAR CANBY, CALIF.

LOCATION.--At gaging station, at lower end of Warm Spring Valley, 4 miles southwest of Canby, Modoc County. DRAINAGE AREA.--1,430 square miles, approximately, excluding Goose Lake basin. RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magne-sium (Mg)	Sodium (Na)	Po-tas-sium (K)	Bi-car-bon-ate (HCO ₃)	Car-bon-ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		So-dium ad-sorp-tion ratio (micro-mhos at 25° C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Cal-cium, Mag-nesi-um	Non-ben-ton-ate		
Oct. 13, 1960.....	43	--	--	--	--	34	--	169	0	--	9.0	--	--	0.3	--	--	--	97	0	1.5	337 8.0
Nov. 10.....	76	--	--	--	--	36	--	134	0	--	7.5	--	--	.1	--	--	--	92	0	1.8	272 8.6
Dec. 13.....	80	--	--	--	--	22	--	139	0	--	12	--	--	.2	--	--	--	92	0	1.9	289 8.2
Jan. 12, 1961.....	59	--	--	--	--	18	--	150	0	--	5.0	--	--	.1	--	--	--	76	0	1.9	259 7.8
Feb. 16.....	225	--	--	--	--	22	--	106	0	--	2.1	--	--	.1	--	--	--	64	0	1.9	204 7.8
Mar. 9.....	49	--	--	--	--	--	--	145	0	--	11	--	--	.3	--	--	--	85	0	1.9	263 8.0
Apr. 12.....	38	--	--	--	--	19	--	110	2	--	6.5	--	--	.1	--	--	--	75	0	1.0	236 8.3
May 11.....	142	31	0.03	23	9.6	29	4.7	158	0	23	8.2	0.2	1.3	.2	208	0.28	--	97	0	1.3	296 7.6
June 15.....	42	--	--	--	--	36	--	186	0	--	5.4	--	--	.0	--	--	--	106	0	1.5	355 8.2
July 12.....	34	--	--	--	--	25	--	162	5	--	4.0	--	--	.0	--	--	--	102	0	1.1	283 8.5
Aug. 2.....	3.6	--	--	--	--	20	--	131	10	--	3.5	--	--	.0	--	--	--	81	0	1.0	233 8.5
Sept. 13.....	27	32	--	27	9.4	28	5.4	180	3	12	8.2	.1	.9	.1	215	.29	--	106	0	1.2	326 8.4

a Daily mean discharge.

Sediment discharge measurements and particle-size analyses of suspended sediment, water year October 1960 to September 1961 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S sieve; V visual accumulation tube; W in distilled water)

[illegible]

SACRAMENTO RIVER BASIN--Continued
11-3520. PIT RIVER NEAR BIEBER, CALIF.

LOCATION.--Approximately 200 feet upstream from gaging station, 2.2 miles upstream from Spring Gulch, and 7.4 miles south of Bieber, Lassen County.
DRAINAGE AREA.--2,970 square miles, approximately, excluding Goose Lake basin.
RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium sum	Non-carbonate			
Oct. 13, 1960.....	31					28		196	0		8.0			0.3				119	0	1.1	352	8.2
Nov. 10.....	56					36		158	0		7.8			.2				91	0	1.6	301	7.9
Dec. 15.....	a105					22		128	0		5.5			.1				72	0	1.1	231	7.9
Jan. 12, 1961.....	a120					22		135	0		5.8			.1				76	0	1.1	254	7.7
Feb. 16.....	1,250					13		76	0		--			.1				45	0	.9	145	7.8
Mar. 9.....	178					22		130	0		6.5			.2				79	0	1.1	245	7.9
Apr. 12.....	178					17		114	0		2.8			.0				74	0	.7	284	8.0
May 11.....	178				9.2	4.1		113	0	3.0	4.0	0.2	0.9	.1	161	0.22		88	0	.6	284	8.0
July 15.....	47	27	0.05	20		33		197	4		6.0			.1				108	0	1.4	331	8.3
July 12.....	a2					36		214	4		6.0			.1				123	0	1.4	389	8.3

a Daily mean discharge.

SACRAMENTO RIVER BASIN--Continued
 11-3650. PIT RIVER NEAR MONTGOMERY CREEK, CALIF.
 LOCATION.--At gaging station, 1 mile upstream from Cow Canyon Creek, and 3.5 miles west of Montgomery Creek, Shasta County.
 DRAINAGE AREA.--5,170 square miles, approximately, excluding Goose Lake basin.
 RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.
 Water temperatures: June to September 1951, October 1953 to September 1957, October 1958 to August 1959.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 12, 1960.....	4,030	--	--	--	--	10	--	87	0	--	2.5	--	--	0.1	--	--	--	56	0	0.6	148	8.1
Nov. 9,.....	3,260	--	--	--	--	9.3	--	90	0	--	2.6	--	--	0	--	--	--	57	0	0.5	156	7.9
Dec. 14,.....	862	--	--	--	--	11	--	90	0	--	5.5	--	--	1	--	--	--	57	0	0.6	156	7.9
Jan. 15, 1961.....	3,310	--	--	--	--	11	--	91	0	--	3.2	--	--	0	--	--	--	61	0	0.6	152	7.9
Feb. 15,.....	6,620	--	--	--	--	7.7	--	75	0	--	--	--	--	1	--	--	--	48	0	0.5	129	8.0
Mar. 8,.....	4,730	--	--	--	--	6.6	--	82	0	--	3.6	--	--	2	--	--	--	52	0	0.4	143	8.1
Apr. 12,.....	4,910	--	--	--	--	8.9	--	78	0	--	3.8	--	--	0	--	--	--	53	0	0.5	134	8.1
May 10,.....	4,770	30	0.00	12	4.9	7.9	1.7	76	0	2.0	3.2	0.1	0.0	1	99	0.13	50	0	0.5	127	8.1	
June 15,.....	3,340	--	--	--	--	8.5	--	83	0	--	1.3	--	--	0	--	--	55	0	0.5	143	8.1	
July 12,.....	3,150	--	--	--	--	14	--	86	3	--	4.0	--	--	0	--	--	56	0	0.8	161	8.5	
Aug. 2,.....	3,020	--	--	--	--	11	--	84	0	--	4.8	--	--	1	--	--	55	0	0.6	154	7.9	
Sept. 13,.....	2,480	33	--	13	5.7	10	2.2	87	0	2.0	5.8	2	0.6	1	116	.16	--	56	0	0.6	153	8.2

SACRAMENTO RIVER BASIN--Continued

11-3680. MCCLOUD RIVER ABOVE SHASTA LAKE, CALIF.

LOCATION --At gaging station upstream from Shasta Lake, Shasta County, 0.2 mile downstream from Big Bollobokka Creek, and 11.3 miles east of La Moine.
 DRAINAGE AREA --606 square miles.
 RECORDS AVAILABLE --Chemical analyses: October 1958 to September 1961.
 Water temperatures: June to September 1961, October 1963 to September 1959.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbinate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium, sodium	Non-carbonate		
Oct. 11, 1960.....	946	--	--	--	--	5.0	--	58	--	--	1.0	--	--	0.0	--	--	--	38	0	0.4	97
Nov. 8.....	940	--	--	--	--	4.9	--	58	--	--	1.5	--	--	0.0	--	--	--	37	0	0.3	98
Dec. 13.....	1,210	--	--	--	--	4.8	--	60	--	--	2.0	--	--	0.1	--	--	--	42	0	0.3	101
Jan. 11, 1961.....	1,200	--	--	--	--	5.0	--	66	--	--	2.2	--	--	0.0	--	--	--	44	0	0.3	100
Feb. 14.....	3,450	--	--	--	--	3.3	--	50	--	--	2.2	--	--	0.0	--	--	--	35	0	0.2	82
Mar. 7.....	1,480	--	--	--	--	7.6	--	53	--	--	2.2	--	--	0.0	--	--	--	40	0	0.5	96
Apr. 11.....	1,710	--	--	--	--	4.2	--	54	--	--	1.8	--	--	0.0	--	--	--	43	0	0.3	94
May 9.....	1,540	31	0.00	10	3.6	2.8	1.3	56	--	1.4	--	0.1	0.2	0.0	79	0.11	--	40	0	0.2	94
June 14.....	1,320	--	--	--	--	5.1	--	58	--	--	--	--	--	0.0	--	--	--	39	0	0.4	100
July 11.....	1,080	--	--	--	--	4.9	--	55	--	--	1.8	--	--	0.0	--	--	--	41	0	0.3	97
Aug. 2.....	1,020	--	--	--	--	4.9	--	55	--	--	2.8	--	--	0.1	--	--	--	37	0	0.3	95
Sept. 11.....	1,984	37	--	10	3.2	4.3	1.2	55	--	1.0	2.8	1.1	0.2	0.0	87	0.12	--	38	0	0.3	95

SACRAMENTO RIVER BASIN--Continued

11-3705. SACRAMENTO RIVER AT KESWICK, CALIF.

LOCATION.--At gaging station, 0.4 mile upstream from Middle Creek, 0.8 mile downstream from Keswick Dam, 1.6 miles downstream from Keswick, Shasta County, and 10 miles downstream from Shasta Dam.
 DRAINAGE AREA.--6,710 square miles, approximately, excluding Goose Lake basin.
 RECORDS AVAILABLE.--Chemical analyses: December 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbocation (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		So-dium con-duct-ance (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium-Magnesium	Non-carbonate			
Oct. 10, 1960.....	6,340	--	--	9.6	5.1	6.1	--	61	--	--	2.5	--	--	0.0	--	--	--	45	0	0.4	115	7.7
Nov. 7.....	5,830	--	--	--	--	7.5	--	65	--	--	1.9	--	--	--	--	--	--	47	0	.5	124	7.6
Dec. 12.....	3,700	--	--	--	--	7.5	--	106	--	--	3.0	--	--	--	--	--	--	69	0	.4	133	7.1
Jan. 10, 1961.....	4,240	--	--	--	--	7.7	--	89	--	--	2.2	--	--	--	--	--	--	54	0	.4	129	7.5
Mar. 6.....	12,600	--	--	--	--	7.6	--	67	--	--	1.8	--	--	--	--	--	--	49	0	.5	126	7.7
Apr. 10.....	6,900	--	--	--	--	7.5	--	58	--	--	2.5	--	--	--	--	--	--	44	0	.5	116	7.9
May 8.....	7,200	23	0.21	11	4.5	6.4	0.3	57	--	8.0	2.8	0.1	0.0	--	84	0.11	46	0	.4	119	7.3	
June 12.....	6,280	--	--	--	--	6.5	--	61	--	--	2.2	--	--	--	--	--	--	50	0	.4	119	7.7
July 10.....	11,300	--	--	--	--	6.6	--	63	--	--	2.2	--	--	--	--	--	--	46	0	.4	117	8.0
Aug. 8.....	11,800	--	--	--	--	6.0	--	62	--	--	2.4	--	--	--	--	--	--	47	0	.4	112	7.9
Sept. 7.....	8,040	23	--	12	3.6	6.0	1.2	62	--	5.0	2.5	.1	.2	.0	85	.12	--	45	0	.4	114	7.9

SACRAMENTO RIVER BASIN--Continued

11-3720. CLEAR CREEK NEAR IGO, CALIF.

LOCATION.--At gaging station, at highway bridge on Redding-Igo road, 1.0 mile northeast of Igo, Shasta County, 8 miles southwest of Redding, and 11.1 miles upstream from mouth.

DRAINAGE AREA.--228 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 10, 1960.....	40	--	--	16	5.6	14	--	67	--	--	18	--	--	0.0	--	--	--	63	8	0.8	193
Nov. 7.....	835	--	--	--	--	13	--	66	--	--	17	--	--	0	--	--	--	59	5	.7	180
Dec. 12.....	8160	--	--	--	--	6.5	--	63	--	--	7.2	--	--	0	--	--	--	51	0	.4	119
Jan. 10, 1961.....	152	--	--	--	--	6.5	--	46	--	--	6.0	--	--	0	--	--	--	44	6	.4	111
Feb. 13.....	1,440	--	--	--	--	3.0	--	26	--	--	5.5	--	--	0	--	--	--	26	5	.3	63
Mar. 6.....	338	--	--	--	--	5.5	--	33	--	--	2.8	--	--	0	--	--	--	30	3	.4	83
Apr. 10.....	398	--	--	--	--	4.3	--	36	--	--	3.2	--	--	0	--	--	--	30	0	.3	81
May 8.....	240	17	0.01	10	2.1	4.8	0.7	37	--	7.0	4.0	0.0	0.2	0	64	0.09	34	34	.4	.4	83
June 12.....	132	--	--	--	--	6.7	--	48	--	--	6.4	--	--	0	--	--	44	5	.4	.4	110
July 10.....	55	--	--	--	--	9.9	--	56	--	--	9.4	--	--	0	--	--	48	2	.6	.6	140
Aug. 7.....	38	--	--	--	--	14	--	66	--	--	19	--	--	0	--	--	61	7	.8	.8	191
Sept. 7.....	28	14	--	19	3.5	15	1.6	69	--	9.0	22	.1	.4	0	119	0.16	--	62	5	.8	202

a Daily mean discharge.

SACRAMENTO RIVER BASIN--Continued
 11-3740. COW CREEK NEAR MILLVILLE, CALIF.
 LOCATION.--At gaging station, 4.2 miles southwest of Millville, Shasta County, and 4.3 miles downstream from Little Cow Creek.
 DRAINAGE AREA.--427 square miles.
 RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961																						
Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 10, 1960.....	39	---	---	---	---	8.9	---	98	0	---	9.5	---	---	0.1	---	---	---	76	0	0.4	189	8.0
Nov. 7.....	61	---	---	---	---	9.3	---	89	0	---	5.0	---	---	.2	---	---	---	68	0	.5	170	7.9
Dec. 12.....	225	---	---	---	---	9.2	---	71	0	---	8.5	---	---	.1	---	---	---	65	7	.5	167	8.0
Jan. 10, 1961.....	222	---	---	---	---	9.6	---	70	0	---	6.8	---	---	.0	---	---	---	69	12	.5	162	7.6
Feb. 13.....	1,700	---	---	---	---	4.2	---	45	0	---	2.2	---	---	.0	---	---	---	41	4	.3	99	7.8
Mar. 6.....	478	---	---	---	---	5.7	---	58	0	---	4.5	---	---	.2	---	---	---	49	1	.4	128	7.8
Apr. 10.....	545	---	---	---	---	5.1	---	50	0	---	2.0	---	---	.0	---	---	---	42	1	.3	104	7.9
May 8.....	428	26	0.02	10	4.1	4.8	0.9	53	0	4.4	4.6	0.0	0.0	.0	81	0.11	42	0	.3	105	7.9	
June 12.....	224	---	---	---	---	5.1	---	62	0	---	4.0	---	---	.0	---	---	---	46	0	.3	110	7.9
July 10.....	41	---	---	---	---	7.9	---	82	0	---	4.5	---	---	.1	---	---	---	61	0	.4	152	8.1
Aug. 8.....	17	---	---	---	---	8.4	---	99	0	---	6.5	---	---	.2	---	---	---	74	0	.4	178	8.0
Sept. 7.....	19	35	---	19	6.8	7.9	1.8	100	2	1.0	5.4	.2	1.1	.0	129	.18	75	0	.4	182	8.3	

SACRAMENTO RIVER BASIN--Continued
11-3758. COTTONWOOD CREEK NEAR ONO, CALIF.

LOCATION --Approximately 1 mile downstream from North Fork, and approximately 8 miles southeast of Ono, Tehama County.

RECORDS AVAILABLE --Chemical analyses: October 1958 to September 1961.

REMARKS --Records of discharge for gaging stations at Middle Fork Cottonwood Creek near Ono and North Fork Cottonwood Creek near Igo are combined to give the flow at this station.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃	Specific conductance (microhms at 25°C)	pH		
															Parts per million	Tons per acre-foot	Tons per day					
Oct. 10, 1960.....	28	---	---	26	14	12	---	144	0	---	20	---	---	0.0	---	---	---	124	6	0.5	296	8.2
Nov. 7.....	15	---	---	---	---	13	---	162	4	---	24	---	---	0	---	---	---	152	13	5	359	8.3
Dec. 12.....	105	---	---	---	---	9.0	---	124	0	---	12	---	---	1	---	---	---	106	4	4	239	8.0
Jan. 10, 1961.....	115	---	---	---	---	8.1	---	109	0	---	8.5	---	---	0	---	---	---	88	0	4	179	7.6
Feb. 13.....	1,308	---	---	---	---	5.6	---	58	0	---	2.2	---	---	0	---	---	---	62	14	3	147	8.1
Mar. 6.....	347	---	---	---	---	7.2	---	104	0	---	4.2	---	---	0	---	---	---	92	7	3	210	8.1
Apr. 10.....	297	---	---	---	---	6.1	---	117	1	---	3.5	---	---	0	---	---	---	107	9	3	217	8.3
May 8.....	190	19	0.00	20	9.5	6.3	0.8	108	0	8.0	4.2	0.1	0.1	0	121	0.16	---	89	0	3	162	8.0
June 12.....	78	---	---	---	---	8.6	---	99	0	---	7.6	---	---	0	---	---	---	84	3	4	199	7.9
July 10.....	30	---	---	---	---	8.7	---	139	4	---	8.2	---	---	0	---	---	---	119	0	3	268	8.3
Aug. 7.....	17	---	---	---	---	10	---	146	4	---	12	---	---	0	---	---	---	128	2	4	279	8.4
Sept. 7.....	12	22	---	29	13	11	1.4	143	3	7.0	15	1	2	0	172	.23	---	126	4	4	283	8.4

SACRAMENTO RIVER BASIN--Continued

11-3759. SOUTH FORK COTTONWOOD CREEK NEAR COTTONWOOD, CALIF.

LOCATION.--At bridge on Evergreen Road, approximately 1 mile upstream from confluence with Cottonwood Creek, and 3.5 miles southwest of Cottonwood, Shasta County.

DRAINAGE AREA.--218 square miles.

RECORDS AVAILABLE.--Chemical analyses: November 1988 to September 1981.

REMARKS.--No discharge records available.

Chemical analyses, in parts per million, water year October 1980 to September 1981

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 10, 1980.....						12		181	0	12			0.0				131	0	0.5	311
Dec. 12.....						20		191	0	47			.1				186	29	.8	421
Jan. 5, 1981.....						18		174	0	33			.1				165	22	.6	370
Feb. 15.....						16		171	0	17	9.2		.0				106	10	.4	352
Mar. 14.....						15		139	3	17			.2				129	10	.6	319
Apr. 11.....						11		122	2	10			.1				108	5	.5	251
May 2.....						11	0.8	122	0	9.8	0.1	0.0	.1				105	5	.5	248
June 6.....	10		0.02	28	8.6	11	9.2	100	0	9.5			.2	141	0.19		84	2	.5	202
July 7.....						12		116	5	13			.0				102	0	.5	255
Aug. 7.....						14		138	0	14			.2				115	2	.6	280

SACRAMENTO RIVER BASIN--Continued
 11-3760. COTTONWOOD CREEK NEAR COTTONWOOD, CALIF.
 LOCATION.--At gaging station, 2 miles east of Cottonwood, Shasta County, and 2.4 miles upstream from mouth.
 DRAINAGE AREA.--945 square miles.
 RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961																					
Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bi-car- bon- ate (HCO ₃)	Car- bon- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Bo- ron (NO ₃) (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		So- dium con- duct- ance (micro- mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Cal-cium-Mag-nesium	Non-car-bon-ate			
Oct. 10, 1960.....	138	--	--	14	8.3	8.6	--	94	0	--	4.5	--	--	0.0	--	--	69	0	0.4	172	7.9
Nov. 1.....	94	--	--	--	--	9.9	--	95	0	--	8.9	--	--	0	--	--	75	0	.5	180	7.8
Dec. 12.....	257	--	--	--	--	11	--	120	0	--	17	--	--	0	--	--	110	12	.5	269	8.0
Jan. 10, 1961.....	200	--	--	--	--	11	--	145	0	--	13	--	--	0	--	--	122	3	.4	246	7.9
Feb. 13.....	2,610	--	--	--	--	6.6	--	98	0	--	3.2	--	--	0	--	--	86	6	.3	199	8.1
Mar. 6.....	620	--	--	--	--	10	--	113	0	--	6.2	--	--	0	--	--	97	4	.4	228	7.8
Apr. 10.....	612	--	--	--	--	8.3	--	117	1	--	5.5	--	--	0	--	--	102	4	.4	222	8.3
May 8.....	440	22	0.00	20	8.8	8.5	1.3	107	0	8.0	5.5	0.1	0.5	0	128	0.17	86	0	.4	181	7.8
June 12.....	233	--	--	--	--	8.3	--	106	0	--	5.8	--	--	0	--	--	90	3	.4	200	7.9
July 10.....	90	--	--	--	--	9.1	--	116	0	--	3.8	--	--	0	--	--	87	0	.4	205	8.2
Aug. 8.....	66	--	--	--	--	8.5	--	102	0	--	4.4	--	--	.1	--	--	78	0	.4	184	8.0
Sept. 7.....	61	28	--	16	8.5	8.5	1.4	99	0	5.0	4.0	.1	.4	0	121	.16	75	0	.4	177	8.0

SACRAMENTO RIVER BASIN--Continued
11-3765. BATTLE CREEK NEAR COTTONWOOD, CALIF.

LOCATION.--At gaging station, 6.3 miles upstream from mouth, and 7.6 miles east of Cottonwood, Shasta County.
DRAINAGE AREA.--362 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961 (discontinued).

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 10, 1960.....	193	--	--	--	--	8.5	--	87	0	--	4.0	--	--	0.0	--	--	--	59	0	0.5	149	8.0
Nov. 7.....	168	--	--	--	--	9.2	--	89	0	--	--	--	--	.1	--	--	--	58	0	.5	154	7.9
Dec. 12.....	258	--	--	--	--	8.5	--	86	0	--	3.0	--	--	.0	--	--	--	57	0	.5	140	8.0
Jan. 3, 1961.....	233	--	--	--	--	8.5	--	86	0	--	2.0	--	--	.1	--	--	--	58	0	.5	144	7.9
Feb. 13.....	1,440	--	--	--	--	4.2	--	51	0	--	1.2	--	--	.0	--	--	--	38	0	.3	95	7.9
Mar. 14.....	367	--	--	--	--	7.5	--	77	0	--	1.5	--	--	.1	--	--	--	51	0	.5	127	8.1
Apr. 11.....	414	--	--	--	--	6.6	--	65	0	--	1.0	--	--	.1	--	--	--	47	0	.4	118	7.9
May 2.....	379	40	0.00	9.2	4.9	7.9	1.8	67	0	1.0	2.5	0.2	0.1	.0	101	0.14	43	0	.5	113	8.0	
June 6.....	427	--	--	--	--	6.0	--	62	0	--	2.5	--	--	.0	--	--	43	0	.4	109	8.1	
July 6.....	227	--	--	--	--	7.9	--	78	0	--	2.0	--	--	.0	--	--	52	0	.5	135	8.1	
Aug. 8.....	182	--	--	--	--	8.5	--	86	0	--	3.5	--	--	.1	--	--	56	0	.5	145	8.1	
Sept. 7.....	145	47	--	10	7.5	8.4	2.2	88	1	1.0	2.5	.1	.1	.1	123	.17	--	56	0	.5	153	8.3

a Daily mean discharge.

SACRAMENTO RIVER BASIN--Continued

11-3765, BATTLE CREEK NEAR COTTONWOOD, CALIF.--Continued

Periodic determinations of suspended-sediment discharge, water year October 1960 to September 1961
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sam- pling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment									Method of analysis		
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500		1.000	2.000
Nov. 15, 1960.....	1135		56	222	4	2.4												
Dec. 2.....	1240		56	920	42	104												
Dec. 3.....	1300		47	534	8	12												
Dec. 29.....	1630		45	233	6	3.8												
Jan. 25, 1961.....	1500		49	216	4	2.3												
Feb. 20.....	1545		51	503	4	5.4												
Mar. 22.....	1745		51	486	5	6.6												
Apr. 5.....	1500		56	516	3	4.2												
Apr. 19.....	1725		54	401	4	4.3												
May 3.....	1000		56	347	4	3.7												
June 2.....	1235		62	382	4	4.2												
June 23.....	1300		64	309	6	5.0												
July 20.....	1230		66	193	4	2.1												
Aug. 25.....	0950		61	153	7	2.9												

^d Daily mean discharge.

SACRAMENTO RIVER BASIN--Continued
11-3772. SACRAMENTO RIVER AT BEND, CALIF.

LOCATION.--At highway bridge at Bend, Tehama County, approximately 7.9 miles upstream from gaging station near Red Bluff, 0.3 mile upstream from Spring Creek, and approximately 9 miles north of Red Bluff.
DRAINAGE AREA.--9,300 square miles, approximately upstream from gaging station.
RECORDS AVAILABLE.--Chemical analyses: May 1955 to September 1961.

Water temperatures: May 1955 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 114 ppm Nov. 21-30; minimum, 87 ppm July 21-31.

Hardness: Maximum, 56 ppm Nov. 11-20; minimum, 28 ppm Dec. 1.

Specific conductance: Maximum daily, 163 micromhos Jan. 27; minimum daily, 61 micromhos Dec. 1.

Water temperature: Maximum, 63°F July 22; minimum, 46°F Jan. 6, 18.

EXTREMES, 1955-61.--Dissolved solids: Maximum, 138 ppm Dec. 28, 1958; minimum, 70 ppm Feb. 16, 1959.

Hardness: Maximum, 66 ppm Dec. 28, 1958; minimum, 28 ppm Jan. 14, 15, 1956, Dec. 1, 1960.

Specific conductance: Maximum daily, 215 micromhos June 4, 1960; minimum daily, 61 micromhos Dec. 1, 1960.

Water temperature: Maximum, 64°F Sept. 6, 12, 1959, June 2, 1960; minimum, 41°F Jan. 27, 1957.

REMARKS. Conductivity of specific conductance of daily samples available in district office at Sacramento, Calif. Discharge records given for Sacramento River near Red Bluff. No appreciable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1960 to September 1961.

CHEMICAL ANALYSES, IN PILTS 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)	Carbocationate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)			
														Parts per million	Tons per acre-foot	Tons per day						
Oct. 1-10, 1960.....	6,370	26	0.00	11	5.2	6.7	1.1	66		5.0	5.0	0.0	0.8	0.0	103	0.14	1,770	49	0	0.4	122	7.3
Oct. 11-20, 1960.....	6,044	27	.00	11	5.0	6.7	1.3	68		4.0	4.2	1.1	1.6	0.0	99	.13	1,620	48	0	.4	122	7.1
Oct. 21-31, 1960.....	5,906	27	.00	11	5.0	7.2	1.2	66		5.0	2.2	1.0	1.0	0.0	97	.13	1,560	48	0	.4	123	7.3
Nov. 1-10, 1960.....	6,072	28	.00	12	5.4	6.7	1.4	69		5.0	3.8	1.0	1.0	1.0	101	.14	1,850	52	0	.4	129	7.4
Nov. 11-20, 1960.....	6,224	26	.01	12	6.3	7.1	1.4	71		7.0	4.8	0.0	1.0	0.0	109	.15	1,930	56	0	.4	136	7.6
Nov. 21-30, 1960.....	7,008	26	.02	12	5.8	7.4	1.4	67		7.0	5.0	0.0	1.0	.7	114	.16	2,160	54	0	.4	135	7.3
Dec. 1-10, 1960.....	50,500	14	--	--	--	2.4	1.9	34		4.0	1.5	--	2.1	.2	--	--	--	26	0	.2	67	6.1
Dec. 11-20, 1960.....	7,122	29	.14	13	5.0	7.4	2.0	64		10	3.7	1.1	1.6	0.0	111	.15	2,130	53	1	.4	143	7.4
Dec. 16-21, 1960.....	10,740	24	.12	11	5.2	6.7	1.4	59		10	3.0	1.0	1.6	0.0	98	.13	2,840	49	1	.4	127	6.9
Dec. 22-31, 1960.....	5,395	28	.08	13	4.7	7.2	1.8	65		8.0	4.0	1.0	1.0	0.0	106	.14	1,540	52	0	.4	139	7.7
Jan. 1-9, 1961.....	5,116	26	.02	11	6.1	8.3	2.0	72		9.6	3.2	1.1	1.2	0.0	103	.14	1,420	52	0	.5	139	7.8
Jan. 10-19, 1961.....	5,059	27	.04	12	5.6	8.3	1.6	75		4.6	3.1	1.1	1.2	0.0	110	.15	1,500	53	0	.5	142	7.8
Jan. 20-29, 1961.....	5,445	27	.05	12	5.8	8.9	1.4	78		5.4	4.5	1.0	1.4	0.0	105	.14	1,540	54	0	.5	148	8.0
Jan. 30, 1961.....																						
Feb. 1, 2, 1961.....	24,880	21	.21	9.6	3.9	5.2	1.0	48		8.0	2.5	1.1	1.6	1.0	100	.14	6,720	40	1	.4	110	7.1
Feb. 3-8, 1961.....	11,270	24	.13	12	5.4	6.9	1.0	64		8.0	3.5	1.1	1.2	1.0	97	.13	3,040	52	0	.4	137	7.6
Feb. 9-16, 1961.....	24,200	24	.13	10	4.9	6.0	1.0	58		7.0	3.0	1.1	1.3	0.0	100	.13	6,340	45	0	.4	119	7.8

	Feb. 17-28, 1961..	17,480	26	.09	11	5.7	7.2	1.3	68	6.0	3.0	.1	.8	0.0	104	.14	4,910	51	0	.4	131	7.7
	Mar. 1-10.....	14,900	27	.05	11	5.7	8.0	1.4	70	6.0	3.0	.1	1.0	.0	95	.13	3,820	51	0	.5	132	7.7
	Mar. 11-20.....	18,190	25	.13	10	5.6	6.9	1.1	63	6.0	3.0	.1	.8	.1	100	.14	4,910	48	0	.4	122	7.5
	Mar. 21-31.....	15,130	25	.01	11	5.0	6.6	1.3	64	6.0	2.5	.1	.7	.1	104	.14	4,250	48	0	.4	122	7.5
	Apr. 1-10.....	9,270	24	.04	11	5.5	6.4	1.0	62	7.0	3.5	.0	.3	.0	93	.13	2,330	50	0	.4	130	8.0
	Apr. 11-20.....	8,189	24	.04	11	5.5	6.9	1.1	63	7.0	3.7	.0	.3	.0	100	.14	2,210	50	0	.4	128	7.8
	Apr. 21-30.....	9,161	24	.05	11	4.9	6.9	1.1	63	6.0	3.7	.0	.0	.0	92	.13	2,280	48	0	.4	126	7.7
	May 1-10.....	9,208	28	.00	12	5.6	6.5	1.1	64	7.6	4.1	.0	.5	.0	97	.13	2,410	53	1	.4	125	7.8
	May 11-20.....	8,659	26	.00	12	5.4	6.5	1.1	64	7.6	3.2	.0	.4	.0	94	.13	2,200	52	0	.4	124	7.7
	May 21-31.....	8,355	25	.00	11	6.0	6.5	1.1	64	8.0	3.0	.2	.5	.0	93	.13	2,100	52	0	.4	123	7.6
	June 1-13.....	9,291	28	.00	11	5.0	6.6	1.1	64	6.0	3.4	.0	.2	.0	96	.13	2,410	48	0	.4	123	7.6
	June 14-21.....	9,764	25	.00	12	4.4	6.4	1.4	64	7.0	4.4	.0	.2	.0	93	.13	2,450	48	0	.4	124	7.4
	June 22-30.....	10,920	25	.00	12	4.1	6.0	1.1	64	4.4	3.9	.0	.2	.0	90	.12	2,650	47	0	.4	123	7.4
	July 1-10.....	10,970	24	.00	11	4.7	6.7	1.2	64	5.0	3.5	.0	.3	.0	89	.12	2,640	47	0	.4	121	8.0
	July 11-20.....	11,270	26	.00	11	5.0	6.3	1.2	64	4.0	3.2	.0	.1	.0	93	.13	2,830	48	0	.4	119	7.9
	July 21-31.....	11,680	24	.00	11	5.0	6.3	1.2	63	5.0	2.2	.1	.4	.0	87	.12	2,740	48	0	.4	119	7.5
	Aug. 1-10.....	11,610	26	.00	10	5.4	5.3	1.3	67	4.0	1.8	.1	.4	.0	95	.13	2,980	47	0	.3	121	7.5
	Aug. 11-20.....	11,190	25	.00	11	4.7	5.5	1.2	67	4.0	2.2	.1	.4	.0	98	.13	2,960	47	0	.4	121	7.7
	Aug. 21-31.....	10,100	25	.00	10	5.8	5.4	1.5	69	3.0	2.2	.1	.4	.0	96	.13	2,620	49	0	.3	121	7.5
	Sept. 1-10.....	8,242	26	.00	11	5.2	6.4	1.0	73	2.6	2.6	.2	.4	.0	89	.12	1,980	49	0	.3	123	7.3
	Sept. 11-20.....	7,373	25	.00	12	4.5	6.4	1.0	73	2.6	2.6	.2	.2	.0	100	.14	1,960	49	0	.4	124	7.9
	Sept. 21-30.....	6,831	25	.00	11	5.1	6.5	.8	67	4.2	2.5	.2	.2	.0	89	.12	1,840	48	0	.4	122	7.7
	Weighted average	9,910	25	a0.04	a11	a5.2	6.6	1.2	65	5.9	3.2	a0.1	0.6	0.0	a97	a0.13	a2,600	49	0	0.4	125	--

a Includes estimates for missing data.

Temperature (°F) of water, water year October 1960 to September 1961

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

SACRAMENTO RIVER BASIN--Continued

11-3775. PAYNES CREEK NEAR RED BLUFF, CALIF.

LOCATION.--At gaging station, 0.4 mile upstream from mouth, and 6.5 miles northeast of Red Bluff, Tehama County.

DRAINAGE AREA.--92.5 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

REMARKS.--No flow during August and September.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 11, 1960.....	0.2					21		122		20			0.4				84	0	1.0	252
Nov. 2.....	76.3					21		124		16.8			.5				82	0	1.0	252
Dec. 8.....	12					12		86		12			.0				73	0	.8	162
Jan. 8, 1961.....	19					16		100		12			.4				73	0	.8	162
Feb. 16.....	307					5.9		57		2.8			.6				41	0	.4	110
Mar. 14.....	57					11		83		6.5			.2				54	0	.7	152
Apr. 11.....	40					12		86		8.0			.2				60	0	.7	162
May 2.....	24					14	1.4	92	2.0	9.0	0.3	0.3	.3				62	0	.8	178
June 6.....	10	48	0.00	12	7.8	16		103		12			.3	140	0.19		71	0	.8	198
July 7.....	4.1					18		112		14			.4				79	0	.9	219

SACRAMENTO RIVER BASIN--Continued

--Temperature recorder at gaging station at lower end of Iron Canyon, 0.5 mile downstream from Sevenmile Creek, and 4.6 miles northeast of Red Bluff, Tehama County.

[illegible]

SACRAMENTO RIVER BASIN--Continued

11-3785. SACRAMENTO RIVER AT RED BLUFF, CALIF.

LOCATION.--At U.S. Highway 99E bridge, at Red Bluff, Tehama County, approximately 5 miles downstream from gaging station near Red Bluff.

DRAINAGE AREA.--9,300 square miles, approximately, excluding Goose Lake basin, upstream from gaging station.

RECORDS AVAILABLE.--Water temperatures: October 1957 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 64°F June 15; minimum, 45°F Jan. 5, 7.

Sediment concentrations: Maximum daily, 755 ppm Dec. 1; minimum daily, 4 ppm on many days.

Sediment loads: Maximum daily, 136,000 tons Dec. 1; minimum daily, 53 tons Nov. 23, 24.

EXTREMES, 1957-61.--Water temperatures: Maximum, 66°F June 1, 1960; minimum, 44°F Jan. 6, 1958.

Sediment concentrations: Maximum daily, 1,510 ppm Feb. 8, 1960; minimum daily, 4 ppm on many days during 1958-61.

Sediment loads: Maximum daily, 271,000 tons Feb. 8, 1960; minimum daily, 44 tons Dec. 4-6, 1959.

REMARKS.--No appreciable inflow between sampling point and gaging station except for heavy local runoff.

Month	Temperature (°F) of water, water year October 1960 to September 1961																															Average	
	Day																																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
October	60	--	60	--	59	--	59	--	56	--	57	--	58	--	59	--	60	58	60	--	60	--	59	--	59	--	57	--	59	--	59	--	--
November	59	--	55	--	55	--	57	--	56	--	57	--	52	51	54	55	54	56	55	55	55	54	52	53	52	48	50	50	50	51	--	54	
December	51	50	51	50	50	49	49	50	49	47	50	49	50	49	48	50	50	50	52	52	49	51	50	48	--	--	--	--	48	48	48	50	--
January	48	47	47	47	45	46	45	46	48	50	50	50	47	49	47	47	48	46	47	48	48	48	48	50	49	50	50	50	49	49	51	48	
February	51	52	52	53	53	53	51	50	51	50	48	48	49	50	48	48	48	48	49	49	50	49	49	50	49	50	49	50	50	50	50	50	
March	49	50	48	50	48	50	47	49	50	50	50	50	50	50	50	48	49	49	--	53	50	52	50	49	48	50	53	55	56	56	50	50	
April	58	58	60	59	57	57	56	58	58	56	--	56	56	57	58	59	59	55	54	53	52	50	51	54	55	57	57	58	56	56	--	56	
May	53	56	57	55	55	53	54	56	56	54	55	57	58	60	60	60	58	60	58	60	58	58	56	60	58	59	59	57	56	58	57	57	
June	58	55	56	60	60	60	60	59	60	--	60	--	62	--	64	--	62	--	61	--	60	--	59	--	60	--	60	--	59	--	--	--	--
July	60	--	59	--	57	--	58	--	59	--	60	--	60	--	59	--	59	--	60	58	60	--	59	--	59	--	59	--	59	--	--	--	--
August	58	--	59	--	58	--	60	--	60	--	57	--	58	--	58	--	60	--	58	--	60	--	60	--	60	--	60	--	60	--	60	--	--
September	62	--	61	--	60	--	60	--	60	--	62	--	61	--	61	--	62	--	63	63	63	--	62	--	62	--	62	--	62	--	62	--	--

Temperature (°F) of water, water year October 1960 to September 1961

SACRAMENTO RIVER BASIN--Continued

11-3785. SACRAMENTO RIVER AT RED BLUFF, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961
(Where no concentrations are reported loads are estimated)

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..	6220	6	101	5980	6	97	50500	755	S 136000
2..	6220	--	100	6030	--	98	23400	296	S 23400
3..	6240	6	101	6000	6	97	11800	80	2350
4..	6240	--	100	6000	--	97	7590	23	471
5..	6240	6	101	6000	6	97	6400	13	225
6..	6470	--	140	6050	--	98	5770	9	140
7..	6540	8	141	6150	6	100	5410	8	117
8..	6540	--	120	6170	--	100	5230	8	113
9..	6520	6	106	6170	5	83	5080	6	82
10..	6470	--	87	6170	--	83	4980	6	81
11..	6440	5	87	6270	6	102	4910	6	80
12..	6270	--	85	6370	--	100	4810	6	78
13..	6120	6	99	8540	40	S 1040	4760	6	77
14..	6100	--	99	7970	58	S 1380	4720	6	76
15..	6030	5	81	5750	16	248	4850	7	92
16..	5980	--	81	5300	7	100	7030	20	380
17..	5930	6	96	5320	6	86	16400	207	S 10000
18..	5890	6	95	5700	9	139	15400	165	S 7510
19..	5860	6	95	5700	13	200	10500	50	1420
20..	5820	--	94	5320	7	101	8130	23	505
21..	5820	6	94	5190	6	84	7010	16	303
22..	5840	--	95	5020	6	81	6370	12	206
23..	5860	6	95	4870	6	53	5980	12	194
24..	5910	--	96	4930	4	53	5730	9	139
25..	5930	7	112	9020	64	S 3210	5520	--	130
26..	5930	--	110	16400	180	S 9320	5340	--	130
27..	5960	6	97	7730	25	522	5190	--	110
28..	5930	--	80	5890	12	191	5060	--	110
29..	5930	5	80	5510	8	119	4980	8	108
30..	5930	--	80	5730	18	278	4930	7	93
31..	5930	--	96	--	--	--	4850	6	79
Total	189110	--	3044	193250	--	18357	268630	--	184999
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..	4980	6	81	22700	406	S 30500	15200	20	821
2..	5190	7	98	25000	593	S 50100	14600	21	828
3..	5150	6	83	18900	315	S 18000	14500	19	744
4..	5150	6	83	12500	100	3380	14500	21	822
5..	5120	7	97	10200	50	1380	14500	25	979
6..	5100	6	83	9150	35	865	14800	22	879
7..	5100	8	110	8700	30	705	14500	17	666
8..	5100	6	83	8180	15	331	14500	20	783
9..	5150	6	83	25000	486	S 51000	16500	38	1690
10..	5190	6	84	23600	345	S 27300	15400	25	1040
11..	5150	8	111	30200	454	S 44600	15200	22	903
12..	5100	8	110	25200	190	12900	15000	18	729
13..	5060	7	96	20900	65	3670	14900	16	644
14..	5080	8	110	21900	80	4730	15200	23	944
15..	5040	9	122	23700	80	5120	21500	174	S 10400
16..	5040	7	95	23100	80	4990	19600	75	3970
17..	5000	7	94	20400	45	2480	23400	184	S 12400
18..	4980	7	94	19300	38	1980	19500	60	3160
19..	4950	6	80	18400	36	1790	17800	30	1440
20..	4950	6	80	17900	32	1550	19800	77	4120
21..	4950	6	80	17500	28	1320	17800	32	1540
22..	4930	6	80	17300	28	1310	17100	25	1150
23..	5020	6	81	16900	26	1190	17100	20	923
24..	5040	8	109	16700	24	1080	18200	50	2460
25..	5000	8	108	16600	21	941	18900	90	S 5100
26..	5170	8	112	16300	22	968	15800	28	1190
27..	5910	21	335	16200	19	851	16200	50	2190
28..	5820	17	267	16200	20	875	12500	24	810
29..	7660	78	S 3160	--	--	--	11400	18	554
30..	19200	635	S 36700	--	--	--	11000	18	535
31..	32600	669	S 77200	--	--	--	10400	15	421
Total	202880	--	120109	518630	--	275886	497300	--	64835

S Computed by subdividing day.

SACRAMENTO RIVER BASIN--Continued

11-3785. SACRAMENTO RIVER AT RED BLUFF, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
(Where no concentrations are reported loads are estimated)

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..	10100	15	409	9370	12	304	9070	12	294
2..	10000	13	351	9370	11	278	9600	14	363
3..	9920	13	348	9150	10	247	9580	12	310
4..	9720	16	420	9010	9	219	9550	11	284
5..	9430	17	433	8980	10	242	9520	10	257
6..	9210	11	274	9150	9	222	9460	12	307
7..	9010	12	292	9490	12	307	9320	10	252
8..	8590	10	232	9210	12	298	9230	8	199
9..	8400	14	318	9120	12	295	9180	8	198
10..	8320	11	247	9230	10	249	9090	--	220
11..	8270	10	223	9430	13	331	9070	10	245
12..	8160	13	286	9460	15	383	9040	--	220
13..	8270	10	223	8870	12	287	8930	8	193
14..	8050	8	174	8590	8	186	9150	--	200
15..	7970	8	172	8480	8	183	9320	8	201
16..	7920	11	235	8370	9	203	9780	--	210
17..	7860	10	212	8350	8	180	9750	8	211
18..	8100	10	219	8320	9	202	9490	--	210
19..	8670	12	281	8350	8	180	9720	8	210
20..	8620	12	279	8370	11	249	10200	--	300
21..	8730	11	259	8430	10	228	10500	12	340
22..	9150	10	247	8370	10	226	10600	--	340
23..	10100	20	545	8350	13	293	11000	12	356
24..	10100	24	654	8290	9	201	11000	--	300
25..	9150	12	296	8180	6	133	11000	10	297
26..	9070	8	196	8210	6	133	11000	--	300
27..	8400	8	181	8320	7	157	10900	10	294
28..	8670	9	211	8210	6	133	10900	--	260
29..	8870	11	263	8670	6	140	11000	8	238
30..	9370	14	354	8290	8	179	10900	--	240
31..	--	--	--	8590	9	209	--	--	--
Total	266200	--	8834	270580	--	7077	297050	--	7849
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..	10900	8	235	11700	6	190	9150	6	148
2..	10900	--	240	11600	--	157	8650	--	140
3..	10800	8	233	11600	5	157	8240	5	111
4..	10800	--	230	11600	--	160	8210	--	110
5..	10900	8	235	11600	5	157	8240	5	111
6..	10800	--	230	11600	--	160	8270	--	89
7..	10800	8	233	11600	5	157	8290	4	90
8..	11200	--	300	11600	--	160	7780	--	84
9..	11300	11	336	11600	5	157	7780	6	126
10..	11300	--	340	11600	--	160	7810	--	130
11..	11200	11	333	11600	5	157	7780	5	105
12..	11200	--	330	11600	--	190	7620	--	100
13..	11200	12	363	11600	6	188	7240	5	98
14..	11200	--	270	11600	--	190	7270	--	98
15..	11200	6	181	11600	5	157	7270	4	79
16..	11200	--	210	11300	--	150	7320	--	99
17..	11200	8	242	10700	4	116	7060	8	152
18..	11200	--	240	10600	--	110	7080	--	130
19..	11500	8	248	10600	5	143	7060	7	133
20..	11600	8	251	10700	--	140	7030	7	133
21..	11600	7	219	10700	5	144	6900	4	75
22..	11700	--	220	10700	--	120	6880	--	74
23..	11700	7	221	10700	4	116	6820	4	74
24..	11700	--	190	10600	--	110	6850	--	74
25..	11700	6	190	10400	5	140	6820	4	74
26..	11700	--	190	10200	--	140	6820	--	74
27..	11600	6	188	10000	5	135	6800	4	73
28..	11700	--	190	9690	--	130	6820	--	74
29..	11700	7	221	9690	5	131	6800	5	92
30..	11700	--	220	9210	--	120	6800	--	73
31..	11700	--	190	9180	--	150	--	--	--
Total	350900	--	7519	339070	--	4625	223460	--	3023
Total discharge for year (cfs-days).....								3,617,060	
Total load for year (tons).....								706,187	

SACRAMENTO RIVER BASIN--Continued
 11-3785. SACRAMENTO RIVER AT RED BLUFF, CALIF.--Continued

Particle size analyses of suspended sediment, water Year October 1960 to September 1961
 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
 P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Samp- ling point	Water tem- per- ature (°F)	Discharges (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Dec. 1, 1960.....	1245		51	65,900	918							44	61	90	99	100		V
Jan. 30, 1961.....	0800		48	21,900	853							91	95	99	100	100		V
Jan. 31.....	1700		50	47,700	1,050							70	80	92	100			V
Feb. 1.....	0800		50	23,200	431							90	90	95	99	100		V
Feb. 2.....	1700		52	35,000	1,270							86	92	99	100			V
Feb. 11.....	1700		50	38,000	782							80	87	98	100			V

SACRAMENTO RIVER BASIN--Continued

11-3788. RED BANK CREEK NEAR RED BLUFF, CALIF.

LOCATION.--At gaging station on road bridge, 0.1 mile downstream from unnamed tributary, 1.8 miles southeast of Red Bank, and approximately 13 miles west of Red Bluff, Tehama County.
 DRAINAGE AREA.--93.5 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1959 to September 1961.

REMARKS.--No flow during summer months.

Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Dec. 5, 1960.....	7.6	15		50	25	17	0.8	184	0	63	30	0.0	4.9	0.0	297	0.40		228	77	0.5	517
Jan. 3, 1961.....	2.7	11		61	29	19	.5	234	7	72	30	.0	1.6	.1	346	.47		271	68	.5	578
Feb. 15.....	49	17		48	22	14	.2	204	8	47	6.0	.1	1.9	.1	264	.36		210	30	.4	432
Mar. 2.....	11.7	--		--	--	17	--	215	7	--	10	--	--	--	--	--		226	38	.5	475
Apr. 10.....	6.9	--		--	--	19	--	253	6	--	10	--	--	--	--	--		254	37	.5	522
May 1.....	3.0	20	0.00	47	29	18	.9	236	0	55	12	.0	.0	.0	298	.41		235	41	.5	496

SACRAMENTO RIVER BASIN--Continued
11-3790. ANTELOPE CREEK NEAR RED BLUFF, CALIF.

LOCATION.--At gaging station, in Rio De Los Berrendos Grant, 1.8 miles upstream from diversion dam of Los Molinos Mutual Water Co., 6.5 miles east of Red Bluff, Tehama County, and 9.7 miles upstream from mouth.

DRAINAGE AREA.--124 square miles.

RECORDS AVAILABLE.--October 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium, sodium	Non-carbonate	
Oct. 11, 1960.....	34	--	--	--	--	10	--	89	0	--	10	--	--	0.1	--	--	65	0	0.5	167 8.0
Nov. 2.....	34	--	--	--	--	11	--	87	0	--	8.0	--	--	.2	--	--	64	0	.6	169 7.9
Dec. 3.....	34	--	--	--	--	11	--	85	0	--	7.2	--	--	.0	--	--	59	0	.6	156 7.9
Jan. 3, 1961.....	45	--	--	--	--	10.6	--	85	0	--	7.2	--	--	.0	--	--	59	0	.6	156 7.9
Feb. 16.....	300	--	--	--	--	3.8	--	47	0	--	1.5	--	--	.1	--	--	38	0	.3	84 7.9
Mar. 15.....	510	--	--	--	--	3.1	--	45	0	--	1.8	--	--	.1	--	--	33	0	.2	75 7.6
Apr. 11.....	100	--	--	--	--	6.4	--	56	0	--	4.9	--	--	.1	--	--	42	0	.4	101 8.1
May 2.....	91	29	0.00	9.2	4.1	7.6	1.0	58	0	0.0	5.5	0.1	0.0	.0	86	0.12	40	0	.5	107 7.9
June 1.....	54	--	--	--	--	11.3	--	82	0	--	8.2	--	--	.1	--	--	52	0	.6	156 8.1
July 7.....	33	--	--	--	--	13	--	81	0	--	8.5	--	--	.1	--	--	55	0	.6	156 8.1
Aug. 8.....	29	--	--	--	--	13	--	82	0	--	10	--	--	.2	--	--	57	0	.8	163 8.4
Sept. 14.....	29	41	--	13	6.7	11	1.4	86	1	.0	11	.1	.2	.1	128	.17	60	0	.6	169 8.3

SACRAMENTO RIVER BASIN--Continued

11-3795. ELDER CREEK NEAR PASKENTA, CALIF.

LOCATION.--At gaging station, 2.5 miles downstream from South Fork, 8 miles northeast of Flourney, and 11 miles north of Paskenta, Tehama County.
 DRAINAGE AREA.--85.8 square miles.
 RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)		
															Parts per million	Tons per acre-foot	Tons per day					
Oct. 11, 1960.....	2.1	--	--	--	--	130	--	178	6	--	293	--	--	0.2	--	--	--	308	152	3.2	1,250	8.3
Nov. 1.....	2.2	--	--	--	--	117	--	199	0	--	229	--	--	.1	--	--	--	274	111	3.1	1,070	8.2
Dec. 5.....	31	--	--	--	--	23	--	177	6	--	45	--	--	.1	--	--	--	188	33	.7	462	8.4
Jan. 2, 1961.....	17	--	--	--	--	23	--	194	2	--	40	--	--	.0	--	--	--	192	30	.7	467	8.3
Feb. 15.....	186	--	--	--	--	8.5	--	158	2	--	6.5	--	--	.0	--	--	--	134	1	.3	274	8.4
Mar. 2.....	50	--	--	--	--	13	--	165	8	--	19	--	--	.2	--	--	--	164	16	.4	349	8.6
Apr. 10.....	64	--	--	--	--	9.7	--	128	8	--	12	--	--	.0	--	--	--	127	9	.4	266	8.6
May 1.....	44	14	0.00	26	19	13	0.8	145	6	9.8	18	0.2	0.0	.0	--	0.24	142	13	.5	312	8.4	
June 7.....	20	--	--	--	--	19	--	169	1	--	33	--	--	.0	--	--	--	164	24	.6	387	8.5
July 5.....	5.0	--	--	--	--	45	--	148	6	--	102	--	--	.1	--	--	--	183	52	1.4	586	8.5
Aug. 9.....	3.7	--	--	--	--	76	--	185	0	--	169	--	--	.2	--	--	--	216	64	2.3	803	8.2
Sept. 6.....	.9	14	--	49	39	127	1.8	147	3	8.0	308	.0	.4	.2	622	.85	--	283	58	3.3	1,250	8.3

SACRAMENTO RIVER BASIN--Continued

11-3805. ELDER CREEK AT GERBER, CALIF.

LOCATION.--In Saucos Grant, at U.S. Highway 99W bridge, 1,200 feet upstream from gaging station, 1.2 miles west of Gerber, Tehama County, and 3.7 miles upstream from mouth.

DRAINAGE AREA.--142 square miles.

RECORDS AVAILABLE.--Chemical analyses: January 1959 to September 1961.

REMARKS.--No flow during summer months.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (SO ₂)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate			
Dec. 6, 1960.....	a27	17		35	25	24	0.9	171	5	23	48	0.0	2.2	264	0.36		189	41	0.8	472	8.4
Jan. 3, 1961.....	9.2					20		197	0		39		.1				196	34	.6	462	8.0
Feb. 16.....	a183					16	9.2	142	1	8.5			.0				117	0	.4	281	8.3
Mar. 14.....	41							182	4	22			.1				170	14	.5	380	8.5
Apr. 11.....	50					11		141	5	14			.1				133	9	.4	284	8.4
May 2.....	38					17	.8	143	5	12		.1	.0	197	.27		151	12	.5	399	8.4
June 7.....	12		0.00	30	19	17		195	4	30			.1				190	24	.5	394	8.5
July 7.....	.2					20		264	5	31			.1				242	17	.6	513	8.3

a Instantaneous discharge.

SACRAMENTO RIVER BASIN--Continued

11-3816.2. MILL CREEK AT MOUTH, NEAR LOS MOLINOS, CALIF.

LOCATION.--At bridge on U.S. Highway 99, 0.8 mile upstream from confluence with Sacramento River, and 4.7 miles downstream from gaging station near Los Molinos, Tehama County.
 DRAINAGE AREA.--34 square miles upstream from gaging station.
 RECORDS AVAILABLE.--Chemical analyses given October 1943 to September 1961.
 REMARKS.--Records of discharge are given for Mill Creek near Los Molinos. Considerable diversion between gaging station and sampling point.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium, silum	Non-carbonate			
Oct. 11, 1960.....	98	--	--	--	--	20	--	63	--	26	--	--	0.6	--	--	--	62	10	1.1	229	7.8
Nov. 2.....	171	--	--	--	--	18	--	67	--	22	--	--	1.0	--	--	--	52	5	1.8	215	7.8
Dec. 3.....	170	--	--	--	--	14	--	60	--	16	--	--	1.5	--	--	--	52	3	1.8	174	7.9
Jan. 3, 1961.....	130	--	--	--	--	18	--	62	--	17	--	--	1.5	--	--	--	59	8	1.0	191	8.0
Feb. 16.....	472	--	--	--	--	7.1	--	47	--	7.2	--	--	2.2	--	--	--	33	0	1.0	112	7.9
Mar. 15.....	961	--	--	--	--	8.1	--	51	--	7.5	--	--	2.2	--	--	--	38	0	1.0	117	7.7
Apr. 11.....	322	--	--	--	--	11	--	43	--	8.5	--	--	3	--	--	--	35	0	1.0	122	7.8
May 2.....	291	29	0.00	9.6	3.4	10	1.6	39	13	9.5	0.2	0.0	3	96	0.13	38	6	0.7	125	7.8	
June 6.....	272	--	--	--	--	8.6	--	32	13	8.2	--	--	2	--	--	35	9	0.6	118	7.7	
July 6.....	181	--	--	--	--	11	--	43	--	10	--	--	3	--	--	46	11	0.7	153	7.7	
Aug. 8.....	133	--	--	--	--	14	--	64	--	18	--	--	5	--	--	64	12	0.8	199	8.0	
Sept. 14.....	91	37	--	22	8.5	17	3.2	98	18	20	1	2	6	175	24	90	10	0.8	261	8.0	

SACRAMENTO RIVER BASIN--Continued
11-3820. THOMES CREEK AT PASKENTA, CALIF.

LOCATION.--At gaging station, 0.25 mile upstream from Digger Creek, and 0.3 mile upstream from highway bridge at Paskenta, Tehama County.
DRAINAGE AREA.--188 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbocationate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 10, 1960.....	4.1	--	--	--	--	20	--	122	5	--	41	--	--	0.2	--	--	--	188	80	0.6	453
Nov. 1.....	4.1	--	--	--	--	23	--	136	0	--	42	--	--	.2	--	--	--	180	68	.7	443
Dec. 5.....	105	--	--	--	--	6.2	--	88	0	--	8.0	--	--	.1	--	--	--	92	20	.3	196
Jan. 2, 1961.....	772	--	--	--	--	6.3	--	91	0	--	4.5	--	--	.1	--	--	--	85	10	.3	187
Feb. 15.....	798	--	--	--	--	3.4	--	76	0	--	.5	--	--	.0	--	--	--	64	12	.2	135
Mar. 2.....	200	--	--	--	--	5.7	--	94	0	--	2.2	--	--	.0	--	--	--	85	8	.3	165
Apr. 10.....	330	--	--	--	--	3.3	--	68	0	--	2.6	--	--	.0	--	--	--	64	8	.2	129
May 1.....	369	8.2	0.03	17	3.0	3.6	0.7	66	0	7.2	2.6	0.2	0.0	.0	73	0.10	0.2	53	1	.2	125
June 7.....	158	--	--	--	--	3.5	--	70	0	--	2.6	--	--	.0	--	--	--	68	11	.2	140
July 5.....	20	--	--	--	--	7.9	--	114	3	--	9.5	--	--	.1	--	--	--	115	17	.3	253
Aug. 9.....	10	--	--	--	--	11	--	133	0	--	19	--	--	.1	--	--	--	145	36	.4	328
Sept. 6.....	2.0	8.9	--	4.6	14	17	1.3	159	0	32	33	.0	.0	.2	230	.31	.6	172	42	.6	403

SACRAMENTO RIVER BASIN--Continued
11-3821. THOMES CREEK NEAR MOUTH, NEAR CORNING, CALIF.

LOCATION --At U. S. Highway 99W bridge, 2.6 miles upstream from mouth, and 3.5 miles north of Corning, Tehama County.
RECORDS AVAILABLE.--Chemical analyses: January 1959 to September 1961.
REMARKS. No discharge records available. No flow during summer months.

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Dec. 6, 1960.....					7.0		112	0		7.2			0.0				116	24	0.3	246 8.2
Jan. 3, 1961.....					5.7		117	0		3.5			.1				111	15	.2	239 8.1
Feb. 16.....					3.8		84	0		2.8			.1				78	9	.2	165 8.0
Mar. 14.....					5.5		108	2		4.0			.0				103	11	.2	222 8.3
Apr. 11.....					3.7		86	0		3.5			.0				81	10	.2	166 8.2
May 2.....					3.8	0.6	84	0	11	3.0	0.2	0.0	.0	99	0.13		79	10	.2	161 8.0
June 7.....	11		0.00	23	5.2		113	0		3.8			.0				95	12	.2	188 8.2
July 7.....					6.1		139	0		4.5			.1				125	11	.2	261 8.2
Aug. 8.....					5.9		141	3		6.5			.1				135	14	.2	282 8.4

SACRAMENTO RIVER BASIN--Continued
11-3838. SACRAMENTO RIVER NEAR HAMILTON CITY, CALIF.

LOCATION.--At gaging station, on State Highway 32 bridge, 1.3 miles northeast of Hamilton City, Glenn County, and 2.4 miles upstream from Pine Creek.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.
REMARKS.--Records of discharge given in State of California Bulletin No. 23-61 for Sacramento River at Hamilton City.

Chemical analyses, in parts per million, water year October 1960 to September 1961																						
Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Po- tas- sium (K)	Bi- car- bon- ate (HCO ₃)	Car- bon- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Specific con- ductance (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Cal- cium, Mag- ne- sium	Non-car- bon- ate			
Oct. 10, 1960.....	5,406	--	--	11	4.7	7.3	--	67	--	--	3.5	--	--	0.0	--	--	--	47	0	0.5	128	7.9
Nov. 1.....	4,928	--	--	--	--	7.6	--	69	--	--	4.8	--	--	0.0	--	--	--	49	0	0.5	130	8.1
Dec. 5.....	11,660	--	--	--	--	7.1	--	87	--	--	5.5	--	--	.1	--	--	--	60	0	0.4	140	7.3
Jan. 2, 1961.....	5,260	--	--	--	--	8.3	--	80	--	--	5.0	--	--	0.0	--	--	--	61	0	0.5	149	7.7
Feb. 15.....	24,770	--	--	--	--	8.0	--	66	--	--	2.2	--	--	.1	--	--	--	53	0	0.4	127	8.0
Mar. 2.....	15,110	--	--	--	--	8.0	--	74	--	--	2.2	--	--	0.0	--	--	--	53	0	0.5	137	7.9
Apr. 10.....	7,986	--	--	--	--	6.6	--	71	--	--	3.5	--	--	0.0	--	--	--	53	0	0.4	135	8.0
May 1.....	7,252	22	0.06	11	5.7	7.2	0.8	64	--	8.8	2.6	0.2	0.0	0.0	90	0.12	--	51	0	0.4	131	7.7
June 8.....	7,254	--	--	--	--	7.4	--	64	--	--	3.1	--	--	0.0	--	--	--	54	2	0.4	128	7.9
July 5.....	8,102	--	--	--	--	6.8	--	70	--	--	1.9	--	--	0.0	--	--	--	47	0	0.4	123	8.0
Aug. 9.....	8,651	--	--	--	--	6.4	--	64	--	--	2.5	--	--	0.0	--	--	--	46	0	0.4	119	7.7
Sept. 7.....	6,131	26	--	11	5.2	6.3	1.1	65	--	5.0	3.0	.1	.5	.0	90	.12	--	49	0	0.4	123	7.9

Chemical analyses, in parts per million, water year October 1960 to September 1961

SACRAMENTO RIVER BASIN--Continued

11-3840. BIG CHICO CREEK NEAR CHICO, CALIF.

LOCATION.--At gaging station, in Arroyo Chico Grant, 1.8 miles upstream from golf clubhouse in Bidwell Park, 2.6 miles upstream from Lindo Channel, and 7 miles northeast of Chico, Butte County.
 DRAINAGE AREA.--67.9 square miles.
 RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Chemical analyses, in parts per million, water year 1960 to September 1961																						
Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 10, 1960.....	23	---	---	---	---	13	---	102	0	---	14	---	---	0.1	---	---	---	74	0	0.7	203	8.1
Nov. 1.....	23	---	---	---	---	16	---	113	0	---	8.5	---	---	.3	---	---	---	76	0	.8	217	8.0
Dec. 5.....	122	---	---	---	---	6.2	---	57	0	---	4.8	---	---	.0	---	---	---	43	0	.4	109	7.8
Jan. 2, 1961.....	39	---	---	---	---	13	---	52	0	---	7.5	---	---	.2	---	---	---	74	31	.6	181	7.9
Feb. 14.....	284	---	---	---	---	3.3	---	49	0	---	2.0	---	---	.1	---	---	---	38	0	.2	91	7.9
Mar. 3.....	63	---	---	---	---	7.4	---	77	0	---	4.0	---	---	.1	---	---	---	58	0	.4	149	8.2
Apr. 10.....	82	---	---	---	---	7.9	---	72	0	---	3.0	---	---	.1	---	---	---	53	0	.5	135	8.1
May 1.....	73	33	0.00	10	6.6	8.3	2.2	75	0	3.0	5.8	0.1	0.4	.0	106	0.14	52	0	.5	139	8.1	
June 8.....	39	---	---	---	---	12	---	95	0	---	10	---	---	.1	---	---	---	68	0	.6	182	8.2
July 6.....	27	---	---	---	---	16	---	106	0	---	12	---	---	.1	---	---	---	74	0	.8	209	8.0
Aug. 9.....	22	---	---	---	---	14	---	105	2	---	14	---	---	.3	---	---	---	78	0	.7	210	8.5
Sept. 7.....	20	39	---	17	8.6	17	1.1	113	0	3.2	14	.1	3.9	.1	160	.22	---	78	0	.8	223	8.2

SACRAMENTO RIVER BASIN--Continued
11-3842. BIG CHICO CREEK AT CHICO, CALIF.

LOCATION.--At gaging station, at intersection of Bidwell Way and Rose Avenue, and approximately 1 mile west of Chico, Butte County.
RECORDS AVAILABLE.--Chemical analyses: January 1959 to September 1961.
REMARKS.--Records of discharge given in State of California Bulletin No. 23-61.

Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 10, 1960.....	8.2					13		102			12			0.1				74	0	0.7	203	8.1
Nov. 1.....	4.5					16		111			9.5			.2				80	0	.8	223	8.0
Dec. 5.....	116					6.2		58			4.2			.1				44	0	.4	110	7.9
Jan. 2, 1961.....	23					11		100			8.0			.1				70	0	.6	182	7.9
Feb. 14.....	76					4.1		49			2.8			.1				40	0	.3	99	8.0
Mar. 3.....	54					8.1		77			4.4			.2				61	0	.4	152	7.9
Apr. 10.....	74					8.5		74			5.0			.1				54	0	.5	139	7.8
May 1.....	64	34	0.00	11	6.0	9.6	0.5	73		3.0	4.8	0.1	0.4	.1	106	0.14		52	0	.6	137	7.9
June 7.....	14					11		95			9.5			.0				72	0	.6	174	8.1
July 5.....	3.3					15		106			12			.2				77	0	.7	208	8.2

Chemical analyses, in parts per million, water year October 1960 to September 1961

SACRAMENTO RIVER BASIN--Continued

11-3880. STONY CREEK AT BLACK BUTTE DAMSITE, NEAR ORLAND, CALIF.
 LOCATION.--At gaging station, 120 feet downstream from diversion dam, and 8.7 miles northwest of Orland, Glenn County.
 DRAINAGE AREA.--1,000 square miles.
 RECORDS AVAILABLE.--Chemical analyses: October 1957 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 10, 1960.....	228	--	--	--	--	15	--	169	0	16	--	--	0.3	--	--	--	147	8	0.5	334
Nov. 1.....	28	--	--	--	--	25	--	194	5	28	--	--	0.5	--	--	--	178	11	.8	430
Dec. 5.....	164	13	--	--	15	23	0.9	131	4	42	0.0	1.2	0	251	0.34	--	178	48	.7	453
Jan. 1, 1961.....	184	11	--	--	13	20	0.5	198	4	33	0.3	0.3	0.2	242	.33	--	173	39	.7	453
Feb. 15.....	808	12	--	--	8.8	17	2.2	149	0	34	.1	.4	.1	134	.18	--	163	23	.5	223
Mar. 2.....	188	--	--	--	--	17	--	149	1	20	--	--	0	--	--	--	147	23	.6	348
Apr. 10.....	233	--	--	--	--	13	--	118	0	14	--	--	.1	--	--	--	110	17	.5	238
May 1.....	155	8.9	0.02	--	9.0	13	.6	122	0	13	.2	0	.1	146	.20	--	107	7	.6	261
June 7.....	72	--	--	--	--	14	--	135	0	16	--	--	.2	--	--	--	123	12	.6	286
July 5.....	161	--	--	--	--	16	--	134	1	16	--	--	.2	--	--	--	113	1	.7	278
Aug. 9.....	102	--	--	--	--	15	--	152	0	15	--	--	.3	--	--	--	123	0	.6	293
Sept. 6.....	114	11	--	30	13	15	.9	157	2	16	.1	.4	.2	176	.24	--	130	0	.6	310

a Instantaneous discharge.

SACRAMENTO RIVER BASIN--Continued

11-3885. STONY CREEK NEAR HAMILTON CITY, CALIF.

LOCATION --At gaging station, in Capay Grant, 2.3 miles southwest of Hamilton City, 8 miles upstream from mouth, and 8 miles east of Orland, Glenn County.

DRAINAGE AREA --764 square miles

RECORDS AVAILABLE --Chemical analyses: October 1953 to September 1981.

REMARKS --No flow during summer months.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃		Soil adsorption ratio	Specific conductance (micro-mhos at 25 C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Jan. 2, 1981.....	18					18		170	0		29			0.1				185	26	0.6	402
Feb. 2.....	887					13		129	0		16							149	16		283
Mar. 2.....	178					18		153	1		20			.1				149	21	.6	353
Apr. 10.....	141					13		133	1		16			.2				121	10	.5	288
May 1.....	53	6.2	0.01	33	12	14	0.8	136	5	14	18	0.2	0.0	.1	168	0.23		131	11	.5	311
June 8.....	1.2					17		149	4		18			.1				140	11	.6	329

SACRAMENTO RIVER BASIN--Continued

11-3890. SACRAMENTO RIVER AT BUTTE CITY, CALIF.

LOCATION.--At highway bridge downstream from gaging station and 0.5 mile south of Butte City, Glenn County.

RECORDS AVAILABLE.--Chemical analyses: May 1955 to September 1961.

Water temperatures: May 1955 to September 1958, October 1959 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 123 ppm Dec. 8-16; minimum, 86 ppm Dec. 17-20.

Specific conductance: Maximum, 44 ppm Nov. 26-28; minimum, 29 ppm Jan. 26-28.

Water temperatures: Maximum, 66 ppm Jan. 26-28; minimum, 43 ppm Dec. 16-18, 1959.

Hardness: Maximum, 150 ppm Mar. 1-4, 1960; minimum, 72 ppm Feb. 16-18, 1959.

EXTREMES, 1955-61.--Dissolved solids: Maximum, 150 ppm Mar. 1-4, 1960; minimum, 72 ppm Feb. 16-18, 1959.

Specific conductance: Maximum daily, 236 micromhos Mar. 3, 1960; minimum daily, 69 micromhos Dec. 2, 1960.

Water temperatures: Maximum (1955-56, 1959-61), 75°F June 2, 3, 5, 7, 1960; minimum (1955-57, 1959-61), freezing point Jan. 2-5, 7, 1960.

REMARKS.--Records of specific conductance of daily samples available in district office at Sacramento, Calif.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Boron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate	
Oct. 1-10, 1960...	5,733	27	0.00	12	4.9	8.0	1.7	72		5.0	3.0	0.1	1.2	a 98	0.13	50	0	0.5
Oct. 11-20, 1960...	5,368	26	.00	12	5.1	8.1	1.4	65		7.0	6.8	.2	1.2	110	.15	51	0	.5
Oct. 21-31, 1960...	5,170	28	.00	12	5.6	8.1	1.3	74		5.0	3.0	.2	.5	108	.15	53	0	.5
Nov. 1-7, 1960...	5,273	30	.00	12	5.8	8.0	1.7	76		5.0	5.2	.2	.7	98	.13	54	0	.5
Nov. 8-15, 1960...	6,489	29	.00	13	4.7	6.4	1.9	74		5.0	4.5	.2	1.0	108	.15	52	0	.5
Nov. 16-25, 1960...	5,700	31	.01	12	6.8	9.0	1.9	80		7.0	4.5	.2	1.1	118	.16	58	0	.5
Nov. 26-28, 1960...	14,160	25	.08	9.6	4.9	6.7	1.8	64		5.0	2.5	.3	2.5	a 90	.12	44	0	.4
Nov. 29-30, 1960...	6,760	26	.03	12	5.8	8.0	2.1	65		8.0	6.0	-.1	1.1	107	.13	54	0	.5
Dec. 1-6, 1960...	18,195	32	.04	12	8.4	9.1	1.7	85		10	5.8	.3	1.4	132	.17	54	0	.5
Dec. 9-16, 1960...	6,195	32	.04	12	4.1	7.9	1.0	58		7.0	4.2	.3	1.4	a 86	.12	47	0	.5
Dec. 17-20, 1960...	14,620	19	.19	12	4.1	7.9	1.0	58		7.0	4.2	.3	1.4	a 86	.12	47	0	.5
Dec. 21-31, 1960...	7,322	30	.05	14	6.6	8.4	1.3	74		9.0	5.3	.2	1.0	a 112	.15	62	1	.5

Jan. 1-9, 1961....	6,013	27	.06	13	8.5	9.1	9.1	1.8	.1	.3	0.1	116	.16	1,883	68	0	.5	159	7.7
Jan. 10-19.....	5,899	28	.02	13	7.1	9.8	1.6	4.6	.1	.4	.0	121	.16	1,930	61	0	.5	161	7.9
Jan. 20-29.....	6,378	28	.04	14	6.3	9.8	1.6	4.8	.2	.6	.0	116	.16	2,000	81	0	.6	164	8.1
Jan. 30, 31,																			
Feb. 1-3.....	36,400	19	.19	11	5.7	6.0	1.3	3.5	.1	1.3	.1	95	.13	9,850	51	4	.4	127	7.1
Feb. 4-9.....	17,800	24	.10	11	6.3	7.3	1.0	3.2	.0	1.9	.2	164	.13	5,090	51	4	.4	154	7.3
Feb. 10-19.....	31,040	24	.13	12	5.1	6.1	1.0	3.0	.0	.9	.1	91	.12	7,630	51	0	.4	126	7.6
Feb. 20-28.....	20,010	26	.06	12	6.3	7.7	1.3	7.2	.0	.7	.1	100	.14	5,400	56	0	.4	142	7.9
Mar. 1-9.....	17,000	28	.07	12	6.3	8.5	1.4	7.0	.0	.9	.1	106	.14	4,870	56	0	.5	144	7.7
Mar. 10-20.....	21,350	27	.12	12	5.4	7.9	1.4	6.9	.1	1.0	.1	88	.12	5,070	52	0	.5	132	7.8
Mar. 21-31.....	19,800	26	.13	11	5.5	7.3	1.0	6.0	.1	1.0	.1	87	.12	4,650	50	0	.5	130	7.6
Apr. 1-10.....	11,740	23	.02	12	6.2	8.4	1.4	7.0	.0	.2	.1	108	.15	3,420	56	0	.5	146	7.7
Apr. 11-20.....	7,482	25	.03	13	5.6	8.2	1.1	7.3	.0	.2	.1	111	.15	2,240	57	0	.5	149	7.8
Apr. 21-30.....	7,224	25	.03	12	6.1	8.2	1.1	7.0	.0	.5	.0	94	.13	1,830	55	0	.5	141	8.1
May 1-10.....	7,181	24	.00	12	6.6	7.5	1.3	7.2	.0	.3	.0	104	.14	2,020	57	0	.4	141	7.6
May 11-20.....	6,993	25	.00	13	6.4	7.6	1.2	7.0	.1	.9	.0	103	.14	1,940	59	2	.4	141	7.8
May 21-31.....	6,629	28	.00	13	5.7	7.6	1.2	7.2	.0	.5	.0	102	.14	1,830	56	0	.4	141	7.8
June 1-10.....	7,639	28	.00	12	5.8	7.0	1.3	7.1	.0	.4	.1	105	.14	2,170	54	0	.4	137	8.0
June 11-20.....	7,401	27	.00	12	5.6	7.1	1.4	7.1	.0	.5	.1	102	.14	2,040	53	0	.4	139	7.9
June 21-30.....	8,150	29	.00	12	4.4	7.9	1.3	6.9	.1	.3	.0	98	.13	2,170	52	0	.4	133	7.9
July 1-10.....	8,322	29	.00	12	4.9	7.0	1.2	6.7	.1	.3	.0	96	.13	2,080	50	0	.4	130	8.0
July 11-20.....	8,309	29	.00	11	5.1	7.0	1.3	6.7	.1	.2	.1	91	.13	2,040	48	0	.4	128	7.7
July 21-31.....	8,669	25	.00	12	4.1	7.0	1.2	6.7	.0	.1	.0	91	.12	2,130	47	0	.4	126	7.8
Aug. 1-10.....	8,603	26	.00	11	5.2	6.0	1.2	6.9	.0	.6	.0	101	.14	2,350	49	0	.4	129	7.8
Aug. 11-20.....	8,622	27	.00	10	5.3	5.9	1.2	7.1	.1	.5	.0	101	.14	2,350	51	0	.4	129	7.7
Aug. 21-31.....	7,746	27	.00	11	5.7	5.9	1.2	7.1	.1	.5	.0	96	.13	2,010	51	0	.4	129	7.8
Sept. 1-16.....	6,474	26	.00	12	5.6	6.6	.8	7.4	.2	.3	.0	103	.14	1,800	53	0	.4	136	7.3
Sept. 17-30.....	6,180	29	.00	12	5.6	6.6	.9	7.4	.1	.2	.0	99	.13	1,650	53	0	.4	137	7.6
Weighted average	10,150	26	0.06	12	5.7	7.5	1.3	7.0	0.1	0.8	0.1	100	0.14	2,740	54	0	0.4	138	--

a Calculated from determined constituents.

SACRAMENTO RIVER BASIN--Continued
11-3890. SACRAMENTO RIVER AT BUTTE CITY, CALIF.--Continued

Temperature (°F) of water, water year October 1960 to September 1961

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

SACRAMENTO RIVER BASIN--Continued

11-3995. SACRAMENTO RIVER AT COLUSA, CALIF.

LOCATION.--At gaging station, at north end of Jimeno Grant, downstream from highway bridge at Colusa, Colusa County, at mile 89.4 upstream from Sacramento.
 RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate			
Oct. 12, 1960.....	5,560	--	--	--	--	6.9	--	71	--	--	3.0	--	--	0.2	--	--	--	54	0	0.4	134	8.0
Nov. 2.....	5,060	--	--	--	--	8.2	--	74	--	--	4.9	--	--	.1	--	--	--	56	0	.5	141	8.0
Dec. 6.....	10,500	--	--	--	--	7.7	--	64	--	--	7.0	--	--	.1	--	--	--	63	11	.4	146	7.7
Jan. 3, 1961.....	6,060	--	--	--	--	9.0	--	80	--	--	4.5	--	--	.0	--	--	--	62	0	.5	162	7.4
Feb. 16.....	27,900	--	--	--	--	6.6	--	67	--	--	3.0	--	--	.0	--	--	--	56	1	.4	140	7.9
Mar. 2.....	17,600	--	--	--	--	9.8	--	79	--	--	3.2	--	--	.0	--	--	--	55	0	.6	150	7.9
Apr. 11.....	8,970	--	--	--	--	6.9	--	77	--	--	3.5	--	--	.0	--	--	--	58	0	.4	146	8.0
May 2.....	6,920	22	0.10	12	6.3	7.5	1.3	77	--	6.2	3.0	0.1	0.0	.1	97	0.13	--	56	0	.5	139	8.0
June 8.....	7,330	--	--	--	--	7.9	--	73	--	--	3.9	--	--	.0	--	--	--	57	0	.3	138	7.9
July 7.....	7,100	--	--	--	--	6.2	--	72	--	--	2.6	--	--	.0	--	--	--	57	0	.4	138	7.9
Aug. 10.....	8,400	--	--	--	--	7.3	--	66	--	--	2.6	--	--	.1	--	--	--	56	0	.4	123	7.9
Sept. 8.....	6,190	26	--	12	5.6	7.1	1.3	71	--	5.0	3.5	.1	.4	.0	98	.13	--	53	0	.4	131	8.0

a Daily mean discharge.

SACRAMENTO RIVER BASIN--Continued

11-3900. BUTTE CREEK NEAR CHICO, CALIF.

LOCATION.--At gaging station, 0.7 mile downstream from Little Butte Creek, and 7.5 miles east of Chico, Butte County.
DRAINAGE AREA.--148 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 10, 1960.....	99	---	---	---	---	3.4	---	68	---	---	2.0	---	---	0.0	---	---	---	52	0	0.2	117	8.0
Nov. 1.....	135	---	---	---	---	4.5	---	64	---	---	---	---	---	0	---	---	50	0	0.3	112	7.7	
Dec. 5.....	312	---	---	---	---	2.9	---	54	---	---	.5	---	---	.1	---	---	40	0	.2	90	7.8	
Jan. 2, 1961.....	186	---	---	---	---	2.2	---	60	---	---	0	---	---	0	---	---	46	0	.1	101	7.8	
Feb. 14.....	588	---	---	---	---	2.2	---	43	---	---	.8	---	---	0	---	---	34	0	.2	79	7.8	
Mar. 3.....	8308	---	---	---	---	2.9	---	53	---	---	0	---	---	0	---	---	36	0	.2	86	8.0	
Apr. 10.....	446	---	---	---	---	2.8	---	41	---	---	.2	---	---	0	---	---	32	0	.2	76	7.9	
May 1.....	446	21	0.00	6.4	3.2	3.3	0.6	45	---	0.0	.5	0.1	0.0	0	57	0.08	29	0	.3	73	7.8	
June 8.....	276	---	---	---	---	2.4	---	48	---	---	.5	---	---	0	---	---	36	0	.2	78	7.8	
July 6.....	179	---	---	---	---	3.4	---	54	---	---	.8	---	---	0	---	---	43	1	.2	95	7.8	
Aug. 9.....	118	---	---	---	---	3.6	---	63	---	---	2.2	---	---	0	---	---	46	0	.2	105	8.2	
Sept. 7.....	118	22	---	12	4.9	4.1	1.1	70	---	.0	---	.1	---	.0	79	.11	---	50	0	.3	114	7.9

a Daily mean discharge.

SACRAMENTO RIVER BASIN--Continued
11-3906. SACRAMENTO RIVER AT BOYER'S BEND, NEAR DUNNIGAN, CALIF.

LOCATION.--On pump pier 1,200 feet downstream from Miller's Landing, 4.1 miles northwest of Kirkville, and 8.6 miles northeast of Dunnigan, Yolo County. RECORDS AVAILABLE.--Chemical analyses: June 1960 to September 1961.

Water temperatures: June 1960 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 125 ppm Oct. 1-10, Jan. 11-20; minimum, 73 ppm Dec. 2-5.

Hardness: Maximum, 68 ppm Jan. 1-10; minimum, 36 ppm Dec. 2-5.

Water specific conductance: Maximum daily, 190 micromhos Dec. 13; minimum daily, 74 micromhos Dec. 3.

Water temperatures: Maximum, 77°F June 16; minimum, 45°F Jan. 3-8, 15.

EXTREMES, 1960-61.--Dissolved solids: Maximum 125 ppm Oct. 1-10, 1960, Jan. 11-20, 1961; minimum, 73 ppm Dec. 2-5, 1960.

Hardness: Maximum, 68 ppm Jan. 1-10; minimum, 36 ppm Dec. 2-5, 1960.

Water specific conductance: Maximum daily, 190 micromhos Dec. 13, 1960; minimum, 74 micromhos Dec. 3, 1960.

Water temperatures: Maximum, 77°F June 16, 1961; minimum, 45°F Jan. 3-8, 15, 1961.

REMARKS.--Records of specific conductance of daily samples available in district office at Sacramento, Calif. Records of discharge given for Sacramento River below Wilkins Slough.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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		Sodium adsorption ratio (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 1-10, 1960.....	5,475	34	0.00	13	6.2	9.7	1.2	85		5.0	3.8	0.0	1.2	0.1	125	0.17	1,850	58	0	0.6	152	7.4
Oct. 11-20.....	5,280	33	0.00	13	6.2	9.7	1.3	80		6.0	4.0	0.0	0.7	0.1	124	0.17	1,770	58	0	0.6	149	7.4
Oct. 21-31.....	5,139	29	0.00	13	6.0	8.9	1.3	80		6.0	3.8	0.0	0.7	0.1	113	0.16	1,580	57	0	0.5	147	7.4
Nov. 1-8.....	5,236	29	0.00	14	5.4	9.4	1.7	82		5.0	3.2	0.0	0.5	0.1	112	0.15	1,580	57	0	0.5	147	7.7
Nov. 9-17.....	6,594	29	0.01	12	6.3	8.1	1.7	78		7.0	4.2	0.1	0.6	0.1	115	0.16	2,050	56	0	0.5	145	7.7
Nov. 18-26.....	6,196	30	0.01	14	6.8	10	2.3	86		6.0	5.8	0.2	1.2	0.1	119	0.16	1,990	63	0	0.6	166	7.6
Nov. 27-29.....	13,630	23	0.09	9.6	4.4	6.2	1.5	48		6.0	3.5	0.3	2.6	0.1	81	0.11	2,980	42	3	0.4	110	7.6
Nov. 30-Dec. 1....	7,990	27	0.03	12	6.3	9.1	1.4	68		9.0	9.0	0.0	1.6	0.1	110	0.15	2,370	56	0	0.5	153	7.2
Dec. 2-5.....	20,500	21	0.15	8.0	3.9	5.1	1.4	40		6.0	6.0	0.0	2.5	0.1	73	0.10	4,040	36	3	0.4	95	7.0
Dec. 6-17.....	8,379	31	0.04	14	7.5	9.3	1.5	80		10	7.5	0.1	2.0	0.0	116	0.16	2,620	66	0	0.5	171	8.2
Dec. 18-21.....	13,900	22	0.09	11	5.0	7.2	1.1	52		9.0	8.5	0.1	2.0	0.0	99	0.13	3,720	48	5	0.4	129	7.2
Dec. 22-31.....	8,012	27	0.03	14	7.1	9.0	1.2	78		9.0	7.5	0.1	1.9	0.0	117	0.16	2,530	64	0	0.5	169	8.1
Jan. 1-10, 1961....	6,501	29	0.03	14	8.1	9.9	0.9	92		9.0	5.0	0.0	0.4	0.0	122	0.17	2,140	68	0	0.5	172	8.2
Jan. 11-20.....	6,537	29	0.03	14	7.8	12	0.9	95		7.2	4.8	0.0	0.4	0.0	125	0.17	2,210	67	0	0.5	178	8.2
Jan. 21-30.....	6,913	28	0.03	14	7.5	12	0.9	93		7.2	5.3	0.0	0.4	0.0	122	0.17	2,280	66	0	0.6	179	7.9
Jan. 31, Feb. 1-6.	23,770	20	0.22	12	4.9	5.9	1.0	58		9.0	3.3	0.0	1.1	0.1	93	0.13	5,970	50	2	0.4	126	7.7
Feb. 7-10.....	16,800	23	0.14	14	6.1	7.6	1.1	74		10	3.8	0.0	1.0	0.1	108	0.15	4,900	60	0	0.4	157	7.5
Feb. 11-18.....	25,340	22	0.15	11	4.7	6.1	0.8	58		7.6	3.0	0.0	0.7	0.1	91	0.12	6,230	47	0	0.4	122	7.7

^a Calculated from determined constituents.

SACRAMENTO RIVER BASIN--Continued

11-3906. SACRAMENTO RIVER AT BOYER S BEND, NEAR DUNNIGAN, CALIF.--Continued
Chemical analyses, in parts per million, water year October 1960 to September 1961--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)	Borate (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Feb. 19-28, 1961..	20,880	25	0.10	13	5.5	7.4	1.1	70		8.0	3.2	0.0	0.4	0.1	100	0.14	5,640	55	0	0.4	142	7.9
Mar. 1-10.....	16,810	29	.08	12	6.8	8.9	1.0	80		6.0	4.0	.1	.7	.1	a108	.14	4,900	58	0	.5	146	7.8
Mar. 11-20.....	20,290	26	.14	11	6.2	7.5	1.0	69		.6	0	.1	.8	.1	92	.13	5,040	53	0	.5	131	7.7
Mar. 21-31.....	20,770	26	.01	12	5.6	7.5	1.0	71		8.0	3.5	.1	.7	.1	105	.14	5,890	53	0	.5	132	7.9
Apr. 1-10.....	12,770	26	.04	12	6.8	7.3	1.1	72		7.0	5.0	.0	.7	.1	104	.14	3,890	58	0	.4	148	8.0
Apr. 11-20.....	7,441	27	.04	14	6.4	9.3	.9	79		7.6	5.2	.0	.4	.0	107	.15	2,150	62	0	.5	156	8.1
Apr. 21-30.....	5,929	26	.04	13	6.3	8.4	.9	74		7.4	6.0	.0	.1	.1	108	.15	1,700	58	0	.5	150	8.1
May 1-10.....	5,684	27	.00	14	6.8	8.0	1.1	76		8.0	4.9	.1	.4	.0	107	.15	1,840	63	1	.4	150	7.9
May 11-20.....	6,206	20	.00	14	6.8	8.0	1.1	78		8.0	5.1	.0	.4	.0	112	.15	1,880	63	0	.4	154	7.9
May 21-31.....	6,881	26	.00	13	6.6	8.3	1.2	72		6.0	5.0	.1	.3	.0	111	.15	1,830	64	0	.5	158	8.0
June 1-10.....	6,981	26	.00	13	6.6	8.3	1.2	72		6.6	4.5	.0	.3	.1	107	.15	2,020	67	0	.5	152	8.1
June 11-20.....	5,684	28	.00	13	6.0	7.8	1.3	75		6.0	4.2	.0	.3	.1	107	.15	1,840	57	0	.5	146	8.1
June 21-30.....	6,133	28	.00	13	4.9	7.2	1.1	72		5.6	4.5	.0	.4	.1	104	.14	1,720	53	0	.4	137	8.0
July 1-10.....	6,316	27	.00	13	5.0	7.7	1.1	72		6.0	4.2	.0	.2	.0	102	.14	1,740	53	0	.5	137	7.7
July 11-20.....	6,357	26	.00	12	5.4	7.1	1.2	70		5.0	3.5	.0	.3	.0	95	.13	1,830	52	0	.4	134	8.1
July 21-31.....	6,678	26	.00	12	5.1	7.1	1.1	70		5.0	3.4	.0	.1	.0	95	.13	1,710	51	0	.4	131	8.0
Aug. 1-10.....	6,972	28	.00	11	6.4	6.5	1.3	73		5.0	3.0	.1	.5	.0	104	.14	1,960	54	0	.4	133	7.9
Aug. 11-20.....	7,045	28	.00	11	6.0	6.5	1.2	74		4.0	3.0	.1	.8	.0	106	.14	2,020	52	0	.4	135	7.9
Aug. 21-31.....	6,443	27	.00	12	6.3	6.8	1.5	79		4.0	3.2	.1	.5	.0	108	.15	1,880	56	0	.4	142	7.6
Sept. 1-10.....	5,721	26	.00	14	5.6	7.6	.9	82		5.0	4.0	.1	.0	.1	104	.14	1,610	58	0	.4	151	7.7
Sept. 11-20.....	6,245	28	.00	14	6.0	9.1	.6	85		4.6	4.0	.2	.3	.0	113	.15	1,910	60	0	.5	154	7.9
Sept. 21-30.....	6,230	37	.00	13	6.1	8.6	1.1	81		3.6	4.4	.2	.3	.0	115	.16	1,930	57	0	.5	150	8.1
Weighted average	9,227	27	0.06	12	6.0	7.9	1.1	73		6.9	4.3	0.1	0.7	0.1	105	0.14	2,620	55	0	0.5	143	--

a Calculated from determined constituents.

SACRAMENTO RIVER BASIN--Continued
 11-3906. SACRAMENTO RIVER AT BOYERS BEND, NEAR DUNHIGAN, CALIF.--Continued
 Temperature (°F) of water, water year October 1960 to September 1961

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

SACRAMENTO RIVER BASIN--Continued

11-3906.5. SACRAMENTO RIVER ABOVE COLUSA TROUGH, AT KNIGHTS LANDING, CALIF.

LOCATION.--Approximately 200 yards upstream from State Highway 24 bridge at Knights Landing, Yolo County, and approximately 0.3 mile upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: July 1960 to September 1961.

REMARKS.--Records of discharge given for Sacramento River at Knights Landing. Considerable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, July 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate			
July 8, 1960.....	7,140	4	--	--	--	9.6	--	82	--	--	5.8	--	--	0.0	--	--	--	59	0	0.5	157	7.8
Aug. 12.....	6,590	--	--	--	--	11	--	80	--	--	6.6	--	--	0	--	--	--	60	0	0.6	158	7.6
Sept. 12.....	6,640	25	0.04	13	7.8	12	1.3	89	--	10	3.9	0.1	0.2	0	116	0.16	--	65	0	0.6	164	7.8
Oct. 15.....	5,860	--	--	--	--	11	--	81	--	--	4.0	--	--	0	--	--	--	62	0	0.6	164	8.0
Nov. 4.....	5,850	--	--	--	--	9.0	--	75	--	--	3.8	--	--	.1	--	--	--	57	0	0.5	144	7.8
Dec. 9.....	10,400	--	--	--	--	9.1	--	76	--	--	8.0	--	--	.1	--	--	--	62	0	0.6	164	7.6
Jan. 4, 1961.....	6,860	--	--	--	--	9.3	--	85	--	--	5.2	--	--	.1	--	--	--	67	0	0.5	170	8.0
Feb. 8.....	15,800	--	--	--	--	9.9	--	60	--	--	4.7	--	--	.1	--	--	--	56	7	0.6	155	7.2
Mar. 13.....	19,800	--	--	--	--	8.1	--	70	--	--	2.3	--	--	.1	--	--	--	52	0	0.5	134	7.9
Apr. 6.....	13,400	--	--	--	--	4.4	--	72	--	--	5.2	--	--	0	--	--	--	60	1	0.2	141	7.7
May 4.....	6,140	23	0.06	14	6.6	11	2.3	79	--	9.4	7.6	.0	.3	0	113	.15	--	62	0	0.6	166	7.9
June 13.....	6,430	--	--	--	--	11	--	86	--	--	5.4	--	--	0	--	--	--	67	0	0.6	176	8.2
July 6.....	6,430	--	--	--	--	9.9	--	75	--	--	5.5	--	--	0	--	--	--	57	0	0.6	153	8.1
Aug. 10.....	8,130	--	--	--	--	11	--	78	--	--	5.2	--	--	.1	--	--	--	59	0	0.6	188	7.9
Sept. 8.....	7,500	24	--	14	8.3	14	1.1	97	--	12	8.0	.1	.3	.1	130	.18	--	69	0	0.7	188	7.9

SACRAMENTO RIVER BASIN--Continued

11-3907. COLUSA TROUGH NEAR COLUSA, CALIF.

LOCATION --At gaging station, 3 miles west of Colusa, Colusa County, on State Highway 20, and 6 miles northeast of Williams.

RECORDS AVAILABLE --Chemical analyses, October 1953, to September 1961.

REMARKS --Records of discharge given in State of California Bulletin No. 23-61 for Colusa Basin Drain at Highway 20. This water is the drainage from Colusa Basin passing down the Back Barrow Pit and entering the Sacramento River just above Knights Landing gaging station.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 12, 1960.....	299	--	--	--	--	37	--	176	--	24	--	--	0.1	--	--	--	133	0	1.4	410
Nov. 2.....	482	--	--	--	--	46	--	185	--	14	--	--	.1	--	--	--	126	0	1.3	436
Dec. 6.....	571	--	--	--	--	89	--	214	--	46	--	--	.3	--	--	--	180	5	2.9	706
Jan. 4, 1961.....	169	--	--	--	--	136	--	308	--	88	--	--	.3	--	--	--	298	45	3.4	1,190
Feb. 16.....	1,028	--	--	--	--	94	--	231	--	60	--	--	.3	--	--	--	176	0	3.1	809
Mar. 2.....	209	--	--	--	--	163	--	302	10	110	--	--	.4	--	--	--	329	65	3.9	1,300
Apr. 12.....	391	--	--	--	--	39	--	146	0	23	--	--	.2	--	--	--	125	5	1.5	416
May 2.....	723	18	0.04	21	16	48	2.6	148	0	24	0.3	1.6	.1	269	0.37	--	119	0	1.9	437
June 8.....	824	--	--	--	--	52	--	170	0	26	--	--	.1	--	--	--	121	0	2.1	454
July 7.....	533	--	--	--	--	42	--	192	0	24	--	--	.2	--	--	--	143	0	1.5	471
Aug. 10.....	988	--	--	--	--	43	--	192	0	22	--	--	.3	--	--	--	136	0	1.6	430
Sept. 7.....	1,197	18	--	26	17	42	1.8	195	0	21	.4	.0	.1	255	.35	--	134	0	1.6	442

SACRAMENTO RIVER BASIN--Continued

11-3911. SACRAMENTO SLOUGH NEAR KNIGHTS LANDING, CALIF.

LOCATION.--At gaging station, on levee near Reclamation District 1,500 pumping plant, 1 mile upstream from mouth, and 5.4 miles southeast of Knights Landing, Yolo County.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

REMARKS.--Records of discharge given in State of California Bulletin No. 23-61 for Sacramento Slough at Sacramento River. This water is entire outflow of the Sutter Bypass area and the Reclamation District 1,500.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	
														Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate		
Oct. 3, 1960.....	357	--	--	--	--	23	--	203	0	24	--	--	0.2	--	--	--	157	0	0.8	399 8.2
Nov. 4.....	496	--	--	--	--	25	--	200	0	19	--	--	.2	--	--	--	149	0	.9	378 8.1
Dec. 9.....	2,697	--	--	--	--	8.6	--	77	0	5.0	--	--	.1	--	--	--	62	0	.5	154 7.6
Jan. 4, 1961.....	331	--	--	--	--	37	--	230	0	48	--	--	.0	--	--	--	195	6	1.2	518 8.2
Mar. 13.....	890	--	--	--	--	19	--	172	0	13	--	--	.1	--	--	--	128	0	.7	318 7.9
May 4.....	875	24	0.04	27	18	22	2.6	178	0	25	0.0	0.4	.1	217	0.30	--	142	0	.8	361 8.0
June 13.....	924	--	--	--	--	32	--	198	0	36	--	--	.0	--	--	--	153	0	1.1	437 7.5
July 6.....	874	--	--	--	--	54	--	227	0	77	--	--	.1	--	--	--	194	8	1.7	627 7.9
Aug. 15.....	789	--	--	--	--	32	--	238	5	25	--	--	.1	--	--	--	176	0	1.0	444 8.4
Sept. 11.....	1,166	30	--	31	19	25	2.0	227	0	14	.1	.5	.0	239	.33	--	157	0	.9	387 8.1

a Estimated daily mean discharge.

SACRAMENTO RIVER BASIN--Continued
11-4015. INDIAN CREEK NEAR CRESCENT MILLS, CALIF.

LOCATION.--At gaging station, 0.8 mile upstream from Dixie Creek, and 1.5 miles south of town of Crescent Mills, Calif.
DRAINAGE AREA (revised).--739 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhm-cmhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 14, 1960.....	17	--	--	--	--	11	--	124	--	--	6.0	--	--	--	--	--	94	0	0.5	223	8.1
Nov. 11, 1960.....	58	--	--	--	--	8.2	--	97	--	--	2.8	--	--	--	--	--	75	0	0.4	182	7.5
Dec. 16, 1960.....	107	--	--	--	--	8.6	--	92	--	--	7.0	--	--	--	--	--	70	0	0.4	187	7.8
Jan. 13, 1961.....	90	--	--	--	--	8.4	--	96	--	--	2.8	--	--	--	--	--	71	0	0.4	160	7.9
Feb. 17, 1961.....	402	--	--	--	--	5.9	--	67	--	--	4	--	--	--	--	--	49	0	0.4	123	7.9
Mar. 10, 1961.....	287	--	--	--	--	7.0	--	73	--	--	4.2	--	--	--	--	--	55	0	0.4	137	7.7
Apr. 13, 1961.....	402	--	--	--	--	7.8	--	55	--	--	1.9	--	--	--	--	--	44	0	0.5	99	7.6
May 12, 1961.....	437	25	0.04	9.6	4.4	3.7	0.7	56	--	3.0	2.2	0.1	0.2	0	77	0.10	42	0	0.2	100	7.4
June 15, 1961.....	95	--	--	--	--	6.9	--	86	--	--	5.9	--	--	--	--	--	61	0	0.4	148	7.3
July 13, 1961.....	11	--	--	--	--	14	--	144	--	--	5.0	--	--	--	--	--	104	0	0.6	253	7.8
Aug. 3, 1961.....	3.9	--	--	--	--	21	--	207	--	--	14	--	--	--	--	--	147	0	0.8	375	7.9
Sept. 6, 1961.....	6.8	31	--	30	9.5	17	1.4	160	--	10	8.5	1.1	0.3	187	0.25	--	114	0	0.7	280	8.2

SACRAMENTO RIVER BASIN--Continued

11--4070. FEATHER RIVER NEAR OROVILLE, CALIF.

LOCATION.--At gaging station, 75 feet upstream from bridge on Feather River Highway, 1.9 miles downstream from North Fork, and 4 miles northeast of Oroville, Butte County.

DRAINAGE AREA (revised).--3,615 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

Water temperatures: October 1953 to September 1954, November 1956 to September 1961.

Sediment records: November 1956 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 78°F Aug. 9; minimum, 37°F on several days during January.

Sediment concentrations: Maximum daily, 236 ppm Jan. 31; minimum daily, 1 ppm on several days during January.

Sediment loads: Maximum daily, 10,300 tons Jan. 31; minimum daily, 4 tons Jan. 14, 1959; minimum, 35°F Dec. 27, 1959.

EXTREMES, 1953-54, 1956-61.--Temperatures: Maximum daily, 81°F Sept. 24, 1952, 1959; minimum, 37°F Dec. 27, 1959.

Sediment concentrations: Maximum daily, 666 ppm Jan. 31, 1952, 1959; minimum daily, 1 ppm on several days in 1961.

Sediment loads (1956-61).--Maximum daily, 365,000 tons Feb. 8, 1960; minimum daily, 4 tons, Jan. 14, 1961.

REMARKS.--Measurement of suspended sediment made at bridge on (revised) Oroville-Chico Highway, 5.2 miles downstream from gaging station. No appreciable inflow between sampling point and gaging station except during periods of heavy rainfall.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Po- tas- sium (K)	Bi- car- bon- ate (HCO ₃)	Car- bon- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		So- dium ad- sorp- tion ratio	Specific con- ductance (micro- mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Cal- cium, Mag- ne- sium	Non-car- bon- ate			
Oct. 14, 1960.....	1,360	---	---	---	---	5.6	---	73	---	---	3.0	---	---	0.1	---	---	---	55	0	0.3	125	7.9
Nov. 11.....	1,440	---	---	---	---	4.9	---	70	---	---	1.2	---	---	0	---	---	---	53	0	0.3	124	7.5
Dec. 16.....	2,960	---	---	---	---	5.2	---	68	---	---	4.9	---	---	0	---	---	---	46	0	0.3	116	7.7
Jan. 17, 1961.....	5,000	---	---	---	---	3.4	---	64	---	---	3.8	---	---	0.1	---	---	---	38	0	0.2	89	8.0
Feb. 1.....	5,000	---	---	---	---	4.4	---	51	---	---	2.4	---	---	0	---	---	---	42	0	0.3	97	7.9
Mar. 10.....	2,640	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Apr. 13.....	4,980	---	---	---	---	3.7	---	41	---	---	2.0	---	---	0	---	---	---	33	0	0.3	73	7.9
May 12.....	5,480	19	0.02	6.0	3.4	2.7	0.6	39	2.0	5.1	0.1	0.1	0	0	53	0.07	29	0	0.2	69	7.7	
June 16.....	2,620	---	---	---	---	3.7	---	58	---	5.6	---	---	---	0	---	---	---	42	0	0.2	99	7.6
July 13.....	2,520	---	---	---	---	4.5	---	61	---	1.5	---	---	---	0.1	---	---	---	46	0	0.3	105	8.0
Aug. 14.....	2,540	---	---	---	---	4.5	---	64	---	2.0	---	---	---	0	---	---	---	48	0	0.3	111	7.8
Sept. 12.....	1,290	12	---	12	5.6	5.3	1.4	74	3.0	3.5	3.1	0.2	0	0	79	0.11	53	0	0.3	128	8.0	

SACRAMENTO RIVER BASIN--Continued

11-4070. FEATHER RIVER NEAR OROVILLE, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961
(Where no concentrations are reported loads are estimated)

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..	1680	--	18	1630	--	13	4510	127	S 2200
2..	1670	3	14	1630	--	13	8560	84	S 2070
3..	1590	--	13	1630	4	18	4950	21	281
4..	1370	--	15	1530	--	17	3580	18	174
5..	1390	4	15	1410	--	15	3180	10	86
6..	1430	--	15	1410	--	15	2960	6	48
7..	1480	--	16	1430	4	15	2880	5	39
8..	1430	--	15	1470	--	16	2810	--	38
9..	1440	3	12	1440	--	12	2760	4	30
10..	1390	--	11	1430	--	12	2880	--	31
11..	1360	--	11	1480	3	12	2890	4	31
12..	1380	4	15	1990	7	38	2840	--	31
13..	1380	--	15	2600	34	S 280	2830	--	31
14..	1370	--	15	3000	33	267	2820	4	30
15..	1360	--	11	2950	11	88	2830	--	31
16..	1350	3	11	2770	6	45	3110	5	42
17..	1350	4	15	2740	--	44	4820	26	S 358
18..	1350	--	15	3590	12	S 126	4860	17	S 236
19..	1350	--	15	3510	--	100	4020	6	65
20..	1350	3	11	3000	6	49	3660	--	49
21..	1350	--	11	2790	--	38	3450	4	37
22..	1340	--	11	2300	--	31	3350	--	36
23..	1350	--	11	2250	5	30	3280	--	27
24..	1430	3	12	2360	--	38	3190	3	26
25..	1650	--	13	3310	100	K 1300	3150	--	26
26..	1670	--	14	5710	129	S 2300	3090	--	25
27..	1690	4	18	3740	12	121	2810	3	23
28..	1640	--	18	3250	--	35	2300	--	19
29..	1630	--	13	2900	3	23	2150	--	23
30..	1630	--	13	2820	--	23	1990	5	27
31..	1630	3	13	--	--	--	1730	--	19
Total	45480	--	425	74070	--	5134	104240	--	6189
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..	1700	--	14	11300	62	S 2080	2600	4	28
2..	1680	2	9	8490	62	S 1480	2400	4	26
3..	1780	--	10	7800	40	842	2420	--	26
4..	1720	--	9	5860	15	237	2520	3	20
5..	1720	2	9	4390	14	166	2460	--	20
6..	1680	--	9	4170	11	124	2900	4	31
7..	1630	--	13	3790	8	82	2700	--	29
8..	1640	4	18	3540	8	76	2540	--	34
9..	1740	--	23	10000	154	S 5360	3180	11	94
10..	1910	--	21	11500	57	S 1890	3090	--	75
11..	1810	2	10	11000	54	S 1700	2940	--	48
12..	1770	--	5	9470	22	563	2720	--	37
13..	1740	--	5	6870	19	352	2740	4	30
14..	1660	1	4	5960	13	209	2980	--	32
15..	1670	--	5	6040	11	179	6560	91	S 1770
16..	1690	--	5	6120	9	149	6020	18	293
17..	1690	1	5	5290	--	100	6130	90	S 1590
18..	1820	--	5	4450	6	72	5110	16	221
19..	1770	--	10	3970	--	64	4480	16	194
20..	1640	2	9	3920	6	64	5580	23	347
21..	1500	--	8	3840	--	52	5270	11	157
22..	1350	--	7	3190	4	34	5190	--	98
23..	1610	2	9	3330	--	27	7900	37	S 837
24..	1320	--	11	3110	3	25	8850	47	S 1200
25..	1820	--	15	2870	--	23	8120	25	S 548
26..	1540	4	17	2690	3	22	7080	16	305
27..	1930	--	16	2870	--	39	7060	20	381
28..	1530	--	12	2560	--	41	6300	12	204
29..	1720	--	23	--	--	--	5620	--	150
30..	3000	15	122	--	--	--	5430	7	103
31..	14000	236	S 10300	--	--	--	5260	--	85
Total	65780	--	10738	158390	--	16052	144150	--	9014

S Computed by subdividing day.

K Computed from estimated-concentration graph and subdividing day.

QUALITY OF SURFACE WATERS, 1961

SACRAMENTO RIVER BASIN--Continued

11-4070. FEATHER RIVER NEAR OROVILLE, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
(Where no concentrations are reported loads are estimated)

(where no concentrations are reported loads are estimates)									
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..	5270	--	85	5060	--	160	4530	--	110
2..	5550	8	120	5310	--	160	4530	--	130
3..	6740	--	280	4740	7	90	4330	10	117
4..	8010	21	454	4790	--	65	3880	--	84
5..	7610	--	370	4330	--	58	3580	--	68
6..	6830	12	221	4680	6	76	3340	6	54
7..	6440	--	160	4620	--	87	2890	--	47
8..	5580	--	110	4300	--	81	3020	--	49
9..	5260	6	85	4170	8	290	2930	6	47
10..	5100	--	83	5780	--	230	2520	--	34
11..	4580	--	74	5780	--	170	2320	5	31
12..	4870	8	105	5490	10	148	2660	4	29
13..	5020	--	110	5350	--	140	2970	--	32
14..	4350	--	82	5090	--	110	2840	--	31
15..	4260	6	69	4790	6	78	2720	4	29
16..	4250	--	69	5160	--	84	2720	--	22
17..	4850	--	92	5140	--	97	2450	--	20
18..	5120	7	97	5170	8	112	2230	3	18
19..	4500	--	61	5460	--	130	2490	--	20
20..	4030	--	54	5340	--	130	2420	--	20
21..	3850	5	52	5020	8	108	2360	3	19
22..	4890	14	185	4850	--	79	2420	--	20
23..	4390	--	140	4510	--	61	2420	--	20
24..	3850	8	83	4260	4	46	2400	4	26
25..	3780	--	61	4300	--	46	2380	--	32
26..	3850	--	62	4180	--	45	2560	--	35
27..	3950	6	64	3560	4	38	2720	5	37
28..	4150	--	67	3450	--	37	2740	--	37
29..	4460	--	80	3420	--	46	2720	--	37
30..	4860	9	118	3690	--	70	2680	5	36
31..	--	--	--	3960	8	86	--	--	--
Total	150250	--	3707	145750	--	2958	86770	--	1291
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..	2680	--	29	2640	--	29	1920	--	21
2..	2660	--	29	2640	--	29	1680	--	18
3..	2660	4	29	2610	4	28	1680	5	23
4..	2660	--	29	2590	--	28	1680	--	23
5..	2660	--	36	2580	--	28	1670	--	23
6..	2650	6	43	2580	4	28	1650	5	22
7..	2660	--	43	2580	--	28	1650	--	22
8..	2640	--	36	2580	--	28	1560	--	17
9..	2600	4	28	2560	5	35	1400	--	15
10..	2560	--	28	2560	--	35	1390	4	15
11..	2560	5	35	2560	--	35	1340	--	14
12..	2560	--	35	2540	5	34	1260	--	14
13..	2560	4	28	2540	--	34	1170	--	13
14..	2550	--	28	2560	--	35	1170	4	13
15..	2540	--	27	2550	--	34	1160	--	13
16..	2560	4	28	2520	6	41	1180	--	13
17..	2530	--	27	2530	--	41	1200	--	13
18..	2540	--	27	2500	--	34	1220	4	13
19..	2520	4	27	2520	4	27	1220	--	13
20..	2540	--	34	2500	--	27	1210	4	13
21..	2530	5	34	2450	--	26	1200	--	10
22..	2540	5	34	2460	4	27	1190	3	10
23..	2560	--	35	2500	--	27	1150	--	9
24..	2560	--	28	2490	4	27	1140	--	9
25..	2570	4	28	2480	6	40	1070	--	9
26..	2580	--	28	2500	--	40	978	3	8
27..	2580	--	35	2500	--	27	970	--	8
28..	2560	5	35	2240	3	18	984	--	8
29..	2600	--	35	2120	--	17	1010	--	8
30..	2600	--	28	2180	--	24	967	4	10
31..	2620	4	28	2080	4	22	--	--	--
Total	80190	--	974	77240	--	933	39069	--	420
Total discharge for year (cfs-days).....									1,171,379
Total load for year (tons).....									57,833

SACRAMENTO RIVER BASIN--Continued

11-4070. FEATHER RIVER NEAR OROVILLE, CALIF.--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;

P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sam- pling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment con- cen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis	
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000		2.000
Jan. 31, 1961.....	1430		49	18,900	405							74	84	93	100			V
Jan. 31.....	1830		47	22,100	282							75	84	90	100			V
Feb. 9.....	1730		49	17,400	302							84	91	97	100			V
Mar. 17.....	0900		46	6,790	171							100	--	--	--			V

SACRAMENTO RIVER BASIN--Continued

11-4215. YUBA RIVER AT MARYSVILLE, CALIF.

LOCATION.--On Simpson Lane Bridge in Marysville, Yuba County, 800 feet upstream from site of former gaging station, and approximately 2 miles upstream at mouth.

DRAINAGE AREA.--1,340 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

REMARKS. No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 3, 1960.....		--		--	--	3.5	--	68	--	3.0	--	--	0.0	--	--		64	8	0.2	134
Nov. 3.....		--		--	--	3.9	--	79	--	1.5	--	--	0	--	--		77	12	.2	169
Dec. 19.....		--		--	--	4.5	--	64	--	2.0	--	--	0	--	--		51	0	.3	113
Jan. 4, 1961.....		--		--	--	2.7	--	56	--	1.2	--	--	0	--	--		48	1	.2	109
Feb. 9.....		--		--	--	3.0	--	53	--	1.5	--	--	.1	--	--		48	1	.2	104
Mar. 14.....		--		--	--	2.2	--	44	--	1.5	--	--	0	--	--		39	3	.2	189
Apr. 5.....		--		--	--	1.1	--	40	--	2.0	--	--	0	--	--		36	3	.1	78
May 4.....		12	0.00	9.1	2.9	2.0	0.4	39	3.6	2.0	0.0	0.0	0	51	0.07		34	2	.2	78
June 12.....		--		--	--	2.1	--	42	--	--	--	--	0	--	--		33	0	.2	76
July 7.....		--		--	--	3.0	--	56	--	1.5	--	--	0	--	--		52	6	.2	118
Aug. 14.....		--		--	--	3.7	--	70	--	2.5	--	--	0	--	--		69	12	.2	146
Sept. 12.....		20		20	6.6	3.3	.5	76	17	2.5	.1	.1	0	107	.15		77	15	.2	166

SACRAMENTO RIVER BASIN--Continued

11-4217. FEATHER RIVER BELOW SHANGHAI BEND, NEAR YUBA CITY, CALIF.

LOCATION.--At gaging station, north of Barry Road, approximately 3 miles west of Olivehurst, and 5 miles south of Yuba City, Sutter County.

RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

REMARKS.--Records of discharge given in State of California Bulletin No. 23-61.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium		
Oct. 3, 1960.....	1,390	--	--	--	--	5.6	--	76	--	3.0	--	--	0.1	--	--	--	60	0	136
Nov. 4.....	1,120	--	--	--	--	5.7	--	79	--	2.0	--	--	--	--	--	--	58	0	140
Dec. 9.....	2,460	--	--	--	--	4.6	--	66	--	--	--	--	1	--	--	--	53	0	119
Jan. 4, 1961.....	3,420	--	--	--	--	4.5	--	64	--	1.0	--	--	0	--	--	--	50	0	116
Feb. 9.....	4,000	--	--	--	--	3.4	--	52	--	1.2	--	--	0	--	--	--	41	0	97
Mar. 13.....	4,280	--	--	--	--	3.7	--	54	--	1.5	--	--	1	--	--	--	41	0	99
Apr. 6.....	10,900	--	--	--	--	1.4	--	40	--	2.0	--	--	0	--	--	--	34	1	76
May 3.....	4,800	14	0.02	9.2	2.9	2.6	0.4	43	3.2	2.1	0.0	0.0	0	55	0.07	--	35	0	82
June 12.....	1,730	--	--	--	--	3.1	--	52	--	1.3	--	--	0	--	--	--	41	0	95
July 7.....	909	--	--	--	--	4.8	--	65	--	2.0	--	--	0	--	--	--	52	0	120
Aug. 15.....	881	--	--	--	--	4.9	--	69	--	--	--	--	0	--	--	--	53	0	126
Sept. 12.....	564	17	--	18	4.9	5.4	1.2	82	6.0	4.8	1	3	0	98	.13	--	65	0	154

a Instantaneous discharge.

SACRAMENTO RIVER BASIN--Continued

11-4240. BEAR RIVER NEAR WHEATLAND, CALIF.

LOCATION: --Near gaging station, at bridge on U.S. Highway 99E, 1 mile southeast of Wheatland, Yuba County, and 6.5 miles downstream from Rock Creek. DRAINAGE AREA: 285 square miles.

RECORDS AVAILABLE: --Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium-Magnesium	Non-carbonate		
Oct. 3, 1960.....	3.8	---	---	---	---	6.5	---	143	0	---	14	---	---	0.0	---	---	155	38	0.2	324	8.2
Nov. 3.....	1.3	---	---	---	---	8.4	---	146	0	---	12	---	---	.1	---	---	157	37	.3	328	8.0
Dec. 8.....	249	---	---	---	---	4.1	---	43	0	---	1.5	---	---	.0	---	---	46	11	.3	109	7.8
Jan. 3, 1961.....	128	---	---	---	---	3.5	---	50	0	---	3.0	---	---	.0	---	---	58	17	.2	128	7.9
Feb. 9.....	385	---	---	---	---	6.2	---	68	0	---	5.0	---	---	.0	---	---	76	20	.3	176	7.8
Mar. 10.....	7.6	---	---	---	---	7.2	---	116	0	---	9.0	---	---	.0	---	---	128	33	.3	278	8.1
Apr. 5.....	105	---	---	---	---	1.7	---	55	0	---	4.0	---	---	.0	---	---	55	10	.1	123	7.9
May 4.....	16	16	0.00	21	8.9	6.8	1.8	90	0	21	5.5	0.1	0.3	.0	125	0.17	89	15	.3	206	8.0
June 13.....	6.0	---	---	---	---	6.6	---	120	0	---	8.8	---	---	.0	---	---	134	29	.3	265	8.2
Sept. 11.....	7.0	19	---	27	15	5.8	.7	119	3	24	13	.0	.0	.0	166	.23	130	28	.2	280	8.4

SACRAMENTO RIVER BASIN--Continued

11-4249. BEAR RIVER NEAR MOUTH, NEAR RIO OSO, CALIF.

LOCATION --At bridge on Feather River Boulevard, 0.3 mile northwest of Rio Oso, Sutter County, and approximately 3 miles upstream from mouth.
 RECORDS AVAILABLE --Chemical analyses: November 1958 to September 1961.

REMARKS --No discharge records available. Stream dry during summer months.

Chemical analyses, in part per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate			
Dec. 19, 1960.....						6.5		78		11			0.0				84	20	0.3	199	7.5
Jan. 4, 1961.....						4.5		63		3.5			0.0				59	7	.3	136	7.6
Feb. 9, 1961.....						7.0		74		3.0			0.0				73	14	.3	185	7.9
Mar. 10, 1961.....						9.6		107		10			0.0				104	16	.4	252	8.0
Apr. 5, 1961.....						2.8		66	24	4.8	0.4	0.3	.1	251	0.34		66	12	.1	147	8.0
May 4, 1961.....	35		0.13	28	16	30	6.5	139		43							134	20	1.1	401	8.0

SACRAMENTO RIVER BASIN--Continued
11-4250. FEATHER RIVER AT NICOLAUS, CALIF.

LOCATION.--At gaging station at highway bridge at Nicolaus, Sutter County, and 2.9 miles downstream from Bear River.
DRAINAGE AREA.--5,920 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: March 1951 to September 1961.
Water temperatures: March 1951 to September 1958, November 1959 to September 1961.
EXTREMES, 1960-61.--Dissolved solids: Maximum, 104 ppm Sept. 11-20; minimum, 59 ppm May 22-31.
Hardness: Maximum, 79 ppm Nov. 23, 24; minimum, 35 ppm Apr. 5.
Specific conductance: Maximum daily, 169 micromhos Nov. 23; minimum daily, 77 micromhos May 22.
Water temperatures: Maximum, 94°F July 21; minimum, freezing point Jan. 3-6.
EXTREMES, 1951-58, 1959-61.--Dissolved solids (1951-55, 1956-58, 1959-61): Maximum, 165 ppm Oct. 8-14, 1957; minimum, 43 ppm May 19-31, 1958.
Hardness (1951-55, 1956-58, 1959-61): Maximum, 114 ppm June 21, 1954; minimum, 22 ppm June 1-3, 8, 10, 1952.
Specific conductance (1951-55, 1956-58, 1959-61): Maximum daily, 291 micromhos July 26, 1958; minimum daily, 50 micromhos May 28, 1952.
Water temperatures: Maximum, 94°F July 21, 1961; minimum, freezing point Jan. 3-6, 1961.
REMARKS.--Records of specific conductance of daily samples available in district office at Sacramento, Calif.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃	Specific conductance (micro-mhos at 25°C)	pH		
														Parts per million	Tons per acre-foot	Tons per day					
Oct. 1-10, 1960...	1,135			14	5.6	6.0		74						--	--	--	58	0	0.3	145	7.4
Oct. 11-20.....	846			14	6.1	6.1		62						94	0.13	215	60	0	0.3	148	7.5
Oct. 21-31.....	1,089			14	6.1	7.4		83						99	.13	216	60	0	0.4	150	7.5
Nov. 1-12.....	1,082			13	6.2	6.1		80						95	.13	278	58	0	0.4	142	8.2
Nov. 13-22.....	3,122			13	5.5	6.2		70						89	.12	750	55	0	0.4	137	7.7
Nov. 23, 24.....	3,050			18	8.3	7.1		78						--	--	--	79	15	0.3	189	7.7
Nov. 25-30.....	4,638			11	5.8	5.8		63						89	.12	1,160	51	0	0.3	127	7.7
Dec. 1-11.....	5,345			10	6.1	5.4		57						86	.12	1,240	50	3	0.3	121	7.5
Dec. 12-20.....	4,374			10	5.8	5.5		58						82	.11	968	49	1	0.3	118	7.3
Dec. 21-31.....	4,000			10	5.8	5.3		60						84	.11	907	49	0	0.3	117	7.5
Jan. 1-15, 1961...	2,843			11	6.0	5.8		62						85	.12	652	52	1	0.3	122	7.7
Jan. 16-31.....	2,771			12	5.8	5.7		61						83	.11	621	54	4	0.3	129	7.6
Feb. 1-9.....	11,760			9.6	4.4	4.4		50						--	--	--	42	1	0.3	105	7.2
Feb. 10-18.....	15,760			10	4.1	3.9		49						73	.10	3,110	42	2	0.3	100	7.0
Feb. 19-28.....	6,771			9.5	5.5	4.0		56						74	.10	1,350	46	0	0.3	107	7.2
Mar. 1-10.....	4,037			12	3.9	4.3		56						78	.11	1,850	46	0	0.3	112	6.7
Mar. 11-20.....	7,705			10	4.6	4.0		51						78	.11	1,620	44	2	0.3	109	6.7
Mar. 21-31.....	11,800			11	4.5	4.0		52						80	.11	2,550	46	3	0.3	110	6.7

SACRAMENTO RIVER BASIN--Continued
 11-4250. FEATHER RIVER AT NICOLAUS, CALIF.--Continued
 Chemical analyses, in parts per million, water year October 1960 to September 1961--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		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Apr. 1-10, 1961...	9,659			8.8	4.1	4.0		44							68	0.09	1,770	39	3	0.3	90	6.7
Apr. 11-20.....	6,328			8.8	3.4	3.9		44							64	.09	1,080	36	0	.3	86	6.8
Apr. 21-30.....	4,540			9.6	3.9	4.0		46								--	--	40	2	.3	92	7.0
May 1-10.....	4,092			8.8	3.9	2.1		41								--	--	38	4	.1	89	6.8
May 11-21.....	5,410			8.8	3.9	2.0		39								--	--	38	6	.1	82	6.8
May 22-31.....	4,066			8.8	3.9	1.9		38							59	.08	648	38	7	.1	83	6.9
June 1-9.....	3,984			10.4	4.1	3.5		41							71	.10	377	35	4	.2	106	7.2
June 10-19.....	1,983			10.4	4.1	3.5		50							92	.13	370	42	3	.3	133	6.9
June 20-30.....	1,683			12	6.3	5.8		68							96	.12	171	56	0	.3	132	7.0
July 1-12.....	702			12	6.3	5.2		68								--	--	58	0	.3	134	7.1
July 13-31.....	576			12	6.8	5.8		71								--	--	56	0	.3	133	7.5
Aug. 1-31.....	671			13	5.7	5.3		70							85	.12	154	56	0	.3	153	7.8
Sept. 1-10.....	414			14	6.8	6.5		82							97	.13	108	63	0	.4	162	7.3
Sept. 11-20.....	589			14	7.5	7.0		83							104	.14	165	66	0	.4	162	7.3
Sept. 21-30.....	707			14	6.6	7.2		83								--	--	62	0	.4	155	7.8
Weighted average	3,716			10	4.8	4.3		53							a76	a0.10	a763	45	1	0.3	108	--

a Includes estimates for missing data.

SACRAMENTO RIVER BASIN--Continued

11-4250. FEATHER RIVER AT NICOLAUS, CALIF.--Continued

Temperature (°F) of water, water year October 1960 to September 1961

Month		Day																													Average		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		30	31
October.....	68	68	70	71	69	67	59	55	55	58	58	61	61	66	62	63	61	64	63	63	59	60	61	--	58	55	54	51	55	54	55	61	
November.....	54	54	54	54	54	52	50	50	49	51	46	46	46	45	44	45	43	44	44	44	45	43	46	47	45	42	40	40	43	42	--	47	
December.....	40	39	46	41	39	37	36	34	36	41	40	36	36	37	37	36	34	39	39	39	39	37	38	37	39	37	38	39	40	37	37	38	
January.....	39	34	32	32	32	32	33	37	41	44	35	39	--	--	--	--	--	--	--	35	37	33	46	38	35	38	40	40	40	39	41	43	37
February.....	43	43	43	40	43	44	44	42	43	42	43	43	43	41	41	41	40	41	41	43	42	42	40	41	51	50	44	45	--	--	43	44	
March.....	53	56	53	53	50	53	53	54	53	54	53	54	54	52	53	53	52	53	53	54	54	56	55	54	55	52	53	54	56	54	57	54	
April.....	57	60	62	62	60	58	59	62	60	60	59	59	57	64	--	60	63	60	58	59	58	56	54	55	60	62	64	63	64	--	--	60	
May.....	64	64	65	64	65	64	64	65	63	62	60	64	65	65	65	65	67	66	66	66	66	66	66	66	68	67	68	66	64	71	65	65	
June.....	--	69	70	71	72	73	75	74	--	76	78	80	81	85	87	83	83	87	86	87	88	83	85	87	87	85	82	79	81	83	--	81	
July.....	85	86	87	83	82	81	84	85	85	86	93	87	88	87	89	87	89	93	92	91	94	92	83	84	84	83	84	86	84	80	80	86	
August.....	82	85	86	86	88	87	89	89	91	80	83	86	82	82	80	79	82	81	77	85	82	81	82	81	78	76	79	82	82	80	83	85	
September.....	82	74	--	81	83	74	84	77	77	77	80	80	75	73	75	74	74	76	75	77	76	73	67	69	68	73	69	69	67	66	--	75	

SACRAMENTO RIVER BASIN--Continued

11-4335. MIDDLE FORK AMERICAN RIVER NEAR AUBURN, CALIF.

LOCATION ---At gaging station, 0.5 mile upstream from Mountain Quarry Co. plant, 1.9 miles upstream from mouth, and 3.5 miles northeast of Auburn, Placer County.
 DRAINAGE AREA ---19 square miles.
 RECORDS AVAILABLE ---Chemical analyses: October 1988 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate		
Oct. 7, 1960.....	66	--	--	--	--	3.0	--	38	--	--	5.5	--	--	0.1	--	--	--	38	7	0.2	93
Nov. 3.....	60	--	--	--	--	2.9	--	36	--	--	5.0	--	--	--	--	--	--	36	6	--	92
Dec. 8.....	233	--	--	--	--	2.6	--	34	--	--	2.5	--	--	--	--	--	--	30	2	--	72
Jan. 3, 1961.....	134	--	--	--	--	2.5	--	34	--	--	2.5	--	--	--	--	--	--	29	1	--	75
Feb. 10.....	4,120	--	--	--	--	2.4	--	22	--	--	1.5	--	--	--	--	--	--	21	3	--	52
Mar. 3.....	554	--	--	--	--	3.4	--	24	--	--	3.4	--	--	--	--	--	--	22	2	--	54
Apr. 5.....	3,010	--	--	--	--	.6	--	13	--	--	1.8	--	--	--	--	--	--	12	1	--	28
May 12.....	1,860	8.9	0.02	3.4	0.9	1.7	0.5	17	--	0.0	1.6	0.0	0.0	--	24	0.03	--	12	0	--	12
June 19.....	264	--	--	--	--	2.0	--	28	--	--	2.4	--	--	--	--	--	--	13	0	--	33
July 5.....	53	--	--	--	--	2.2	--	45	--	--	3.7	--	--	--	--	--	--	24	1	--	57
Aug. 14.....	38	13	--	--	2.3	3.3	.9	39	--	4.0	7.0	.1	.1	.0	61	.08	--	34	0	--	83
Sept. 12.....	38	13	--	11	2.3	3.3	.9	39	--	4.0	7.0	.1	.1	.0	61	.08	--	37	5	--	94

Sediment discharge measurements and particle-size analyses of suspended sediment, water year October 1960 to September 1961
 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sampling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment con- cen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis	
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000		2.000
Jan. 31, 1961.....	1025		48	399	42	45												V
Mar. 15.....	0955		44	1,080	22	64												
Apr. 4.....	1615		--	2,980	58	467												

SACRAMENTO RIVER BASIN--Continued

11-4455. SOUTH FORK AMERICAN RIVER NEAR LOTUS, CALIF.

LOCATION.--At gaging station, 0.4 mile downstream from Greenwood Creek, 2.4 miles northwest of Lotus, El Dorado County, and 3.3 miles northwest of Coloma.

DRAINAGE AREA.--678 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

Water temperatures: December 1959 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 82°F June 26, Aug. 7; minimum, 35°F several days during January.

EXTREMES, 1959-61.--Water temperatures: Maximum, 85°F July 20, 1960; minimum, 34°F Jan. 2-6, 1960.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge-Silica (cfs) (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bi-car- bon- ate (HCO ₃)	Car- bon- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Specific con- duct- ance (micro- mhos at 25°C)		
														Parts per million	Tons per acre-foot	Tons per day	Cal- cium, Mag- ne- sium	Non-car- bon- ate			
Oct. 7, 1960.....	195	--	--	--	2.7	--	20	--	--	4.8	--	--	0.1	--	--	--	20	4	0.3	56	7.0
Nov. 3.....	124	--	--	--	2.8	--	24	--	--	3.0	--	.1	--	--	--	--	21	1	.3	57	7.3
Dec. 8.....	225	--	--	--	3.4	--	32	--	--	3.8	--	--	--	--	--	--	28	2	.3	68	7.4
Jan. 3, 1961.....	106	--	--	--	3.4	--	52	--	--	3.2	--	--	--	--	--	--	34	0	.3	80	7.4
Feb. 10.....	577	--	--	--	3.6	--	38	--	--	3.8	--	--	--	--	--	--	39	8	.3	93	7.6
Mar. 3.....	317	--	--	--	3.4	--	28	--	--	4.5	--	--	--	--	--	--	25	2	.3	64	7.6
Apr. 5.....	1,560	--	--	--	9	--	16	--	--	2.1	--	--	--	--	--	--	14	1	.1	34	7.2
May 3.....	385	9.5	0.04	4.4	0.0	0.3	17	0.0	0.0	1.6	0.0	1.0	.1	27	0.04	11	0	.2	34	7.2	
June 12.....	440	--	--	--	1.8	--	19	--	--	.8	--	--	--	--	--	--	13	0	.2	35	7.8
July 5.....	394	--	--	--	2.5	--	24	--	--	2.6	--	--	--	--	--	--	19	0	.3	50	7.5
Aug. 14.....	138	--	--	--	3.1	--	22	--	--	1.6	--	--	--	--	--	--	14	0	.3	41	7.3
Sept. 12.....	160	8.1	5.2	1.0	2.1	.6	20	.0	.0	5.0	.0	.0	.0	32	.04	17	1	.2	49	7.6	

SACRAMENTO RIVER BASIN--Continued

11-4455. SOUTH FORK AMERICAN RIVER NEAR LOTUS, CALIF.--Continued

Temperature ($^{\circ}\text{F}$) of water, water year October 1960 to September 1961

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

SACRAMENTO RIVER BASIN--Continued
11-4464. AMERICAN RIVER AT NIMBUS DAM, CALIF.

LOCATION.--At dam, approximately 1.5 miles east of Fair Oaks, Sacramento County.

RECORDS AVAILABLE.--Chemical analyses: November 1958 to September 1961.

REMARKS.--Records of discharge furnished by U.S. Bureau of Reclamation.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bi-car- bon- ate (HCO ₃)	Car- bon- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		So- dium ad- sorp- tion ratio	Specific con- duct- ance (micro- mhos at 25°C)	
															Parts per million	Tons per acre- foot	Tons per day	Cal- cium, Mag- ne- sium	Non- car- bon- ate			
Oct. 7, 1960.....	515	---	---	---	---	2.1	---	25	---	---	5.8	---	---	0.0	---	---	---	24	4	0.2	58	7.0
Nov. 4.....	1,020	---	---	---	---	2.4	---	27	---	---	2.8	---	---	.1	---	---	---	24	3	0.2	61	7.2
Dec. 19.....	2,920	---	---	---	---	2.3	---	34	---	---	1.5	---	---	0	---	---	---	29	1	0.2	66	7.2
Jan. 6, 1961.....	2,500	---	---	---	---	3.1	---	32	---	---	1.8	---	---	0	---	---	---	27	1	0.2	64	7.5
Feb. 9.....	1,150	---	---	---	---	2.3	---	42	---	---	5.5	---	---	0	---	---	---	40	6	0.2	92	7.8
Mar. 13.....	684	---	---	---	---	2.2	---	33	---	---	---	---	---	.1	---	---	---	31	4	0.2	76	7.6
Apr. 7.....	989	---	---	---	---	1.3	---	33	---	---	3.8	---	---	0	---	---	---	32	5	0.1	76	7.7
May 3.....	1,060	9.1	0.01	8.1	2.6	2.7	---	34	---	4.0	4.2	0.0	0.1	0	51	0.07	31	3	0.2	76	7.5	
June 2.....	1,530	---	---	---	---	2.7	---	31	---	---	3.5	---	---	0	---	---	---	30	5	0.2	73	7.7
July 5.....	3,060	---	---	---	---	2.0	---	29	---	---	1.6	---	---	0	---	---	---	24	0	0.2	59	7.7
Aug. 7.....	3,820	---	---	---	---	1.8	---	23	---	---	3.8	---	---	.1	---	---	---	20	1	0.2	52	7.5
Sept. 11.....	1,030	12	---	8.0	1.9	2.7	.7	30	---	2.0	6.0	.1	.1	0	48	.07	28	3	0.2	71	7.5	

SACRAMENTO RIVER BASIN--Continued

11-4465. AMERICAN RIVER AT FAIR OAKS, CALIF.

LOCATION.--At old highway bridge 2.2 miles downstream from gaging station, 1,500 feet upstream from new highway bridge at Fair Oaks, Sacramento County, 2.6 miles downstream from Nimbus Dam, and 10 miles downstream from South Fork.

DRAWING AREA.--1,889 square miles upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: January to December 1958, March 1951 to September 1958, November 1959 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 55 ppm Feb. 21-28, Mar. 21-Apr. 20; minimum, 39 ppm Aug. 1-31.

Hardness: Maximum, 36 ppm May 11-20; minimum, 24 ppm July 1-Aug. 31.

Water temperatures: Maximum daily, 108 microhms Oct. 14; minimum daily, 53 microhms Aug. 14, 17.

Specific conductance: Maximum daily, 79°F Sept. 28; minimum, 40°F Jan. 6.

EXTREMES, 1951-56, 1959-61.--Dissolved solids: Maximum, 83 ppm Aug. 11-20, 1954; minimum, 27 ppm June 4-30, Aug. 2-31, 1958.

Hardness: Maximum, 41 ppm Aug. 1-Sept. 10, 1951, Nov. 21-30, 1954; minimum, 12 ppm May 24-31, 1958.

Specific conductance: Maximum daily, 112 microhms Aug. 28, 1951; minimum daily, 29 microhms June 3, 1952.

Water temperatures: Maximum, 81°F July 27, Aug. 3, 1954; minimum, freezing point Nov. 25, 26, 1957, Nov. 25-29, 1958.

REMARKS.--Records of specific conductance of daily samples available in district office at Sacramento, Calif.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated) a			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhms at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 1-10, 1960...	546			6.5	2.8	3.9		37							50	0.07	73.7	28	0	0.3	71
Oct. 11-20, 1960...	531			6.3	2.8	4.2		37							50	0.07	71.7	27	0	0.3	71
Oct. 21-31, 1960...	524			6.2	2.3	2.9		31							44	0.06	62.3	25	0	0.3	63
Nov. 1-10, 1960...	1,030			6.0	2.9	2.7		32							45	0.06	125	27	1	0.2	64
Nov. 11-21, 1960...	1,100			6.3	2.4	3.1		32							45	0.08	134	26	0	0.3	64
Nov. 22-30, 1960...	1,150			6.7	2.6	2.7		33							46	0.08	143	27	0	0.2	65
Dec. 1-10, 1960...	1,610			6.4	2.4	2.6		26							47	0.06	204	26	5	0.2	87
Dec. 11-20, 1960...	2,150			7.2	2.4	2.6		28							47	0.07	275	28	5	0.2	88
Dec. 21-31, 1960...	2,650			8.0	1.5	2.6		28							48	0.06	326	26	3	0.2	88
Jan. 1-9, 1961...	2,650			8.0	1.5	2.9		28							48	0.07	343	26	3	0.2	88
Jan. 10-20, 1961...	2,630			8.0	1.5	2.6		28							47	0.06	334	26	3	0.3	87
Jan. 21-31, 1961...	1,500			8.0	1.5	2.9		28							48	0.07	194	26	3	0.3	68
Feb. 1-10, 1961...	1,080			7.4	2.9	2.8		35							51	0.07	149	30	1	0.2	73
Feb. 11-20, 1961...	939			7.8	2.1	4.6		35							52	0.07	132	28	0	0.4	75
Feb. 21-28, 1961...	713			7.7	3.2	3.3		35							55	0.07	106	32	3	0.2	79
Mar. 1-10, 1961...	562			8.8	2.4	3.3		33							54	0.07	81.9	32	5	0.2	77
Mar. 11-20, 1961...	658			8.8	2.4	3.3		32							54	0.07	96.9	32	6	0.2	77
Mar. 21-31, 1961...	825			8.8	2.4	3.2		32							55	0.07	123	32	6	0.2	78

	950	8.8	2.2	3.1	32	55	141	31	5	2	78
Apr. 1-10, 1961...	950	8.8	2.2	3.1	32	55	141	31	5	2	78
Apr. 11-20,	981	8.8	2.4	3.6	32	55	146	32	6	2	78
Apr. 21-30,	1,020	8.8	2.2	3.1	31	53	146	32	6	2	77
May 1-10,	1,040	8.0	3.4	2.7	32	52	149	34	8	2	76
May 11-20,	1,030	8.0	3.9	1.7	30	52	145	36	11	1	75
May 21-31,	1,020	8.0	2.9	2.0	32	51	140	32	6	2	73
June 1-30,	2,080	7.2	2.4	2.7	28	48	140	28	5	2	68
July 1-31,	3,760	6.4	1.9	2.4	26	41	146	24	3	2	59
Aug. 1-31,	3,200	5.6	2.4	2.1	26	39	145	24	3	2	56
Sept. 1-30,	1,070	6.4	2.4	2.9	29	43	124	26	2	3	62
Weighted average	1,654	7.0	2.2	2.6	29	46	205	27	3	0.2	65

a Calculated from specific conductance.

Temperature (°F) of water, water year October 1960 to September 1961

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

SACRAMENTO RIVER BASIN--Continued

11-4470. AMERICAN RIVER AT SACRAMENTO, CALIF.

LOCATION--At site of former gaging station, at H Street Bridge, east of Sacramento, Sacramento County, and 6.5 miles upstream from mouth.
 DRAINAGE AREA--1,899 square miles, upstream from gaging station.
 RECORDS AVAILABLE--Chemical analyses, October 1953 to September 1961.
 REMARKS--Records of discharge given for American River at Fair Oaks. No appreciable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 7, 1960.....	552	--	--	--	--	2.1	--	27	--	3.2	--	--	0.0	--	--	--	24	2	0.2	58	7.2
Nov. 4.....	1,050	--	--	--	--	2.0	--	30	--	1.2	--	--	0	--	--	--	25	0	0.2	62	7.3
Dec. 19.....	2,170	--	--	--	--	2.3	--	34	--	2.2	--	--	0	--	--	--	29	1	0.2	66	7.5
Jan. 6, 1961.....	2,640	--	--	--	--	2.0	--	32	--	1.2	--	--	0	--	--	--	26	0	0.2	64	7.5
Feb. 9.....	1,080	--	--	--	--	3.0	--	35	--	2.4	--	--	0	--	--	--	29	0	0.2	71	7.7
Mar. 3.....	566	--	--	--	--	3.4	--	34	--	2.4	--	--	0	--	--	--	33	5	0.3	81	7.7
Apr. 6.....	955	--	--	--	--	1.6	--	35	--	3.8	--	--	0	--	--	--	34	5	1	78	7.7
May 5.....	1,030	8.5	0.00	8.4	2.3	3.3	1.0	33	4.0	3.0	0.0	0.2	0	48	0.07	--	31	4	0.3	76	7.6
June 2.....	1,470	--	--	--	--	2.7	--	29	--	3.0	--	--	0	--	--	--	28	4	0.2	70	7.4
July 5.....	3,010	--	--	--	--	2.1	--	27	--	2.5	--	--	0	--	--	--	25	3	0.2	61	7.5
Aug. 7.....	3,770	--	--	--	--	1.9	--	24	--	4.0	--	--	1	--	--	--	20	0	0.2	54	7.5
Sept. 11.....	1,000	12	--	6.8	1.7	1.9	0.7	26	2.0	4.0	1.1	0.4	0	43	0.06	--	24	3	0.2	59	7.4

SACRAMENTO RIVER BASIN--Continued

11-4475. SACRAMENTO RIVER AT SACRAMENTO, CALIF.

LOCATION:--At Tower Bridge, 0.6 mile downstream from gaging station at Sacramento, Sacramento County, and approximately 1.3 miles downstream from confluence with American River.

RECORDS AVAILABLE.--Chemical analyses: April 1951 to May 1960.

Water temperatures: May 1955 to September 1961.

Sediment records: October 1956 to September 1961

RECORDS, 1960 TO SEPTEMBER 1961.
EXTREMES, 1960-61.---Water temperatures: Maximum, 80°F on several days during January, minimum, 42°F on several days during January.

Sediment concentrations: Maximum daily, (estimated) 680 ppm Feb. 2; minimum daily, 16 ppm Oct. 22, 23.

Sediment loads: Maximum daily, (estimated) 75,000 tons Feb. 2; minimum daily, (estimated) 290 tons Oct. 23.

---Water temperatures: Maximum, 80°F June 15, 16, 1961; minimum, 39°F Jan. 30, 31, Feb. 1, 1957.

Sediment concentrations (1956-61): Maximum daily, 865 ppm Feb. 9, 1960; minimum daily, (estimated) 11 ppm Nov. 30, 1959.

Sediment loads (1956-61): Maximum daily, 147,000 tons Feb. 9, 1960; minimum daily, (estimated) 200 tons Dec. 14, 1959.

REMARKS.--No appreciable inflow between gaging station and sampling point except during periods of heavy local runoff.

Temperature (°F) of water, water year October 1960 to September 1961																																		
Month		Day																														Aver- age		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		31	
October	65	--	68	--	67	--	--	--	60	--	61	--	--	--	--	62	--	64	--	64	--	64	--	63	--	--	--	61	--	62	--	--	--	
November	64	--	57	--	57	--	58	--	58	--	55	--	55	--	53	--	53	--	53	--	54	--	54	--	56	--	--	50	49	52	48	48	--	--
December	53	52	51	50	48	47	46	45	44	44	47	47	49	50	52	51	52	51	49	48	47	47	47	47	47	47	47	47	47	50	47	48	--	
January	48	48	48	48	46	42	45	42	43	47	42	42	42	42	42	46	46	47	45	48	47	47	49	50	47	49	50	52	51	50	53	54	47	
February	52	52	49	53	52	52	52	52	52	52	51	51	51	51	51	52	51	51	52	53	53	53	53	53	53	53	53	53	53	53	52	52	52	
March	54	54	53	53	52	52	52	52	52	52	53	53	53	53	53	53	53	53	54	54	54	54	55	--	54	54	53	53	53	52	55	57	53	
April	60	62	64	63	61	61	61	62	63	60	61	63	64	64	64	62	60	60	62	--	--	--	--	--	--	60	61	62	66	64	63	--	62	--
May	53	65	64	63	64	61	63	65	63	62	63	65	66	68	67	67	68	62	67	67	68	66	67	67	69	67	65	67	67	65	67	67	65	
June	67	69	70	71	70	70	71	72	74	70	75	72	--	80	80	78	76	76	76	74	75	78	77	76	75	78	77	76	72	70	72	73	--	
July	75	75	71	69	70	71	70	70	73	77	79	75	73	75	71	70	73	72	77	75	75	71	70	72	--	74	75	75	72	71	71	73	--	73
August	73	--	75	--	71	--	76	--	79	--	77	--	72	--	73	--	73	--	70	--	73	--	72	--	72	--	72	--	73	--	72	--	75	--
September	--	72	--	75	--	73	--	70	--	73	--	69	--	71	--	68	--	68	--	67	--	67	--	68	--	67	--	67	--	61	--	69	--	--

SACRAMENTO RIVER BASIN--Continued

11-4475. SACRAMENTO RIVER AT SACRAMENTO, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961
(Where no concentrations are reported loads are estimated)

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..	7970	--	690	7930	25	535	15400	77	3200
2..	8170	42	926	8200	--	620	17300	86	4020
3..	7890	--	1100	8300	31	695	28100	568	45200
4..	8170	57	1260	8400	--	730	32600	667	58700
5..	7970	--	1100	8400	34	771	31700	459	39300
6..	8010	41	887	8500	--	760	27700	308	23000
7..	7970	--	880	8500	30	689	23500	212	13500
8..	8090	--	960	8600	--	670	20800	142	7970
9..	8380	--	1100	8700	29	681	18300	112	5530
10..	8050	50	1090	8800	--	710	17100	88	4060
11..	8170	--	950	9000	33	802	17000	75	3440
12..	8050	32	696	9100	--	980	15100	60	2450
13..	7930	--	580	9600	57	1480	14500	55	2150
14..	7720	26	542	11000	--	2400	14000	45	1700
15..	7440	--	600	13000	105	3690	13400	39	1410
16..	7520	36	731	15000	--	4900	12900	32	1110
17..	7400	--	540	14500	137	5360	12800	31	1070
18..	7440	19	382	12500	--	3700	14600	34	1340
19..	7110	--	360	12000	75	2430	20500	112	6200
20..	7110	22	422	12000	--	2000	23400	277	17500
21..	7070	--	400	12500	60	2030	22200	142	8510
22..	7400	16	320	12000	--	1700	20700	110	6150
23..	6780	--	290	11500	40	1240	18800	74	3760
24..	7400	17	340	10900	--	1100	17700	62	2960
25..	7110	--	500	10700	45	1300	16800	42	1910
26..	7680	38	788	11400	--	1900	15900	38	1630
27..	7440	--	680	17800	--	4800	15300	33	1360
28..	7640	28	578	23900	383	24700	14800	30	1200
29..	7800	--	530	21000	215	12200	14200	27	1040
30..	7760	22	461	17300	109	5090	13400	24	868
31..	7760	--	460	--	--	--	12900	27	940
Total	238400	--	21143	351030	--	90663	573400	--	273178
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..	12600	23	782	31700	572	51200	24300	128	8400
2..	12300	17	565	40600	680	75000	23900	130	8390
3..	12300	22	731	43100	500	58200	23300	160	10000
4..	12500	24	810	44900	439	53200	22300	167	10100
5..	12700	24	823	46600	470	59100	21900	149	8810
6..	12900	27	940	46300	320	40000	21600	136	7930
7..	12700	30	1030	41600	225	25300	21900	133	7860
8..	12700	27	926	35500	188	18000	21900	146	8630
9..	12700	24	823	30500	185	15200	21900	172	10200
10..	13300	20	718	30500	222	18300	22400	160	9700
11..	13700	24	888	39800	258	27700	23700	132	8450
12..	13700	29	1070	45100	317	38600	23700	138	8830
13..	13700	25	925	48500	212	27800	23200	124	7770
14..	13400	26	941	49500	205	27400	23500	96	6090
15..	13200	28	998	49100	184	24400	23000	145	9000
16..	13100	30	1060	48000	144	18700	28000	241	18200
17..	12800	24	829	46900	145	18400	32000	286	24700
18..	12900	23	801	45400	162	19900	34500	280	26100
19..	12700	24	823	42900	148	17100	35400	243	23200
20..	12600	20	680	39600	120	12800	34800	218	20500
21..	11600	18	564	36400	110	10800	34500	184	17100
22..	11200	19	575	34000	127	11700	34300	188	17400
23..	11100	23	689	31800	140	12000	33500	155	14000
24..	11000	20	594	30300	157	12800	33600	140	13000
25..	11000	20	594	28400	160	12000	34700	133	12500
26..	11200	24	726	26600	160	11000	36400	135	13300
27..	11800	28	892	25700	148	10300	36700	145	14400
28..	12400	56	1870	25100	139	9420	35700	169	16300
29..	14000	66	2490	--	--	--	34700	188	17600
30..	14100	116	4420	--	--	--	32100	156	13500
31..	23100	202	12600	--	--	--	29000	150	11700
Total	401000	--	43177	1084400	--	736320	882400	--	403660

S Computed by subdividing day.

B Computed from estimated-concentration graph.

SACRAMENTO RIVER BASIN--Continued

11-4475. SACRAMENTO RIVER AT SACRAMENTO, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
(Where no concentrations are reported loads are estimated)

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..	26500	144	10300	10100	48	1310	12600	89	3000
2..	25200	127	8640	10600	49	1400	13700	128	4730
3..	24600	120	8000	11400	58	1790	14500	126	4930
4..	24800	114	7630	11600	59	1850	15300	82	3390
5..	25200	146	9930	11600	59	1850	15800	77	3280
6..	25500	140	9600	11300	51	1560	14900	65	2610
7..	24800	115	7700	11000	57	1690	14100	48	1830
8..	23700	120	7680	11700	61	1900	13000	53	1860
9..	22000	117	6950	11700	55	1740	12100	51	1670
10..	20900	95	5360	11600	54	1690	11500	51	1580
11..	19900	112	6020	12000	67	2170	10800	46	1340
12..	18300	100	4940	13900	85	3190	10600	46	1320
13..	16100	97	4220	14800	94	3760	9870	52	1390
14..	17400	111	5210	14800	96	3840	9680	39	1020
15..	16000	125	5400	14700	93	3690	9260	37	925
16..	14800	99	3960	13800	84	3130	8750	27	638
17..	13800	94	3500	14100	83	3160	8660	30	701
18..	13400	80	2880	14000	78	2990	9040	19	464
19..	12800	68	2350	14400	77	2990	8390	26	589
20..	12300	74	2460	15500	90	3770	8500	25	574
21..	11300	57	1740	15600	101	4250	8720	28	660
22..	10700	45	1300	15700	69	2920	8980	39	946
23..	11400	45	1390	15000	74	3000	9440	46	1170
24..	12100	50	1630	14500	84	3290	9620	38	987
25..	12000	45	1460	14100	66	2510	9830	45	1190
26..	11900	48	1540	13900	67	2510	10100	39	1060
27..	11000	55	1630	13700	61	2300	10100	33	900
28..	10100	60	1640	13100	51	1800	10100	36	982
29..	9980	55	1480	12500	59	1990	10000	48	1300
30..	9460	50	1280	11900	72	2310	10100	45	1230
31..	--	--	--	11800	78	2490	--	--	--
Total	507940	--	137830	406400	--	78800	328040	--	48266
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..	9980	46	1240	10900	33	971	10600	--	1300
2..	9870	41	1090	11200	--	910	9810	--	1100
3..	9890	33	881	11200	--	940	9790	--	1100
4..	9640	38	989	11300	--	980	9430	38	968
5..	9560	36	929	11300	33	1010	9170	--	920
6..	9640	31	807	11700	--	1000	9040	36	879
7..	9600	30	780	11500	27	838	9320	--	1100
8..	9830	31	823	11600	--	850	9220	58	1440
9..	9890	34	908	11600	35	1100	9500	--	1600
10..	10100	38	1040	11800	--	1100	9950	54	1450
11..	10100	36	980	11900	38	1220	9870	--	1500
12..	10100	33	900	11900	--	1300	10100	63	1720
13..	10400	27	758	12000	46	1490	10300	--	1800
14..	10300	33	918	12300	--	1500	10100	65	1770
15..	10500	33	936	12300	--	1400	10100	--	1600
16..	10600	32	916	11600	--	1300	9980	53	1430
17..	10700	40	1160	11500	41	1270	10300	--	1500
18..	10600	47	1350	11400	--	1400	10400	56	1570
19..	10700	37	1070	11200	51	1540	10100	--	1400
20..	11000	33	980	11100	--	1500	10200	40	1100
21..	11000	34	1010	11100	44	1320	9920	--	1100
22..	11400	38	1200	11400	400	1400	9570	42	1090
23..	11500	49	1510	11300	53	1620	9410	--	1000
24..	11500	45	1400	11200	--	1600	9350	38	959
25..	11400	46	1420	11300	46	1400	9290	--	1000
26..	11200	37	1120	11300	--	1400	9220	43	1070
27..	11300	42	1280	11300	48	1460	9450	--	1100
28..	11200	44	1330	11300	--	1500	9120	39	960
29..	11200	38	1150	11100	47	1410	8920	--	960
30..	11100	35	1050	11100	--	1400	9020	44	1070
31..	11100	38	1140	11100	46	1380	--	--	--
Total	326900	--	33075	354800	--	39509	290550	--	37556

Total discharge for year (cfs-days)..... 5,745,280

Total load for year (tons)..... 1,943,177

B Computed from estimated-concentration graph.

SACRAMENTO RIVER BASIN--Continued
11-4475. SACRAMENTO RIVER AT SACRAMENTO, CALIF.--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sampling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment concentra- tion (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis	
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000		2.000
Oct. 6, 1960.....	0840		66	7,340	23							96	100					S
Oct. 6.....	1500		67	9,010	39							95	100					V
Nov. 29.....	0940		48	421,000	153							77	92		100			V
Dec. 4.....	1055		51	32,700	560		31	39	53	64	73	91	99	100	100			VPWC
Dec. 5.....	1345		50	32,600	454							55	68	77	100			V
Dec. 13.....	1035		47	14,300	60							91	95	98	100			V
Feb. 1, 1961.....	1105		51	31,600	460			37		60		77	90	98	100			VPWC
Feb. 2.....	1600		52	41,300	466							65	77	98	100			V
Feb. 3.....	1020		53	42,900	499							80	90	97	100			V
Feb. 5.....	0900		53	46,400	473							82	90	100				V
Feb. 7.....	1405		53	41,400	201							72	84	99	100			V
Mar. 29.....	1035		52	34,900	162							45	61	96	100			V

d Daily mean discharge.

Particle-size analyses of bed material, October 1959 to September 1961
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Number of sampling points	Discharge	Bed material											Method of analysis	
				Percent finer than size indicated, in millimeters												
				0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000		32.000
Feb. 16, 1960.....	1115	5	47,000				1	13	95	100	--					S
Oct. 6.....	0840	5	7,340				1	13	95	99	100					S
Oct. 6.....	1500	3	9,010				1	12	92	99	100					S
Dec. 5.....	1345	8	32,600				1	10	93	100	--					S
Dec. 13.....	1035	5	14,300				1	7	83	99	100					S
Feb. 3, 1961.....	1020	4	42,900				1	11	95	100	--					S

SACRAMENTO RIVER BASIN--Continued
11-4476.5. SACRAMENTO RIVER AT FREEPORT, CALIF.

LOCATION.--At drawbridge at Freeport, Sacramento County, approximately 11 miles south of Sacramento.
RECORDS AVAILABLE.--Chemical analyses: June 1960 to September 1961.

Water temperatures: June 1960 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 169 ppm Sept. 11-20; minimum, 72 ppm Dec. 4-7.

Hardness: Maximum, 91 ppm Sept. 11-20; minimum, 40 ppm Dec. 4-7.

Specific conductance: Maximum daily, 267 microhos Jan. 29; minimum, 44°F Jan. 5.

Water temperatures: Maximum, 76°F June 16, 17; minimum, 44°F Jan. 5.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 169 ppm Sept. 11-20, 1961; minimum, 72 ppm Dec. 4-7, 1960.

Hardness: Maximum, 91 ppm Sept. 11-20, 1961; minimum, 40 ppm Dec. 4-7, 1960.

Specific conductance: Maximum daily, 267 microhos Jan. 29, 1961; minimum, 44°F Jan. 5, 1961.

Water temperatures: Maximum, 76°F June 16, 17, 1961; minimum, 44°F Jan. 5, 1961.

REMARKS.--Records of specific conductance of daily samples available in district office at Sacramento, Calif. Records of discharge given for Sacramento River at Sacramento. No appreciable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 1-11, 1960.....	8,076	24	0.00	14	7.5	12	1.3	87		9.0	9.5	0.1	1.6	0.0	134	0.18	2,920	66	0	0.6	185	7.4
Oct. 12-20.....	7,524	25	.00	14	7.1	11	1.4	83		8.0	8.0	.2	1.6	.0	123	.17	2,500	64	0	.6	174	7.2
Oct. 21-31.....	7,440	24	.00	14	7.1	12	1.4	89		10	8.0	.1	1.6	.0	123	.17	2,470	64	0	.6	179	7.4
Nov. 1-9.....	8,382	25	.00	13	6.7	11	1.4	84		8.0	6.8	.1	1.5	.0	108	.15	2,480	60	0	.6	171	7.9
Nov. 10-19.....	11,450	25	.02	14	6.1	11	1.3	82		8.0	6.3	.1	1.4	.1	110	.13	3,400	60	0	.6	168	7.5
Nov. 20-28.....	13,630	23	.00	14	6.6	11	1.5	82		9.0	6.3	.0	1.2	.1	115	.16	4,230	62	0	.6	169	7.7
Nov. 29, 30.....	19,150	20	.03	9.6	4.6	7.5	1.4	51		7.0	6.0	--	3.4	.0	85	.12	4,390	43	1	.5	124	7.1
Dec. 1-3.....	20,270	23	.01	13	6.0	11	1.5	70		11	9.5	.1	3.0	.0	112	.15	6,130	57	0	.6	167	7.2
Dec. 4-7.....	28,880	16	.03	8.8	4.4	5.7	1.5	43		7.0	6.5	.1	2.1	.0	72	.10	5,610	40	5	.4	111	6.9
Dec. 8-19.....	15,920	21	.03	14	6.6	10	1.5	76		12	8.0	.1	1.5	.0	116	.16	4,990	62	0	.6	170	8.1
Dec. 20-31.....	17,180	20	.01	12	6.3	9.3	1.2	68		10	8.5	.1	1.8	.1	101	.14	4,680	56	0	.5	158	8.1
Jan. 1-9, 1961.....	12,600	22	.02	12	7.2	14	.5	82		9.6	7.0	.1	.5	.0	117	.16	3,980	59	0	.8	169	7.7
Jan. 10-18.....	13,310	22	.00	13	6.9	14	1.5	83		10	7.3	.1	.7	.1	119	.16	4,280	61	0	.8	177	7.8
Feb. 18-28.....	11,660	23	.00	14	7.3	15	1.1	89		10	8.9	.1	.3	.0	126	.17	3,970	65	0	.8	182	7.8
Jan. 28-31, Feb. 1	20,720	22	.10	15	7.4	15	1.4	80		16	12	.1	1.3	.1	137	.19	7,660	68	2	.8	207	7.4
Feb. 2-10.....	39,960	18	.18	12	5.8	9.1	1.2	62		12	6.5	.2	1.3	.1	100	.14	10,790	54	3	.5	151	7.7
Feb. 11-19.....	46,130	20	.14	11	5.0	6.2	1.0	56		8.4	3.0	.1	1.0	.1	87	.12	10,840	48	0	.4	126	7.4

a. Calculated from determined constituents.

SACRAMENTO RIVER BASIN--Continued
 11-4476.5. SACRAMENTO RIVER AT FREEPORT, CALIF.--Continued
 Chemical analyses, in parts per million, water year October 1960 to September 1961--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (SO ₂)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Feb. 20-28, 1961..	30,880	24	0.07	13	5.5	8.0	1.3	71	8.0	4.2	0.1	0.7	0.2	106	0.14	8,840	55	0	0.5	146	7.9
Mar. 1-10.....	22,840	26	.05	13	6.7	9.3	1.3	79	7.0	5.5	.1	1.0	.1	109	.15	6,830	60	0	.5	156	7.7
Mar. 11-20.....	28,180	24	.08	12	5.8	8.3	1.3	69	7.0	4.5	.1	1.3	.1	98	.13	7,460	54	0	.5	138	7.7
Mar. 21-31.....	34,110	23	.10	11	5.7	6.5	.9	65	6.0	3.5	.1	1.0	.1	90	.12	8,290	51	0	.4	127	7.6
Apr. 1-10.....	24,320	22	.02	12	5.8	5.2	.9	66	9.0	5.5	.1	.7	.1	91	.12	5,880	54	0	.5	140	7.7
Apr. 11-20.....	15,480	21	.02	12	6.0	7.7	.7	67	8.0	5.8	.0	.9	.1	104	.14	4,350	53	0	.4	143	7.8
Apr. 21-30.....	10,980	22	.01	13	6.2	11	.9	70	9.0	8.8	.0	1.1	.1	116	.16	3,440	58	1	.6	160	7.8
May 1-10.....	11,260	25	.00	14	7.5	12	1.0	76	14	10	.0	1.2	.0	126	.17	3,830	66	4	.6	182	7.9
May 11-20.....	14,200	24	.00	14	7.8	14	1.1	82	13	12	.0	1.0	.0	127	.17	4,870	67	0	.7	193	7.9
May 21-31.....	13,800	22	.00	15	7.9	15	1.1	87	13	12	.0	1.4	.1	132	.18	4,920	70	0	.8	205	8.0
June 1-10.....	13,750	24	.00	14	8.3	15	1.2	90	12	12	.0	1.1	.1	139	.19	5,160	69	0	.8	207	7.6
June 11-20.....	9,355	24	.00	15	7.7	14	1.3	88	11	12	.0	1.2	.1	134	.18	3,380	69	0	.7	204	8.0
June 21-30.....	9,699	23	.00	13	7.2	13	1.3	77	11	11	.0	1.2	.1	124	.17	3,250	62	0	.7	184	7.9
July 1-10.....	9,800	23	.00	13	6.0	12	1.2	82	7.0	4.8	.1	1.3	.1	116	.16	3,070	57	0	.7	175	8.1
July 11-20.....	10,500	23	.00	11	7.7	12	1.2	76	9.0	9.0	.1	1.3	.1	111	.15	3,150	59	0	.7	168	8.1
July 21-31.....	11,260	24	.00	11	6.9	11	1.1	76	9.0	7.5	.1	1.2	.1	116	.16	3,530	56	0	.7	166	7.8
Aug. 1-10.....	11,410	23	.00	13	7.2	12	1.4	84	9.0	9.0	.1	1.1	.0	125	.17	3,850	62	0	.7	180	7.8
Aug. 11-20.....	11,720	24	.00	13	7.7	14	1.2	86	7.0	9.5	.1	1.0	.0	120	.17	3,800	64	0	.8	188	7.7
Aug. 21-31.....	11,230	22	.00	14	8.0	16	1.4	96	10	10	.1	1.1	.1	139	.19	4,210	88	0	.8	204	7.7
Sept. 1-10.....	8,563	25	.00	16	10	20	1.2	112	11	13	.3	1.3	.1	136	.21	4,040	93	0	1.0	242	7.8
Sept. 11-20.....	10,310	25	.00	16	13	21	1.2	112	11	14	.3	1.0	.0	138	.19	3,880	91	0	.9	243	7.8
Sept. 21-30.....	9,327	25	.00	16	8.0	17	1.3	100	9.8	11	.2	.9	.0	138	.19	3,460	73	0	.9	214	7.8
Weighted average	15,740	22	0.04	13	6.6	11	1.2	76	9.5	7.4	bo.1	1.2	0.1	112	0.15	4,760	60	0	0.6	165	--

a Calculated from determined constituents.

b Includes estimates for missing periods.

SACRAMENTO RIVER BASIN--Continued

11-4476.5. SACRAMENTO RIVER AT FREEPORT, CALIF.--Continued

Temperature (°F) of water, water year October 1960 to September 1961

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

SACRAMENTO RIVER BASIN--Continued

11-4500. CLEAR LAKE AT LAKEPORT, CALIF.

LOCATION.--At foot of Third Street, near municipal wharf in Lakeport, Lake County.

DRAINAGE AREA.--326 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium, silicon	Non-carbonate				
Oct. 12, 1960.....						9.7		147			6.5				0.8			117		0	0.4	273	7.5
Nov. 2.....						10		152			7.5				.8			122		0	.5	272	7.9
Dec. 7.....						10		144			5.5				.8			118		0	.4	237	8.1
Jan. 4, 1961.....						9.7		136			4.5				.9			118		0	.4	253	8.2
Feb. 16.....						9.2		135			6.0				.9			110		0	.4	252	8.2
Mar. 13.....						9.3		142			4.7				.8			111		0	.4	252	7.9
Apr. 12.....						9.7		138			5.5				.9			112		0	.4	250	7.7
May 3.....			0.01	22	21	10	1.8	176		9.6	6.2	0.1	1.7	.8		174	0.24	140		0	.4	253	8.0
June 2.....				22	15	10		149			4.8				.8			117		0	.4	262	8.1
July 8.....						11		154			5.5				.9			127	1	0	.4	270	8.2
Aug. 14.....						11		164			6.6				.9			123		0	.4	283	7.9
Sept. 6.....	10			24	17	12	2.4	159		7.0	8.8	0	3.2	.8		163	.22	129		0	.5	286	8.1

SACRAMENTO RIVER BASIN--Continued

11-4510. CACHE CREEK NEAR LOWER LAKE, CALIF.

LOCATION --At gaging station, 500 feet downstream from Clear Lake Dam, 1.9 miles downstream from Copsey Creek, and 2.5 miles northeast of Lower Lake, Lake County.

DRAINAGE AREA --528 square miles.

RECORDS AVAILABLE --October 1953 to September 1961.

Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961																						
Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 12, 1960.....	40	--	--	--	--	11	--	165	0	--	6.0	--	--	1.0	--	--	--	129	0	0.4	294	8.0
Nov. 3.....	2.4	--	--	--	--	13	--	171	0	--	8.5	--	--	1.0	--	--	--	135	0	.5	298	8.0
Dec. 7.....	1.7	--	--	--	--	9.2	--	114	0	--	4.0	--	--	.6	--	--	--	90	0	.4	210	7.6
Jan. 4, 1961.....	1.6	--	--	--	--	9.2	--	132	0	--	3.8	--	--	.6	--	--	--	101	1	.4	229	7.9
Feb. 16.....	2.2	--	--	--	--	9.7	--	98	0	--	5.0	--	--	.3	--	--	--	87	7	.5	216	7.6
Mar. 13.....	3.4	--	--	--	--	9.9	--	104	0	--	5.8	--	--	.3	--	--	--	94	9	.4	231	7.6
Apr. 12.....	7.9	--	--	--	--	12	--	107	0	--	6.0	--	--	.4	--	--	--	105	17	.5	253	7.7
May 3.....	236	7.0	0.01	--	19	13	2.3	181	0	9.0	7.1	0.1	1.9	.9	--	174	0.24	140	0	.5	293	7.8
June 2.....	272	--	--	26	16	12	--	158	0	--	6.3	--	--	.9	--	--	--	128	0	.5	287	7.6
July 8.....	416	--	--	--	--	12	--	160	0	--	6.0	--	--	.9	--	--	--	128	0	.5	281	8.0
Aug. 14.....	368	--	--	--	--	12	--	165	0	--	6.9	--	--	.9	--	--	--	128	0	.5	293	7.8
Sept. 6.....	246	.6	--	26	17	12	2.7	167	2	8.0	9.2	.0	.9	.9	--	.161	.22	136	0	.4	302	8.3

SACRAMENTO RIVER BASIN--Continued

11-4515. NORTH FORK CACHE CREEK NEAR LOWER LAKE, CALIF.

LOCATION.--At bridge on State Highway 20, 3 miles downstream from gaging station, 2 miles upstream from confluence with Cache Creek, and 6.5 miles northeast of Lower Lake County.

DRAINAGE AREA 198 square miles upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

REMARKS.--Miscellaneous suspended-sediment samples collected at gaging station. Some inflow between gaging station and sampling point during rainy season.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)	
													Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate			
Oct. 12, 1960.....	2.0	--	--	--	--	40	--	195	--	86	--	--	--	--	--	196	21	1.2	554	8.4
Nov. 2.....	2.3	--	--	--	--	49	--	216	0	72	--	4.4	--	--	--	198	21	1.5	588	8.1
Dec. 7.....	79	--	--	--	--	87	--	194	8	60	--	5.7	--	--	--	198	26	2.7	542	8.4
Jan. 4, 1961.....	36	--	--	--	--	30	--	190	12	43	--	3.7	--	--	--	184	9	1.0	452	8.4
Feb. 16.....	414	--	--	--	--	9.8	--	117	--	5.5	--	5	--	--	--	96	0	4	223	8.2
Mar. 13.....	144	--	--	--	--	15	--	142	2	14	--	9	--	--	--	115	0	6	279	8.3
Apr. 12.....	100	--	--	--	--	18	--	186	5	14	--	1.5	--	--	--	153	0	6	345	8.4
May 3.....	80	20	0.00	25	20	19	0.7	174	3	16	0.1	0.6	1.5	203	0.28	144	0	7	346	8.3
June 2.....	38	--	--	--	--	25	--	187	9	29	--	2.3	--	--	--	167	0	8	420	8.5
July 8.....	5.9	--	--	--	--	30	--	182	13	42	--	3.3	--	--	--	180	9	1.0	474	8.5
Aug. 14.....	2.0	--	--	--	--	37	--	207	5	52	--	3.7	--	--	--	186	8	1.2	510	8.3
Sept. 6.....	1.2	19	--	32	27	41	1.6	200	7	16	1.1	3.4	305	.41	192	17	1.3	532	8.5	

SACRAMENTO RIVER BASIN--Continued

11-4515. NORTH FORK CACHE CREEK NEAR LOWER LAKE, CALIF.--Continued

Sediment discharge measurements and particle-size analyses of suspended sediment, water year October 1960 to September 1961

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;

P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sampling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis		
							Percent finer than size indicated, in millimeters												
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000		2.000	
Oct. 21, 1960.....	0910		58	1.8	1	t													
Nov. 14.....	1340		--	5.2	2	t													
Nov. 18.....	0925		53	4.4	1	t													
Nov. 28.....	1400		51	28	1	0.1													
Dec. 7.....	1300		47	77	1	.2													
Dec. 27.....	1450		48	72	1	.2													
Dec. 30.....	0915		42	59	1	.2													
Jan. 29, 1961.....	0900		49	98	4	1.1													
Jan. 31.....	0900		50	2,700	1,490	10,900		24		46		63	72	84	98	100			VPWC
Feb. 16.....	1620		52	414	74	83													
Feb. 3.....	0920		44	113	3	.9													
Mar. 7.....	1020		48	113	3	.9													
Mar. 26.....	1415		54	283	55	42													
Apr. 18.....	0830		54	84	4	.9													
Apr. 23.....	1510		58	132	8	2.9													
May 16.....	1030		66	69	4	.7													
June 5.....	1535		78	32	3	.3													
June 7.....	0900		--	33	8	.7													
July 17.....	1450		89	4.5	3	t													
July 19.....	1450		88	4.0	4	t													
Aug. 22.....	1140		80	1.6	3	t													
Aug. 29.....	0800		70	1.5	2	t													
Sept. 24.....	0920		64	1.7	4	t													

t Less than 0.05 ton.

SACRAMENTO RIVER BASIN--Continued

11-4517.6. CACHE CREEK ABOVE RUMSEY, CALIF.

LOCATION.--At gage, 0.4 mile downstream from highway bridge, and 2.5 miles northwest of Rumsey, Yolo County.

DRAINAGE AREA.--854 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1960 to September 1961.

Sediment records: November 1960 to September 1961.

EXTREMES, 1960-61.--Sediment concentrations: Maximum daily, 5,160 ppm Dec. 1; minimum daily, 1 ppm on several days.

Sediment loads: Maximum daily, 79,600 tons Dec. 1; minimum daily, less than 0.05 ton on several days.

EXTREMES, January 1960 to September 1961.--Sediment concentrations: Maximum daily, 5,300 ppm Feb. 8, 1960; minimum daily, 1 ppm on several days in 1960.

Sediment loads: Maximum daily, 188,000 tons Feb. 8, 1960; minimum daily, less than 0.05 ton on several days in 1960.

Month	Temperature (°F) of water, water year October 1960 to September 1961																															Aver- age
	Day																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
November.....	52	49	48	45	45	42	41	--	57	--	--	48	49	46	48	--	--	50	--	--	47	--	--	--	51	47	44	42	43	46	--	--
December.....	--	--	--	--	--	--	--	--	41	43	--	--	--	44	--	43	--	52	49	45	45	45	--	42	--	--	42	--	--	38	--	--
January.....	34	--	--	--	35	--	40	--	--	--	--	--	42	--	--	--	--	--	45	--	--	--	45	--	48	48	47	47	49	48	50	--
February.....	52	52	49	48	48	51	48	49	51	51	45	47	47	51	44	45	44	44	47	49	50	48	50	53	47	55	51	50	51	53	--	48
March.....	49	--	48	--	49	49	--	48	45	48	50	--	51	--	48	47	46	47	50	46	49	52	50	53	47	55	51	50	51	53	--	49
April.....	56	--	60	--	58	--	53	--	--	--	--	53	--	--	56	--	55	--	--	--	54	50	51	51	51	55	--	--	--	56	--	--
May.....	--	61	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June.....	--	--	--	--	74	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	82	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
August.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
September.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	73	--	65	--	--	--	--	--	--	--

SACRAMENTO RIVER BASIN--Continued

11-4517.6. CACHE CREEK ABOVE HUMSEY, CALIF.--Continued

Suspended sediment, November 1960 to April 1961
(Where no concentrations are reported, loads are estimated)

Day	November			December			January		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	4.6	--	(t)	3,400	5,160	s79,600	68	--	0.7
2	4.4	--	(t)	1,210	558	s2,070	68	5	.9
3	4.1	--	(t)	482	117	s166	67	--	.9
4	5.5	--	(t)	244	35	23	66	--	.5
5	5.9	--	(t)	161	16	7.0	64	--	.3
6	5.8	--	(t)	122	10	3.3	62	2	.3
7	6.1	--	(t)	98	8	2.1	60	--	.3
8	6.3	--	(t)	83	--	1.6	57	2	.3
9	5.8	1	(t)	78	--	1.3	55	--	.3
10	5.4	--	(t)	72	4	.8	55	--	.3
11	5.3	--	(t)	73	3	.6	56	--	.3
12	7.0	9	0.2	72	--	.8	54	--	.4
13	19	12	s.7	59	--	.6	55	4	.6
14	42	20	s2.4	50	4	.5	53	--	.6
15	25	9	.6	51	--	.6	54	--	.6
16	17	--	.4	70	5	.9	52	--	.6
17	14	--	.3	600	120	k320	53	--	.6
18	12	8	.3	1,200	144	s522	51	--	.6
19	9.8	--	.2	560	36	s58	50	--	.5
20	9.6	--	.2	350	16	15	50	--	.5
21	9.0	6	.1	240	10	6.5	50	--	.5
22	7.7	--	.1	180	7	3.4	48	--	.5
23	7.7	--	.1	150	--	2.4	50	4	.5
24	7.5	--	.1	130	6	2.1	51	--	.6
25	9.8	10	.3	115	--	1.6	53	7	1.0
26	148	190	s100	100	--	1.1	657	1,430	s3,360
27	124	149	s54	92	3	.7	465	262	s404
28	72	31	6.0	86	--	.5	227	* 60	37
29	48	16	2.1	78	--	.4	480	627	s2,230
30	42	15	1.7	75	2	.4	1,460	725	s3,750
31				72	--	.4	3,420	2,400	s27,700
Total	690.3		170.0	10,353		82,813.6	8,112		37,494.2
Day	February			March			April		
	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	1,650	510	s2,560	201	6	3.3	277	16	12
2	1,520	628	s3,250	193	--	3.1	262	--	9.2
3	1,500	300	1,220	192	4	2.1	245	12	7.9
4	960	100	259	191	--	2.1	233	--	7.5
5	620	52	87	176	4	1.9	210	11	6.2
6	500	31	42	182	4	2.0	197	--	5.3
7	430	23	27	189	--	2.0	192	--	5.2
8	370	20	20	181	4	2.0	176	10	4.8
9	430	234	s549	305	18	18	166	--	4.5
10	1,050	207	s650	284	13	10	160	--	4.3
11	950	379	s1,350	256	9	6.2	151	--	4.1
12	1,700	342	s1,690	247	--	5.3	140	10	3.8
13	1,000	135	364	237	8	5.1	140	--	3.8
14	820	115	255	244	--	5.3	272	--	19
15	770	70	146	907	1,200	s3,040	290	66	52
16	780	70	147	648	110	192	290	--	45
17	610	60	99	1,000	1,190	s3,280	290	--	39
18	530	45	64	940	206	s540	279	45	34
19	460	30	37	720	110	214	281	--	32
20	399	23	25	626	97	164	284	--	31
21	363	20	20	532	68	98	369	108	108
22	325	17	15	472	54	69	456	106	131
23	301	12	9.8	444	40	48	492	98	130
24	274	--	6.7	406	36	39	465	72	90
25	253	8	5.5	413	36	40	449	91	110
26	240	--	3.9	390	26	27	437	--	81
27	252	6	3.8	424	38	44	416	54	61
28	207	--	3.4	398	25	27	397	--	54
29				354	22	21	386	--	48
30				335	21	19	364	44	46
31				306	--	16			
Total	19,244		12,909.1	12,393.		7,946.4	8,786		1,189.6

Total discharge for period November to April (cfs-days)..... 59,578.3
 Total load for period November to April (tons)..... 142,522.9

s Computed by subdividing day.

k Computed from estimated-concentration graph and subdividing day.

t Less than 0.05 ton.

SACRAMENTO RIVER BASIN--Continued

11-4517.6. CACHE CREEK ABOVE RUMSEY, CALIF.--Continued

Periodic determinations of suspended-sediment discharge, October 1960, May to September 1961
 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
 P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sam- pling point	Water tem- per- ature (° F)	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis	
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000		2.000
Oct. 21, 1960.....	1005			24	6	0.4												
May 2, 1961.....	0905			336	42	38												
June 5.....	1425			270	31	23												
July 17.....	1345			540	65	95												
Aug. 22.....	0920			260	25	18												
Sept. 24.....	1035			136	20	7.3												

Particle-size analyses of suspended sediment, water year October 1960 to September 1961
 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
 P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sam- pling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment concentra- tion (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis
							Percent finer than size indicated, in millimeters										
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	
Dec. 1, 1960.....	1200		52	e12,000	20,100		36	43	57	71	83	88	97	99	100		VPWC
Dec. 1.....	1630		51	7,770	5,500		32	40	53	65	78	86	96	98	100		VPWC
Dec. 2.....	0730		49	1,260	647		--	--	--	--	--	94	98	100	--		V
Dec. 2.....	1540		51	1,060	333		--	61	--	83	--	96	99	100	--		VPWC
Jan. 26, 1961.....	1600		49	918	2,000		--	61	--	88	--	99	100	--	--		VPWC
Jan. 31.....	1220		52	5,350	4,640		44	46	61	75	88	91	96	98	100		VPWC
Mar. 15.....	0740		48	606	2,270		51	61	80	91	97	100	--	--	--		VPWC
Mar. 17.....	0800		46	e1,000	1,810		--	56	--	82	--	99	100	--	--		VPWC

e Estimated.

SACRAMENTO RIVER BASIN--Continued

11-4520. CACHE CREEK NEAR CAPAY, CALIF.

LOCATION.--At gaging station, 1.8 miles upstream from Clear Lake Water Company's diversion dam, 3.2 miles northwest of Capay, Yolo County, and 5.4 miles northwest of Esparto.
DRAINAGE AREA.--1,052 square miles.
RECORDS AVAILABLE.--October 1952 to September 1961.

Chemical analyses: October 1952 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
													Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 13, 1960.....	45	--	--	--	--	30	--	204	--	40	--	--	--	--	--	177	0	1.0	479
Nov. 4.....	6.8	--	--	--	--	60	--	270	--	75	--	1.5	--	--	--	228	7	1.7	678
Dec. 1.....	146	--	--	--	--	54	--	210	--	76	--	2.9	--	--	--	211	28	1.9	631
Jan. 5.....	46	--	--	--	--	21	--	148	--	68	--	3.4	--	--	--	239	26	1.7	528
Feb. 18.....	453	--	--	--	--	26	--	163	--	58	--	1.9	--	--	--	139	20	1.6	328
Mar. 1.....	196	--	--	--	--	41	--	216	--	51	--	1.9	--	--	--	206	11	1.2	572
Apr. 13.....	128	--	--	--	--	44	--	230	--	50	--	2.0	--	--	--	204	1	1.3	574
May 4.....	337	13	0.00	28	23	29	3.3	197	3	26	0.2	0.2	1.4	241	0.33	163	0	1.0	414
June 2.....	320	--	--	--	--	23	--	184	4	22	--	1.3	--	--	--	151	0	.8	383
July 8.....	406	--	--	--	--	17	--	169	--	12	--	1.1	--	--	--	142	0	.6	324
Aug. 14.....	340	--	--	--	--	18	--	183	0	13	--	.9	--	--	--	140	0	.7	337
Sept. 6.....	176	6.5	--	26	22	20	2.8	190	2	17	.3	1.1	203	.28	--	154	0	.7	362

SACRAMENTO RIVER BASIN--Continued

11-4525. CACHE CREEK AT YOLO, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961
(Where no concentrations are reported loads are estimated)

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..							547	500	K 7400
2..							2360	3690	S 31500
3..							659	690	S 1450
4..							260	90	63
5..							98	50	13
6..							74	52	10
7..							49	28	3.7
8..							33	22	2.0
9..							14	12	.7
10..							6.1	3	K .1
11..							0	--	0
12..							0	--	0
13..							0	--	0
14..							0	--	0
15..							0	--	0
16..							0	--	0
17..							0	--	0
18..							530	304	S 474
19..							383	116	S 138
20..							151	65	27
21..							1.8	--	.1
22..							0	--	0
23..							0	--	0
24..							0	--	0
25..							0	--	0
26..							0	--	0
27..							6.5	4	.1
28..							15	--	.3
29..							3.2	4	K .1
30..							0	--	0
31..							0	--	0
Total	0		0	0		0	5190.6	--	41082.1
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..	0	--	0	2270	1790	S 12900	120	--	75
2..	0	--	0	1050	353	S 1050	108	--	70
3..	0	--	0	1380	334	S 1390	99	275	74
4..	0	--	0	770	150	312	90	--	68
5..	0	--	0	536	140	203	84	--	61
6..	0	--	0	408	130	143	78	--	55
7..	0	--	0	336	--	110	84	--	57
8..	0	--	0	276	--	82	84	--	54
9..	0	--	0	246	--	66	87	--	54
10..	0	--	0	675	272	S 539	168	--	110
11..	0	--	0	616	--	330	162	--	100
12..	0	--	0	1260	768	S 2780	144	--	89
13..	0	--	0	860	158	S 392	141	--	84
14..	0	--	0	672	--	240	135	--	77
15..	0	--	0	608	133	218	267	--	270
16..	0	--	0	636	130	223	592	--	580
17..	0	--	0	524	--	200	604	370	S 722
18..	0	--	0	443	--	180	860	--	930
19..	0	--	0	380	--	160	612	--	300
20..	0	--	0	330	--	150	506	115	157
21..	0	--	0	294	--	140	460	106	132
22..	0	--	0	261	--	130	394	--	100
23..	0	--	0	231	180	112	348	--	87
24..	0	--	0	207	--	100	327	--	78
25..	0	--	0	186	--	90	303	90	74
26..	3.6	4	K 1.7	171	--	83	297	100	80
27..	555	821	S 1280	150	--	81	297	--	88
28..	400	400	432	135	--	77	303	--	98
29..	200	140	76	--	--	--	282	--	76
30..	891	772	S 2940	--	--	--	261	--	68
31..	1710	1330	S 10900	--	--	--	240	--	58
Total	3759.6	--	15629.7	15911	--	22481	8537	--	4926

S Computed by subdividing day.

K Computed from estimated-concentration graph and subdividing day.

SACRAMENTO RIVER BASIN--Continued

11-4525. CACHE CREEK AT YOLO, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
(Where no concentrations are reported loads are estimated)

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..	189			8.6					
2..	156			9.2					
3..	120			12					
4..	59			13					
5..	48			3.9					
6..	41			0					
7..	31			0					
8..	25			0					
9..	20			0					
10..	16			0					
11..	2.8			0					
12..	0			0					
13..	0			0					
14..	0			0					
15..	0			0					
16..	0			0					
17..	0			0					
18..	0			0					
19..	0			0					
20..	0			0					
21..	0			0					
22..	0			0					
23..	0			0					
24..	22			0					
25..	22			0					
26..	22			0					
27..	22			0					
28..	22			0					
29..	17			0					
30..	12			0					
31..	--			0					
Total	846.8		140	46.7		4	0		0
	JULY			AUGUST			SEPTEMBER		
1..									
2..									
3..									
4..									
5..									
6..									
7..									
8..									
9..									
10..									
11..									
12..									
13..									
14..									
15..									
16..									
17..									
18..									
19..									
20..									
21..									
22..									
23..									
24..									
25..									
26..									
27..									
28..									
29..									
30..									
31..									
Total	0		0	0		0	0		0
Total discharge for year (cfs-days).....								34,291.7	
Total load for year (tons).....								84,262.8	

SACRAMENTO RIVER BASIN--Continued
 11-4525. CACHE CREEK AT YOLO, CALIF.--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961
 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
 P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sam- pling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Dec. 2, 1960.....	1000		52	1,950	3,980			40		56		64	73	86	99	100	VPWC	
Dec. 2.....	1250		53	1,610	2,070			65		84		92	95	96	100		VPWC	
Jan. 30, 1961.....	1800		53	1,440	1,080			--		--		99	100	--	--		V	
Jan. 31.....	1550		52	1,710	1,120			64		89		99	100	--	--		VPWC	
Jan. 31.....	1730		54	2,470	2,840			37		82		77	84	93	100		VPWC	
Feb. 1.....	1440		53	1,860	1,140			62		88		98	100	--	--		VPWC	
Feb. 23.....	1125		49	231	178			--		--		98	99	100	--	--	V	
Mar. 20.....	1250		57	488	109			--		--		94	96	99	100		V	

SACRAMENTO RIVER BASIN--Continued
11-4535. PUTAH CREEK NEAR GUENOC, CALIF.

LOCATION.--Temperature recorder at gaging station, in Guenoc land grant, just upstream from Coyote Valley damsite, 2.8 miles up-stream from Soda Creek, 3.2 miles downstream from highway bridge at Guenoc, Lake County, and 5.6 miles northeast of Middletown. DRAINAGE AREA.--112 square miles.
RECORDS AVAILABLE.--Water temperatures: March 1960 to September 1961.
EXTREMES, 1960-61.--Water temperatures: Maximum, 84°F July 22, Aug. 5, 8, 9; minimum, 44°F Jan. 2-5.
EXTREMES, March 1960 to September 1961.--Water temperatures: Maximum, 86°F July 20, 1960; minimum, 44°F Jan. 2-5, 1961.

Temperature (°F) of water, water year October 1960 to September 1961																																		
Month		Day																														Average		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			31
October	Maximum	72	72	71	69	68	68	67	67	64	62	64	64	64	61	65	66	66	67	67	66	67	66	67	64	66	65	63	62	64	64	64	65	
	Minimum	66	66	65	64	65	66	63	61	57	56	57	58	57	55	58	58	58	58	60	59	60	59	60	59	59	59	57	58	58	57	58	60	
November	Maximum	64	62	62	60	59	58	60	61	60	60	60	58	56	56	57	59	59	60	59	57	58	57	55	56	53	51	51	51	51	52	--	58	
	Minimum	58	59	56	56	55	56	57	55	55	55	55	54	53	54	53	54	55	57	54	54	55	53	53	54	53	50	49	49	50	51	--	54	
December	Maximum	52	52	52	52	51	50	50	51	50	52	52	52	51	51	51	53	52	52	52	52	52	52	52	51	51	52	51	52	48	49	48	51	
	Minimum	52	51	51	50	49	47	48	49	49	49	49	50	51	50	51	51	51	52	52	50	51	50	50	50	50	50	49	51	49	47	46	46	50
January	Maximum	48	47	46	46	46	47	47	48	51	51	50	49	50	50	51	51	51	50	50	50	51	51	52	52	52	50	50	50	50	50	53	50	48
	Minimum	45	44	44	44	44	45	45	46	48	48	47	47	48	48	49	50	49	48	48	48	50	50	50	50	50	52	49	48	49	49	50	48	50
February	Maximum	53	54	53	53	52	54	54	51	52	51	51	50	52	52	51	51	51	50	51	54	55	56	54	53	55	54	56	56	--	--	--	53	50
	Minimum	52	53	51	50	50	52	50	50	50	50	50	48	49	49	49	49	48	48	48	50	52	53	51	52	51	52	51	51	52	--	--	--	50
March	Maximum	57	57	54	56	54	54	55	53	51	53	55	54	57	55	51	51	52	54	54	54	55	55	56	55	54	54	55	56	58	60	61	55	55
	Minimum	53	54	51	52	51	51	49	50	47	50	51	52	52	51	49	48	47	48	50	48	49	52	51	52	50	52	51	49	51	53	55	51	51
April	Maximum	62	65	67	66	64	64	63	64	66	64	66	61	64	65	67	69	66	63	62	58	54	58	62	64	65	66	61	66	--	--	63	63	
	Minimum	56	58	59	61	56	57	56	56	57	56	57	56	57	54	56	57	59	59	53	54	54	51	49	51	53	54	55	58	55	--	--	56	56
May	Maximum	66	67	67	66	62	60	66	68	64	62	63	67	68	71	72	70	72	73	71	68	72	69	71	72	71	72	71	70	67	68	66	68	
	Minimum	58	58	59	55	56	57	55	57	58	57	56	58	60	63	61	62	63	63	61	62	63	61	60	60	61	62	60	62	61	60	59	59	
June	Maximum	67	70	72	74	72	73	74	73	74	75	73	76	78	79	80	78	77	78	79	78	79	78	79	79	79	77	75	74	76	--	76	76	
	Minimum	62	63	64	64	63	63	62	62	63	64	65	65	67	68	69	68	65	67	69	71	71	70	72	73	73	73	71	69	68	68	--	67	
July	Maximum	79	78	77	75	75	76	77	78	79	80	81	79	82	79	79	79	80	81	80	82	83	84	83	83	82	82	81	81	81	80	80	80	
	Minimum	71	71	72	70	68	67	67	70	71	72	72	73	73	73	74	74	74	74	74	75	76	74	75	76	74	74	73	73	73	73	73	72	72
August	Maximum	82	82	82	84	82	83	84	81	82	83	82	80	80	80	80	79	80	76	81	82	80	79	79	79	79	77	78	79	80	81	81	81	81
	Minimum	72	73	74	77	78	78	76	77	76	77	77	75	72	72	71	70	72	73	72	74	72	72	72	72	72	71	71	73	74	74	74	74	74
September	Maximum	80	76	76	78	78	76	76	76	77	75	75	76	74	73	75	76	74	73	74	73	73	74	73	74	73	74	75	73	74	73	74	--	75
	Minimum	75	71	70	70	70	70	70	70	70	70	69	69	69	69	69	69	67	67	67	68	67	68	67	66	66	66	67	68	69	67	66	--	69

SACRAMENTO RIVER BASIN--Continued
11-4540. PUTAH CREEK NEAR WINTERS, CALIF.

LOCATION.--At gaging station, 1 mile downstream from Monticello Dam, 6 miles west of Winters, Yolo County, and 8 miles downstream from Capell Creek.
DRAINAGE AREA.--577 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Po- tas- sium (K)	Bi- car- bon- ate (HCO ₃)	Car- bon- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃	So- dium ad- sorp- tion (micro- mhos at 25°C)	Specific con- duct- pH		
															Parts per million	Tons per acre-foot	Tons per day					
Oct. 13, 1960.....	66	--	--	--	--	7.4	--	164	5	--	7.5	--	--	0.1	--	--	--	150	7	0.3	311	8.3
Nov. 4.....	32	--	--	--	--	9.2	--	177	0	--	5.2	--	--	.2	--	--	--	160	15	.3	313	8.2
Dec. 8.....	11	--	--	--	--	11	--	180	4	--	7.0	--	--	.2	--	--	--	157	3	.4	333	8.4
Jan. 5, 1961.....	12	--	--	--	--	9.9	--	195	0	--	6.0	--	--	.2	--	--	--	162	2	.3	336	8.5
Feb. 17.....	75	--	--	--	--	9.0	--	177	4	--	5.5	--	--	.2	--	--	--	161	9	.3	326	8.5
Mar. 1.....	84	--	--	--	--	9.2	--	162	12	--	4.8	--	--	.2	--	--	--	158	5	.3	324	8.5
Apr. 13.....	171	--	--	--	--	9.1	--	172	8	--	5.5	--	--	.1	--	--	--	158	4	.3	318	8.6
May 4.....	273	15	0.00	20	26	10	1.8	176	5	15	5.5	0.2	0.4	.2	186	0.25	158	5	.4	320	8.5	
June 1.....	360	--	--	--	--	8.6	--	174	6	--	7.8	--	--	.2	--	--	159	6	.3	318	8.5	
July 7.....	386	--	--	--	--	8.8	--	176	4	--	5.2	--	--	.3	--	--	162	11	.3	321	8.3	
Aug. 14.....	322	--	--	--	--	10	--	186	0	--	7.6	--	--	.1	--	--	157	4	.4	334	7.9	
Sept. 12.....	260	13	--	20	26	7.7	1.8	144	20	11	4.2	.2	.3	.0	175	.24	156	4	.3	316	8.5	

SACRAMENTO RIVER BASIN--Continued

11-4553. LINDSAY SLOUGH NEAR RIO VISTA, CALIF.

LOCATION.--Near tidal gaging station, 6 miles north of Rio Vista, Solano County, and 1.1 miles upstream from confluence with Cache Slough.
 RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25 C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate			
Oct. 3, 1960.....						16		104		11			0.1				78	0	0.8	221	7.8
Oct. 7.....						16		95		8.5			.1				68	0	.9	268	8.0
Nov. 1.....						15		86		14			.1				68	0	.8	201	7.6
Dec. 12.....						13		84		10			.1				73	4	.7	197	7.8
Jan. 9, 1961.....						13		103		22			.2				91	7	1.2	302	7.8
Feb. 13.....						26		107		17			.2				90	2	.8	279	8.2
Mar. 6.....						17															
Apr. 10.....						15		83		10			.1				69	1	.8	202	8.0
May 1.....		18	0.07	13	8.5	14	1.2	84	15	9.4	0.2	1.2	.1	122	0.17		68	0	.7	199	7.9
June 5.....						19		100		12			.0				79	0	.9	234	8.0
July 10.....						17		93		14			.1				80	4	.8	221	7.7
Aug. 8.....						12		85		9.4			.0				68	0	.6	188	7.7
Sept. 12.....	21			15	9.6	17	1.6	102	13	11	.1	.4	.0	139	.19		77	0	.8	228	7.9

SACRAMENTO RIVER BASIN--Continued

11-4554. SACRAMENTO RIVER NEAR RIO VISTA, CALIF.

LOCATION.--At pier, 1,500 feet upstream from tidal gaging station, 1 mile south of Rio Vista, Solano County, and approximately 3.1 miles downstream from Steamboat Slough.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 3, 1960.....						14		94			9.5			0.1				74	0	0.7	201
Nov. 7.....						19.9		86			7.5			.1				69	0	.5	182
Dec. 12.....						12		74			12			.0				57	0	.7	184
Jan. 9, 1961.....						11		81			8.5			.0				67	1	.6	184
Feb. 13.....						11		69			7.7			.1				61	4	.6	169
Mar. 6.....						10		88			9.2			.1				71	0	.5	195
Apr. 10.....						10		72			7.5			.0				62	3	.6	163
May 1.....		18	0.01	13	6.7	11	1.8	69		14	8.8	0.0	0.7	.1		108	0.15	60	3	.6	169
June 5.....						17		94			12			.0				72	0	.9	216
July 10.....						14		78			10			.0				63	0	.8	183
Aug. 8.....						12		78			10			.2				60	0	.7	178
Sept. 12.....	21			16	9.5	18	1.4	109		12	13	.1	.8	.0	146	.20		79	0	.9	235

NAPA RIVER BASIN

11-4560. NAPA RIVER NEAR ST. HELENA, CALIF.

LOCATION --At gaging station, 0.2 mile upstream from highway bridge, 1.3 miles northeast of Zinfandel, and 2.5 miles east of St. Helena, Napa County.

DRAINAGE AREA --81.3 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1953 to September 1961.

Water temperatures: October 1957 to September 1961.

Sediment records: December 1956 to September 1961.

EXTREMES, 1960-61 --Sediment concentrations: Maximum daily, 409 ppm Jan. 31; minimum daily, no flow on several days.

Sediment loads: Maximum daily, 1,520 tons Jan. 31; minimum daily, 0 ton on several days.

EXTREMES, 1956-61 --Sediment concentrations: Maximum daily, 2,310 ppm Feb. 8, 1960; minimum daily, no flow on many days in 1957, 1959-61.

Sediment loads: Maximum daily, 39,600 tons Feb. 8, 1960; minimum daily, 0 ton on many days in 1957, 1959-61.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 13, 1960.....	0.4	--	--	--	--	25	--	155	--	--	67	--	--	1.9	--	--	--	182	55	0.8	499
Nov. 4.....	1.0	--	--	--	--	22	--	180	--	--	44	--	--	1.9	--	--	--	173	25	0.7	439
Dec. 8.....	8.5	--	--	--	--	30	--	104	--	--	36	--	--	1.1	--	--	--	84	0	1.4	320
Jan. 5, 1961.....	8.5	--	--	--	--	28	--	108	--	--	30	--	--	1.1	--	--	--	86	0	1.2	295
Feb. 17.....	180	--	--	--	--	11	--	62	--	--	9.0	--	--	1.1	--	--	--	56	5	0.6	162
Mar. 1.....	42	--	--	--	--	16	--	85	--	--	13	--	--	1.4	--	--	--	71	1	0.8	218
Apr. 13.....	38	--	--	--	--	17	--	101	--	--	16	--	--	1.6	--	--	--	80	0	0.8	244
May 4.....	18	43	0.00	19	11	21	2.4	110	16	16	18	0.4	3.4	0.5	189	0.26	91	1	1.0	272	
June 1.....	7.7	--	--	--	--	25	--	130	--	--	24	--	--	0.7	--	--	--	107	0	1.1	320
July 7.....	6	--	--	--	--	20	--	182	--	--	13	--	--	0.6	--	--	--	151	2	0.7	365
Aug. 2.....	2	--	--	--	--	19	--	185	--	--	14	--	--	0.5	--	--	--	152	0	0.6	360
Sept. 6.....	4	29	--	32	18	19	2.7	196	18	18	13	0.1	0.1	0.4	229	0.31	156	0	0.7	375	

NAPA RIVER BASIN--Continued
 11-4560. NAPA RIVER NEAR ST. HELENA, CALIF.--Continued
 Temperature (°F) of water, water year October 1960 to September 1961

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

NAPA RIVER BASIN--Continued

11-4560. NAPA RIVER NEAR ST. HELENA, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961
(Where no concentrations are reported loads are estimated)

Day	OCTOBER			NOVEMBER			DECEMBER		
	Mean discharge (cfs)	Suspended sediment Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Suspended sediment Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Suspended sediment Mean concentration (ppm)	Tons per day
1..	0	--		.7	1	T	262	286	S 399
2..	0	--		.7	--	T	122	40	13
3..	0	--		.9	3	T	53	15	2.1
4..	0	--		1.0	--	T	26	8	.6
5..	0	--		.8	--	T	15	5	.2
6..	.2	5		.8	7	T	11	4	.1
7..	.8	--		1.5	--	T	9.1	4	.1
8..	1.8	--		1.6	--	T	8.5	4	.1
9..	1.6	4		1.6	10	T	7.9	--	.1
10..	1.0	--		1.5	--	T	8.8	3	.1
11..	.6	--		1.5	--	T	11	--	.2
12..	.5	5		3.4	11	0.1	7.9	--	.1
13..	.4	--		6.7	17	.3	7.6	--	.1
14..	.2	--		8.2	13	.3	7.0	4	.1
15..	.1	6		3.6	4	T	7.6	4	.1
16..	.1	--		2.4	4	T	15	11	S .6
17..	.1	--		2.2	4	T	62	20	S 3.5
18..	.2	7		2.3	5	T	42	10	1.1
19..	.1	--		2.3	4	T	43	9	1.0
20..	.1	--		2.0	5	T	23	9	.6
21..	.2	3		1.8	3	T	17	8	.4
22..	.1	--		1.7	3	T	16	5	.2
23..	.1	--		1.9	--	T	14	3	.1
24..	.1	3		2.2	4	T	13	4	.1
25..	.2	--		2.9	8	.1	13	3	.1
26..	.2	--		14	21	.8	11	2	.1
27..	.2	4		8.5	27	.6	11	3	.1
28..	.3	--		4.3	20	.2	11	3	.1
29..	.4	--		3.3	12	.1	9.4	3	.1
30..	.3	--		3.6	--	.1	9.1	7	.2
31..	.4	2		--	--	--	8.8	5	.1
Total	10.3	--	0.1	89.9	--	3.1	882.7	--	424.4
Day	JANUARY			FEBRUARY			MARCH		
	Mean discharge (cfs)	Suspended sediment Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Suspended sediment Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Suspended sediment Mean concentration (ppm)	Tons per day
1..	8.8	3	0.1	372	80	80	42	5	0.6
2..	8.5	3	.1	321	53	S 49	39	4	.4
3..	8.5	3	.1	232	22	14	37	4	.4
4..	8.5	6	.1	160	15	B 6.5	34	3	.3
5..	8.5	5	.1	120	12	3.9	30	4	.4
6..	8.5	3	.1	102	10	2.8	39	4	.4
7..	8.2	6	.1	86	7	1.6	32	3	.3
8..	8.5	4	.1	77	7	1.5	62	13	S 4.5
9..	8.2	5	.1	261	61	S 51	98	19	S 5.9
10..	8.2	4	B .1	228	40	B 25	63	6	1.0
11..	7.9	4	B .1	634	258	S 554	57	6	.9
12..	7.9	3	B .1	366	65	64	49	6	.8
13..	7.9	2	T	292	72	S 74	44	5	.6
14..	7.9	2	T	303	82	S 76	77	15	S 9.4
15..	7.9	3	.1	268	24	17	309	87	S 77
16..	7.9	1	T	225	16	9.7	204	23	13
17..	7.9	3	.1	180	13	6.3	257	77	S 84
18..	7.9	3	.1	148	10	4.0	118	20	12
19..	7.9	3	.1	122	7	2.3	166	12	5.4
20..	7.9	3	.1	105	8	2.3	154	13	5.4
21..	7.6	2	T	92	8	2.0	128	11	3.8
22..	7.3	4	.1	79	6	1.3	114	10	3.1
23..	8.5	6	.1	72	5	1.0	110	9	2.7
24..	8.2	4	.1	65	4	.7	122	12	B 4.0
25..	24	19	S 3.3	60	6	1.0	117	10	3.2
26..	174	119	S 61	55	5	.7	176	36	S 22
27..	84	34	S 8.4	50	5	.7	212	33	19
28..	56	21	S 3.2	47	6	.8	164	15	6.6
29..	336	369	S 530	--	--	--	132	10	B 3.6
30..	339	121	S 144	--	--	--	112	9	B 2.7
31..	1020	409	S 1520	--	--	--	101	9	2.5
Total	2228.0	--	2272.0	5122	--	1053.1	3609	--	295.9

S Computed by subdividing day.
T Less than 0.05 ton.

B Computed from estimated-concentration graph.

NAPA RIVER BASIN--Continued

11-4560. NAPA RIVER NEAR ST. HELENA, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
(Where no concentrations are reported loads are estimated)

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..	86	9	2.1	22	7	0.4	7.7	--	0.1
2..	78	8	1.7	21	--	.5	7.3	7	.1
3..	72	7	1.4	20	10	.5	6.8	--	.1
4..	67	8	1.4	18	--	.6	6.6	9	.2
5..	57	9	1.4	18	13	.6	7.0	--	.2
6..	52	7	1.0	18	--	.6	7.0	11	.2
7..	48	8	1.0	17	11	.5	7.5	--	.2
8..	44	9	1.1	16	--	.5	6.2	8	.1
9..	43	8	.9	15	11	.4	5.2	--	.1
10..	42	8	.9	15	--	.4	5.0	4	.1
11..	40	7	.8	15	10	.4	5.0	--	.1
12..	40	8	.9	13	--	.4	4.4	5	.1
13..	38	7	.7	12	12	.4	4.2	--	.1
14..	34	8	.7	12	--	.5	3.5	4	T
15..	33	7	.6	13	16	.6	3.2	--	T
16..	30	7	.6	11	--	.5	2.5	4	T
17..	30	6	.5	11	14	.4	2.9	--	T
18..	27	11	.8	11	--	.4	2.8	4	T
19..	26	9	.6	11	13	.4	3.2	--	.1
20..	26	6	.4	10	--	.3	2.9	7	.1
21..	30	15	1.5	11	9	.3	2.4	--	.1
22..	52	29	4.1	10	--	.2	2.5	7	T
23..	65	21	3.7	9.5	8	.2	1.8	--	T
24..	40	12	1.3	8.6	7	.2	1.8	3	T
25..	30	9	.7	8.2	7	.2	1.5	--	T
26..	27	12	.9	7.9	--	.1	1.7	3	T
27..	25	10	.7	7.5	6	.1	1.5	--	T
28..	23	9	.6	7.7	--	.1	1.5	4	T
29..	23	11	.7	7.3	7	.1	1.4	--	T
30..	23	7	.4	6.8	--	.1	1.3	4	T
31..	--	--	--	7.0	6	.1	--	--	--
Total	1251	--	34.1	390.5	--	11.0	118.3	--	2.3
Day	JULY			AUGUST			SEPTEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	1.3	--	--	0.2	--	--	0.1	--	--
2..	1.3	10	--	.2	--	--	.2	--	--
3..	1.4	--	--	.6	--	--	.2	6	--
4..	1.2	7	--	.5	--	--	.2	--	--
5..	.9	--	--	.6	--	--	.2	--	--
6..	.7	9	--	.6	7	--	.4	9	--
7..	.6	--	--	.4	--	--	.5	--	--
8..	.8	5	--	.3	--	--	.5	--	--
9..	.8	--	--	.2	4	--	.5	--	--
10..	.9	6	--	.1	--	--	.5	3	--
11..	.7	--	--	.2	--	--	.4	--	--
12..	.8	4	--	.4	--	--	.4	--	--
13..	.6	--	--	.4	5	--	.3	1	--
14..	.7	3	--	.4	--	--	.2	--	--
15..	.5	--	--	.2	--	--	.2	--	--
16..	.5	5	--	.2	3	--	.4	--	--
17..	.2	--	--	.5	--	--	.5	4	--
18..	.1	3	--	.5	--	--	.5	--	--
19..	0	--	--	.5	--	--	.5	--	--
20..	0	--	--	.5	5	--	.5	2	--
21..	.1	1	--	.4	--	--	.6	--	--
22..	.2	--	--	.6	--	--	.5	--	--
23..	.2	4	--	.7	4	--	.5	--	--
24..	.2	--	--	.4	--	--	.5	2	--
25..	.2	--	--	.2	--	--	.4	--	--
26..	.2	4	--	.1	--	--	.2	--	--
27..	.2	--	--	.1	4	--	.2	4	--
28..	.5	--	--	.2	--	--	.3	--	--
29..	.3	--	--	.3	--	--	.4	--	--
30..	.4	3	--	.3	3	--	.4	--	--
31..	.5	--	--	.2	--	--	--	--	--
Total	17.0	--	0.3	11.0	--	0.1	11.2	--	0.1

Total discharge for year (cfs-days)..... 13,740.9
 Total load for year (tons)..... 4,098.5

T Less than 0.05 ton.

NAPA RIVER BASIN--Continued

11-4560. NAPA RIVER NEAR ST. HELENA, CALIF.--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961
 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
 P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sam- pling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis
							Percent finer than size indicated, in millimeters										
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	
Jan. 29, 1961.....	1650		49	693	882							80	88	96	100	--	V
Jan. 31.....	1720		53	915	339							73	82	88	95	100	V
Feb. 11.....	0905		51	1,000	510							86	93	99	99	100	V

RUSSIAN RIVER BASIN

11-4625. RUSSIAN RIVER NEAR HOPLAND, CALIF.

LOCATION.--At gaging station, in Rancho de Sanel Grant, 0.2 mile downstream from McNab Creek, 4 miles north of Hopland, Mendocino County, and 17 miles upstream from Sulfur Creek.
 DRAINAGE AREA.--362 square miles.
 RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonylate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 12, 1960.....	248	--	--	19	8.6	6.4	--	97	--	--	3.5	--	--	0.2	--	--	--	83	3	0.3	183
Nov. 3.....	315	--	--	--	--	8.0	--	100	--	--	3.8	--	--	.4	--	--	--	81	0	.5	183
Dec. 7.....	300	--	--	--	--	10	--	108	--	--	6.5	--	--	.4	--	--	--	95	6	.5	217
Jan. 4, 1961.....	459	--	--	--	--	6.6	--	92	--	--	4.5	--	--	.3	--	--	--	74	0	.3	175
Feb. 17.....	1,570	--	--	--	--	5.9	--	76	--	--	3.8	--	--	.2	--	--	--	69	7	.3	157
Mar. 13.....	1,230	--	--	--	--	5.9	--	84	--	--	2.7	--	--	.3	--	--	--	69	0	.3	163
Apr. 12.....	595	--	--	--	--	9.2	--	98	--	--	5.5	--	--	.2	--	--	--	82	2	.4	190
May 3.....	570	12	0.08	18	7.8	7.7	1.4	94	--	8.6	3.9	0.2	0.6	.3	107	0.15	--	77	0	.4	175
June 1.....	231	--	--	--	--	7.4	--	101	--	--	4.8	--	--	.4	--	--	--	86	3	.3	197
July 7.....	333	--	--	--	--	5.9	--	94	--	--	2.2	--	--	.1	--	--	--	75	0	.3	169
Aug. 2.....	365	--	--	--	--	5.6	--	94	--	--	1.5	--	--	.3	--	--	--	76	0	.3	172
Sept. 6.....	495	9.3	--	20	6.8	6.4	.9	94	--	8.0	5.0	.0	1.5	.3	104	.14	--	78	1	.3	176

RUSSIAN RIVER BASIN--Continued

11-4640. RUSSIAN RIVER NEAR HEALDSBURG, CALIF.

LOCATION--At gaging station, in Sotoyome Grant, 2 miles east of Healdsburg, Sonoma County, and 3.5 miles upstream from Dry Creek.

DRAINAGE AREA--791 square miles.

RECORDS AVAILABLE--Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 13, 1960.....	227	--		23	12	7.7	--	130	0	--	5.5	--	--	0.4	--	--	--	106	0	0.3	234
Nov. 7.....	875	--		--	--	9.6	--	124	0	--	--	--	--	.4	--	--	--	101	0	.3	227
Nov. 27.....	875	--		--	--	9.6	--	116	0	--	5.2	--	--	.4	--	--	--	108	13	.4	238
Dec. 4.....	605	--		--	--	8.0	--	103	0	--	3.0	--	--	.2	--	--	--	116	5	.3	247
Jan. 4, 1961.....	3,270	--		--	--	5.6	--	103	0	--	3.0	--	--	.2	--	--	--	118	11	.3	247
Feb. 17.....	842	--		--	--	8.5	--	148	0	--	4.2	--	--	.3	--	--	--	132	11	.3	280
Mar. 1.....		--		--	--																
Apr. 13.....	890	--		--	--	8.3	--	135	0	--	4.5	--	--	.3	--	--	--	119	8	.3	246
May 3.....	752	13	0.02	23	12	9.5	1.4	130	1	11	3.8	0.2	0.8	.3	140	0.19	--	108	0	.4	237
June 1.....	415	--		--	--	8.5	--	134	1	--	5.5	--	--	.3	--	--	--	114	2	.3	247
July 1.....	325	--		--	--	7.5	--	128	0	--	3.3	--	--	.2	--	--	--	105	0	.3	229
Aug. 2.....	300	--		--	--	6.9	--	125	0	--	4.6	--	--	.4	--	--	--	104	2	.3	220
Sept. 6.....	390	12		24	9.2	7.0	1.0	120	0	7.0	2.2	.1	.8	.4	123	.17	--	98	0	.3	215

RUSSIAN RIVER BASIN--Continued
11-4670. RUSSIAN RIVER AT GUERNEVILLE, CALIF.

LOCATION --On State Highway 12 bridge in Guerneville, Sonoma County, 5.3 miles downstream from gaging station, and 6.5 miles upstream from Austin Creek.
DRAINAGE AREA --1,342 square miles downstream from gaging station.
RECORDS AVAILABLE --Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium-Magnesium	Non-bicarbonate		
Oct. 13, 1960....	228	--	--	24	13	9.7	--	140	0	--	8.0	--	--	0.4	--	--	--	114	0	0.4	257
Nov. 4.....	275	--	--	--	--	8.9	--	127	2	--	5.5	--	--	.4	--	--	--	108	1	.4	244
Dec. 8.....	1,160	--	--	--	--	9.3	--	65	0	--	7.2	--	--	.4	--	--	--	114	61	.4	264
Jan. 4, 1961....	726	--	--	--	--	9.3	--	143	0	--	6.0	--	--	.3	--	--	--	123	6	.4	266
Feb. 17.....	6,400	--	--	--	--	6.5	--	96	0	--	4.0	--	--	.1	--	--	--	81	2	.3	193
Mar. 1.....	1,070	--	--	--	--	13	--	146	0	--	5.5	--	--	.3	--	--	--	127	7	.5	260
Apr. 13.....	995	--	--	--	--	9.3	--	139	0	--	6.0	--	--	.3	--	--	--	120	6	.4	258
May 4.....	790	--	--	24	13	13	2.5	139	0	14	5.8	0.1	1.1	.3	155	0.21	--	112	0	.5	253
June 1.....	441	--	0.02	--	--	9.3	--	144	0	--	6.5	--	--	.3	--	--	--	119	1	.4	264
July 7.....	289	--	--	--	--	7.7	--	136	0	--	3.1	--	--	.3	--	--	--	112	0	.3	242
Aug. 1.....	275	--	--	--	--	7.5	--	133	0	--	4.0	--	--	.3	--	--	--	115	6	.3	236
Sept. 5.....	377	14	--	23	11	7.9	1.1	128	0	8.0	2.5	.1	.7	.4	132	.18	--	104	0	.3	226

GUALALA RIVER BASIN

11-4675. SOUTH FORK GUALALA RIVER NEAR ANNAPOLIS, CALIF.

LOCATION -- Approximately 400 feet downstream from gaging station, 1,400 feet downstream from Wheatfield Fork Gualala River, and 4.8 miles west of Annapolis, Sonoma County, California.

DRAINAGE AREA 161 square miles.

RECORDS AVAILABLE -- Chemical analyses: January 1959 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium, sodium	Non-carbonate		
Oct. 10, 1960.....	8.9	--	--	27	15	15	--	163	0	11	--	--	0.0	--	--	--	128	0	0.6	300
Nov. 7.....	8.9	--	--	--	--	14	--	164	0	13	--	--	.1	--	--	--	130	0	.5	302
Dec. 5.....	370	--	--	--	--	9.0	--	66	0	7.2	--	--	.1	--	--	--	66	12	.5	184
Jan. 9, 1961.....	120	--	--	--	--	9.6	--	115	0	6.8	--	--	.0	--	--	--	95	1	.4	224
Feb. 6.....	836	--	--	--	--	7.2	--	88	0	4.8	--	--	.0	--	--	--	72	0	.4	176
Mar. 7.....	336	--	--	--	--	8.5	--	87	0	5.8	--	--	.0	--	--	--	76	5	.4	181
Apr. 3.....	299	--	--	--	--	5.8	--	98	0	8.0	--	--	.0	--	--	--	83	3	.3	195
May 1.....	78	17	0.00	24	10	13	1.3	127	0	7.5	0.1	1.0	.1	148	0.20	--	107	0	.5	232
June 5.....	44	--	--	--	--	12	--	129	0	7.5	--	--	.0	--	--	--	107	1	.5	232
July 3.....	13	--	--	--	--	13	--	150	0	7.2	--	--	.1	--	--	--	110	0	.5	272
Aug. 1.....	6.0	--	--	--	--	13	--	149	0	10	--	--	.1	--	--	--	123	1	.5	276
Sept. 5.....	3.7	18	--	28	11	15	1.4	147	2	13	.0	.2	.2	173	.24	--	116	0	.6	274

NAVARRO RIVER BASIN

11-4680. NAVARRO RIVER NEAR NAVARRO, CALIF.

LOCATION --At gaging station, 2.7 miles downstream from North Fork, 5.4 miles upstream from mouth, and 6.6 miles west of Navarro, Mendocino County.
 DRAINAGE AREA --304 square miles.
 RECORDS AVAILABLE --Chemical analyses: January 1959 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 10, 1960.....	21	--	--	27	11	13	--	147	--	10	--	--	0.1	--	--	--	114	0	0.5	280
Nov. 7.....	15	--	--	--	--	14	--	150	--	14	--	--	.2	--	--	--	118	0	.6	277
Dec. 5.....	452	--	--	--	--	9.7	--	95	--	8.0	--	--	.1	--	--	--	79	1	.5	199
Jan. 9, 1961.....	112	--	--	--	--	11	--	120	--	7.5	--	--	.1	--	--	--	100	2	.5	235
Feb. 6.....	702	--	--	--	--	7.7	--	86	--	6.2	--	--	.1	--	--	--	71	0	.4	178
Mar. 7.....	357	--	--	--	--	9.3	--	96	--	6.0	--	--	.1	--	--	--	82	3	.4	198
Apr. 3.....	427	--	--	--	--	6.8	--	96	--	8.5	--	--	.0	--	--	--	78	0	.3	194
May 11.....	222	17	0.00	24	7.3	11	1.2	114	11	7.8	0.1	0.5	.1	136	0.18	--	90	0	.5	201
June 5.....	80	--	--	--	--	13	--	134	--	9.0	--	--	.2	--	--	--	105	0	.1	255
July 3.....	26	--	--	--	--	13	--	145	--	7.4	--	--	.1	--	--	--	105	0	.6	261
Aug. 1.....	11	--	--	--	--	13	--	140	--	8.7	--	--	.3	--	--	--	116	1	.5	258
Sept. 5.....	7.1	18	--	26	11	14	1.4	143	8.0	10	.0	.5	.2	159	.22	--	109	0	.6	263

NAVARRO RIVER BASIN

11-4680. NAVARRO RIVER NEAR NAVARRO, CALIF.

LOCATION --At gaging station, 2.7 miles downstream from North Fork, 5.4 miles upstream from mouth, and 6.6 miles west of Navarro, Mendocino County.
 DRAINAGE AREA --304 square miles.
 RECORDS AVAILABLE --Chemical analyses: January 1959 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 10, 1960.....	21	--	--	27	11	13	--	147	--	10	--	--	0.1	--	--	--	114	0	0.5	280
Nov. 7.....	15	--	--	--	--	14	--	150	--	14	--	--	.2	--	--	--	118	0	.6	277
Dec. 5.....	452	--	--	--	--	9.7	--	95	--	8.0	--	--	.1	--	--	--	79	1	.5	199
Jan. 9, 1961.....	112	--	--	--	--	11	--	120	--	7.5	--	--	.1	--	--	--	100	2	.5	235
Feb. 6.....	702	--	--	--	--	7.7	--	86	--	6.2	--	--	.1	--	--	--	71	0	.4	178
Mar. 7.....	357	--	--	--	--	9.3	--	96	--	6.0	--	--	.1	--	--	--	82	3	.4	186
Apr. 3.....	427	--	--	--	--	6.8	--	96	--	8.5	--	--	.0	--	--	--	78	0	.3	194
May 11.....	222	17	0.00	24	7.3	11	1.2	114	11	7.8	0.1	0.5	.1	136	0.18	--	90	0	.5	201
June 5.....	80	--	--	--	--	13	--	134	--	9.0	--	--	.2	--	--	--	105	0	.1	255
July 3.....	26	--	--	--	--	13	--	145	--	7.4	--	--	.1	--	--	--	105	0	.6	261
Aug. 1.....	11	--	--	--	--	13	--	140	--	8.7	--	--	.3	--	--	--	116	1	.5	258
Sept. 5.....	7.1	18	--	26	11	14	1.4	143	8.0	10	.0	.5	.2	159	.22	--	109	0	.6	263

BIG RIVER BASIN

11-4681. BIG RIVER NEAR MOUTH, NEAR MENDOCINO, CALIF.

LOCATION.--Approximately 200 feet upstream from Little North Fork Big River, and approximately 5.5 miles east of Mendocino, Mendocino County.
 RECORDS AVAILABLE.--Chemical analyses: January 1959 to September 1961.
 REMARKS.--No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonylate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium			
Oct. 10, 1960.....		--		22	8.8	13	--	123	--	--	8.5	--	--	0.4	--	--	--	91	0	232	7.8
Nov. 7.....		--		--	--	14	--	123	--	--	14	--	--	.5	--	--	--	94	0	235	7.9
Dec. 5.....		--		--	--	9.0	--	76	--	--	7.0	--	--	.1	--	--	--	60	0	156	7.6
Jan. 9, 1961.....		--		--	--	10	--	96	--	--	6.8	--	--	.2	--	--	--	76	0	185	7.8
Feb. 6.....		--		--	--	7.7	--	68	--	--	5.5	--	--	.1	--	--	--	56	0	146	8.0
Mar. 7.....		--		--	--	8.5	--	75	--	--	5.5	--	--	.1	--	--	--	60	0	153	7.8
Apr. 3.....		--		--	--	5.2	--	73	--	--	7.9	--	--	.3	--	--	--	59	0	146	7.8
May 11.....		18	0.00	18	5.1	8.8	1.1	87	--	7.0	7.0	0.1	0.7	.1	109	0.15	--	66	0	157	7.8
June 5.....		--		--	--	10	--	101	--	--	5.3	--	--	.3	--	--	--	78	0	196	8.2
July 3.....		--		--	--	12	--	112	--	--	7.7	--	--	.3	--	--	--	80	0	210	8.0
Aug. 1.....		--		--	--	12	--	116	--	--	7.8	--	--	.4	--	--	--	86	0	211	7.8
Sept. 5.....		19		22	7.3	13	1.4	116	--	7.0	8.0	.1	.0	.4	135	.18	--	85	0	215	7.9

NOTO RIVER BASIN

11-4665. NOTO RIVER NEAR FORT BRAGG, CALIF.

LOCATION. --At gaging station, 0.7 mile downstream from South Fork, and 3.5 miles east of Fort Bragg, Mendocino County.

DRAINAGE AREA. --105 square miles.

RECORDS AVAILABLE. --Chemical analyses: January 1959 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 10, 1960.....	9.2	---	---	15	6.0	11	---	63	---	---	10	---	---	0.1	---	---	---	62	0	0.6	172
Nov. 7.....	7.1	---	---	---	---	12	---	85	---	---	9.7	---	---	0.2	---	---	---	65	0	0.6	174
Dec. 5.....	198	---	---	---	---	8.1	---	62	---	---	7.5	---	---	0.1	---	---	47	0	0.5	132	
Jan. 9, 1961.....	46	---	---	---	---	9.0	---	88	---	---	6.8	---	---	0	---	---	65	0	0.5	145	
Feb. 6.....	328	---	---	---	---	6.6	---	50	---	---	5.5	---	---	0	---	---	43	2	0.4	116	
Mar. 7.....	256	---	---	---	---	8.1	---	54	---	---	6.0	---	---	0	---	---	43	0	0.5	116	
Apr. 3.....	211	---	---	---	---	4.4	---	53	---	---	7.8	---	---	0	---	---	42	0	0.3	114	
May 11.....	218	18	0.04	13	3.3	7.5	0.9	59	---	5.0	7.6	0.1	0.6	0	85	0.12	46	0	0.5	120	
June 5.....	58	---	---	---	---	9.3	---	72	---	---	6.5	---	---	0	---	---	55	0	0.5	148	
July 3.....	20	---	---	---	---	9.9	---	77	---	---	7.3	---	---	0	---	---	59	0	0.6	157	
Aug. 2.....	9.2	---	---	---	---	10	---	76	---	---	9.2	---	---	0.2	106	---	64	0	0.6	163	
Spt. 5.....	4.3	18	---	16	4.9	11	1.2	80	---	3.4	12	1	0.3	0.2	---	0.14	60	0	0.6	169	

MATTOLE RIVER BASIN

11-4690. MATTOLE RIVER NEAR PETROLIA, CALIF.

LOCATION.--At gaging station, 0.2 mile downstream from Clear Creek, 1.2 miles southeast of Petrolia, Humboldt County, and 1.3 miles upstream from North Fork. DRAINAGE AREA.--242 square miles.

RECORDS AVAILABLE.--Chemical analyses: January 1959 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium-Magnesium	Non-carbonate			
Oct. 12, 1960.....	69	---	---	36	6.3	8.4	---	114	0	---	5.0	---	---	0.0	---	---	---	116	23	0.3	260	8.0
Nov. 9.....	49	---	---	---	---	9.7	---	122	0	---	---	---	---	0.1	---	---	---	112	12	4	271	8.2
Dec. 7.....	1,540	---	---	---	---	6.4	---	58	0	---	4.2	---	---	0	---	---	58	10	4	137	7.3	
Jan. 11, 1961.....	1,522	---	---	---	---	6.5	---	70	0	---	3.5	---	---	0.1	---	---	67	10	3	154	7.7	
Feb. 8.....	1,720	---	---	---	---	5.3	---	54	0	---	3	---	---	0	---	---	53	9	3	125	7.9	
Mar. 8.....	1,330	---	---	---	---	5.6	---	58	0	---	2.8	---	---	---	---	---	55	7	3	131	7.8	
Apr. 5.....	968	---	---	---	---	3.4	---	63	0	---	4.8	---	---	0.1	---	---	56	4	2	136	7.8	
May 10.....	2,430	15	0.00	13	3.8	6.0	1.2	54	0	9.0	5.5	0.1	0.1	0.1	81	0.11	48	4	4	148	7.7	
June 6.....	355	---	---	---	---	3.4	---	79	0	---	4.2	---	---	0.1	---	---	70	5	2	168	8.1	
July 5.....	135	---	---	---	---	7.2	---	103	0	---	4.5	---	---	0	---	---	89	5	3	208	8.0	
Aug. 2.....	66	---	---	---	---	8.4	---	119	0	---	4.0	---	---	1.1	---	---	103	5	4	234	8.2	
Sept. 5.....	46	13	---	36	5.4	8.4	1.3	123	2	21	5.0	0.1	0.2	1.1	152	0.21	112	8	3	252	8.3	

EEL RIVER BASIN

11-4710. POTTER VALLEY POWERHOUSE TAILRACE NEAR POTTER VALLEY, CALIF.

LOCATION.--At gaging station, 100 feet downstream from powerhouse of Pacific Gas and Electric Company, and 3 miles northwest of Potter Valley, Mendocino County.
 RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961																						
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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio (microhmhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 12, 1960.....	245	--	--	19	6.0	5.4	--	90	--	--	3.5	--	--	0.2	--	--	72	72	0	0.3	164	8.0
Nov. 3.....	306	--	--	--	--	5.6	--	95	--	--	5.5	--	--	.4	--	--	78	78	0	.3	174	7.9
Dec. 7.....	303	--	--	--	--	5.3	--	72	--	--	3.8	--	--	--	--	--	61	61	2	.3	144	7.4
Jan. 4, 1961.....	211	--	--	--	--	5.8	--	88	--	--	3.2	--	--	.4	--	--	71	71	0	.3	146	7.5
Feb. 17.....	300	--	--	--	--	4.0	--	54	--	--	1.8	--	--	--	--	--	49	49	5	.2	108	7.9
Mar. 13.....	302	--	--	--	--	4.2	--	66	--	--	1.5	--	--	.3	--	--	57	57	3	.2	130	7.8
Apr. 12.....	305	--	--	--	--	4.1	--	75	--	--	2.0	--	--	.2	--	--	62	62	0	.2	137	7.9
May 3.....	309	10	0.04	16	4.9	0.9	0.9	75	--	5.8	2.0	0.2	0.2	.2	82	0.11	60	60	0	.3	134	7.9
June 2.....	213	--	--	--	--	4.9	--	78	--	--	2.5	--	--	.2	--	--	66	66	2	.3	148	8.0
July 8.....	110	--	--	--	--	4.7	--	90	--	--	2.7	--	--	.1	--	--	69	69	0	.2	152	8.1
Aug. 2.....	94	--	--	--	--	4.6	--	80	--	--	2.8	--	--	.3	--	--	72	72	6	.2	150	7.8
Sept. 6.....	267	10	--	19	5.0	4.5	.7	81	--	7.0	2.0	.0	.5	.2	89	.12	68	68	2	.2	150	7.9

Chemical analyses, in parts per million, water year October 1960 to September 1961

EEL RIVER BASIN--Continued

11-4721.5. EEL RIVER NEAR DOS RIOS, CALIF.

LOCATION.--At bridge upstream from Outlet Creek, and approximately 6.2 miles south of Dos Rios, Mendocino County.

RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

REMARKS.--Discharge used is difference between gaging stations at Eel River above Dos Rios and Outlet Creek near Longvale. No correction made for inflow between stations.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonylate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate		
Oct. 11, 1960.....	13	--	--	--	--	25	--	115	0	--	6.8	--	--	0.4	--	--	107	6	1.1	340
Nov. 8.....	32	--	--	--	--	9.2	--	130	0	--	6.0	--	--	.4	--	--	117	10	.4	271
Dec. 6.....	768	--	--	--	--	5.6	--	75	0	--	3.5	--	--	.1	--	--	66	4	.3	154
Jan. 10, 1961.....	317	--	--	--	--	8.5	--	98	0	14	4.0	--	--	.3	--	--	84	4	.4	191
Feb. 7.....	1,810	--	--	--	--	4.0	--	69	0	--	2.5	--	--	.2	--	--	59	2	.2	134
Mar. 7.....	1,970	--	--	--	--	4.2	--	72	0	--	--	--	--	.1	--	--	60	1	.2	137
Apr. 4.....	1,610	--	--	--	--	2.4	--	72	0	--	3.5	--	--	.1	--	--	63	4	.1	135
May 10.....	1,360	14	0.00	18	6.8	5.4	0.8	85	0	10	2.8	0.1	0.0	.2	100	0.14	73	3	.3	163
June 6.....	1,194	--	--	--	--	6.6	--	109	0	--	4.3	--	--	.1	--	--	92	3	.3	207
July 4.....	35	--	--	--	--	8.5	--	132	0	--	5.0	--	--	.2	--	--	114	8	.3	249
Aug. 1.....	14	--	--	--	--	10	--	109	2	--	5.1	--	--	.3	--	--	94	1	.5	227
Sept. 4.....	8.1	8.1	--	25	7.9	10	1.2	102	4	18	7.0	.1	.2	.3	132	.18	95	5	.5	226

EEL RIVER BASIN--Continued
11-4722. OUTLET CREEK NEAR LONGVALE, CALIF.

LOCATION.--At railroad bridge, approximately 0.9 mile downstream from gaging station, approximately 600 feet upstream from Eel River, and 6.5 miles northeast of Longvale, Mendocino County.
DRAINAGE AREA.--159 square miles upstream from gaging station.
RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.
REMARKS.--No appreciable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day				
Oct. 11, 1960.....	2.4	--	--	--	--	13	--	150	0	--	22	--	--	1.9	--	--	--	127	4	0.5	316 8.2
Nov. 8.....	2.9	--	--	--	--	17	--	168	0	--	26	--	--	2.1	--	--	--	149	11	.6	360 8.1
Dec. 6.....	215	--	--	--	--	6.0	--	60	0	--	5.0	--	--	.2	--	--	--	52	3	.4	129 7.8
Jan. 10, 1961.....	388	--	--	--	--	7.1	--	76	0	7.0	7.2	--	--	.5	--	--	--	66	4	.4	158 7.8
Feb. 7.....	398	--	--	--	--	4.7	--	58	0	--	4.0	--	--	.3	--	--	--	49	1	.3	118 7.8
Mar. 7.....	796	--	--	--	--	3.7	--	42	0	--	2.4	--	--	.1	--	--	--	36	2	.3	88 7.7
Apr. 4.....	245	--	--	--	--	3.1	--	67	0	--	5.2	--	--	.2	--	--	--	56	1	.2	127 8.0
May 10.....	521	13	0.00	9.6	5.1	4.4	0.5	55	0	6.0	3.5	0.1	0.4	.2	70	0.10	--	45	0	.3	108 7.5
June 6.....	43	--	--	--	--	7.5	--	92	0	--	6.5	--	--	.7	--	--	--	76	1	.4	181 8.1
July 4.....	9.4	--	--	--	--	10	--	127	0	--	8.8	--	--	.7	--	--	--	103	0	.4	239 8.1
Aug. 1.....	1.7	--	--	--	--	17	--	159	3	--	22	--	--	2.3	--	--	--	131	0	.6	318 8.4
Sept. 4.....	1.7	14	--	35	16	24	1.8	170	4	7.0	38	.1	.0	4.2	228	.31	--	152	6	.8	396 8.4

KEL RIVER BASIN--Continued

11-4725, KEL RIVER ABOVE DOS RIOS, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961
(Where no concentrations are reported loads are estimated)

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..	4.4	--		8.7	--	T	16500	1300	57900		
2..	4.7	--		8.5	--	T	7500	290	5870		
3..	5.1	--		8.1	--	T	2700	40	292		
4..	5.0	--		7.1	--	T	1170	34	107		
5..	5.3	--		7.1	--	T	784	17	36		
6..	8.1	--		7.9	--	T	553	10	15		
7..	13	--		8.3	--	T	452	--	9		
8..	15	2		29	2	T	392	6	6		
9..	13	--		20	--	T	345	--	6		
10..	13	--		18	--	T	340	8	7		
11..	11	--		23	--	1	350	--	9		
12..	11	--		52	45	S	308	7	6		
13..	10	--		365	109	S	290	--	5		
14..	9.9	--		360	88	S	280	--	5		
15..	9.9	1		205	43	S	625	64	S	195	
16..	9.9	--		113	--	7	5390	285	S	5800	
17..	9.7	--		79	18	S	4	691	S	26300	
18..	9.1	--		395	92	S	110	268	S	5480	
19..	11	--		256	88	S	65	99	S	982	
20..	9.5	2		132	33	K	12	43		211	
21..	8.7	1		118	13		4	--		150	
22..	8.3	--		102	9		2	28		100	
23..	8.1	--		141	112	S	77	--		62	
24..	8.1	--		640	539	S	2890	815	--	40	
25..	8.5	--		4850	636		8330	652	15	26	
26..	9.5	--		2010	135	S	968	525	--	20	
27..	9.3	--		815	40		88	431	12	14	
28..	8.9	--		525	15		21	358	--	9	
29..	8.7	--		395	10		11	308	--	5	
30..	8.9	--		640	--		55	278	3	2	
31..	8.9	1		--	--	--	--	282	--	2	
Total	283.5	--	1	12338.7	--	12889	71528	--		103671	
	JANUARY			FEBRUARY			MARCH				
1..	258	--	3	10000	482	S	14200	254	--	6	
2..	241	4	3	9040	506	S	12800	229	6	4	
3..	229	--	2	6840	300	K	6000	211	--	2	
4..	221	4	2	3980	--	--	1400	192	--	1	
5..	209	--	2	2490	--		610	280	21	S	15
6..	211	--	2	1810	55		269	1360	112	S	470
7..	215	--	2	1410	--		110	1170	53	S	186
8..	235	4	3	1290	28		98	1470	62	S	274
9..	229	--	2	9730	766	S	24400	2530	142	S	1120
10..	219	3	2	7030	390	K	8200	2710	218	S	1680
11..	203	--	2	18700	1320	S	70000	2810	128	S	998
12..	195	--	1	11000	430		12800	1790	38	S	197
13..	190	--	1	7860	300		6370	1320	20		71
14..	184	--	1	6890	190		3530	2720	240	S	3690
15..	179	2	1	6600	190		3390	8810	576		13700
16..	177	--	1	5260	175		2490	7180	318		6160
17..	175	--	T	3760	85		863	10300	552		15400
18..	171	1	T	2680	58		420	6830	235	S	4540
19..	168	--	T	1950	--		240	4940	221	S	3340
20..	166	--	T	1550	32		134	5270	173	S	2700
21..	166	--	T	1270	--		82	3620	70		684
22..	163	--	T	1100	19		56	3290	75		666
23..	203	--	1	970	--		47	3280	53		469
24..	225	--	2	915	18		44	3740	104	S	1150
25..	213	--	2	543	15		22	4240	78	S	923
26..	529	26	S	494	--		19	4220	95	S	1130
27..	622	38	S	462	--		16	3850	55		572
28..	353	14		343	11		10	3080	33		274
29..	3010	252	S	2540	--		--	2240	25		151
30..	3520	136	S	1350	--		--	1490	24		97
31..	15500	1280	S	60300	--		--	1690	21		96
Total	28579	--	64360	125967	--	168620	97116	--		60766	

S Computed by subdividing day.
T Less than 0.50 ton.K Computed from estimated-concentration
graph and subdividing day.

KEL RIVER BASIN--Continued

11-4725. KEL RIVER ABOVE DOS RIOS, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
(Where no concentrations are reported loads are estimated)

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..	1660	18	81	824	14	31	180	--	3
2..	1540	--	58	757	--	25	166	6	3
3..	1450	11	43	616	5	8	158	--	2
4..	1370	--	44	480	--	4	151	2	1
5..	1290	13	45	353	1	1	142	--	T
6..	930	--	30	398	2	2	141	1	T
7..	995	11	30	525	3	4	141	--	T
8..	856	--	23	449	--	4	134	--	1
9..	802	10	22	395	5	5	127	2	1
10..	766	--	21	837	32	S 77	119	--	1
11..	498	--	12	2240	125	S 801	113	3	1
12..	386	7	7	1660	40	S 192	110	--	1
13..	441	--	8	1210	12	39	103	5	1
14..	398	7	8	990	--	21	96	--	1
15..	395	--	7	860	4	9	85	2	T
16..	389	--	6	616	--	5	81	--	T
17..	365	5	5	532	2	3	72	--	1
18..	325	--	4	443	--	2	64	3	1
19..	300	5	4	410	2	2	59	--	T
20..	273	--	4	407	--	2	55	3	T
21..	337	24	S 26	386	3	3	53	--	T
22..	1030	51	S 147	360	--	3	50	3	T
23..	2080	78	S 477	315	--	3	48	--	T
24..	1050	18	51	252	--	2	44	--	T
25..	925	--	27	221	--	2	42	--	T
26..	824	9	20	219	--	2	38	--	T
27..	652	--	14	211	4	2	35	--	T
28..	584	8	13	197	--	2	33	--	T
29..	716	14	27	186	1	1	32	--	T
30..	766	8	17	186	--	1	32	5	T
31..	--	--	--	195	3	2	--	--	--
Total	24393	--	1281	17730	--	1260	2704	--	25
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..	31	--	--	12	--	--	7.0	--	--
2..	29	--	--	12	--	--	6.6	--	--
3..	28	--	--	12	--	--	6.6	--	--
4..	26	--	--	12	--	--	6.4	--	--
5..	26	4	--	11	2	--	6.2	--	--
6..	27	--	--	11	--	--	6.1	--	--
7..	26	--	--	11	--	--	5.7	--	--
8..	25	--	--	11	--	--	5.7	--	--
9..	24	--	--	11	--	--	5.7	--	--
10..	22	2	--	10	--	--	5.7	2	--
11..	20	--	--	9.7	--	--	5.9	--	--
12..	19	--	--	9.5	--	--	6.1	--	--
13..	18	--	--	9.5	--	--	5.9	--	--
14..	18	--	--	9.3	--	--	5.9	--	--
15..	17	2	--	9.3	1	--	6.1	--	--
16..	17	--	--	9.1	--	--	6.4	--	--
17..	16	--	--	8.9	--	--	6.6	--	--
18..	16	4	--	8.7	--	--	6.8	--	--
19..	16	--	--	8.5	--	--	6.8	--	--
20..	15	1	--	11	10	--	6.8	1	--
21..	16	--	--	9.9	--	--	6.8	--	--
22..	16	--	--	8.7	7	--	6.8	--	--
23..	16	--	--	8.1	--	--	6.8	2	--
24..	15	--	--	8.5	--	--	6.6	--	--
25..	16	2	--	7.7	--	--	6.4	--	--
26..	15	--	--	7.9	--	--	6.4	--	--
27..	15	--	--	8.7	--	--	6.2	--	--
28..	14	--	--	8.3	--	--	6.1	--	--
29..	13	--	--	8.3	--	--	5.9	--	--
30..	13	1	--	8.1	--	--	5.9	--	--
31..	12	--	--	7.5	4	--	--	--	--
Total	597	--	4	299.2	--	2	188.9	--	1

Total discharge for year (cfs-days)..... 381,724.3
 Total load for year (tons)..... 412,880

S Computed by subdividing day.

T Less than 0.50 ton.

EEL RIVER BASIN--Continued
 11-4725. EEL RIVER ABOVE DOS RIOS, CALIF.--Continued
 Particle-size analyses of suspended sediment, water year October 1960 to September 1961
 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
 P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Samp- ling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Nov. 24, 1960.....	1650		--	2,290	720			--	--	--	87	92	92	99	100	--	--	V
Nov. 25.....	0900		--	5,650	730			--	--	--	83	88	96	100	100	--	--	V
Dec. 1.....	0935		48	6,890	2,080		26	33	45		67	76	86	94	99	100	100	VPWC
Dec. 17.....	0935		52	15,600	820			--	--	--		76	86	92	98	100	100	V
Jan. 31, 1961.....	0905		52	19,900	2,070			26		44		66	80	91	99	100	100	VPWC
Feb. 9.....	0905		51	11,300	1,110			--	--	--		59	71	86	98	100	100	V
Feb. 11.....	0855		46	20,700	1,330			--	--	--		68	79	91	98	100	100	V
Mar. 10.....	0935		47	2,940	276			--	--	--		94	98	100	100	100	100	V
Mar. 14.....	1635		51	1,250	546			--	--	--		95	100	--	--	--	--	V
Mar. 15.....	0855		--	9,400	684			--	--	--		72	83	92	100	100	100	V
Mar. 26.....	0840		46	4,460	97			--	--	--		73	83	96	100	100	100	V

EEL RIVER BASIN--Continued

11-4739. MIDDLE FORK EEL RIVER AT DOS RIOS, CALIF.

LOCATION.--at bridge on county road 0.4 mile upstream from mouth, and 0.5 mile southeast of Dos Rios, Mendocino County.

RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

Water temperatures: October 1957 to September 1961, October 1960 to September 1961.

Station records: October 1957 to September 1961.

REMARKS.--Water discharge used is difference between discharge at gages on Eel River above Dos Rios and Eel River below Dos Rios. No correction made for inflow between stations.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 11, 1960.....	44	--	--	--	--	14	--	121	0	--	26	--	--	0.3	--	--	--	149	50	0.5	368	8.0
Nov. 8.....	82	--	--	--	--	16	--	132	0	--	20	--	--	.3	--	--	--	152	44	.6	371	9.2
Dec. 6.....	2,120	--	--	--	--	5.3	--	76	0	--	2.0	--	--	.0	--	--	--	70	8	.3	154	8.9
Jan. 10, 1961.....	897	--	--	--	--	4.9	--	94	0	14	3.8	--	--	.2	--	--	--	83	6	.2	184	8.0
Feb. 7.....	5,060	--	--	--	--	3.6	--	73	0	--	1.5	--	--	.1	--	--	--	64	4	.2	138	8.0
Mar. 7.....	4,510	--	--	--	--	3.7	--	84	0	--	--	--	--	.1	--	--	--	74	5	.2	162	8.1
Apr. 4.....	7,470	--	--	--	--	1.3	--	56	0	--	2.0	--	--	.1	--	--	--	50	4	.1	103	8.1
May 10.....	3,860	14	0.00	15	5.5	3.2	0.9	67	0	7.0	2.0	0.1	0.0	0.0	81	0.11	60	5	.2	128	8.0	
June 6.....	1,080	--	--	--	--	1.3	--	71	0	--	2.3	--	--	.0	--	--	65	7	.1	140	8.1	
July 4.....	221	--	--	--	--	5.9	--	116	0	--	5.8	--	--	.1	--	--	110	15	.2	235	8.2	
Aug. 1.....	56	--	--	--	--	10	--	119	5	--	10	--	--	.1	--	--	125	19	.4	278	8.5	
Sept. 4.....	31	7.9	.00	32	9.4	11	1.1	103	4	30	16	.1	.0	.2	163	.22	118	27	.4	282	8.4	

EEL RIVER BASIN--Continued
 11-4739. MIDDLE FORK EEL RIVER AT DOS RIOS, CALIF.--Continued
 Temperature (°F) of water, water year October 1960 to September 1961

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

EEL RIVER BASIN--Continued

11-4739. MIDDLE FORK EEL RIVER AT DOS RIOS, CALIF.--Continued

Monthly and annual summary of suspended-sediment discharge, water year October 1960 to September 1961

Month	Discharge (cfs)	Suspended-sediment (tons)
October 1960.....	526.5	1
November.....	19,464.3	43,100
December.....	84,851	283,000
January 1961.....	34,121	110,000
February.....	14,123	287,000
March.....	130,894	102,000
April.....	71,797	18,700
May.....	55,472	6,640
June.....	14,536	390
July.....	3,086	50
August.....	928.8	9
September.....	518.1	6
Total for year.....	559,426.7	847,896

Particle-size analyses of suspended sediment, water year October 1960 to September 1961

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;

P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sam- pling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis
							Percent finer than size indicated, in millimeters										
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	
Nov. 24, 1960.....	1630		47	3,100	2,930		23		38		57	70	88	100			VPWC
Nov. 25.....	1620		45	7,000	1,760		--		--		73	81	90	99	100		V
Dec. 1.....	0920		42	30,000	3,950		29		50		69	81	93	99	100		VPWC
Dec. 17.....	0950		48	18,000	2,230		19		34		55	62	73	87	99	100	VPWC
Jan. 31, 1961.....	0920		50	20,000	2,540		30		54		85	89	95	99	100		VPWC
Feb. 2.....	0925		52	13,000	2,110		--		--		66	75	87	99	100		V
Feb. 2.....	1645		51	13,000	2,020		--		--		67	77	89	99	100		V
Feb. 9.....	0850		49	9,000	1,870		--		--		57	77	89	99	100		V
Mar. 14.....	1655		49	6,000	1,080		--		--		56	94	99	100	--		V
Mar. 15.....	0900		45	10,000	880		--		--		64	76	89	99	100		V
Mar. 17.....	0925		45	9,000	545		--		--		68	77	90	100	--		V
Mar. 23.....	0925		48	6,100	321		--		--		65	72	80	95	100		V
Apr. 23.....	1040		44	2,500	84		--		--		91	96	97	100	--		V

E Estimated.

EEL RIVER BASIN--Continued

11-4752.5. EEL RIVER AT MCCANN, CALIF.

LOCATION --Downstream from Summer Bridge, approximately 0.5 mile northwest of McCann, Humboldt County, and 6.5 miles upstream from confluence with the South Fork.
 RECORDS AVAILABLE --Chemical analyses: October 1983 to September 1961.
 REMARKS --No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 11, 1960.....		---	---	---	---	6.9	---	141	0	---	5.9	---	---	0.2	---	---	---	130	14	0.3	284	8.0
Nov. 8.....		---	---	---	---	8.0	---	118	0	---	4.5	---	---	.2	---	---	---	138	41	.3	301	8.1
Dec. 6.....		---	---	---	---	4.5	---	74	0	---	2.8	---	---	.1	---	---	---	68	7	.2	153	7.8
Jan. 10, 1961.....		---	---	---	---	5.4	---	100	0	15	3.8	---	---	.2	---	---	---	90	8	.2	200	7.9
Feb. 7.....		---	---	---	---	3.4	---	76	0	---	2.0	---	---	.1	---	---	---	66	4	.2	147	8.0
Mar. 7.....		---	---	---	---	3.7	---	76	0	---	---	---	---	.0	---	---	---	69	7	.2	152	7.9
Apr. 4.....		---	---	---	---	1.6	---	68	0	---	2.4	---	---	.0	---	---	---	61	5	.1	131	8.1
May 10.....		14	0.00	17	5.7	4.0	1.0	76	0	9.0	2.2	0.1	0.2	.1	90	0.12	---	66	4	.2	144	7.9
June 6.....		---	---	---	---	3.7	---	84	0	---	3.4	---	---	.0	---	---	---	75	6	.2	163	8.1
July 4.....		---	---	---	---	6.4	---	123	0	---	4.5	---	---	.2	---	---	---	110	9	.3	235	8.2
Aug. 1.....		---	---	---	---	7.2	---	125	4	---	5.4	---	---	.0	---	---	---	114	5	.3	255	8.3
Sept. 4.....		12	.00	34	8.6	7.9	1.3	126	2	22	7.0	.0	.0	.3	158	.21	---	120	12	.3	266	8.3

KEL RIVER BASIN--Continued
11-4755. SOUTH FORK KEL RIVER NEAR BRANSCOMB, CALIF.

LOCATION---Temperature recorder at gaging station, 0.4 mile upstream from Jack of Hearts Creek, and 4.7 miles north of Branscomb, Mendocino County.
DRAINAGE AREA---43.9 square miles.
RECORDS AVAILABLE---Water temperatures: October 1960 to September 1961.
EXTREMES, 1960-61---Water temperatures: Maximum, 82°F Aug. 7.

Temperature (°F) of water, water year October 1960 to September 1961																																
Month	Day																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October																																
Maximum																																
Minimum																																
November																																
Maximum	51	51	50	50	49	48	49	49	49	49	50	50	50	50	49	49	50	50	49	48	48	48	48	48	48	48	48	48	48	48	48	48
Minimum	51	50	50	48	46	47	48	49	48	48	49	50	50	50	49	49	49	50	49	47	47	48	48	48	48	48	48	48	48	48	48	48
December																																
Maximum																																
Minimum																																
January																																
Maximum																																
Minimum																																
February																																
Maximum	51	51	51	51	51	51	51	50	50	50	50	50	50	50	50	50	50	50	49	49	49	49	49	49	48	48	48	48	48	49	49	49
Minimum	51	51	51	51	51	51	50	50	50	50	50	50	50	50	50	50	50	49	49	49	49	49	49	48	48	48	48	48	48	49	49	49
March																																
Maximum	49	47	46	45	45	45	45	45	45	46	47	47	48	48	48	48	48	48	48	48	48	48	48	48	48	49	49	50	51	51	52	53
Minimum	47	46	43	43	44	45	44	45	45	45	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46
April																																
Maximum	53	57	58	59	59	54	51	51	51	51	52	52	50	51	53	54	52	48	48	46	46	46	46	46	46	46	46	46	46	46	46	46
Minimum	52	54	56	57	55	49	48	47	48	47	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49
May																																
Maximum	53	52	52	51	51	49	51	52	51	50	51	51	54	55	55	57	57	58	55	54	54	54	54	54	56	56	57	57	59	58	57	54
Minimum	52	50	49	48	49	48	47	49	51	50	50	48	49	50	51	52	54	56	54	53	53	53	53	53	53	53	56	53	56	58	57	56
June																																
Maximum	61	62	63	63	63	59	62	62	63	65	66	67	71	73	73	72	72	73	74	72	74	75	76	76	76	74	71	70	71	69	69	69
Minimum	57	60	60	62	59	58	58	60	60	62	62	62	65	67	68	67	67	68	67	68	67	68	68	67	68	69	70	67	65	63	63	64
July																																
Maximum	72	74	71	66	66	68	70	72	73	76	78	78	79	77	76	76	77	78	77	78	78	78	79	80	79	79	79	76	75	76	75	76
Minimum	65	65	64	63	60	60	61	63	64	65	68	69	70	66	65	64	66	67	66	64	66	67	66	69	68	67	66	66	66	66	64	65
August																																
Maximum	75	76	77	76	78	79	82	81	81	78	74	77	73	74	73	74	73	71	70	73	71	70	70	68	66	69	71	72	72	70	74	74
Minimum	63	64	66	72	73	71	72	71	68	67	70	66	65	64	62	62	60	61	63	66	64	63	61	62	61	63	63	65	64	63	65	63
September																																
Maximum	69	69	70	70	68	67	64	65	64	65	65	63	59	62	62	61	62	63	64	62	60	61	61	61	62	62	60	59	59	59	63	63
Minimum	64	60	59	59	58	57	56	55	55	55	55	54	54	55	59	57	58	56	55	54	54	52	52	52	52	53	53	54	51	50	51	56

EEL RIVER BASIN--Continued

11-4755. SOUTH FORK EEL RIVER NEAR BRANSCOMB, CALIF.--Continued

Periodic determinations of suspended-sediment discharges, water year October 1960 to September 1961
 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
 F, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sam- pling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment concentra- tion (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis	
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000		2.000
Oct. 20, 1960.....	1210		52	3.2	1	t												
Nov. 17.....	1330		50	12	4	0.1												
Dec. 12.....	1250		44	74	6	1.2												
Jan. 25, 1961.....	1245		48	37	3	.3												
Jan. 28.....	1145		48		4	.5												
Feb. 17.....	1550		50	568	24	37												
Mar. 1.....	1715		49	94	7	1.8												
Mar. 25.....	1635		49	603	27	44												
Apr. 5.....	1410		55	121	9	2.9												
Apr. 22.....	1555		45	159	33	14												
May 17.....	0855		52	156	5	2.1												
June 6.....	1350		58	44	2	.2												
June 26.....	1320		69	19	4	.2												
July 18.....	1310		74	11	3	.1												
Aug. 10.....	1250		71	5.3	3	t												
Sept. 5.....	1230		63	3.7	1	t												

t Less than 0.05 ton.

EEL RIVER BASIN--Continued
 11-4765. SOUTH FORK EEL RIVER NEAR MIRANDA, CALIF.

LOCATION: ---At gaging station, at Sylvandale Campgrounds on U.S. Highway 101, 0.5 mile upstream from Rocky Glen Creek, 4.3 miles southeast of Miranda, Humboldt County, and 20 miles upstream from mouth.
 Drainage area: 1,880 sq. miles.
 RECORDS AVAILABLE: ---Chemical analyses: October 1953 to September 1961.
 Water temperatures: November 1960 to September 1961.
 EXTREMES, 1960-61: ---Water temperatures: Maximum, 92°F July 10; minimum, 40°F Jan. 5.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 11, 1960.....	75	--	--	30	10	8.8	--	138	0	8.5	--	--	0.0	--	--	--	118	3	0.4	258
Nov. 8.....	58	--	--	--	--	9.7	--	136	2	--	--	--	--	--	--	--	118	3	.4	284
Dec. 6.....	1,880	--	--	--	--	6.3	--	82	0	4.2	--	--	0.0	--	--	--	58	5	.4	130
Jan. 10, 1961.....	2,440	--	--	--	--	6.7	--	78	0	4.8	--	--	0.0	--	--	--	67	3	.4	153
Feb. 7.....	1,910	--	--	--	--	5.0	--	64	0	4.5	--	--	0.0	--	--	--	52	0	.3	125
Mar. 7.....	1,670	--	--	--	--	5.2	--	58	0	2.8	--	--	0.0	--	--	--	51	3	.3	120
Apr. 4.....	2,080	--	0.00	--	--	3.0	--	68	0	4.6	--	--	.1	--	--	--	57	1	.2	133
May 10.....	484	--	--	12	5.6	5.7	0.7	65	0	3.8	0.1	0.1	.1	84	0.11	--	53	0	.3	129
June 8.....	182	--	--	--	--	1.9	--	82	0	5.3	--	--	0.0	--	--	--	72	1	.2	165
July 4.....	94	--	--	--	--	7.2	--	110	0	3.8	--	--	0.0	--	--	--	84	0	.3	197
Aug. 1.....	63	9.9	9.9	--	--	8.4	--	111	6	5.8	--	--	.1	--	--	--	99	0	.4	218
Sept. 4.....	63	9.9	9.9	27	8.4	9.5	1.4	120	4	8.0	.1	.2	.1	136	.18	--	102	0	.4	231

EEL RIVER BASIN--Continued
 11-4765. SOUTH FORK EEL RIVER NEAR MIRANDA, CALIF.--Continued
 Temperature (°F) of water, November 1960 to September 1961

Month	Day																															Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
November	---	---	---	55	52	47	---	---	54	54	54	48	47	49	48	51	52	57	49	48	52	46	48	52	53	50	52	49	50	52	---	---
Maximum	---	---	---	45	42	44	---	---	49	48	48	47	46	46	46	47	51	48	46	46	46	44	46	48	50	49	47	46	48	49	---	---
December	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Maximum	52	54	53	51	50	49	48	47	48	46	47	48	47	48	48	51	52	52	55	52	53	50	50	49	49	52	50	49	48	47	46	50
Minimum	52	52	50	46	46	44	41	42	42	47	46	46	46	47	48	48	51	52	52	51	50	48	48	48	49	46	42	42	41	42	47	47
January	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Maximum	46	44	42	41	40	44	41	44	46	49	48	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	
Minimum	40	39	38	37	37	38	39	41	43	46	45	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	
February	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Maximum	52	55	55	56	53	53	50	50	52	52	52	49	50	52	51	50	48	50	51	54	53	52	51	49	51	51	49	53	49	53	---	---
Minimum	50	52	51	51	50	50	47	48	50	52	49	48	48	50	49	46	46	44	44	47	50	48	45	48	46	44	46	46	46	46	46	---
March	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Maximum	51	52	48	52	51	49	50	48	47	49	50	50	53	52	49	48	49	53	50	52	53	51	53	52	50	49	52	52	57	56	56	51
Minimum	48	48	44	44	48	47	46	47	46	46	47	48	49	50	47	47	46	47	46	47	47	49	50	48	47	48	48	46	48	50	47	47
April	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Maximum	58	60	62	64	62	60	62	62	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
Minimum	50	52	56	56	52	52	51	51	54	52	53	53	51	52	53	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
May	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Maximum	61	60	59	60	57	56	61	62	59	56	53	56	59	60	63	62	69	70	63	60	62	60	64	66	63	63	64	65	61	63	70	62
Minimum	49	55	54	52	55	54	52	53	56	52	51	52	53	53	56	56	57	58	56	55	56	55	54	56	58	55	58	60	58	59	55	55
June	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Maximum	69	69	72	70	66	67	64	67	68	68	68	72	73	83	89	89	81	79	80	75	81	84	84	87	87	81	78	75	77	77	76	
Minimum	62	63	62	64	63	61	56	59	60	60	61	62	60	62	68	70	68	66	66	64	67	69	68	69	69	68	67	64	61	---	---	
July	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Maximum	77	78	70	73	75	78	84	88	92	91	87	84	84	83	82	86	89	84	78	78	76	77	82	83	81	79	77	77	77	79	81	
Minimum	62	64	64	66	60	61	60	62	65	66	70	72	73	69	69	69	69	69	67	66	66	66	63	62	64	63	64	61	61	63	63	65
August	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Maximum	79	79	81	77	76	84	86	88	85	85	78	84	79	77	77	79	80	78	84	78	77	75	75	74	65	74	78	74	74	76	79	79
Minimum	63	63	64	65	66	63	70	72	67	66	72	66	68	67	65	63	62	60	65	68	65	64	60	62	62	64	64	61	62	61	65	69
September	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Maximum	73	72	76	77	74	70	65	68	72	70	69	66	66	67	67	67	64	66	62	67	68	67	64	67	67	69	71	70	73	66	63	55
Minimum	67	59	57	59	60	59	58	54	54	56	57	59	57	61	61	60	57	59	59	56	55	54	54	55	56	55	56	57	53	51	---	---

EEL RIVER BASIN--Continued

11-4770. EEL RIVER AT SCOTIA, CALIF.

LOCATION --At gaging station at bridge on U.S. Highway 101, 0.5 mile north of Scotia, Humboldt County, and 6 miles upstream from Van Duzen River.
 DRAINAGE AREA 3,113 square miles.
 RECORDS AVAILABLE --Chemical analyses: October 1953 to September 1961.
 Water temperatures: October 1957 to September 1961.

Sediment records: October 1957 to September 1961.

EXTREMES, 1960-61. --Water temperatures: Maximum, 75°F June 16-18; minimum, 42°F Jan. 3.

Sediment concentrations: Maximum daily, 3,730 ppm Feb. 11; minimum daily, 1 ppm on many days.

Sediment loads: Maximum daily, 955,000 tons Feb. 11; minimum daily, 0.3 ton Sept. 12-15.

EXTREMES, 1957-61. --Water temperatures: Maximum (1960-61), 75°F June 16-18, 1961; minimum, 41°F Jan. 2, 1960.

Sediment concentrations: Maximum daily, 7,340 ppm Feb. 8, 1960; minimum daily, 1 ppm on many days in 1958-61.

Sediment loads: Maximum daily, 5,380,000 tons Feb. 8, 1960; minimum daily, 0.3 ton on many days in 1958-61.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Calcium, magnesium, sodium	Non-carbonate			
Oct. 11, 1960.....	175	--	--	37	9.6	8.9	--	161	0	--	7.0	--	--	0.0	--	--	132	0	0.3	294	8.2
Nov. 8.....	135	--	--	--	--	7.1	--	174	0	--	--	--	--	--	--	--	147	4	0.3	297	8.2
Dec. 3.....	6,400	--	--	--	--	7.1	--	108	0	--	5.5	--	--	0.0	--	--	140	26	1.3	249	7.0
Jan. 10, 1961.....	2,110	--	--	--	--	6.6	--	100	0	--	5.2	--	--	0.0	--	--	88	6	1.3	190	8.0
Feb. 7.....	10,900	--	--	--	--	4.6	--	76	0	--	3.5	--	--	0.0	--	--	65	3	2	147	8.0
Mar. 7.....	10,000	--	--	--	--	6.4	--	82	0	--	4.0	--	--	0.0	--	--	71	4	0.3	165	7.9
Apr. 4.....	10,400	--	--	--	--	2.7	--	76	0	--	4.4	--	--	0.0	--	--	67	5	1	151	8.0
May 10.....	6,900	15	0.00	16	6.3	5.8	0.9	76	0	9.0	4.0	0.1	1.2	0.1	95	0.13	66	4	0.3	155	7.9
June 6.....	2,600	--	--	--	--	5.7	--	94	0	--	5.0	--	--	0.0	--	--	84	7	0.3	185	8.1
July 4.....	706	--	--	--	--	7.8	--	131	0	--	5.8	--	--	0.0	--	--	111	4	0.3	244	8.1
Aug. 1.....	252	--	--	--	--	9.6	--	147	3	--	6.8	--	--	0.1	--	--	125	0	0.4	274	8.5
Sept. 4.....	152	8.5	--	33	9.8	9.6	1.4	138	4	16	8.0	0.1	0.2	0.1	159	0.22	123	3	0.4	272	8.5

EEL RIVER BASIN--Continued
 11--4770. EEL RIVER AT SCOTIA, CALIF.--Continued
 Temperature (°F) of water, water year October 1960 to September 1961

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

EEL RIVER BASIN--Continued

11-4770. EEL RIVER AT SCOTIA, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961
(Where no concentrations are reported loads are estimated)

Day	OCTOBER			NOVEMBER			DECEMBER		
	Suspended sediment			Suspended sediment			Suspended sediment		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1..	100	--	0.5	147	1	0.4	37700	2180	S 317000
2..	100	--	.5	147	--	.4	58500	2180	S 373000
3..	95	--	.5	140	1	.4	23600	870	55400
4..	95	--	.5	140	--	.4	13100	410	14500
5..	100	2	.5	140	1	.4	8550	290	6690
6..	147	--	.8	135	--	.4	6400	200	B 3500
7..	196	2	1.1	135	1	.4	5170	140	B 2000
8..	203	--	1.1	135	--	.4	4320	90	1050
9..	196	2	1.1	135	1	.4	3790	50	512
10..	182	--	1.0	140	--	.8	3550	40	383
11..	175	2	.9	154	2	.8	3770	50	509
12..	168	--	.9	196	2	1.1	3410	40	368
13..	175	2	.9	354	7	6.7	2850	20	154
14..	175	--	.5	640	14	24	2450	10	66
15..	168	1	.5	1700	62	S 291	2510	10	B 68
16..	161	--	.4	1320	28	100	7450	480	K 13000
17..	154	1	.4	1010	19	52	67800	2910	S 582000
18..	147	--	.4	1620	293	S 1260	71200	2230	S 440000
19..	140	2	.8	3310	374	3340	45000	1310	159000
20..	140	--	.8	2350	155	983	25800	860	59900
21..	140	--	.4	1440	68	264	15700	500	21200
22..	140	1	.4	1130	44	134	11700	440	13900
23..	140	--	.4	1290	108	S 434	9260	490	12300
24..	140	1	.4	9930	1520	S 49900	7650	410	8470
25..	140	--	.4	31300	2960	250000	6590	200	3540
26..	147	1	.4	26500	1400	S 109000	5720	200	3090
27..	154	--	.4	11500	460	14300	5130	120	B 1700
28..	161	1	.4	6850	160	2960	4600	64	795
29..	154	--	.4	4600	75	932	4150	42	471
30..	154	1	.4	4450	175	2100	3750	36	365
31..	147	--	.4	--	--	--	3390	34	311
Total	4634	--	18.5	113038	--	436087.0	474520	--	2095242
Day	JANUARY			FEBRUARY			MARCH		
	Suspended sediment			Suspended sediment			Suspended sediment		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1..	3190	24	207	62700	1890	S 344000	5370	120	1740
2..	2890	16	125	39100	1790	S 196000	5000	100	1350
3..	2490	16	108	41000	1410	S 165000	4710	90	1140
4..	2330	13	82	24400	720	47400	4260	80	920
5..	2210	11	66	16800	550	24900	4540	120	1470
6..	2090	10	56	13100	360	12700	6900	362	S 7170
7..	1990	12	64	10900	270	7950	10000	530	14300
8..	2050	10	55	9280	450	11300	8770	317	S 7810
9..	2070	9	50	25400	2130	S 205000	15400	877	S 37600
10..	2110	11	63	54500	2150	S 323000	19300	810	42200
11..	2050	10	55	94800	3730	955000	19300	700	36500
12..	1970	9	48	73000	2120	418000	19000	470	24100
13..	1790	8	39	46800	1680	212000	14700	260	10300
14..	1640	7	31	46200	1510	188000	14200	357	S 15400
15..	1550	6	25	42200	1150	131000	44200	2190	S 278000
16..	1470	5	20	38600	970	101000	45300	1170	S 148000
17..	1410	5	19	27700	660	49400	50300	1420	S 197000
18..	1360	6	22	20800	500	28100	43800	820	97000
19..	1300	4	14	16300	430	18900	31300	590	49900
20..	1250	3	10	13500	490	17900	33000	750	66800
21..	1200	3	B 9.7	11400	700	21500	24300	400	26200
22..	1160	3	9.4	800	990	21400	20500	410	22700
23..	1290	6	21	8780	520	12300	23700	480	30700
24..	1490	9	36	7850	370	7840	21400	300	17300
25..	1710	13	60	7210	280	5450	25400	520	35700
26..	1680	8	36	6260	220	3720	23300	370	23300
27..	2850	46	S 478	5750	220	3420	23800	370	23800
28..	3910	70	739	5320	190	2730	19600	250	13200
29..	5330	258	S 6240	--	--	--	15400	210	8730
30..	23800	1980	S 131000	--	--	--	13400	170	6150
31..	68700	3540	S 668000	--	--	--	11800	143	4560
Total	152330	--	807788.1	779550	--	3534910	621950	--	1251040

S Computed by subdividing day.

B Computed from estimated-concentration graph.

K Computed from estimated-concentration graph and subdividing day.

EEL RIVER BASIN--Continued

11-4770. EEL RIVER AT SCOTIA, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
(Where no concentrations are reported loads are estimated)

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..	11100	155	4650	6820	65	1200	2760	5	37	
2..	9550	260	6700	6900	64	1190	2620	--	35	
3..	10300	260	7230	6350	50	857	2590	5	35	
4..	10400	241	6770	5570	35	526	2570	--	49	
5..	9740	240	6300	5110	40	552	2710	10	73	
6..	8750	230	5430	5220	53	747	2600	--	98	
7..	7510	196	3970	5750	52	807	2460	14	93	
8..	6710	150	2720	5500	32	475	2380	--	64	
9..	6000	110	1780	5280	32	456	2220	8	48	
10..	5550	73	1090	6900	126	5	2510	2090	--	34
11..	5150	73	1020	13300	420	5	15800	1980	4	21
12..	4880	56	738	15700	490	20800	1910	--	21	
13..	4750	45	577	11400	170	5230	1800	5	24	
14..	4600	40	497	9340	84	2120	1750	--	28	
15..	4500	30	365	7880	60	1280	1660	6	27	
16..	4300	25	290	6920	43	803	1580	--	21	
17..	4100	22	244	6110	30	495	1450	4	16	
18..	4000	20	220	5520	22	328	1350	--	15	
19..	3950	19	203	5120	21	290	1290	4	14	
20..	3900	17	179	4780	21	271	1230	--	13	
21..	4600	80	994	4540	19	233	1170	4	13	
22..	7570	529	5	4250	17	195	1130	--	12	
23..	11400	505	15500	4010	13	141	1070	3	8.7	
24..	11800	275	8760	3720	13	131	1000	--	8.1	
25..	8280	112	2500	3500	12	113	972	3	7.9	
26..	7360	75	1490	3330	10	90	916	--	7.4	
27..	6650	58	1040	3230	8	70	860	4	9.3	
28..	6050	44	719	3080	6	50	834	--	6.8	
29..	5950	42	675	2850	7	54	782	3	6.3	
30..	6570	65	1150	2790	9	68	756	--	6.1	
31..	--	--	--	2780	7	53	--	--	--	
Total	205970	--	95001	183550	--	57935	50490	--	851.6	
</										

S Computed by subdividing day.

B Computed from estimated-concentration graph.

EKL RIVER BASIN--Continued

11-4770. EKL RIVER AT SCOTIA, CALIF.--Continued

Particle size analyses of suspended sediment, water year October 1960 to September 1961

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;

P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sampling point	Water temperature (°F)	Discharges (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Nov. 24, 1960.....	1600		50	12,700	2,410		—	27	—	41	—	58	68	80	96	100		VPWC
Nov. 26.....	1400		50	23,300	1,200		—	39	—	62	—	86	96	100	—	—		VPWC
Dec. 2.....	0900		47	e 62,000	2,330		—	32	—	53	—	80	94	99	100	—		VPWC
Dec. 17.....	1400		45	e 80,000	3,720		23	29	41	55	69	78	93	99	100	—		VPWC
Dec. 18.....	0800		47	e 70,000	2,450		—	30	—	51	—	78	94	99	100	—		VPWC
Jan. 10, 1961.....	0800		51	26,200	2,540		—	—	—	—	—	53	72	89	100	—		V
Jan. 31.....	1300		52	76,000	4,030		—	28	—	51	—	75	93	99	100	—		VPWC
Feb. 9.....	1700		51	38,800	3,530		15	19	26	34	45	55	75	90	100	—		VPWC
Feb. 10.....	1700		51	51,900	1,820		—	—	—	—	—	77	93	100	—	—		V
Feb. 11.....	1600		51	108,000	3,605		—	27	—	51	—	75	93	99	99	100		VPWC
Feb. 18.....	1105		49	20,900			—	—	—	—	—	58	74	91	100	—		V
Mar. 15.....	0700		50	34,900	2,010		—	28	—	48	—	71	88	98	98	100		VPWC
Mar. 17.....	1800		50	55,500	1,420		—	—	—	—	—	70	89	100	—	—		V
Mar. 25.....	1200		50	26,800	520		—	—	—	—	—	62	76	95	100	—		V

e Estimated.

KEL RIVER BASIN--Continued

11-4777. SOUTH FORK VAN DUZEN RIVER NEAR BRIDGEVILLE, CALIF.

LOCATION.--Temperature recorder at gaging station, 0.2 mile upstream from Butte Creek, 3 miles upstream from mouth, and 7.8 miles east of Bridgeville, Humboldt County.

DRAINAGE AREA.—36.2 square miles.

RECORDS AVAILABLE: ---Water temperatures: November 1960 to September 1961.

RECORDS AVAILABLE.--Water temperatures, November 1960 to September, 1962, and water temperatures, November 1961 to September, 1962.

Temperature (°F) of water. November 1960 to September 1961

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

EEL RIVER BASIN--Continued

11-4785. VAN DUZEN RIVER NEAR BRIDGEVILLE, CALIF.

LOCATION.--At gaging station, at bridge on State Highway 36, 0.3 mile downstream from Pip Creek, 0.5 mile upstream from Rogers Creek, and 4 miles west of Bridgeville, Humboldt County.

DRAINAGE AREA (revised).--216 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

Water temperatures: December 1960 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 80°F July 11, 12; minimum, 44°F several days during March.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonates (HCO ₃)	Carbonyl (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Bo- ton (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		So- dum sorp- tion ratio	Specific con- duct- (micro- mhos at 25°C)	
															Parts per million	Tons per acre- foot	Tons per day	Cal- cium, Mag- nes- ium	Non- car- bon- ate			
Oct. 11, 1960.....	16	---	---	---	---	6.9	---	120	0	---	4.8	---	---	---	0.1	---	---	---	115	17	0.3	255
Nov. 8.....	15	---	---	---	---	7.0	---	124	0	---	4.2	---	---	---	0.1	---	---	---	111	9	---	246
Dec. 6.....	647	---	---	---	---	3.6	---	68	0	---	1.5	---	---	---	0.1	---	---	---	62	6	---	136
Jan. 10, 1961.....	316	---	---	---	---	3.8	---	76	0	11	2.5	---	---	---	---	---	---	---	65	3	---	145
Feb. 7.....	904	---	---	---	---	3.4	---	65	0	---	2.0	---	---	---	---	---	---	---	56	3	---	122
Mar. 7.....	1,150	---	---	---	---	3.7	---	60	0	---	---	---	---	---	---	---	---	---	50	1	---	115
Apr. 4.....	1,070	---	---	---	---	1.0	---	56	0	---	2.0	---	---	---	---	---	---	---	50	4	---	105
May 10.....	2,440	14	0.00	12	4.1	2.7	1.0	54	0	6.0	1.5	0.1	0.4	69	0.09	47	3	---	104	7.4	---	7.4
June 6.....	82	---	---	---	---	3.7	---	82	0	---	2.7	---	---	---	---	---	---	---	71	4	---	151
July 4.....	58	---	---	---	---	5.0	---	92	3	---	3.8	---	---	---	---	---	---	89	9	---	189	
Aug. 2.....	20	---	---	---	---	7.0	---	126	0	---	3.4	---	---	---	---	---	---	101	0	---	225	
Sept. 5.....	12	10	---	32	8.0	7.5	1.0	131	0	17	5.0	0.1	0.1	146	0.20	113	6	---	246	8.2	---	8.2

REL RIVER BASIN--Continued
 11-4785, VAN DUZEN RIVER NEAR BRIDGEVILLE, CALIF.--Continued
 Temperature (°F) of water, December 1960 to September 1961

Month	Temperature (°F) at Water, December 2000 to September 2002																															Average		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
December	--	--	50	50	50	50	50	50	49	49	49	49	49	49	49	49	49	49	48	48	48	48	48	48	48	48	48	48	47	47	47	47	49	
	--	--	50	50	50	50	50	50	49	49	49	49	49	49	49	49	49	49	48	48	48	48	48	48	48	48	48	48	47	47	47	47	48	
January	47	47	46	46	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	
	47	46	46	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	
February	45	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	--	--	--	--	46	
	45	45	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	46	46	--	--	46	
March	46	46	46	46	46	46	46	45	45	45	45	45	45	45	45	45	45	44	44	44	44	44	44	44	44	44	46	46	46	46	46	46	46	45
	46	46	46	46	46	46	46	45	45	45	45	45	45	45	45	45	44	44	44	44	44	44	44	44	44	44	46	46	46	46	46	46	45	
April	46	47	48	48	48	48	48	48	48	48	48	48	48	48	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	48	
	46	46	47	48	48	48	48	48	48	48	48	48	48	48	49	49	49	49	49	48	48	47	46	46	46	46	47	48	49	49	49	48	48	
May	49	49	49	49	50	51	52	52	52	52	51	50	51	52	52	52	53	54	54	54	55	55	55	56	57	57	57	57	58	59	60	53	53	
	48	48	48	49	50	51	52	52	51	50	50	51	52	52	52	52	53	54	54	54	55	55	55	56	57	57	57	58	59	60	53	53		
June	63	63	64	64	64	65	65	64	64	64	65	66	67	71	76	76	75	71	70	67	70	70	70	71	70	68	66	65	69	70	68	68	68	
	59	63	63	64	64	64	63	63	63	64	64	65	66	67	71	72	70	68	66	64	63	64	65	64	65	63	62	61	63	--	--	65		
July	67	68	69	67	66	69	67	73	75	78	80	80	77	78	76	76	77	77	75	70	68	67	70	73	74	73	73	73	74	74	73	73	73	
	64	64	65	65	62	62	64	64	66	68	71	72	71	70	73	73	72	68	68	66	65	65	64	64	64	65	66	65	66	66	67	67	67	
August	74	74	75	71	69	78	78	76	76	76	76	72	75	74	72	74	73	78	75	75	75	75	75	75	75	75	70	74	72	73	74	74	74	
	66	67	67	67	67	66	69	70	68	68	68	68	66	68	68	68	68	66	66	66	66	66	66	66	66	66	66	66	67	68	67	68	67	
September	71	71	71	71	71	70	69	68	68	69	67	65	64	67	66	68	65	65	68	66	66	66	64	65	65	65	65	63	66	--	--	67	67	
	69	64	62	64	65	65	64	62	61	63	63	63	63	62	64	64	62	62	62	62	62	61	59	58	59	59	60	59	60	61	62	62	62	

MAD RIVER BASIN

11-4805. MAD RIVER NEAR FOREST GLEN, CALIF.

LOCATION.--Temperature recorder at gaging station, 0.7 mile downstream from Lamb Creek, and 7.0 miles northwest of Forest Glen, Trinity County, 44 square miles.
 PREVIOUS RECORDS.--None.
 PRESENT INSTALLATION.--Water temperatures: November 1960 to September 1961.
 EXTREMES, November 1960 to September 1961.--Water temperatures: Maximum, 79°F June 25; minimum, 38°F Jan. 5.

Temperature (°F) of water, November 1960 to September 1961

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

MAD RIVER BASIN--Continued

11-4805. MAD RIVER NEAR FOREST GLEN, CALIF.--Continued

Sediment discharge measurements and particle-size analyses of suspended sediment, water year October 1960 to September 1961
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sam- pling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis		
							Percent finer than size indicated, in millimeters												
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000		2.000	
Oct. 19, 1960.....	1400		59	3.7	1	t													
Nov. 16.....	1725		48	11	6	0.2													
Dec. 2.....	1320		46	3,160	141	1,200													
Jan. 6, 1961.....	1030		--	67	35	6.3													
Jan. 27.....	1515		46	109	11	3.2													
Feb. 6.....	1425		48	518	21	29													
Feb. 8.....	1600		48	3,050	644	5,300					54	67	85	98	100			V	
Feb. 18.....	1450		44	968	28	73													
Mar. 24.....	1330		46	1,260	31	105					82	91	99	100				V	
Mar. 27.....	1240		43	1,220	33	109													
Apr. 8.....	1630		--	365	9	8.9													
Apr. 21.....	1430		46	206	26	14													
June 7.....	1350		64	96	5	1.3													
June 13.....	1745		--	67	4	.7													
June 27.....	1210		--	30	2	.2													
Aug. 28.....	1630		--	3.0	1	t													

t Less than 0.05 ton.

MAD RIVER BASIN--Continued

11-4810. MAD RIVER NEAR ARCAT, CALIF.

LOCATION--At gaging station, 100 feet upstream from bridge on U.S. Highway 299, 1.0 mile downstream from Warren Creek, and 2.8 miles northeast of Arcata, Humboldt County.

DRAINAGE AREA --485 square miles.

RECORDS AVAILABLE--Chemical analyses: November 1958 to September 1961.

Water temperatures: December 1957 to September 1961.

Sediment records: December 1957 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Minimum, 40°F Jan. 3, 4, Mar. 29.

Sediment concentrations: Maximum daily, 3,170 ppm Nov. 25, minimum daily, 0.1 ppm on many days during October and November.

Sediment loads: Maximum daily, 160,000 tons Feb. 11; minimum daily, 0.1 ton on many days during October and November.

EXTREMES, 1957-61.--Water temperatures: Minimum, 40°F Jan. 4, 1959, Jan. 3, 4, Mar. 29, 1961.

Sediment concentrations: Maximum daily, 4,560 ppm Feb. 8, 1960; minimum daily, 1 ppm on many days in 1958-60.

Sediment loads: Maximum daily, 489,000 tons Feb. 8, 1960; minimum daily, 0.1 ton on many days in 1958-60.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate		
Oct. 12, 1960.....	35	--	--	38	7.5	5.8	--	139	0	6.0	--	--	0.0	--	--	126	12	0.2	262 8.0
Nov. 9.....	26	--	--	--	--	6.9	--	137	0	--	--	--	.1	--	--	121	19	.3	260 8.2
Dec. 2.....	8,670	--	--	12	1.5	3.4	1.0	42	0	5.0	--	--	--	--	--	36	2	.3	88 7.0
Dec. 7.....	904	--	--	--	--	4.7	--	64	0	3.5	--	--	.1	--	--	63	11	.3	138 7.4
Jan. 11, 1961.....	346	--	--	--	--	4.6	--	76	0	3.5	--	--	.0	--	--	78	16	.2	159 7.2
Feb. 9.....	3,810	--	--	--	--	3.5	--	58	0	2.5	--	--	.1	--	--	50	2	.2	114 7.8
Mar. 8.....	2,540	--	--	--	--	3.6	--	44	0	2.2	--	--	.0	--	--	43	7	.2	98 7.7
Apr. 5.....	1,720	--	--	--	--	1.1	--	47	0	3.2	--	--	.0	--	--	44	5	.1	97 7.7
May.....	2,230	13	0.00	11	3.5	4.5	.8	49	0	4.0	0.1	0.2	.0	66	0.09	42	2	.3	97 7.6
June 7.....	2,545	--	--	--	--	1.7	--	66	0	3.8	--	--	.0	--	--	60	6	.1	137 7.8
July 8.....	478	--	--	18	4.1	3.9	.5	73	0	6.0	2.2	--	--	--	--	62	2	.2	142 7.2
July 6.....	108	--	--	--	--	4.6	--	11	0	3.1	--	--	.1	--	--	82	1	.2	203 8.2
Aug. 2.....	48	--	--	--	--	5.8	--	124	2	5.0	--	--	.0	--	--	110	5	.2	235 8.3
Sept. 5.....	29	10	--	36	6.3	5.9	1.2	134	0	6.5	.1	.4	.0	143	.19	116	6	.2	246 8.2

MAD RIVER BASIN—Continued
 11-4810. MAD RIVER NEAR ARCAT, CALIF.—Continued
 Temperature (°F) of water, water year October 1960 to September 1961

Month	Day																															Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Maximum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Minimum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
November	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Maximum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Minimum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
December	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Maximum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Minimum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
January	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Maximum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Minimum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
February	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Maximum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Minimum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
March	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Maximum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Minimum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
April	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Maximum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Minimum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
May	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Maximum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Minimum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
June	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Maximum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Minimum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
July	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Maximum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Minimum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
August	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Maximum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Minimum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
September	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Maximum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58
Minimum	59	59	59	59	63	63	62	62	60	60	60	60	60	60	60	60	60	60	56	60	60	60	60	60	61	59	59	58	58	58	58	58

MAD RIVER BASIN--Continued

11-4810. MAD RIVER NEAR ARCATA, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961
(Where no concentrations are reported loads are estimated)

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..	23	--	0.1	29	1	0.1	5730	1010	S 24300
2..	24	--	.1	29	--	.1	8670	1510	S 39300
3..	25	2	.1	38	23	2.4	4050	340	3720
4..	31	--	.2	28	--	.9	2400	124	804
5..	27	2	.1	26	4	.3	1600	70	302
6..	26	--	.1	26	--	.1	1160	44	B 140
7..	29	3	.2	26	1	.1	904	34	83
8..	37	--	.4	26	--	.1	754	32	65
9..	50	--	.5	26	2	.1	650	32	56
10..	44	2	.2	28	--	.2	580	31	49
11..	39	--	.2	48	4	.5	670	31	56
12..	35	1	.1	51	--	.8	580	34	53
13..	33	--	.1	115	23	7.1	510	34	47
14..	31	1	.1	231	--	22	470	33	42
15..	29	--	.1	285	37	28	438	17	20
16..	27	1	.1	285	34	26	670	240	K 570
17..	26	--	.1	327	35	31	11600	2340	S 79900
18..	26	2	.1	1310	651	S 2480	9820	1350	S 37100
19..	26	1	.1	712	445	S 912	6100	600	9880
20..	26	4	.3	433	50	58	3580	310	3000
21..	26	--	.3	370	10	10	2430	200	B 1300
22..	25	--	.3	321	10	8.7	1780	100	481
23..	26	4	.3	737	50	99	1360	77	283
24..	26	--	.2	3660	818	S 8540	1110	49	B 150
25..	26	2	.1	10900	3170	S 109000	917	26	64
26..	29	--	.2	5070	695	S 11300	802	19	41
27..	28	2	.2	2490	160	1080	695	16	30
28..	31	--	.3	1530	85	351	620	19	32
29..	32	4	.3	1120	45	136	540	30	44
30..	32	--	.3	1000	35	95	490	36	48
31..	30	--	.2	--	--	--	450	12	15
Total	925	--	6.0	31277	--	134189.5	72130	--	201975
	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..	414	7	B 7.8	6290	1010	S 18700	1160	38	119
2..	378	7	7.1	5530	851	12700	1680	110	499
3..	353	7	B 6.7	5040	430	5850	1360	42	154
4..	328	34	30	3230	210	1830	1160	30	94
5..	311	62	52	2280	160	985	1260	50	170
6..	293	24	B 19	1870	100	505	3090	360	S 3230
7..	290	5	3.9	1640	75	332	2850	180	1390
8..	300	12	B 9.7	1350	50	182	2540	131	898
9..	311	27	23	3810	900	S 16400	3370	310	2820
10..	363	27	26	7300	1050	S 23100	3850	500	5200
11..	346	31	29	18900	2990	S 160000	4600	1040	12900
12..	422	33	38	10400	1370	S 40200	4000	410	4430
13..	390	13	14	8490	1110	S 26000	3500	550	5200
14..	360	8	7.8	9270	1210	30300	3600	310	3010
15..	335	7	6.3	9550	988	S 24300	5000	1510	20400
16..	311	26	22	7040	710	13500	4100	620	6860
17..	286	18	14	4950	420	5610	6000	910	14700
18..	269	16	12	3700	310	3100	5000	390	5270
19..	253	15	10	2860	200	1540	4200	460	5220
20..	238	5	3.2	2350	150	952	3900	660	6950
21..	226	3	B 1.8	2010	110	597	3500	260	2460
22..	214	3	B 1.7	1820	90	442	3200	980	5010
23..	250	10	6.8	1570	100	424	5000	470	6350
24..	300	11	B 8.9	1630	80	309	5200	440	6180
25..	286	10	7.7	1640	115	509	8000	880	19000
26..	279	10	7.5	1330	48	172	6000	380	6160
27..	304	7	5.7	1190	38	122	5000	360	4860
28..	328	8	7.1	1200	39	126	4000	240	2590
29..	406	10	11	--	--	--	3610	200	B 1900
30..	2090	386	S 2370	--	--	--	3050	165	1360
31..	10900	2340	S 78300	--	--	--	2660	116	833
Total	22134	--	81069.7	128040	--	388787	115440	--	156217

S Computed by subdividing day.

B Computed from estimated-concentration graph.

K Computed from estimated-concentration graph and subdividing day.

MAD RIVER BASIN--Continued

11-4810. MAD RIVER NEAR ARCATA, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
(Where no concentrations are reported loads are estimated)

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..	2340	89	562	1620	53	232	570	8	12
2..	2190	80	473	1590	48	206	490	6	7.9
3..	2160	90	525	1310	30	106	502	7	9.5
4..	2020	74	404	1160	24	75	482	6	7.8
5..	1720	60	279	1110	24	72	458	5	6.2
6..	1470	49	194	3370	264	S 2860	498	7	9.4
7..	1260	43	146	3480	211	S 2130	545	13	19
8..	1120	35	106	2280	63	388	478	7	9.0
9..	1010	31	85	2230	71	427	442	5	6.0
10..	931	29	73	3210	208	1800	410	--	4.4
11..	856	37	86	5010	421	5690	386	4	4.2
12..	931	52	131	4200	230	2610	367	--	4.0
13..	892	42	101	3120	123	1040	346	3	2.8
14..	778	31	65	2480	70	469	325	--	2.6
15..	720	22	43	2020	61	333	300	4	3.2
16..	685	23	B 43	1660	43	193	276	--	3.0
17..	660	29	52	1470	35	139	253	--	2.0
18..	660	32	57	1280	27	93	235	3	1.9
19..	645	43	75	1160	23	72	226	--	1.8
20..	610	43	71	1040	23	65	211	--	1.7
21..	1290	120	S 613	938	24	61	211	3	1.7
22..	2310	218	1360	856	18	42	197	--	1.6
23..	2220	126	755	808	16	35	186	--	1.5
24..	1940	95	498	742	13	26	173	--	1.4
25..	1900	104	534	680	12	22	161	3	1.3
26..	1880	96	487	685	10	18	153	--	1.2
27..	1690	64	292	675	14	26	148	--	1.2
28..	1550	48	201	610	8	13	146	3	1.2
29..	1580	52	222	575	10	16	142	--	1.2
30..	1580	45	192	640	11	19	132	--	1.7
31..	--	--	--	635	11	19	--	--	--
Total	41598	--	8725	52644	--	19297	9449	--	131.4
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..	126	2	0.7	49	--	0.3	33	--	0.3
2..	124	--	.7	48	--	.3	32	--	.3
3..	122	--	.7	48	--	.3	32	5	.4
4..	118	--	.6	48	--	.4	30	--	.3
5..	114	2	.6	48	4	.5	29	--	.2
6..	108	--	.6	48	--	.5	28	--	.2
7..	105	--	.6	48	--	.5	28	--	.2
8..	103	--	.6	45	--	.5	28	--	.2
9..	99	2	.5	44	--	.5	27	--	.2
10..	96	--	.5	42	--	.5	28	--	.2
11..	89	--	.5	41	--	.4	28	--	.2
12..	86	--	.5	40	--	.4	26	--	.2
13..	84	--	.5	38	4	.4	27	--	.2
14..	82	--	.4	37	--	.4	26	--	.2
15..	81	2	.4	36	--	.4	28	--	.2
16..	76	--	.4	35	--	.4	32	--	.3
17..	70	--	.4	35	--	.4	38	--	.4
18..	68	8	1.5	34	--	.4	40	--	.4
19..	68	8	1.5	33	--	.3	35	--	.4
20..	66	--	.4	32	2	.3	31	--	.3
21..	65	--	.4	31	--	.2	33	--	.3
22..	63	--	.3	31	--	.2	30	2	.2
23..	63	2	.3	30	8	.6	30	--	.2
24..	61	--	.3	30	--	.2	31	--	.2
25..	58	--	.3	30	--	.2	31	--	.2
26..	57	14	2.2	31	3	.3	30	--	.2
27..	56	--	.6	36	--	.3	28	--	.2
28..	55	--	.4	41	--	.3	28	--	.3
29..	52	--	.4	35	--	.3	27	--	.4
30..	51	--	.3	33	--	.3	26	6	.4
31..	51	2	.3	31	--	.3	--	--	--
Total	2517	--	18.4	1188	--	11.2	900	--	7.9
Total discharge for year (cfs-days).....								478,242	
Total load for year (tons).....								990,436.1	

S Computed by subdividing day.

B Computed from estimated-concentration graph.

MAD RIVER BASIN--Continued
11-4810. MAD RIVER NEAR ARCAT, CALIF.--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sam- pling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Nov. 19, 1960.....	1000		52	742	511		22	24	32	42	54	99	100	--	--	--	--	V
Nov. 25.....	1100		50	16,600	5,230							65	84	95	99	100	--	VPWC
Dec. 1.....	1600		48	6,420	1,210							69	83	92	99	100	--	V
Dec. 1.....	1700		48	7,540	1,600			18	37			60	79	91	99	99	100	VPWC
Dec. 2.....	1015		48	9,210	1,100			28	48			70	84	93	99	100	--	VPWC
Dec. 2.....	1600		48	7,360	956				--	--	--	58	72	91	100	--	--	V
Dec. 17.....	1130		48	14,700	3,170				21			63	84	95	99	100	--	VPWC
Dec. 19.....	1600		48	5,380	479				--	--	--	74	86	98	100	--	--	V
Jan. 30, 1961.....	1630		48	2,190	386				--	--	--	85	91	99	100	--	--	VPWC
Jan. 31.....	1600		48	13,100	2,920				24			65	84	95	99	100	--	V
Feb. 3.....	1100		48	5,060	407				--	--	--	82	89	100	--	--	--	VPWC
Feb. 9.....	1700		48	6,480	1,870				24			70	86	94	99	100	--	VPWC
Feb. 13.....	1600		47	9,360	1,150				--	--	--	56	69	88	99	100	--	V
Mar. 17.....	1600		--	8,000	617				--	--	--	68	80	97	100	--	--	V
Mar. 23.....	1805		--	5,000	310				--	--	--	70	76	90	94	98	100	V
Mar. 25.....	1000		--	6,800	936				--	--	--	71	82	95	99	100	--	V
May 11.....	1500		50	5,280	413				--	--	--	83	91	98	100	--	--	V

e Estimated.

Particle-size analyses of bed material, October 1959 to September 1961
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Number of sampling points	Discharge	Bed material												Method of analysis
				Percent finer than size indicated, in millimeters												
				0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	32.000	
Jan. 14, 1960.....	1210	4	748			1	2	6	28	52	65	74	82	92	100	S
Sept. 16.....	0800	3	24				1	12	47	68	80	89	96	100	--	S
Dec. 2.....	1330	5	8,150				--	1	9	21	36	55	76	90	100	S
June 8, 1961.....	1010	4	482				--	1	2	5	9	17	35	71	100	S

REDWOOD CREEK BASIN

11-4825. REDWOOD CREEK AT ORICK, CALIF.

LOCATION.--At gaging station, on U.S. Highway 101 bridge at Orick, Humboldt County, and 0.9 mile downstream from Prairie Creek.
 DRAINAGE AREA.--278 square miles.
 RECORDS AVAILABLE.--Chemical analyses: November 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 12, 1960.....	34	--	--	--	--	5.1	--	67	--	--	6.8	--	--	0.0	--	--	--	63	8	0.3	156	8.0
Nov. 9.....	28	--	--	--	--	4.6	--	57	--	--	4.0	--	--	0.0	--	--	--	94	9	0.2	151	7.7
Dec. 7.....	1,020	--	--	--	--	3.4	--	38	--	--	4.0	--	--	0.0	--	--	--	37	6	0.2	90	7.6
Jan. 11, 1961.....	386	--	--	--	--	3.9	--	45	7.0	7.0	4.5	--	--	0.1	--	--	--	43	6	0.3	101	7.6
Feb. 8.....	1,200	--	--	--	--	3.1	--	39	--	--	4.8	--	--	0.0	--	--	--	38	3	0.2	84	7.7
Mar. 8.....	2,230	--	--	--	--	4.1	--	34	--	--	3.0	--	--	0.0	--	--	--	29	1	0.3	75	7.6
Apr. 5.....	1,460	--	--	--	--	1.1	--	31	--	--	4.6	--	--	0.0	--	--	--	30	5	0.1	72	7.5
May 9.....	1,970	7.3	0.01	9.2	1.6	2.5	0.6	33	4.4	4.4	2.8	0.2	0.0	0.1	45	0.06	30	3	0.2	72	7.5	
June 7.....	1,448	--	--	--	--	1.4	--	41	--	--	5.2	--	--	0.0	--	--	--	40	6	0.1	96	7.7
July 5.....	158	--	--	--	--	4.2	--	56	--	--	5.0	--	--	0.0	--	--	--	51	5	0.3	121	7.7
Aug. 2.....	70	--	--	--	--	5.1	--	64	--	--	4.6	--	--	0.0	--	--	--	59	7	0.3	135	7.9
Sept. 5.....	39	8.1	--	20	2.6	4.9	0.9	66	6.0	6.0	6.8	0.1	0.1	0.2	83	0.11	--	61	7	0.3	142	7.8

LOWER Klamath Lake Basin

11-4895. ANTELOPE CREEK NEAR TENNANT, CALIF.

LOCATION --At gaging station, 2.5 miles south of Tennant, Siskiyou County, 4 miles downstream from Frog Lake, and 17 miles southeast of Mount Hebron. DRAINAGE AREA --38.8 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1959 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbocationate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate		
Oct. 12, 1960.....	13	--	--	--	--	2.9	--	36	--	--	0.4	--	--	0.0	--	--	--	25	0	0.3	64
Nov. 9.....	12	--	--	--	--	2.8	--	39	--	--	.5	--	--	0	--	--	--	28	0	.2	63
Dec. 14.....	18	--	--	--	--	3.2	--	35	--	--	--	--	--	0	--	--	--	23	0	.3	59
Jan. 11, 1961.....	18	--	--	--	--	3.2	--	37	--	0.0	--	--	--	0	--	--	--	24	0	.3	58
Feb. 15.....	47	--	--	--	--	2.7	--	29	--	--	1.5	--	--	0	--	--	--	19	0	.3	47
Mar. 8.....	24	--	--	--	--	1.4	--	27	--	--	--	--	--	0	--	--	--	26	4	.1	57
Apr. 12.....	41	--	--	--	--	3.3	--	30	--	--	.8	--	--	0	--	--	--	20	0	.3	48
May 10.....	85	19	0.02	3.8	1.6	2.7	0.8	23	--	.8	.8	0.1	0.0	0	39	0.03	--	16	0	.2	38
June 1.....	127	--	--	--	--	2.7	--	29	--	--	.8	--	--	0	--	--	--	16	0	.2	38
July 12.....	27	--	--	--	--	2.7	--	29	--	--	.8	--	--	0	--	--	--	21	0	.3	52
Aug. 1.....	17	--	--	--	--	4.1	--	36	--	--	--	--	--	0	--	--	--	21	0	.4	58
Sept. 12.....	13	30	--	7.2	1.3	2.8	1.4	36	--	.0	1.0	.1	.2	.0	62	.08	--	24	0	.2	61

LOWER KLAMATH LAKE BASIN--Continued

11-4905. BUTTE CREEK NEAR MACDOEL, CALIF.

LOCATION--At gaging station, 7 miles south of Macdoel, Siskiyou County, and 7.5 miles downstream from Little Antelope Creek.

DRAINAGE AREA--178 square miles.

RECORDS AVAILABLE--Chemical analyses: October 1959 to September 1961.

REMARKS--No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate		
Oct. 12, 1960.....																		27	0	0.3	74
Nov. 9.....						3.9		42			0.4							32	0	0.3	73
Dec. 14.....						3.6		46			0.8							27	0	0.3	73
Jan. 14.....						4.2		42										27	0	0.3	65
Jan. 11, 1961.....						3.8		42		0.0								29	0	0.3	65
Feb. 13.....						3.6		42			1.0							27	0	0.4	64
Mar. 8.....						1.4		42										31	0	0.1	68
May 10.....						3.6	1.3	46		0		0.2	0.2	0		66	0.09	29	0	0.3	74
June 13.....		28	0.03	7.1	2.9	3.7		38										27	0	0.3	64
July 12.....						4.5		53			1.2							37	0	0.3	89
Aug. 1.....						5.5		50										30	0	0.4	82
Sept. 12.....		21		8.0	3.2	3.6	1.7	47		1.0	1.5	1.1	0.3	0	63	0.09		33	0	0.3	80

KLAMATH RIVER BASIN

11-5125. KLAMATH RIVER BELOW FALL CREEK, NEAR COPCO, CALIF.

LOCATION.---At gaging station 500 feet downstream from Fall Creek, 0.5 mile downstream from Copco No. 2 plant of The California Oregon Power Co., and 1 mile south of Copco, Siskiyou County, approximately.

DRAINAGE AREA.---4,370 square miles.

RECORDS AVAILABLE.---Chemical analyses; October 1953 to September 1961 (discontinued).

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 6, 1960.....	1,710	--	--	--	--	15	--	86	--	4.1	--	--	0.1	--	--	--	56	0	0.9	178
Nov. 7,.....	1,820	--	--	--	--	21	--	62	--	5.0	--	--	.1	--	--	--	57	0	1.2	208
Dec. 12,.....	2,510	--	--	--	--	26	--	102	--	5.2	--	--	.1	--	--	--	65	0	1.4	242
Jan. 4, 1961.....	2,040	--	--	--	--	20	--	92	12	5.0	--	--	.2	--	--	--	54	0	1.2	185
Feb. 5,.....	580	--	--	--	--	24	--	89	34	5.5	--	--	.2	--	--	--	72	0	1.2	244
Mar. 2,.....	2,330	--	--	--	--	25	--	110	58	3.0	--	--	.1	--	--	--	100	10	1.0	308
Apr. 10,.....	1,920	--	--	--	--	19	--	98	--	1.2	--	--	.1	--	--	--	91	11	.9	285
May 8,.....	1,400	23	0.03	16	9.8	22	3.0	86	46	10	0.2	1.1	.1	173	0.24	--	80	9	1.1	286
June 5,.....	1,890	--	--	--	--	16	--	80	--	4.8	--	--	.1	--	--	--	51	0	.9	180
July 3,.....	1,110	--	--	--	--	13	--	75	--	2.2	--	--	.0	--	--	--	53	0	1.0	188
Aug. 7,.....	1,410	--	--	--	--	13	--	75	--	2.2	--	--	.0	--	--	--	53	0	.6	188
Sept. 11,.....	1,660	38	--	14	5.1	15	2.9	63	12	4.6	.1	2.3	.1	135	.18	--	56	0	.9	178

Klamath River Basin--Continued

111-5175. SHASTA RIVER NEAR YREKA, CALIF.

LOCATION.--At gaging station, 0.5 mile upstream from mouth, and 7 miles north of Yreka, Siskiyou County.
DRAINAGE AREA.--796 square miles.

RECORDS AVAILABLE. --Chemical analyses: December 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1981

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)	Borates (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium, sodium	Non-carbonate			
Oct. 11, 1960.....	126	---	---	---	---	38	---	288	12	---	26	---	---	0.4	---	---	---	210	0	1.1	553	8.4
Nov. 8.....	150	---	---	---	---	29	---	222	25	---	22	---	---	.4	---	---	---	200	0	.9	502	8.7
Dec. 13.....	152	---	---	---	---	43	---	274	10	---	26	---	---	.5	---	---	---	204	0	1.3	536	8.4
Jan. 4.....	184	---	---	---	---	38	---	244	10	9.0	24	---	---	.5	---	---	---	209	0	1.2	409	8.5
Jan. 14, 1961.....	364	---	---	---	---	36	---	268	7	---	18	---	---	.5	---	---	---	200	0	1.1	480	8.5
Mar. 7.....	221	---	---	---	---	31	---	268	13	---	18	---	---	.4	---	---	---	191	0	1.0	500	8.6
Apr. 11.....	60	---	---	---	---	36	---	238	33	---	22	---	---	.4	---	---	---	280	0	1.1	492	9.0
May 9.....	91	.46	0.01	.42	.43	42	3.3	345	23	11	33	0.2	.8	.6	415	0.56	---	280	0	1.1	647	8.8
June 14.....	120	---	---	---	---	41	---	295	18	---	19	---	---	.6	---	---	---	240	0	1.3	541	8.5
July 11.....	17	---	---	---	---	51	---	347	29	---	38	---	---	.7	---	---	---	278	0	1.3	871	8.7
Aug. 1.....	27	---	---	---	---	58	---	408	17	---	40	---	---	.7	---	---	---	295	0	1.5	734	8.5
Sept. 12.....	28	55	38	38	39	55	4.5	353	11	9.0	34	.3	.7	.7	422	.57	---	256	0	1.5	642	8.5

Periodic determinations of suspended sediment discharge, water year October 1960 to September 1961

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;

P, pipet; **S**, sleeve; **V**, visual accumulation tube; **W**, in distilled water)

[illegible]

KLAMATH RIVER BASIN--Continued

11-5178.2. KLAMATH RIVER AT KLAMATH RIVER SCHOOL, NEAR HAMBURG, CALIF.

LOCATION.---At State Highway 96 bridge, 0.9 mile downstream from Klamath River School, 1.8 miles upstream from Horse Creek, and approximately 5.5 miles upstream from Hamburg, Siskiyou County, Oregon.

RECORDS AVAILABLE.---Chemical analyses: December 1958 to September 1961.

REMARKS.---No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (Fe)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl Sulfate (CO ₂)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
													Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate		
Oct. 11, 1960.....						15		92		5.5						71	0	0.8	188 7.6
Nov. 8.....						21		103		7.0		0.2				70	0	1.1	236 7.8
Dec. 13.....						24		117		7.2		.2				81	0	1.2	263 7.9
Jan. 12, 1961.....						19		112		6.5		.2				73	0	1.0	226 7.9
Feb. 14.....						17		128		6.5		.1				100	0	.7	283 7.9
Mar. 7.....						21		126		4.9		.1				103	0	.9	295 8.0
Apr. 11.....						16		104		3.5		.2				93	8	.7	283 7.7
June 9.....			0.03	18	11	19	2.6	104		10.2	0.1	1.5		174	0.24	91	6	.9	266 8.0
June 13.....						4.0		104		6.2		.1				88	3	.2	216 8.0
July 11.....						18		98		6.0		.1				72	0	.9	212 8.2
Aug. 1.....						16		92		3.2		.0				55	0	.9	176 8.0
Sept. 12.....	38			5.2	11	16	3.2	90		5.2	.2	1.5	.2	134	.18	58	0	.9	188 7.8

KLAMATH RIVER BASIN--Continued

11-5195. SCOTT RIVER NEAR FORT JONES, CALIF.

LOCATION.---At gaging station, 1.7 miles upstream from Snow Creek, and 10.8 miles downstream from Fort Jones, Siskiyou County.
 DRAINAGE AREA.---862 square miles.
 RECORDS AVAILABLE.---Chemical analyses: November 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfate (CO ₃)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Soil sodium adsorption ratio (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 11, 1960.....	77	---	---	---	---	5.4	---	176	0	4.2	---	---	0.0	---	---	---	139	0	0.2	304	8.2
Nov. 8.....	65	---	---	---	---	4.2	---	164	0	3.5	---	---	0.0	---	---	---	132	0	0.2	271	8.2
Dec. 13.....	234	---	---	---	---	3.9	---	118	0	2.0	---	---	---	---	---	---	102	5	0.2	205	8.2
Jan. 11, 1961.....	285	---	---	---	---	3.5	---	109	0	2.5	---	---	.1	---	---	---	89	0	0.2	183	8.0
Feb. 14.....	2,060	---	---	---	---	2.7	---	92	0	1.0	---	---	0.0	---	---	---	73	0	0.1	151	7.8
Mar. 7.....	598	---	---	---	---	3.3	---	102	0	1.0	---	---	0.0	---	---	---	80	0	0.2	172	8.0
Apr. 11.....	932	---	---	---	---	2.1	---	84	0	1.0	---	---	0.0	---	---	---	71	2	.1	141	8.0
May 9.....	654	20	0.01	14	9.6	2.4	0.7	92	0	4.7	0.0	0.9	.1	98	0.13	---	75	0	.1	149	8.0
June 13.....	870	---	---	---	---	2.3	---	71	0	.6	---	---	0.0	---	---	---	62	4	.1	118	8.0
July 11.....	145	---	---	---	---	4.7	---	128	8	4.8	---	---	---	---	---	---	122	4	.2	238	8.6
Aug. 1.....	68	---	---	---	---	4.9	---	165	0	4.0	---	---	0.0	---	---	---	137	2	0.2	282	8.0
Sept. 12.....	56	19	---	35	15	4.3	.9	174	1	6.0	.1	2.1	.1	174	.24	---	149	5	.2	288	8.3

KLAMATH RIVER BASIN--Continued

11-5205. KLAMATH RIVER NEAR SEIAD VALLEY, CALIF.

LOCATION.--At gaging station, 0.4 mile upstream from Bittenbender Creek, 1.4 miles downstream from Grider Creek, and 2.2 miles west of Seiad Valley, Siskiyou County.
 DRAINAGE AREA.--6,980 square miles, approximately.
 RECORDS AVAILABLE.--Chemical analyses: December 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 11, 1960.....	2,300	--	--	--	--	14	--	98	--	5.4	--	--	0.1	--	--	--	64	0	0	189
Nov. 8.....	2,150	--	--	--	--	20	--	103	--	7.0	--	--	.1	--	--	--	72	0	1.0	233
Dec. 13.....	3,290	--	--	--	--	21	--	105	--	6.0	--	--	.1	--	--	--	81	0	1.0	251
Jan. 13, 1961.....	2,620	--	--	--	--	17	--	110	14	6.2	--	--	.2	--	--	--	73	0	.9	218
Feb. 14.....	6,820	--	--	--	--	9.6	--	104	13	4.5	--	--	.1	--	--	--	87	2	.8	200
Mar. 7.....	3,760	--	--	--	--	15	--	119	--	3.9	--	--	.1	--	--	--	101	3	.6	263
Apr. 11.....	4,300	--	--	--	--	11	--	96	23	3.0	--	--	.1	--	--	--	85	8	.5	211
May 9.....	3,440	20	0.03	17	9.6	15	1.7	97	24	8.7	0.1	0.7	.1	145	0.20	--	82	2	.7	223
June 13.....	3,440	--	--	--	--	9.6	--	89	--	3.9	--	--	.0	--	--	--	72	0	.5	171
July 11.....	1,520	--	--	--	--	16	--	102	--	5.0	--	--	.1	--	--	--	76	0	.8	213
Aug. 1.....	1,340	--	--	--	--	13	--	102	--	5.5	--	--	.0	--	--	--	89	0	.7	194
Sept. 12.....	1,820	37	--	15	8.1	15	2.4	100	10	8.2	.3	1.7	.1	145	.20	--	71	0	.8	195

KLAMATH RIVER BASIN--Continued

11-5225. SALMON RIVER AT SOMESEAR, CALIF.

LOCATION.--At gaging station, 0.5 mile east of Somesbar Post Office, Siskiyou County, and 1.5 miles upstream from mouth.

DRAINAGE AREA.--746 square miles.

RECORDS AVAILABLE.--Chemical analyses: November 1968 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium-Magnesium	Non-carbonate			
Oct. 13, 1960.....	179	--	--	--	--	3.2	--	73	--	2.8	--	--	.0	--	--	--	62	2	0.2	138	7.8
Nov. 10, 170	170	--	--	--	--	2.9	--	76	--	2.5	--	--	.1	--	--	--	65	3	.2	140	8.1
Dec. 8, 801	801	--	--	--	--	2.3	--	57	--	1.0	--	--	.0	--	--	--	50	3	.1	107	7.6
Jan. 12, 1961..... 636	636	--	--	--	--	2.0	--	58	4.0	1.2	--	--	.0	--	--	--	47	0	.1	104	7.5
Mar. 9, 2,260	2,260	--	--	--	--	2.4	--	62	--	--	--	--	.0	--	--	--	50	0	.1	107	8.0
Apr. 6, 4,150	4,150	--	--	--	--	.7	--	42	--	1.5	--	--	.0	--	--	--	37	3	.0	78	7.8
May 8, 2,220	2,220	13	0.01	11	1.9	1.5	0.5	44	1.8	--	0.1	0.0	.1	52	0.07	--	36	0	.1	77	7.6
June 7, 3,060	3,060	--	--	--	--	1.8	--	28	--	1.0	--	--	.0	--	--	--	24	1	.1	51	7.6
July 6, 636	636	--	--	--	--	2.4	--	46	--	2.0	--	--	.0	--	--	--	40	2	.2	87	7.8
Aug. 3, 264	264	--	--	--	--	3.6	--	66	--	4.4	--	--	.0	--	--	--	51	0	.2	115	8.2
Sept. 6, 166	166	16	0.00	18	3.6	3.3	1.0	67	4.4	4.8	.0	.0	.0	87	.12	--	60	0	.2	130	8.6

KLAMATH RIVER BASIN--Continued
11-5230. KLAMATH RIVER AT SOMESBAR, CALIF.

LOCATION.--At gaging station, 300 feet downstream from Salmon River, and 1 mile west of Somesbar Post Office, Siskiyou County.
DRAINAGE AREA.--8,480 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (calculated)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 13, 1960.....	2,750	--	--	--	--	13	--	96	0	--	5.2	--	--	0.1	--	--	66	0	0.7	187
Nov. 10.....	2,750	--	--	--	--	17	--	104	0	--	7.2	--	--	.1	--	--	75	0	.9	227
Dec. 8.....	5,850	--	--	--	--	14	--	95	0	--	4.8	--	--	.0	--	--	71	0	.7	204
Jan. 12, 1961.....	4,710	--	--	--	--	11	--	97	0	8.0	4.8	--	--	.1	--	--	70	0	.6	182
Mar. 9.....	10,700	--	--	--	--	7.4	--	81	0	--	--	--	--	.1	--	--	65	0	.4	162
Apr. 6.....	15,800	--	--	--	--	2.0	--	64	0	--	2.6	--	--	--	--	--	54	2	.1	120
May 8.....	8,700	--	0.02	12	6.8	5.3	1.1	60	0	9.6	7.0	0.1	0.2	.1	90	0.12	53	9	.3	139
June 7.....	11,400	--	--	--	--	1.6	--	56	0	--	3.0	--	--	.0	--	--	48	0	.1	106
July 6.....	2,860	--	--	--	--	8.6	--	81	0	--	3.5	--	--	.0	--	--	66	0	.5	163
Aug. 3.....	1,980	--	--	--	--	10	--	91	0	--	3.1	--	--	.1	--	--	63	0	.6	165
Sept. 6.....	1,680	21	--	16	8.3	11	1.6	98	1	8.0	6.4	0.0	.2	.1	122	.17	74	0	.6	183

KLAMATH RIVER BASIN--Continued

11-5255. TRINITY RIVER AT LEWISTON, CALIF.

LOCATION--At old highway bridge in Lewiston, Trinity County, 0.3 mile downstream from gaging station, and 0.8 mile downstream from Deadwood Creek.
 DRAINAGE AREA, 708 square miles.
 RECORDS AVAILABLE--Chemical analyses: December 1953 to September 1961.
 Water temperatures: September 1951 to September 1955, October 1957 to September 1961.
 EXTREMES, 1950-61--Water temperatures: Maximum, 67°F Oct. 1, 2, June 13, 15-17; minimum, 39°F several days during January.
 EXTREMES, 1951-55, 1957-58, 1959-61--Water temperatures: Maximum, 79°F July 20, 21, 28, 29, 1960; minimum, 33°F on several days in January 1952.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbocationate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (calculated)		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Calcium, Magnesium, slum	Non-carbonate			
Oct. 14, 1960.....	174	--	--	--	--	5.9	--	88	--	--	6.4	--	--	--	--	76	4	0.3	179	8.1
Nov. 11.....	184	--	--	--	--	5.8	--	89	--	--	7.0	--	0.1	--	--	80	7	0.3	174	8.0
Dec. 9.....	889	--	--	--	--	5.6	--	54	--	--	2.0	--	--	--	--	46	2	0.2	103	7.7
Jan. 12, 1961.....	354	--	--	--	--	2.9	--	62	--	4.0	2.5	--	0.1	--	--	51	0	0.2	108	8.0
Feb. 8.....	378	--	--	--	--	3.2	--	67	--	--	3.0	--	--	--	--	48	3	0.2	123	7.9
Mar. 9.....	175	--	--	--	--	5.2	--	65	--	--	--	--	0	--	--	48	0	0.3	117	7.9
Apr. 7.....	166	--	--	--	--	1.4	--	66	--	--	3.1	--	--	--	--	55	1	0.1	115	7.9
May 8.....	175	15	0.00	8.4	8.8	2.5	0.6	62	--	4.0	1.8	0.1	0.3	0	70	0.10	1	0.2	108	7.9
June 8.....	192	--	--	--	--	1.2	--	61	--	--	4.2	--	0	--	--	52	2	0.1	113	8.0
July 7.....	186	--	--	--	--	2.4	--	58	--	--	2.9	--	--	--	--	45	0	0.2	104	7.9
Aug. 4.....	178	--	--	--	--	2.8	--	58	--	--	--	--	--	--	--	50	0	0.2	99	7.9
Sept. 7.....	182	15	--	6.4	7.7	2.3	0.5	56	--	1.4	2.5	0	0.1	64	0.09	48	2	0.1	99	8.0

QUALITY OF SURFACE WATERS, 1961

Klamath River Basin--Continued

11-5255. TRINITY RIVER AT LEWISTON, CALIF.--Continued

Temperature ($^{\circ}\text{F}$) of water, water year October 1960 to September 1961

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

KLAMATH RIVER BASIN--Continued

11-5270. TRINITY RIVER NEAR BURNT RANCH, CALIF.

LOCATION.--At gaging station, 500 feet upstream from Cedar Flat Creek, 700 feet upstream from highway bridge at Cedar Flat, and 2.3 miles southeast of Burnt Ranch, Trinity County.
 DRAINAGE AREA.--1,438 square miles.
 RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 13, 1960.....	295	--	--	--	--	5.8	--	102	0	--	8.6	--	--	0.1	--	--	--	88	4	0.3	200	8.0
Nov. 11.....	286	--	--	--	--	5.9	--	102	0	--	8.8	--	--	0	--	--	--	92	8	.3	206	8.0
Dec. 8.....	1,460	--	--	--	--	4.0	--	65	0	--	4.2	--	--	0	--	--	--	58	5	.2	129	7.9
Jan. 12, 1961.....	1,460	--	--	--	--	3.3	--	70	0	4.0	3.2	--	--	.1	--	--	--	56	0	.2	124	7.9
Feb. 9.....	3,770	--	--	--	--	2.5	--	69	0	--	1.5	--	--	.1	--	--	--	55	0	.1	117	7.9
Mar. 9.....	1,570	--	--	--	--	2.9	--	85	0	--	--	--	--	.1	--	--	--	72	2	.2	153	8.2
Apr. 6.....	2,680	--	--	--	--	1.3	--	68	0	--	2.6	--	--	0	--	--	--	60	4	.1	119	8.0
May 8.....	1,230	17	0.00	15	5.7	2.9	0.6	73	0	5.0	3.2	0.1	0.3	0	86	0.12	--	61	1	.2	131	7.9
June 8.....	1,450	--	--	--	--	1.1	--	47	0	--	2.7	--	--	0	--	--	--	52	4	.1	123	7.9
July 6.....	332	--	--	--	--	3.6	--	85	0	--	5.0	--	--	0	--	--	--	57	0	.2	151	8.0
Aug. 6.....	332	--	--	--	--	4.6	--	82	1	--	--	--	--	0	--	--	--	67	0	.2	151	8.0
Sept. 6.....	285	11	--	17	7.7	4.6	.7	82	1	5.0	7.0	.0	.0	.0	94	.13	--	74	5	.2	162	8.3

KLAMATH RIVER BASIN--Continued

11-5290. SOUTH FORK TRINITY RIVER NEAR SALTER, CALIF.

LOCATION. --At gaging station. 4 miles south of Salver. Humboldt County. and 8 miles upstream from mouth.

DRAINAGE AREA. --899 square miles.

RECORDS AVAILABLE. --Water temperatures: November 1956 to September 1961.

Sediment records: November 1956 to September 1961.

EXTREMES, 1960-61.--Sediment concentrations: Maximum daily, 992 ppm Feb. 11; minimum daily, 1 ppm on many days.

Sediment loads: Maximum daily, 36,500 tons Feb. 11; minimum daily, 0.2 ton on several days.

EXTREMES, 1956-61.--Sediment concentrations: Maximum daily, 4,190 ppm Jan. 29, 1958; minimum daily, 1 ppm on many days in

1956-61.

Sediment loads: Maximum daily, 255,000 tons Feb. 19, 1958; minimum daily, 0.2 ton on many days in 1957, 1960-61.

Temperature ($^{\circ}\text{F}$) of water. water year October 1960 to September 1961[illegible]

KLAMATH RIVER BASIN--Continued

11-5290. SOUTH FORK TRINITY RIVER NEAR SALLYER, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961
(Where no concentrations are reported loads are estimated)

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..	73	--	0.4	97	1	0.3	4620	404	S 7010
2..	76	--	.4	97	--	.3	4810	250	S 3660
3..	77	1	.2	96	--	.3	2240	73	S 468
4..	74	--	.2	94	1	.3	1590	34	146
5..	74	--	.4	93	--	.3	1220	17	56
6..	89	2	.5	94	--	.3	1100	12	36
7..	116	--	.6	97	--	.3	1020	14	39
8..	143	--	.8	102	1	.3	888	10	24
9..	130	--	.7	104	--	.3	765	4	8.3
10..	125	2	.7	106	1	.3	654	4	7.1
11..	109	--	.6	118	--	.3	654	10	18
12..	106	--	.6	139	--	.8	609	5	8.2
13..	104	2	.6	180	--	1.0	588	3	4.8
14..	104	--	.6	251	4	2.7	579	3	4.7
15..	102	--	.6	261	--	2.8	576	3	4.7
16..	101	--	.5	241	3	2.0	901	70	S 229
17..	99	--	.5	241	4	2.6	8870	815	S 22300
18..	96	1	.3	587	151	S 254	780	367	S 8380
19..	96	--	.3	519	41	57	4740	180	2300
20..	94	--	.3	347	13	12	3050	84	692
21..	94	1	.3	308	4	3.3	2320	50	313
22..	94	--	.3	273	--	2.2	1970	--	220
23..	94	--	.3	440	34	K 67	1690	--	180
24..	93	1	.3	1240	--	800	1470	32	127
25..	94	--	.3	1940	435	2280	1300	--	70
26..	96	--	.3	1500	122	494	1160	16	50
27..	101	--	.3	1040	37	104	1080	--	47
28..	99	1	.3	758	20	41	1000	16	43
29..	99	--	.3	615	16	27	920	13	32
30..	99	--	.3	642	20	35	860	--	19
31..	99	--	.3	--	--	--	804	5	11
Total	3050	--	13.1	12620	--	4191.7	61928	--	46507.8
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..	755	7	14	6880	276	S 5600	1710	11	51
2..	702	--	9.5	6710	297	S 5790	1690	10	46
3..	667	--	5.4	6130	180	2980	1590	13	56
4..	639	2	3.5	4270	90	1040	1510	13	53
5..	609	--	3.3	3180	55	472	1580	17	73
6..	600	--	3.2	2640	31	221	1920	40	207
7..	594	2	3.2	2290	26	161	1850	22	110
8..	624	--	5.1	2120	30	172	1840	18	89
9..	612	4	6.6	4960	395	S 6940	2250	41	249
10..	636	10	17	7450	308	S 6640	2450	52	344
11..	591	--	6.4	13300	992	S 36500	2890	98	S 796
12..	567	--	4.6	9540	402	S 10700	3150	50	425
13..	534	2	2.9	7180	200	3880	3480	62	583
14..	519	--	2.8	6590	152	2700	4050	62	S 713
15..	501	--	2.7	6930	195	3650	6510	222	S 4000
16..	480	2	2.6	6270	127	2150	5580	108	1630
17..	465	--	2.5	5230	95	1340	6350	--	2400
18..	453	--	2.4	4360	69	812	5750	94	1460
19..	438	--	2.4	3690	52	518	5670	85	1300
20..	423	2	2.3	3180	42	361	6380	77	1330
21..	417	--	2.3	2820	33	251	5300	56	801
22..	405	--	1.1	2630	25	178	5250	67	950
23..	459	3	3.7	2420	20	131	3640	82	1250
24..	519	--	14	2260	19	116	5270	62	882
25..	474	--	5.1	2150	16	93	4850	46	602
26..	495	2	2.7	2000	15	81	4520	50	610
27..	624	7	12	1900	15	77	4270	43	496
28..	688	9	17	1800	13	63	3850	40	416
29..	952	57	S 227	--	--	--	3490	33	311
30..	3750	240	S 2510	--	--	--	3250	26	228
31..	10200	813	S 25300	--	--	--	3120	23	194
Total	30392	--	28197.3	130880	--	93767	117010	--	22655

S Computed by subdividing day.

K Computed from estimated-concentration graph and subdividing day.

KLAMATH RIVER BASIN--Continued

11-5290. SOUTH FORK TRINITY RIVER NEAR SALYER, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
(Where no concentrations are reported loads are estimated)

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..	3010	17	138	1690	8	37	892	--	12
2..	3080	20	166	1620	--	31	880	--	12
3..	3210	26	225	1500	6	24	932	--	15
4..	3130	21	177	1420	--	23	948	--	18
5..	2790	22	166	1360	6	22	920	--	20
6..	2500	26	176	1530	--	41	852	--	16
7..	2300	16	99	1490	6	24	828	--	16
8..	2150	12	70	1380	--	15	769	--	15
9..	2030	11	60	1370	7	26	723	--	14
10..	1930	9	47	1620	--	57	692	--	11
11..	1850	--	35	1860	6	30	671	--	9.1
12..	1860	--	65	1840	--	25	651	--	8.8
13..	1780	10	48	1740	5	23	624	--	8.4
14..	1660	--	36	1620	--	22	600	--	8.1
15..	1580	--	34	1520	4	16	564	4	6.1
16..	1530	--	33	1450	--	16	534	--	5.8
17..	1510	--	33	1370	4	15	510	--	5.5
18..	1470	7	28	1320	--	14	483	--	5.2
19..	1410	--	23	1280	4	14	462	5	6.2
20..	1360	7	26	1260	--	14	444	--	6.0
21..	1430	16	62	1200	5	16	423	--	6.9
22..	1640	28	124	1160	--	16	408	6	6.6
23..	1630	--	100	1120	5	15	390	--	6.3
24..	1570	10	42	1070	--	12	375	--	5.1
25..	1570	--	30	1030	4	11	360	--	3.9
26..	1630	8	35	1020	--	14	358	3	2.9
27..	1660	--	45	988	6	16	355	--	2.9
28..	1660	10	45	936	--	15	350	--	3.8
29..	1720	--	56	920	6	15	345	5	4.7
30..	1770	--	57	948	--	13	340	--	4.6
31..	--	--	--	940	5	13	--	--	--
Total	58420	--	2281	41572	--	645	17683	--	265.9
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..	335	--	4.5	156	2	--	104	--	--
2..	330	--	5.3	152	--	--	103	--	--
3..	325	6	5.3	149	--	--	102	--	--
4..	316	--	4.3	146	3	--	100	--	--
5..	310	--	2.5	144	--	--	96	--	--
6..	304	2	1.6	141	--	--	95	--	--
7..	296	--	1.6	139	--	--	93	--	--
8..	290	--	2.3	138	--	--	92	--	--
9..	284	--	3.1	150	--	--	91	--	--
10..	280	5	3.8	150	--	--	90	--	--
11..	272	--	3.7	137	--	--	89	--	--
12..	264	--	2.9	132	--	--	87	--	--
13..	256	4	2.8	141	--	--	86	--	--
14..	247	--	2.7	145	--	--	85	--	--
15..	240	--	2.6	143	--	--	86	--	--
16..	234	--	2.5	132	--	--	93	--	--
17..	228	--	1.8	126	--	--	102	--	--
18..	222	--	1.8	120	--	--	105	--	--
19..	215	3	1.7	118	--	--	104	--	--
20..	209	--	1.7	116	--	--	103	--	--
21..	204	--	2.2	114	--	--	99	1	--
22..	199	--	2.1	111	--	--	97	--	--
23..	195	--	2.6	107	--	--	96	--	--
24..	190	5	2.6	104	1	--	94	--	--
25..	186	--	2.5	102	--	--	93	--	--
26..	181	--	2.0	102	--	--	92	--	--
27..	175	--	1.9	114	--	--	91	--	--
28..	172	3	1.4	115	--	--	89	--	--
29..	168	--	1.4	112	--	--	88	--	--
30..	164	--	.9	112	--	--	88	--	--
31..	159	--	.9	110	--	--	--	--	--
Total	7450	--	79.0	3978	--	24	2833	--	8
Total discharge for year (cfs-days).....									487,816
Total load for year (tons).....									198,634.8

KLAMATH RIVER BASIN--Continued

11-5290. SOUTH FORK TRINITY RIVER NEAR SALYER, CALIF.--Continued

Particle size analyses of suspended sediment, water year October 1960 to September 1961

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;

P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Dates of collection	Time (24 hour)	Samp- ling point	Water tem- per- ature (° F)	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment												Method of analysis
							Percent finer than size indicated, in millimeters												
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000		
Nov. 25, 1960.....	1530		--	2,180	482							84	92	98	100	--		V	
Dec. 1.....	0940		47	2,360	288							88	96	99	100	--		V	
Dec. 2.....	0800		--	5,340	271							67	80	94	98	100	100	V	
Dec. 17.....	1100		40	10,800	1,090							54	71	88	99	100	100	V	
Dec. 18.....	1100		42	7,640	334							62	74	91	99	100	100	V	
Jan. 31, 1961.....	1130		48	13,000	1,250							56	89	86	99	100	100	V	
Feb. 11.....	1030		47	14,900	1,230							51	62	77	97	100	100	V	

KLAMATH RIVER BASIN--Continued

11-5300. TRINITY RIVER NEAR HOOPA, CALIF.

LOCATION--At gaging station in Hoopa Indian Reservation, 0.7 mile downstream from Campbell Creek, and 1.8 miles southeast of Hoopa, Humboldt County.

DRAINAGE AREA, 548 square miles.

RECORDS AVAILABLE--Chemical analyses: October 1953 to September 1961.

Water temperatures: November 1956 to September 1961.

Sediment records: November 1956 to September 1961.

EXTREMES, 1960-61.--Sediment concentrations: Maximum daily, not determined; minimum daily, 1 ppm Nov. 10.

Sediment loads: Maximum daily, not determined; minimum daily, 1 ton Nov. 10.

EXTREMES, 1956-61.--Sediment concentrations: Maximum daily, 3,360 ppm Jan. 12, 1959; minimum daily, 1 ppm on many days in 1957-60.

Sediment loads: Maximum daily, 967,000 tons Feb. 19, 1958; minimum daily, 1 ton on many days in 1957-60.

REMARKS.--Measurement of suspended sediment made at bridge on State Highway 96, 3.5 miles downstream from gaging station. No appreciable inflow between

sampling point and gaging station except during periods of heavy runoff.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)		Hardness as CaCO ₃	Sodium carbonate ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Calcium magnesium	Non-carbonate	
Oct. 13, 1960.....	506	--	--	--	--	5.3	--	112	0	--	7.4	--	--	0.0	--	--	99	7	0.2
Nov. 10.....	472	--	--	--	--	5.3	--	115	0	--	9.0	--	--	1.1	--	--	104	10	2
Dec. 8.....	267	--	--	--	--	3.6	--	78	0	--	3.0	--	--	0	--	--	71	7	2
Jan. 12, 1961.....	2,500	--	--	--	--	3.3	--	81	0	5.0	3.0	--	--	1.1	--	--	67	1	2
Feb. 9.....	10,500	--	--	--	--	3.0	--	76	0	--	2.5	--	--	0	--	--	65	3	2
Mar. 9.....	5,880	--	--	--	--	1.6	--	85	0	--	--	--	--	0	--	--	73	3	1
Apr. 6.....	8,540	--	--	--	--	1.0	--	70	0	--	3.0	--	--	1	--	--	64	7	0
May 8.....	4,060	16	0.00	16	5.6	2.3	0.4	74	0	5.0	2.0	0.1	0.2	0	84	0.11	63	2	1
June 7.....	3,310	--	--	--	--	3.9	--	64	0	--	3.8	--	--	0	--	--	59	7	1
July 6.....	1,210	--	--	--	--	3.1	--	82	0	--	4.4	--	--	0	--	--	74	7	2
Aug. 3.....	630	--	--	--	--	5.1	--	107	0	--	--	--	--	0	--	--	84	0	2
Sept. 6.....	477	15	--	23	8.3	4.8	0.8	100	2	7.6	6.1	0.0	0.2	0	117	1.16	92	7	2

KLAMATH RIVER BASIN--Continued

11-5300. TRINITY RIVER NEAR HOOPA, CALIF.--Continued

Temperature (°F) of water, water year October 1960 to September 1961

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

KLAMATH RIVER BASIN--Continued

11-5300. TRINITY RIVER NEAR HOOPA, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961
(Where no concentrations are reported loads are estimated)

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..	352	2	2	472	6	8	7980	244	S 8140
2..	352	--	2	468	--	3	12000	315	S 11200
3..	361	--	2	464	--	3	6880	88	1630
4..	361	--	2	460	2	2	5000	42	567
5..	358	--	2	456	--	2	4060	.32	351
6..	374	4	4	448	2	2	3500	20	185
7..	500	--	11	444	--	2	3130	18	152
8..	580	5	8	452	4	5	2870	19	147
9..	659	--	7	456	--	2	2680	20	145
10..	614	--	5	472	1	1	2570	20	139
11..	564	--	3	580	--	9	2520	17	116
12..	528	--	3	618	4	7	2360	13	83
13..	508	--	3	725	--	14	2280	14	86
14..	496	2	3	952	13	33	2250	14	85
15..	488	--	3	1000	--	27	2240	13	79
16..	480	--	3	915	6	15	2730	25	S 211
17..	472	--	3	1010	17	S 51	15900	532	S 26200
18..	464	2	3	2280	44	K 280	17300	312	S 15300
19..	460	--	2	1880	22	S 115	12500	136	4660
20..	456	--	2	1330	--	40	8900	74	1780
21..	452	2	2	1200	--	23	6880	50	925
22..	448	--	2	1170	4	13	5820	40	629
23..	444	--	2	1810	100	S 804	5140	40	555
24..	444	--	2	6320	282	S 4700	4660	30	377
25..	448	--	2	10000	499	S 15400	4310	25	291
26..	468	--	3	6750	214	S 4490	4030	22	239
27..	472	2	3	3610	79	770	3790	19	194
28..	472	--	3	2670	--	290	3600	19	185
29..	472	--	3	2250	--	140	3390	18	165
30..	476	2	3	2250	24	146	3250	18	158
31..	472	--	3	--	--	--	3140	17	144
Total	14495	--	101	53912	--	27397	167660	--	75126
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..	3030	13	106	15300	--	--	4350	19	223
2..	2890	10	78	13400	--	--	4460	15	181
3..	2800	12	91	14200	--	--	4240	22	252
4..	2720	13	95	10200	--	--	4030	26	280
5..	2640	12	86	7630	--	--	4200	34	386
6..	2620	13	92	6550	--	--	5240	49	693
7..	2600	11	77	5740	--	--	5160	51	711
8..	2610	9	63	5280	--	--	5060	46	630
9..	2580	11	77	10500	--	--	5880	60	953
10..	2670	10	72	17800	--	--	6330	52	889
11..	2540	9	62	31800	--	--	7500	67	1360
12..	2500	8	54	24700	--	--	8300	75	1680
13..	2300	9	56	18300	--	--	9500	49	1260
14..	2260	7	43	16600	--	--	11300	56	1820
15..	1720	6	28	16300	--	--	17300	129	6030
16..	1610	11	48	15000	--	--	15500	65	2720
17..	1570	16	68	12600	--	--	16100	94	4090
18..	1440	6	23	10600	--	--	15200	58	2380
19..	1370	4	15	8960	80	1940	13900	208	7810
20..	1320	2	7	7730	63	1310	15200	156	6400
21..	1300	2	8	7080	--	920	13300	105	3770
22..	1270	2	8	6630	--	700	12900	106	3690
23..	1340	3	11	6160	35	582	14500	104	4070
24..	1440	4	16	5740	29	449	13700	85	3140
25..	1380	4	19	5480	--	370	13100	75	2650
26..	1370	8	30	5060	--	340	12500	65	2190
27..	1570	--	--	4740	--	290	12100	58	1890
28..	1720	--	--	4510	--	240	11000	51	1510
29..	1950	--	--	--	--	--	9980	41	1100
30..	5510	--	--	--	--	--	9380	38	962
31..	18200	--	--	--	--	--	9200	41	1020
Total	82840	--	32000	314590	--	140000	310410	--	66740

S Computed by subdividing day.

B Computed from estimated-concentration graph.

K Computed from estimated-concentration graph and subdividing day.

KLAMATH RIVER BASIN--Continued

11-5300, TRINITY RIVER NEAR HOOPA, CALIF.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
(Where no concentrations are reported loads are estimated)

Day	Mean discharge (cfs)	APRIL		MAY			JUNE		
		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..	9050	39	953	4780	20	258	3110	4	34
2..	9650	48	1250	4740	23	294	3480	6	56
3..	10700	59	1700	4350	20	235	3930	8	85
4..	10900	52	1530	4100	16	177	4000	7	76
5..	9800	39	1030	3960	26	278	3790	4	41
6..	8540	32	738	4330	35	409	3530	4	38
7..	7650	23	475	4350	29	341	3310	6	54
8..	6950	21	394	4060	13	143	3080	5	42
9..	6500	21	369	4110	19	211	2840	4	31
10..	6140	18	298	4800	16	207	2670	4	29
11..	5880	22	349	5280	17	242	2640	4	29
12..	6040	22	359	5160	17	237	2570	4	28
13..	5680	20	307	4900	20	265	2460	4	27
14..	5240	19	269	4640	15	188	2510	4	27
15..	4920	17	226	4470	15	181	2690	4	29
16..	4980	22	296	4400	8	95	2660	4	29
17..	5200	17	239	4380	16	189	2550	3	21
18..	5040	21	286	4440	57	683	2360	3	19
19..	4620	24	299	4560	93	1150	2200	3	18
20..	4370	11	130	4550	135	1660	2090	3	17
21..	4460	14	169	4280	125	1440	2010	2	11
22..	4740	28	358	4030	138	1500	2010	2	11
23..	4560	19	234	3930	70	743	1950	3	16
24..	4350	18	211	3610	10	97	1850	3	15
25..	4240	19	218	3440	8	74	1850	3	15
26..	4290	21	243	3520	7	67	1770	3	14
27..	4370	20	236	3360	5	45	1640	3	13
28..	4400	23	273	3110	8	67	1500	3	12
29..	4600	23	286	3070	7	58	1420	3	12
30..	4840	20	261	3240	3	26	1380	3	11
31..	--	--	--	3220	2	17	--	--	--
Total	182700	--	13986	129170	--	11577	75850	--	860
Day	Mean discharge (cfs)	JULY		AUGUST			SEPTEMBER		
		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..	1330	2	7	646	6	10	512	4	6
2..	1310	3	11	638	--	9	501	--	5
3..	1310	4	14	630	5	9	505	4	5
4..	1260	5	17	618	--	8	498	--	5
5..	1230	5	17	618	6	10	491	6	8
6..	1210	4	13	622	--	7	477	--	8
7..	1170	3	9	662	4	7	473	6	8
8..	1130	3	9	685	--	7	470	--	8
9..	1120	4	12	685	--	9	470	6	8
10..	1110	8	24	680	5	9	459	--	7
11..	1090	6	18	630	--	9	459	6	7
12..	1080	8	23	614	--	8	456	--	6
13..	1070	11	32	618	--	8	452	5	6
14..	1110	12	36	626	--	7	452	--	6
15..	1100	13	39	606	--	7	456	6	7
16..	1030	--	31	586	--	6	508	--	8
17..	994	--	16	570	--	6	543	6	9
18..	950	--	8	554	--	6	594	--	10
19..	920	3	7	547	--	4	554	6	9
20..	905	4	10	540	--	4	533	--	7
21..	895	--	10	536	--	4	515	3	4
22..	880	4	10	529	--	3	505	--	3
23..	835	--	9	512	--	3	501	2	3
24..	795	--	9	505	2	3	494	--	4
25..	770	--	10	501	--	3	491	4	5
26..	740	7	14	512	--	3	484	--	3
27..	720	--	12	550	--	4	480	2	3
28..	695	6	11	562	--	5	473	--	3
29..	680	--	11	543	--	4	466	2	3
30..	666	6	11	543	--	4	466	--	3
31..	654	--	11	526	--	6	--	--	--
Total	30759	--	464	18194	--	192	14738	--	177

Total discharge for year (cfs-days)..... 1,395,318
 Total load for year (tons)..... 368,620

B Computed from estimated-concentration graph.

ELAMATH RIVER BASIN--Continued

11-5300. TRINITY RIVER NEAR HOOPA, CALIF.--Continued

Particle size analyses of suspended sediment, water Year October 1960 to September 1961
 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
 P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sam- pling point	Water tem- per- ature (° F)	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis	
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000		2.000
Nov. 25, 1960.....	1730		47	13,300	794								48	61	77	99	100	V
Dec. 1.....	1440		47	7,050	188								76	82	93	99	100	V
Dec. 17.....	1630		47	22,000	725								68	81	96	100	100	V
Mar. 23, 1961.....	1550		48	14,400	84								61	68	79	95	100	V

KLAMATH RIVER BASIN--Continued
11-5305. KLAMATH RIVER NEAR KLAMATH, CALIF.

LOCATION --At gaging station, 2.8 miles upstream from Turwar Creek, and 3.3 miles east of Klamath, Del Norte County.
DRAINAGE AREA --12,100 square miles, approximately.
RECORDS AVAILABLE --Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 12, 1960.....	3,260	--	--	--	--	8.5	--	97	--	--	5.0	--	--	0.1	--	--	--	76	0	0.4	191
Nov. 9.....	3,110	--	--	--	--	10	--	101	--	--	6.0	--	--	.1	--	--	--	82	0	.5	205
Dec. 7.....	12,100	--	--	--	--	8.9	--	87	--	--	3.8	--	--	.1	--	--	--	72	1	.5	177
Jan. 11, 1961.....	8,170	--	--	--	--	8.9	--	88	5.0	3.2	3.2	--	--	.1	--	--	--	64	0	.3	148
Feb. 8.....	19,100	--	--	--	--	5.2	--	79	--	--	3.0	--	--	.0	--	--	--	63	0	.3	142
Mar. 8.....	21,700	--	--	--	--	--	--	72	--	--	--	--	--	.0	--	--	--	53	0	.5	139
Apr. 5.....	33,500	--	--	--	--	1.4	--	60	--	--	2.6	--	--	.0	--	--	--	52	3	.1	113
May 9.....	19,200	14	0.02	12	6.3	3.7	0.7	60	6.4	7.3	0.1	0.0	.1	.0	81	0.11	56	7	.2	120	
June 7.....	16,300	--	--	--	--	1.7	--	57	--	--	3.2	--	--	.0	--	--	--	48	1	.1	106
July 5.....	4,880	--	--	--	--	6.6	--	80	--	--	4.0	--	--	.1	--	--	--	69	3	.3	159
Aug. 3.....	3,350	--	--	--	--	7.4	--	90	--	--	--	--	--	.0	--	--	--	68	0	.4	164
Sept. 6.....	2,650	20	--	17	7.5	8.4	1.4	94	7.6	6.0	.0	.0	.1	.1	114	.16	74	0	.4	178	

SMITH RIVER BASIN

11-5325. SMITH RIVER NEAR CRESCENT CITY, CALIF.

LOCATION.--At gaging station, 0.5 mile downstream from South Fork, and 8 miles east of Crescent City, Del Norte County.

DRAINAGE AREA.--613 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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 (calculated)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 12, 1960.....	273	--	--	--	--	2.2	--	75	--	--	2.5	--	--	0.0	--	--	--	65	3	0.1	136
Nov. 9.....	248	--	--	--	--	2.5	--	80	--	--	2.8	--	--	0	--	--	--	67	1	.1	139
Dec. 7.....	2,710	--	--	--	--	2.1	--	54	--	--	4.2	--	--	.0	--	--	--	46	2	.1	95
Jan. 11, 1961.....	1,810	--	--	--	--	1.7	--	80	--	1.0	1.8	--	--	.1	--	--	--	49	0	.1	100
Feb. 8.....	4,610	--	--	--	--	2.0	--	51	--	--	3.2	--	--	.0	--	--	--	42	0	.1	88
Mar. 8.....	7,120	--	--	--	--	3.7	--	48	--	--	1.4	--	--	.0	--	--	--	34	0	.3	82
Apr. 5.....	4,880	--	--	--	--	.6	--	42	--	--	2.9	--	--	.0	--	--	--	38	4	.0	76
May 9.....	9,820	13	0.02	4.9	6.2	1.8	0.0	48	--	.0	3.6	0.0	0.2	.0	49	0.07	--	37	1	.1	86
June 7.....	1,890	--	--	--	--	1.8	--	62	--	--	3.6	--	--	.0	--	--	--	43	4	.0	88
July 5.....	3,920	--	--	--	--	2.7	--	74	--	--	3.9	--	--	.0	--	--	--	57	6	.1	114
Aug. 2.....	392	--	--	--	--	2.7	--	74	--	--	3.9	--	--	.0	--	--	--	60	0	.2	125
Sept. 5.....	290	13	.00	7.2	12	2.6	.2	76	--	4.0	4.8	.0	.0	.0	81	.11	--	68	6	.1	133

MISCELLANEOUS ANALYSES OF STREAMS IN PACIFIC SLOPE BASINS IN CALIFORNIA--Continued

Periodic determinations of suspended-sediment discharge and particle-size, water year October 1960 to September 1961--Continued
 (Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (°F)	Sam- pling point	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment									Method of analysis		
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500		1.000	2.000
SACRAMENTO RIVER BASIN--Continued																		
11-3935.-MIDDLE FORK FEATHER RIVER BELOW SLOAT--Continued																		
Apr. 18, 1961.....	1145	49		359	5	4.8												
May 3.....	0910	--		372	4	4.0												
June 2.....	0930	--		435	31	36												
June 10.....	1520	66		273	5	3.7												
July 12.....	1600	--		50	2	.3												
Aug. 2.....	1040	--		39	4	.4												
Aug. 30.....	0925	--		45	457	56												
11-4517.2. BEAR CREEK NEAR RUMSEY																		
Nov. 18, 1960 ...	1015	53		2.4	20	0.1												
Dec. 2.....	1620	50		92	15	26												
Jan. 29, 1961....	1000	51		24	15	1.0												
Jan. 31.....	1130	53		1,030	2,530	7,040	49											
Feb. 16.....	1535	53		39	5	.5												
Mar. 26.....	1505	55		17	4	.2												
Apr. 2.....	1600	56		16	6	.3												
May 2.....	1000	62		7.3	21	.1												
June 5.....	1445	81		2.0	21	.1												
July 17.....	1405	90		.4	33	T												
Aug. 22.....	1030	73		.7	32	.1												
Sept. 24.....	1010	63		1.3	18	.1												
11-4530. YOLO BYPASS NEAR WOODLAND																		
Dec. 3, 1960.....	1230	51		1,020	764	2,100												
Feb. 10, 1961....	1025	53		1,230	126	418												

MISCELLANEOUS ANALYSES OF STREAMS IN PACIFIC SLOPE BASINS IN CALIFORNIA--Continued

Periodic determinations of suspended-sediment discharge and particle-size

water year October 1960 to September 1961--Continued

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;

P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (°F)	Sam- pling point	Discharge (cfs)	Sediment concentra- tion (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis
							Percent finer than size indicated, in millimeters										
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	
EEL RIVER BASIN																	
11-4731. WILLIAMS CREEK NEAR COVELO																	
May 4, 1961.....	0935	43		71	10	1.9											
June 16.....	1055	70		14	4	T											
July 25.....	--	60		1.4	4	T											
Aug. 29.....	0950	--		.6	2	T											
11-4736. SHORT CREEK NEAR COVELO																	
Feb. 17, 1961.....	1315	49		65	10	1.8											
Mar. 26.....	1055	46		107	31	9.0											
Apr. 23.....	1145	52		41	15	1.7											
May 6.....	1035	66		11	2	.1											
11-4744. HULLS CREEK NEAR COVELO																	
May 2, 1961.....	1245	55		77	2	0.4											
June 12.....	2030	63		12	3	.1											
T Less than 0.05 ton.																	

T Less than 0.05 ton.

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

WILLAPA RIVER BASIN

12-115. WILLAPA RIVER AT LEBAM, WASH.

LOCATION.--At bridge, on State Highway 12, 0.1 mile upstream from gaging station, 0.4 mile west of Lebam, Pacific County, and 1.1 miles upstream from Walker Creek.

DRAINAGE AREA.--41.4 square miles.

RECORDS AVAILABLE.--Chemical analyses: July 1959 to July 1960.

Water temperatures: March 1952 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 70°F July 12, 13; minimum, 39°F Dec. 8-10, 29, Jan. 3, 27.

EXTREMES, 1962-61.--Water temperatures: Maximum, 72°F July 19, 20, 1956; minimum, freezing point Jan. 28-30, 1957.

Chemical analyses, in parts per million, October 1960 to July 1961

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)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Calcium, Magnesium	Non-carbonate			
Oct. 14, 1960.....	15	13		5.0	1.5	5.5	0.6	26		3.8	4.5	0.0	0.5	0.01	54		19	0	0	66	6.9
Jan. 5, 1961.....	452	12		3.5	.9	4.4	.5	15		3.2	3.5	.0	1.3	.05	48		12	0	0	49	6.9
Apr. 7, 1961.....	115	15		4.5	.8	4.6	.5	19		3.4	3.8	.0	1.0	.02	51		14	0	0	52	6.9
July 14, 1961.....	9.1	14		5.0	1.3	5.0	.6	27		2.8	3.8	.1	.8	.06	50		18	0	0	61	6.9

WILLAPA RIVER BASIN--Continued
 12-115. WILLAPA RIVER AT LEBAM, WASH.--Continued
 Temperature (°F) of water, water year October 1960 to September 1961

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

CHEHALIS RIVER BASIN
12-250. NEWAUKUM RIVER NEAR CHEHALIS, WASH.

LOCATION.--At gaging station, at County bridge, 2.5 miles southeast of Chehalis, Lewis County, and 3.5 miles upstream from mouth.
DRAINAGE AREA.--155 square miles.
RECORDS AVAILABLE.--Chemical analyses: July 1960 to September 1961.

Chemical analyses, in parts per million, July 1960 to September 1961

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)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Specific conductance (microhmhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate	
July 18, 1960.....	55	17		7.5	2.1	5.2	0.4	37	1.6	6.0	0.0	0.1	0.04	58			27	0	80
Aug. 9.....	34	16		9.5	1.5	5.7	.8	38	1.4	8.0	.1	.1	.03	65			30	0	89
Sept. 13.....	59	16		8.5	1.9	5.4	.5	38	1.0	7.5	.0	.4	.08	64			29	0	88
Oct. 17.....	71	17		9.0	1.7	5.5	.4	37	2.0	8.5	.1	.3	.05	63			30	0	89
Nov. 8.....	204	15		7.0	1.0	3.8	.3	29	2.6	4.8	.0	.6	.05	50			22	0	68
Dec. 5.....	400	14		5.5	1.0	3.0	.5	24	2.2	3.2	.2	.9	.03	46			18	0	54
Jan. 5, 1961.....	1,230	14		4.0	1.5	3.1	.3	22	1.8	3.2	.1	.7	.06	46			16	0	50
Feb. 7.....	1,780	12		4.0	.6	2.6	.5	17	1.8	2.0	.0	1.0	.15	42			12	0	39
Mar. 7.....	1,220	13		4.0	.8	2.7	.1	19	1.8	2.0	.0	.7	.10	39			14	0	41
Apr. 7.....	502	14		5.0	1.1	3.5	.7	25	1.2	2.8	.1	.3	.04	47			17	0	51
May 9.....	672	14		4.0	1.5	3.2	.2	24	.8	2.2	.0	.5	.05	36			16	0	49
June 13.....	124	17		7.0	1.8	4.2	.3	24	1.8	4.5	.1	.1	.03	58			25	0	72
July 11.....	33	16		9.0	1.9	5.5	.6	38	1.2	6.2	.1	.2	.03	63			29	0	83
Aug. 8.....	33	17		9.0	2.4	5.8	.6	39	2.2	8.5	.1	.1	.04	69			32	0	91
Sept. 12.....	32	16		9.0	2.5	6.2	.7	40	1.6	10	.0	.2	.03	72			33	0	97

CHEHALIS RIVER BASIN--Continued

12-275. CHEHALIS RIVER NEAR GRAND MOUND, WASH.

LOCATION.--Temperature recorder at gaging station at highway bridge at Meadows, 1.5 miles southwest of Grand Mound, Thurston County, and 6 miles downstream from Skookumchuck River.
DRAINAGE AREA.--895 square miles.

RECORDS AVAILABLE.--Water temperatures: March 1952 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 76°F July 13, 14; minimum, 42°F on several days during December and January.

EXTREMES, 1952-61.--Water temperatures: Maximum, 80°F July 23, 23, 1959; minimum, freezing point Jan. 29-31, Feb. 1-4, 1957.

Temperature (°F) of water, water year October 1960 to September 1961

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

CHEHALIS RIVER BASIN--Continued

12-310. CHEHALIS RIVER AT PORTER, WASH.

LOCATION.--At gaging station, at County Highway bridge in Porter, Grays Harbor County, immediately upstream from mouth of Porter Creek.
 DRAINAGE AREA.--1,294 square miles.
 RECORDS AVAILABLE.--Chemical analyses: July 1959 to September 1961.
 Water temperatures: July 1959 to September 1960.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- he- sium (Mg)	Sodium (Na)	Po- tas- sium (K)	Bi- car- bon- ate (HCO ₃)	Car- bon- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Phos- phate (PO ₄)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃	So- dium ad- sorp- tion ratio	Specific con- duct- ance (micro- mhos at 25°C)	pH
															Parts per million	Tons per acre-foot				
Oct. 6, 1960.....	334	18		8.5	2.6	5.9	0.8	42		4.0	6.2	0.0	0.5	0.11	72		32	0	94	7.3
Nov. 4.....	2,340	16		5.5	1.9	4.3	.4	26		3.8	4.0	.1	1.0	.07	60		21	0	65	7.0
Dec. 6.....	3,720	16		6.0	1.8	3.7	.2	26		4.0	3.0	.1	.9	.06	54		22	1	63	6.9
Jan. 6, 1961.....	9,370	13		4.0	1.1	3.3	.2	19		2.2	2.8	.1	1.2	.06	44		14	0	44	6.8
Feb. 2.....	11,200	15		4.0	1.2	3.2	.4	20		3.6	3.0	.1	1.0	.06	46		15	0	49	7.0
Mar. 3.....	16,500	14		4.0	1.1	3.2	.2	18		1.6	2.8	.0	.9	.04	37		14	0	47	6.9
Apr. 4.....	4,980	16		6.0	1.4	4.2	.8	27		3.6	3.0	.1	.9	.05	54		21	0	62	7.2
May 2.....	5,590	14		5.0	1.3	3.8	.4	25		2.0	3.0	.1	.7	.03	52		18	0	56	6.9
June 1.....	1,460	17		6.5	2.4	5.1	.5	34		2.8	3.5	.3	.5	.07	63		26	0	76	7.2
July 18.....	417	20		8.0	3.0	6.3	.4	43		3.2	6.0	.1	.2	.07	68		32	0	93	7.2
Aug. 1.....	339	19		8.0	3.0	6.5	.9	45		2.8	5.5	.0	.3	.06	70		32	0	96	7.6
Sept. 5.....	420	19		9.0	3.1	8.4	1.2	46		3.6	9.5	.1	.5	.14	80		35	0	109	7.2

CHEHALIS RIVER BASIN--Continued
12-350. SATSOP RIVER NEAR SATSOP, WASH.

LOCATION.--At gaging station at bridge on U.S. Highway 410, 0.8 mile west of Satsop, Grays Harbor County, and 2 miles upstream from mouth.
DRAINAGE AREA.--299 square miles.
RECORDS AVAILABLE.--Chemical analyses: July 1960 to September 1961 (discontinued).

Chemical analyses, in parts per million, July 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (ppm)	Iron (Fe) (ppm)	Calcium (Ca) (ppm)	Magnesium (Mg) (ppm)	Sodium (Na) (ppm)	Potassium (K) (ppm)	Bicarbonate (HCO ₃) (ppm)	Carbonate (CO ₃) (ppm)	Sulfate (SO ₄) (ppm)	Chloride (Cl) (ppm)	Fluoride (F) (ppm)	Nitrate (NO ₃) (ppm)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium, sodium	Non-carbonate	
July 19, 1960.....	376	15		6.0	2.3	3.7	0.3	34		2.0	2.2	0.0	0.1	53			24	0	69.7.3
Aug. 2.....	340	16		7.0	1.8	3.6	0.7	34		2.8	2.5	0.1	0.1	53			25	0	68.7.4
Sept. 7.....	394	14		7.0	1.8	4.0	0.4	32		4.6	2.0	0.0	0.3	54			25	0	73.7.5
Oct. 6.....	332	15		6.0	1.9	3.9	0.7	34		4.2	2.5	0.2	0.1	48			26	0	72.7.4
Nov. 4.....	1,400	13		6.0	1.4	3.3	0.5	25		4.2	2.2	0.0	1.1	48			21	0	61.7.2
Dec. 6.....	1,780	14		6.0	1.1	2.7	0.0	26		1.6	2.5	0.1	0.5	44			20	0	55.7.1
Jan. 6, 1961.....	6,310	12		3.5	0.9	2.6	0.0	17		2.6	1.8	0.0	1.2	38			14	0	43.7.0
Feb. 2.....	9,860	11		3.5	1.1	2.4	0.2	16		2.2	2.0	0.1	0.8	33			13	0	41.6.9
Mar. 3.....	5,140	13		5.0	0.6	2.6	0.1	20		3.0	1.8	0.0	0.4	35			15	0	44.7.0
Apr. 5.....	1,880	13		5.0	1.3	2.8	0.2	25		2.8	2.0	0.1	0.2	42			18	0	51.7.2
May 2.....	2,320	8.0		5.0	1.0	3.0	0.3	24		2.8	1.8	0.1	0.3	41			17	0	50.7.0
June 1.....	703	15		6.0	1.7	3.5	0.6	30		4.4	2.0	0.0	0.2	47			22	0	56.7.4
July 16.....	360	16		6.5	2.0	3.8	0.3	34		3.0	2.0	0.0	0.2	53			24	0	59.7.3
Aug. 1.....	279	13		6.5	2.6	3.6	0.5	33		5.6	2.5	0.1	0.2	52			25	0	67.7.3
Sept. 5.....	360	15		7.0	1.9	4.1	0.7	32		5.6	2.5	0.1	0.3	54			25	0	71.7.2

HUMTULIPS RIVER BASIN

12-390. HUMTULIPS RIVER NEAR HUMTULIPS, WASH.

LOCATION.--At bridge on U.S. Highway 101, 0.2 mile south of Humtulsips, Grays Harbor County, 1.1 miles upstream from Stevens Creek and 1.4 miles downstream from gaging station.

DRAINAGE AREA.--130 square miles upstream from gaging station.

RECORDS AVAILABLE.--July 1959 to September 1961 (discontinued).

REMARKS.--Minor inflow between sampling point and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		So-dium ad-sorp-tion ratio	Specific con-duct-ance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Cal-cium, Mag-nesi-um	Non-car-bon-ate			
Oct. 6, 1960.....	211	11		8.0	1.3	3.2	0.1	32		3.2	2.2	0.3	0.0	0.00	48		25	0			67	7.3
Nov. 4.....	1,200	10		6.0	1.5	2.7	0.0	26		3.0	3.0	0.0	0.8	0.03	46		21	0			56	7.1
Dec. 6.....	1,050	10		6.0	1.3	2.6	0.0	25		2.4	1.8	1.5	0.1	0.01	39		20	0			54	7.2
Jan. 6, 1961.....	3,530	8.4		4.0	1.2	2.0	0.0	19		1.8	2.2	0.0	0.3	0.02	34		15	0			43	7.1
Feb. 2.....	5,330	7.9		4.5	0.8	2.1	1.1	17		2.6	2.2	0.0	0.3	0.02	36		14	0			41	7.0
Mar. 3.....	2,570	10		5.0	0.9	2.3	0.0	22		2.8	2.0	0.0	0.2	0.03	31		16	0			43	7.3
Apr. 4.....	1,270	9.7		5.0	1.5	2.6	0.5	24		2.2	2.0	1.1	0.2	0.01	42		19	0			49	7.2
May 2.....	1,770	7.9		5.0	1.8	2.9	1.3	22		1.8	1.8	1.1	0.3	0.02	35		16	0			44	7.3
June 1.....	432	11		6.0	1.7	2.9	0.3	26		1.8	2.0	1.0	0.0	0.01	44		22	0			59	7.3
July 18.....	180	12		7.5	1.7	3.2	0.0	33		3.6	2.8	0.0	0.0	0.00	47		26	0			68	7.3
Aug. 1.....	130	12		7.5	1.8	3.5	0.3	35		3.2	2.0	0.0	0.2	0.01	52		26	0			69	7.5
Sept. 5.....	255	11		7.5	1.5	3.0	0.3	31		4.0	2.5	1.1	0.2	0.00	52		24	0			63	7.2

QUEETS RIVER BASIN

12-406. QUEETS RIVER AT QUEETS, WASH.

LOCATION.--At bridge on U.S. Highway 101 at Queets, Jefferson County, 1.4 miles upstream from mouth, and 1.9 miles downstream from Moses Creek.
 RECORDS AVAILABLE.--Chemical analyses: July 1960 to September 1961 (discontinued).
 REMARKS.--No discharge records available.

Chemical analyses, in parts per million, July 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbocationate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	phosphate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
July 19, 1960.....	4.8			9.5	1.2	2.3	0.3	30		6.8	1.2	0.0	0.0	0.00	46			26	4		73	7.4
Sept. 7.....	5.0			9.5	1.0	2.8	.2	28		8.4	2.5	.1	.3	.01	46			28	4		73	7.2
Oct. 6.....	4.2			10	1.3	3.0	.7	32		9.2	2.5	.1	.0	.02	46			30	4		81	7.5
Nov. 4.....	5.8			8.5	.4	2.4	.2	24		5.0	2.5	.0	.6	.02	40			23	4		64	7.1
Dec. 6.....	5.6			7.5	.6	2.3	.8	24		6.0	3.0	.1	.3	.00	39			22	2		64	7.2
Jan. 6, 1961.....	4.8			5.0	.7	1.9	.0	16		4.2	2.0	.1	.3	.01	34			15	2		43	6.9
Feb. 2.....	4.8			5.0	.7	1.9	.1	16		3.6	2.2	.1	.3	.04	29			15	2		43	6.9
Mar. 3.....	5.6			6.0	.3	2.2	.1	16		4.6	2.2	.0	.0	.04	32			16	1		46	7.0
Apr. 5.....	5.3			7.0	.7	2.3	.0	22		6.0	2.0	.1	.1	.01	38			20	2		56	7.1
May 2.....	4.3			6.0	.2	2.0	.4	17		4.4	1.8	.1	.3	.03	38			16	2		45	6.8
June 1.....	5.2			9.5	.6	2.1	.4	28		7.4	1.5	.1	1.4	.00	41			26	3		67	7.3
July 18.....	5.3			10	.9	2.1	.0	29		8.0	1.5	.1	.0	.00	44			29	5		71	7.4
Aug. 1.....	4.6			10	1.3	2.3	.3	30		9.6	1.8	.1	.1	.01	48			30	6		74	7.2
Sept. 5.....	5.5			10	.9	3.0	.5	28		10	2.0	.1	.2	.01	49			29	6		75	7.2

QUILLAYUTE RIVER BASIN
12-415. SOLEDUCK RIVER NEAR FAIRHOLM, WASH.

LOCATION.--At bridge on U.S. Highway 101, 2.7 miles downstream from Camp Creek, 8.4 miles west of Fairholm, Clallam County, 8.5 miles downstream from gaging station, and 9.2 miles upstream from Bear Creek.
DRAINAGE AREA.--83.8 square miles upstream from gaging station.
RECORDS AVAILABLE.--Chemical analyses: July 1960 to September 1961 (discontinued).
REMARKS.--Appreciable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, July 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbocationate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Ni-Phosphate (Ni ₃ (PO ₄))	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate	
July 18, 1960.....	286	5.0		11	1.7	1.8	0.2	39		6.4	1.0	0.0	0.0	51			34	2	80
Aug. 2.....	171	5.1		14	1.0	2.2	.6	42		8.0	1.2	.1	.0	55			39	4	89
Sept. 7.....	154	5.2		13	1.5	2.7	.3	42		7.6	1.2	.1	.1	52			38	4	91
Oct. 5.....	83	5.6		15	1.4	2.7	.5	47		9.8	1.5	.2	.0	58			43	4	102
Nov. 4.....	501	5.4		10	1.5	1.9	.0	34		5.8	1.5	.0	.1	47			31	3	73
Dec. 6.....	447	5.9		12	.9	1.9	.0	37		5.8	1.5	.1	.1	51			34	3	77
Jan. 5, 1961.....	2,170	5.0		8.0	.7	1.6	.0	26		3.8	1.2	.1	.3	37			23	2	56
Feb. 2.....	2,700	4.7		7.5	1.1	1.4	.1	23		2.8	1.2	.1	.2	31			19	0	47
Mar. 2.....	1,250	5.7		8.0	1.0	1.9	.0	28		4.0	1.2	.1	.1	39			24	1	59
Apr. 4.....	1,855	5.0		9.0	1.2	2.2	.7	31		5.2	1.0	.1	.1	44			28	2	64
May 1.....	802	4.9		9.5	1.0	1.8	.2	32		5.6	1.2	.1	.0	40			28	2	66
June 1.....	482	5.1		10	1.2	1.6	.3	34		6.2	1.0	.1	.0	42			30	2	70
July 1.....	222	5.4		12	1.2	2.0	.2	39		6.8	1.0	.1	.1	51			35	3	79
Aug. 1.....	140	5.1		14	1.4	2.3	.2	43		8.4	1.0	.1	.0	58			41	6	91
Sept. 5.....	140	5.1		13	1.5	2.6	.5	42		8.4	1.2	.1	.1	54			39	4	90

DUCKABUSH RIVER BASIN

12-540. DUCKABUSH RIVER BELOW BRINNON, WASH.

LOCATION.--At bridge on U.S. Highway 101, 0.2 mile upstream from gaging station, 4.2 miles southwest of Brinnon, Jefferson County, and 4.3 miles downstream from gaging station.

DRAINAGE AREA.--66.5 miles upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: July 1960 to September 1961 (discontinued).

REMARKS.--Appreciable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, July 1960 to September 1961

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)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Calcium magnesium	Non-carbonate			
July 18, 1960.....	345	5.1		9.5	1.2	1.3	0.1	32		4.4	1.0	0.0	0.0	0.01	41		28	2		60	7.9
Aug. 2.....	189	6.3		11	1.6	3.6	.4	38		5.0	5.0	.1	.0	.00	54		34	3		89	7.7
Sept. 7 a.....	94	--		47	113	--	--	50		--	1,700	--	--	--	--	--	--	--	--	5,550	7.5
Oct. 5 a.....	64	--		25	42	--	--	45		--	545	--	--	--	--	--	197	234		1,990	7.3
Nov. 4 a.....	186	6.3		12	4.2	29	1.0	37		11	51	.1	.4	.01	133		48	17		253	7.4
Dec. 6 a.....	275	--		22	26	--	--	40		--	380	--	--	--	--	--	160	127		1,430	7.5
Jan. 5, 1961 a.....	498	--		--	--	--	--	35		--	104	--	--	--	--	--	63	34		447	7.3
Feb. 2.....	1,140	6.9		7.0	1.1	.9	.3	27		3.2	.5	.1	.3	.01	34		22	0		53	7.6
Mar. 2.....	578	7.1		8.5	1.0	1.4	.0	33		3.4	.5	.0	.3	.02	38		28	0		63	7.8
Apr. 4.....	596	6.2		8.0	1.3	1.4	.5	33		3.6	.5	.1	.1	.01	45		28	1		63	7.4
May 1.....	995	5.4		8.0	.8	1.1	.0	28		2.8	.2	.1	.1	.00	37		23	0		54	7.4
June 1.....	965	4.6		8.0	.7	1.0	.2	26		2.8	.2	.1	.1	.01	36		23	2		53	7.3
July 17.....	400	5.7		9.5	.8	1.3	.0	31		4.4	1.0	.1	.1	.00	38		27	2		62	7.5
Aug. 1.....	225	6.2		11	1.1	1.8	.1	37		4.2	1.2	.0	.2	.07	47		32	2		73	7.8
Sept. 5.....	123	7.0		12	1.1	4.2	.3	39		6.2	3.5	.0	.1	.01	55		34	2		87	7.4

a Salt water intrusion.

SKOMISH RIVER BASIN--Continued

12-615. SKOMISH RIVER NEAR POTLATCH, WASH.

LOCATION.--At U.S. Highway 101 bridge, 0.5 mile downstream from gaging station, 4.8 miles southwest of Potlatch, Mason, County, and 5 miles upstream from mouth. DRAINAGE AREA (revised).--227 square miles upstream from gaging station.

RECORDS AVAILABLE.--August 1960 to September 1961 (discontinued).

ANALYSES.--Chemical analyses: May 1955 to September 1961.

TEMPERATURES.--May 1955 to September 1961: 68°F July 13; minimum, 41°F Dec. 10, 11, Mar. 5.

WATER TEMPERATURES.--Maximum, 68°F July 13, 1961; minimum, 40°F Oct. 10, 11, Mar. 5.

EXTREMES, 1955-61.--Water temperatures: Maximum, 68°F July 13, 1961; minimum, 40°F Oct. 10, 11, Mar. 5.

REMARKS.--No inflow between sampling point and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, August 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium-Magnesium	Non-bicarbonate		
Aug. 11, 1960.....	230	14			9.0	2.4	2.3	0.3	42	1.2	2.5	0.0	0.1	0.04	50			32	0		74
Sept. 7.....	250	13			9.5	1.8	2.4	0.3	41	1.2	2.0	1	0.4	0.03	50			31	0		77
Oct. 5.....	190	14			9.5	2.1	2.3	0.4	43	2.4	1.5	1	0	0.06	49			32	0		77
Nov. 4.....	805	12			8.5	1.6	2.0	0	36	2.2	1.8	0	0	0.02	49			28	0		66
Dec. 6.....	1,130	11			9.5	1.4	1.9	0	34	1.6	1.2	1	0	0.02	43			26	0		55
Jan. 5, 1961.....	2,190	8.9			9.0	1.4	1.9	0	31	1.8	1.5	1	0	0.3	41			23	0		55
Feb. 2.....	3,200	9.4			6.0	0.9	1.4	0	24	2	1.5	1	0	1.03	31			18	0		44
Mar. 2.....	3,170	11			6.0	1.4	1.7	0	28	4	1.0	0	0	1	00	40		21	0		51
Apr. 4.....	1,510	11			7.0	1.6	1.9	0.5	31	8	1.2	1	0	0.02	44			24	0		56
May 1.....	1,440	9.8			7.0	1.4	1.7	0	31	4	1.2	0	0	0.02	36			23	0		55
June 1.....	643	12			8.0	1.9	2.0	0	37	1.0	1.0	0	0	0	45			28	0		65
July 17.....	287	14			8.5	2.4	2.2	0	40	1.6	1.5	0	0	0.04	52			31	0		72
Aug. 1.....	238	13			9.0	2.5	2.1	0	40	1.6	1.5	1	0	1	03	51		33	0		72
Sept. 5.....	260	14			9.0	2.1	2.7	0	41	1.6	1.8	0	0	1	04	39		31	0		72

NISQUALLY RIVER BASIN

12-825. NISQUALLY RIVER NEAR NATIONAL, WASH.

LOCATION.--Temperature recorder at gaging station, 100 feet downstream from railroad bridge, 1 mile west of National, Pierce County, 2.5 miles west of Ashford, and 3 miles upstream from Mineral Creek.

DRAINAGE AREA: --133 square miles.

RECORDS AVAILABLE. --Water temperatures:

EXTREMES, 1960-61.--Water temperatures:

Maximum, 65°F July 13, 1961: minimum freezing

maximum, July 13, 1901, 1901, minimum, freezing point on many days during winter months.

Temperature ($^{\circ}\text{F}$) of water, water year October 1960 to September 1961

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

PUYALLUP RIVER BASIN
12-1015. PUYALLUP RIVER AT PUYALLUP, WASH.

LOCATION.--At bridge, 0.8 mile downstream from gaging station, 1.8 miles northwest of Puyallup, Pierce County, and 6.2 miles upstream from mouth.
DRAINAGE AREA.--948 square miles upstream from gaging station.
RECORDS AVAILABLE.--Chemical analyses: July 1959 to September 1961 (discontinued).
Water temperatures: July 1959 to September 1960.
REMARKS.--No appreciable inflow between sampling point and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate	
Oct. 4, 1960.....	1,090	16		9.0	2.6	4.4	0.8	38		10	2.0	0.1	0.2	0.05	68		33	2	92
Nov. 4.....	3,100	14		7.0	1.5	3.1	1.0	30		6.0	1.5	0	1.0	0.06	53		24	0	67
Nov. 30.....	4,390	15		7.0	1.1	2.6	0.6	26		6.0	1.8	0	0.8	0.04	55		22	0	63
Jan. 3, 1961.....	2,170	18		8.0	2.7	4.0	0.7	39		4.6	2.0	0	0.7	0.13	65		31	0	85
Feb. 2.....	5,100	14		6.0	1.3	2.8	0.6	24		4.6	1.0	0	0.7	0.05	47		20	1	56
Mar. 6.....	4,320	17		7.0	2.3	3.3	0.5	32		5.4	1.5	0	0.7	0.06	57		27	1	70
Apr. 19.....	3,460	15		7.0	1.6	3.7	0.6	32		4.4	1.5	0	0.3	0.04	56		24	0	68
May 3.....	5,640	14		6.0	1.4	2.9	0.7	26		4.6	1.0	0	0.6	0.04	49		21	0	58
June 5.....	6,490	12		5.0	0.9	2.2	0.5	20		4.0	1.0	0	0.2	0.06	39		16	0	46
July 5.....	3,170	13		6.0	1.3	2.9	0.7	25		5.6	1.0	0	0.3	0.12	47		20	0	56
Aug. 3.....	2,520	11		5.5	1.4	2.9	0.7	20		7.8	1.5	0	0.1	0.06	47		20	3	54
Sept. 6.....	2,160	13		7.0	1.9	3.5	1.0	27		9.4	1.0	0	0.3	0.03	55		26	4	70

DUWAMISH RIVER BASIN

12-1130. GREEN RIVER NEAR AUBURN, WASH.

LOCATION.--At bridge on State Highway 5B, 0.1 mile upstream from Big Soos Creek, 1.8 miles east of Auburn, King County, and 2.1 miles upstream from gaging station.

DRAINAGE AREA (revised).--399 square miles, excluding 3.67 square miles in the vicinity of Youngs Lake, upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: July 1959 to September 1961.

Water temperatures: March 1952 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 73°F July 12-14; minimum, 39°F Dec. 9, 10, 15-17.

EXTREMES, 1952-61.--Water temperatures: Maximum, 75°F July 28, 1968; minimum, 33°F Feb. 16, 17, 1956.

REMARKS.--Minor inflow between sampling point and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium				Non-carbonate
Oct. 4, 1960.....	172	13		11	2.7	5.1	0.2	50		4.6	2.8	0.1	0.5	0.06	66			38	0		101	7.3
Nov. 4.....	1,330	13		6.0	1.0	3.0	0.3	25		3.6	1.2	0	0.8	0.04	46			19	0		53	7.1
Nov. 30.....	1,920	14		6.5	1.3	2.9	0.2	28		3.6	1.5	1	1.0	0.04	53			21	0		63	7.7
Jan. 3, 1961.....	1,050	14		6.5	1.7	3.5	0.0	30		3.6	1.2	0	0.7	0.04	48			23	0		65	7.3
Feb. 2.....	3,280	14		5.0	1.7	2.2	0.4	21		2.4	1.0	1	0.4	0.03	40			15	0		43	7.3
Mar. 6.....	2,500	13		5.5	1.6	2.9	0.1	27		2.4	1.2	0	0.9	0.04	41			20	0		56	7.4
Apr. 19.....	1,850	13		5.5	1.1	2.9	0.1	26		2.0	1.5	1	0.4	0.03	42			18	0		52	7.3
May 3.....	2,800	12		5.0	1.0	2.6	0.3	24		2.4	1.8	0	0.4	0.04	45			17	0		47	7.2
June 5.....	1,660	12		5.0	1.0	2.6	0.4	24		2.0	1.0	1	0.1	0.02	40			17	0		48	7.2
July 5.....	470	14		8.5	1.8	4.3	0.4	38		3.6	1.8	1	0.6	0.03	56			28	0		78	7.3
Aug. 3.....	230	14		10	2.7	5.4	0.7	48		5.4	3.0	0	0.4	0.01	71			36	0		97	7.5
Sept. 6.....	230	14		11	1.9	5.2	0.6	46		5.2	3.2	1	0.5	0.06	71			35	0		93	7.0

DUWAMISH RIVER BASIN--Continued
12-1130. GREEN RIVER NEAR AUBURN, WASH.--Continued
Temperature (°F) of water, water year October 1960 to September 1961

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

DUWAMISH RIVER BASIN--Continued

12-1134. DUWAMISH RIVER AT TUKWILA, WASH.

LOCATION--At county bridge at Tukwila, King County, 1.7 miles west of Renton, and 10 miles upstream from mouth.

RECORDS AVAILABLE--Chemical analyses, July 1959 to September 1961.

Water temperatures: July 1959 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 433 ppm Aug. 10-Sept. 7; minimum, 41 ppm Feb. 20-22.

Hardness: Maximum, 156 ppm Sept. 21-26; minimum, 15 ppm Feb. 20-22.

Specific conductance: Maximum daily, 3,270 microhos Aug. 25; minimum daily, 39 microhos Feb. 22.

Water temperatures: Maximum, 75°F July 11; minimum, 39°F Jan. 3.

EXTREMES, 1959-61.--Dissolved solids: Maximum, 464 ppm Sept. 3, 1959; minimum, 38 ppm Oct. 22-26, 1959.

Hardness: Maximum, 156 ppm Sept. 21-26, 1961; minimum, 15 ppm Sept. 27-30, Nov. 21-26, 1959.

Specific conductance: Maximum daily, 3,270 microhos Aug. 25, 1961; minimum daily, 38 microhos Sept. 27, 1959.

Water temperatures: Maximum, 75°F July 11, 1961; minimum, 38°F Nov. 16, 1959, Jan. 19, 1960.

REMARKS.--Records of specific conductance of daily samples available in district office at Portland, Oreg. No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhos at 25°C)
														Parts per million	Tons per acre-foot	Calcium, Magnesium	Non-bicarbonate		
Oct. 1-27, 1960...	16			14	6.7	36	2.2	61	13	56	0.2	1.5	0.23	187		62	12		308
Oct. 28-Nov. 10...	14			6.5	1.9	4.3	.6	31	4.8	2.5	.1	.9	.09	61		24	0		71
Nov. 11-16...	14			7.0	1.3	3.2	.4	26	5.2	2.5	.1	1.5	.09	54		23	2		67
Nov. 17-21...	13			5.5	.9	2.8	.4	20	4.8	1.5	.4	1.4	.08	52		18	1		53
Nov. 22-Dec. 5...	14			7.5	2.0	3.9	.6	30	7.0	2.2	.0	1.8	.14	60		26	2		78
Dec. 6-13...	16			9.0	2.3	4.7	.7	36	7.2	4.0	.0	2.0	.12	67		32	2		82
Dec. 14-27...	15			7.5	2.2	4.2	.6	32	6.4	3.2	.1	1.4	.09	60		28	2		83
Dec. 28-																			
Jan. 5, 1961...	15			10	1.7	6.5	1.1	40	5.4	5.8	.1	1.5	.10	72		32	0		98
Jan. 6-11...	13			6.0	1.1	3.3	.8	24	4.8	2.2	.1	1.3	.08	51		20	0		90
Jan. 12-22...	14			6.5	1.8	4.0	.8	30	4.6	2.5	.2	1.2	.08	59		24	0		70
Jan. 23-31...	16			9.0	2.1	6.4	.8	36	6.8	5.0	.1	1.6	.11	68		31	2		96
Feb. 1-11...	14			7.0	1.3	3.4	.5	28	4.2	2.0	.1	1.1	.06	48		20	0		61
Feb. 12-22...	14			7.0	1.9	4.2	.6	33	4.8	2.8	.1	1.2	.15	55		25	0		72
Feb. 23-26...	13			5.0	1.8	3.0	.5	20	3.2	1.0	.1	1.6	.07	41		16	0		44
Feb. 27-Mar. 6...	13			6.0	1.5	3.5	.5	25	5.2	2.0	.1	.8	.00	48		21	0		64
Feb. 27-Mar. 6...	14			7.0	2.1	4.8	.6	32	5.4	3.5	.1	1.4	.05	54		26	0		78

DUWAMISH RIVER BASIN--Continued

12-1134. DUWAMISH RIVER AT TUKWILA, WASH.--Continued

Chemical analyses, in parts per million, water year October 1960 to September 1961--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)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (microhm-cm at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day					
Mar. 7-14, 1961...	15			8.5	2.0	6.4	0.7	37		6.2	5.2	0.1	1.1	0.03		64		30	0		94	7.1
Mar. 15-22.....	14			6.0	1.9	4.2	.5	29		5.2	2.5	.1	.7	.01		52		22	0		69	7.1
Mar. 23-27.....	14			7.5	2.1	5.4	.9	31		5.6	4.5	.1	.2	.03		59		27	2		84	6.4
Mar. 28-Apr. 2....	15			8.0	2.3	6.5	.7	37		5.2	6.2	.1	1.2	.07		69		30	0		93	7.1
Apr. 3-5.....	13			5.0	1.3	3.4	.4	25		4.0	1.8	.1	1.0	.04		56		18	0		55	7.1
Apr. 6-20.....	15			6.5	2.0	4.7	.6	32		4.4	3.8	.1	.8	.07		58		24	0		74	7.2
Apr. 21-26.....	15			8.0	2.2	6.1	.9	38		4.4	5.8	.1	.8	.07		68		29	0		91	7.2
Apr. 27-29.....	15			8.0	1.8	4.8	.6	36		4.0	5.0	.1	.7	.07		64		28	0		88	7.5
Apr. 30-May 16....	14			7.0	1.8	4.2	.5	32		3.2	2.0	.1	.5	.07		55		25	0		75	7.1
May 17-25.....	13			6.0	1.5	4.2	.5	30		3.2	2.5	.1	.5	.06		47		21	0		64	7.1
May 26-June 8....	13			6.5	1.7	5.2	.5	32		3.6	3.8	.1	.4	.06		50		23	0		73	7.1
June 9-21.....	15			9.0	2.6	8.4	.9	42		3.6	8.5	.1	.8	.10		70		33	0		110	7.1
June 22-July 5....	17			11	3.4	12	1.3	53		6.0	13	.1	1.1	.14		91		42	0		146	7.0
July 6-10.....	17			11	3.2	10	1.1	52		5.6	10	.1	.9	.17		83		40	0		134	7.2
July 11-24.....	19			13	4.3	17	1.5	62		7.2	20	.1	.6	.19		110		50	0		183	7.2
July 25-29.....	--			--	--	58	--	64		--	96	--	--	--		262		80	28		457	7.2
July 30-Aug. 9....	19			14	4.8	18	1.6	68		8.2	20	.1	1.4	.24		121		54	0		192	7.2
Aug. 10-Sept. 7...	--			--	--	108	--	70		--	182	--	--	--		433		110	53		766	7.1
Sept. 8-14.....	--			--	--	48	--	73		--	76	--	--	--		132		78	20		403	7.4
Sept. 15-20.....	19			16	4.7	18	2.0	70		7.8	21	.1	2.3	.41		132		59	0		202	7.4
Sept. 21-26.....	--			--	--	180	--	72		--	310	--	--	--		1,210		156	97		1,210	7.6
Sept. 27-30.....	19			15	5.4	19	2.0	71		9.0	25	.1	1.6	.38		136		60	2		218	7.6
Time-weighted average.....	15			8.8	2.7	21	0.9	43		6.0	31	0.1	1.1	.12		110		42	8		194	--

DUWAMISH RIVER BASIN--Continued

12-1134. DUWAMISH RIVER AT TUKWILA, WASH. --Continued

Temperature ($^{\circ}\text{F}$) of water, water year October 1960 to September 1961

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

LAKE WASHINGTON BASIN
12-1175. CEDAR RIVER NEAR LANDSBURG, WASH.

LOCATION --At county bridge at Landsburg, King County, 2 miles downstream from gaging station, 2.3 miles downstream from Rock Creek, and 10 miles east of Rock Creek.

DRAINAGE AREA (revised) --117 square miles, excluding Rock Creek drainage upstream from Walsh Lake diversion, upstream from gaging station.

RECORDS AVAILABLE --Chemical analyses: July 1959 to July 1960.

Water temperatures: August 1953 to September 1961.

EXTREMES, 1950-61 --Water temperatures: Maximum, 87°F July 13; minimum, 41°F on many days during winter months.

EXTREMES, 1953-61 --Water temperatures: Maximum, 87°F July 27, 28, 1960, July 13, 1961; minimum, 36°F on several days during January and February in 1956, 1957, and 1960.

Chemical analyses, in parts per million, October 1960 to July 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio (micro-mhos at 25°C)	Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate			
Oct. 4, 1960.....	335	9.7		6.5	1.1	1.8	0.1	28		0.0	1.0	0.0	0.4	0.02	34			20	0	0	51	7.3
Jan. 3, 1961.....	555	12		8.0	1.6	1.9	0	34		1.8	.8	.0	.5	.03	44			26	0	0	64	7.8
Apr. 19.....	1,170	9.4		5.0	.9	1.6	0	22		.6	.8	.0	.3	.01	30			16	0	0	41	7.3
July 5.....	558	11		9.5	1.0	1.9	.3	37		1.6	1.0	.0	.2	.01	51			28	0	0	67	7.5

LAKE WASHINGTON BASIN--Continued

[illegible]

LAKE WASHINGTON BASIN--Continued
12-1190. CEDAR RIVER AT RENTON, WASH.

LOCATION.--At bridge on State Highway 5, 1.8 miles south of Renton, King County, 2.8 miles upstream from gaging station, and 4.8 miles upstream from mouth. DRAINAGE AREA (revised).--186 square miles upstream from gaging station, including 3.67 square miles in vicinity of Youngs Lake in Big Soos Creek basin. RECORDS AVAILABLE.--Chemical analyses: July 1969 to September 1961 (discontinued). REMARKS.--Minor inflow between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carb- onate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	phos- phate (PO ₄)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		So- dium ad- sorp- tion ratio	Specific con- duct- ivity (micro- mhos at 25°C)	
															Parts per million	Tons per acre- foot	Tons per day	Cal- cium, Mag- nes- ium			Non- car- bon- ate
Oct. 4, 1960.....	259	11		8.0	1.4	2.5	0.0	34		2.4	1.2	0.0	0.3	0.04	45		26	0	0	65	7.2
Nov. 4.....	852	9.6		5.5	1.1	2.1	1.1	24		3.0	1.8	0.0	0.5	0.02	38		18	0	0	47	7.1
Nov. 30.....	1,210	10		6.0	1.8	1.9	2.2	24		3.2	1.2	1.7	0.03	0.03	43		18	0	0	50	7.4
Jan. 3, 1961.....	441	12		7.0	1.6	2.5	0.0	31		3.0	1.2	0.0	0.9	0.02	44		24	0	0	63	7.4
Feb. 2.....	1,130	10		5.0	1.2	1.8	2.2	22		2.2	1.5	1.8	0.03	0.03	34		18	0	0	47	7.4
Mar. 6.....	1,450	11		6.0	1.0	1.9	0.0	24		1.6	1.0	0.0	0.7	0.02	35		19	0	0	50	7.3
Apr. 19.....	1,150	10		5.0	1.4	2.0	1.1	24		2.0	1.0	1.1	0.4	0.01	35		18	0	0	47	7.4
May 3.....	1,130	11		6.0	1.0	2.2	2.3	25		2.4	1.0	1.1	0.3	0.00	42		19	0	0	51	7.2
June 5.....	696	11		7.0	1.0	2.2	3.28	28		2.6	1.0	0.0	0.3	0.02	45		22	0	0	56	7.2
July 5.....	207	13		10	1.7	3.5	7.42	42		5.4	1.2	1.1	2.06	0.06	60		32	0	0	81	7.3
Aug. 3.....	200	12		8.5	1.7	3.1	5.38	38		2.0	1.0	0.0	0.3	0.02	48		28	0	0	71	7.4
Sept. 6.....	186	13		9.5	1.8	3.5	5.42	42		3.2	1.2	0.0	0.4	0.03	53		31	0	0	78	7.3

LAKE WASHINGTON BASIN--Continued

12-1265. SAMWAMISH RIVER AT BOTHELL, WASH.

LOCATION.--At bridge on State Highway 2, at Bothell, King County, 0.1 mile upstream from gaging station and 0.1 mile downstream from North Creek. DRAINAGE AREA (revised).--212 square miles.

RECORDS AVAILABLE.--Chemical analyses: July 1959 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Specific conductance (microhm-cm at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 4, 1960.....	117	14		9.5	4.4	5.4	0.9	52		7.8	3.0	0.1	0.9	0.16	73			42	0	111	7.4
Nov. 4.....	219	13		10	4.7	5.0	1.2	48		12	3.2	1.1	2.0	1.0	84			44	4	116	6.9
Nov. 30.....	758	9.3		8.5	3.4	4.2	1.0	36		10	2.5	2	2.4	.06	68			35	6	95	6.9
Jan. 3, 1961.....	431	10		8.5	3.6	4.6	.7	41		7.0	2.8	.0	1.7	.07	64			36	2	98	7.1
Feb. 2.....	928	10		7.5	3.0	3.5	1.1	32		7.4	2.2	.1	2.8	.09	62			31	5	83	6.8
Mar. 6.....	1,070	7.5		8.0	2.7	3.9	.8	35		6.6	2.0	.1	1.3	.06	57			31	2	82	7.1
Apr. 19.....	574	7.5		7.5	3.4	4.6	.9	38		7.6	2.0	.1	1.6	.09	60			32	2	90	7.1
May 3.....	527	12		8.0	3.5	4.5	1.0	39		8.0	2.0	.1	1.5	.09	68			31	2	91	7.0
June 5.....	262	7.8		9.0	3.6	5.2	1.0	44		7.6	2.5	.1	1.1	.09	64			37	1	100	7.0
July 6.....	210	11		9.0	4.2	5.3	1.1	46		7.4	3.0	.1	1.2	.12	74			40	2	102	7.1
Aug. 3.....	125	8.4		9.0	4.5	5.6	1.1	50		8.0	3.0	.1	1.6	.12	68			41	0	105	7.2
Sept. 6.....	111	14		10	4.3	5.8	1.2	52		8.4	3.0	.2	1.0	.13	79			43	0	109	7.1

SNOHOMISH RIVER BASIN--Continued

12-1382. SULTAN RIVER AT SULTAN, WASH.

LOCATION.--At bridge on U.S. Highway 2, at Sultan, Snohomish County, 0.2 mile upstream from mouth, and 10.6 miles downstream from gaging station near Startup.
 RECORDS AVAILABLE.--Chemical analyses: July 1960 to September 1961 (discontinued).
 REMARKS.--No discharge records available.

Chemical analyses, in parts per million, July 1960 to September 1961

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)	Ni-Phosphate (NO ₃)(PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
July 20, 1960.....		5.3		5.0	1.0	1.2	0.3	19		2.0	0.5	0.0	0.1	0.01	26		16	1		40
Aug. 18.....		9.4		8.0	2.2	3.3	5.36	36		3.4	1.5	1.1	2	.02	51		29	0		69
Sept. 19.....		8.5		7.0	1.9	1.9	5.32	32		3.8	1.2	1.1	.3	.01	46		25	0		63
Oct. 12.....		6.2		5.5	1.5	1.3	2.18	18		3.4	1.2	0	.4	.00	30		16	0		40
Nov. 17.....		4.2		3.5	.3	.7	.0	11		.6	.5	0	.4	.00	23		10	1		26
Dec. 20.....		4.3		3.5	.3	.6	.0	12		1.6	.5	.1	.3	.01	22		10	0		27
Jan. 16, 1961.....		3.3		2.5	.5	.9	1.1	9		1.6	.2	0	.2	.02	18		8	0		22
Feb. 16.....		5.2		3.5	.8	.9	1.1	14		2.4	.5	0	.3	.01	23		12	0		30
Mar. 13.....		4.6		4.0	.4	.8	1.4	14		2.8	.8	.1	.3	.01	20		12	0		29
Apr. 20.....		4.9		4.0	.4	1.1	1.1	14		1.6	.8	.1	.3	.01	24		12	0		32
May 9.....		4.7		3.5	.7	1.0	.2	14		2.4	.5	0	.3	.01	20		12	0		32
June 13.....		3.7		3.0	.6	.7	.3	12		2.2	.8	0	.2	.01	19		10	0		36
July 12.....		4.8		4.5	.6	.8	.3	16		3.2	.8	0	.1	.00	23		14	0		37
Aug. 21.....		5.0		9.0	2.1	2.3	.7	36		4.0	1.5	.1	.3	.01	51		31	0		73
Sept. 21.....		5.7		9.0	1.9	2.3	.7	37		4.8	1.8	0	.2	.01	52		30	0		72

SNOWHISH RIVER BASIN--Continued

12-1485. TOLT RIVER AT CARNATION, WASH.

LOCATION --At bridge on State Highway 15B, 0.2 mile downstream from Langlois Creek, 0.2 mile upstream from mouth, 0.8 mile south of Carnation, King County, and 7.9 miles downstream from gaging station. (Continued from gaging station.)
 DRAINAGE AREA --8.1 square miles.
 RECORDS AVAILABLE --Chemical analyses, July 1960 to September 1961 (discontinued).
 REMARKS --Inflow between gaging station and sampling point includes that of Stoessel Creek which is approximately 2.5 percent of the total flow at sampling point.

Chemical analyses, in parts per million, July 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (Fe)	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)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate	
July 20, 1960.....	176	8.0		6.0	1.5	1.7	0.1	26		3.0	0.8	0.0	0.1	0.00	36		21	0	51
Aug. 18.....	160	8.5		5.5	1.2	1.9	0.3	22		4.4	0.8	0.1	0.3	0.00	42		18	0	48
Sept. 19.....	156	8.8		7.5	0.8	2.0	0.3	28		4.0	1.0	0.3	0.00	0.00	41		22	0	55
Oct. 18.....	209	7.8		6.5	0.7	1.8	0.2	23		4.4	1.2	1.1	0.6	0.00	34		19	0	57
Nov. 17.....	1,850	6.7		4.0	0.6	1.3	0.0	13		2.8	1.2	1.1	0.4	0.00	26		12	2	32
Dec. 20.....	859	7.1		4.0	0.6	1.2	0.2	15		2.4	0.6	0.0	0.8	0.00	26		12	0	35
Jan. 16, 1961.....	2,380	5.1		3.0	0.3	1.0	0.1	16		2.8	1.2	0.1	0.4	0.01	26		19	1	24
Feb. 11.....	1,680	8.5		4.0	1.0	1.0	0.1	16		3.8	1.2	0.1	0.5	0.01	32		14	1	36
Mar. 13.....	900	7.9		4.0	1.0	1.4	0.0	17		3.0	0.8	0.0	0.5	0.01	30		14	0	37
Apr. 19.....	650	7.7		5.0	0.5	1.5	0.0	18		3.2	0.8	0.1	0.4	0.01	30		14	0	40
May 9.....	738	7.3		4.5	0.7	1.5	0.1	17		3.6	0.2	0.1	0.4	0.01	32		14	0	36
June 13.....	350	6.9		4.5	0.9	1.4	0.2	18		2.2	0.5	0.0	0.2	0.01	30		14	0	39
July 12.....	184	6.5		7.0	0.6	1.6	0.3	24		3.6	0.8	0.0	0.1	0.00	35		20	0	50
Aug. 21.....	90	8.4		7.5	1.8	2.1	0.5	32		4.4	0.5	0.1	0.3	0.00	47		26	0	62
Sept. 21.....	221	6.0		5.0	0.9	1.8	0.4	17		5.2	1.2	0.1	0.4	0.01	41		16	2	41

SNOMISH RIVER BASIN--Continued
12-1555. SNOMISH RIVER AT SNOMISH, WASH.

LOCATION --At gaging station, at bridge on State Highway 1A at Snomish, Snohomish County, and 0.8 mile downstream from Pilchuck River.

DRAINAGE AREA (revised) --1,714 square miles.

RECORDS AVAILABLE --Chemical analyses: July 1959 to September 1961.

Water temperatures: July 1959 to September 1961.

EXTREMES, 1960-61. --Dissolved solids: Maximum, 44 ppm Sept. 13-30; minimum, 18 ppm June 16-28

Hardness: Maximum, 22 ppm Sept. 13-30; minimum, 8 ppm Feb. 21, 22, May 16-June 15.

Specific conductance: Maximum daily, 64 micromhos July 26, Aug. 27-29; minimum daily, 21 micromhos Feb. 21, 22.

Water temperatures: Maximum, 69°F July 20, Aug. 13, 15; minimum, 38°F on several days during winter months.

EXTREMES, 1959-61. --Dissolved solids: Maximum, 80 ppm Dec. 23, 1959; minimum, 18 ppm June 16-28, 1961.

Hardness: Maximum, 33 ppm Dec. 23, 1959; minimum, 8 ppm Nov. 18-24, 1959, Feb. 21, 22, May 16-June 15, 1961.

Specific conductance: Maximum daily, 104 micromhos Dec. 23, 1959; minimum daily, 21 micromhos Feb. 21, 22, 1961.

Water temperatures: Maximum, 73°F Aug. 9, 1960; minimum, 34°F Jan. 3, 1960.

REMARKS --Records of specific conductance of daily samples available in district office at Portland, Oreg. Discharge below 10,000 cfs not determined

Chemical analyses, in parts per million, water year October 1960 to September 1961

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)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Sodium carbonate ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate		
Oct. 1-31, 1960....	--	6.3		4.5	1.2	2.1	0.6	20	2.8	1.2	0.1	0.5	0.01	35	0.05	16	0		44
Nov. 1-20.....	--	5.9		4.0	.8	1.6	.6	16	3.2	.8	.1	.9	.03	30	.04	14	1		37
Nov. 21-Dec. 9....	--	7.6		5.0	.9	1.7	.5	19	3.8	1.5	1.1	1.4	.02	40	.05	16	1		46
Dec. 10-27.....	--	6.5		4.5	.7	1.5	.2	16	3.2	1.0	1.1	.8	.00	31	.04	14	1		39
Dec. 28-Jan. 4, 1961....	--	8.3		5.5	1.0	1.9	.2	22	3.8	1.5	.0	.8	.01	40	.05	18	0		49
Jan. 5-19.....	23,230	5.9		4.0	.4	1.3	.4	14	2.2	.5	.0	.9	.01	30	.04	12	0		33
Jan. 20-27.....	--	7.5		4.5	1.1	1.6	.4	18	3.0	1.2	1.1	.7	.09	37	.05	16	0		42
Jan. 28-Feb. 3....	--	5.6		4.0	.0	1.2	.3	13	2.0	.8	1.1	.8	.01	25	.03	10	0		29
Feb. 4-11.....	23,060	6.1		5.0	.3	1.2	.2	14	2.4	.8	1.1	.6	.02	27	.04	12	0		36
Feb. 12-20.....	16,390	7.1		5.0	.3	1.6	.2	18	2.4	.5	.0	.2	.03	31	.04	14	0		40
Feb. 21-22.....	32,360	3.9		2.5	.3	.8	.9	10	1.6	.5	.0	.2	.03	21	.03	8	0		21
Feb. 23-Mar. 5....	21,240	7.2		4.5	.8	1.5	.2	18	3.2	.8	.0	.8	.03	32	.04	14	0		39
Mar. 6-13.....	6.9			5.0	1.0	1.8	.4	21	3.4	1.5	1.1	1.0	.00	32	.04	17	0		46
Mar. 14-29.....	--	5.9		4.5	.6	1.5	.4	16	2.8	1.0	1.1	.6	.01	27	.04	14	0		37
Mar. 30-Apr. 4....	--	4.6		4.0	.3	1.2	.4	15	2.8	.8	.0	.4	.06	26	.04	11	0		30
Apr. 5-16.....	13,020	6.2		4.0	.7	1.4	.2	16	2.4	.8	1.1	.7	.01	26	.04	13	0		36
Apr. 17-May 15....	--	6.3		4.5	.6	1.6	.2	17	2.8	1.2	.0	.6	.00	32	.04	14	0		38

STILLAGUAMISH RIVER BASIN

12-1677. STILLAGUAMISH RIVER NEAR SILVANA, WASH.

LOCATION.--At bridge on U.S. Highway 99, 1.5 miles east of Silvana, Snohomish County, and 7 miles downstream from confluence of the North and South Forks.
 RECORDS AVAILABLE.--Chemical analyses: July 1959 to September 1961.
 REMARKS.--No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (Fe)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbocationate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180° C)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate		
Oct. 4, 1960.....		8.8		9.5	2.6	2.5	0.2	43		4.0	2.2	0.0	0.0	0.01	52			34	0	82	7.4
Nov. 4.....		6.5		5.0	1.8	1.5	.2	23		3.2	1.0	.0	.8	.00	34			20	1	58	7.4
Nov. 30.....		6.8		7.0	1.8	1.1	.2	37		4.6	1.2	.1	.8	.02	43			27	2	56	7.2
Jan. 5, 1961.....		6.6		8.0	1.8	2.1	.3	32		3.0	1.8	.1	.4	.03	25			14	0	66	7.2
Jan. 2.....		8.0		6.0	1.9	1.8	.1	32		2.0	1.0	.1	.4	.03	40			22	0	32	7.1
Mar. 2.....		7.8		6.0	1.9	1.7	.1	27		2.4	1.0	.1	.9	.00	40			20	0	55	7.2
Apr. 19.....				6.0	1.2	1.5	.3	24		2.4	1.0	.1	.5	.03	39			20	0	51	7.4
May 3.....		5.1		4.5	.9	1.1	.5	19		2.8	1.0	.0	.2	.02	28			15	0	38	7.2
June 5.....		4.6		4.5	.9	1.0	.3	18		2.0	.8	.0	.3	.02	26			15	0	37	7.1
July 5.....		7.9		7.0	1.8	1.7	.4	30		2.8	1.0	.1	.3	.02	40			25	0	59	7.2
Aug. 3.....		9.4		9.0	3.5	2.6	.7	44		3.6	2.5	.1	.1	.02	58			37	1	84	7.4
Sept. 6.....		7.9		8.0	1.2	1.9	.7	30		3.2	1.2	.0	.5	.03	41			25	0	60	7.2

SKAGIT RIVER BASIN

12-1790. SKAGIT RIVER AT MARBLEMOUNT, WASH.

LOCATION --At Cascade Road bridge at Marblemount, Skagit County, 2.5 miles downstream from Dieboud Creek, and 7 miles downstream from gaging station. DRAINAGE AREA (revised)--1,274 square miles, upstream from gaging station, of which 400 square miles is in Canada.

RECORDS AVAILABLE.--Chemical analyses: July 1959 to July 1960.

Water temperatures: January 1953 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 56°F July 30; minimum, 38°F Feb. 19-23, Mar. 4.

EXTREMES, 1953-61.--Water temperatures: Maximum, 56°F July 30, 1961; minimum, 35°F Mar. 1, 1956.

REMARKS.--Temperature recorder at gaging station above Alma Creek, near Marblemount. Moderate inflow between gaging station and sampling point.

Chemical analyses, in parts per million, October 1960 to July 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium			Non-carbonate
Oct. 5, 1960.....	4,170	4.6		7.5	0.8	1.0	0.3	26	4.0	0.0	0.0	0.2	0.01	35			22	1	51	7.2
Jan. 3, 1961.....	5,850	6.2		9.0	1.4	.8	.4	32	3.8	.0	.0	.2	.01	39			26	2	64	7.5
Apr. 20.....	5,260	5.8		9.3	.7	.8	.2	31	4.0	.0	.1	.1	.00	29			26	1	61	7.4
July 6.....	10,800	4.7		7.0	.7	.7	.3	24	3.6	.0	.0	.2	.01	29			20	0	46	7.3

SKAGIT RIVER BASIN--Continued

12-1970. SKAGIT RIVER AT MARBLEMOUNT, WASH.--Continued

Temperature (°F) of water, water year October 1960 to September 1961

[illegible]

SKAGIT RIVER BASIN--Continued

12-2005. SKAGIT RIVER NEAR MOUNT VERNON, WASH.

LOCATION.--At gaging station, at bridge on U.S. Highway 99, 1 mile north of Mount Vernon, Skagit County, and 3 miles downstream from Nookachamps Creek. DRAINAGE AREA (revised).--3,093 square miles, of which 400 square miles is in Canada. RECORDS AVAILABLE.--Chemical analyses: July 1959 to September 1961.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbocationate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		
Oct. 4, 1960.....	8,030	6.2		7.0	1.0	1.2	0.2	24		4.8	0.2	0.1	0.2	0.02	34			22	2		52
Nov. 4.....	16,000	6.5		7.5	.8	1.1	.4	26		4.4	.2	.0	.4	.01	39			22	0		53
Nov. 30.....	15,300	7.7		8.0	1.6	1.3	.4	30		5.4	.8	.0	.5	.04	45			26	2		63
Jan. 4, 1961.....	13,200	7.6		8.0	1.4	1.3	.5	29		5.2	.2	.0	.3	.01	48			26	2		62
Feb. 2.....	21,400	6.6		7.0	1.3	1.0	.3	27		3.0	.0	.1	.4	.03	35			23	1		52
Mar. 6.....	13,900	9.0		8.5	1.5	1.5	.5	32		4.8	1.0	.1	.4	.03	44			27	1		64
Apr. 19.....	15,100	8.1		8.0	1.5	1.6	.4	31		4.4	.5	.1	.3	.02	44			26	0		64
May 3.....	22,500	6.3		7.0	.9	1.1	.6	25		4.0	.5	.1	.3	.01	33			21	0		51
June 6.....	22,600	5.9		5.6	1.0	.8	.5	20		3.6	.2	.0	.3	.01	29			16	0		40
July 6.....	22,400	5.6		5.6	.7	.9	.5	20		2.8	.0	.1	.2	.02	32			16	0		40
Aug. 3.....	13,000	5.1		5.5	1.2	1.1	.5	21		4.4	.5	.1	.1	.02	32			18	2		44
Sept. 6.....	11,900	5.5		5.5	.9	1.1	.6	21		4.2	.5	.1	.1	.02	32			18	0		42

NOOKSACK RIVER BASIN

12-2105. NOOKSACK RIVER AT LAWRENCE, WASH.

LOCATION.--At bridge on State Highway 1 at Lawrence, Whatcom County, 5.1 miles downstream from gaging station at Deming, and 5.3 miles downstream from South Fork.
 DRAINAGE AREA (revised).--584 square miles, including 5 square miles in Canada, upstream from gaging station.
 RECORDS AVAILABLE.--Chemical analyses: July 1959 to September 1960.
 Water temperatures: September 1959 to September 1960.
 REMARKS.--Minor inflow between sampling point and gaging station. Only discharges above 3,500 cfs are published.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium, sodium	Non-carbonate			
Oct. 4, 1960.....	--	9.3		12	3.5	2.8	0.1	43		14	1.0	0.1	0.1	0.01	65			44	10		103	7.7
Oct. 4.....	--	8.3		10	2.7	1.6	.2	36		8.0					53			36	7		80	7.6
Dec. 1.....	--	8.0		19.5	2.7	1.5	.2	37		7.6					54			34	4		78	7.6
Jan. 4.....	--	9.3		12	3.2	2.0	.2	46		8.4	.8	.1	.7	.02	68			43	6		98	7.4
Feb. 2, 1961.....	8,390	6.5		11	1.9	1.0	.2	26		4.2	.0	.1	.5	.03	39			24	2		53	7.2
Mar. 6.....	--	9.4		11	2.7	1.7	.9	42		6.8	1.0	.0	.5	.21	54			38	4		85	7.5
Apr. 19.....	--	8.4		10	2.6	1.8	.2	38		6.6	1.0	.1	.2	.02	55			36	4		81	7.4
May 3.....	4,280	7.2		7.5	2.5	1.3	.3	31		6.0	.5	.1	.3	.02	47			29	4		66	7.3
June 5.....	6,340	5.9		7.0	1.4	1.0	.3	23		6.2	.2	.1	.2	.02	36			23	4		55	7.2
July 5.....	--	7.0		8.0	2.0	1.2	.3	28		8.8	.0	.1	.2	.02	46			28	6		66	7.4
Aug. 3.....	--	6.3		8.5	2.2	1.2	.3	26		10	.5	.1	.1	.02	49			30	8		69	7.3
Sept. 6.....	--	8.2		10	2.3	1.5	.6	33		11	.8	.1	.2	.02	59			34	8		79	7.3

PEND OREILLE RIVER BASIN

12-3482. BITTERROOT RIVER NEAR CORVALLIS, MONT.

LOCATION.--Temperature recorder at gaging station, 20 feet downstream from present highway bridge, 1.2 miles downstream from Blodgett Creek, and 1.5 miles west of Corvallis, Ravalli County.

DRAINAGE AREA.--1,711 square miles.

RECORDS AVAILABLE.--Water temperatures: August 1959 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 74°F on several days during July and August; minimum, freezing point on many days during December to March.

EXTREMES, 1958-61.--Water temperatures: Maximum, 74°F on several days during July and August 1961; minimum, freezing point on many days during winter months each year.

REMARKS.--Recorder stopped Dec. 9 to Jan. 10; range in temperature 32°F to 35°F.

Temperature (°F) of water, water year October 1960 to September 1961

/Water-stage recorder with temperature attachment/

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

PEND OREILLE RIVER BASIN--Continued
12-3530. CLARK FORK BELOW MISSOULA, MONT.

LOCATION.--Temperature recorder at gaging station, 1 (revised) mile downstream from Bitterroot River and 5 miles west of Missoula, Missoula County.
DRAINAGE AREA.--9,003 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1959 to September 1961.
EXTREMES, 1960-61.--Water temperatures: Maximum, 77°F Aug. 19, 22, 24; minimum, freezing point on many days during December to February.
EXTREMES, 1959-61.--Water temperatures: Maximum, 77°F Aug. 19, 22, 24, 1961; minimum, freezing point on many days during winter month.
REMARKS.--Recorder stopped Mar. 19 to Apr. 3; range not determined.

Temperature (°F) of water, water year October 1960 to September 1961
/Water-stage recorder with temperature attachment/

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

PEND OREILLE RIVER BASIN--Continued
12-3965. PEND OREILLE RIVER AT METALINE FALLS, WASH.

LOCATION.--At bridge on State Highway 6 at Metaline Falls, Pend Oreille County, 0.2 mile upstream from Sullivan Creek and 7 miles downstream from gaging station.

DRAINAGE AREA.--25,000 square miles, approximately, upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: December 1948 to September 1950, July 1959 to September 1961.

Water temperatures: December 1948 to September 1950.

REMARKS.--Small amount of inflow between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (microhm/cm at 25°C)
															Parts per million	Tons per acre-foot	Calcium, Magnesium		
Oct. 27, 1960.....	17,900	6.9		22	5.5	2.3	0.6	96	0	7.2	0.2	0.2	0.2	0.01	91		78	2	156
Nov. 28.....	26,800	6.1		22	5.2	2.1	.8	89	0	8.4	.5	.2	.4	.03	91		76	4	157
Dec. 21.....	20,700	7.0		22	5.9	2.2	.6	92	0	9.2	.5	.1	.2	.02	94		79	4	165
Jan. 25, 1961.....	16,300	6.9		22	6.4	2.4	.8	94	0	8.6	.5	.1	.2	.02	94		81	4	167
Mar. 1.....	28,300	8.0		21	5.7	2.4	.6	85	0	8.4	.2	.2	.1	.03	92		76	6	155
Mar. 29.....	35,200	7.3		22	4.9	2.4	.7	86	0	10	.3	.2	.1	.01	87		73	4	153
Apr. 25.....	45,400	9.8		22	5.3	2.5	.9	87	0	8.6	.2	.0	.1	.13	96		77	6	159
May 23.....	63,200	7.8		19	5.2	2.2	.8	78	0	7.6	.0	.1	.2	.01	90		69	5	143
June 27.....	47,900	6.0		17	4.5	1.6	.7	73	0	6.4	.0	.1	.1	.00	72		61	1	127
July 26.....	21,100	5.3		20	4.6	1.9	.5	82	0	6.0	.0	.1	.1	.02	80		69	2	142
Aug. 30.....	7,100	6.1		21	5.1	2.2	.7	87	0	6.8	.5	.1	.2	.02	81		74	2	148
Sept. 26.....	16,500	5.4		21	5.4	2.8	.8	86	2	8.0	.8	.2	.2	.01	86		74	0	155

COLUMBIA RIVER MAIN STEM

12-3995. COLUMBIA RIVER AT NORTHPORT, WASH.

LOCATION --At bridge on State Highway 22, at Northport, Stevens County, and 12 miles downstream from gaging station at international boundary. DRAINAGE AREA--59,700 square miles, approximately upstream from gaging station.

RECORDS AVAILABLE--Chitanka Pass; February 1961 to January 1961, November 1951 to September 1961.

EXTREMES 1960-61.--Dissolved solids: Maximum, 102 ppm Dec. 19-Jan. 10; minimum, 74 ppm July 1-31.

Hardness: Maximum, 82 ppm Jan. 11-31; minimum, 62 ppm July 1-31.

Specific conductance: Maximum daily, 175 micromhos Jan. 5, 29; Feb. 13, 15; minimum daily, 126 micromhos July 13, Aug. 3.

Water temperatures: Maximum, 68°F Aug. 19, 21; minimum, 36°F on several days during January and February.

EXTREMES, 1958-61.--Dissolved solids: Maximum, 105 ppm Mar. 3-31, 1960; minimum, 74 ppm Aug. 1-Sept. 15, 1959, Aug. 15-Sept. 7, 1960, July 1-31, 1961.

Hardness: Maximum, 69 ppm Feb. 17-28, 1959; minimum, 62 ppm July 16-31, Aug. 16-31, 1959, July 1-31, 1961.

Specific conductance: Maximum, 188 micromhos Mar. 2, 1959; minimum daily, 123 micromhos Aug. 2, 1960.

Water temperatures: Maximum, 70°F May 14, 19, 1959; minimum, freezing point Jan. 18-20, 23, 1960.

REMARKS.--Records of specific conductance of daily samples available in district office at Portland, Oreg. No appreciable inflow between sampling point and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 1-31, 1960...	57,270	4.1		21	4.2	1.4	0.8	70	14	0.0	0.2	0.7	0.03	85	0.12	13,140	70	12	0.1	144	7.7
Nov. 1-23.....	56,440					1.6	--	76	--	--	--	--	--	87	.12	13,280	74	12	--	150	7.7
Nov. 24-Dec. 18....	44,080					1.8	--	78	--	--	--	--	--	97	.13	11,540	76	12	--	159	7.7
Dec. 19-.....																					
Jan. 10, 1961....	32,820	4.8		24	5.1	1.9	.8	82	16	.2	.2	.5	.06	102	.14	9,040	81	14	.1	167	7.8
Jan. 11-31.....	37,020					1.7	--	80	--	--	--	--	--	98	.13	9,800	82	16	--	171	7.7
Feb. 1-16.....	45,200					1.7	--	81	--	--	--	--	--	98	.13	11,960	81	15	--	169	7.8
Feb. 17-28.....	64,150					2.0	--	82	--	--	--	--	--	97	.13	16,800	78	11	--	164	7.7
Mar. 1-25.....	58,000					2.2	--	82	--	--	--	--	--	99	.13	15,900	80	13	--	166	7.7
Mar. 26-Apr. 10....	72,990					2.5	--	81	--	--	--	--	--	97	.13	19,120	77	11	--	157	7.8
Apr. 11-30.....	82,600	6.3		24	3.9	2.6	1.0	81	14	1.2	.2	.4	.04	94	.13	20,960	76	10	.1	155	7.7
May 1-20.....	142,400					1.9	--	76	--	--	--	--	--	88	.12	33,830	72	10	--	149	7.9
May 21-June 6.....	332,200					1.6	--	72	--	--	--	--	--	82	.11	73,550	67	8	--	140	7.9
June 7-30.....	418,700					1.2	--	70	--	--	--	--	--	77	.10	87,050	65	8	--	135	7.7
July 1-12.....	222,900	5.3		19	3.5	1.0	.6	67	9.2	.0	.1	.5	.01	74	.10	44,540	62	7	.1	129	7.7
July 13-31.....	153,200					1.1	--	66	--	--	--	--	--	74	.10	30,610	62	8	--	126	7.6
Aug. 1-30.....	102,100					1.2	--	68	--	--	--	--	--	76	.10	20,950	64	8	--	133	7.6
Aug. 31-Sept. 30..	80,710					1.6	--	68	--	--	--	--	--	80	.11	13,110	67	12	--	135	7.5
Weighted average	111,082					1.5	--	72	--	--	--	--	--	83	0.11	24,900	69	9	--	142	--

COLUMBIA RIVER MAIN STEM--Continued
12-3995. COLUMBIA RIVER AT NORTHPORT, WASH.--Continued

Temperature (°F) of water, water year October 1960 to September 1961																																
Month	Day																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October	59	59	59	58	58	57	57	56	56	56	54	54	54	54	55	54	55	55	54	53	54	54	54	54	53	53	51	51	51	51	50	
November	51	50	49	49	49	49	48	47	48	47	47	47	47	47	47	47	47	45	46	45	44	44	43	43	43	45	44	43	43	43	44	
December	43	43	43	42	40	40	40	39	39	39	39	39	38	38	38	38	38	38	38	38	38	37	40	39	41	39	40	37	38	38	39	
January	39	40	38	--	37	--	--	--	--	--	--	--	38	38	40	40	39	40	39	39	38	38	--	38	38	36	36	37	36	36	--	
February	36	36	37	36	37	38	38	39	38	38	38	39	40	38	39	39	39	39	40	40	39	41	40	40	40	40	40	40	40	40	39	
March	39	40	40	40	39	39	40	40	40	41	41	40	41	42	42	42	42	42	43	43	43	42	--	43	44	44	44	44	45	45	42	
April	45	46	46	44	45	--	--	--	--	--	--	--	--	--	--	--	--	--	43	44	45	44	48	45	46	46	46	47	47	48	48	--
May	48	48	47	47	46	46	47	47	47	47	47	48	49	49	49	50	50	51	51	52	51	52	--	51	51	52	52	53	53	54	50	
June	54	54	53	53	54	54	54	54	54	54	54	--	55	56	56	56	56	57	58	57	57	57	57	57	58	59	58	58	57	56	56	
July	57	58	59	58	59	59	60	60	61	60	60	62	62	63	--	64	65	65	65	--	65	65	65	65	65	65	66	64	64	64	65	
August	65	65	65	65	65	65	65	63	65	65	65	65	66	67	67	66	65	65	68	67	68	67	67	66	--	65	64	64	64	64	65	
September	63	62	63	61	62	62	63	62	63	62	62	63	62	63	63	63	63	63	62	61	61	60	60	60	60	58	57	56	--	61		

KETTLE RIVER BASIN

12-4049. KETTLE RIVER NEAR BARSTOW, WASH.

LOCATION.--At county bridge 0.2 mile downstream from Toulou Creek, 1.1 miles east of Barstow, Ferry County, 5.8 miles downstream from Boulder Creek, and 17 miles downstream from international gaging station at Laurier.

RECORDS AVAILABLE.--Chemical analyses: July 1960 to September 1961.

REMARKS.--No discharge records available.

Chemical analyses, in parts per million, July 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (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) (PO ₄)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃	Soil adsorption ratio	Specific conductance (micro-mhos at 25°C)	
													Parts per million	Tons per acre-foot				Tons per day
July 27, 1960.....	12		20	5.4	3.7	1.0	84	0	9.2	0.5	0.2	0.1	0.01	94		72	3	153 7.9
Aug. 26.....	13		29	5.8	5.2	1.2	113	0	14	.8	.3	.2	.01	133		96	4	209 8.2
Sept. 30.....	10		29	8.3	5.2	1.2	116	0	15	.8	.3	.0	.01	127		98	4	216 8.0
Oct. 26.....	13		28	5.1	4.5	1.1	102	0	12	.5	.3	.5	.02	114		96	2	187 8.0
Nov. 30.....	12		26	6.0	4.3	.9	105	0	13	.2	.4	.3	.01	122		90	4	197 8.2
Dec. 22.....	14		29	6.2	4.8	1.0	115	0	15	1.0	.3	.4	.07	129		98	4	211 8.0
Jan. 25, 1961.....	12		28	6.8	5.1	1.2	113	0	13	.5	.3	.2	.02	124		98	8	207 8.0
Mar. 2.....	11		22	4.8	4.2	.9	86	0	11	.0	.3	.1	.01	97		74	4	180 8.0
Mar. 26.....	13		17	4.0	3.2	.6	69	0	9.2	.2	.3	.1	.00	88		59	2	130 6.9
Apr. 25.....	13		15	2.6	2.8	.7	57	0	6.2	.0	.2	.2	.01	73		48	2	109 7.5
May 22.....	10		7.0	1.0	1.8	.6	26	0	2.8	.0	.2	.5	.03	45		22	0	52 7.1
June 27.....	11		14	2.5	2.7	.6	55	0	7.2	.2	.2	.0	.02	71		45	0	103 8.0
July 26.....	9.9		22	4.3	4.0	1.2	87	0	9.8	.0	.3	.1	.02	99		73	2	181 7.8
Aug. 30.....	8.1		29	5.7	5.3	1.7	114	0	14	.5	.3	.1	.01	126		96	2	204 7.9
Sept. 26.....	12		33	6.6	6.0	1.4	117	6	16	1.0	.4	.2	.01	141		110	4	233 8.7

COLVILLE RIVER BASIN

12-4090. COLVILLE RIVER AT KETTLE FALLS, WASH.

LOCATION.--At county bridge, 0.2 mile upstream from Washington Water Power Company's plant, 0.3 mile upstream from gaging station, and 0.5 mile south of Kettle Falls, Stevens County.
 DRAINAGE AREA.--1,007 square miles, upstream from gaging station.
 RECORDS AVAILABLE.--Chemical analyses: July 1960 to September 1961.
 REMARKS.--No inflow between gaging station and sampling point.

Chemical analyses, in parts per million, July 1960 to September 1961

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)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium, sodium	Non-carbonate		
July 27, 1960.....	137	15		44	14	5.8	2.0	189	3	15	1.0	0.1	0.1	193			167	7		318
Aug. 26.....	135	16		43	15	5.2	2.1	209	0	15	2.2	1.0	0.2	205			169	5		316
Sept. 29.....	120	16		45	16	6.1	2.5	209	1	17	1.5	2.2	1.2	211			177	4		336
Oct. 27.....	148	19		44	18	6.0	3.1	207	0	16	1.8	3.1	1.8	210			175	6		399
Nov. 30.....	322	21		43	15	5.5	2.6	188	0	23	1.8	2.5	2.0	228			168	14		341
Dec. 21.....	220	20		42	14	5.0	1.9	192	0	17	1.5	2.2	1.8	201			164	7		323
Jan. 25, 1961.....	160	20		48	16	6.6	2.2	208	0	22	2.0	1.7	1.8	230			184	14		368
Mar. 1.....	782	21		38	14	6.3	2.0	166	0	23	1.0	2.1	0.9	194			152	18		303
Mar. 29.....	1,070	22		33	11	4.6	1.7	144	0	15	0.8	2.2	0.2	172			126	8		252
Apr. 25.....	1,040	19		32	8.2	4.2	1.5	134	0	12	0.5	2.2	0.4	151			114	4		229
May 22.....	1,420	20		31	8.2	4.6	1.6	130	0	13	0.0	2.2	0.6	143			111	4		229
June 27.....	362	20		42	13	5.6	2.0	184	0	17	1.2	2.2	0.8	197			157	6		315
July 26.....	210	20		44	12	6.0	2.7	194	0	16	1.0	2.2	0.7	201			161	2		324
Aug. 30.....	137	17		46	15	6.6	3.1	209	0	17	1.5	2.2	0.6	209			176	4		335
Sept. 26.....	141	17		46	15	6.4	2.9	191	10	18	1.2	2.2	0.5	210			176	3		354

SPOKANE RIVER BASIN

12-4195. SPOKANE RIVER NEAR OTIS ORCHARDS, WASH.

LOCATION.--At bridge on U.S. Highway 10, 0.5 mile downstream from state line, 2.5 miles upstream from gaging station, and 3 miles east of Otis Orchards, Spokane County, 3,880 square miles, approximately, upstream from gaging station.

DRAINAGE AREA.--3,880 square miles, approximately, upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: July 1959 to September 1961.

REMARKS.--No appreciable inflow between sampling point and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 28, 1960.....	1,830	7.5		5.5	1.5	1.4	0.4	22		5.4	0.0	0.1	0.4	0.03	36		20	2		49	7.1
Nov. 29.....	3,120	8.3		6.0	1.2	1.2	0.3	22		6.6		0.5	0.1	0.03	38		20	2		52	7.2
Dec. 21.....	2,750	7.9		5.5	1.5	1.2	0.3	23		5.4		0.0	0.3	0.1	35		20	1		52	7.2
Jan. 24, 1961.....	3,490	8.2		5.5	1.7	1.4	0.6	24		5.8		0.0	0.1	0.03	36		20	1		54	7.4
Feb. 28.....	24,100	8.8		6.0	1.8	1.4	0.4	22		6.6		0.1	0.1	0.05	44		22	4		55	7.0
Mar. 28.....	12,900	9.4		5.5	1.8	1.4	0.5	22		8.2		0.1	0.3	0.05	46		21	4		53	7.2
Apr. 25.....	12,800	10		6.0	1.4	1.4	0.7	20		7.8		0.1	0.3	0.06	42		21	4		55	7.0
May 29.....	21,554	18		5.0	1.2	1.3	0.6	20		5.8		0.1	0.1	0.04	40		18	2		44	7.3
June 27.....	8,500	8.5		5.0	1.0	1.0	0.7	20		4.0		0.2	0.1	0.06	30		18	1		44	7.1
July 25.....	838	8.6		5.5	1.0	1.0	0.7	20		4.0		0.1	0.1	0.06	30		18	2		46	7.1
Aug. 29.....	121	8.8		6.0	0.8	1.6	0.7	19		6.0		0.1	0.4	0.05	33		18	2		48	6.9
Sept. 26.....	1,300	8.8		6.0	1.0	1.3	0.7	19		6.8		0.2	0.3	0.04	37		19	4		49	6.9

SPOKANE RIVER BASIN--Continued
12-4310. LITTLE SPOKANE RIVER AT DARTFORD, WASH.

LOCATION.--At Mill Road bridge, 0.5 mile east of Dartford, Spokane County, and 0.6 mile upstream from gaging station.
DRAINAGE AREA.--665 square miles, upstream from gaging station.
RECORDS AVAILABLE.--Chemical analyses: July 1960 to September 1961.
REMARKS.--No inflow between sampling point and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, July 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate		
July 28, 1960.....	180	16		28	8.5	4.7	1.7	130	0	6.0	2.0	0.1	0.9	0.08	132			105	0		216
Aug. 24.....	165	18		30	7.8	4.8	1.8	133	0	5.8	2.2	.3	1.4	.06	150			107	0		225
Sept. 28.....	165	18		31	8.1	4.9	1.8	136	0	7.6	3.0	.2	1.2	.08	145			111	0		236
Oct. 26.....	177	20		32	7.6	4.9	2.0	136	0	7.0	2.2	.3	3.2	.08	143			111	0		228
Nov. 28.....	486	17		20	5.2	3.8	1.8	88	0	5.6	1.5	.2	1.8	.13	109			71	0		156
Dec. 21.....	273	20		26	6.4	4.1	1.8	112	0	5.4	2.2	.2	1.8	.13	127			91	0		196
Jan. 24, 1961.....	284	21		25	6.6	4.6	1.9	110	0	5.4	1.5	.2	1.7	.10	124			90	0		192
Feb. 28.....	982	23		14	3.8	4.1	1.6	64	0	5.4	.8	.2	1.1	.09	92			51	0		118
Mar. 28.....	976	22		15	3.9	4.1	1.5	69	0	5.6	.5	.2	.4	.05	98			54	0		125
Apr. 24.....	566	21		19	4.1	4.1	1.5	82	0	3.8	1.0	.2	.7	.08	98			64	0		146
May 23.....	628	22		17	4.3	4.4	1.4	76	0	5.6	.8	.2	.8	.12	92			60	0		137
June 26.....	273	18		26	6.6	4.7	1.6	114	0	6.4	2.0	.2	1.8	.09	122			92	0		197
July 28.....	142	18		30	7.6	5.0	2.0	128	0	6.8	3.0	.2	1.2	.09	137			104	0		222
Aug. 29.....	143	19		32	7.8	4.9	1.9	135	0	6.6	2.5	.2	1.2	.07	146			112	2		227
Sept. 26.....	158	18		33	7.8	4.7	1.9	133	4	7.6	2.5	.3	1.8	.05	147			114	0		239

SPOKANE RIVER BASIN--Continued

12-4330. SPOKANE RIVER AT LONG LAKE, WASH.

LOCATION.--At bridge, 0.2 mile downstream from gaging station, 1.2 miles upstream from Chamokane Creek, and 12 miles north of Reardon, Lincoln County.
DRAINAGE AREA.--5,920 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: July 1959 to September 1961.

Water temperatures: July 1959 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 133 ppm Sept. 1-30; minimum, 47 ppm June 3-26.

Hardness: Maximum, 106 ppm Sept. 1-30; minimum, 28 ppm May 10-June 26.

Specific conductance: Maximum daily, 235 micromhos Sept. 20; minimum daily, 63 micromhos June 2.

Water temperatures: Maximum, 74° July 23; minimum, 37° Dec. 31, Jan. 7.

Hardness: Maximum, 133 ppm Sept. 1-30, 1961; minimum, 46 ppm May 15-June 7, 1960.

Specific conductance: Maximum daily, 235 micromhos Sept. 20, 1961; minimum, 63 micromhos June 2, 1961.

Water temperatures: Maximum, 76° Aug. 18, 1959; minimum, freezing point Jan. 21, Feb. 26, 1960.

REMARKS.--Records of specific conductance of daily samples available in district office at Portland, Ore. No appreciable inflow between gaging station and sampling point except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate		
Oct. 1-31, 1960...	2,862	8.2		21	7.4	4.0	2.0	95		9.4	3.0	0.1	2.2	0.11	106	0.14	83	5		180 7.6
Nov. 1-15.....	3,298	9.8		20	6.5	3.3	1.7	86		10.2	2.8	1.1	2.1	0.13	102	0.14	78	6		170 7.7
Nov. 16-30.....	3,298	9.8		20	6.5	3.3	1.5	86		9.2	2.5	1.1	2.6	0.18	107	0.15	76	6		171 7.5
Dec. 1-15.....	4,470	11		16	6.1	3.0	1.4	70		9.8	2.0	1.1	2.4	0.21	95	0.13	65	8		147 7.4
Jan. 12, 1961...	4,629	11		15	5.2	2.8	1.4	65		8.4	1.8	1.1	2.3	0.17	88	0.12	59	6		129 7.4
Jan. 13-Feb. 2....	5,247	11		14	5.7	3.0	1.4	64		8.0	2.2	1.1	2.4	0.19	89	0.12	58	6		130 7.4
Feb. 3-11.....	10,520	11		15	4.4	3.3	2.0	60		7.0	2.5	1.1	2.6	0.18	82	0.11	54	6		126 7.3
Feb. 12-Mar. 4....	25,470	11		9.0	2.5	2.4	1.1	36		6.4	1.0	1.1	1.5	0.08	61	0.08	41	33	4	79 7.2
Mar. 5-16.....	17,150	9.4		9.0	2.1	2.1	0.9	34		7.4	0.8	1.1	1.0	0.09	52	0.07	31	33	3	77 7.5
Mar. 17-Apr. 3....	15,680	10		10	2.2	2.3	1.1	39		7.6	0.5	1.1	1.3	0.08	62	0.08	34	2		85 7.4
Apr. 4-May 3.....	15,590	11		9.0	2.6	2.2	1.4	36		8.4	1.0	1.1	0.8	0.08	60	0.08	33	4		79 7.3
May 4-9.....	17,980	11		9.0	2.8	2.1	1.1	36		8.4	0.5	1.1	0.6	0.07	60	0.08	34	4		82 7.2
May 10-June 2....	22,680	11		8.0	1.9	2.0	0.9	28		7.2	0.2	1.1	0.5	0.06	50	0.07	28	3		70 7.1
June 3-26.....	15,940	9.8		7.5	2.4	1.6	0.9	31		6.0	0.8	1.1	0.9	0.06	47	0.06	26	3		71 7.2
June 27-July 8....	2,642	9.7		9.0	3.2	2.2	0.9	40		6.4	0.8	1.1	1.3	0.07	52	0.07	36	2		84 7.1

July 9-15, 1961...	2,870	10	13	4.3	2.7	1.4	56	7.6	1.5	.1	1.9	.08	69	.08	2,870	50	4	115	7.3
July 16-24.....	2,892	10	15	6.7	2.6	1.4	88	9	1.5	.1	2.4	.13	82	.11	2,892	60	6	130	7.4
July 25-Aug. 18...	1,684	11	23	8.4	4.2	2.2	108	8.8	2.8	.1	2.4	.13	100	.11	1,680	78	6	167	7.4
Aug. 19-30.....	2,135	10	26	10	4.5	2.2	122	11	4.5	.1	3.0	.25	133	.18	2,140	106	6	199	7.5
Weighted average	9,119	10	11	3.3	2.4	1.2	44	7.6	1.1	0.1	1.3	0.10	65	0.09	1,610	40	4	95	--

Temperature (°F) of water, water year October 1960 to September 1961

Month	Day																			Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
October.....	60	61	60	59	60	60	59	58	58	58	58	57	57	57	57	57	57	57	57	57
November.....	50	51	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
December.....	41	41	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
January.....	38	38	39	38	41	38	37	39	39	38	38	39	39	38	40	39	40	40	40	40
February.....	39	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
March.....	41	40	40	39	41	40	41	40	41	40	41	40	40	42	41	42	41	41	41	41
April.....	44	45	44	44	44	44	46	45	44	45	46	46	45	46	46	46	46	46	46	46
May.....	53	51	53	54	53	53	53	53	53	53	53	54	54	54	54	54	54	54	54	54
June.....	62	63	64	64	64	65	63	65	64	65	66	65	66	66	66	66	66	66	66	66
July.....	71	70	70	70	70	70	71	70	71	70	71	71	71	71	71	71	71	71	71	71
August.....	72	68	68	67	69	66	70	69	68	70	70	70	70	70	70	70	70	70	70	70
September.....	68	65	65	68	68	68	61	66	67	68	67	69	64	66	64	64	64	64	64	64

OKANOGAN RIVER BASIN

12-4473. OKANOGAN RIVER NEAR BREWSTER, WASH.

LOCATION.--At bridge on State Highway 10, 1.5 miles upstream from mouth, 3.5 miles east of Brewster, Okanogan County, and 11.5 miles downstream from gaging station.

DRAINAGE AREA.--8,210 square miles, approximately, upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: July 1959 to September 1961.

REMARKS.--Records of discharge given for Okanogan River near Malott. No appreciable inflow between sampling point and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate		
Oct. 18, 1960.....	1,200	11		37	10	9.7	2.1	144	2	1.5	0.3	0.0	0.04	182			135	13		298
Nov. 16.....	1,240	11		36	9.4	9.2	1.8	139	0	1.8	.3	.1	.03	180			129	15		278
Dec. 19.....	1,070	11		38	10	9.8	1.9	149	0	1.5	.3	.2	.06	181			137	15		300
Jan. 17, 1961....	1,280	9.8		35	8.6	9.2	2.1	137	0	1.5	.2	.2	.08	172			123	10		273
Feb. 16.....	1,250	12		34	8.8	8.9	2.0	132	0	1.2	.3	.2	.07	166			121	13		265
Mar. 13.....	1,150	10		35	9.0	8.9	1.9	134	1	1.5	.3	.1	.04	165			124	13		271
Apr. 21.....	1,850	11		31	6.5	6.5	1.6	116	0	1.0	.1	.2	.11	144			104	9		225
May 9.....	4,130	12		21	4.8	4.7	1.0	83	0	.2	.1	.3	.05	100			72	4		160
June 13.....	15,500	18.9		4	3.2	3.3	.9	82	0	.0	.1	.3	.04	115			78	6		160
July 31.....	2,500	11		35	11.8	8.1	1.3	337	2	1.5	.3	.4	.05	182			131	15		282
Aug. 21.....	1,800	11		35	11	12	2.6	154	3	1.5	.2	.1	.04	205			147	16		314
Sept. 20.....	1,845	11		39	12	12	2.6	154	3	1.5	.2	.1	.04	205			147	16		314

METHOW RIVER BASIN

12-4499.5. METHOW RIVER AT PATEROS, WASH.

LOCATION --At bridge, on U.S. Highway 97, in Pateros, Okanogan County, 0.5 mile upstream from mouth, and 4 miles downstream from gaging station.
 DRAINAGE AREA --1,760 square miles, approximately, upstream from gaging station.
 RECORDS AVAILABLE --Chemical analyses: July 1959 to September 1961.
 REMARKS --No appreciable inflow between sampling point and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 18, 1960.....	435	11		29	5.3	4.6	0.6	109	3	11	0.5	0.2	0.6	0.00	119			94	0		198	8.4
Nov. 16.....	422	12		29	4.8	4.0	0.6	110	0	10	.8	.2	.7	.02	120			92	2		190	8.1
Dec. 19.....	300	13		28	5.1	4.0	0.7	110	0	9.8	.8	.2	1.0	.02	118			91	1		184	8.2
Jan. 17, 1961.....	360	12		29	4.9	4.4	.9	112	0	8.8	.8	.1	.8	.00	120			93	1		192	8.0
Feb. 16.....	368	13		28	5.7	4.5	.8	112	0	9.8	.5	.2	.7	.00	117			93	1		189	8.1
Mar. 13.....	380	11		28	4.8	4.3	.8	107	1	9.4	.5	.3	.7	.00	118			90	0		188	8.3
Apr. 21.....	1,380	12		23	3.1	3.3	.5	86	0	7.0	.2	.2	.4	.01	96			70	0		151	8.1
May 9.....	2,480	10		18	2.6	3.2	.6	68	0	4.8	.0	.2	.3	.01	74			56	0		120	7.8
May 13.....	2,680	10		19	2.5	3.1	.5	36	0	2.8	.0	.1	.2	.01	46			28	0		67	7.4
July 12.....	1,520	11		20	2.3	3.1	.7	74	0	5.8	.0	.2	.4	.07	83			60	0		131	7.9
Aug. 21.....	1,387	11		29	5.9	4.6	1.1	114	0	11	.2	.2	1.3	.00	123			97	4		199	8.2
Sept. 20.....	320	13		32	6.0	5.0	1.1	123	0	12	.5	.2	1.3	.00	137			105	4		211	8.2

WENATCHEE RIVER BASIN

12-4576. WENATCHEE RIVER NEAR LEAVENWORTH, WASH.

LOCATION --At bridge on U. S. Highway 2, 0.3 mile upstream from Hatchery Creek, and 6 miles northwest of Leavenworth, Chelan County.
 RECORDS AVAILABLE --Chemical analyses, July 1959 to September 1961.
 REMARKS --No discharge records available.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 18, 1960.....		8.2		4.5	1.1	1.3	0.7	22	2.4	0.2	0.0	0.0	0.00	30			16	0			42.7.4
Nov. 17.....		7.3		3.5	.8	1.4	.8	16	2.8	.0	.1	.1	.00	29			12	0			34.7.0
Dec. 20.....		8.0		4.0	.9	1.0	.6	19	2.0	.0	.1	.2	.00	26			14	0			37.7.4
Jan. 16, 1961.....		6.1		3.0	1.7	1.0	.6	12	2.4	.0	.0	.3	.00	26			13	0			27.6.7
Feb. 16.....		9.2		3.3	1.0	1.1	.6	18	2.2	.0	.0	.3	.01	31			13	0			36.7.2
Mar. 13.....		9.3		4.0	1.1	1.2	.8	20	2.2	.3	.0	.2	.01	31			14	0			38.7.3
Apr. 20.....		9.3		4.0	1.0	1.3	.8	20	2.4	.0	.1	.3	.01	32			14	0			40.7.4
May 9.....		9.1		4.0	.8	1.2	1.0	18	2.0	.0	.1	.2	.01	27			13	0			37.7.2
June 13.....		6.6		2.5	.7	.8	.7	12	1.6	.2	.0	.2	.01	23			9	0			25.6.9
July 12.....		6.3		3.0	.4	1.0	.7	11	2.0	.0	.0	.1	.03	22			9	0			25.6.7
Aug. 21.....		6.7		4.0	.6	1.1	1.0	17	2.0	.0	.0	.2	.00	30			12	0			32.7.3
Sept. 20.....		8.9		4.0	1.2	1.4	1.1	22	2.8	.2	.1	.1	.00	33			15	0			39.7.4

WENATCHEE RIVER BASIN--Continued

12-4625.2. WENATCHEE RIVER AT WENATCHEE, WASH.

LOCATION.--At bridge on U.S. Highway 97, 0.8 mile northwest of Wenatchee, Chelan County, and 0.9 mile upstream from mouth.
 RECORDS AVAILABLE.--Chemical analyses: July 1960 to September 1961.
 REMARKS.--No discharge records available.

Chemical analyses, in parts per million, July 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbocationate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate		
July 20, 1960.....		6.3		3.5	1.2	1.1	0.7	19		1.0	0.2	0.0	0.2	0.01	25			14	0	0	35
Aug. 18.....	8.3			6.5	3.2	2.4	1.1	40		3.2	1.5	1	3	0.01	46			30	0	0	70
Sept. 20.....	10			8.0	4.0	3.1	1.1	49		4.2	1.0	0	6	0.03	58			36	0	0	92
Oct. 18.....	9.9			8.0	4.2	2.8	1.2	48		5.0	1.0	1	6	0.01	59			37	0	0	89
Nov. 16.....	8.1			5.5	2.3	1.6	0.9	30		1.8	1.5	1	3	0.20	38			23	0	0	56
Dec. 19.....	9.3			6.0	3.3	2.0	0.6	38		3.0	0.5	1	6	0.01	44			28	0	0	69
Jan. 16, 1961.....	7.4			5.0	1.8	1.0	0.8	24		2.2	0.2	0	6	0.02	37			20	0	0	47
Feb. 17.....	11			6.0	3.3	1.8	1.0	36		3.2	0.2	0	4	0.02	40			26	0	0	65
Mar. 13.....	11			7.0	2.9	2.1	0.9	36		3.4	0	0	0	0.02	40			30	0	0	70
Apr. 21.....	10			6.0	2.6	1.9	0.8	34		3.4	0	1	3	0.01	43			26	0	0	63
May 9.....	10			5.0	2.4	1.6	0.8	29		2.0	0	1	4	0.01	36			22	0	0	54
June 13.....	7.6			3.0	1.3	0.9	0.5	18		1.6	0	0	2	0.00	26			13	0	0	33
July 12.....	6.8			4.0	1.0	1.0	0.7	18		1.0	0.2	0	1	0.01	24			14	0	0	37
Aug. 21.....	9.4			6.5	2.7	2.4	1.2	36		3.6	1.0	1	5	0.03	48			27	0	0	66
Sept. 21.....	11			9.0	5.0	3.6	1.3	56		5.8	1.0	1	8	0.02	66			43	0	0	101

CRAB CREEK BASIN

12-4726. CRAB CREEK NEAR SRYRNA, WASH.

LOCATION.--At county bridge, 2.5 miles east of Sryrna, Grant County, 12.5 miles upstream from gaging station, and 17 miles upstream from mouth of Soap Lake is probably noncontributing, upstream from gaging station.

DRAINAGE AREA.--4,550 square miles, approximately, of which about 500 square miles in the vicinity of Soap Lake is probably noncontributing, upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: August 1959 to September 1961.

Water temperatures: August 1959 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 872 ppm Mar. 23-25; minimum, 408 ppm June 30-July 7.

Hardness: Maximum, 258 ppm Mar. 23-25; minimum, 172 ppm June 30-July 7.

Specific conductance: Maximum daily, 1,320 microhos Mar. 24, 25; minimum daily, 646 microhos July 4.

Water temperatures: Maximum, 86°F June 18, Aug. 1; minimum, freezing point on several days during December and January.

EXTREMES, 1959-61.--Dissolved solids: Maximum, 872 ppm Mar. 23-25, 1961; minimum, 408 ppm June 30-July 7, 1961.

Hardness: Maximum, 258 ppm Mar. 23-25, 1961; minimum, 172 ppm June 30-July 7, 1961.

Specific conductance: Maximum daily, 1,320 microhos Mar. 24, 25, 1961; minimum daily, 646 microhos July 4, 1961.

Water temperatures: Maximum, 86°F July 7, 8, 1960; minimum, freezing point on several days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Portland, Oreg. Records of discharge given for Crab Creek near Beverly. No appreciable inflow between sampling point and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhos at 25°C)
														Parts per million	Tons per acre-foot	Calcium, Magnesium	Non-carbonate		
Oct. 1-31, 1960...	64.4 24													574	0.78	221	0	0	897 8.1
Nov. 1-15...	58.8 28			44	27	114	14	342	0	132	43	1.1	0.6	622	0.85	234	0	0	962 8.2
Nov. 16-23...	66.5 29			46	28	123	14	367	0	142	46	1.2	0.6	622	0.90	232	0	0	1,020 8.4
Nov. 24-26...	74.0 29			48	27	136	15	378	6	147	52	1.2	0.7	662	1.06	240	0	0	1,200 8.3
Nov. 27-Dec. 7...	72.2 30			50	28	176	17	418	6	190	68	1.2	1.4	782	0.86	226	0	0	982 8.2
Dec. 6-Jan. 6, 1961...	54.4 32			44	27	124	13	362	0	132	45	1.3	1.6	600	0.82	223	0	0	941 8.2
Jan. 7-10...	79.0 31			42	27	145	16	396	7	132	52	1.2	2.6	682	0.90	214	0	0	1,020 8.4
Jan. 11-Feb. 1...	66.5 32			45	25	116	14	360	0	122	46	1.3	2.8	598	0.81	217	0	0	958 8.1
Feb. 2...	86.0 28			38	22	146	16	398	0	114	43	1.2	2.7	708	0.96	186	0	0	1,080 8.2
Feb. 3...	94.0 30			48	22	164	18	380	0	168	60	1.2	2.7	708	0.96	212	0	0	1,080 8.2
Feb. 4-13...	91.3 31			43	25	142	16	380	0	146	52	8	2.5	667	0.91	212	0	0	1,020 8.0
Feb. 14-Mar. 7...	71.9 30			44	26	125	16	380	0	137	48	7	1.0	634	0.86	217	0	0	951 8.2
Feb. 6-13...	67.0 29			41	28	131	15	363	0	136	52	1.0	1.5	610	0.83	216	0	0	947 8.1
Mar. 14-22...	69.0 28			42	27	139	15	368	0	141	52	1.0	1.6	610	0.84	218	0	0	963 8.1
Mar. 23-25...	66.7 26			46	34	202	19	420	0	259	74	1.1	1.6	872	1.19	258	0	0	1,300 8.2
Mar. 26-Apr. 14...	52.8 26			44	29	130	15	362	0	147	52	1.1	0.8	617	0.84	228	0	0	960 8.2

Apr. 15-21, 1961..	67.6	16	40	28	118	14	132	8	52	9	1	25	554	.75	101	214	0	876	8.4	0	
22-May 12.....	62.8	18	40	25	114	14	128	0	44	9	1.1	30	540	.73	91.6	209	0	866	8.1	0	
May 19-June 5.....	61.9	21	40	25	103	12	126	0	44	9	1.1	30	540	.68	84.1	204	0	815	8.2	0	
June 6-13.....	61.9	21	38	24	93	12	292	0	36	9	1.3	30	488	.85	85.5	194	0	776	7.9	0	
June 14-23.....	67.6	21	36	22	82	12	272	0	31	8	1.0	.29	449	.61	82.0	180	0	705	8.1	0	
June 24-30.....	62.9	18	35	21	74	10	253	0	29	8	.5	.15	408	.55	69.3	172	0	660	8.1	0	
July 1-7.....	62.9	18	36	24	85	12	279	0	104	32	8.6	.25	462	.63	53.8	187	0	739	8.1	0	
July 8-20.....	41.5	21	40	23	100	13	302	0	111	36	9.1	1.0	268	.510	69	58	0	779	8.1	0	
July 21-25.....	40.4	24	40	24	96	12	288	0	115	36	9.1	1.0	222	505	69	200	0	773	8.1	0	
July 26-Aug. 25.....	49.6	26	41	24	96	12	298	0	115	36	9.1	1.0	222	505	69	200	0	773	8.1	0	
Aug. 26-Sept. 3.....	55.8	27	42	26	106	13	317	0	127	36	9.1	1.6	201	544	82	210	0	848	8.0	0	
Sept. 4-30.....	67.8	23	42	26	98	12	300	0	116	37	9.1	.6	.19	501	.68	210	0	765	8.0	0	
Weighted average	62.2	26	42	26	115	14	335	0	129	44	1.0	1.1	0.35	569	0.77	96.0	212	0	884	--	--

Temperature (°F) of water, water year October 1960 to September 1961

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

YAKIMA RIVER BASIN

12-4987. NACHES RIVER AT YAKIMA, WASH.

LOCATION --At bridge on U.S. Highway 97, 300 feet upstream from mouth, and 0.6 mile north of Yakima, Yakima County.
 RECORDS AVAILABLE.--Chemical analyses: July 1960 to September 1961.
 REMARKS.--No discharge records available.

Chemical analyses, in parts per million, July 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bi-car- bon- ate (HCO ₃)	Car- bon- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Phos- phate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		So- dium ad- sorp- tion ratio (25°C)	Specific con- duct- ance (micro- hmhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Cal- cium	Non-car- bon- ate			
July 29, 1960.....		17		9.0	1.7	3.2	1.1	41	0	2.2	1.0	0.1	0.1	0.05	59			30	0		75	7.4
Aug. 23.....		17		8.5	2.0	3.4	1.0	42	0	3.0	1.2	.1	.2	.05	60			29	0		79	7.8
Sept. 26.....		19		10	3.5	4.8	1.2	55	0	5.2	1.5	.1	.1	.06	72			40	0		104	8.0
Oct. 25.....		22		12	3.6	5.1	1.2	52	5	4.6	1.8	.1	.4	.08	81			44	0		109	8.8
Nov. 22.....		16		9.5	2.3	3.6	.6	45	0	3.6	1.5	.1	.4	.07	62			33	0		84	7.7
Dec. 19.....		15		9.0	2.9	4.4	.5	47	0	4.6	1.2	.1	.1	.06	62			34	0		90	7.7
Jan. 23, 1961....		15		9.0	2.2	3.5	.6	43	0	3.2	1.0	.1	.3	.06	56			32	0		81	7.7
Feb. 27.....		16		8.0	2.1	3.6	.5	39	0	3.2	.8	.1	.2	.06	53			29	0		74	7.4
Mar. 27.....		22		10	2.7	4.5	.8	52	0	4.2	1.2	.1	.1	.05	77			36	0		93	7.9
Apr. 26.....		19		9.0	1.6	3.6	.7	42	0	2.8	.8	.1	.1	.06	69			29	0		76	7.6
May 23.....		15		6.0	1.5	2.7	.7	30	0	2.4	.5	.2	.1	.07	50			21	0		56	7.3
June 26.....		14		8.0	1.6	2.5	.6	31	0	2.6	.5	.0	.3	.03	43			22	0		55	7.6
July 27.....		15		8.0	1.4	3.0	.9	38	0	3.2	.5	.1	.1	.05	51			26	0		67	7.6
Aug. 31.....		17		9.0	2.0	3.6	1.0	44	0	3.6	1.0	.1	.1	.04	63			31	0		78	7.4

YAKIMA RIVER BASIN--Continued
12-5050. YAKIMA RIVER NEAR PARKER, WASH.--Continued

Chemical analyses, in parts per million, water year October 1960 to September 1961--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
													Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Apr. 18-May 11, 1961....	5,243	16		9.0	3.4	4.4	0.7	50	3.2	1.2	0.1	0.4	70	0.10	991	36	0		91	7.4
May 12-June 10....	8,200	14		8.0	3.1	3.6	.9	44	2.2	1.0	.1	.3	60	.08	1,330	33	0		77	7.5
June 11-27.....	4,014	15		8.5	2.5	4.0	.8	44	3.6	1.0	.1	.4	58	.08	639	32	0		84	7.2
June 28-July 25....	319	15		9.5	3.2	5.3	.9	53	5.0	1.5	.2	.4	69	.09	39.4	37	0		98	7.4
July 26-Aug. 24....	320	17		10	3.6	5.7	1.4	57	4.4	1.5	.1	.4	72	.10	82.2	40	0		102	7.6
Aug. 25-Sept. 23....	243	18		10	4.8	6.7	1.3	63	5.4	2.0	.1	.4	80	.11	92.5	43	0		102	7.6
Sept. 24-30.....	380	16		13	3.6	6.8	1.4	69	4.8	2.5	.1	.4	89	.12	91.3	47	0		124	7.9
Weighted average	2,790	17		11	3.9	5.3	1.0	58	4.1	1.7	0.1	0.5	77	0.10	579	43	0		107	--

Temperature (°F) of water, water year October 1960 to September 1961

		Temperature at 2 1/2 ft. of water, water from October 1900 to September 1901.																															
		Day																														Average	
Month		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		31
56	October.....	56	57	57	56	58	57	54	53	53	55	54	50	57	58	48	49	54	55	55	--	55	--	52	--	52	50	52	--	51	45	54	
45	November.....	48	48	46	47	--	44	42	45	45	45	43	43	42	43	42	44	42	44	43	44	42	38	40	36	40	38	38	41	--	42	44	
40	December.....	40	41	38	39	37	36	34	35	34	35	34	35	37	38	35	34	35	36	35	37	37	37	38	35	36	35	33	34	33	36		
33	January.....	33	33	34	33	36	35	38	38	38	38	38	38	40	41	42	38	38	40	37	35	35	36	38	36	35	33	34	34	35	38	37	
38	February.....	38	37	38	42	42	43	39	41	41	40	40	40	40	40	40	38	44	40	38	43	41	41	39	42	39	40	42	--	47	43	41	
42	March.....	42	41	39	37	37	37	42	43	41	42	43	39	42	45	46	45	45	43	42	46	44	45	45	47	45	47	45	48	47	50	48	
50	April.....	50	48	48	45	47	48	47	49	50	47	48	48	47	44	47	48	51	47	44	44	--	45	45	52	50	54	50	51	52	48	--	48
48	May.....	48	48	48	48	47	59	55	49	50	49	52	52	52	49	51	52	52	56	52	56	52	54	53	52	54	52	52	53	52	51	51	
60	June.....	60	59	59	56	60	60	57	58	58	58	58	58	58	58	58	58	60	65	62	60	64	65	64	63	66	67	64	58	65	60	60	60
64	July.....	64	66	66	64	64	64	65	61	70	64	71	68	72	68	68	68	70	72	69	68	66	67	65	69	69	70	70	67	68	66	67	
70	August.....	70	70	72	72	68	--	68	64	65	69	67	69	68	68	--	68	70	--	69	70	72	68	66	62	62	65	68	65	68	68	68	
65	September.....	65	65	63	68	65	59	65	60	65	63	63	64	63	58	64	62	60	62	60	59	59	59	57	61	58	57	58	54	57	--	61	

YAKIMA RIVER BASIN--Continued

12-5105. YAKIMA RIVER AT KIONA, WASH.

LOCATION.--At highway bridge, downstream from gaging station at Kiona, Benton County, 3.5 miles downstream from intake of Kiona Canal, and 25 miles upstream from mouth.

DRAINAGE AREA.--5,600 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: December 1952 to September 1961.

Water temperatures: December 1952 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 233 ppm Sept. 11-30; minimum, 81 ppm May 20-28.

Hardness: Maximum, 136 ppm July 13-27; minimum, 46 ppm May 20-28.

Specific conductance: Maximum, 447, 1,300 micromhos Sept. 16; minimum, 109 micromhos June 6.

Water temperatures: Maximum, 47.7, 21.2 micromhos Sept. 16; minimum, 44.7, 21.2 micromhos Sept. 16.

EXTREMES 1952-61.--Dissolved solids: Maximum, 242 ppm Oct. 11, 1958; minimum, 76 ppm May 1-23, 1957, Dec. 16-31, 1959.

Hardness: Maximum, 148 ppm Oct. 1-11, 1958; minimum, 42 ppm May 1-23, 1957, Dec. 16-31, 1959.

Specific conductance: Maximum, 148 ppm Oct. 1-11, 1958; minimum, 42 ppm May 1-23, 1957, Dec. 16-31, 1959.

Water temperatures: Maximum, 84°F July 18, 1960; minimum, 44°F July 21, 1961; minimum, freezing point on several days during winter months most years.

REMARKS.--Records of specific conductance of daily samples available in district office at Portland, Oreg.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 1-31, 1960...	2,209	29		32	12	21	3.5	174	0	21	7.0	0.0	2.9	0.10	230	0.31	1,370	129	0	0.8	331
Nov. 1-19.....	2,377	--		--	--	16	--	155	0	--	--	--	--	--	210	.29	1,360	112	0	--	283
Nov. 20-Dec. 5....	2,342	--		--	--	15	--	142	0	--	--	--	--	--	188	.26	1,190	110	0	--	279
Dec. 6-13.....	2,342	--		--	--	17	--	145	0	--	--	--	--	--	188	.26	1,190	110	0	--	279
Dec. 14-17.....	2,342	--		--	--	17	--	145	0	--	--	--	--	--	188	.26	1,190	110	0	--	279
Jan. 8, 1961....	2,145	--		--	--	18	--	142	0	--	--	--	--	--	181	.25	1,050	106	0	--	280
Jan. 9-17.....	2,937	27		22	8.9	15	2.5	122	0	13	6.5	.2	2.6	.01	158	.21	1,250	92	0	.7	245
Jan. 18-27.....	3,631	--		--	--	12	--	101	0	--	--	--	--	--	129	.18	1,280	76	0	--	201
Jan. 28-Feb. 2....	2,960	--		--	--	15	--	116	0	--	--	--	--	--	150	.20	1,200	88	0	--	233
Feb. 3-11.....	6,128	--		--	--	12	--	94	0	--	--	--	--	--	131	.18	2,170	71	0	--	195
Feb. 12-21.....	7,582	--		--	--	11	--	90	0	--	--	--	--	--	120	.16	2,460	66	0	--	180
Feb. 22-Mar. 7....	7,407	--		--	--	8.7	--	79	0	--	--	--	--	--	100	.14	2,000	58	0	--	152
Mar. 8-14.....	5,364	--		--	--	10	--	88	0	--	--	--	--	--	112	.15	1,820	64	0	--	173
Mar. 15-Apr. 4....	7,828	--		--	--	8.4	--	82	0	--	--	--	--	--	110	.15	2,320	60	0	--	155
Apr. 5-10.....	7,865	21		14	4.9	7.2	1.3	76	0	5.6	2.2	.1	1.0	.01	103	.14	2,190	55	0	.4	140
Apr. 11-28.....	4,859	--		--	--	9.3	--	87	0	--	--	--	--	--	114	.16	1,500	63	0	--	166
Apr. 29-May 19....	8,191	--		--	--	7.8	--	74	0	--	--	--	--	--	93	.13	2,060	54	0	--	140

MISCELLANEOUS ANALYSES OF STREAMS IN PACIFIC SLOPE BASINS IN WASHINGTON AND UPPER COLUMBIA RIVER BASIN

Chemical analyses, in parts per million, July 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Calcium, Magnesium	Non-carbonate		

CHEHALIS RIVER BASIN

12-200. CHEHALIS RIVER AT DRYAD, WASH.

Oct. 14, 1960.....	62	15			6.5	1.9	5.1	0.3	31		2.8	5.5	0.1	0.4	0.02	59		24	0	74	7.2
Jan. 5, 1961.....	1,520	14			4.0	1.4	3.6	1.1	21		2.2	3.0	1.1	.9	.04	42		16	0	53	7.1
Apr. 7.....	336	15			5.5	.8	4.0	1.1	24		2.4	3.8	1.1	.4	.03	48		17	0	57	7.3
July 14.....	47	14			7.0	1.6	5.7	.5	33		3.2	5.2	1.1	.3	.17	62		24	0	76	7.0

12-374. WYNOCHEE RIVER NEAR MONTESANO, WASH.

Oct. 6, 1960.....	61	11			8.5	1.8	2.7	0.2	35		4.0	1.8	0.3	0.1	0.00	50		28	0	71	7.2
Jan. 6, 1961.....	3,740	7.4			5.0	1.8	1.9	2	20		1.8	1.5	0	.3	.01	37		16	0	41	7.2
Apr. 5.....	1,130	9.5			7.0	1.8	1.8	1.1	26		3.6	1.8	0	.2	.01	41		25	0	52	7.1
July 18.....	121	11			8.0	1.9	2.7	.3	36		3.8	2.0	1	.2	.02	46		28	0	68	7.5

OZETTE RIVER BASIN

12-431.5. OZETTE RIVER AT OZETTE, WASH.

Oct. 5, 1960.....	2.5				2.5	0.8	3.7	0.1	9		2.0	5.8	0.0	0.2	0.00	29		9	2	42	6.7
Jan. 5, 1961.....	3.0				2.0	.9	3.6	.3	8		2.4	5.2	0	.4	.00	35		9	2	39	6.7
Apr. 4.....	3.7				3.0	.9	3.6	.2	8		3.2	5.8	1	.4	.00	36		11	4	38	6.8
July 17.....	2.7				3.0	.4	4.1	.3	9		3.0	5.2	1	.4	.01	28		9	2	39	6.9

ELWHA RIVER BASIN

12-455. ELWHA RIVER NEAR PORT ANGELES, WASH.

Oct. 5, 1960.....	344	5.9			1.6	1.2	2.2	0.0	49		8.8	1.0	0.0	0.0	0.00	67		45	5	101	7.6
Jan. 5, 1961.....	2,510	6.9			1.4	1.2	1.9	.0	44		7.4	.5	1	.1	.03	57		40	4	93	7.6
Apr. 4.....	1,940	7.0			1.5	.9	1.9	1	44		8.6	.8	1	.1	.01	62		41	5	92	7.6
July 17.....	1,660	4.8			1.1	.7	1.5	.0	34		6.6	.8	1	.1	.01	44		30	2	69	7.7

MISCELLANEOUS ANALYSES OF STREAMS IN PACIFIC SLOPE BASINS IN WASHINGTON AND UPPER COLUMBIA RIVER BASIN--Continued

Chemical analyses, in parts per million, July 1960 to September 1961--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbocatione (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Sodium carbonate ratio	Specific conductance (microhm-cm at 25°C)
														Parts per million	Tons per acre-foot	Calcium, Magnesium	Non-carbonate		
DUGENESS RIVER BASIN																			
12-480. DUGENESS RIVER NEAR SEQUIM, WASH.																			
Oct. 5, 1960.....	102	7.2		22	3.5	3.5	0.2	78		8.8	2.0	0.0	0.0	0.00	92		69	5	151
Jan. 5, 1961.....	383	6.5		17	2.7	2.9	0.0	62		7.4	1.2	0.1	0.01	74		54	2	120	7.7
Apr. 4.....	460	7.0		16	2.8	2.8	0.1	86		7.8	0.8	0.1	0.01	75		56	2	125	7.7
July 17.....	696	5.0		14	1.2	1.7	0.1	48		5.4	1.2	0.1	0.01	54		40	0	88	7.8
QUILCENE RIVER BASIN																			
12-523. BIG QUILCENE RIVER NEAR QUILCENE, WASH.																			
Oct. 5, 1960.....		10		18	2.9	7.8	0.0	52		3.0	21	0.1	0.3	0.05	94		57	14	158
Jan. 5, 1961.....		10		12	2.0	3.1	0.0	44		1.8	5.8	0.1	0.02	57		38	2	95	7.5
Apr. 4.....		10		12	1.3	2.2	0.0	43		2.0	2.8	0.1	0.01	55		35	0	80	7.6
July 17.....		7.8		12	2.0	2.7	0.1	46		2.2	4.8	0.1	0.02	59		38	0	90	7.6
DOSEWALLIPS RIVER BASIN																			
12-535. DOSEWALLIPS RIVER AT BRINNON, WASH.																			
Oct. 5, 1960.....		7.5		18	1.6	2.3	0.0	56		8.0	1.5	0.0	0.1	0.00	72		52	6	114
Jan. 5, 1961.....		6.9		14	1.7	1.8	0.0	47		6.4	1.0	0.1	0.01	59		42	4	93	7.6
Apr. 4.....		7.1		14	1.9	1.5	0.0	46		5.6	0.5	0.1	0.01	55		39	2	88	7.8
July 17.....		5.4		12	1.0	1.3	0.1	39		5.8	0.8	0.1	0.02	48		34	2	74	7.7

DESCHUTES RIVER BASIN

12-790. DESCHUTES RIVER NEAR RAINIER, WASH.

Oct. 14, 1960.....	42	21		12	3.1	7.3	0.7	51		2.2	11	0.0	0.4	0.04	87		43	1	121	7.4
Jan. 5, 1961.....	513	17		7.5	1.9	4.0	.2	35		1.2	4.0	.1	.5	.06	60		26	0	74	7.2
Apr. 7.....	243	18		8.0	1.8	4.6	.3	37		1.0	4.5	.1	.3	.05	65		28	0	79	7.4
July 14.....	50	23		12	2.9	7.3	.7	51		2.8	10	.0	.4	.13	91		42	0	120	7.2

NISQUALLY RIVER BASIN

12-895. NISQUALLY RIVER AT MCKENNA, WASH.

Oct. 14, 1960.....	659	14		6.5	1.3	3.6	0.7	28		5.2	2.2	0.2	0.2	0.05	53		22	0	61	7.3
Jan. 5, 1961.....	2,040	14		5.0	1.5	3.0	.5	26		2.8	1.5	.0	.4	.16	51		18	0	53	7.0
Apr. 7.....	1,570	15		5.5	1.2	2.6	.3	25		1.8	1.2	.1	.3	.02	48		18	0	48	7.2
July 14.....	504	14		5.5	1.3	2.8	.4	28		2.8	1.5	.0	.1	.05	45		19	0	53	7.2

PUYALLUP RIVER BASIN

12-935. PUYALLUP RIVER NEAR ORTING, WASH.

Oct. 4, 1960.....	285	14		7.0	2.2	3.9	0.6	25		13	2.0	0.0	0.4	0.14	65		26	6	74	7.4
Jan. 3, 1961.....	366	16		6.0	1.1	2.9	.4	25		3.4	1.2	.1	.2	.02	45		20	0	55	7.1
Apr. 19.....	597	14		5.5	1.4	2.9	.3	24		3.6	1.2	.0	.2	.02	48		18	0	50	7.0
July 5.....	874	9.9		4.0	1.4	2.1	.2	14		7.4	.2	.1	.1	.03	37		16	4	43	7.3

MISCELLANEOUS ANALYSES OF STREAMS IN PACIFIC SLOPE BASINS IN WASHINGTON AND UPPER COLUMBIA RIVER BASIN--Continued

Chemical analyses, in parts per million, July 1960 to September 1961--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (Fe)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F) (NO ₃) (PO ₄)	NI-Phosphate (NO ₃) (PO ₄)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium				Non-carbonate
DUWAMISH RIVER BASIN																					
12-1065. GREEN RIVER AT PALMER, WASH.																					
Oct. 4, 1960.....	162	13		6.5	1.4	3.3	0.2	32		1.4	1.5	0.0	0.2	0.01	46		22	0		62	7.4
Jan. 3, 1961.....	692	14		5.0	.8	2.4	.0	22		1.6	1.0	.0	.2	.02	36		16	0		49	7.4
Apr. 19.....	1,420	12		4.5	.8	2.4	.0	20		1.4	.8	.0	.2	.03	38		13	0		57	7.1
July 5.....	1,430	13		6.0	.6	3.0	.1	26		2.4	.8	.1	.1	.03	39		18	0		50	7.4
SNICHOMISH RIVER BASIN																					
12-1345. SKYKOMISH RIVER NEAR GOLD BAR, WASH.																					
Oct. 18, 1960.....	1,170	5.5		4.0	0.8	2.0	0.6	18		2.6	1.8	0.0	0.3	0.00	30		13	0		39	7.2
Jan. 16, 1961.....	23,700	4.0		2.5	.3	.9	.3	10		1.4	.5	.0	.4	.02	21		7	0		22	6.8
Apr. 20.....	3,140	5.9		4.5	.2	1.4	.2	16		1.8	1.0	.0	.2	.00	24		12	0		34	7.4
July 12.....	3,070	4.2		3.5	.3	1.0	.3	14		.6	1.2	.0	.0	.01	17		10	0		26	7.1
12-1444. SNOQUALMIE RIVER AT SNOQUALMIE, WASH.																					
Oct. 12, 1960.....	5.8			4.5	0.6	1.7	0.2	17		2.6	0.8	0.0	0.4	0.01	30		14	0		36	6.9
Jan. 16, 1961.....	4.0			5.0	.4	1.8	.4	17		2.4	1.5	.0	.3	.10	29		12	0		32	7.2
Apr. 19.....	6.3			4.5	.1	1.0	.1	14		2.4	1.2	.0	.3	.01	25		12	0		31	6.8
July 11.....	5.0			4.5	.4	1.0	.2	16		2.0	.5	.1	.1	.07	27		13	0		31	7.1
STILLAGUAMISH RIVER BASIN																					
12-1610. SOUTH FORK STILLAGUAMISH RIVER NEAR GRANITE FALLS, WASH.																					
Oct. 5, 1960.....	183	6.5		8.0	1.6	1.6	0.3	32		4.0	1.0	0.0	0.2	0.01	42		26	1		60	7.3
Jan. 3, 1961.....	342	6.8		4.0	1.3	1.2	.0	18		2.6	1.0	.0	.3	.03	34		20	1		50	7.4
Apr. 20.....	698	5.2		5.0	.8	1.0	.1	18		2.4	1.0	.1	.2	.02	29		16	0		39	7.0
July 6.....	698	3.5		4.5	.4	.7	.1	16		2.0	.5	.1	.2	.01	23		13	0		30	7.0

SEAGIT RIVER BASIN
12-1875. SAUK RIVER AT DARRINGTON, WASH.

Oct. 5, 1960.....	11		7.0	1.5	2.8	0.8	29	7.0	1.8	0.1	0.2	0.02	52			24	0	65	7.5
Jan. 3, 1961.....	10		7.0	1.3	1.9	.4	28	5.2	1.5	.0	.2	.02	47			23	0	59	7.3
Apr. 20.....	8		6.0	.9	1.5	.4	23	3.6	1.0	.0	.1	.01	34			16	0	58	7.1
July 6.....	5.2		4.0	.2	.9	.4	14	2.4	.2	.0	.1	.02	22			11	0	28	7.3

SAMISH RIVER BASIN
12-2015. SAMISH RIVER NEAR BURLINGTON, WASH.

Oct. 5, 1960.....	36	12	10	4.3	3.7	0.7	50	5.4	3.0	0.0	2.0	0.05	71			42	2	101	7.1
Jan. 4, 1961.....	157	8.3	7.5	2.1	2.7	.4	26	4.4	2.0	.1	3.2	.03	53			27	6	70	7.1
Apr. 20.....	315	6.4	6.0	1.7	2.6	.2	24	5.2	1.8	.1	1.7	.02	40			22	2	57	7.1
July 5.....	78	9.6	9.0	3.1	3.5	.9	43	5.2	2.2	.1	1.3	.02	58			35	0	86	7.1

SANOIL RIVER BASIN
12-4350. SANOIL RIVER AT KELLER, WASH.

July 27, 1960.....	19		25	6.6	6.6	1.3	108	0	14	0.5	0.3	0.1	0.08	123		90	1	196	8.0
Oct. 26.....	22		29	6.0	6.9	1.7	117	0	15	1.0	.4	.7	.11	141		97	1	212	7.8
Jan. 26, 1961.....	21		25	6.2	6.0	1.2	103	0	13	1.5	.3	.1	.07	125		88	4	192	8.0
Apr. 25.....	23		15	3.3	5.0	.9	63	0	8.4	.0	.3	.2	.11	98		51	0	121	7.3
July 25.....	22		25	5.5	6.5	1.4	93	6	13	.0	.3	.1	.12	130		85	0	192	8.8

MISCELLANEOUS ANALYSES OF STREAMS IN PACIFIC SLOPE BASINS IN WASHINGTON AND UPPER COLUMBIA RIVER BASIN--Continued

Chemical analyses, in parts per million, July 1960 to September 1961--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Car-bon-bon-ale (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo-ride (F)	Ni-trate phosphate (NO ₃ (PO ₄))	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃	So-dium ad-sorp-tion ratio	Specific con-duct-ance (micro-mhos at 25°C)	
														Parts per million	Tons per acre-foot				Cal-cium, Mag-nesium
OKANOGAN RIVER BASIN																			
12-4395. OKANOGAN RIVER AT OROVILLE, WASH.																			
Oct. 18, 1960.....	607	9.9		33	9.6	9.8	2.3	139	0	26	1.5	0.3	0.4	0.04	172		122	8	270 8.2
Jan. 17, 1961.....	546	7.5		34	9.0	10	2.4	141	0	26	1.2	0.3	1	0.04	176		122	6	273 8.0
Apr. 20.....	400	6.3		35	9.3	10	2.2	142	0	28	1.5	0.2	1	0.02	170		126	9	272 8.0
July 11.....	484	7.9		30	8.2	8.6	2.1	114	4	24	1.2	0.2	1	0.02	149		109	9	238 8.5
SIMILKAMEEN RIVER AT OROVILLE, WASH.																			
July 20, 1960.....	1,640	10		20	4.1	3.1	0.8	76		11	0.2	0.1	0.1	0.02	90		67	4	142 8.1
Oct. 18.....	430	12		31	5.1	4.7	1.1	109		19	0.2	0.2	0	0.02	132		98	9	208 8.0
Jan. 17, 1961.....	790	10		30	4.0	4.4	1.0	102		17	0.5	0.1	0.1	0.09	125		92	8	199 8.0
Apr. 20.....	1,450	11		26	2.9	3.6	0.8	87		12	0	0.1	0.2	0.01	103		77	6	164 8.0
July 11.....	2,240	11		20	3.2	3.0	0.9	70		12	0.5	0.1	0.1	0.04	87		63	6	135 7.8
CHELAN RIVER BASIN																			
12-4525. CHELAN RIVER AT CHELAN, WASH.																			
July 20, 1960.....	5,030	4.9		6.0	1.4	1.5	0.5	24		3.2	0.0	0.1	0.1	0.01	34		20	1	52 7.4
Oct. 18.....	2,210	5.0		6.5	0.8	1.2	0.4	25		3.4	0	0	0.4	0.01	31		20	0	48 7.4
Jan. 17, 1961.....	2,100	3.7		6.5	0.8	1.4	0.5	24		3.4	0	0	0.2	0.03	36		20	0	49 7.3
Apr. 21.....	1,630	5.0		6.5	0.9	1.5	0.5	24		4.2	0	0.1	0.2	0.00	35		20	0	49 7.4
July 12.....	4,600	5.3		7.0	0.6	1.1	0.5	24		4.4	0.2	0	0.1	0.04	38		20	0	49 7.4

ENTIAT RIVER BASIN

12-4530. ENTIAT RIVER NEAR ENTIAT, WASH.

Oct. 18, 1960.....	15		12	3.0	3.0	1.4	55	4.8	0.5	0.1	0.3	0.02	70	42	0	99	7.7
Jan. 16, 1961.....	13		8.5	1.9	2.5	1.1	45	3.5	.2	.1	.1	.07	59	32	0	77	7.4
Apr. 21.....	13		10	2.4	2.6	.8	45	4.0	.0	.1	.2	.01	60	35	0	83	7.7
July 12.....	11		7.0	.6	1.4	.8	27	3.4	.2	.0	.1	.01	41	20	0	50	7.5

YAKIMA RIVER BASIN

12-4795. YAKIMA RIVER AT CLE ELUM, WASH.

Oct. 19, 1960.....	6.8	487	6.5	1.3	1.9	0.0	30	1.6	0.8	0.0	0.2	0.02	37	22	0	51	7.2
Jan. 17, 1961.....	9.4	1,050	7.0	1.8	2.3	.1	34	2.6	1.0	.0	.1	.01	42	25	0	59	7.3
Apr. 21.....	7.6	1,790	6.0	2.0	2.1	.0	30	1.4	.5	.0	.1	.01	37	24	0	57	7.6
July 11.....	5.7	2,410	5.5	1.6	1.0	.1	27	.8	.2	.1	.1	.02	29	20	0	45	7.3

PART 13. SNAKE RIVER BASIN

SNAKE RIVER MAIN STEM

13-375. SNAKE RIVER HEAR HEISE, IDAHO

LOCATION --At Eagle Rock canal headgate, 1.2 miles upstream from Heise, Jefferson County, 1.6 miles downstream from Anderson canal headgate, 1.8 miles downstream from gaging station, approximately 4.8 miles east of Ririe, and approximately 21 miles upstream from Henrys Fork.

DRAINAGE AREA --5,752 square miles upstream from gaging station.

RECORDS AVAILABLE --Chemical analyses: January 1953 to September 1961.

Water temperatures: January 1953 to September 1961.

EXTREMES, 1960-61 --Dissolved solids: Maximum, 344 ppm Dec. 4-10; minimum, 174 ppm July 9-Sept. 2.

Hardness: Maximum, 256 ppm Dec. 4-10; minimum, 125 ppm Aug. 8-Sept. 2.

Specific conductance: Maximum daily, 579 microhos Dec. 6; minimum daily, 273 microhos July 21.

Water temperatures: Maximum, 63°F on several days during August and September; minimum, freezing point on many days during winter months.

EXTREMES, 1953-61 --Dissolved solids: Maximum, 378 ppm Nov. 11-20, 1956; minimum, 161 ppm July 1-10, 1954.

Hardness: Maximum, 276 ppm Feb. 1-28, 1955; minimum, 117 ppm July 21-Aug. 10, 1955.

Specific conductance: Maximum daily, 791 microhos Nov. 13, 1956; minimum daily, 240 microhos June 27, 1954.

Water temperatures: Maximum, 67°F July 19, 1955; minimum, freezing point on many days during winter months.

REMARKS --Records of specific conductance of daily samples available in district office at Portland, Oreg. Approximately 2.5 percent of normal annual streamflow of 5,000,000 acre feet is diverted by Anderson canal between sampling point and gaging station. This diversion occurs during the months of May to November.

Except for leakage through the headgate, no other diversion or appreciable inflow between sampling point and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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) (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃	So-dium ad-sorp-tion ratio	Specific con-duct-ance (micro-mhos at 25°C)			
														Parts per million	Tons per acre-foot	Tons per day						
Oct. 1-14, 1960.....	4,202	9.8		44	9.7	14	2.2	148	0	40	14	0.6	0.7	0.05	217	0.30	2,460	180	28	0.5	361	7.9
Oct. 15-Nov. 4.....	1,639	--		--	--	19	--	187	0	--	--	--	--	--	284	.39	1,260	202	49	--	469	8.1
Nov. 5-Dec. 3.....	1,440	--		--	--	20	--	205	0	--	--	--	--	--	316	.43	1,230	228	60	--	519	8.2
Dec. 4-10.....	1,394	--		--	--	22	--	220	0	--	--	--	--	--	344	.47	1,280	256	76	--	554	8.2
Dec. 11-30.....	1,395	--		--	--	19	--	207	0	--	--	--	--	--	319	.43	1,200	232	62	--	523	8.1
Dec. 31- Jan. 9, 1961.....	1,854	--		--	--	18	--	198	0	--	--	--	--	--	309	.42	1,550	220	58	--	496	8.1
Jan. 10-Feb. 8.....	1,829	9.7		64	15	16	2.7	196	0	61	20	.7	.7	.01	302	.41	1,490	222	62	.5	489	8.2
Feb. 9-Mar. 8.....	1,661	--		--	--	17	--	196	2	--	--	--	--	--	318	.43	1,430	227	63	--	507	8.3
Mar. 9-Apr. 2.....	1,753	--		--	--	18	--	200	0	--	--	--	--	--	300	.41	1,420	229	65	--	494	8.2
Apr. 3-17.....	2,149	9.6		59	16	17	2.7	194	0	64	18	.5	.4	.04	289	.39	1,680	212	52	.5	475	8.1
Apr. 18-24.....	3,691	--		--	--	14	--	176	0	--	--	--	--	--	260	.35	2,590	197	53	--	426	8.0
Apr. 25-May 15.....	7,278	--		--	--	14	--	162	0	--	--	--	--	--	236	.32	4,640	177	44	--	397	8.0
May 16-June 8.....	11,440	--		--	--	12	--	158	0	--	--	--	--	--	220	.30	6,800	167	37	--	372	8.0
June 9-20.....	12,480	--		--	--	9.7	--	150	0	--	--	--	--	--	204	.28	6,870	154	31	--	342	7.9
June 21-July 8.....	12,510	--		--	--	8.3	--	138	0	--	--	--	--	--	180	.24	6,080	141	28	--	306	8.0

July 9-11	11	36	9.6	8.8	1.7	126	0	31	7.2	.4	.3	.07	174	.24	5,300	130	26	.3	278 8.1
Aug. 7, 1961.....	11	36	9.6	8.8	1.7	126	0	31	7.2	.4	.3	.07	174	.24	5,300	130	26	.3	278 8.1
Aug. 8-Sept. 2.....	11	36	9.6	8.8	1.7	126	0	31	7.2	.4	.3	.07	174	.24	5,300	130	26	.3	278 8.1
Sept. 3-15.....	11	36	9.6	8.8	1.7	126	0	31	7.2	.4	.3	.07	174	.24	5,300	130	26	.3	278 8.1
Sept. 16-21.....	11	36	9.6	8.8	1.7	126	0	31	7.2	.4	.3	.07	174	.24	5,300	130	26	.3	278 8.1
Sept. 22-30.....	11	36	9.6	8.8	1.7	126	0	31	7.2	.4	.3	.07	174	.24	5,300	130	26	.3	278 8.1
Weighted average	11	36	9.6	8.8	1.7	126	0	31	7.2	.4	.3	.07	174	.24	5,300	130	26	.3	278 8.1

Temperature (°F) of water, water year October 1960 to September 1961

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

SNAKE RIVER MAIN STEM

13-1545. SNAKE RIVER AT KING HILL, IDAHO

LOCATION.--At county highway bridge, approximately 400 yards downstream from gaging station at King Hill, Elmore County, and 20 miles downstream from Big Wood River.

DRAINAGE AREA.--35,800 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: March 1951 to September 1961.

Water temperatures: March 1951 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 354 ppm Oct. 1-31; minimum, 291 ppm May 4-June 3.

Hardness: Maximum, 206 ppm Sept. 25-30; minimum, 176 ppm May 4-June 3.

Specific conductance: Maximum daily, 553 micromhos Oct. 19-Nov. 15; minimum daily, 469 micromhos May 24, 29, 31.

Water temperatures: Maximum, 69°F on several days during summer months; minimum, 47°F on several days during December and January.

EXTREMES, 1961-61.--Dissolved solids: Maximum, 354 ppm Oct. 1-31, 1962; minimum, 282 ppm May 1-10, 1952.

Hardness: Maximum, 220 ppm Nov. 1-10, 21-30, 1953, Oct. 16-31, 1958; minimum, 166 ppm May 1-10, 1952.

Specific conductance: Maximum daily, 594 micromhos Oct. 31, 1952; minimum daily, 384 micromhos May 7, 1952.

Water temperatures: Maximum, 72°F Aug. 1, 1956; minimum, 40°F Feb. 2, 1956.

REMARKS.--Record of specific conductance of daily samples available in district office at Portland, Oreg. No appreciable inflow between gaging station and sampling point except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl sulfide (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boride (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 1-31, 1960...	8,795	35		49	20	36	4.5	230	0	55	26	0.8	3.7	0.06	354	0.50	8,410	205	16	1.1	542
Nov. 1-30.....	8,528	--		--	--	35	--	230	0	--	--	--	--	--	--	--	8,040	202	13	--	537
Dec. 1-11.....	8,219	--		--	--	35	--	228	0	--	--	--	--	--	--	--	7,680	192	5	--	530
Dec. 12-31.....	8,178	--		--	--	34	--	226	0	--	--	--	--	--	--	--	7,570	204	19	--	537
Jan. 1-16, 1961...	7,810	34		48	19	34	4.8	224	0	50	25	.7	4.1	.11	335	.46	7,060	200	16	1.0	528
Jan. 17-Feb. 5....	7,586	--		--	--	33	--	214	1	--	--	--	--	--	320	.45	6,760	201	24	--	518
Feb. 6-21.....	7,422	--		--	--	33	--	214	0	--	--	--	--	--	324	.44	6,600	195	20	--	506
Feb. 22-Mar. 10...	7,322	--		--	--	33	--	214	0	--	--	--	--	--	324	.44	6,190	186	21	--	498
Mar. 11-28.....	7,164	--		--	--	33	--	201	4	--	--	--	--	--	316	.43	6,110	189	18	--	497
Mar. 29-Apr. 15...	7,137	32		42	19	33	5.6	202	0	50	26	.6	3.1	.08	309	.42	5,950	182	16	1.1	484
Apr. 16-May 3.....	6,857	--		--	--	33	--	202	3	--	--	--	--	--	317	.43	5,890	190	19	--	493

SNAKE RIVER MAIN STEM--Continued

13-1545. SNAKE RIVER AT KING HILL, IDAHO--Continued

Chemical analyses, in parts per million, water year October 1960 to September 1961--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbocationate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium, silum	Non-carbonate		
May 4--																				
June 3, 1961.....	6,664	--	--	--	--	32	--	190	0	--	--	--	--	291	.40	5,240	176	20	--	480 8.0
June 4-July 2.....	6,630	--	--	--	--	34	--	204	0	--	--	--	--	312	.42	5,580	188	21	--	503 8.2
July 3-Aug. 2.....	6,634	33	42	42	22	34	4.4	206	0	54	26	0.6	2.7	318	.43	5,700	197	28	1.0	505 8.2
Aug. 3-31.....	6,560	--	--	--	--	35	--	199	0	--	--	--	--	311	.42	5,840	183	20	--	486 7.5
Sept. 1-24.....	7,432	--	--	--	--	37	--	200	11	--	--	--	--	314	.43	6,280	201	19	--	516 8.3
Sept. 25-30.....	7,455	--	--	--	--	37	--	203	11	--	--	--	--	337	.46	6,810	206	21	--	542 8.7
Weighted average	7,457	--	--	--	--	34	--	212	1	--	--	--	--	326	0.44	6,660	195	19	--	513

Temperature (°F) of water, water year October 1960 to September 1961

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

BOISE RIVER BASIN

13-2125. BOISE RIVER AT NOTUS, IDAHO

LOCATION. --At highway bridge, 1,100 feet upstream from gaging station, 0.2 mile southeast of Notus, Canyon County, and 7 miles northwest of Caldwell.
 DRAINAGE. --820 square miles, approximately.
 RECORDS AVAILABLE. --Chemical analyses: January 1939 to January 1940, November 1950 to September 1961.

Sediment records: January 1939 to June 1940.

EXTREMES, 1960-61. --Dissolved solids: Maximum, 561 ppm Aug. 1-30; minimum, 275 ppm Apr. 23-26.

Hardness: Maximum, 200 ppm Aug. 1-30; minimum, 109 ppm Apr. 23-26.

Water temperatures: Maximum daily, 903 microhms Aug. 5, 18; minimum daily, 390 microhms Apr. 24.

EXTREMES, 1939-40, 1950-61. --Dissolved solids: Maximum, 914 ppm Aug. 21-31, 1939; minimum, 35 ppm June 11-26, 1953.

Hardness: Maximum, 284 ppm July 21-31, 1939; minimum, 35 ppm June 11-26, 1953.

Specific conductance: Maximum daily, 1,470 microhms July 30, Aug. 26, 1939; minimum daily, 82 microhms Apr. 27, 1952.

Water temperatures: Maximum, 85°F on several days during summer months in 1951, 1952, 1954; minimum, freezing point Jan. 31, 1956.

REMARKS. --Records of specific conductance of daily samples available in district office at Portland, Oreg. No appreciable inflow between gaging station and sampling point except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl Sulfate (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Bo-ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃	So-rium ad-sorp-tion ratio	Specific con-ductance (microhms at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day					
Oct. 1-9, 1960.....	500	32	--	44	12	64	4.7	244	0	68	16	0.6	4.8	0.10	375	0.51	506	158	0	2.2	562	8.0
Oct. 10-16.....	873	--	--	--	--	55	--	220	0	--	--	--	--	--	330	.45	778	156	0	--	498	7.9
Oct. 17-Nov. 16.....	792	--	--	--	--	77	--	286	0	--	--	--	--	--	436	.59	932	192	0	--	661	7.6
Nov. 17-Dec. 3.....	736	--	--	--	--	78	--	284	0	--	--	--	--	--	444	.60	882	192	0	--	667	7.6
Dec. 4-.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Jan. 2, 1961.....	621	--	--	--	--	82	--	289	0	--	--	--	--	--	458	.62	768	194	0	--	689	7.6
Jan. 29-Feb. 16.....	535	36	--	54	15	74	5.2	287	0	86	.8	9.0	.03	--	468	.64	676	196	0	2.3	694	7.6
Jan. 29-Feb. 16.....	537	--	--	--	--	73	--	286	0	--	--	--	--	--	465	.63	674	199	0	--	690	7.6
Feb. 17-Mar. 13.....	486	--	--	--	--	82	--	288	0	--	--	--	--	--	449	.61	589	190	0	--	699	7.7
Mar. 14-18.....	485	--	--	--	--	79	--	288	0	--	--	--	--	--	431	.59	564	184	0	--	680	7.6
Mar. 19-Apr. 10.....	428	--	--	--	--	80	--	281	0	--	--	--	--	--	435	.59	503	188	0	--	672	7.8
Apr. 11-16.....	120	28	--	52	17	104	7.8	343	0	104	.30	.7	5.4	.20	508	.69	165	198	0	3.2	788	7.7
Apr. 17-19.....	68.7	--	--	--	--	64	--	207	0	--	--	--	--	--	351	.48	65.1	134	0	--	537	7.9
Apr. 20-22.....	45.3	--	--	--	--	92	--	264	0	--	--	--	--	--	490	.67	59.9	178	0	--	736	8.1
Apr. 23-26.....	147	--	--	--	--	43	--	161	0	--	--	--	--	--	275	.37	109	109	0	--	418	7.9
Apr. 27-29.....	72.0	--	--	--	--	72	--	223	0	--	--	--	--	--	395	.54	76.8	150	0	--	604	7.8

BOISE RIVER BASIN--Continued
 13-2125. BOISE RIVER AT NOTUS, IDAHO--Continued
 Chemical analyses, in parts per million, water year October 1960 to September 1961--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		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
														Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate			
Apr. 30- May 3, 1961.....	166	--	--	--	--	47	--	174	0	--	--	--	--	286	0.39	128	115	0	--	438	7.6
May 4.....	186	--	--	--	--	99	--	282	0	--	--	--	--	516	.70	259	190	0	--	765	7.7
May 5-8.....	260	--	--	--	--	45	--	174	0	--	--	--	--	277	.38	194	116	0	--	428	7.9
May 9.....	123	--	--	--	--	64	--	214	0	--	--	--	--	356	.48	118	139	0	--	536	8.0
May 10, 11.....	49.5	--	--	--	--	88	--	261	0	--	--	--	--	474	.64	83.4	176	0	--	715	7.9
May 12-15.....	94.5	--	--	--	--	70	--	225	0	--	--	--	--	371	.50	94.7	149	0	--	571	8.1
May 16-19.....	45.5	--	--	--	--	87	--	262	7	--	--	--	--	495	.67	60.8	190	0	--	761	8.5
May 20-27.....	49.6	--	--	--	--	104	--	285	0	--	--	--	--	506	.69	87.8	192	0	--	791	8.0
May 28, 29.....	78.0	--	--	--	--	70	--	232	0	--	--	--	--	384	.52	80.9	156	0	--	598	7.9
May 30-June 5.....	247	--	--	--	--	57	--	206	0	--	--	--	--	324	.44	216	136	0	--	636	8.0
June 6-16.....	151	--	--	--	--	77	--	249	0	--	--	--	--	412	.66	168	164	0	--	783	8.1
June 17-28.....	82.8	--	--	--	--	99	--	288	0	--	--	--	--	514	.70	115	190	0	--	783	8.1
June 29-July 5.....	128	--	--	--	--	78	--	264	0	--	--	--	--	449	.61	155	172	0	--	672	8.0
July 6-11.....	198	33	--	42	13	71	5.0	247	0	20	0.6	4.3	0.16	410	0.56	217	160	0	2.4	607	8.2
July 12-31.....	52.8	--	--	--	--	114	--	300	4	--	--	--	--	545	.74	77.7	196	0	--	802	8.3
Aug. 1-30.....	61.3	--	--	--	--	119	--	318	0	--	--	--	--	561	.76	92.9	200	0	--	831	8.1
Aug. 31-Sept. 18.....	104	--	--	--	--	108	--	306	0	--	--	--	--	516	.70	145	188	0	--	781	8.0
Sept. 19-30.....	597	--	--	--	--	70	--	246	0	--	--	--	--	372	.51	600	148	0	--	573	7.6
Weighted average	379.3	--	--	--	--	77	--	277	0	--	--	--	--	436	0.59	447	185	--	--	660	--

BOISE RIVER BASIN--Continued
 13-2125. BOISE RIVER AT NOTUS, IDAHO--Continued
 Temperature (°F) of water, water year October 1960 to September 1961

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

MALHEUR RIVER BASIN--Continued

13-2270. BULLY CREEK NEAR VALE, OREG.--Continued

Suspended sediment, water year October 1960 to September 1961
(Where no concentrations are reported, loads are estimated)

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..	15	--	2	10	C 12	T	8.6	C 38	1
2..	14	50	2	10	C 12	T	8.2	C 38	1
3..	14	C 21	1	10	C 12	T	8.2	C 38	1
4..	14	C 21	1	10	C 12	T	9.5	C 38	1
5..	14	C 21	1	10	C 12	T	7.8	C 38	1
6..	14	C 21	1	10	C 12	T	7.0	C 38	1
7..	14	C 21	1	10	C 12	T	6.5	C 38	1
8..	13	C 21	1	10	C 12	T	6.0	C 38	1
9..	12	C 21	1	10	C 12	T	6.0	C 38	1
10..	12	C 21	1	10	C 12	T	6.0	C 14	T
11..	14	C 21	1	10	C 12	T	6.0	C 14	T
12..	13	C 21	1	10	C 12	T	6.0	C 14	T
13..	12	C 21	1	10	C 12	T	6.0	C 14	T
14..	11	C 21	1	10	C 12	T	6.0	C 14	T
15..	12	C 21	1	10	C 12	T	6.5	C 14	T
16..	11	8	T	10	C 12	T	7.0	C 14	T
17..	11	--	T	9.5	C 12	T	8.0	C 14	T
18..	10	--	T	10	C 12	T	9.0	C 14	T
19..	11	100	4	10	C 12	T	8.5	C 14	T
20..	10	77	2	9.5	C 12	T	8.0	C 14	T
21..	11	C 27	1	9.0	C 12	T	7.0	C 14	T
22..	10	C 27	1	9.0	C 12	T	8.0	C 14	T
23..	10	C 27	1	9.0	C 12	T	8.0	C 14	T
24..	10	C 27	1	8.6	C 12	T	7.5	C 14	T
25..	10	C 27	1	8.6	C 12	T	7.0	C 14	T
26..	10	C 27	1	8.6	C 35	1	7.5	C 14	T
27..	10	C 27	1	8.6	C 35	1	8.0	C 14	T
28..	10	190	5	8.6	C 35	1	7.4	C 14	T
29..	10	--	1	8.6	C 35	1	7.0	C 14	T
30..	10	--	1	8.6	C 35	1	7.0	C 14	T
31..	10	27	1	--	--	--	7.4	C 14	T
Total	362	--	39	286.2	--	13	226.6	--	15
Day	JANUARY			FEBRUARY			MARCH		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	7.0	C 24	T	92	1270	S 402	8.2	--	1
2..	6.5	C 24	T	52	1250	S 276	7.8	44	1
3..	6.5	C 24	T	196	2360	S 1340	7.8	--	1
4..	6.0	C 24	T	50	420	57	7.8	--	1
5..	6.0	C 24	T	34	122	11	8.2	--	1
6..	6.0	C 24	T	29	74	6	8.6	27	1
7..	6.0	C 24	T	21	55	3	8.6	--	1
8..	7.0	C 24	T	28	68	5	8.2	--	1
9..	7.5	C 24	T	22	55	3	7.8	C 17	T
10..	8.0	C 24	1	98	767	S 290	7.8	C 17	T
11..	9.0	C 24	1	78	240	51	7.8	C 17	T
12..	9.5	C 24	1	50	105	14	7.8	C 17	T
13..	9.5	C 24	1	38	73	7	8.2	C 17	T
14..	9.0	C 24	1	34	69	6	8.2	C 17	T
15..	9.0	C 24	1	35	73	7	54	594	S 102
16..	8.2	--	1	28	71	5	63	204	35
17..	7.8	--	1	16	62	3	28	115	9
18..	7.8	--	1	15	62	3	22	40	2
19..	7.4	--	1	14	54	2	19	25	B 1
20..	7.4	32	1	13	C 34	1	15	120	A 5
21..	7.0	--	1	12	C 34	1	12	100	B 3
22..	7.0	--	1	12	C 34	1	10	66	2
23..	7.0	46	1	12	C 34	1	13	54	2
24..	6.5	--	1	10	C 34	1	59	230	A 37
25..	6.0	48	1	10	C 34	1	57	160	25
26..	6.0	--	1	10	85	A 2	50	61	8
27..	6.5	57	1	9.0	44	B 1	44	53	6
28..	7.0	65	1	8.2	38	1	34	50	5
29..	7.8	--	1	--	--	--	24	44	3
30..	8.2	--	1	--	--	--	29	71	S 4
31..	9.0	100	2	--	--	--	16	64	K 4
Total	229.1	--	27	1026.2	--	2501	661.8	--	266

E Estimated.

S Computed by subdividing day.

T Less than 0.50 ton.

A Computed from partly estimated concentration graph.

B Computed from estimated concentration graph.

C Composite period.

J Computed from partly estimated concentration graph and subdividing day.

MALHEUR RIVER BASIN--Continued

13-2270. BULLY CREEK NEAR VALE, OREG.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
(Where no concentrations are reported, loads are estimated)

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..	19	24	1	5.4	C 24	T	7.8	51	1
2..	32	260	K 27	5.4	C 24	T	7.8	--	2
3..	37	140	A 14	5.8	C 24	T	7.8	--	2
4..	24	74	B 5	6.2	C 24	T	7.8	77	2
5..	14	31	B 1	6.6	C 24	T	7.8	--	2
6..	12	C 11	T	7.0	C 24	T	8.6	--	2
7..	12	C 11	T	6.2	C 24	T	8.2	119	3
8..	12	C 11	T	5.8	C 24	T	7.8	--	2
9..	12	C 11	T	6.2	C 24	T	7.0	--	2
10..	10	C 11	T	6.2	C 24	T	7.0	83	2
11..	8.2	C 11	T	7.0	C 24	T	7.0	--	2
12..	4.2	C 9	T	6.6	C 24	T	7.4	--	2
13..	4.0	C 9	T	7.0	C 24	T	7.0	76	1
14..	2.5	C 9	T	7.0	C 32	1	6.6	--	1
15..	2.5	C 9	T	7.4	C 32	1	7.0	--	1
16..	2.5	C 9	T	7.4	C 32	1	7.0	63	1
17..	2.5	C 9	T	7.8	C 32	1	6.6	--	1
18..	2.5	C 9	T	8.2	C 32	1	7.0	--	2
19..	2.5	C 9	T	8.2	C 32	1	7.4	85	2
20..	9.2	--	1	8.6	C 32	1	7.0	--	2
21..	4.8	C 16	T	8.6	C 32	1	7.4	--	2
22..	4.5	C 16	T	9.0	C 32	1	7.0	550	A 10
23..	4.5	C 16	T	9.5	C 32	1	7.4	--	2
24..	4.8	C 16	T	9.5	C 32	1	7.4	--	2
25..	4.2	C 16	T	9.5	C 32	1	7.4	--	2
26..	4.5	C 16	T	9.0	C 32	1	7.0	--	2
27..	4.2	C 16	T	9.0	C 32	1	6.6	--	2
28..	4.5	C 16	T	9.0	C 32	1	6.6	--	2
29..	4.8	C 16	T	9.0	C 32	1	9.5	140	A 4
30..	5.0	C 16	T	8.2	C 32	1	9.5	113	3
31..	--	--	--	8.2	C 32	1	--	--	--
Total	27.4	--	53	234.5	--	23	223.4	--	66
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..	7.8	--	1	5.4	--	1	2.2	C 30	T
2..	7.4	55	E 1	5.4	66	1	2.2	C 30	T
3..	7.0	--	1	5.8	--	1	2.2	C 30	T
4..	7.0	--	1	5.8	--	2	2.2	C 30	T
5..	7.0	320	A 6	5.8	130	2	2.2	C 30	T
6..	7.0	130	B 2	5.8	--	2	2.2	C 30	T
7..	7.0	18	T	5.8	--	1	2.2	C 30	T
8..	6.6	--	1	5.8	75	1	2.2	C 30	T
9..	6.2	75	1	6.2	--	1	2.2	C 30	T
10..	6.2	--	1	5.8	75	1	2.2	C 30	T
11..	5.8	150	2	5.4	--	1	2.2	C 30	T
12..	5.8	--	1	5.0	--	1	2.2	C 30	T
13..	5.4	--	1	5.0	130	2	2.2	C 30	T
14..	5.8	56	1	5.0	--	1	2.2	C 30	T
15..	6.2	--	1	4.5	13	T	2.2	C 30	T
16..	6.2	--	2	4.2	--	T	2.2	C 30	T
17..	5.8	100	2	4.2	65	1	2.2	C 30	T
18..	5.8	--	2	4.0	--	T	2.2	C 30	T
19..	5.8	--	1	3.5	23	T	2.4	C 30	T
20..	6.2	69	1	3.2	--	T	2.4	C 30	T
21..	5.8	--	1	3.2	15	T	2.4	C 30	T
22..	5.4	92	1	3.2	--	T	2.4	C 30	T
23..	5.4	--	1	2.8	80	1	2.4	C 30	T
24..	5.4	88	1	2.8	--	T	2.4	C 30	T
25..	5.4	--	1	3.0	--	T	2.4	C 30	T
26..	5.8	95	1	2.8	23	T	2.4	C 30	T
27..	5.4	--	2	2.2	--	T	2.2	C 30	T
28..	5.4	190	A 3	2.2	--	T	2.2	C 30	T
29..	5.8	120	B 2	2.4	--	T	2.2	C 30	T
30..	5.8	95	1	2.4	28	T	2.2	C 30	T
31..	5.8	--	1	2.5	--	T	--	--	--
Total	189.4	--	44	131.1	--	23	67.8	--	5

Total discharge for year (cfs-days)..... 3,908.5
 Total load for year (tons)..... 3,075

E Estimated.
 T Less than 0.50 ton.
 A Computed from partly estimated concentration graph.

B Computed from estimated concentration graph.
 C Composite period.
 K Computed from estimated-concentration graph and subdividing day.

MALHEUR RIVER BASIN--Continued

13-2270. BULLY CREEK NEAR VALE, OREG.--Continued

Particle-size analyses of suspended sediment, water year October 1960 to September 1961

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sampling point	Water tem- per- ature (° F)	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Suspended sediment											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Feb. 3, 1961.....	2255		36	78	908		44	68	82	92	97	97	98	98	98	100	100	SBWC
Mar. 16.....	2350		49	71	456		47	59	69	76	80	84	86	87	88	100	100	SBWC

MALHEUR RIVER BASIN--Continued

13-2340. MALHEUR RIVER NEAR ONTARIO, OREG.

LOCATION.--At bridge on State Highway 201, 0.4 mile upstream from mouth, 1.5 miles northwest of Ontario, Malheur County, and 5.8 miles downstream from Brosman Diversion Dam.

RECORDS AVAILABLE.--Chemical analyses: August 1960 to August 1961.

REMARKS.--No discharge records available.

Chemical analyses, in parts per million, August 1960 to August 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Ammonium (NH ₄)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180° C)	Hardness as CaCO ₃	Total acidity (micro-mos at H ⁺ , 25° C)	pH or Col.	Detergents (ABS)	
Aug. 25, 1960	46					75	29	242	13	--	457	0	376	60	0.7	6.9	--	1,050	308	0	1,560	8.1	--
Sept. 20, 1960	46					78	29	244	13	--	460	0	369	62	.8	6.2	4.8	1,080	312	0	1,500	8.1	35
Oct. 25, 1960	45					82	32	237	12	0.0	477	7	379	55	.8	5.2	.97	1,090	336	0	1,590	8.3	--
Nov. 8, 1960	44					83	26	224	12	0.0	476	0	326	58	.8	6.9	1.1	1,020	314	0	1,510	8.2	--
Dec. 14, 1960	47					89	29	233	12	1.1	502	0	338	59	.8	7.4	1.2	1,060	340	0	1,520	8.2	35
Jan. 31, 1961	42					81	26	206	11	1.1	445	0	314	54	1.1	6.9	1.2	1,000	308	0	1,390	8.1	75
Feb. 28, 1961	43					70	27	190	10	0	385	13	283	48	.5	5.6	.99	869	284	0	1,270	8.5	60
Mar. 29, 1961	39					54	21	152	8.4	1.1	331	5	215	38	.6	3.8	.79	719	222	0	1,030	8.4	.04
Apr. 25, 1961	35					55	22	163	9.9	1.1	356	0	224	50	.7	2.6	.91	762	226	0	1,090	8.0	.04
May 22, 1961	38					69	30	250	13	0	460	0	362	70	.8	3.6	1.2	1,060	294	0	1,580	8.2	.09
June 27, 1961	39					60	31	314	15	1.1	524	0	415	89	.9	3.0	1.7	1,230	278	0	1,830	8.0	.02
July 25, 1961	40					57	33	330	15	1.0	500	0	463	87	.8	5.3	1.3	1,270	278	0	1,850	8.0	.02
Aug. 30, 1961	44					67	33	304	15	1.9	512	0	419	86	.9	2.2	1.3	1,230	304	0	1,760	8.0	.03
																							70

SNAKE RIVER MAIN STEM

13-2690. SNAKE RIVER AT WEISER, IDAHO

LOCATION.--At bridge on U.S. Highway 30N, at Weiser, Washington County, 0.3 mile downstream from gaging station, and 0.6 mile downstream from Weiser River.

DRAINAGE AREA.--69,200 square miles, approximately, upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: August 1911 to August 1912, August 1960 to August 1961.

REMARKS.--Samples analyzed are a composite of samples taken at 3 lateral points. No inflow between gaging station and sampling point except during periods of heavy local runoff.

Chemical analyses, in parts per million, August 1960 to August 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Ammonium (NH ₄)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total hardness as mg/L at 25°C	pH	Color or turbidity (ABS)
																			Calcium, mg/L	Non-carbonate, mg/L			
Aug. 25, 1960	13,700	26				42	18	52	5.2	--	215	0	75	25	0.7	3.2	0.12	357	181	5	570	7.8	--
Sept. 20, 1960	13,100	28				40	20	52	5.2	--	222	0	77	26	0.7	2.7	0.23	358	183	1	578	8.0	--
Oct. 31, 1960	10,900	32				52	19	56	5.3	0	232	6	84	28	0.9	3.7	0.09	397	206	6	620	8.3	--
Nov. 8, 1960	11,300	32				52	18	56	5.5	0	248	0	86	28	0.6	5.5	0.17	413	204	0	647	8.1	5
Dec. 14, 1960	11,400	31				50	16	46	4.7	0	225	0	67	24	0.8	4.0	0.15	376	192	8	563	8.0	5
Feb. 3, 1961	16,500	31				38	14	37	5.2	0	180	0	51	20	0.7	4.5	0.33	305	151	4	466	7.7	--
Feb. 28, 1961	11,300	31				40	19	44	4.7	0	205	0	67	22	0.5	3.9	0.20	326	179	11	521	8.2	0.05
Mar. 29, 1961	13,200	29				35	12	34	3.7	0	163	0	49	18	0.5	1.9	0.15	265	136	2	415	8.0	0.01
Apr. 24, 1961	10,200	25				36	14	40	4.6	0	183	0	56	22	0.7	1.5	0.08	304	148	0	463	8.1	0.02
May 23, 1961	12,700	17				26	12	34	3.8	1	140	0	48	18	0.6	1.0	0.10	228	115	0	381	8.2	0.02
June 27, 1961	7,870	23				40	18	50	5.8	1	210	0	72	25	0.8	1.8	0.10	341	176	4	553	8.2	0.03
July 25, 1961	8,380	22				36	18	47	5.6	4	196	0	75	26	0.9	1.6	0.05	335	165	4	533	8.1	0.01
Aug. 30, 1961	9,520	27				38	18	53	5.4	3	208	0	79	26	0.7	1.6	0.14	365	169	0	544	8.1	0.02

POWDER RIVER BASIN

13-2771. POWDER RIVER BELOW BAKER, OREG.

LOCATION.--At county road bridge, 4.0 miles upstream from Pine Creek, and 4.5 miles north of Baker, Baker County.

RECORDS AVAILABLE.--Chemical analyses: August 1960 to July 1961.

REMARKS.--No discharge records available.

Chemical analyses, in parts per million, August 1960 to July 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (mg/l)	Aluminum (Al) (mg/l)	Iron (Fe) (mg/l)	Manganese (Mn) (mg/l)	Calcium (Ca) (mg/l)	Magnesium (Mg) (mg/l)	Sodium (Na) (mg/l)	Potassium (K) (mg/l)	Ammonium (NH ₄) (mg/l)	Bicarbonate (HCO ₃) (mg/l)	Carbonate (CO ₃) (mg/l)	Sulfate (SO ₄) (mg/l)	Chloride (Cl) (mg/l)	Fluoride (F) (mg/l)	Nitrate (NO ₃) (mg/l)	Dissolved solids (mg/l at 180°C)	Hardness as CaCO ₃		Total acidity (micro-mhos at 25°C)	pH	Coliforms or germs (per 100 ml)	Turbidity (APC)
																		Calcium	Non-magnesium				
Aug. 25, 1960		13				23	7.5	29	4.1	--	117	4	24	15	0.3	7.0	189	88	0	312	8.5	--	0
Sept. 20, 1960		22				26	7.3	30	5.6	--	138	0	25	15	.3	2.3	210	95	0	324	7.4	--	5
Oct. 24, 1960		21				25	8.2	30	5.3	0.2	129	5	25	14	.3	2.5	222	96	0	318	8.7	--	5
Nov. 8, 1960		22				21	6.5	18	4.2	0	107	0	17	6.5	.2	8.2	160	79	0	248	7.2	--	20
Dec. 14, 1960		22				20	6.2	13	2.3	0	98	0	16	3.5	.2	4.6	142	76	0	204	7.2	--	75
Feb. 1, 1961		19				14	3.7	8.0	6.4	.1	69	0	9.2	3.2	.5	2.5	132	50	0	150	6.8	--	240
Feb. 28, 1961		20				17	6.0	8.9	2.1	.1	88	0	12	1.5	.2	3	119	67	0	169	7.9	0.07	10
Mar. 28, 1961		22				14	5.4	11	1.6	.1	76	0	11	1.5	.2	3	107	57	0	182	8.1	.06	5
Apr. 24, 1961		18				16	4.3	11	2.0	0	69	4	11	4.0	.2	2.3	113	58	0	161	8.4	.25	5
May 23, 1961		9.9				25	7.3	16	3.6	.1	139	0	11	3.5	.2	3.1	150	92	0	250	7.9	.12	5
June 27, 1961		26				24	7.6	18	3.6	.1	138	0	14	4.5	.2	7.1	172	91	0	256	8.2	.05	10
July 25, 1961		24				26	7.5	21	4.4	.1	146	0	14	9.0	.3	6.2	188	96	0	285	7.5	.25	5

SNAKE RIVER MAIN STEM

13-2902. SNAKE RIVER BELOW PINE CREEK, AT ORBOW, OREG.

LOCATION.--Temperature recorder at gaging station, at Orbow, Baker County, 0.1 mile upstream from Hansaker Creek, 0.1 mile north of Orbow School, 0.3 mile downstream from Pine Creek, and 3.2 miles north of Homestead.
 DRAINAGE AREA.--73,150 square miles, approximately.
 RECORDS AVAILABLE.--May 1956 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 73°F Aug. 20-23, sometime during period Aug. 24 to Sept. 14; minimum, 36°F several days during January and February.
 EXTREMES, 1956-61.--Water temperatures: Maximum, 81°F July 25, 1956; minimum, freezing point on several days during January 1957.

			Temperature (°F) of water, water year October 1960 to September 1961																															Average		
			Day																																	
Month			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
October	Maximum	66	66	66	66	66	65	65	65	65	64	64	63	63	63	62	62	62	62	61	61	60	60	59	59	59	59	59	58	58	57	62				
	Minimum	65	65	65	65	65	65	65	63	63	63	63	63	62	62	62	61	61	60	60	59	59	59	59	59	59	58	58	57	57	61					
November	Maximum	57	57	57	56	56	55	55	55	54	54	54	53	53	52	52	52	51	51	51	51	51	51	51	51	51	50	50	50	49	49	53				
	Minimum	57	56	56	56	55	55	55	54	54	54	53	53	52	52	52	51	51	51	51	51	51	51	51	51	50	50	50	49	49	52					
December	Maximum	49	48	48	48	48	48	47	46	46	46	46	46	46	45	45	45	45	44	44	44	44	44	44	44	43	43	43	42	42	42	45				
	Minimum	48	48	48	48	48	47	46	46	46	46	46	46	45	45	45	45	44	44	44	44	44	44	44	44	43	43	43	42	42	42	45				
January	Maximum	42	41	40	40	40	40	40	40	40	39	39	38	38	38	38	38	38	37	37	37	37	37	37	37	37	37	37	37	37	37	38				
	Minimum	41	40	40	40	40	40	40	40	40	39	39	38	38	38	38	38	37	37	37	36	36	36	37	37	37	37	37	37	37	37	36				
February	Maximum	36	36	37	37	38	38	38	38	38	38	38	38	38	38	38	38	39	39	39	39	39	39	39	40	40	40	41	41	41	41	39				
	Minimum	36	36	36	37	37	38	38	37	38	38	37	37	37	38	38	38	38	39	39	39	39	39	39	39	39	39	40	41	41	41	38				
March	Maximum	41	--	41	41	41	41	41	41	41	41	41	--	42	42	42	42	42	43	43	43	44	44	44	44	44	44	44	44	45	45	43				
	Minimum	41	--	41	41	41	41	41	41	41	41	41	41	--	42	42	42	42	43	43	43	44	44	44	44	44	44	44	44	44	45	42				
April	Maximum	45	46	48	48	48	48	48	48	48	48	48	48	49	50	50	50	51	51	51	51	51	51	51	51	51	51	51	52	52	52	50				
	Minimum	45	45	46	48	48	48	48	48	48	48	48	49	50	50	50	50	51	51	51	51	51	51	51	51	51	51	51	52	52	52	50				
May	Maximum	53	53	54	54	54	54	54	54	54	54	54	54	55	55	55	57	57	57	57	59	60	61	--	--	--	--	--	--	--	--	--				
	Minimum	52	53	53	54	54	54	54	54	54	54	54	54	55	55	55	56	56	57	58	58	59	--	--	--	--	--	--	--	--	--	--				
June	Maximum	63	64	64	64	65	65	66	66	66	66	66	67	68	68	68	67	68	68	67	68	68	68	68	69	69	69	69	69	69	69	67				
	Minimum	61	63	64	64	65	65	66	66	66	66	66	67	67	68	67	67	67	67	67	67	67	67	68	68	69	69	69	69	69	69	66				
July	Maximum	--	--	--	--	--	--	--	--	--	70	70	70	70	71	71	70	69	69	69	69	69	69	71	71	71	70	70	71	71	72	--				
	Minimum	--	--	--	--	--	--	--	--	--	70	70	70	70	70	70	69	69	69	69	69	69	69	69	70	70	69	70	70	71	71	--				
August	Maximum	--	--	--	--	--	--	--	--	--	--	72	72	72	72	72	72	72	72	72	72	73	73	73	73	73	73	73	73	73	73	--				
	Minimum	--	--	--	--	--	--	--	--	--	--	72	72	72	72	72	72	72	72	72	72	72	73	73	73	73	73	73	73	73	73	--				
September	Maximum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
	Minimum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			

SALMON RIVER BASIN

13-3042. BIG SPRINGS CREEK NEAR LEADORE, IDAHO

LOCATION.--Temperature recorder at gaging station, downstream from culvert crossing, on State Highway 28, and 2.7 miles northwest of Leadore, Lemhi County.

RECORDS AVAILABLE.--Water temperatures: July 1959 to September 1961 (discontinued).

EXTREMES, 1960-61.--Water temperatures: Maximum, 68°F July 14; minimum, 38°F Dec. 31, Jan. 27.

EXTREMES, 1959-61.--Water temperatures: Maximum, 68°F July 5, 1960, July 14, 1961; minimum, 36°F Feb. 26, 28, 29, Mar. 10, 1960.

Temperature (°F) of water, water year October 1960 to September 1961

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

GRANDE RONDE RIVER BASIN

113-3190. GRANDE RONDE RIVER AT LA GRANDE, OREG.

LOCATION.--Temperature recorder at gaging station, 2 miles northwest of La Grande, Union County, and 5 miles downstream from Five point Creek.
DRAINAGE AREA.--678 square miles.

WATER TEMPERATURES AVAILABLE, --Water temperatures: September 1959 to August 1961 (discontinued).

EXTREMES, 1960-61.--Water temperatures: Minimum, freezing point on many days during winter months.

EXTREMES, 1959-61.--Water temperatures: Maximum (1959-61), 86°F July 27, 1960; minimum, freezing point on many days during winter months.

Temperature (°F) of water, October 1960 to August 1961

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

GRANDE RONDE RIVER BASIN--Continued

13-3235. GRANDE RONDE RIVER NEAR ELGIN, OREG.

LOCATION --At bridge on State Highway 82, 0.1 mile downstream from gaging station, 1.6 miles downstream from Willow Creek, and 3.8 miles south of Elgin, Union County, 1,250 square miles, approximately.

DATE OF ANALYSIS --August 1961 to August 1962, September 1959 to August 1961.

RECORDS AVAILABLE --Chemical analyses: August 1961 to August 1962, September 1959 to August 1961.

REMARKS --No inflow between gaging station and sampling point except during periods of heavy local runoff.

Chemical analyses, in parts per million, October 1960 to August 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Ammonium (NH ₄)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃	Toxicity (micro-inches at 25°C)	pH	Coliform or (ABS)	Durability
Oct. 24, 1960	80	31				12	4.7	11	2.5	0.0	83	4.0	3.0	0.1	0.3	0.19	111	49	149	7.7		-- 30
Nov. 8,	106	31				12	4.0	10	2.2	0.0	77	3.4	3.0	0.2	0.5	0.26	110	46	140	7.6		-- 10
Dec. 14,	158	34				12	3.9	9.7	2.0	0.0	74	3.4	3.0	0.2	0.5	0.15	107	46	129	7.5		-- 5
Feb. 1, 1961	301	30				10	3.3	7.0	2.4	0.1	58	3.4	1.8	0.0	1.0	0.20	104	38	107	7.6		-- 95
Feb. 28,	920	31				8.0	2.6	4.9	2.0	0.0	46	3.2	1.0	0.2	0.8	0.24	98	31	84	7.6		0 02 20
Mar. 28,	1,410	33				7.0	2.7	5.0	1.5	0.0	44	3.4	0.8	0.1	0.5	0.10	92	29	80	7.6		01 20
Apr. 24,	930	31				6.5	2.9	5.2	1.5	0.0	44	3.6	1.0	0.1	0.3	0.08	81	28	77	7.2		01 15
May 23,	1,980	27				5.0	1.7	3.5	1.3	0.0	33	1.6	0.0	0.1	0.2	0.11	65	20	58	7.4		02 20
June 24,	1,180	26				8.5	3.1	6.5	1.9	0.1	57	2.4	0.8	0.1	0.4	0.23	83	34	97	7.3		01 45
July 24,	24	25				11	4.0	8.9	3.1	0.2	52	3.8	1.0	0.2	0.2	0.18	121	59	133	7.6		01 15
Aug. 30,	12	38				15	5.0	9.2	3.3	0.2	50	3.8	1.0	0.2	0.2	0.26	129	58	151	7.6		02 10

GRANDE RONDE RIVER BASIN--Continued

13-3314. WALLOWA RIVER ABOVE MINAM RIVER AT MINAM, OREG.

LOCATION.--At county road bridge, at Minam, Wallowa County, 100 yards upstream from Minam River, 125 yards upstream from bridge on State Highway 92, and 0.8 mile downstream from Big Canyon Creek.

RECORDS AVAILABLE.--Chemical analyses: August 1960 to August 1961.

REMARKS.--No discharge records available.

Chemical analyses, in parts per million, August 1960 to August 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Ammonium (NH ₄)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃	Total acidity (micro-mhos at 25°C)	pH	Color or turbidity (ABS)		
Aug. 25, 1960	25					36	5.9	11	3.2	--	144	5	11	1.5	0.1	0.8	--	172	114	263	8.6	--	0
Sept. 20,	25					37	4.6	13	3.0	--	130	10	13	2.0	.2	.5	0.08	173	112	254	8.7	--	0
Oct. 24,	23					35	5.1	11	3.3	0.0	127	9	14	2.0	.2	.2	.07	165	108	249	8.7	--	5
Nov. 8,	24					34	4.0	10	2.6	0.0	130	3	14	1.5	.1	1.2	.11	163	102	245	8.4	--	5
Dec. 14,	24					32	4.7	9.7	2.2	0.0	130	0	12	2.0	.2	.9	.09	159	100	224	8.2	--	0
Feb. 1, 1961	25					26	3.7	8.0	4.6	0.0	104	0	10	2.0	.2	2.8	.33	139	80	198	7.3	--	90
Feb. 28,	26					22	3.0	7.3	2.4	0.0	94	0	8.6	1.2	.2	.7	.16	130	67	170	8.2	0.01	10
Mar. 28,	28					19	3.4	6.6	1.8	0.0	83	0	8.0	1.0	.2	.7	.13	117	62	150	7.9	0.00	10
Apr. 24,	24					20	2.2	5.9	1.8	0.0	67	6	8.0	1.0	.2	.1	.07	111	59	142	8.9	0.00	0
May 23,	15					13	3.8	2.8	1.0	0.0	47	0	3.6	.2	.1	.5	.08	65	36	86	7.6	0.00	5
June 27,	16					18	3.1	5.8	1.8	0.0	77	0	6.4	.5	.1	.3	.06	90	58	139	8.2	0.01	5
July 24,	25					36	6.0	12	3.8	.1	156	0	13	2.0	.3	.2	.15	179	114	267	8.2	0.01	0
Aug. 30,	28					39	6.1	13	3.4	.1	151	8	14	2.0	.2	.2	.09	192	122	274	8.4	0.00	0

GRANDE RONDE RIVER BASIN--Continued
13-3325. GRANDE RONDE RIVER AT RONDOWA, OREG.

LOCATION.--Temperature recorder at gaging station at Rondowa, Wallowa County, 500 feet downstream from Wallowa River, 13 miles northeast of Elgin, and at mile 81.4.
DRAINAGE AREA.--2,555 square miles.
RECORDS AVAILABLE.--Water temperatures: June 1959 to June 1961 (discontinued).
EXTRIMES, 1959-61.--Water temperatures: Minimum, freezing point on several days during January and February.
EXTRIMES, 1959-61.--Water temperatures: Maximum (1959-60), 77°F July 27-29, 1960; minimum, freezing point on several days during January and February 1961.

Temperature (°F) of water, October 1960 to June 1961																																	
Month	Day																															Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
October	57	56	55	56	57	56	53	53	49	49	49	49	49	47	48	50	50	50	50	50	50	51	51	49	48	47	47	47	47	44	45	50	
Maximum	52	51	50	51	52	53	53	48	46	46	49	48	47	44	44	46	47	47	47	49	48	47	48	49	46	47	46	44	41	43	48	45	
Minimum	47	46	45	43	40	40	43	45	43	42	44	44	44	41	43	43	43	43	42	42	40	38	44	44	42	41	38	34	35	--	42	40	
November	45	43	43	40	38	38	40	43	40	40	42	42	43	41	37	37	42	42	41	40	37	38	38	42	41	38	34	34	--	40	40	40	
Maximum	36	40	40	37	33	33	34	34	33	33	33	33	34	34	34	33	35	35	36	36	35	35	35	34	36	37	37	35	34	34	35	35	
Minimum	35	36	40	37	33	33	33	33	33	33	33	33	33	33	33	33	33	33	34	34	35	35	34	34	34	35	35	34	34	34	34	34	
December	35	35	35	33	33	34	35	35	36	36	36	36	36	36	37	37	37	35	32	33	32	32	32	32	36	36	34	32	33	35	36	35	
Maximum	34	35	33	33	33	33	34	35	35	35	36	36	36	36	37	37	37	35	32	33	32	32	32	32	32	32	32	32	32	32	32	32	
Minimum	36	37	38	38	39	39	39	39	39	40	41	41	39	36	40	40	34	33	34	36	41	41	40	40	39	39	39	40	--	--	--	38	38
January	35	36	36	38	38	39	38	38	39	40	39	34	34	34	34	34	32	32	34	36	37	38	37	38	37	38	37	36	--	--	--	36	36
Maximum	40	39	38	39	38	40	42	42	41	40	41	46	45	43	45	45	44	44	43	42	43	43	43	43	43	42	45	46	47	47	47	47	
Minimum	39	37	36	36	37	37	37	37	37	38	39	39	41	42	41	40	41	41	41	39	41	41	41	42	42	41	38	39	41	42	44	40	
February	47	48	48	44	43	44	45	44	43	47	47	47	46	45	49	54	53	50	43	43	45	45	45	46	50	52	53	55	54	51	--	47	47
Maximum	43	46	43	38	38	38	39	41	41	41	44	46	42	40	43	46	49	42	40	39	42	43	42	42	42	46	45	47	49	48	--	43	43
Minimum	50	49	47	46	45	50	52	50	50	52	51	49	54	53	51	54	53	54	54	54	53	52	52	51	52	52	50	48	51	51	52	51	
March	47	46	44	43	43	44	46	47	48	48	45	42	45	49	47	48	46	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	
Maximum	43	46	43	38	38	38	39	41	41	41	44	46	42	40	43	46	49	42	40	39	42	43	42	42	42	46	45	47	49	48	--	43	43
Minimum	50	49	47	46	45	50	52	50	50	52	51	49	54	53	51	54	53	54	54	54	53	52	52	51	52	52	50	48	51	51	52	51	
April	47	46	44	43	43	44	46	47	48	48	45	42	45	49	47	48	46	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	
Maximum	43	46	43	38	38	38	39	41	41	41	44	46	42	40	43	46	49	42	40	39	42	43	42	42	42	46	45	47	49	48	--	43	43
Minimum	50	49	47	46	45	50	52	50	50	52	51	49	54	53	51	54	53	54	54	54	53	52	52	51	52	52	50	48	51	51	52	51	
May	47	46	44	43	43	44	46	47	48	48	45	42	45	49	47	48	46	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	
Maximum	54	54	53	53	53	52	51	53	52	52	52	54	56	58	58	57	59	59	59	59	58	61	63	--	--	--	--	63	61	--	--	56	56
Minimum	46	47	46	46	47	47	45	46	49	46	49	48	47	49	51	52	52	52	54	53	53	54	--	57	58	59	57	56	--	54	--	51	51

SNAKE RIVER MAIN STEM

13-3343. SNAKE RIVER NEAR ANATONE, WASH.

LOCATION.--Temperature recorder at gaging station, 1.5 miles downstream from Grande Ronde River, 7.8 miles east of Anatone, Asotin County, 22 miles south of Clarkston, and at mile 28.4 from Lewiston.

DRAINAGE AREA. ---92,960 square miles, approximately.

RECORDS AVAILABLE.--Water temperatures: October 1959 to September 1961,

EXTREMES, 1960-61. --Water temperatures: Minimum, 35°F Jan. 22.

1959-61. --Water temperatures: Maximum (1959-60), 77°F Aug. 11. 1960: minimum, 33°F Jan. 15. 16. 20. 21. 1960. EXTREMES. 1959-61. --Water temperatures: Maximum (1959-60), 77°F Aug. 11. 1960: minimum, 33°F Jan. 15. 16. 20. 21. 1960.

Month		Temperature (°F) of water, water year October 1960 to September 1961																															Average
		Day																															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October	Maximum	64	63	63	63	63	62	61																									
	Minimum	63	62	61	62	62	61	60																									
	Average																																
November	Maximum					50	49	50	50	49	49	48	48	48	48	48	48	47	47	47	47	46	46	46	46	46	46	45	44	43	43		
	Minimum					49	49	49	49	49	48	48	48	48	48	47	47	47	47	46	46	46	46	46	46	46	46	45	44	43	42		
	Average																																
December	Maximum	43	44	44	44	44	42	41	41	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	39	39	41	
	Minimum	42	43	44	44	44	42	40	40	39	39	39	39	39	39	39	39	39	39	39	38	37	36	36	36	36	36	36	36	36	37	38	
	Average																																
January	Maximum	39	39	38	38	38	38	38	39	39	39	39	39	39	39	39	39	39	39	38	37	36	36	36	36	36	36	36	36	37	38	40	
	Minimum	39	38	38	38	38	38	38	39	39	39	39	39	39	39	39	39	39	39	38	37	36	36	36	36	36	36	36	36	37	38	39	
	Average																																
February	Maximum	38	39	39	39	40	40	40	40	39	40	41	41	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	39	39	41	
	Minimum	38	38	39	39	39	39	39	39	39	39	40	40	40	39	40	40	40	40	40	40	40	40	40	40	40	40	40	40	39	39	40	
	Average																																
March	Maximum	43	43	43	42	43	43	44	44	44	45	45	45	44	46	47	47	46	47	48	47	46	46	46	46	47	47	46	47	49	50	51	
	Minimum	42	42	42	42	42	42	43	44	44	44	44	44	44	44	44	46	46	45	46	46	46	46	46	46	47	46	47	48	50	45	46	
	Average																																
April	Maximum	50	52	52	49	48	49	50	50	49	49	49	51	49	50	53	55	55	51	49	49	49	49	50	52	53	54	56	56	54		53	
	Minimum	49	50	51	49	48	48	48	48	48	49	49	49	48	48	50	53	53	49	48	47	49	49	49	50	52	54	54	53		50	50	
	Average																																
May	Maximum	53	53	51	50	49	51	52	52	53	53	53	53	54	54	54	56	57	58	59	58	57	57	57	57	57	55	55	55	55	54	53	
	Minimum	52	51	50	49	48	48	50	51	52	52	52	51	51	53	53	53	54	55	55	55	57	55	55	56	56	55	54	54	54	54	53	
	Average																																
June	Maximum	58	60	59	58	59	59	59	59	61	60	61	61	62	63	64	66	66	68	68	67	69	70	71	71	71	71	69	69	68		64	
	Minimum	55	57	58	58	58	58	58	58	59	60	60	61	62	63	64	65	66	66	66	66	67	68	69	69	69	69	68	67		63	63	
	Average																																
July	Maximum	70	71	70	70	70	71	71	71	72	73	74	75	76	77	77	77	77	78	77	78	77	76	77	77	75	75	75	74	74	74	74	
	Minimum	67	68	68	68	69	69	69	70	71	71	73	74	74	74	74	74	73	73	73	73	74	74	74	72	72	72	72	72	72	72	72	
	Average																																
August	Maximum	76	76																														
	Minimum	72	73																														
	Average																																
September	Maximum	72	70	70	71	71	71	70	69	69	69	69	69	70	70	71	69	69	68	68	67	67	67	67	67	67	67	67	67	67	67	68	
	Minimum	70	68	67	68	69	69	68	67	67	67	68	67	68	69	69	68	68	68	67	67	67	67	67	67	67	67	67	67	67	67	66	
	Average																																

SNAKE RIVER MAIN STEM
13-3435. SNAKE RIVER NEAR CLARKSTON, WASH.--Continued

LOCATION.--Temperature recorder at gaging station, 2 miles upstream from Alpowa Creek, 7 miles downstream from Clarkston, Whitman County, and 134 miles upstream from mouth.
DRAINAGE AREA.--103,200 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: December 1959 to September 1961.
EXTREMES, 1960-61.--Water temperatures: Maximum, 78°F on several days during July and August; minimum, 38°F on several days during January and February.
EXTREMES, 1959-61.--Water temperatures: Maximum, 78°F July 19-21, 1960, several days during July and August 1961; minimum (1960-61), 38°F on several days during January and February 1961.

Temperature (°F) of water, water year October 1960 to September 1961																																	
Month	Day																															Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
October	66	65	66	64	64	64	64	63	62	61	60	59	59	58	58	58	58	58	58	58	58	58	58	58	58	58	56	56	55	54	54	60	
Maximum	66	65	66	64	64	64	64	63	62	61	60	59	59	58	58	58	58	58	58	58	58	58	58	58	58	58	56	56	55	54	54	60	
Minimum	64	64	64	63	63	64	63	62	61	60	59	59	58	58	58	58	58	58	58	58	58	58	58	58	58	57	56	56	55	54	54	59	
November	54	54	54	53	52	52	52	52	51	51	50	50	50	50	50	49	49	49	49	49	48	48	48	48	48	47	46	46	45	45	50		
Maximum	54	54	54	53	52	52	51	51	52	51	51	50	49	49	50	49	49	49	49	49	48	48	48	48	48	47	46	46	45	45	49		
Minimum	54	54	53	52	52	51	51	52	51	50	49	49	49	49	49	49	49	49	49	48	48	48	48	48	48	47	46	46	45	45	49		
December	45	45	45	45	45	44	44	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	41	41	41	41	42		
Maximum	45	45	45	45	45	44	44	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	41	41	41	41	41	42	
Minimum	45	45	45	45	44	44	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	41	41	41	41	41	42	
January	41	41	40	40	40	40	40	40	40	40	40	40	40	40	40	40	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	42	
Maximum	41	41	40	40	40	40	40	40	40	40	40	40	40	40	40	40	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	42
Minimum	41	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	42
February	38	38	39	39	40	40	40	40	40	40	40	40	40	40	40	40	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	42
Maximum	38	38	39	39	40	40	40	40	40	40	40	40	40	40	40	40	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	42
Minimum	38	38	39	39	39	40	40	40	40	40	40	40	40	40	40	40	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	42
March	42	42	42	42	42	42	42	42	42	44	44	44	44	44	44	44	46	46	46	46	46	46	46	46	46	46	46	46	46	46	48	48	45
Maximum	42	42	42	42	42	42	42	42	42	44	44	44	44	44	44	44	46	46	46	46	46	46	46	46	46	46	46	46	46	46	48	48	45
Minimum	42	42	42	42	42	42	42	42	42	44	44	44	44	44	44	44	46	46	46	46	46	46	46	46	46	46	46	46	46	46	48	48	45
April	48	48	48	48	46	46	47	47	46	47	48	49	48	49	48	48	50	52	51	49	48	48	48	48	48	49	50	50	52	52	52	49	
Maximum	48	48	48	48	46	46	47	47	46	47	48	49	48	49	48	48	50	52	51	49	48	48	48	48	48	49	50	50	52	52	52	49	
Minimum	48	48	48	46	46	45	46	46	46	47	48	47	48	48	47	48	50	51	49	48	48	48	48	48	48	48	49	50	50	52	52	47	
May	52	52	50	49	48	48	50	50	50	52	52	50	50	52	52	52	52	52	51	52	52	52	52	52	52	52	52	51	50	50	50	51	
Maximum	52	52	50	49	48	48	50	50	50	52	52	50	50	52	52	52	52	52	51	52	52	52	52	52	52	52	52	51	50	50	50	51	
Minimum	52	50	49	48	48	48	48	49	50	50	50	50	50	52	52	51	51	52	52	52	52	52	52	52	52	52	51	50	50	50	50	50	
June	51	52	52	52	52	53	53	54	54	54	54	55	55	56	58	59	60	61	62	63	64	64	64	64	65	66	67	68	68	67	67	59	
Maximum	51	52	52	52	52	53	53	54	54	54	54	55	55	56	58	59	60	61	62	63	64	64	64	64	65	66	67	68	68	67	67	59	
Minimum	50	51	52	52	52	53	53	54	54	54	54	55	55	56	58	59	60	61	62	63	64	64	64	64	65	66	67	68	67	67	67	58	
July	67	68	68	69	69	70	70	71	72	73	74	75	75	76	76	76	76	76	76	77	78	77	77	77	76	76	75	76	74	74	74	74	74
Maximum	67	68	68	69	69	70	70	71	72	73	74	75	75	76	76	76	76	76	76	77	78	77	77	77	76	76	75	76	74	74	74	74	74
Minimum	67	67	68	68	69	69	70	71	72	72	74	74	74	74	74	74	74	74	74	74	75	76	76	76	76	76	74	74	74	74	74	74	74
August	75	76	76	78	78	77	78	78	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	75	74	75	75	74	73	75	75
Maximum	75	76	76	78	78	77	78	78	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	75	74	75	75	74	73	75	75
Minimum	73	74	74	75	77	75	74	73	74	73	74	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	71	72	71	72	72	71	73
September	71	69	68	68	67	68	66	66	66	66	66	66	66	66	66	66	66	66	65	65	63	62	62	61	61	62	61	60	60	60	60	65	
Maximum	71	69	68	68	67	68	66	66	66	66	66	66	66	66	66	66	66	66	65	65	63	62	62	61	61	62	61	60	60	60	60	65	
Minimum	68	68	66	66	67	67	66	66	66	65	65	65	65	65	65	65	66	66	66	65	64	63	62	62	61	61	61	60	59	59	64	64	

PALOUSE RIVER BASIN

13-3510. PALOUSE RIVER NEAR HOOVER, WASH.

LOCATION.--At bridge on State Highway 11B, 3.3 miles downstream from Cow Creek, 2.7 miles southwest of Hooper, Whitman County, and 3.7 miles downstream from gaging station.

DRAINAGE AREA.--2,540 square miles, approximately, upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: July 1959 to September 1961.

REMARKS.--Minor inflow between sampling point and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbocation (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium, sodium	Non-carbonate		
Oct. 24, 1960.....	71	16		29	13	27	5.2	184	4	10	15	0.4	1.2	0.70	212			127	0	356	8.5
Nov. 23.....	202	23		16	6.1	13	3.6	97	0	6.8	7.0	3.3	5.2	.96	139			70	0	198	7.4
Dec. 20.....	756	29		25	8.3	16	3.6	138	0	8.8	5.2	3.3	8.3	1.1	176			97	0	260	7.7
Jan. 24, 1961.....	360	28		19	6.8	12	3.2	103	0	7.0	3.2	2.2	7.9	.51	146			76	0	200	7.8
Feb. 28.....	2,020	29		17	5.5	11	2.9	62	0	9.2	2.2	3.13	.46	.44	144			65	0	177	7.6
Mar. 28.....	1,600	27		17	5.6	11	2.9	90	0	6.4	2.5	2.2	7.6	.42	139			66	0	181	7.6
Apr. 24.....	1,110	25		18	5.2	12	2.4	96	0	6.8	2.8	1.1	3.9	.28	129			66	0	179	7.7
May 24.....	484	23		19	6.5	12	3.3	108	0	6.2	3.0	6.3	3.3	.46	138			71	0	197	7.7
June 27.....	98	20		26	11	19	5.2	148	10	5.8	5.6	3.1	6.3	.31	238			111	0	291	8.8
July 25.....	37	24		30	12	25	6.5	218	0	12	8.0	4.2	1.9	.30	225			126	0	369	8.0
Aug. 25.....	75.5	24		34	14	26	5.6	196	10	12	8.5	4.4	2.9	.33	225			144	0	379	7.8
Sept. 25.....	29	25		34	14	26	5.6	196	10	12	8.5	4.4	3.0	.19	231			143	0	382	8.7

SNAKE RIVER MAIN STEM

13-3532. SNAKE RIVER NEAR PASCO, WASH.

LOCATION.--At Northern Pacific Railway bridge, 0.3 mile upstream from mouth, 0.7 mile downstream from U.S. Highway 395 bridge, and 2 miles southeast of Pasco, Franklin County.

RECORDS AVAILABLE.--Chemical analyses: July 1960 to August 1961.

REMARKS.--No discharge records available.

Chemical analyses, in parts per million, July 1960 to August 1961

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)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Sodium sorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate		
July 28, 1960.....	13			18	5.8	16	2.2	86	1	20	7.0	0.7	0.0	0.01	124		69	0	0	203 8.3
Aug. 22.....	16			24	9.8	27	3.2	126	0	38	17	.6	.3	.05	260		100	0	0	323 8.2
Sept. 2.....	19			31	13	37	4.1	152	0	52	17	.7	.3	.10	262		130	0	0	419 8.1
Oct. 24.....	22			32	14	34	4.1	155	0	51	16	.7	1.8	.15	256		136	0	0	411 8.2
Nov. 2.....	22			28	6.6	26	3.0	136	0	38	14	.4	1.9	.41	216		110	0	0	336 7.9
Dec. 16.....	24			34	12	31	3.3	163	0	48	16	.7	2.7	.13	253		134	0	0	403 8.2
Jan. 24, 1961.....	24			30	12	27	3.2	147	0	38	14	.5	2.6	.10	232		124	3	1	362 8.1
Feb. 28.....	23			19	7.0	16	2.2	92	0	21	8.2	.4	2.2	.11	148		76	1	0	223 7.7
Mar. 27.....	23			17	6.6	15	2.1	86	0	21	7.8	.3	1.6	.13	144		70	0	0	204 7.7
Apr. 24.....	18			11	2.6	8.0	1.3	52	0	9.2	3.2	.2	.4	.07	87		38	0	0	117 7.4
May 24.....	12			6.5	1.2	3.7	.9	30	0	4.0	1.0	.1	.5	.06	50		21	0	0	63 7.0
June 26.....	11			11	3.7	9.4	1.6	57	0	12	4.5	.2	.1	.00	82		43	0	0	132 7.8
July 25.....	13			17	4.7	13	2.0	80	0	17	7.0	.4	.2	.04	113		62	0	0	183 7.7
Aug. 29.....	14			24	9.5	27	3.4	126	0	37	14	.4	.4	.03	187		99	0	0	312 7.9

WALLA WALLA RIVER BASIN--Continued

14-185. WALLA WALLA RIVER NEAR TOUCHET, WASH.

LOCATION (revised).--At county bridge, 0.9 mile downstream from Warm Springs Canyon, 2.5 miles downstream from gaging station, and 3.7 miles west of Touchet, Walla Walla County.

DRAINAGE AREA.--1,660 square miles upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: July 1959 to September 1961.

Water temperatures: July 1959 to September 1961.

EXTREMES, 1960-61.--Dissolved solids: Maximum, 497 ppm Aug. 7-Sept. 4; minimum, 98 ppm Apr. 3-6.

Hardness: Maximum, 260 ppm Aug. 7-Sept. 4; minimum, 30 ppm Feb. 11-22.

Specific conductance: Maximum daily, 812 micromhos July 15; minimum daily, 83 micromhos Feb. 14, 15, 21.

Water temperatures: Maximum, 94°F Aug. 4; minimum, 33°F Dec. 13.

EXTREMES, 1959-61.--Dissolved solids: Maximum, 507 ppm July 13-Aug. 1, 1960; minimum, 94 ppm Mar. 22-Apr. 2, 1960.

Hardness: Maximum, 265 ppm July 13-Aug. 1, 1960; minimum, 30 ppm Feb. 11-22, 1961.

Specific conductance: Maximum daily, 812 micromhos July 15, 1961; minimum daily, 83 micromhos Feb. 14, 15, 21, 1961.

Water temperatures: Maximum, 94°F Aug. 4, 1961; minimum, freezing point Jan. 21, 23, Feb. 28, Mar. 2, 4, 1960.

REMARKS.--Records of specific conductance of daily samples available in district office at Portland, Oreg. Station relocation Mar. 10, 1961, from bridge 410, 3.5 miles downstream from present sampling point. Some inflow from Gardena Creek and Warm Springs Canyon between gaging station and sampling point during high runoff.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Calcium Magnesium	Non-carbonate	
Oct. 1-9, 1960....	57.1	33		42	14	40	6.5	227	38	21	0.4	0.4	0.46	317	0.43	162	0	477 8.1
Oct. 10-Nov. 9....	103	32		30	11	26	5.2	165	22	15	.3	1.0	.40	233	.32	64.8	119	343 8.1
Nov. 10-12.....	164	34		29	11	25	4.8	159	20	14	.2	1.7	.44	217	.30	108	116	344 8.0
Nov. 13-18.....	284	34		17	6.1	13	5.3	97	8.0	12	.2	2.2	1.3	150	.20	119	68	214 7.0
Nov. 19.....	756	40		20	18	40	37	204	9.6	53	--	--	--	361	.49	737	124	581 6.1
Nov. 20-22.....	492	35		16	8.5	14	7.0	119	7.2	12	--	4.6	.11	164	.22	218	75	261 6.7
Nov. 23, 24.....	486	35		17	5.2	12	3.5	93	15	8.5	.2	2.1	.47	141	.19	185	64	186 7.8
Nov. 25-Dec. 1....	783	34		14	4.3	9.0	3.0	70	6.0	6.5	.1	3.3	.39	123	.17	260	73	213 7.6
Dec. 2-18.....	368	35		18	6.9	14	3.3	97	9.6	10	.2	2.7	.46	153	.21	152	73	213 7.7
Jan. 20, 1961....	486	34		17	5.2	11	3.1	87	7.8	8.0	.2	2.3	.46	139	.19	182	64	185 7.7
Jan. 5, 6.....	1,176	37		23	4.2	14	3.1	101	8.8	11	.3	2.3	.50	164	.22	221	75	220 7.7
Jan. 7.....	1,100	40		40	9.7	7.2	12	191	5.0	3.0	.3	2.1	1.2	214	.29	636	140	308 6.8
Jan. 8-23.....	644	32		15	4.6	9.5	3.3	77	6.6	5.5	.2	2.7	.47	125	.17	217	56	159 7.5
Jan. 24-26.....	492	35		16	5.6	11	2.9	82	8.2	5.5	.2	1.7	.38	127	.17	169	63	171 7.9
Jan. 27-30.....	540	39		18	5.9	14	3.8	100	7.6	7.8	.2	1.6	.36	149	.20	217	69	205 8.0
Jan. 31-Feb. 10...	1,405	33		12	3.8	6.8	4.7	60	5.2	3.5	.2	2.5	.76	119	.16	451	46	127 7.3

WALLA WALLA RIVER BASIN--Continued
 14-185. WALLA WALLA RIVER NEAR TOUCHET, WASH.--Continued

Chemical analyses, in parts per million, water year October 1960 to September 1961--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)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate	
Feb. 11-22, 1961..	2,611	28		9.0	1.9	4.4	4.0	42		4.0	1.5	0.3	2.8	111	0.15	783	30	0	86
Feb. 23-Mar. 13..	1,848	34	11	4.5	4.5	6.5	4.6	60		4.6	3.8	.1	3.3	113	.15	564	46	0	124
Mar. 14-19.....	2,722	25		9.0	3.3	4.8	3.6	47		3.6	2.5	.1	2.9	99	.13	728	36	0	96
Mar. 20-27.....	1,682	32	10	4.4	4.4	5.9	2.8	55		4.4	3.0	.1	2.7	114	.16	518	43	0	112
Mar. 28-Apr. 2....	1,205	35	12	4.3	4.3	6.9	2.6	63		4.8	4.0	.1	2.7	111	.15	361	48	0	128
Apr. 3-6.....	1,425	32		9.5	3.8	5.7	2.1	53		4.0	2.8	.1	1.6	98	.13	377	39	0	106
Apr. 7-12.....	1,896	32	12	4.7	3.7	6.9	2.4	60		6.9	4.9	.1	1.7	110	.13	297	30	0	138
Apr. 13-18.....	1,096	31	11	4.5	4.5	8.6	2.5	72		6.4	4.8	.2	1.4	110	.15	211	42	0	118
Apr. 19-May 1....	1,711	31	13	4.5	4.5	7.4	2.4	62		5.2	3.5	.1	1.4	101	.14	254	51	0	143
May 2-8.....	932	30	12	3.4	3.4	7.4	2.4	62		5.2	3.5	.1	1.4	101	.14	254	44	0	124
May 9-24.....	725	31	13	4.5	4.5	9.0	3.1	74		7.6	4.0	.1	1.0	107	.15	209	51	0	146
May 25-June 1....	400	31	16	5.6	12	3.5	89		10	10	5.2	.2	1.0	131	.17	138	63	0	180
June 2-5.....	317	38	18	6.4	15	4.5	99		12	12	9.0	.2	1.0	152	.21	130	72	0	212
June 6-12.....	240	33	22	7.4	23	4.4	116		14	14	22	.2	1.1	185	.25	120	86	0	282
June 13-16.....	139	34	27	9.9	25	5.1	140		23	23	21	.2	1.3	210	.29	78.8	108	0	331
June 17-21.....	70.2	32	35	13	13	31	6.0	174		34	24	.2	1.5	258	.35	48.9	140	0	426
June 22-26.....	36.4	35	48	16	16	40	6.8	224		52	29	.3	1.2	338	.46	33.2	186	2	543
June 27-July 7....	13.3	35	62	24	24	61	8.7	290		91	40	.4	1.5	24	.464	16.7	252	14	740
July 8-Aug. 6....	5.2	27	52	30	30	62	9.5	261		108	47	.4	.9	14	.63	6.64	254	40	746
Aug. 7-Sept. 4....	17.0	29	60	27	27	67	9.4	274		110	48	.4	1.5	22	.68	9.34	260	36	748
Sept. 5-25.....	11.2	33	50	20	20	54	6.9	277		75	30	.4	.3	21	.56	12.5	230	2	624
Sept. 26.....	31		33	11	11	--	--	168		--	--	.2	1.8	.35	--	--	131	0	358
Weighted average	597.3	32		13	4.5	8.3	3.4	68		6.4	4.9	0.2	2.4	122	0.17	197	50	--	142

WALLA WALLA RIVER BASIN--Continued
 14-185. WALLA WALLA RIVER NEAR TOUCHET, WASH.--Continued
 Temperature (°F) of water, water year October 1960 to September 1961

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

COLUMBIA RIVER MAIN STEM

14-192. COLUMBIA RIVER AT McNARY DAM, WASH.

LOCATION.--At McNary Dam, Benton County, 1.2 miles upstream from gaging station, 2.5 miles east of Plymouth, and approximately 3 miles upstream from Umatilla River.

DRAINAGE AREA.--214,000 square miles, approximately, upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: July 1959 to September 1961.

REMARKS.--No appreciable inflow between gaging station and sampling point except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 24, 1960.....	83,100	9.7		24	5.8	11	1.6	96		22	4.5	0.4	1.1	0.08	126			84	6		210	7.9
Nov. 22.....	182,000	9.4		24	7.8	11	1.3	98		24	4.0	0.3	1.1	.13	136			86	6		222	7.9
Dec. 1.....	182,000	11		24	7.8	12	1.3	104		24	6.2	0.3	1.3	.13	144			92	7		233	8.0
Jan. 23, 1961.....	94,800	13		25	7.2	11	2.0	105		22	6.2	0.3	1.2	.12	144			92	6		235	7.9
Feb. 28.....	164,000	15		19	5.3	7.9	1.8	76		15	3.2	.2	1.7	.13	112			70	7		170	7.6
Mar. 27.....	179,000	15		18	4.9	6.7	1.4	73		13	3.0	.2	1.2	.12	104			65	5		160	7.8
Apr. 24.....	148,000	12		18	4.4	5.4	1.1	70		15	2.5	.2	1.1	.10	96			63	6		148	7.5
May 24.....	411,000	9.3		16	2.9	3.2	.8	57		9.6	1.0	.1	.5	.07	72			52	6		116	7.8
June 26.....	454,000	7.2		17	4.2	2.6	.7	65		11	1.2	.2	.3	.05	79			60	6		131	7.9
July 25.....	179,000	4.9		19	3.7	2.5	.8	70		10	1.0	.1	.1	.03	78			63	6		136	7.9
Aug. 29.....	116,000	5.4		21	4.4	5.5	1.2	79		14	2.8	.2	.2	.09	97			70	6		161	7.6

UMATILLA RIVER BASIN

14-200. UMATILLA RIVER ABOVE MEACHAM CREEK, NEAR GIBBON, OREG.

LOCATION:--Temperature recorder at gaging station, 0.8 mile downstream from Ryan Creek, 2.2 miles upstream from Meacham Creek, and 2.5 miles northeast of Gibbon, Umatilla County.

DRAINAGE AREA:--125 square miles.

RECORDS AVAILABLE:--Water temperatures: June 1959 to September 1961 (discontinued).

EXTREMES, 1960-61.--Water temperatures: Maximum, 77°F July 13, 15, 21; minimum, 33°F Jan. 27.

EXTREMES, 1959-61.--Water temperatures: Maximum, 77°F July 13, 15, 21, 1961; minimum, freezing point Jan. 18-20, 1960.

Temperature (°F) of water, water year October 1960 to September 1961

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

UMATILLA RIVER BASIN--Continued

14-260. UMATILLA RIVER AT YOAKUM, OREG.

LOCATION.--At gaging station, at highway bridge, 0.5 mile northeast of Yoakum, Umatilla County, 2.5 miles downstream from abandoned Furnish Reservoir, and 11 miles downstream from Birch Creek.
DRAINAGE AREA.--1,260 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: August 1911 to August 1912, August 1960 to August 1961.

Chemical analyses, in parts per million, August 1960 to August 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Ammonium (NH ₄)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃	Total acidity (micro-mhos at 25°C)	Specific conductance (micro-mhos at 25°C)	pH	Color or turbidity (ABS)	Detergent (ABS)
Aug. 25, 1960	227	33				11	3.8	7.2	2.7	--	67	0	3.0	2.5	0.1	0.5	--	101	43	0	126	8.0	--	15
Sept. 19, 1960	55	23				13	5.0	11	3.3	--	66	6	6.2	6.5	.2	1.0	0.42	106	53	0	159	8.5	--	0
Oct. 24, 1960	93	28				13	4.7	11	3.2	0.1	74	0	6.0	7.8	.3	1.0	.61	109	52	0	137	7.9	--	5
Nov. 13, 1960	94	28				14	3.6	11	3.7	0	80	0	5.8	7.0	.2	1.0	.42	118	56	0	166	7.8	--	0
Dec. 13, 1960	206	32				15	5.7	11	3.2	0	80	0	7.2	7.8	.3	2.4	.45	139	40	0	113	7.5	--	0
Jan. 30, 1961	273	32				15	5.7	12	3.4	0	84	0	7.2	7.8	.3	2.4	1.2	137	61	0	171	7.3	--	1,720
Feb. 27, 1961	1,140	32				6.5	2.5	4.5	1.6	0	39	0	1.6	1.5	.1	1.1	.19	74	26	0	78	7.5	0.04	5
Mar. 27, 1961	1,450	31				7.0	2.2	4.8	1.7	0	39	0	3.6	1.5	.1	1.8	.07	79	26	0	74	7.3	.00	160
Apr. 24, 1961	882	30				7.5	1.9	4.5	1.6	0	41	0	2.8	2.0	.2	.2	.26	80	26	0	77	8.0	.01	10
May 21, 1961	654	28				7.0	2.2	5.0	1.6	.1	40	1	1.8	1.5	.1	1.2	.15	75	26	0	77	8.4	.01	10
June 26, 1961	476	32				8.0	3.6	7.5	2.2	0	51	0	3.2	5.5	.1	1.0	.25	96	35	0	107	8.1	.04	5
July 24, 1961	468	32				9.5	2.7	5.3	2.0	0	52	0	3.2	2.2	.2	.8	.31	93	35	0	96	8.1	.02	10
Aug. 30, 1961	340	33				12	3.2	7.4	2.6	.1	51	9	4.2	2.2	.2	.4	.24	111	43	0	117	8.6	.02	10

UMATILLA RIVER BASIN--Continued

14-335. UMATILLA RIVER NEAR UMATILLA, OREG.

LOCATION.--At gaging station, 1.5 miles downstream from West Diversion main canal of Umatilla Project, 1.8 miles southeast of Umatilla, Umatilla County, and 2 miles upstream from mouth.
DRAINAGE AREA.--2,290 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: August 1911 to August 1912, August 1960 to August 1961.

Chemical analyses, in parts per million, August 1960 to August 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) num	Alu- num (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Ammonium (NH ₄)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		To- Specific tal conduct- acid- ivity as mhos at H ⁺ 25°C)	pH	Col- or	De- Tur- bid- gen- sity (ABS)
Aug. 25, 1960	78	39				34	14	24	5.5	--	173	23	10	6.2	0.4	1.9	--	241	142	0	352	9.0	--	0
Sept. 19.....	34	39				38	14	25	5.1	--	205	14	15	6.8	.5	1.3	0.15	255	153	0	383	8.6	--	0
Oct. 24.....	16	38				44	15	26	5.9	0.1	233	9	13	7.0	.5	2.7	.32	270	170	0	415	8.5	--	0
Nov. 7.....	190	38				37	11	22	4.7	0	203	0	10	7.2	.4	3.6	.36	232	138	0	364	8.0	--	0
Dec. 13.....	146	42				39	10	23	4.5	0	205	0	10	6.8	.4	5.0	.47	252	140	0	359	7.9	--	0
Jan. 30, 1961	143	43				35	12	22	4.6	0	191	3	11	6.5	.4	5.4	.43	235	136	0	355	8.4	--	5
Feb. 27.....	1,160	33				10	3.9	6.6	2.2	1	61	0	4.4	2.2	.3	1.1	.23	103	41	0	114	7.9	0.02	25
Mar. 27.....	1,220	31				10	3.8	7.2	2.1	0	60	0	4.0	2.5	.2	1.0	.13	102	40	0	110	7.5	.01	320
Apr. 24.....	250	32				21	6.4	13	3.2	1	87	16	6.0	4.5	.2	5.1	.17	150	79	0	203	9.1	.01	5
May 21.....	4.4	34				42	10	21	4.7	1	216	0	9.4	5.8	.4	2.3	.28	238	148	0	374	8.2	.02	0
June 26.....	12	40				44	13	23	5.1	0	217	8	11	5.5	.4	2.8	.26	257	164	0	397	8.5	.04	0
July 24.....	9.2	35				36	14	22	5.3	1	198	10	10	6.8	.5	8.1	.14	239	146	0	365	8.7	.02	0
Aug. 30.....	25	41				32	13	24	5.6	1	160	24	11	6.2	.5	1.5	.18	240	133	0	332	9.0	.02	0

JOHN DAY RIVER BASIN

14-388. JOHN DAY RIVER NEAR MOUNT VERNON, OREG.

LOCATION --At bridge on U.S. Highway 26, 1.5 miles downstream from Harper Creek, and 1.5 miles west of Mount Vernon, Grant County.
 RECORDS AVAILABLE.--Chemical analyses: August 1960 to August 1961.
 REMARKS.--No discharge records available.

Chemical analyses, in parts per million, August 1960 to August 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Alu- min- ium (Al)	Iron (Fe)	Man- ga- nese (Mn)	Cal- cium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Pot- as- sium (K)	Am- mon- ium (NH ₄)	Bi- car- bon- ate (HCO ₃)	Car- bon- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Phos- phate (PO ₄)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃	To- tal acid- ity (micro- mhos at 25°C)	Specific conductance (micro- mhos at 25°C)	pH	Col- or or turbidity (ABS)	De- ter- gid- ity (ABS)
Aug. 24, 1960		41				44	28	21	4.2	--	318	0	7.4	2.5	0.2	0.3	--	301	227	0	481	8.0	--	0
Sept. 19.....		43				47	29	22	4.1	--	328	0	7.8	2.8	.3	.2	0.40	318	238	0	512	8.1	--	0
Oct. 25.....		36				22	16	11	3.2	0.0	170	0	5.0	2.2	.2	.2	.33	176	119	0	270	8.1	--	0
Nov. 7.....		36				20	12	9.1	3.0	.0	141	0	3.0	1.5	.1	.4	.28	150	99	0	229	8.0	--	0
Dec. 13.....		32				17	11	7.4	2.4	.0	110	8	3.0	1.5	.2	.0	.30	138	89	0	192	8.7	--	0
Jan. 31, 1961		33				16	11	7.5	2.7	.0	120	0	3.6	2.0	.4	.2	.25	152	87	0	191	7.9	--	0
Feb. 27.....		31				16	12	7.3	1.9	.0	121	0	3.2	1.5	.1	.6	.20	128	90	0	197	8.0	0.04	5
Mar. 28.....		32				16	11	6.7	1.7	.0	116	0	4.4	1.5	.1	.2	.15	136	87	0	188	8.1	.01	5
Apr. 25.....		30				16	11	7.2	1.8	.0	114	4	4.4	1.2	.1	.2	.13	138	90	0	193	8.4	.02	5
May 2.....		32				20	14	8.0	2.4	.0	147	0	4.4	2.5	.1	.2	.21	150	106	0	233	8.2	.02	10
June 26.....		43				20	26	17	3.8	.1	282	0	6.6	2.5	.2	.6	.41	288	208	0	288	7.9	.01	0
July 26.....		43				46	28	21	3.6	.0	322	0	7.6	3.2	.3	.3	.45	319	232	0	486	7.8	.00	5
Aug. 29.....		43				46	27	23	5.0	.1	326	0	7.8	3.2	.3	.2	.42	316	227	0	482	7.9	.01	0

JOHN DAY RIVER BASIN--Continued
14-480. JOHN DAY RIVER AT McDONALD FERRY, OREG.

LOCATION --At gaging station, at McDonald Ferry, 0.8 mile downstream from Rock Creek, and 10 miles east of Klondike, Sherman County.
DRAINAGE AREA--7,580 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: August 1911 to August 1912, August 1960 to August 1961.

Chemical analyses, in parts per million, August 1960 to August 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Ammonium (NH ₄)	Bicarbonate (HCO ₃)	Carbonyl (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total conductivity (micro-mhos at 25°C)	pH	Coliform or turbidity (ABS)	Detergent (ABS)
Aug. 25, 1960	94	23				25	13	24	3.1	--	175	4	13	4.5	0.2	0.2	--	196	116	0	318	8.4	--	0
Sept. 19.....	110	20				22	13	23	2.8	--	157	7	12	3.8	.3	.1	0.01	176	108	0	296	8.6	--	0
Oct. 23.....	275	24				30	14	19	2.5	0.0	194	0	13	4.8	.2	.2	.03	206	133	0	325	8.2	--	60
Nov. 7.....	372	24				30	12	18	2.5	.0	185	0	12	3.2	.2	.5	.04	194	123	0	310	8.2	--	5
Dec. 12.....	360	26				21	10	12	1.5	.1	134	0	8.0	2.5	.1	.2	.05	154	95	0	222	8.0	--	5
Jan. 30, 1961	588	28				23	10	12	1.8	.0	139	0	7.8	2.5	.4	.1	.06	166	98	0	231	8.1	--	0
Feb. 27.....	2,440	29				15	6.1	6.8	1.7	.0	88	0	4.4	1.5	.2	.3	.17	120	62	0	153	8.1	0.02	20
Mar. 27.....	4,660	32				13	5.1	7.8	1.5	.0	79	0	4.2	1.5	.2	.2	.07	115	54	0	134	8.0	.03	80
Apr. 27.....	2,280	28				16	5.6	8.2	1.3	.0	92	0	5.8	1.5	.1	.4	.05	116	63	0	154	7.8	.02	5
May 21.....	3,000	28				14	5.5	7.4	1.4	.0	84	0	4.4	1.0	.1	.1	.08	106	58	0	143	7.9	.02	15
June 26.....	604	23				18	8.3	10	2.1	.0	109	3	6.8	1.8	.1	.1	.04	129	79	0	195	8.5	.00	0
July 24.....	105	14				22	11	19	2.9	.1	141	7	9.8	3.5	.2	.2	.05	162	101	0	263	8.7	.00	0
Aug. 30.....	60	30				24	15	30	4.2	.2	190	7	16	5.8	.3	.3	.09	240	122	0	341	8.6	.01	20

DESCHUTES RIVER BASIN--Continued

14-795. CROOKED RIVER NEAR POST, OREG.

LOCATION.--At county highway bridge, 4.5 miles downstream from gaging station 795, 7 miles southeast of Post, Crook County, and 12 miles upstream from gaging station 798.

DRAINAGE AREA.--2,160 square miles, approximately, upstream from gaging station.

RECORDS AVAILABLE.--Water temperatures: July 1959 to September 1961.

Sediment records: July 1959 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Minimum, freezing point on several days during December and January.

Sediment concentrations: Maximum daily, 554 ppm Feb. 10; minimum daily, 0 ppm on many days May to August.

Sediment loads: Maximum daily, 3,260 tons Feb. 10; minimum daily, less than 0.50 ton on many days.

EXTREMES, 1958-61.--Water temperatures: Minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 1,020 ppm Mar. 20, 1960; minimum daily, 0 ppm on many days May to August 1961.

Sediment loads: Maximum daily, 3,260 tons Feb. 10, 1961; minimum daily, less than 0.50 ton on many days each year.

REMARKS.--Sediment records available for site near Prineville for period April 1958 to June 1959.

Temperature (°F) of water, water year October 1960 to September 1961																																Aver- age				
Month		Day																																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		31			
October.....	--	63	--	65	--	55	--	51	--	47	--	52	--	54	--	56	--	54	--	53	--	54	--	54	--	50	--	47	--	50	--	--	--	--		
November.....	43	--	46	--	42	--	46	--	43	--	44	--	41	--	40	--	43	--	40	--	37	--	38	--	37	--	33	--	33	--	33	--	--	--	--	
December.....	34	--	34	--	35	--	32	--	34	--	33	--	32	--	33	--	38	--	37	--	32	--	35	--	34	--	34	--	38	--	34	--	--	--	--	
January.....	--	32	--	34	--	--	--	--	35	--	35	--	36	--	37	--	38	--	--	--	--	--	35	--	36	--	37	--	37	--	37	--	36	--	--	
February.....	40	36	39	40	41	38	39	38	41	39	39	36	40	39	42	40	38	34	37	43	43	38	36	42	39	40	39	40	44	50	51	44	--	--		
March.....	38	37	38	39	39	38	42	44	44	44	43	42	43	45	44	44	44	49	47	44	45	47	46	--	43	44	48	50	50	50	51	44	--	--		
April.....	50	48	48	49	47	48	50	46	44	50	53	50	51	54	50	56	54	47	47	46	48	44	44	51	54	57	60	59	56	55	--	51	--	--		
May.....	--	53	--	48	--	--	58	--	59	--	51	--	53	--	55	--	63	--	67	--	67	--	64	--	64	--	63	--	58	--	56	--	--	--	--	
June.....	--	64	--	--	--	66	--	72	--	68	--	--	--	78	--	78	--	--	--	79	--	80	--	80	--	--	--	74	65	--	--	--	--	--	--	
July.....	--	65	--	71	--	72	--	76	--	77	--	78	--	75	--	72	--	76	--	77	--	75	--	72	--	73	--	73	--	74	--	--	--	--	--	
August.....	--	--	76	--	76	--	77	--	72	--	74	--	71	--	75	--	--	74	--	73	--	--	--	--	69	--	73	--	--	--	--	68	--	--	--	
September.....	--	--	--	78	--	76	--	66	--	68	--	68	--	66	--	63	--	62	--	59	--	60	--	56	--	57	--	63	--	61	--	--	--	--	--	--

DESCHUTES RIVER BASIN--Continued

14-795. CROOKED RIVER NEAR POST, OREG.--Continued

Suspended sediment, July to September 1959

(Where no concentrations are reported, loads are estimated.)

Day	APRIL			MAY			JUNE		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..									
2..									
3..									
4..									
5..									
6..									
7..									
8..									
9..									
10..									
11..									
12..									
13..									
14..									
15..									
16..									
17..									
18..									
19..									
20..									
21..									
22..									
23..									
24..									
25..									
26..									
27..									
28..									
29..									
30..									
31..									
Total									
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..	23	--	T	6.5	C 7	T	17	C 8	T
2..	16	--	T	6.5	C 7	T	18	C 8	T
3..	17	--	T	6	C 7	T	17	C 8	T
4..	18	--	T	6	C 7	T	16	C 8	T
5..	18	--	T	6	C 7	T	17	C 8	T
6..	18	--	T	6	C 7	T	18	C 8	T
7..	18	--	T	5	C 7	T	18	C 8	T
8..	17	--	T	5	C 7	T	15	C 8	T
9..	17	--	T	5	C 7	T	13	C 8	T
10..	16	--	T	5.5	C 7	T	13	C 8	T
11..	14	11	T	5.5	C 7	T	13	C 8	T
12..	13	10	T	6	C 7	T	13	C 8	T
13..	11	10	T	6	C 7	T	13	C 8	T
14..	9.2	C 9	T	6	C 7	T	13	C 8	T
15..	8.7	C 9	T	7.2	C 7	T	13	C 8	T
16..	7.8	C 9	T	7.5	C 7	T	15	C 8	T
17..	7.8	C 9	T	8.2	C 7	T	16	C 8	T
18..	7.8	C 9	T	8.2	C 7	T	18	C 8	T
19..	8.2	C 9	T	9.2	C 7	T	26	C 11	1
20..	9.2	C 9	T	13	C 6	T	25	C 11	1
21..	9.6	C 9	T	16	C 6	T	24	C 11	1
22..	8.2	C 9	T	14	C 6	T	22	C 11	1
23..	7.5	C 9	T	14	C 6	T	21	C 11	1
24..	7.8	C 9	T	13	C 6	T	20	C 11	1
25..	9.2	C 9	T	12	C 6	T	18	C 11	1
26..	9.6	C 9	T	11	C 6	T	20	C 11	1
27..	8.7	C 9	T	12	C 6	T	22	C 11	1
28..	11	C 9	T	13	C 6	T	24	C 11	1
29..	7.5	C 9	T	13	C 6	T	22	C 11	1
30..	7	C 9	T	13	C 6	T	22	C 11	1
31..	7	C 9	T	15	C 6	T	--	--	--
Total	367.8	--	10	28 .3	--	5	542	--	18

Total discharge for period (cfs-days)..... 1,190.1
 Total load for period (tons)..... 33

T Less than 0.50 ton.
 C Composite period.

DESCHUTES RIVER BASIN--Continued

14-795. CROOKED RIVER NEAR POST, OREG.--Continued

Suspended sediment, water year October 1960 to September 1961
(Where no concentrations are reported, loads are estimated.)

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	--	T	54	C 4	1	95	C 5	1
2..	11	6	T	52	C 4	1	95	C 5	1
3..	11	--	T	54	C 4	1	91	C 5	1
4..	12	26	1	51	C 4	1	93	C 5	1
5..	13	38	A 1	49	C 4	1	82	C 5	1
6..	13	44	2	47	C 4	1	70	C 5	1
7..	13	44	A 2	51	C 4	1	49	C 5	1
8..	14	36	1	51	C 4	1	60	C 5	1
9..	17	22	A 1	51	C 4	1	64	C 5	1
10..	17	12	1	51	C 4	1	66	C 5	1
11..	16	6	T	54	C 4	1	68	C 5	1
12..	17	4	T	56	C 4	1	70	C 5	1
13..	20	--	1	56	C 4	1	66	C 5	1
14..	24	10	1	56	C 4	1	70	C 5	1
15..	29	C 2	T	58	C 4	1	68	C 5	1
16..	32	C 2	T	60	C 4	1	72	C 5	1
17..	33	C 2	T	64	C 4	1	76	17 B	3
18..	36	C 2	T	62	C 4	1	95	--	5
19..	39	C 2	T	56	C 4	1	161	22 K	10
20..	37	C 2	T	56	C 4	1	128	--	7
21..	39	C 2	T	56	C 4	1	116	12	4
22..	37	C 2	T	51	C 4	1	99	--	3
23..	37	C 2	T	72	23 K	5	101	8	2
24..	39	C 2	T	80	--	6	90	C 6	1
25..	37	C 2	T	106	22	6	90	C 6	1
26..	40	C 3	T	110	--	6	90	C 6	1
27..	44	C 3	T	97	18	5	87	C 6	1
28..	60	C 3	T	58	--	3	60	C 6	1
29..	68	C 3	T	74	8	2	76	C 6	1
30..	62	C 3	T	99	--	2	64	C 6	1
31..	58	C 3	T	--	--	--	66	C 6	1
Total	936	--	17	1892	--	57	2578	--	58
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..	65	C 4	1	451	198 S	242	250	7	5
2..	58	C 4	1	470	81	103	235	4	3
3..	56	C 4	1	520	80	112	208	4	2
4..	55	C 4	1	417	84	95	196	4	2
5..	65	C 4	1	373	47	47	196	7	4
6..	70	C 4	1	504	83 S	128	176	4	2
7..	75	C 4	1	581	155	243	163	3	1
8..	70	C 4	1	421	63	72	168	3	1
9..	70	C 4	1	1260	370 K	2200	179	4	2
10..	75	C 4	1	2020	554 S	3260	193	7	4
11..	75	C 4	1	1220	176	580	187	8	4
12..	70	C 4	1	694	83	156	168	7	3
13..	70	C 4	1	505	44	60	309	33 S	38
14..	80	C 4	1	520	29	41	1190	221 S	747
15..	72	C 4	1	635	49	84	1310	250 S	884
16..	64	C 4	1	495	35	47	994	104	279
17..	66	C 4	1	405	20	22	786	46	98
18..	68	C 4	1	324	16	14	721	33	64
19..	68	C 4	1	304	15	12	661	21	37
20..	64	C 4	1	353	18	17	605	17	28
21..	76	C 4	1	430	23 K	29	536	14	20
22..	76	C 4	1	536	29 B	42	575	14	22
23..	76	C 4	1	425	33	38	694	23	43
24..	70	C 4	1	373	23	43	749	33	67
25..	70	C 4	1	314	15	13	931	45 B	113
26..	70	C 4	1	256	12	8	859	59 B	137
27..	70	C 4	1	262	11	8	714	35	67
28..	70	C 4	1	253	12	8	642	27	47
29..	70	C 4	1	--	--	--	575	14	22
30..	70	C 4	1	--	--	--	611	19	31
31..	427	226 S	389	--	--	--	714	31	60
Total	2501	--	419	15321	--	7704	16495	--	2837

S Computed by subdividing day.

T Less than 0.50 ton.

A Computed from partly estimated concentration graph.

B Computed from estimated concentration graph.

C Composite period.

K Computed from estimated-concentration graph and subdividing day.

DESCHUTES RIVER BASIN--Continued

14-795. CROOKED RIVER NEAR POST, OREG.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
(Where no concentrations are reported, loads are estimated.)

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..	842	73	166	274	4	3	139	C 2	1
2..	1090	79	250	331	18	16	106	C 2	1
3..	1460	148	583	307	11	9	91	C 2	1
4..	1240	100	335	271	--	4	174	15	10
5..	1000	61	165	280	7	5	93	10	5
6..	834	43	97	310	--	5	141	3	1
7..	728	29	57	324	6	5	134	--	1
8..	680	21	39	283	--	5	118	C 0	T
9..	587	23	36	321	25	24	99	C 0	T
10..	558	48	72	369	24	24	112	C 0	T
11..	599	27	44	438	23	27	93	C 0	T
12..	735	35	69	505	23	31	99	C 0	T
13..	629	20	34	389	12	13	93	C 0	T
14..	558	17	26	338	9	8	66	C 0	T
15..	542	17	25	349	20	19	49	C 0	T
16..	587	21	33	334	18	16	34	C 1	T
17..	635	25	43	295	6	5	30	C 1	T
18..	593	20	32	274	C 3	2	27	C 1	T
19..	500	24	32	250	C 3	2	19	C 1	T
20..	461	22	27	250	C 3	2	13	C 1	T
21..	413	17	19	274	C 3	2	12	C 1	T
22..	377	16	16	250	C 3	2	13	C 1	T
23..	345	15	14	214	C 3	2	14	C 1	T
24..	320	7	6	176	C 1	T	13	C 1	T
25..	265	5	4	158	C 1	T	12	C 1	T
26..	223	4	2	144	C 1	T	13	C 1	T
27..	211	4	2	137	C 1	T	12	C 1	T
28..	199	3	2	121	C 1	T	11	C 1	T
29..	217	6	4	118	C 1	T	12	C 1	T
30..	265	--	--	176	C 1	T	13	C 1	T
31..	--	--	--	171	C 1	T	--	--	--
Total	17693	--	2239	8431	--	234	1955	--	21
	JULY			AUGUST			SEPTEMBER		
1..	13	C 3	T	12	C 4	T	17	C 5	T
2..	13	C 3	T	9.6	C 4	T	19	C 5	T
3..	14	C 3	T	7.6	C 4	T	17	C 5	T
4..	17	C 3	T	8.0	C 4	T	16	C 5	T
5..	17	C 3	T	9.0	C 4	T	14	C 5	T
6..	14	C 3	T	11	C 4	T	14	C 5	T
7..	15	C 3	T	13	C 4	T	15	C 5	T
8..	15	C 3	T	12	C 4	T	15	C 5	T
9..	17	C 3	T	11	C 4	T	14	C 5	T
10..	16	C 3	T	9.6	C 4	T	13	C 5	T
11..	14	C 3	T	9.6	C 4	T	13	C 5	T
12..	13	C 3	T	11	C 4	T	14	C 5	T
13..	13	C 3	T	13	C 4	T	14	C 5	T
14..	13	C 3	T	13	C 4	T	12	C 5	T
15..	13	C 3	T	13	C 4	T	13	C 5	T
16..	13	C 3	T	14	C 4	T	13	C 5	T
17..	13	C 3	T	12	C 4	T	13	C 5	T
18..	13	C 3	T	11	C 4	T	13	C 5	T
19..	12	C 3	T	11	C 4	T	14	C 5	T
20..	12	C 3	T	11	C 4	T	16	C 5	T
21..	12	C 3	T	10	C 4	T	13	C 5	T
22..	12	C 3	T	13	C 4	T	14	C 5	T
23..	11	C 3	T	13	C 4	T	14	C 5	T
24..	11	C 3	T	13	C 4	T	14	C 5	T
25..	11	C 3	T	14	C 4	T	14	C 5	T
26..	12	C 3	T	14	C 4	T	14	C 5	T
27..	11	C 3	T	16	C 4	T	14	C 5	T
28..	11	C 3	T	18	C 4	T	16	C 5	T
29..	11	C 3	T	16	C 4	T	16	C 5	T
30..	12	C 3	T	16	C 4	T	15	C 5	T
31..	13	C 3	T	15	C 4	T	--	--	--
Total	407	--	3	379.4	--	4	433	--	6
Total discharge for year (cfs-days).....							69,021.4		
Total load for year (tons).....							13,599		

T Less than 0.50 ton.

A Computed from partly estimated-concentration graph.
B Computed from estimated-concentration graph.C Composite period.
K Computed from estimated-concentration graph and subdividing day.

DESCHUTES RIVER BASIN--Continued
14-875. CROOKED RIVER NEAR CULVER, OREG.

LOCATION.--Temperature recorder at gaging station, 1 mile upstream from mouth, 1.2 miles downstream from Cove powerplant, and 4 miles northwest of Culver, Jefferson County.
DRAINAGE AREA.--4,330 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: July 1952 to September 1961.
EXTREMES, 1960-61.--Water temperatures: Maximum, 59°F on many days during summer months; minimum, 51°F on several days during winter months.
EXTREMES, 1952-61.--Water temperatures: Maximum, 63°F July 14, 1953; minimum, 40°F Dec. 24, 25, 1955.

Month	Temperature (°F) of water, water year October 1960 to September 1961																															Average
	Day																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October	56	56	56	56	56	56	56	55	55	55	55	55	55	54	54	55	55	55	55	55	55	55	55	55	55	55	55	55	55	54	54	55
Maximum	56	56	56	56	56	56	56	55	55	55	55	55	55	54	54	55	55	55	55	55	55	55	55	55	55	55	55	55	55	54	54	55
Minimum	56	56	56	56	56	56	56	55	55	55	55	55	55	54	54	55	55	55	55	55	55	55	55	55	55	55	55	55	55	54	54	55
November	54	54	54	54	54	54	54	54	54	54	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	52	--	53
Maximum	54	54	54	54	54	54	54	54	54	54	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	52	--	53
Minimum	54	54	54	54	54	54	54	54	54	54	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	52	--	53
December	52	52	52	52	52	51	51	51	51	51	51	51	51	51	51	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
Maximum	52	52	52	52	52	51	51	51	51	51	51	51	51	51	51	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
Minimum	52	52	52	52	52	51	51	51	51	51	51	51	51	51	51	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
January	52	52	52	52	52	52	52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Maximum	52	52	52	52	52	52	52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Minimum	52	52	52	52	52	52	52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
February	52	52	52	52	52	52	52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Maximum	52	52	52	52	52	52	52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Minimum	52	52	52	52	52	52	52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
March	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Maximum	53	53	53	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	55	55	55	56	56	56	54
Minimum	53	53	53	53	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	55	55	55	55	55	56
April	56	57	57	56	55	55	55	55	55	55	55	55	55	55	55	56	56	56	55	55	55	55	55	55	55	55	56	56	55	55	55	55
Maximum	56	57	57	56	55	55	55	55	55	55	55	55	55	55	55	56	56	56	55	55	55	55	55	55	55	55	56	56	55	55	55	55
Minimum	56	56	56	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	56	56	55	55	55	55
May	57	57	57	56	57	56	56	56	56	57	56	57	56	57	56	56	57	58	58	58	58	58	58	58	58	58	57	57	57	57	57	57
Maximum	57	57	57	56	57	56	56	56	56	57	56	57	56	57	56	56	57	58	58	58	58	58	58	58	58	58	57	57	57	57	57	57
Minimum	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	57	57	57	57	57	56
June	58	58	58	58	58	58	58	58	58	58	58	58	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
Maximum	57	57	57	57	57	58	57	57	57	57	57	57	57	57	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
Minimum	57	57	57	57	57	58	57	57	57	57	57	57	57	57	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
July	59	59	58	59	58	58	59	59	59	59	59	59	59	58	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
Maximum	59	59	58	59	58	58	59	59	59	59	59	59	59	58	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
Minimum	57	58	58	58	58	57	57	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
August	59	59	59	59	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
Maximum	59	59	59	59	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
Minimum	58	58	58	58	58	58	57	57	56	56	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57
September	58	57	57	57	57	57	57	57	57	57	57	57	57	56	56	57	56	56	56	56	56	56	56	56	55	55	55	55	55	55	55	55
Maximum	58	57	57	57	57	57	57	57	57	57	57	57	57	56	56	57	56	56	56	56	56	56	56	56	55	55	55	55	55	55	55	55
Minimum	57	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	55	55	55	55	55	55	55	55	55

COLUMBIA RIVER MAIN STEM

14-1057. COLUMBIA RIVER NEAR THE DALLIES, OREG.

LOCATION --At The Dalles Dam, 3.2 miles upstream from gaging station, and 2.6 miles northeast of The Dalles, Wasco County.
DRAINAGE AREA --237,000 square miles, approximately, upstream from gaging station.

RECORDS AVAILABLE --Chemical analyses; December 1950 to September 1961.

WATER TEMPERATURES: December 1950 to September 1961.

EXTREMES: Maximum, 81°F Aug. 12, 13, 1958; minimum, freezing point on several days during winter months some years.

REMARKS --Records of specific conductance of daily samples available in district office at Portland, Oreg. No appreciable inflow between sampling point and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1960 to September 1961

DATE OF COLLECTION

MEAN DISCHARGE (cfs)

SILICA (SiO₂) (Fe)

IRON (Fe)

CALCIUM (Ca)

MAGNESIUM (Mg)

SODIUM (Na)

POTASSIUM (K) (HCO₃)

BICARBONATE (HCO₃)

CARBONATE (CO₃)

SULFATE (SO₄)

CHLORIDE (Cl)

FLUORIDE (F) (NO₃) (B)

BOILER TREATMENT (B)

TONS PER ACRE-FOOT

TONS PER ACRE-DAY

HARDNESS AS CaCO₃

CALCIUM, MAGNESIUM

NON-CARBONATE

SODIUM ADSORPTION RATIO

PH

Specific conductance (microhmhos at 25°C)

Oct. 1-15, 1960...

Oct. 16-31, 1960...

Nov. 1-29, 1960...

Nov. 30-Dec. 22, 1960...

Dec. 23, 24, 1960...

Dec. 25-31, 1960...

Jan. 1-29, 1961...

Jan. 30-Feb. 5, 1961...

Feb. 6-10, 1961...

Feb. 11-17, 1961...

Feb. 18-26, 1961...

Feb. 27-Mar. 6, 1961...

Mar. 7-22, 1961...

Mar. 23-31, 1961...

Apr. 1-10, 1961...

Apr. 11-30, 1961...

May 1-23, 1961...

May 24-31, 1961...

WHITE SALMON RIVER BASIN

14-1235. WHITE SALMON RIVER NEAR UNDERWOOD, WASH.

LOCATION.--At gaging station, 1,000 feet downstream from Pacific Power and Light Company's Condit powerplant, and 2 miles north of Underwood, Skamania County.
 DRAINAGE AREA.--386 square miles.
 RECORDS AVAILABLE.--Chemical analyses: August 1960 to August 1961 (discontinued).

Chemical analyses, in parts per million, August 1960 to August 1961

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)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
AUG. 1, 1960.....	796	22		6.0	2.3	3.8	1.6	36		2.8	1.0	0.1	0.0	0.10	65			24	0		69 7.7
Aug. 31.....	472	28		5.0	3.0	3.6	1.3	37		3.4	1.5	1.1	2.1	0.09	70			25	0		69 7.5
Sept. 30.....	600	28		6.0	2.4	3.6	1.6	38		3.2	1.0	1.1	2.1	0.14	65			25	0		70 7.6
Oct. 31.....	600	28		6.0	2.1	3.5	1.3	35		3.6	1.5	1.1	3.1	0.10	69			24	0		68 7.3
Nov. 30.....	1,100	25		5.0	1.9	3.0	1.1	31		2.4	1.5	0.2	2.08	0.08	55			20	0		58 7.5
Dec. 31.....	850	27		5.5	2.2	3.0	0.9	35		2.2	1.5	1.1	2.2	0.09	61			22	0		64 7.5
Jan. 3, 1961.....	2,160	22		5.0	1.1	2.4	1.0	27		1.8	1.5	1.1	2.2	0.09	52			17	0		49 7.3
Feb. 1.....																					
Feb. 28.....	2,220	25		4.5	2.1	2.8	.9	30		2.4	.5	1.1	2.2	0.09	51			20	0		54 7.3
Mar. 31.....	1,970	23		5.0	2.0	3.0	1.0	32		.4	.5	1.1	2.2	0.07	49			21	0		56 7.5
May 1.....	1,940	23		5.0	1.5	2.8	1.1	29		.8	.2	1.1	1.1	0.06	48			18	0		51 7.4
June 1.....	1,850	23		4.0	2.0	3.0	1.1	29		1.8	.5	1.1	1.1	0.10	53			18	0		52 7.4
June 30.....	1,070	27		5.5	2.0	3.2	.9	34		2.6	.5	1.1	1.1	0.08	64			22	0		63 7.4
July 1.....	867	28		6.0	2.2	3.4	1.3	36		3.6	.8	1.1	1.1	0.14	62			24	0		66 7.4
July 31.....	710	29		6.0	2.3	3.5	1.4	37		4.2	.5	1.1	.8	.10	70			24	0		65 7.3

WILLAMETTE RIVER BASIN--Continued
14-1455. MIDDLE FORK WILLAMETTE RIVER ABOVE SALT CREEK, NEAR OAKRIDGE, OREG.

LOCATION.--Temperature recorder at gaging station, 90 feet upstream from highway bridge, 0.3 mile upstream from Salt Creek, 1.1 miles downstream from Hills Creek Dam, and 2.3 miles southeast of Oakridge, Lane County.

DRAINAGE AREA.--392 square miles.

RECORDS AVAILABLE.--October 1960 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 77°F Sept. 4; minimum, 35°F Jan. 4.

Temperature (°F) of water, water year October 1960 to September 1961

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

WILLAMETTE RIVER BASIN--Continued

14-1480. MIDDLE FORK WILLAMETTE RIVER BELOW NORTH FORK, NEAR OAKRIDGE, OREG.

LOCATION.--Temperature recorder at gaging station, 0.5 mile downstream from Whitehead Creek, 4.2 miles downstream from 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 October 1960, June to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 74° F Aug. 3.

EXTREMES, 1950-61.--Water temperatures: Maximum, 74° F Aug. 3, 1961; minimum, 38° F on several days during winter months.

Temperature (°F) of water, October 1960, June to September 1961																																		
Month		Day																														Average		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		31	
October	Maximum	57	56	56	56	56	57	57	53	53	52	51	51	51	50	51	52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Minimum	55	55	54	54	54	56	53	52	52	51	50	50	49	48	49	51	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
November	Maximum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Minimum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
December	Maximum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Minimum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
January	Maximum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Minimum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
February	Maximum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Minimum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
March	Maximum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Minimum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
April	Maximum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Minimum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
May	Maximum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Minimum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June	Maximum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Minimum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July	Maximum	65	67	68	66	62	63	65	69	71	72	73	73	70	72	72	71	71	71	72	72	72	71	71	71	70	72	72	71	71	71	71	71	70
	Minimum	59	62	62	61	59	58	58	61	64	65	66	66	67	64	65	65	65	65	66	66	66	66	66	65	64	65	66	66	64	65	65	65	64
August	Maximum	71	73	74	73	71	73	71	71	72	70	71	68	67	70	70	71	70	71	72	71	72	71	69	67	67	65	67	68	68	67	70	70	70
	Minimum	65	66	67	70	67	66	66	65	64	67	66	66	65	63	64	64	64	65	65	66	67	65	64	63	61	62	63	62	63	62	63	65	65
September	Maximum	64	61	63	66	65	64	62	63	62	63	63	63	63	61	62	61	58	59	62	60	59	57	57	57	57	57	56	56	54	--	60	--	60
	Minimum	61	59	57	59	60	59	58	57	56	56	57	57	57	58	58	57	56	57	57	55	53	52	51	52	53	51	54	52	50	--	56	--	56

WILLAMETTE RIVER BASIN--Continued

14-1620. BLUE RIVER NEAR BLUE RIVER, OREG.

LOCATION.--Temperature recorder at gaging station, 3 miles upstream from Quartz Creek, and 3.5 miles northeast of town of Blue River, Lane County.

DRAINAGE AREA.--75.0 square miles.

RECORDS AVAILABLE.--Water temperatures: July to September 1961.

EXTREMES, July to September 1961.--Water temperatures: Maximum, 76°F Aug. 3.

Temperature (°F) of water, July to September 1961.

Month	Day																															Average		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
June	Maximum	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	70	70	69	68	65	62	64	---	---
Minimum	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	64	64	64	60	58	56	---	---	---
July	Maximum	66	68	69	65	64	61	64	67	69	70	70	72	68	71	71	71	71	71	72	72	72	71	71	71	71	71	71	72	72	72	70	70	
Minimum	58	60	61	62	61	57	57	57	62	62	62	64	67	65	64	65	63	63	64	64	64	64	66	64	64	63	63	64	64	64	64	63	63	
August	Maximum	72	74	76	74	70	74	74	72	71	72	69	71	73	68	69	70	71	71	70	72	74	74	71	68	69	64	70	70	70	69	65	71	
Minimum	64	65	67	70	68	64	64	64	63	63	64	66	65	64	64	63	62	62	62	63	64	65	65	63	63	63	62	63	62	63	62	63	64	
September	Maximum	63	59	62	64	62	62	61	61	62	62	61	61	58	60	58	60	58	57	55	55	55	55	55	55	55	55	54	54	54	53	59	---	
Minimum	58	58	58	58	58	58	58	57	57	57	58	58	57	57	57	57	57	56	56	54	52	52	52	52	52	52	52	52	52	52	52	52	56	---

14-1625. MCKENZIE RIVER NEAR VIDA, OREG.

LOCATION.--Temperature recorder at gaging station, 1 mile upstream from head of Martin Rapids, and 5 miles east of Vida, Lane County.

DRAINAGE AREA.--930 square miles at cableway 0.4 mile downstream, where all discharge measurements are made.

RECORDS AVAILABLE.--Water temperatures: June to September 1961.

Temperature (°F) of water, June to September 1961

Month	Day																															Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
June	Maximum	---	---	---	---	---	---	---	---	---	---	---	---	54	54	54	55	56	55	55	55	56	56	56	57	57	56	55	55	55	---	
Minimum	---	---	---	---	---	---	---	---	---	---	---	---	---	51	51	51	51	52	51	52	51	53	53	53	54	54	53	53	51	---	---	
July	Maximum	57	57	57	56	54	55	57	58	58	58	58	58	57	57	57	57	57	57	57	58	58	58	57	57	58	57	57	56	56	56	57
Minimum	53	53	53	53	53	53	53	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54
August	Maximum	57	58	58	56	57	57	57	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	55	55	55	54	56
Minimum	54	54	54	54	53	54	54	53	53	53	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	53	53	53	53	53	54
September	Maximum	54	54	54	53	53	52	51	51	51	51	51	51	51	51	51	51	51	51	51	50	50	49	49	49	49	49	49	48	48	---	---
Minimum	53	53	53	52	51	51	51	50	50	50	50	50	50	50	50	50	50	50	50	50	50	49	48	48	48	48	48	48	48	48	---	---

WILLAMETTE RIVER BASIN--Continued

14-1660. WILLAMETTE RIVER AT HARRISBURG, OREG.

LOCATION.--Temperature recorder located 500 feet downstream from gaging station, at bridge on U.S. Highway 99 at Harrisburg, Linn County, and at mile 162.9.
 DRAINAGE AREA.--3,420 square miles, approximately.
 RECORDS AVAILABLE.--Water temperatures: June to September 1961.
 EXTREMES, June to September 1961.--Water temperatures: Maximum, 69°F July 12, 13.

Temperature (°F) of water, June to September 1961

Month	Day																															Average		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
June	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
Maximum																																		
Minimum																																		
July																																		
Maximum	64	64	64	64	61	61	61	64	66	67	68	69	69	68	66	67	67	67	68	68	68	67	66	64	64	65	65	63	62	61	62	---		
Minimum	62	63	63	61	60	60	60	61	64	65	66	67	68	66	65	66	66	66	66	66	66	66	64	63	64	63	64	64	61	61	60	---		
August																																		
Maximum	65	65	66	66	65	65	65	65	66	66	66	66	66	64	63	63	63	63	63	63	64	65	64	64	62	62	64	65	66	66	65	64		
Minimum	63	64	65	65	64	64	64	64	65	65	65	65	65	64	63	62	62	62	62	62	62	62	61	62	61	62	62	64	64	65	65	64		
September																																		
Maximum	65	64	63	64	64	64	62	62	63	63	63	64	64	64	63	62	63	62	62	62	62	62	62	60	60	60	60	61	60	60	---	62		
Minimum	64	63	62	63	64	62	62	62	62	62	62	63	63	62	62	62	62	62	62	62	62	61	60	60	60	60	60	60	59	59	---	---		

WILLAMETTE RIVER BASIN--Continued
 14-1780. NORTH SANTIAM RIVER BELOW BOULDER CREEK, NEAR DETROIT, OREG.

LOCATION.--Temperature recorder at gaging station, 0.5 mile downstream from Boulder Creek, and 3.0 miles southeast of Detroit, Clatsop County, 216 square miles.
 DRAINAGE AREA.--216 square miles.
 RECORDS AVAILABLE.--Water temperatures: April 1951 to September 1961.
 EXTREMES, 1960-61.--Water temperatures: Maximum, 61°F July 11, 12, 14, Aug. 3, 22; minimum, 35°F Jan. 2-4, 27, 28.
 EXTREMES, 1951-61.--Water temperatures: Maximum, 64°F July 28, 1958; minimum, freezing point Dec. 1, 1954, Mar. 5, 1955, Feb. 16, 17, 1956.

Temperature (°F) of water, water year October 1960 to September 1961																																	Average		
Month		Day																														Average			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			31	
October	Maximum	50	50	50	49	50	51	51	48	46	45	44	45	45	45	46	46	46	46	47	47	47	47	47	47	47	47	45	45	45	44	45	47		
	Minimum	48	48	47	48	48	48	46	45	43	44	44	44	44	43	43	45	45	44	45	46	47	47	47	47	47	45	44	44	43	42	44	45		
	Mean	49	49	48	48	49	49	47	46	44	44	44	44	44	44	44	45	45	44	45	46	47	47	47	47	47	46	44	44	43	43	44	46		
November	Maximum	46	46	45	43	42	42	43	44	43	43	43	43	43	43	40	42	43	42	43	43	43	41	41	41	41	41	41	39	40	--	42			
	Minimum	45	45	43	41	41	41	42	43	41	41	43	43	43	40	40	40	42	42	42	42	42	41	41	41	41	41	39	39	40	--	41			
	Mean	45	45	43	42	42	42	43	42	42	42	43	43	43	41	41	41	42	42	42	42	42	41	41	41	41	41	40	39	40	--	41			
December	Maximum	41	41	41	41	40	39	38	38	38	39	40	40	40	40	40	40	40	41	41	40	40	40	40	40	40	40	40	39	38	37	37	40		
	Minimum	40	41	41	40	39	38	38	38	38	39	40	39	39	39	39	40	40	41	40	40	40	40	40	40	40	40	39	38	37	37	37	39		
	Mean	40	41	41	40	39	38	38	38	38	39	40	39	39	39	39	40	40	40	40	40	40	40	40	40	40	40	39	38	37	37	37	39		
January	Maximum	37	37	36	36	38	38	38	39	39	39	39	39	39	39	40	40	40	40	37	37	37	37	37	37	37	37	37	37	37	37	37	38		
	Minimum	37	35	35	35	36	38	38	38	39	39	39	39	39	39	39	40	40	37	37	37	37	37	37	37	37	37	35	35	37	38	39	37		
	Mean	37	36	36	36	37	38	38	38	39	39	39	39	39	39	39	40	40	38	38	38	38	38	38	38	38	38	37	37	37	37	38	39		
February	Maximum	39	40	40	40	41	41	40	39	40	40	39	39	39	39	39	39	39	38	39	39	39	39	39	39	39	39	39	39	40	--	39			
	Minimum	38	39	39	39	40	40	39	39	39	39	39	39	39	39	39	39	39	38	39	39	39	39	39	39	39	39	39	39	40	--	39			
	Mean	38	39	39	39	40	40	39	39	39	39	39	39	39	39	39	39	39	38	39	39	39	39	39	39	39	39	39	39	40	--	39			
March	Maximum	40	39	39	39	39	37	39	39	39	39	38	39	39	39	40	40	40	40	40	40	41	41	41	41	41	41	41	41	41	41	41	41		
	Minimum	39	39	38	38	37	37	37	39	39	38	38	38	39	39	39	39	40	39	40	39	39	39	39	39	39	39	38	38	38	38	--	39		
	Mean	39	39	38	38	38	38	38	39	39	38	38	38	39	39	39	40	40	39	40	39	39	39	39	39	39	39	38	38	38	38	--	39		
April	Maximum	44	44	43	43	43	43	44	42	43	45	44	44	42	44	46	45	44	43	40	41	41	41	41	41	41	41	41	41	43	44	43	40		
	Minimum	41	43	41	41	39	39	40	40	41	42	41	41	41	40	41	41	42	39	38	39	40	39	39	41	41	41	41	39	39	41	40	42	39	
	Mean	42	43	42	42	41	41	41	41	41	42	42	42	42	41	42	43	42	40	40	40	41	40	40	40	40	40	40	40	40	41	40	42	39	
May	Maximum	42	43	43	41	42	43	44	45	43	43	44	44	45	44	46	45	44	43	40	41	41	41	41	41	41	41	41	41	45	45	45	43		
	Minimum	42	42	41	40	40	41	42	42	41	42	42	42	42	42	43	42	43	43	40	41	41	41	41	41	41	41	41	41	45	45	45	43		
	Mean	42	42	41	40	40	41	42	42	41	42	42	42	42	42	42	43	42	43	41	41	41	41	41	41	41	41	41	41	45	45	45	43		
June	Maximum	53	53	54	54	51	50	51	50	51	52	54	56	58	57	59	60	59	58	57	59	59	59	59	59	59	59	60	59	58	56	53	56	--	56
	Minimum	47	48	49	49	49	48	46	48	47	48	50	49	49	51	52	53	53	53	52	50	51	52	52	53	53	52	50	51	49	--	50			
	Mean	50	51	51	51	50	50	49	49	48	48	50	49	49	50	51	52	53	53	52	50	51	52	52	53	53	52	50	51	49	--	50			
July	Maximum	58	59	58	58	53	53	56	58	60	61	61	57	61	60	60	60	60	60	60	60	60	60	60	60	60	59	59	58	59	59	59			
	Minimum	50	51	52	53	52	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50		
	Mean	54	55	55	55	52	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51		
August	Maximum	60	60	61	60	59	59	60	59	59	59	57	57	59	58	57	60	59	58	58	60	59	61	60	58	57	55	59	58	59	58	56	59		
	Minimum	52	54	54	56	56	53	53	53	52	52	53	55	55	55	55	53	53	53	54	54	56	55	54	53	53	54	53	54	53	54	54	54		
	Mean	56	57	57	58	57	56	56	56	56	56	56	57	58	57	58	57	59	58	59	60	59	60	59	58	57	56	59	58	59	58	56	59		
September	Maximum	54	53	56	57	56	54	54	54	54	53	53	52	52	52	52	52	53	52	53	52	50	48	48	48	48	48	48	48	47	--	52			
	Minimum	52	51	51	53	52	50	50	50	50	50	49	48	50	50	50	50	50	50	50	50	49	48	45	44	46	46	46	46	46	45	--	49		
	Mean	53	52	53	55	54	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	51	50	49	48	48	48	48	48	47	--	50			

WILLAMETTE RIVER BASIN--Continued

14-1910. WILLAMETTE RIVER AT SALEM, OREG.

LOCATION.--At bridge on State Highway 22, 300 feet downstream from gaging station at Salem, Marion County.

DRAINAGE AREA.--7,280 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: August to December 1910, August 1911 to August 1912, February 1951 to September 1961.

EXTREMES 1960-1961.--Discharge: Maximum, 131 cfs, to September 1961; minimum, 15 cfs, to September 1961.

Hardness: Maximum, 25 ppm Sept. 19-30; minimum, 15 ppm Nov. 16-24, Feb. 12-18.

Specific conductance: Maximum daily, 71 microhms Dec. 24; minimum daily, 35 microhms Feb. 12.

Water temperatures: Maximum, 74°F July 13; minimum, 38°F Jan. 27-28.

EXTREMES, 1951-61.--Dissolved solids: Maximum, 69 ppm Nov. 1-30, 1952; minimum, 38 ppm Nov. 22-30, 1953.

Hardness: Maximum, 28 ppm Sept. 16-20, 24-29, 1951, Aug. 11-20, Oct. 11-31, 1952, Aug. 1-10, 1953; minimum, 13 ppm Feb. 1-26, 1956.

Specific conductance: Maximum daily, 133 microhms Nov. 7, 1954; minimum daily, 35 microhms Jan. 20, 1953, Feb. 12, 1961.

Water temperatures: Maximum, 78°F July 22, 1959; minimum, freezing point on several days during February 1956.

REMARKS.--Records of specific conductance of daily samples available in district office at Portland, Oreg.

Chemical analyses, in parts per million, water year October 1960 to September 1961

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		Sodium adsorption ratio	Specific conductance (microhms at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 1-28, 1960...	8,900	16		5.5	1.7	3.7	0.6	30		2.0	2.2	0.0	0.7	0.02	53	0.07	1,270	20	0	0.4	61	7.1
Oct. 29-Nov. 15...	14,720					3.0	--	26		--	--	--	--	--	53	.07	2,110	18	0	--	54	7.0
Nov. 16-27...	53,980					2.6	--	18		--	--	--	--	--	52	.07	7,580	15	0	--	46	6.6
Nov. 28-Dec. 7...	146,300					2.1	--	29		--	--	--	--	--	56	.08	9,120	16	0	--	61	6.2
Nov. 28-Dec. 7...	60,320					2.5	--	22		--	--	--	--	--	56	.08	9,120	16	0	--	48	6.9
Dec. 8-19...	26,290					2.9	--	23		--	--	--	--	--	61	.08	4,330	19	0	--	56	6.9
Dec. 20-23...	51,300					2.9	--	20		--	--	--	--	--	66	.10	9,140	17	1	--	50	6.8
Dec. 24...	22,010					3.3	--	23		--	--	--	--	--	63	.09	3,740	21	2	--	59	6.7
Jan. 6, 1961...	33,930	14		5.5	1.2	3.0	.4	22		3.6	2.0	.0	1.0	.01	47	.18	4,310	16	0	.3	53	6.8
Jan. 7-23...	20,370					3.3	--	24		--	--	--	--	--	51	.08	2,800	21	1	--	60	6.8
Jan. 24-Feb. 2...																						
Feb. 3-11...	63,610					2.8	--	20		--	--	--	--	--	53	.07	9,100	17	1	--	50	6.6
Feb. 12-18...	148,000					2.5	--	19		--	--	--	--	--	49	.07	19,580	15	0	--	44	6.8
Feb. 19-Mar. 7...	78,530					3.1	--	23		--	--	--	--	--	47	.06	8,970	16	0	--	48	6.9
Mar. 8-Apr. 7...	53,810					3.1	--	23		--	--	--	--	--	48	.07	6,970	17	0	--	51	7.1
Apr. 8-21...	18,900	16		5.0	1.7	3.2	.5	22		4.0	2.0	.1	1.0	.00	50	.07	2,910	20	2	.3	57	6.8
Apr. 22-May 21...	23,960					3.0	--	22		--	--	--	--	--	50	.07	3,240	17	0	--	51	6.9

WILLAMETTE RIVER BASIN--Continued
 14-1910. WILLAMETTE RIVER AT SALEM, OREG. --Continued

Chemical analyses, in parts per million, water year October 1960 to September 1961--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		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-boronate				
May 22-June 21, 1961...	14,490	---	---	---	---	3.6	---	22	---	---	---	---	---	---	---	56	0.08	2,190	18	0	---	59	6.8
June 22-July 5.....	7,604	---	---	---	---	4.2	---	27	---	---	---	---	---	---	---	61	.08	1,250	22	0	---	66	6.8
July 6-Aug. 4.....	6,243	17	6.0	1.7	4.1	4.2	0.8	30	3.4	3.4	3.2	0.1	0.9	0.01	51	.07	860	22	0	0.4	68	7.1	
Aug. 5-Sept. 4.....	6,092	---	---	---	---	4.2	---	30	---	---	---	---	---	---	51	.07	839	21	0	---	63	7.0	
Sept. 5-18.....	6,589	---	---	---	---	4.0	---	30	---	---	---	---	---	---	54	.07	961	22	0	---	64	7.0	
Sept. 19-30.....	6,248	---	---	---	---	4.2	---	32	---	---	---	---	---	---	61	.08	1,030	23	0	---	66	7.2	
Weighted average	28,345	---	---	---	---	3.0	---	22	---	---	---	---	---	---	52	0.07	3,950	17	0	---	63	---	

Temperature (°F) of water, water year October 1960 to September 1961

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

LEWIS RIVER BASIN

14-2205. LEWIS RIVER AT ARIEL, WASH.

LOCATION.---Temperature recorder at gaging station, at Ariel, Cowlitz County, 0.5 mile downstream from Ariel Dam and powerplant, and 3 miles upstream from Cedar Creek.

RAINFALL.---Total for 1960. 10.44 inches.

RECORDS AVAILABLE.---Records: July 1959 to June 1960.

Water temperatures: October 1950 to September 1961.

EXTREMES, 1960-61.---Water temperatures: Maximum, 75°F Aug. 10; minimum, 41°F Dec. 28, Jan. 4.

EXTREMES, 1950-61.---Water temperatures: Maximum, 75°F Feb. 28, 29, Mar. 1, 2, 11, 12, 1956.

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

KALAMA RIVER BASIN

14-2235. KALAMA RIVER BELOW ITALIAN CREEK, NEAR KALAMA, WASH.

LOCATION.--Temperature recorder at gaging station, 2.5 miles northeast of Kalama, 3 miles upstream from mouth, and 5 miles downstream from Italian Creek.

DRAINAGE AREA (revised).--198 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1954 to September 1961.

EXTREMES, 1954-61.--Water temperatures: Maximum, 66°F July 12; minimum, 38°F Jan. 3, 4.

EXTREMES, 1954-61.--Water temperatures: Maximum, 69°F July 26, 1958; minimum, freezing point Nov. 19, 20, 1958.

Temperature (°F) of water, water year October 1960 to September 1961

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

KALAMA RIVER BASIN--Continued

14-2235.1. KALAMA RIVER ABOVE KALAMA, WASH.

LOCATION--At bridge on U.S. Highway 96, 1.1 miles upstream from mouth, 1.8 miles north of Kalama, Cowlitz County, and 1.9 miles downstream from gaging station.
 DRAINAGE AREA (revised).--198 square miles, upstream from gaging station.
 RECORDS AVAILABLE.--Chemical analyses: July 1960 to September 1961.

Chemical analyses, in parts per million, July 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (Fe)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carb- onate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃) (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		So- dium ad- sorp- tion ratio	Specific con- duct- (micro- mhos at 25°C)	
														Parts per million	Tons per acre- foot	Tons per day	Cal- cium, Mag- nes- ium	Non- car- bon- ate			
July 18, 1960.....	330	19		5.0	1.2	4.1	0.4	27		0.4	3.0	0.1	0.0	0.04	51		18	0		56	7.2
Aug. 9.....	255	19		6.5	1.5	4.2	.7	27		.2	4.0	.1	.1	.05	51		18	0		58	7.4
Sept. 12.....	285	17		5.5	1.0	4.0	.4	26		.8	3.8	.1	.2	.05	51		18	0		59	7.5
Oct. 14.....	354	17		6.0	.3	3.6	.2	25		.4	4.0	.1	.3	.04	49		16	0		53	7.4
Nov. 8.....	516	15		4.5	1.0	2.9	.1	23		.0	2.5	.0	.5	.05	40		15	0		49	7.3
Dec. 5.....	1,220	14		3.5	1.0	2.1	.5	19		.0	2.0	.2	.5	.00	34		12	0		39	7.3
Jan. 5, 1961.....	1,550	15		5.0	1.4	3.2	.2	26		2.0	2.0	.1	.4	.04	35		12	0		34	7.0
Feb. 7.....	3,620	15		4.0	.3	2.0	.2	16		1.0	1.8	.1	.9	.24	32		13	0		34	7.0
Mar. 7.....	2,800	14		4.0	.7	2.4	.1	18		.6	1.8	.0	1.2	.17	32		13	0		38	7.2
Apr. 11.....	1,220	14		3.5	.8	2.7	.7	17		1.4	1.5	.1	.5	.03	38		12	0		38	7.2
May 9.....	1,650	14		4.0	.5	2.4	.2	19		.0	1.8	.0	.4	.03	34		12	0		39	7.2
June 13.....	568	16		4.0	1.2	3.2	.5	22		.0	2.2	.1	.1	.05	41		15	0		47	6.8
July 11.....	352	19		5.0	1.2	4.1	.3	27		.0	3.0	.1	.2	.05	50		18	0		54	7.3
Aug. 8.....	266	20		5.5	1.9	4.3	.5	28		.8	3.2	.1	.2	.05	51		18	0		57	7.4
Sept. 12.....	230	20		5.0	1.4	4.7	.5	28		1.2	4.0	.1	.2	.08	54		18	0		57	7.2

COWLITZ RIVER BASIN--Continued

14-2335. COWLITZ RIVER NEAR KOSMOS, WASH.--Continued

Temperature (°F) of water, water year October 1960 to September 1961

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

COWLITZ RIVER BASIN--Continued
14-2380. COWLITZ RIVER NEAR MAYFIELD, WASH.

LOCATION.--Temperature recorder at gaging station, 1 mile upstream from Mill Creek, 2 miles downstream from Winston Creek, and 2.2 miles west of Mayfield, Lewis County.

DRAINAGE AREA.--1,400 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 67°F Aug. 2-4; minimum, 38°F Jan. 28, 29.

EXTREMES, 1950-61.--Water temperatures: Maximum, 70°F July 28, 29, 1956; minimum, 33°F Jan. 28-31, Feb. 1-2, 1956.

	Temperature (°F) of water, water year October 1960 to September 1961																																	Average
	Day																																	
Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
October	56	56	55	55	55	55	55	54	51	49	48	48	48	48	50	52	52	52	52	52	52	52	52	52	51	50	49	48	47	46	45	51		
Maximum	55	55	55	55	55	55	54	51	49	48	48	48	48	48	50	51	52	52	52	52	52	52	52	51	50	49	48	47	46	45	51			
Minimum	46	46	46	45	44	43	43	43	43	43	44	44	44	44	43	43	43	43	43	43	43	42	42	42	43	43	41	41	41	42	--	43		
November	45	46	45	44	43	43	43	43	43	43	43	44	44	44	43	43	43	43	43	43	42	42	42	42	42	41	41	41	41	41	--	43		
December	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	42	42	42	42	42	42	42	42	41	41	42	42	41	41	41	42		
Maximum	42	43	43	43	41	39	39	39	40	40	41	43	43	43	43	41	40	42	42	42	42	42	42	41	41	42	42	41	40	41	41	41	42	
Minimum	41	41	41	41	42	43	43	43	43	44	44	44	44	44	44	44	44	43	42	42	42	42	41	41	42	42	41	39	40	41	41	42	42	
January	41	41	41	40	40	42	43	43	43	43	44	44	44	44	44	44	44	43	42	42	42	42	41	41	42	41	39	38	40	41	42	42	42	
February	41	41	41	41	42	43	43	43	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	41	42	41	39	38	40	41	42	42	42	
Maximum	41	41	41	41	42	43	43	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	41	41	41	41	41	--	--	42	
Minimum	41	41	41	41	42	43	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	41	41	41	41	--	--	42	
March	41	41	41	41	41	41	41	42	42	42	42	42	42	42	42	42	43	43	45	44	44	43	43	43	43	44	44	44	45	45	45	43	43	
Maximum	41	41	41	41	41	40	40	41	42	42	42	42	42	42	42	42	42	43	44	44	44	44	43	43	43	44	44	44	44	45	45	45	43	
Minimum	41	41	41	41	41	40	40	41	42	42	42	42	42	42	42	42	43	43	45	44	44	44	43	43	43	44	44	44	44	45	45	45	43	
April	45	45	45	44	44	44	45	45	44	44	44	44	45	45	46	47	47	47	44	43	44	44	43	43	43	44	44	44	44	45	45	45	43	
Maximum	45	45	44	44	44	42	41	42	43	44	44	44	44	44	43	44	46	47	44	43	43	42	42	42	43	46	46	48	48	47	--	--	45	
Minimum	46	46	45	44	43	44	46	47	46	46	46	46	46	47	49	51	51	50	50	49	47	46	48	48	50	50	48	48	50	51	48	48	48	
May	48	45	44	43	43	43	44	46	47	46	46	46	46	47	49	51	51	50	50	49	47	46	48	48	50	50	48	48	50	51	48	48	48	
June	54	54	53	53	52	51	49	51	51	51	52	54	57	58	59	59	59	59	58	58	57	57	58	60	60	60	57	56	56	57	--	--	56	
Maximum	51	52	52	52	51	49	48	49	50	49	51	51	53	54	55	56	56	56	56	55	54	54	56	56	57	57	55	55	56	56	--	--	53	
Minimum	60	61	61	61	60	58	58	60	62	63	64	65	66	66	66	66	64	63	64	65	66	66	66	66	66	66	64	64	63	64	64	63	64	
July	56	58	59	59	58	56	54	57	60	61	62	63	63	64	63	63	62	62	64	64	65	66	66	66	66	66	64	64	63	63	63	61	61	
Maximum	65	67	67	67	66	65	65	65	65	65	66	66	66	66	66	66	64	63	63	64	65	66	66	66	66	66	64	64	63	63	63	61	61	
Minimum	64	65	66	66	65	64	64	64	64	64	65	65	65	65	65	64	63	63	63	64	65	65	65	65	64	63	63	62	62	64	64	64	65	
August	65	67	67	67	66	65	65	65	65	65	66	66	66	66	66	66	65	64	63	64	65	66	66	66	66	66	64	63	63	64	66	65	65	
Maximum	64	65	66	66	65	64	64	64	64	64	65	65	65	65	65	64	63	63	63	64	65	65	65	65	64	63	63	62	62	64	64	64	65	
September	64	62	58	60	63	61	61	59	59	59	60	59	59	58	58	58	57	56	58	58	57	56	55	54	54	54	54	54	54	54	54	--	--	58
Maximum	62	58	57	57	60	61	59	58	58	58	58	58	58	58	58	58	57	56	58	58	57	56	55	54	54	54	54	54	54	54	54	--	--	57
Minimum	62	58	57	57	60	61	59	58	58	58	58	58	58	58	58	58	57	56	58	58	57	56	55	54	54	54	54	54	54	54	54	--	--	57

COWLITZ RIVER BASIN--Continued

14-2427. TOUTLE RIVER NEAR CASTLE ROCK, WASH.

LOCATION.--At bridge on U.S. Highway 99, 1 mile upstream from mouth, 2.6 miles north of Castle Rock, Cowlitz County, and 14.4 miles downstream from gaging station.

DRAINAGE AREA.--474 square miles, upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: July 1960 to September 1961.

REMARKS.--Records of discharge given for Toutle River near Silver Lake. Appreciable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, July 1960 to September 1961

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)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃	Sodium carbonate ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day				
July 18, 1960.....	594	19		5.0	1.4	5.3	0.5	29		2.2	4.0	0.1	0.1	0.04	54		18	0		63	7.4
	408	20		6.5	1.3	6.8	1.0	34		2.6	5.5	.2	.0	.07	65		21	0		77	7.7
	480	20		5.0	2.0	6.6	.7	33		3.0	5.2	.1	.3	.05	64		20	0		76	7.6
	600	19		6.0	1.1	5.6	.7	31		2.4	5.0	.2	.3	.05	61		20	0		69	7.5
	1,000	17		4.0	1.6	4.1	.4	26		2.4	3.5	.0	.2	.02	51		16	0		56	7.3
Dec. 5, 1961.....	2,500	15		4.0	.9	3.1	.2	21		2.0	2.2	.1	.2	.03	42		14	0		44	7.1
	1,800	15		4.0	.7	3.4	.5	20		1.8	2.5	.1	.7	.03	44		13	0		44	7.3
	6,050	13		4.0	.2	2.4	.2	16		2.0	1.2	.1	.4	.05	38		11	0		33	7.1
	2,600	14		3.0	1.1	2.9	.1	18		1.2	1.5	.1	.3	.00	41		12	0		39	7.1
	2,560	14		3.5	.9	3.4	.9	19		1.4	2.0	.1	.1	.03	41		12	0		41	7.1
May 9, 1961.....	2,800	14		3.5	1.0	3.2	.8	20		1.2	2.0	.1	.1	.02	39		12	0		42	7.2
	1,490	15		3.0	1.6	3.8	.5	21		1.6	2.5	.1	.2	.04	41		14	0		48	7.1
	710	19		5.0	1.1	5.3	.6	28		2.6	4.0	.1	.1	.05	56		17	0		62	7.4
	452	21		6.0	1.7	6.9	.9	33		3.2	5.0	.2	.0	.03	62		22	0		76	7.5
	419	22		6.0	1.8	7.6	.9	36		3.6	5.8	.1	.1	.06	67		22	0		81	7.4

COWLITZ RIVER BASIN--Continued
14-2450. COWEMAN RIVER NEAR KELSO, WASH.

LOCATION.--Temperature recorder at gaging station, 3 miles downstream from Goble Creek, 3.8 miles southeast of Kelso, Cowlitz County, and 7 miles upstream from mouth.
DRAINAGE AREA.--119 square miles.
RECORDS AVAILABLE.--Water temperatures: July 1950 to September 1961.
EXTREMES, 1960-61.--Water temperatures: Maximum, 80°F July 12; minimum, 36°F Jan. 27.
EXTREMES, 1950-61.--Water temperatures: Maximum, 82°F July 27, 28, 1958; minimum, freezing point on several days during winter months.

Temperature (°F) of water, water year October 1960 to September 1961																																	
Month	Day																															Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
October	58	57	57	56	56	57	57	54	51	49	49	50	50	50	53	54	54	52	54	54	54	55	54	55	54	52	52	50	51	50	47	50	53
Maximum	55	55	55	54	53	56	54	51	49	47	47	47	49	48	50	51	52	50	52	52	53	53	54	52	51	50	50	50	47	46	47	51	53
Minimum	50	49	48	45	43	42	42	44	46	46	46	46	46	46	46	47	48	48	48	47	46	46	46	47	45	43	42	42	43	45	46	41	
November	45	46	46	45	43	41	38	38	37	38	42	45	43	42	42	39	42	44	44	43	41	40	40	40	40	40	40	40	40	40	40	42	45
Maximum	45	45	45	43	41	38	37	37	37	37	38	42	42	42	37	39	42	42	42	42	41	40	40	40	40	40	40	40	40	40	40	40	40
Minimum	41	41	40	39	43	44	44	44	44	45	45	45	45	45	45	45	45	45	45	43	42	41	41	43	42	40	38	40	43	45	43	43	
December	40	40	38	37	39	43	44	44	43	43	43	43	43	43	45	45	45	45	45	42	42	41	40	39	39	41	40	38	36	37	40	43	41
January	45	44	44	44	45	46	46	45	44	45	45	44	44	44	45	44	44	44	43	44	46	44	44	44	44	43	43	43	43	43	43	43	44
Maximum	43	44	44	44	45	44	44	44	44	44	44	44	44	44	44	44	44	43	44	44	44	44	44	44	44	43	42	42	43	43	43	43	44
Minimum	44	43	42	42	42	43	44	44	44	44	43	42	44	45	44	45	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46
February	48	48	47	47	48	48	48	47	47	47	47	47	47	46	50	50	50	47	44	44	45	45	43	46	46	46	48	51	50	49	47	45	
Maximum	47	47	47	43	42	44	43	47	46	44	45	46	45	44	44	44	47	44	42	43	44	43	42	43	42	43	42	42	43	43	43	43	44
Minimum	49	49	47	46	48	47	49	49	49	49	50	49	48	51	55	56	57	58	60	59	54	52	54	57	58	57	54	54	58	57	60	53	53
March	48	47	46	45	45	46	46	47	48	47	48	47	46	47	49	50	51	52	54	52	50	50	50	50	50	50	50	50	50	50	50	50	50
Maximum	43	42	42	42	42	43	44	44	44	44	43	42	44	45	44	45	44	44	45	42	45	45	46	46	46	46	46	46	46	46	46	46	46
Minimum	43	42	42	42	42	43	44	43	42	42	42	42	44	45	44	45	44	44	45	42	45	45	46	46	46	46	46	46	46	46	46	46	46
April	48	48	47	47	48	48	48	47	47	47	47	47	47	46	50	50	50	47	44	44	45	45	43	46	46	46	48	51	50	49	47	45	
Maximum	47	47	47	43	42	44	43	47	46	44	45	46	45	44	44	44	47	44	42	43	44	43	42	43	42	43	42	42	43	43	43	43	44
Minimum	49	49	47	46	48	47	49	49	49	49	50	49	48	51	55	56	57	58	60	59	54	52	54	57	58	57	54	54	58	57	60	53	53
May	49	47	46	45	45	46	46	47	48	47	48	47	46	47	49	50	51	52	54	52	50	50	50	50	50	50	50	50	50	50	50	50	50
Maximum	48	47	46	45	45	46	46	47	48	47	48	47	46	47	49	50	51	52	54	52	50	50	50	50	50	50	50	50	50	50	50	50	50
Minimum	43	42	42	42	42	43	44	44	44	44	43	42	44	45	44	45	44	44	45	42	45	45	46	46	46	46	46	46	46	46	46	46	46
June	64	65	64	65	63	62	59	57	56	56	56	61	64	67	70	72	73	71	69	67	66	68	69	70	71	68	62	61	61	64	65	65	65
Maximum	55	58	59	59	60	55	52	54	53	51	54	58	61	64	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66
Minimum	65	69	68	63	60	65	68	71	73	77	80	79	76	75	71	70	73	76	76	74	71	68	69	73	74	70	68	72	75	74	71	71	71
July	60	60	62	63	60	57	57	58	62	63	67	70	72	70	68	64	68	64	68	64	68	70	66	65	64	63	67	64	62	66	68	65	65
Maximum	75	77	78	73	71	74	74	69	72	74	75	72	73	71	69	67	70	71	74	74	74	74	69	65	69	65	69	68	70	68	66	71	71
Minimum	66	68	69	69	67	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	
August	64	60	59	66	66	64	63	62	62	63	64	63	64	61	60	61	62	61	64	65	66	67	65	63	61	63	61	62	64	64	64	64	65
Maximum	59	58	57	59	63	58	58	56	56	59	57	57	57	57	58	58	58	58	59	59	59	59	56	56	56	56	55	55	55	55	55	55	56
Minimum	64	60	59	66	66	64	63	62	62	63	64	63	64	61	60	61	62	61	64	65	66	67	65	63	61	63	61	62	64	64	64	65	
September	65	60	59	66	66	64	63	62	62	63	64	63	64	61	60	61	62	61	64	65	66	67	65	63	61	63	61	62	64	64	64	65	65
Maximum	59	58	57	59	63	58	58	56	56	59	57	57	57	57	58	58	58	58	59	59	59	59	56	56	56	56	55	55	55	55	55	56	56
Minimum	64	60	59	66	66	64	63	62	62	63	64	63	64	61	60	61	62	61	64	65	66	67	65	63	61	63	61	62	64	64	64	65	65

ELOCHOMAN RIVER BASIN

14-2475. ELOCHOMAN RIVER NEAR CATHLAMET, WASH.

(Formerly published as Elochin River near Cathlamet)

LOCATION.--Temperature recorder at gaging station, 125 feet upstream from railroad bridge, 2.5 miles northeast of Cathlamet, Washington County, and 4.5 miles upstream from mouth.

DRAINAGE AREA.--65.8 square miles.

RECORDS AVAILABLE.--Water temperatures: June 1950 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 75°F July 11, 12; minimum, 39°F Dec. 8-10, Jan. 3-5.

EXTREMES, 1950-61.--Water temperatures: Maximum, 75°F July 11, 12, 1961; minimum, freezing point Feb. 17, 1956.

Temperature (°F) of water, water year October 1960 to September 1961																																	
Month	Day																															Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
October																																	
Maximum	58	57	57	56	56	57	57	54	51	49	49	50	50	50	53	54	54	54	52	54	54	54	55	54	52	52	50	51	50	47	50	53	
Minimum	55	55	55	54	53	56	54	51	49	47	47	47	49	48	50	51	52	50	52	52	53	53	54	52	51	50	50	47	46	47	51	46	
November																																	
Maximum	50	49	48	45	44	43	44	46	46	46	47	47	47	47	47	48	49	48	48	47	46	47	46	47	48	47	45	42	43	45	--	45	
Minimum	49	48	45	43	42	42	42	44	43	44	46	46	46	46	46	47	48	48	47	46	46	46	46	47	45	43	42	42	42	43	--	45	
December																																	
Maximum	45	46	46	45	43	41	38	38	37	38	42	45	43	42	42	39	42	44	44	43	41	40	40	40	40	40	43	43	43	40	40	40	42
Minimum	45	45	45	43	41	38	37	37	37	37	38	42	42	42	42	37	39	42	42	41	40	40	40	40	40	40	40	40	40	40	40	40	40
January																																	
Maximum	41	41	40	39	43	44	44	44	44	45	45	44	43	45	45	45	45	45	43	42	42	41	40	39	39	41	40	38	36	37	40	43	45
Minimum	40	40	38	37	39	43	44	44	43	43	43	43	43	43	45	45	42	42	41	40	39	41	40	39	41	40	38	36	37	40	43	45	
February																																	
Maximum	45	44	44	45	46	46	45	44	45	45	44	44	44	45	45	44	44	43	44	46	44	44	44	44	44	43	43	43	43	43	--	--	44
Minimum	43	44	44	44	45	45	44	44	44	44	44	43	43	44	44	44	44	44	43	44	44	44	44	44	44	43	43	42	42	43	--	--	44
March																																	
Maximum	44	43	42	42	42	43	44	44	44	44	43	42	44	45	45	45	46	47	46	46	45	46	46	46	46	46	46	46	46	47	47	48	45
Minimum	43	42	42	42	42	42	43	44	43	42	42	42	44	45	44	44	44	45	44	45	44	42	45	46	45	44	44	43	42	43	44	47	44
April																																	
Maximum	48	48	47	47	48	48	48	47	47	47	47	47	47	47	46	50	50	47	44	44	44	45	43	46	46	46	46	46	46	47	47	48	45
Minimum	47	47	47	43	42	44	43	47	46	44	45	46	45	44	44	47	47	44	42	43	44	43	42	43	45	44	44	43	42	43	44	47	44
May																																	
Maximum	49	49	47	46	48	47	49	49	49	49	50	49	48	51	55	56	57	58	60	59	54	52	54	57	58	57	54	54	58	57	60	53	49
Minimum	48	47	46	45	45	46	46	47	48	47	46	47	46	47	49	50	51	52	54	52	50	50	49	51	52	50	49	51	52	53	52	49	49
June																																	
Maximum	64	65	64	65	63	62	59	57	56	56	56	61	64	67	70	72	73	71	69	67	66	68	69	70	71	68	62	61	61	64	--	65	
Minimum	55	58	59	59	60	55	52	54	53	51	54	53	54	58	61	64	66	66	63	61	58	59	61	61	63	62	58	57	57	55	--	58	
July																																	
Maximum	65	69	69	68	63	60	65	68	71	73	77	80	79	76	75	71	70	73	76	76	74	71	68	69	73	74	70	68	72	75	74	71	71
Minimum	60	60	62	63	60	57	57	58	62	63	67	70	72	70	68	68	64	68	68	70	66	65	64	63	67	67	64	62	66	68	65	65	65
August																																	
Maximum	75	77	78	73	71	74	74	69	72	74	75	72	73	71	69	67	70	71	74	74	74	74	69	65	69	65	69	68	70	68	66	71	71
Minimum	66	68	69	69	67	65	65	65	65	67	69	68	68	65	62	61	64	66	67	66	67	65	63	61	63	61	62	64	64	64	65	65	65
September																																	
Maximum	64	60	59	66	66	64	63	62	62	63	64	63	64	61	60	61	62	61	59	59	59	56	56	56	56	55	55	55	55	54	--	56	
Minimum	59	58	57	59	63	58	58	56	56	59	59	57	57	60	58	58	58	59	57	57	55	53	53	52	54	52	54	52	52	52	--	56	

GRAYS RIVER BASIN

14-2505. WEST FORK GRAYS RIVER NEAR GRAYS RIVER, WASH.

LOCATION.--Temperature recorder at gaging station, 1 mile upstream from mouth, and 3.2 miles northeast of town of Grays River, Wahkiakum County.

DRAINAGE AREA.--3.2 square miles.

RECORDS AVAILABLE.--Water temperatures: June 1950 to December 1959, August to September 1961.

EXTREMES, 1950-59.--Water temperatures: Maximum, 69°F July 27, 28, 1958.

Temperature (°F) of water, August to September 1961

Temperature \ 17 October August to September, 1904																																		
Month	Day																															Average		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
August																																		
Maximum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	65	65	67	66	66	61	62	63	63	63	65	65	63	61	--		
Minimum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	58	58	59	57	58	59	60	58	59	58	57	60	60	60	--		
September																																		
Maximum	60	59	58	63	62	61	61	61	61	62	62	62	61	59	58	61	61	61	58	58	58	57	55	55	56	54	55	56	54	53	--	59		
Minimum	57	57	57	58	57	55	55	54	55	57	56	55	54	57	55	56	56	58	57	56	53	51	51	50	52	51	51	53	51	52	--	55		

NEHALEM RIVER BASIN

14-3010. NEHALEM RIVER BELOW FOSS, OREG.

LOCATION.--At county bridge, 0.4 mile downstream from Foley Creek, 2.5 miles west of Foss, Tillamook County, and 6.2 miles downstream from gaging station. DRAINAGE AREA.--667 square miles upstream from gaging station. RECORDS AVAILABLE.--Chemical analyses: August 1960 to September 1961 (discontinued). REMARKS.--Minor inflow between gaging station and sampling point except during periods of heavy local runoff.

Chemical analyses, in parts per million, August 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (mg/l)	Aluminum (Al) (mg/l)	Iron (Fe) (mg/l)	Manganese (Mn) (mg/l)	Calcium (Ca) (mg/l)	Magnesium (Mg) (mg/l)	Sodium (Na) (mg/l)	Potassium (K) (mg/l)	Ammonium (NH ₄) (mg/l)	Bicarbonate (HCO ₃) (mg/l)	Carbonate (CO ₃) (mg/l)	Sulfate (SO ₄) (mg/l)	Chloride (Cl) (mg/l)	Fluoride (F) (mg/l)	Nitrate (NO ₃) (mg/l)	Phosphate (PO ₄) (mg/l)	Dissolved solids (residue at 180°C) (mg/l)	Hardness as CaCO ₃ (mg/l)	Total hardness (mg/l)	Toxicity (micrograms/min at 25°C)	pH	Coliform or (ABS) (100 ml)	Detergents (100 ml)
Aug. 30, 1960	166	14				6.5	1.3	6.0	0.8	--	31		3.4	5.5	0.0	0.2	--	55	22	0	97	7.4	--	0
Sept. 29, 1960	119	15				7.5	1.4	6.9	1.1	--	34		4.6	7.2	1.1	3.0	0.05	62	24	0	86	7.3	--	0
Oct. 26, 1960	1,400	13				5.0	1.4	5.2	6.0	0.0	24		3.8	5.2	1.1	1.3	0.05	52	18	0	63	7.1	--	10
Nov. 29, 1960	5,230	13				3.5	.8	3.3	.5	.0	17		3.0	3.8	1.1	.9	.06	44	12	0	49	7.1	--	10
Dec. 28, 1960	2,750	14				4.5	.7	4.1	.2	.0	19		3.4	3.8	1.1	.7	.03	45	14	0	51	7.2	--	0
Jan. 10, 1961	9,110	13				4.0	.6	3.6	.5	.0	16		2.8	3.5	.0	2.4	.03	42	12	0	46	7.0	--	15
Feb. 8, 1961	6,400	14				4.0	.5	3.6	.5	.0	16		2.8	3.2	.0	.6	.06	42	12	0	45	7.1	--	5
Mar. 7, 1961	11,400	13				3.0	.8	3.5	.5	.0	15		3.2	3.5	1.1	.5	.02	38	10	0	42	7.0	0.02	20
Apr. 5, 1961	2,070	14				4.0	1.0	4.0	.5	.0	20		3.0	3.5	1.1	.3	.04	42	14	0	50	7.1	.00	5
May 9, 1961	2,280	14				4.5	.6	4.2	.4	.0	21		3.4	3.5	.2	.4	.03	41	14	0	51	7.2	.00	5
June 6, 1961	491	15				5.5	1.3	5.7	.8	.1	29		2.8	4.0	1.1	.2	.04	49	19	0	68	7.0	.01	0
July 3, 1961	219	15				7.0	1.1	5.9	.9	.1	32		4.4	5.2	1.1	.1	.03	59	22	0	76	7.1	.00	5
Sept. 28, 1961	94	13				7.5	1.9	6.6	.9	.1	35		3.6	8.0	1.1	.1	.03	65	26	0	90	7.1	.01	0

WILSON RIVER BASIN

14-3015, WILSON RIVER NEAR TILLAMOOK, OREG.

LOCATION.--At bridge, on State Highway 6, 0.1 mile upstream from Little North Fork, 0.9 mile downstream from gaging station, and 5.2 miles east of Tillamook, Tillamook County.

DRAINAGE AREA.--161 square miles upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: August 1960 to September 1961 (discontinued).

REMARKS.--No appreciable inflow between gaging station and sampling point except during periods of heavy local runoff.

Chemical analyses, in parts per million, August 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) num (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Ammonium (NH ₄)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃	Total acidity (microhmhos at 25°C)	pH or Col- or	Deter- gents (ABS)	Tur- bid- ity	
Aug. 30, 1960	117	12			6.5	1.8	4.4	0.2	--	34		2.6	3.0	0.0	0.2	--	47	24	0	74	7.8	--	0
Sept. 29,	76	12			7.0	1.5	4.0	0.3	--	34		2.4	3.2	0.0	0.1	0.01	47	24	0	67	7.6	--	0
Oct. 26,	1,190	12			6.0	1.2	3.8	0.9	0.0	26		3.4	3.5	0.1	0.6	0.04	45	20	0	61	7.4	--	5
Nov. 29,	1,850	14			5.0	1.0	3.3	0.3	0.0	24		2.4	3.5	0.1	0.4	0.06	46	17	0	55	7.1	--	5
Dec. 28,	1,090	13			5.5	0.8	3.0	0.0	0.0	24		2.0	2.8	0.0	0.2	0.06	38	17	0	51	7.5	--	0
Jan. 10, 1961	3,010	12			5.0	0.5	3.1	0.1	0.1	21		2.0	2.5	0.0	0.2	0.06	41	14	0	47	7.2	--	10
Feb. 8,	2,780	13			4.5	0.9	3.1	0.1	0.0	22		0.6	2.0	0.0	0.2	0.05	36	14	0	45	7.3	--	5
Mar. 7,	3,020	14			4.0	1.2	3.4	0.1	0.0	22		1.8	3.0	0.0	0.2	0.03	38	15	0	48	7.2	0.00	5
Apr. 5,	848	12			5.0	0.9	3.1	0.1	0.0	22		2.0	2.0	0.1	0.1	0.02	39	16	0	40	7.3	0.00	0
May 9,	944	13			6.0	0.3	3.4	0.0	0.0	23		2.4	2.2	0.1	0.3	0.02	40	16	0	50	7.3	0.00	0
June 6,	267	14			6.0	1.1	4.2	0.3	0.3	30		2.4	2.0	0.1	0.2	0.17	46	20	0	63	7.1	0.00	0
July 3,	131	14			6.0	1.7	4.6	0.7	0.0	34		2.8	2.5	0.1	0.1	0.03	52	22	0	66	7.4	0.01	0
Sept. 28,	71	12			7.0	1.7	4.8	0.6	0.1	34		3.8	4.0	0.1	0.1	0.01	52	24	0	74	7.6	0.00	0

SILETZ RIVER BASIN

14-3058. SILETZ RIVER NEAR SILETZ, OREG.

LOCATION --At Ojala bridge, on State Highway 229, 1.5 miles downstream from Thompson Creek, and 2.9 miles north of Siletz, Lincoln County.
 RECORDS AVAILABLE --Chemical analyses: August 1911 to August 1912, August 1960 to July 1961 (discontinued).
 REMARKS --No discharge records available.

Chemical analyses, in parts per million, August 1960 to July 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Ammonium (NH ₄)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acidity (micro-mhos at 25°C)	pH or Col- or gents (ABS)	Deter- gents (ABS)
																			Calcium, mag- nesium	Non-car- bon- ate			
Aug. 30, 1960		11				4.5	1.1	4.2	0.6	--	25		1.4	3.8	0.0	0.2	--	39	16	0	59	7.7	0
Sept. 26, 1960		11				4.0	1.4	3.6	.3	0.1	26		2.4	4.0	.0	.3	0.01	41	16	0	60	7.9	0
Oct. 2, 1960		8.7				4.0	1.1	3.6	.3	0.1	26		2.6	3.2	.0	.9	.02	37	10	0	63	7.1	0
Nov. 28, 1960		10				3.0	.7	3.0	.3	.0	14		1.4	3.2	.1	1.1	.02	38	12	0	44	7.3	5
Dec. 27, 1960		11				3.5	.7	3.6	.1	.0	17		1.2	3.5	.1	1.1	.02	38	12	0	44	7.3	0
Jan. 10, 1961		10				3.0	.7	3.2	.3	.1	14		1.2	3.2	.1	1.2	.03	34	10	0	41	7.1	0
Feb. 6, 1961		9.8				3.0	.7	3.1	.3	.0	14		2.0	3.0	.0	1.1	.04	31	10	0	38	7.0	10
Mar. 7, 1961		10				3.0	.8	3.3	.3	.0	14		2.0	2.8	.1	1.3	.02	32	10	0	40	7.1	0.02
Apr. 4, 1961		10				3.5	.6	3.5	.2	.0	16		1.4	3.0	.1	1.6	.01	36	11	0	42	7.1	.01
May 9, 1961		10				4.0	.2	3.5	.2	.0	16		1.6	3.0	.1	.7	.01	31	11	0	42	6.9	.00
June 6, 1961		11				4.0	.8	4.3	.6	.0	21		2.2	3.0	.0	.2	.01	39	14	0	48	7.3	.00
July 5, 1961		12				4.0	1.3	4.3	.4	.0	23		2.4	3.5	.1	.1	.01	40	15	0	53	7.3	.00

ALSEA RIVER BASIN--Continued

14-3066. DRIFT CREEK NEAR SALADO, OREG.

LOCATION.--Temperature recorder at gaging station, 0.3 mile downstream from Cape Horn Creek, 4.1 miles southwest of Salado, Lincoln County, and 8.5 miles southeast of Toledo.

DRAINAGE AREA.--20.6 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1958 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 74°F July 12; minimum, 39°F Jan. 3.

EXTREMES, 1956-61.--Water temperatures: Maximum, 74°F July 12, 1961; minimum, 38°F Mar. 3, 1960.

Temperature (°F) of water, water year October 1960 to September 1961.																																	
Month		Day																														Average	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
October	Maximum	57	57	56	56	56	57	56	52	51	50	48	50	51	52	55	55	53	52	54	53	56	55	54	52	52	51	51	50	48	51	53	
	Minimum	51	53	54	51	50	54	52	50	48	46	46	48	48	46	46	49	50	51	51	51	52	54	52	50	51	50	48	47	48	50		
	Average	54	55	55	53	53	55	54	51	49	47	47	48	48	47	48	50	50	50	49	49	50	49	49	48	48	47	46	46	45	45	46	
November	Maximum	51	50	48	46	46	45	47	46	48	48	48	47	46	46	48	49	48	48	48	48	47	47	47	48	47	46	46	46	47	--	48	
	Minimum	50	48	45	44	44	43	44	46	44	45	48	48	47	46	46	48	49	48	48	48	47	47	47	47	46	45	45	45	--	46		
	Average	50	48	46	45	46	44	46	46	46	46	48	48	47	46	46	48	48	48	48	48	47	47	47	47	46	45	45	45	--	47		
December	Maximum	47	46	47	46	46	44	43	42	43	45	47	46	47	46	46	46	47	47	46	44	44	44	44	46	46	46	44	42	42	43	45	
	Minimum	46	46	46	46	44	43	42	42	42	43	45	46	46	44	44	46	47	46	44	44	44	44	44	46	46	44	42	42	42	44		
	Average	46	46	46	46	45	43	42	42	42	42	44	45	46	45	45	46	46	46	46	45	45	45	45	46	46	44	42	42	42	44		
January	Maximum	43	41	41	42	45	46	47	47	48	49	48	48	47	49	49	49	48	47	47	46	46	47	47	47	47	45	45	46	47	49	48	
	Minimum	41	41	39	40	42	45	46	47	47	48	47	47	47	47	48	48	47	47	46	45	45	45	44	44	44	44	45	46	47	48		
	Average	42	41	40	41	43	45	46	47	47	48	48	47	47	47	48	48	47	47	46	45	45	45	44	44	44	44	45	46	47	48		
February	Maximum	48	48	48	49	49	49	48	48	49	49	48	48	48	48	48	48	48	47	48	48	48	48	48	48	47	47	47	47	48	48	45	
	Minimum	47	48	48	48	49	48	47	47	48	49	48	47	47	48	48	47	47	47	47	48	48	47	47	47	47	46	46	47	48	45		
	Average	47	48	48	48	49	48	47	47	48	49	48	47	47	48	48	47	47	47	47	48	48	47	47	47	47	46	46	47	48	46		
March	Maximum	48	47	47	46	46	46	48	48	47	46	47	48	48	48	48	48	49	48	48	48	49	49	48	47	47	48	49	50	49	50	48	
	Minimum	47	47	46	46	46	46	46	46	46	46	47	48	48	48	48	48	47	48	47	47	46	48	47	47	46	45	45	46	47	48		
	Average	47	47	46	46	46	46	47	47	47	47	47	48	48	48	48	48	48	48	47	47	47	47	47	47	46	46	46	47	48	47		
April	Maximum	52	54	52	50	50	51	51	49	49	51	50	49	51	55	52	52	49	46	47	47	48	47	50	51	51	52	52	52	--	50	47	
	Minimum	48	50	48	45	45	45	47	47	47	46	47	47	47	48	49	49	45	44	45	46	46	47	46	46	47	49	50	50	--	47		
	Average	50	52	50	47	48	48	49	48	48	48	48	48	48	52	50	50	49	47	48	48	48	48	49	50	51	51	51	51	51	51		
May	Maximum	51	50	49	49	49	50	50	50	50	50	49	52	54	56	57	58	58	56	54	53	52	52	54	56	54	56	54	53	53	53	50	
	Minimum	50	49	48	47	48	48	49	50	48	48	48	49	50	51	52	53	52	51	52	53	52	51	50	50	50	52	51	50	52	50		
	Average	50	49	48	48	49	49	49	49	49	49	49	49	50	51	52	52	52	51	51	51	51	51	51	51	51	51	51	51	51	51		
June	Maximum	62	59	61	61	58	58	59	56	54	56	55	62	62	65	68	69	70	66	67	65	64	65	66	67	63	61	59	61	63	--	62	
	Minimum	54	56	55	56	56	56	52	53	53	52	53	54	55	56	59	61	62	61	59	59	56	57	57	59	60	56	55	55	54	--	56	
	Average	58	57	58	58	57	57	56	55	55	54	54	58	58	62	68	69	70	68	68	67	66	66	67	68	64	61	60	61	62	61		
July	Maximum	62	66	60	58	59	57	63	66	68	69	73	74	68	65	69	64	69	70	71	69	66	68	68	64	66	69	70	69	67	67	67	
	Minimum	57	57	58	57	56	54	53	55	58	58	60	63	61	61	60	61	59	60	62	63	62	61	58	59	60	59	58	60	61	59	59	
	Average	59	61	59	57	57	56	59	61	62	63	64	66	65	64	65	65	64	65	65	65	64	64	63	62	62	62	62	62	62	62	62	
August	Maximum	70	70	72	67	66	70	68	70	71	69	67	72	66	62	64	68	65	69	69	71	67	68	65	67	64	67	68	69	69	66	68	
	Minimum	59	60	61	62	61	58	59	59	60	59	61	62	61	62	61	59	57	59	59	61	60	62	61	57	60	60	58	59	60	63	60	
	Average	64	65	66	64	63	64	64	64	64	64	64	64	64	63	63	64	64	64	64	64	64	64	63	63	63	63	63	63	63	63	63	
September	Maximum	63	61	65	60	65	63	62	64	63	65	64	62	61	61	60	63	61	63	60	60	60	59	59	56	56	57	56	55	55	--	61	
	Minimum	60	59	57	57	61	56	54	55	58	56	55	55	58	57	58	57	58	57	56	56	54	52	50	51	49	49	54	51	49	--	55	
	Average	61	60	61	58	63	60	59	59	61	61	60	60	60	60	60	60	60	60	60	60	59	59	57	56	56	56	56	56	56	56	56	

ALSEA RIVER BASIN--Continued

14-3067. NEEDLE BRANCH NEAR SALADO, OREG.--Continued

Suspended sediment, water year October 1960 to September 1961
(Where no concentrations are reported, loads are estimated.)

Day	OCTOBER			NOVEMBER			DECEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	0	--	0	0.9	--	T	1.3	--	T
2..	.1	--	T	.7	--	T	1.1	--	T
3..	.1	--	T	.5	--	T	1.3	3	T
4..	.1	--	T	.4	--	T	1.5	--	T
5..	.1	--	T	.4	--	T	1.5	0	T
6..	.1	3	T	.3	--	T	1.4	--	T
7..	.5	11	T	.3	4	T	1.2	--	T
8..	.2	12	T	.2	--	T	1.1	--	T
9..	.1	--	T	.2	--	T	1.0	--	T
10..	.1	--	T	3.2	57	S	.9	--	T
11..	.2	--	T	3.4	14	.1	.9	--	T
12..	.1	--	T	1.6	C	4	.8	--	T
13..	.1	--	T	1.2	C	4	.7	--	T
14..	.1	--	T	2.2	C	4	.6	--	T
15..	.1	--	T	7.8	C	66	.6	--	T
16..	.1	--	T	6.1	12	.2	.7	--	T
17..	.1	--	T	6.8	37	J	.9	3	T
18..	0	--	0	8.0	23	.5	3.0	14	B
19..	0	--	0	4.5	6	.1	3.6	5	T
20..	0	--	0	4.6	7	.1	2.2	--	T
21..	0	--	0	5.3	5	.1	1.7	--	T
22..	0	--	0	4.5	3	T	1.4	--	T
23..	.3	--	T	8.7	44	S	1.2	--	T
24..	.1	10	T	22	220	J	1.1	--	T
25..	.1	--	T	15	80	S	1.0	--	T
26..	.3	12	T	5.6	12	B	1.0	1	T
27..	.6	9	T	3.2	--	.1	.9	--	T
28..	1.2	--	T	2.2	C	3	.8	--	T
29..	.5	--	T	1.6	C	3	.8	--	T
30..	.3	--	T	1.4	C	3	.7	--	T
31..	.5	8	T	--	--	--	.8	--	T
Total	6.1	--	0.1	122.8	--	24.8	37.7	--	0.3
Day	JANUARY			FEBRUARY			MARCH		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	0.7	0	T	2.5	5	T	7.5	20	A
2..	.6	--	T	2.6	9	B	6.5	3	B
3..	.6	--	T	2.5	4	T	4.6	--	.1
4..	.6	--	T	2.4	1	T	3.5	--	.1
5..	2.1	13	A	2.3	C	1	6.1	14	B
6..	8.8	48	S	2.6	C	1	8.0	8	.2
7..	5.6	12	.2	2.6	C	1	6.3	5	.1
8..	3.9	3	T	2.2	C	1	4.8	--	T
9..	3.3	0	T	7.8	52	J	4.4	2	T
10..	2.6	0	T	24	114	S	4.5	5	.1
11..	2.2	--	T	13	33	1.2	7.2	9	.2
12..	2.0	--	T	8.5	16	B	5.6	2	T
13..	2.3	--	T	15	59	A	8.8	28	J
14..	4.7	12	B	9.0	23	.6	9.3	21	A
15..	4.0	6	B	9.3	17	.4	5.9	12	B
16..	5.3	8	B	6.8	--	.2	4.2	7	B
17..	4.4	--	T	5.1	--	.2	3.0	3	T
18..	3.0	--	T	4.2	--	.1	2.4	2	T
19..	2.2	--	T	3.9	--	.1	3.4	11	B
20..	1.7	--	T	5.2	9	.1	5.2	9	.1
21..	1.4	--	T	6.6	14	A	4.0	5	B
22..	1.2	--	T	6.7	15	B	3.0	C	5
23..	1.1	--	T	4.6	6	.1	2.6	C	5
24..	.9	0	T	4.4	6	B	2.3	C	5
25..	.8	--	T	5.6	4	.1	2.0	C	5
26..	.7	--	T	4.8	C	3	2.8	C	5
27..	.7	--	T	4.6	C	3	3.5	C	5
28..	.6	--	T	4.0	C	3	3.2	C	5
29..	1.0	--	T	--	--	--	2.5	C	5
30..	1.2	2	T	--	--	--	1.9	C	5
31..	3.2	9	B	--	--	--	1.6	C	5
Total	73.4	--	2.2	172.8	--	16.9	140.6	--	3.9

S Computed by subdividing day.

T Less than 0.05 ton.

A Computed from partly estimated-concentration graph.

B Computed from estimated-concentration graph.

C Composite period.

J Computed from partly estimated-concentration graph and subdividing day.

ALSEA RIVER BASIN--Continued

14-3068. FLYNN CREEK NEAR SALADO, OREG.--Continued

Suspended sediment, water year October 1960 to September 1961
(Where no concentrations are reported, loads are estimated.)

Day	OCTOBER			NOVEMBER			DECEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	0.2	--	T	1.8	--	T	5.3	3	T
2..	.2	--	T	1.4	--	T	4.6	3	T
3..	.2	--	T	1.1	0	T	4.7	4	0.1
4..	.2	1	T	.9	--	T	4.6	--	T
5..	.2	--	T	.8	--	T	4.6	1	T
6..	.3	4	T	.7	--	T	4.2	--	T
7..	1.4	15	A	.7	0	T	4.1	--	T
8..	.7	--	T	.6	--	T	3.9	--	T
9..	.4	--	T	.6	--	T	3.6	--	T
10..	.3	--	T	4.7	30	S	3.4	--	T
11..	.5	7	T	5.7	14	S	3.3	--	T
12..	.4	6	T	3.4	6	B	3.1	--	T
13..	.3	--	T	2.9	4	T	2.8	--	T
14..	.3	--	T	4.5	3	T	2.7	--	T
15..	.3	--	T	14	59	2.2	2.5	--	T
16..	.2	--	T	15	17	.7	2.6	--	T
17..	.2	--	T	18	36	J	3.5	6	A
18..	.2	2	T	23	31	S	8.5	20	B
19..	.2	--	T	14	13	.5	11	6	B
20..	.2	--	T	14	19	A	8.7	2	T
21..	.2	--	T	15	27	1.1	7.2	--	T
22..	.2	--	T	14	10	.4	6.1	--	T
23..	.6	--	T	22	96	S	5.2	--	T
24..	.5	6	T	55	365	S	4.5	--	T
25..	.4	--	T	45	136	S	4.0	--	T
26..	1.1	5	T	22	53	B	3.8	2	T
27..	1.3	--	T	13	22	B	3.4	--	T
28..	2.8	8	T	10	10	.3	3.1	--	T
29..	1.5	--	T	7.3	3	B	3.0	--	T
30..	1.0	--	T	6.4	4	.1	2.8	--	T
31..	1.1	4	T	--	--	--	2.9	--	T
Total	17.6	--	0.3	337.5	--	99.4	137.7	--	1.4
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..	2.6	2	T	6.2	11	E	0.1	21	26
2..	2.4	--	T	7.1	9	E	.1	21	15
3..	2.4	--	T	7.2	--	--	.1	16	6
4..	2.4	--	T	6.7	5	E	.1	14	2
5..	4.5	14	A	6.2	--	--	.1	16	13
6..	16	51	J	6.8	--	.1	.1	25	10
7..	15	15	B	6.8	--	.1	.1	21	2
8..	12	9	B	6.2	--	.1	.1	16	0
9..	10	7	.2	18	65	J	6.7	14	0
10..	9.0	6	.1	59	200	32	15	7	.3
11..	8.2	6	B	39	78	8.2	22	15	.9
12..	7.5	5	B	29	41	B	3.2	19	7
13..	8.0	6	A	42	74	8.4	24	82	J
14..	14	17	B	33	45	4.0	29	74	A
15..	14	12	B	30	27	2.2	20	26	B
16..	15	14	B	27	17	B	1.2	15	8
17..	14	11	B	20	5	B	.5	11	2
18..	11	8	B	15	2	B	.1	9.2	0
19..	9.0	--	.1	14	1	T	.1	10	8
20..	7.4	4	E	16	5	.2	.2	13	4
21..	6.2	--	.1	21	14	B	.8	11	2
22..	5.3	--	.1	23	20	B	1.2	10	--
23..	4.7	4	E	18	12	.6	.6	8.5	0
24..	4.1	4	T	16	8	B	.3	7.2	--
25..	3.7	--	T	18	1	T	.1	6.2	--
26..	3.4	--	T	16	--	T	.2	8.2	2
27..	3.2	--	T	15	5	A	.1	11	2
28..	2.9	--	T	14	1	T	.1	11	--
29..	3.7	6	B	--	--	--	--	9.4	--
30..	3.7	6	A	--	--	--	--	7.8	--
31..	6.2	15	B	--	--	--	--	6.7	0
Total	231.5	--	7.7	536.2	--	70.8	448.2	--	20.4

E Estimated.

S Computed by subdividing day.

T Less than 0.05 ton.

A Computed from partly estimated-concentration graph.

B Computed from estimated-concentration graph.

J Computed from partly estimated-concentration graph and subdividing day.

ALSEA RIVER BASIN--Continued

14-3068. FLYNN CREEK NEAR SALADO, OREG.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
(Where no concentrations are reported, loads are estimated.)

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..	5.8	--	T	3.0	C 4	T	1.5	--	T
2..	5.1	--	T	3.2	C 4	T	1.4	--	T
3..	4.5	0	T	3.1	C 4	T	1.4	--	T
4..	4.0	--	T	3.2	C 4	T	1.3	--	T
5..	3.7	0	T	3.3	--	T	1.3	U	T
6..	3.4	--	T	3.4	--	T	1.4	--	T
7..	3.2	--	T	3.3	--	T	1.2	--	T
8..	2.9	--	T	3.3	U	T	1.1	--	T
9..	2.8	--	T	3.4	--	T	1.1	4	T
10..	2.5	0	T	4.1	1	T	1.1	--	T
11..	2.4	--	T	3.9	--	T	1.1	--	T
12..	2.5	--	T	3.8	--	T	1.0	--	T
13..	2.4	--	T	3.7	--	T	1.0	8	T
14..	2.2	--	T	3.7	--	T	.9	--	T
15..	2.1	--	T	3.4	U	T	.9	--	T
16..	2.0	--	T	3.2	--	T	.8	4	T
17..	2.0	--	T	3.1	--	T	.8	--	T
18..	2.3	--	T	2.8	U	T	.8	--	T
19..	2.2	8	T	2.7	--	T	.7	--	T
20..	3.1	-- B	0.1	2.5	--	T	.7	--	T
21..	7.4	11	.2	2.4	--	T	.7	--	T
22..	6.7	7 B	.1	2.2	2	T	.7	--	T
23..	5.4	5	.1	2.2	U	T	.7	--	T
24..	4.8	4	.1	2.0	--	T	.6	--	T
25..	4.2	--	T	1.9	--	T	.6	--	T
26..	3.8	--	T	2.1	3	T	.6	--	T
27..	3.4	--	T	2.0	--	T	.6	2	T
28..	3.2	--	T	1.8	--	T	.6	--	T
29..	2.9	4	T	1.7	U	T	.6	--	T
30..	2.8	--	T	1.6	--	T	.6	--	T
31..	--	--	--	1.5	--	T	--	--	--
Total	105.7	--	0.9	87.5	--	0.3	27.8	--	0.2
Day	JULY			AUGUST			SEPTEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	0.6	--	T	0.3	--	T	0.7	4	T
2..	.5	--	T	.2	--	T	.5	--	T
3..	.5	3	T	.2	--	T	.3	--	T
4..	.5	--	T	.2	--	T	.3	0	T
5..	.6	4	T	.2	--	T	.3	--	T
6..	.5	--	T	.2	--	T	.2	U	T
7..	.5	--	T	.2	0	T	.2	--	T
8..	.5	--	T	.2	--	T	.2	--	T
9..	.4	--	T	.2	--	T	.2	--	T
10..	.4	2	T	.2	--	T	.2	--	T
11..	.4	--	T	.2	--	T	.2	0	T
12..	.4	--	T	.2	--	T	.2	--	T
13..	.4	--	T	.2	--	T	.2	--	T
14..	.4	--	T	.2	0	T	.2	--	T
15..	.4	--	T	.3	--	T	.2	--	T
16..	.4	--	T	.3	--	T	.3	--	T
17..	.4	2	T	.3	--	T	.2	--	T
18..	.4	--	T	.2	--	T	.3	--	T
19..	.4	--	T	.2	--	T	.2	--	T
20..	.4	--	T	.2	--	T	.2	--	T
21..	.4	--	T	.2	U	T	.3	--	T
22..	.3	--	T	.2	--	T	.2	--	T
23..	.3	--	T	.2	--	T	.2	--	T
24..	.3	0	T	.2	--	T	.2	--	T
25..	.3	--	T	.2	--	T	.2	0	T
26..	.3	--	T	.2	--	T	.2	--	T
27..	.3	--	T	.2	--	T	.4	--	T
28..	.3	--	T	.2	--	T	.3	0	T
29..	.3	--	T	.2	U	T	.2	3	T
30..	.3	--	T	.2	--	T	.2	--	T
31..	.3	2	T	.5	--	T	--	--	--
Total	12.4	--	0.1	6.9	--	T	7.5	--	T

Total discharge for year (cfs-days)..... 1,956.5

Total load for year (tons)..... 201.6

T Less than 0.05 ton.

C Composite period.

B Computed from estimated-concentration graph.

ALSEA RIVER BASIN--Continued

14-3068.1. DEER CREEK NEAR SALADO, OREG.--Continued

Suspended sediment, water year October 1960 to September 1961
(Where no concentrations are reported, loads are estimated)

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..	0.3	--	T	3.3	10 A	0.1	7.3 C	4	0.1
2..	.3	--	T	2.6	0	T	6.2 C	4	.1
3..	.3	--	T	2.2	--	T	6.5 C	4	.1
4..	.3	2	T	1.7	--	T	6.7	--	T
5..	.3	--	T	1.4	--	T	6.7	1	T
6..	.5	6	T	1.2	--	T	6.4	--	T
7..	2.0	21	0.1	1.1	--	T	5.9	--	T
8..	1.1	4	T	1.0	--	T	5.3	--	T
9..	.6	--	T	1.0	--	T	4.8	--	T
10..	.5	--	T	6.9	50 K	1.4	4.4	--	T
11..	.7	7	T	9.6	11 A	.3	4.3	--	T
12..	.7	8	T	6.6	7 A	.1	3.8	--	T
13..	--	--	T	5.2	3	T	3.6	--	T
14..	.5	1	T	7.5	10 B	.2	3.3	--	T
15..	.4	--	T	23	99 S	6.5	3.2	--	T
16..	.4	--	T	27	27	2.0	3.3	--	T
17..	.4	--	T	33	71 S	8.4	4.8	8 B	.1
18..	.4	0	T	36	35 S	3.8	11	25 B	.7
19..	.4	--	T	18	13	.6	15	9	.4
20..	.4	--	T	20	14 A	.8	11 C	3	.1
21..	.4	--	T	21	7	.4	9.1 C	3	.1
22..	.4	--	T	18	4	.2	7.5 C	3	.1
23..	.9	13 J	.1	36	122 S	16	6.3	--	T
24..	.8	8	T	85	359 S	87	5.4	--	T
25..	.7	8	T	58	110 S	19	5.1	--	T
26..	2.0	11	.1	28	32 A	2.4	5.0	1	T
27..	2.3	4	T	16	14 A	.6	4.4	--	T
28..	4.6	7	.1	12	6	.2	4.1	--	T
29..	2.6	--	T	9.6	--	.1	3.9	--	T
30..	1.8	--	T	8.4	3 A	.1	3.7	--	T
31..	2.1	4	T	--	--	--	3.9	--	T
Total	29.7	--	0.6	500.3	--	150.2	181.9	--	2.1
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..	3.5 C	1	T	11	6 A	0.2	34	34 K	3.4
2..	3.2 C	1	T	12	C 2	.1	30	23 A	1.9
3..	3.2 C	1	T	11	C 2	.1	21	9 A	.5
4..	3.2 C	1	T	10	C 2	.1	17	7 A	.3
5..	6.6	15 B	0.3	9.6 C	2	.1	24	24 J	2.0
6..	32	50 A	4.3	10	C 2	.1	41	34	3.8
7..	24	16	1.0	11	C 2	.1	28	13	1.0
8..	15	9 A	.4	9.7 C	2	.1	21	11 A	.6
9..	13	C 3	.1	32	122 S	20	18	9	.4
10..	11	C 3	.1	94	229 S	61	20	7 A	.4
11..	11	C 3	.1	54	72	10	32	17	1.5
12..	9.8 C	3	.1	40	35 A	3.8	25	6 A	.4
13..	10	8 A	.2	65	83 B	15	44	52 K	7.4
14..	20	--	1.2	46	34	4.2	49	38	5.0
15..	19	--	1.2	44	32	3.8	31	18 A	1.5
16..	24	--	1.2	36	22 A	2.1	22	12 A	.7
17..	19	24 E	1.2	25	14	.9	16	8 A	.3
18..	--	--	1.2	20	--	.5	12	6	.2
19..	11	17 A	.5	19	9 A	.5	14	15 B	.6
20..	9.2	14	.3	24	23	1.5	19	10	.5
21..	8.2	9 A	.2	37	26 A	2.6	15	6 A	.2
22..	7.1	5 A	.1	25	15 A	1.0	12	4 E	.1
23..	6.5	--	T	23	C 4	.2	11	--	.1
24..	5.8	1	T	21	C 4	.2	10	--	.1
25..	5.2	--	T	24	C 4	.3	9.2	--	.1
26..	4.8	--	T	22	C 4	.2	12	7	.2
27..	4.5	--	T	20	C 4	.2	16	8	.3
28..	4.3	--	T	18	C 4	.2	14	--	.1
29..	5.8	7 A	.1	--	--	--	11	--	.1
30..	6.2	3	.1	--	--	--	9.4	--	.1
31..	11	12	.4	--	--	--	8.2	3 E	.1
Total	331.1	--	14.4	773.3	--	129.1	645.8	--	33.9

E Estimated.

S Computed by subdividing day.

T Less than 0.05 ton.

A Computed from partly estimated-concentration graph.

B Computed from estimated-concentration graph.

C Composite period.

J Computed from partly estimated-concentration graph and subdividing day.

K Computed from estimated-concentration graph and subdividing day.

ALSEA RIVER BASIN--Continued

14-3068.1. DEER CREEK NEAR SALADO, OREG.--Continued

Suspended sediment, water year October 1960 to September 1961--Continued
(Where no concentrations are reported, loads are estimated.)

Day	APRIL				MAY				JUNE			
	Mean discharge (cfs)	Suspended sediment		Tons per day	Mean discharge (cfs)	Suspended sediment		Tons per day	Mean discharge (cfs)	Suspended sediment		Tons per day
		Mean concentration (ppm)				Mean concentration (ppm)				Mean concentration (ppm)		
1..	7.1	C	4	0.1	4.2	4		T	2.0	--		T
2..	6.4	C	4	.1	4.8	--		0.1	2.0	--		T
3..	5.8	C	4	.1	4.9	--		.1	1.8	--		T
4..	5.0	C	4	.1	5.3	5	E	.1	1.8	--		T
5..	4.5	--		T	5.8	--		.1	1.7	0		T
6..	4.2	--		T	5.9	--		.1	1.9	--		T
7..	3.9	--		T	5.6	--		T	1.7	--		T
8..	3.5	--		T	5.2	2		T	1.6	--		T
9..	3.3	--		T	5.3	--		T	1.6	6		T
10..	3.1	1		T	6.3	1		T	1.5	--		T
11..	3.0	--		T	6.1	--		T	1.5	--		T
12..	3.2	--		T	5.9	--		T	1.5	--		T
13..	3.1	--		T	5.5	--		T	1.4	--		T
14..	2.8	--		T	5.3	--		T	1.3	--		T
15..	2.6	--		T	4.7	--		T	1.3	--		T
16..	2.6	--		T	4.2	--		T	1.3	3		T
17..	2.4	--		T	3.9	--		T	1.2	--		T
18..	3.0	--		T	3.5	2		T	1.1	--		T
19..	3.1	4		T	3.3	--		T	1.1	4		T
20..	4.8	13	A	.2	3.1	--		T	1.1	--		T
21..	13	24	J	1.0	2.9	--		T	1.1	--		T
22..	12	10	A	.3	2.7	3		T	1.1	--		T
23..	9.0	6	A	.1	2.8	4		T	1.0	--		T
24..	7.3	4		.1	2.6	--		T	1.0	--		T
25..	6.1	4	A	.1	2.5	--		T	.9	--		T
26..	5.1	C	3	T	2.6	--		T	.9	--		T
27..	4.3	C	3	T	2.6	--		T	.9	4		T
28..	3.8	C	3	T	2.3	--		T	.9	--		T
29..	3.5	C	3	T	2.3	2		T	.9	--		T
30..	3.5	C	3	T	2.3	--		T	.8	4		T
31..	--	--		--	2.1	--		T	--	--		--
Total	145.0	--		2.8	126.5	--		1.3	39.9	--		0.4
Day	JULY				AUGUST				SEPTEMBER			
	Mean discharge (cfs)	Suspended sediment		Tons per day	Mean discharge (cfs)	Suspended sediment		Tons per day	Mean discharge (cfs)	Suspended sediment		Tons per day
		Mean concentration (ppm)				Mean concentration (ppm)				Mean concentration (ppm)		
1..	0.8	--		T	0.5	--		T	1.0	5		T
2..	.8	--		T	.5	--		T	.7	--		T
3..	.8	--		T	.5	--		T	.5	--		T
4..	.8	--		T	.5	--		T	.5	0		T
5..	.9	5		T	.5	--		T	.5	--		T
6..	.8	--		T	.5	--		T	.4	0		T
7..	.8	2		T	.4	0		T	.4	--		T
8..	.7	--		T	.4	--		T	.4	--		T
9..	.7	--		T	.4	--		T	.4	--		T
10..	.7	0		T	.4	--		T	.4	--		T
11..	.6	--		T	.4	--		T	.4	0		T
12..	.6	--		T	.4	--		T	.4	--		T
13..	.6	--		T	.4	--		T	.4	--		T
14..	.6	--		T	.4	0		T	.4	--		T
15..	.6	--		T	.6	--		T	.4	--		T
16..	.6	--		T	.6	--		T	.4	--		T
17..	.6	0		T	.5	--		T	.4	--		T
18..	.6	--		T	.4	--		T	.4	--		T
19..	.6	--		T	.4	--		T	.4	--		T
20..	.6	--		T	.4	--		T	.4	--		T
21..	.6	--		T	.4	0		T	.5	--		T
22..	.5	--		T	.4	--		T	.4	--		T
23..	.5	--		T	.4	--		T	.4	--		T
24..	.5	0		T	.4	--		T	.4	0		T
25..	.5	--		T	.4	--		T	.4	0		T
26..	.5	--		T	.4	--		T	.4	--		T
27..	.5	--		T	.4	--		T	.3	--		T
28..	.5	--		T	.4	--		T	.4	0		T
29..	.5	--		T	.4	--		T	.4	--		T
30..	.5	--		T	.4	--		T	.4	--		T
31..	.5	0		T	.9	--		T	--	--		--
Total	19.4	--		0.1	14.0	--		0.1	13.2	--		T

Total discharge for year (cfs-days)..... 2,820.1
Total load for year (tons)..... 335.0

E Estimated.

T Less than 0.05 ton.

A Computed from partly estimated-concentration graph.

C Composite period.

J Computed from partly estimated-concentration graph and subdividing day.

SIUSLAU RIVER BASIN

14-3076.3. SIUSLAU RIVER AT MAPLETON, OREG.

LOCATION.--At covered bridge, at Mapleton, Lane County, 0.1 mile downstream from Knowles Creek, and 0.5 mile upstream from Hadsoll Creek.
 RECORDS AVAILABLE.--Chemical analyses: August 1960 to July 1961 (discontinued).
 REMARKS.--No discharge records available.

Chemical analyses, in parts per million, August 1960 to July 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Ammonium (NH ₄)	Bicarbonate (HCO ₃)	Carbonylate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (PO ₄) at 180°C	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃	Total acidity (micro-mhos at 25°C)	pH	Color or (ABS)	Detergent-bility		
Aug. 30, 1960		11			3.0	1.3	4.8	0.9	--	21	2.2	2.2	5.0	0.0	0.2	0.01	39	13	0	53	6.9	--	0
Sept. 26.....		11			3.5	1.9	11	1.1	--	22	4.6	14	14	0	0.3	0.02	57	16	0	89	6.8	--	0
Oct. 25.....		11			4.0	1.2	5.0	0.8	0.1	24	1.4	1.4	5.2	0	0.2	0.04	50	15	0	39	7.1	--	0
Nov. 28.....		11			2.5	1.7	2.8	0.5	0.0	14	1.6	1.6	3.2	0	1.5	0.06	39	19	0	57	7.0	--	5
Dec. 27.....		12			2.0	1.6	3.0	0.3	0.0	15	1.2	1.2	3.2	0	1.9	0.02	39	10	0	40	7.2	--	0
Jan. 10, 1961		11			2.5	1.9	3.3	0.4	0.0	15	1.6	1.6	3.2	0	1.1	0.03	33	10	0	40	7.1	--	0
Feb. 6.....		12			3.0	1.5	3.2	0.6	0.0	14	1.6	1.6	3.0	0	0.8	0.04	32	10	0	38	7.2	--	5
Mar. 6.....		10			3.0	1.1	3.2	0.6	0.0	14	1.6	1.6	2.8	0	1.7	0.02	32	8	0	34	7.0	0.02	20
Apr. 3.....		11			2.5	1.8	3.3	0.4	0.0	16	1.6	1.6	3.2	0	1.3	0.02	35	10	0	38	7.1	0.01	0
May 9.....		11			4.0	2.0	3.7	0.4	0.0	17	1.0	1.0	3.0	0	1.5	0.02	35	11	0	41	7.0	0.00	0
June 6.....		11			4.0	2.0	4.1	1.0	0.1	19	1.2	1.2	3.2	0	1.1	0.02	37	12	0	45	7.1	0.00	0
July 5.....		12			3.0	1.0	4.1	0.8	0.0	20	1.4	1.4	4.2	0	1.1	0.02	36	12	0	47	6.9	0.00	0

COQUILLE RIVER BASIN--Continued

14-3250. SOUTH FORK COQUILLE RIVER AT POWERS, OREG.

LOCATION--At State Highway bridge, 0.2 mile downstream from Woodward Creek, 0.6 mile north of Powers, Coos County, and 1.1 miles downstream from gaging station.

DRAINAGE AREA.--169 square miles upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: August 1960 to July 1961 (discontinued).

REMARKS.--Minor inflow between gaging station and sampling point except during periods of heavy local runoff.

Chemical analyses, in parts per million, August 1960 to July 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Ammonium (NH ₄)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acidity (micro-mhos at 25°C)	pH	Color	Turbidity
																			Calcium, magnesium	Non-carbonate				
Aug. 29, 1960	29	9.5				9.5	6.1	5.1	0.5	--	45	7	7.0	4.2	0.1	0.0	0.11	68	48	1	124	9.0		0
Sept. 28, 1960	16	9.2				10.5	7.2	5.3	0.5	--	64	0	9.0	4.8	0.1	0.07	0.07	75	54	2	135	8.2		0
Oct. 26, 1960	58	9.3				9.5	7.1	4.8	0.5	0.1	60	0	8.8	4.2	0.0	0.2	0.03	79	52	4	124	7.6		0
Nov. 29, 1960	948	11				5.0	3.2	2.4	2.0	0.1	31	0	4.0	2.8	0.1	0.05	0.05	50	26	0	64	7.6		5
Dec. 27, 1960	450	12				6.0	3.6	2.7	0.0	0.0	36	0	3.6	3.2	0.0	0.2	0.03	49	30	1	73	7.5		0
Jan. 11, 1961	515	11				5.5	4.2	3.0	0.2	0.0	38	0	3.6	2.5	0.1	0.1	0.03	52	31	0	78	7.6		0
Feb. 7, 1961	866	11				5.5	3.6	2.8	0.2	0.0	34	0	3.6	2.2	0.0	0.2	0.04	49	28	0	70	7.5		5
Mar. 6, 1961	2,990	10				4.0	3.3	2.8	0.3	0.0	28	0	3.2	2.8	0.1	0.4	0.00	51	24	0	60	7.5		0.02
Apr. 4, 1961	690	11				5.0	2.8	2.6	0.2	0.0	30	0	3.4	2.0	0.1	0.1	0.03	46	24	0	62	7.4		0.01
May 9, 1961	942	11				4.5	3.3	2.9	0.2	0.0	32	0	3.6	2.5	0.0	0.1	0.01	47	24	0	65	8.3		0.01
June 6, 1961	163	12				6.5	4.4	3.5	0.4	0.0	42	0	4.8	2.5	0.1	0.0	0.03	55	34	0	84	8.0		0.00
July 5, 1961	74	12				8.5	4.7	4.1	0.5	0.0	46	2	6.4	3.2	0.1	0.1	0.07	67	40	0	101	8.4		0.01

COQUILLE RIVER BASIN--Continued

14-3270. NORTH FORK COQUILLE RIVER AT MYRTLE POINT, OREG.

LOCATION.--At bridge on State Highway 42, 0.3 mile upstream from mouth, 0.4 mile north of Myrtle Point, Coos County, and 1.0 mile downstream from Llewellyn Creek.

RECORDS AVAILABLE.--Chemical analyses: September 1960 to July 1961 (discontinued).

Chemical analyses, in parts per million, September 1960 to July 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Ammonium (NH ₄)	Bicarbonate (HCO ₃)	Carbonyl sulfide (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃	Total acidity (micro-mhos at H ⁺ 25°C)	pH or conductivity (ABS)	Temperature (°C)
Sept. 20, 1960	10	11	5.7	6.2	1.3	65	5.2	5.0	0.1	0.6	0.15	75	51	0	126	7.1	0	0	132	7.1	0
Sept. 28, 1960	11	10	5.6	6.3	1.0	64	3.4	4.8	1.1	0.5	0.15	68	48	0	120	7.3	0	0	132	7.3	0
Oct. 26, 1960	10	10	5.4	5.3	0.8	59	5.6	4.5	0.4	1.2	0.15	76	47	0	120	7.3	0	0	132	7.3	0
Nov. 25, 1960	11	10	5.4	5.3	0.7	58	3.0	3.0	1.1	0.5	0.15	42	13	0	51	6.9	0	0	51	6.9	0
Dec. 22, 1960	12	11	4.2	4.3	0.6	22	2.0	3.8	1.1	0.4	0.15	48	16	0	56	7.0	0	0	56	7.0	0
Jan. 11, 1961	12	11	4.0	4.3	0.6	22	2.8	4.0	1.1	0.4	0.15	48	16	0	56	7.2	0	0	56	7.2	0
Feb. 7, 1961	12	10	4.0	3.9	0.6	20	3.0	3.2	0.9	0.5	0.15	42	14	0	51	6.9	0	0	51	6.9	0
Mar. 6, 1961	10	10	3.5	3.7	0.5	15	2.4	3.8	1.1	0.7	0.15	36	12	0	44	6.9	0	0	44	6.9	0
Apr. 4, 1961	11	10	3.5	3.7	0.5	20	2.4	3.8	1.1	0.7	0.15	36	12	0	44	6.9	0	0	44	6.9	0
May 9, 1961	11	10	4.5	4.3	0.4	21	2.8	3.5	1.1	0.6	0.15	43	15	0	53	7.0	0	0	53	7.0	0
June 6, 1961	12	12	5.5	4.9	1.0	28	2.8	3.8	1.0	0.2	0.04	47	19	0	63	7.1	0	0	63	7.1	0
July 5, 1961	12	12	6.5	5.2	1.0	34	3.6	3.5	1.1	0.2	0.04	58	22	0	72	7.1	0	0	72	7.1	0

ROGUE RIVER BASIN

14-3350. ROGUE RIVER BELOW SOUTH FORK ROGUE RIVER, NEAR PROSPECT, OREG.

LOCATION.--At gaging station, at County Road bridge, 0.5 mile downstream from Cascade Gorge, 3.1 miles downstream from South Fork Rogue River, and 6.6 miles southwest of Prospect, Jackson County.
 DRAINAGE AREA.--650 square miles.
 RECORDS AVAILABLE.--Chemical analyses: August 1960 to September 1961 (discontinued).

Chemical analyses, in parts per million, August 1960 to September 1961

Chemical analyses, in parts per million, August 1960 to September 1961																							
Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Ammonium (NH ₄)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total conductivity (micro-mhos at 25°C)	pH	Color or turbidity (ABS)		
																	Calcium, magnesium	Non-carbonate					
Aug. 29, 1960	1,020	32				5.5	2.2	4.2	1.2	--	39	1.4	1.0	0.1	0.0	0.04	66	23	0	67	7.3	--	0
Sept. 7, 1960	975	32				5.5	2.2	4.1	1.1	--	39	1.2	0.8	0.0	0.0	0.17	65	22	0	69	7.4	--	0
Oct. 11, 1960	982	32				6.0	2.0	4.2	1.4	0.0	40	1.0	1.0	0.0	0.1	0.15	68	23	0	67	7.9	--	0
Nov. 14, 1960	1,030	31				5.0	2.6	3.9	1.0	0.0	39	1.0	1.0	0.0	0.0	0.15	70	23	0	66	7.9	--	0
Dec. 5, 1960	1,520	27				5.5	1.9	3.0	0.8	0.0	36	0.2	0.8	0.1	0.2	0.13	64	21	0	59	7.8	--	0
Jan. 10, 1961	1,260	28				5.0	2.2	3.4	1.0	0.0	37	0.0	0.5	0.1	0.0	0.13	62	22	0	61	7.6	--	0
Feb. 27, 1961	2,260	25				5.0	1.8	2.9	1.0	0.0	34	0.2	0.8	0.0	0.0	0.12	55	20	0	56	7.6	0.00	5
Mar. 13, 1961	2,380	27				5.0	2.0	3.3	0.9	0.0	35	0.6	0.8	0.0	0.0	0.09	61	21	0	58	7.7	0.00	0
Apr. 9, 1961	2,620	25				5.5	1.4	3.1	0.7	0.0	32	0.8	0.5	0.1	0.0	0.08	59	20	0	53	7.5	0.00	0
May 1, 1961	2,530	23				4.0	2.1	3.0	1.2	0.0	32	0.2	0.5	0.1	0.0	0.08	55	19	0	54	7.6	0.00	0
June 12, 1961	2,680	23				4.0	1.6	2.7	1.0	0.0	28	0.4	0.2	0.3	0.1	0.08	54	16	0	48	7.4	0.00	0
July 10, 1961	1,340	32				5.5	2.2	3.3	1.3	0.0	36	0.3	0.8	0.1	0.1	0.13	70	22	0	62	7.7	0.00	0
Sept. 11, 1961	1,080	32				5.5	2.4	4.1	1.4	0.0	40	0.8	0.8	0.0	0.1	0.14	66	24	0	67	7.5	0.00	0

ROGUE RIVER BASIN--Continued

14-3375. BEAR CREEK AT CENTRAL POINT, OREG.

LOCATION.--At Constant bridge on Central Point Road, 0.4 mile east of Central Point, Jackson County, 2.0 miles upstream from Griffin Creek, and 4.3 miles downstream from gaging station.

REMARKS.--At Constant bridge on Central Point Road, 0.4 mile east of Central Point, Jackson County, 2.0 miles upstream from Griffin Creek, and 4.3 miles downstream from gaging station.

PERCENTAGE AVAILABLE CHLORINE ANALYSES: August 1960 to September 1961 (discontinued)

REMARKS.--No appreciable inflow between sampling point and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, August 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (mg/l)	Aluminum (Al) (mg/l)	Iron (Fe) (mg/l)	Manganese (Mn) (mg/l)	Calcium (Ca) (mg/l)	Magnesium (Mg) (mg/l)	Sodium (Na) (mg/l)	Potassium (K) (mg/l)	Ammonium (NH ₄) (mg/l)	Bicarbonate (HCO ₃) (mg/l)	Calcium sulfate (SO ₄) (mg/l)	Chloride (Cl) (mg/l)	Fluoride (F) (mg/l)	Nitrate (NO ₃) (mg/l)	Phosphate (PO ₄) (mg/l)	Dissolved solids (residue at 180°C) (mg/l)	Hardness as CaCO ₃ (mg/l)	Non-carbonate hardness (mg/l)	Total hardness (mg/l)	Toxicity (micrograms/l at 25°C)	pH	Color (APC)	Durability (ABS)
Aug. 28, 1960	14	25				23	8.0	14	2.0	--	124	0	8.8	9.0	0.2	0.4	0.26	155	90	0	232	8.2	--	10
Sept. 6, 1960	14	25				21	8.5	14	1.9	--	117	0	9.6	9.5	0.1	0.2	0.53	148	88	0	224	8.2	--	115
Oct. 11, 1960	20	30				25	8.5	15	1.8	0	134	0	7.2	11	0.1	0.3	0.44	161	98	0	252	8.2	--	115
Nov. 14, 1960	38	21				19	6.9	12	2.6	0	99	0	8.0	8.5	0.1	1.3	0.76	133	76	0	204	7.1	--	140
Dec. 5, 1960	69	25				31	10	18	2.4	0	141	0	20	14	0.2	3.6	0.68	210	119	4	311	8.0	--	190
Jan. 9, 1961	30	23				28	8.6	15	1.9	1	128	4	11	11	0.2	2.5	0.59	169	105	0	269	8.4	--	5
Feb. 28, 1961	98	22				27	9.1	14	2.2	1	129	0	14	9.0	0.2	1.6	0.90	174	105	0	265	8.0	0.10	80
Mar. 13, 1961	143	22				28	8.8	13	1.8	0	129	0	16	8.0	0.2	2.1	0.48	173	106	0	258	8.2	0.07	130
Apr. 10, 1961	102	18				27	6.9	12	1.4	2	95	14	14	7.5	0.2	1.1	0.63	157	96	0	229	9.0	0.10	50
May 1, 1961	126	19				21	7.1	11	1.9	0	108	0	8.2	6.0	0.2	0.7	0.32	139	82	0	206	7.6	0.03	35
June 12, 1961	46	26				22	6.9	11	1.9	0	110	0	7.6	8.8	0.1	0.6	0.50	139	83	0	205	7.3	0.03	50
July 12, 1961	46	26				22	10	14	2.2	0	184	0	12	12	0.3	1.3	0.48	181	111	0	260	7.5	0.03	170
Sept. 12, 1961	20	23				38	13	19	2.2	0	184	0	20	12	0.3	0.4	0.56	220	146	0	351	7.7	0.03	170

ROGUE RIVER BASIN--Continued
14-3666. APPLEGATE RIVER AT APPLEGATE, OREG.

LOCATION.--At bridge on State Highway 238, at Applegate, Jackson County, and 0.8 mile downstream from Humbug Creek.
RECORDS AVAILABLE.--Chemical analyses: August 1960 to September 1961 (discontinued).
REMARKS.--No discharge records available.

Chemical analyses, in parts per million, August 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) num	Alu- mi- num (Al)	Iron (Fe)	Man- ga- nese (Mn)	Cal- cium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Pot- as- sium (K)	Am- mo- nium (NH ₄)	Bi- car- bon- ate (HCO ₃)	Cap- bon- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Phos- phate (PO ₄)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃	Total acid- ity as H ⁺ 25°C	Specific conductance (micro- mhos at 25°C)	Col- or or pH	De- ter- gents (ABS)
Aug. 28, 1960		14				27	9.4	5.3	1.2	--	124	2	7.2	3.2	0.2	0.2	0.03	129	106	1	221	8.3	--
Sept. 6, 1960		14				25	9.8	5.3	1.1	--	128	0	6.2	3.5	.1	.0	.08	126	103	0	213	8.2	--
Oct. 10, 1960		16				26	9.5	5.2	.9	0.0	122	0	7.0	4.0	.1	.3	.02	126	108	0	212	8.1	--
Nov. 10, 1960		16				23	7.8	4.3	.8	0.0	135	0	7.2	2.5	.1	.9	.08	117	80	2	193	8.1	--
Dec. 5, 1960		16				18	6.5	3.3	.6	0.0	89	0	5.0	2.0	.1	.7	.17	117	67	2	173	8.1	--
Jan. 10, 1961		13				16	6.5	2.6	.6	0.0	80	0	5.0	2.0	.1	.7	.17	87	67	2	142	7.9	--
Feb. 28, 1961		15				16	6.2	2.4	.8	0.0	80	0	5.0	1.0	.1	.4	.04	90	66	0	140	8.0	0.01
Mar. 13, 1961		17				17	7.3	3.1	.4	0.0	87	0	6.0	1.5	.0	.4	.03	97	72	1	150	7.9	.01
Apr. 10, 1961		14				14	5.3	2.1	.3	0.0	68	0	3.6	1.0	.1	.3	.02	77	56	1	114	8.0	.01
May 1, 1961		12				10	5.8	2.0	.7	0.0	60	0	3.2	.5	.1	.2	.04	71	49	0	103	7.7	.01
June 13, 1961		13				13	5.8	2.3	.6	0.0	71	0	2.8	1.0	.1	.4	.04	74	56	0	120	7.9	.00
July 10, 1961		16				22	7.6	4.1	.9	0.0	106	0	5.2	2.0	.1	.6	.06	115	86	0	179	7.9	.01
Sept. 11, 1961		15				29	9.4	5.9	1.2	.0	136	0	8.0	3.8	.1	.7	.10	138	111	0	228	8.1	.01

ROQUE RIVER BASIN--Continued
14-3723. ROQUE RIVER NEAR AGNESS, ORRG.

LOCATION--Temperature recorder at gaging station, 0.7 mile upstream from Shasta Costa Creek, 1.5 miles north of Agness, Curry County, and 2.4 miles upstream from Illinois River.
DRAINAGE AREA--3 939 square miles.

RECORDS AVAILABLE--Water temperatures: October 1960 to September 1961.

EXTREMES, 1960-61.--Water temperatures: Maximum, 79°F Aug. 3, 10; minimum, 39°F Jan. 3-7.

Temperature (°F) of water, water year October 1960 to September 1961																																	
Month	Day																															Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
October	---	---	---	---	---	---	---	---	60	58	57	56	55	55	54	54	54	54	54	55	55	55	55	56	56	56	56	56	55	55	55	54	---
Maximum	---	---	---	---	---	---	---	---	58	57	56	55	54	54	54	53	53	54	54	55	55	55	55	56	56	56	56	55	55	55	54	---	
Minimum	---	---	---	---	---	---	---	---	55	54	53	52	51	50	49	48	48	49	49	49	49	49	49	49	49	49	49	48	48	48	47	---	
November	55	55	54	53	51	50	50	50	49	49	49	49	49	49	48	48	48	49	49	49	49	48	47	47	47	47	46	45	45	45	---	49	
Maximum	54	54	53	51	50	49	49	49	49	49	48	48	48	48	48	48	49	49	49	49	48	47	47	47	47	46	45	45	45	---	49		
Minimum	---	---	---	---	---	---	---	---	42	40	40	41	41	42	42	42	43	46	47	47	47	45	45	45	44	44	44	43	42	41	---	---	
December	---	---	---	---	---	---	---	---	40	40	40	41	41	42	42	42	42	42	43	46	47	47	45	45	44	44	44	43	42	41	---	---	
Maximum	---	---	---	---	---	---	---	---	40	40	40	41	41	42	42	42	42	42	43	46	47	47	45	45	44	44	44	43	42	41	---	---	
Minimum	---	---	---	---	---	---	---	---	40	40	40	41	41	42	42	42	42	42	43	46	47	47	45	45	44	44	44	43	42	41	---	---	
January	42	41	40	40	39	40	41	43	44	44	44	44	44	44	44	45	46	46	46	46	46	45	44	42	42	44	45	46	47	48	44	44	
Maximum	41	40	39	39	39	39	39	41	42	44	44	44	44	44	44	45	46	46	46	46	46	44	43	42	42	44	45	46	47	48	44	44	
Minimum	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
February	48	49	49	49	49	49	48	48	48	50	50	49	49	49	50	50	49	49	49	48	47	48	48	48	47	47	47	47	47	47	---	48	
Maximum	48	48	49	49	49	48	48	48	48	50	50	49	49	49	50	50	49	49	49	48	47	48	48	48	47	47	47	47	47	47	---	48	
Minimum	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
March	47	47	47	46	46	46	46	46	46	46	46	46	46	47	48	48	48	47	47	47	47	47	47	48	48	48	48	48	50	51	47	47	
Maximum	47	47	47	46	46	46	46	46	46	46	46	46	46	47	48	48	48	47	47	47	47	47	47	48	48	48	48	48	50	51	47	47	
Minimum	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
April	52	53	54	53	52	51	51	52	52	53	53	53	53	53	53	53	55	56	56	54	52	52	50	50	50	52	53	54	56	57	---	53	
Maximum	51	52	53	52	51	51	50	50	51	51	51	52	52	52	52	52	53	55	56	54	52	50	50	49	49	51	52	53	55	56	---	52	
Minimum	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
May	57	56	56	55	54	55	54	55	57	56	54	53	54	55	57	60	63	63	64	63	63	61	60	61	62	62	62	62	60	63	59	60	
Maximum	56	56	55	54	54	54	53	54	56	55	53	53	53	55	57	59	61	62	62	61	61	59	60	59	60	60	60	60	60	60	57	60	
Minimum	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
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August	77	78	79	78	78	78	78	79	78	77	77	77	77	77	76	76	76	76	76	76	75	74	74	73	73	73	73	73	73	72	76	73	
Maximum	73	73	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	75	76	76	74	74	73	73	73	73	70	73	70	
Minimum	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
September	71	71	70	70	70	69	67	67	67	67	67	66	66	64	65	64	64	64	64	64	63	62	62	62	61	60	60	60	59	---	63	65	
Maximum	70	69	68	67	67	66	65	64	64	64	64	63	63	64	65	64	64	64	64	64	63	62	61	60	59	59	58	58	57	---	63	65	
Minimum	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	

ROGUE RIVER BASIN--Continued

14-3770. ILLINOIS RIVER AT KERBY, OREG.

LOCATION.--At gaging station, at Finch Bridge, 0.3 mile downstream from Holton Creek, and 0.5 mile west of Kerby, Josephine County. DRAINAGE AREA.--364 square miles.

RECORDS AVAILABLE.--Chemical analyses: August 1960 to September 1961 (discontinued).

Chemical analyses, in parts per million, August 1960 to September 1961

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (mg)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Ammonium (NH ₄)	Bicarbonate (HCO ₃)	Carboxylate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃	Calcium, magnesium	Non-carbonate	Total hardness	Toxicity (micro-inches at 25°C)	pH	Color	Detergents (ABS)	Turbidity
Aug. 28, 1960	44	20				7.0	13	2.6	0.3	--	88		3.0	2.8	0.1	0.2	0.01		87	72		0		146	7.5	--	0
Sept. 6	34	21				7.0	13	2.6	0.4	--	88		1.4	3.8	0.1	0.1	0.05		85	72		0		145	7.6	--	10
Oct. 10	47	21				7.5	12	2.5	0.3	0.0	85		1.6	2.5	0.1	0.01			84	68		0		139	7.6	--	0
Nov. 15	353	17				5.0	12	2.1	0.2	0.0	75		2.8	2.8	0.1	0.01			76	63		2		127	7.8	--	5
Dec. 6	1,070	17				5.0	10	1.4	0.0	0.0	69		1.6	1.5	0.1	0.03			75	56		0		114	7.9	--	0
Jan. 10, 1961	825	16				6.0	9.6	1.6	0.1	0.0	68		.4	1.8	0.0	0.7	0.01		66	54		0		111	7.9	--	0
Feb. 28	2,080	17				5.5	8.5	1.4	0.4	0.0	61		1.0	1.0	0.1	0.1	0.01		67	48		0		100	7.8	0.00	5
Mar. 13	10,500	15				3.0	7.8	1.2	0.2	0.0	49		1.0	1.8	0.0	0.2	0.01		55	40		0		82	7.8	0.01	45
Apr. 10	1,690	17				6.5	7.2	1.4	0.3	0.1	56		.8	1.0	0.0	0.1	0.01		64	46		0		91	7.7	0.00	0
May 1	2,200	14				4.5	8.1	1.6	0.3	0.0	55		.6	1.2	0.1	0.1	0.01		57	44		0		91	7.8	0.00	0
June 13	508	17				6.5	8.1	1.9	0.3	0.0	62		.4	1.0	0.1	0.2	0.02		67	50		0		104	7.8	0.00	0
July 10	101	19				7.5	11	2.4	0.5	0.0	80		1.8	2.0	0.1	0.4	0.01		81	64		0		128	7.8	0.01	0
Sept. 11	29	20				7.0	14	2.7	0.5	0.0	90		2.8	2.5	0.0	0.2	0.01		86	73		0		147	7.7	0.00	0

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